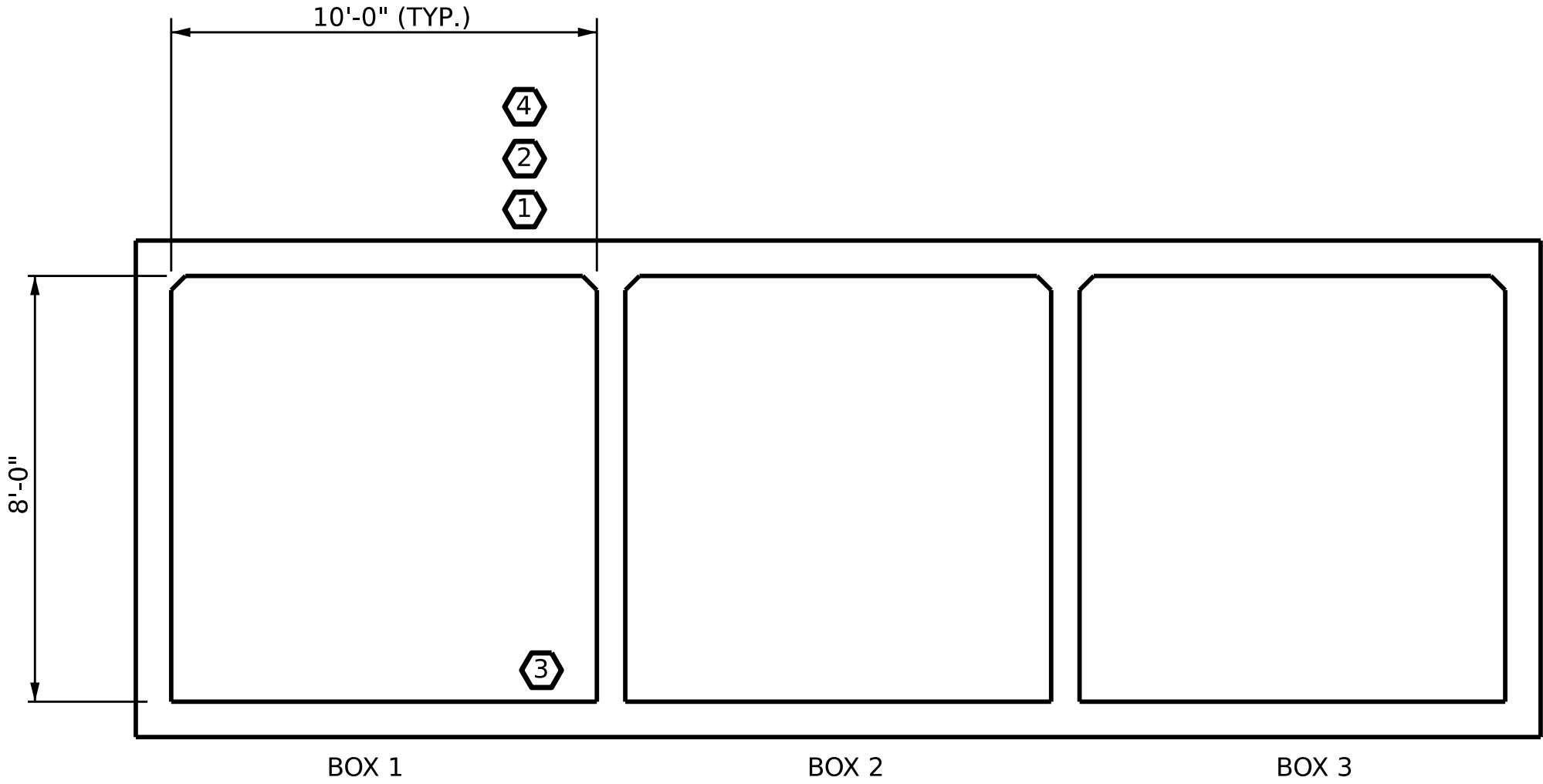


LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS															
LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⬡#	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
						LIVE-LOAD FACTORS (γ LL)	MOMENT				SHEAR				
							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	HL-93 (INVENTORY)	N/A	⬡1	1.27	--	1.75	1.32	1	TOP SLAB	4.93	1.27	1	TOP SLAB	9.40	
	HL-93 (OPERATING)	N/A		1.65	--	1.35	1.71	1	TOP SLAB	4.93	1.65	1	TOP SLAB	9.40	
	HS-20 (INVENTORY)	36.000	⬡2	1.32	47.52	1.75	1.32	1	TOP SLAB	4.93	1.32	1	TOP SLAB	9.40	
	HS-20 (OPERATING)	36.000		1.72	61.92	1.35	1.72	1	TOP SLAB	4.93	1.72	1	TOP SLAB	9.40	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH		2.55	34.43	1.40	2.55	1	TOP SLAB	4.93	2.81	1	TOP SLAB	9.40	
		SNGARBS2		2.38	47.60	1.40	2.38	1	TOP SLAB	4.93	2.63	1	TOP SLAB	9.40	
		SNAGRIS2		2.50	55.00	1.40	2.50	2	TOP SLAB	16.33	2.64	1	BOTTOM SLAB	9.79	
		SNCOTTS3		1.58	43.06	1.40	1.64	1	TOP SLAB	4.93	1.58	1	TOP SLAB	9.40	
		SNAGGRS4		1.67	58.32	1.40	1.71	1	BOTTOM SLAB	10.33	1.67	1	BOTTOM SLAB	9.79	
		SNS5A		1.64	58.30	1.40	1.69	1	BOTTOM SLAB	10.33	1.64	1	BOTTOM SLAB	9.79	
		SNS6A		1.46	58.33	1.40	1.54	1	BOTTOM SLAB	10.33	1.46	1	BOTTOM SLAB	9.79	
		SNS7B		1.40	58.80	1.40	1.47	1	BOTTOM SLAB	10.33	1.40	1	BOTTOM SLAB	9.79	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3		1.78	58.74	1.40	1.86	1	BOTTOM SLAB	10.33	1.78	1	BOTTOM SLAB	9.79	
