

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ _{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	2.25	--	1.75	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.21	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	HL-93 (OPERATING)	N/A		2.25	--	1.35	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.16	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	HS-20 (INVENTORY)	36.000	②	2.25	83.52	1.75	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	2.26	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	HS-20 (OPERATING)	36.000		2.25	83.52	1.35	2.25	1	MIDDLE (EXT. WALL) - INSIDE	4.50	2.94	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.70	37.53	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	9.02	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNGARBS2	20.000		2.70	55.60	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	6.49	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNAGRIS2	22.000		2.70	61.16	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	6.05	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNCOTTS3	27.250		2.70	75.76	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.37	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNAGGRS4	34.925		2.70	97.09	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.69	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNS5A	35.550		2.70	98.83	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.64	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		SNS6A	39.950		2.69	111.06	1.40	2.69	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.39	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.70	91.74	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.22	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT4A	33.075		2.70	91.95	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	4.18	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT6A	41.600		2.70	115.65	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.58	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT7A	42.000		2.70	116.76	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.53	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNT7B	42.000		2.70	116.76	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.69	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNAGRIT4	43.000		2.70	119.54	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.33	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
		TNAGT5A	45.000		2.70	125.10	1.40	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.33	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1
TNAGT5B	45.000	③	2.69	125.10	1.40	2.69	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.04	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1		
EMERGENCY VEHICLE (EV)	EV2	28.750		2.70	77.62	1.30	2.70	1	MIDDLE (EXT. WALL) - INSIDE	4.50	5.00	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	
	EV3	43.000	④	2.69	115.67	1.30	2.69	1	MIDDLE (EXT. WALL) - INSIDE	4.50	3.44	1	RIGHT END (BOTT SLAB) - OUTSIDE	12	1	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS		
LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

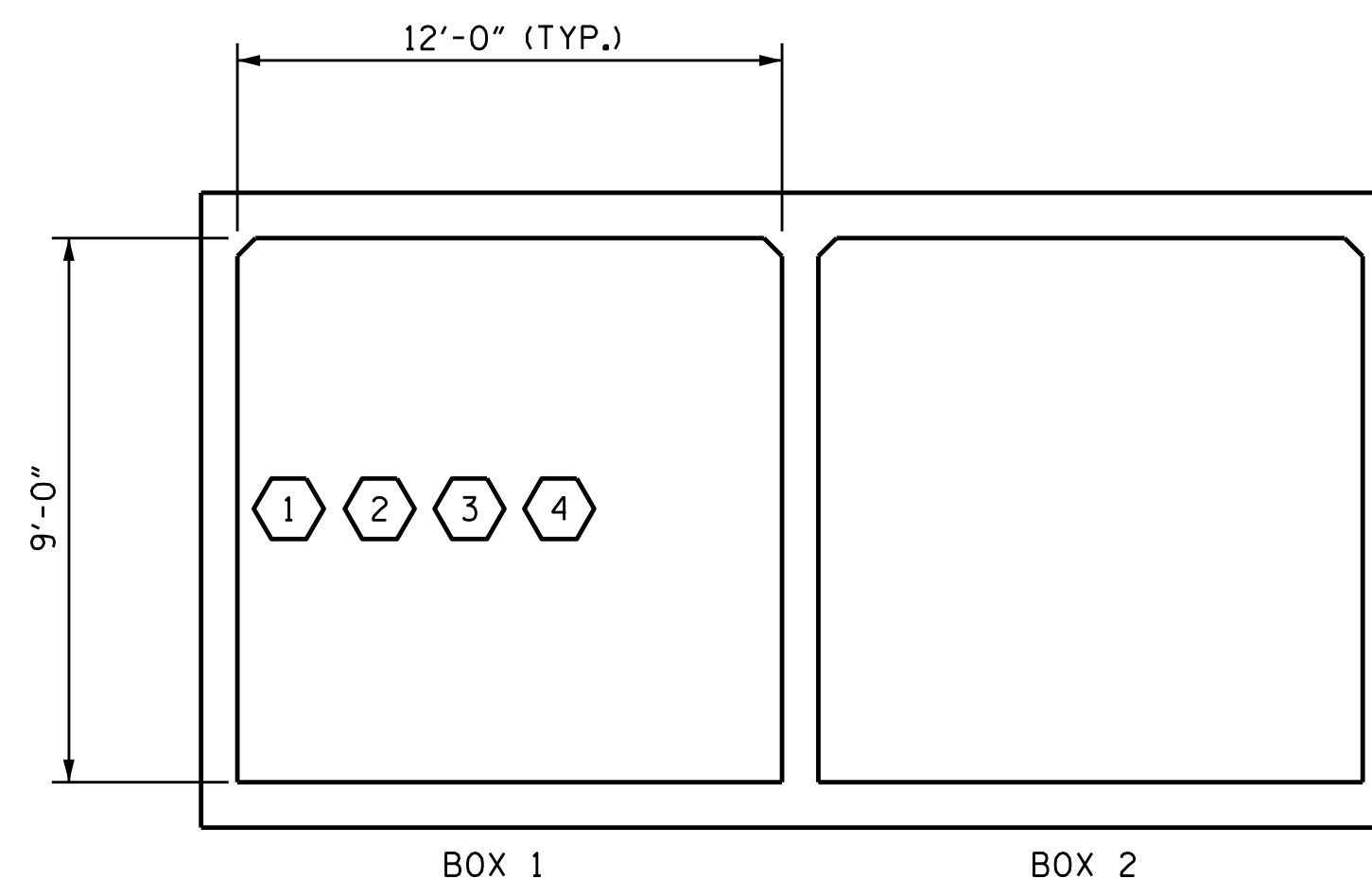
NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1. MAXIMUM FILL CONDITION CONTROLS
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
④	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	

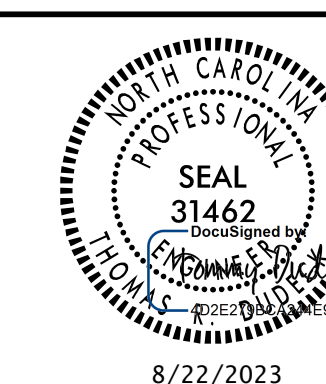


LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. R-3833C
IREDELL COUNTY
 STATION: 36+00.33 -L-

DRAWN BY: J. B. GETLE DATE: 08/01/19
 CHECKED BY: M. B. ISENHOUR DATE: 02/06/20
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 08/22/23

Stantec Consulting Services Inc.
 801 Jones Franklin Road
 Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-02
1			3			TOTAL SHEETS
2			4			16

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