		TNT4A		1.77	58.54	1.40	1.82	1	TOP SLAB	10.33	1.77	1	BOTTOM SLAB	9.79	
		TNT6A		1.47	61.15	1.40	1.52	1	BOTTOM SLAB	10.33	1.47	1	BOTTOM SLAB	9.79	
		TNT7A		1.47	61.74	1.40	1.57	1	BOTTOM SLAB	10.33	1.47	1	BOTTOM SLAB	9.79	
		TNT7B		1.47	61.74	1.40	1.58	1	BOTTOM SLAB	10.33	1.47	1	BOTTOM SLAB	9.79	
		TNAGRIT4		1.35	58.05	1.40	1.45	1	BOTTOM SLAB	10.33	1.35	1	BOTTOM SLAB	9.79	
		TNAGT5A		1.26	56.70	1.40	1.36	1	BOTTOM SLAB	10.33	1.26	1	BOTTOM SLAB	9.79	
		TNAGT5B	⬡3	1.25	56.25	1.40	1.36	1	BOTTOM SLAB	10.33	1.25	1	BOTTOM SLAB	9.79	
EMERGENCY VEHICLE (EV)	EV2		1.80	51.75	1.30	1.80	1	TOP SLAB	4.93	1.99	1	TOP SLAB	9.40		
	EV3		⬡4	1.38	59.34	1.30	1.39	1	TOP SLAB	4.93	1.38	1	TOP SLAB	9.40	



LRFR SUMMARY
(LOOKING DOWNSTREAM)

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	--

NOTES:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATES.

COMMENTS:

-
-
-
-

⬡#	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	

PROJECT NO. HN-0031
TRANSYLVANIA COUNTY
STATION: 16+45.00 -L-

SHEET 2 OF 12

ASSEMBLED BY:	ZCS	DATE :	1/26
CHECKED BY :	MGC	DATE :	2/26
DRAWN BY :	WMC	7/11	REV. 10/1/11
CHECKED BY :	GM	7/11	REV. 12/17
		REV. 04/23	MAA/GM
			MAA/THC
			BNB/AAI

4/22/2026

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

**LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS**

(NON-INTERSTATE TRAFFIC)

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	
1			3	C-2
2			4	
TOTAL SHEETS				12