

**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 | | | |
|--------------------|------------------------|-----------------------------------|---------------------------------|-----------------------------------|---------------|---------------------------|---------------|---------|--------------|----------------------------------------|------------------|---------|--------------|----------------|----------------------------------------|-------|--|
| | | | | | | LIVE-LOAD FACTORS (LL) | RATING FACTOR | BOX NO. | MOMENT | | | | SHEAR | | | | |
| | | | | | | | | | 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 | 1.37 | -- | 1.75 | 1.42 | 1 | TOP SLAB | 5.70 | 1.37 | 1 | BOTTOM SLAB | 11.67 | | | |
| | HL-93 (OPERATING) | N/A | | 1.78 | -- | 1.35 | 1.84 | 1 | TOP SLAB | 5.70 | 1.78 | 1 | BOTTOM SLAB | 11.67 | | | |
| | HS-20 (INVENTORY) | 36.000 | ② | 1.37 | 49.35 | 1.75 | 1.93 | 1 | TOP SLAB | 5.38 | 1.37 | 1 | BOTTOM SLAB | 11.67 | | | |
| | HS-20 (OPERATING) | 36.000 | | 1.78 | 63.98 | 1.35 | 2.50 | 1 | TOP SLAB | 5.38 | 1.78 | 1 | BOTTOM SLAB | 11.67 | | | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 3.33 | 44.91 | 1.40 | 3.51 | 1 | TOP SLAB | 5.38 | 3.33 | 1 | TOP SLAB | 11.56 | | |
| | | SNGARBS2 | 20.000 | | 3.02 | 60.46 | 1.40 | 3.29 | 1 | TOP SLAB | 5.38 | 3.02 | 1 | TOP SLAB | 11.56 | | |
| | | SNAGRIS2 | 22.000 | | 2.79 | 61.28 | 1.40 | 3.19 | 1 | BOT. CORNER WALL | 9.73 | 2.79 | 1 | BOTTOM SLAB | 11.67 | | |
| | | SNCOTTS3 | 27.250 | | 1.78 | 48.57 | 1.40 | 1.78 | 1 | TOP SLAB | 5.38 | 1.93 | 1 | TOP SLAB | 11.56 | | |
| | | SNAGGRS4 | 34.930 | | 1.77 | 61.82 | 1.40 | 2.10 | 1 | TOP SLAB | 5.38 | 1.77 | 1 | BOTTOM SLAB | 11.67 | | |
| | | SNS5A | 35.550 | | 1.75 | 62.27 | 1.40 | 1.97 | 1 | TOP SLAB | 5.70 | 1.75 | 1 | BOTTOM SLAB | 11.67 | | |
| | | SNS6A | 39.950 | | 1.56 | 62.41 | 1.40 | 1.96 | 1 | TOP SLAB | 5.70 | 1.56 | 1 | BOTTOM SLAB | 11.67 | | |
| | | SNS7B | 42.000 | | 1.48 | 62.14 | 1.40 | 2.03 | 1 | TOP SLAB | 5.38 | 1.48 | 1 | BOTTOM SLAB | 11.67 | | |
| | | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.87 | 61.85 | 1.40 | 2.70 | 1 | BOT. CORNER WALL | 9.73 | 1.87 | 1 | BOTTOM SLAB | 11.67 | |
| | TNT4A | | 33.080 | | 1.88 | 62.06 | 1.40 | 2.12 | 1 | TOP SLAB | 5.38 | 1.88 | 1 | BOTTOM SLAB | 11.67 | | |
| | TNT6A | | 41.600 | | 1.49 | 62.03 | 1.40 | 2.13 | 1 | TOP SLAB | 5.38 | 1.49 | 1 | BOTTOM SLAB | 11.67 | | |
| | TNT7A | | 42.000 | | 1.52 | 63.69 | 1.40 | 2.22 | 2 | BOTTOM SLAB | 0.95 | 1.52 | 1 | BOTTOM SLAB | 11.67 | | |
| | TNT7B | | 42.000 | | 1.52 | 63.95 | 1.40 | 2.02 | 1 | TOP SLAB | 5.38 | 1.52 | 1 | BOTTOM SLAB | 11.67 | | |
| | TNAGRIT4 | | 43.000 | | 1.45 | 62.48 | 1.40 | 2.03 | 1 | TOP SLAB | 5.38 | 1.45 | 1 | BOTTOM SLAB | 11.67 | | |
| | TNAGT5A | | 45.000 | | 1.39 | 62.65 | 1.40 | 2.03 | 2 | BOTTOM SLAB | 11.72 | 1.39 | 1 | BOTTOM SLAB | 11.67 | | |
| | TNAGT5B | | 45.000 | ③ | 1.39 | 62.64 | 1.40 | 2.04 | 1 | BOTTOM SLAB | 11.72 | 1.39 | 1 | BOTTOM SLAB | 11.67 | | |
| | EMERGENCY VEHICLE (EV) | | EV2 | 28.750 | | 2.30 | 66.15 | 1.30 | 2.48 | 1 | TOP SLAB | 5.38 | 2.30 | 1 | BOTTOM SLAB | 11.67 | |
| | | EV3 | 43.000 | ④ | 1.54 | 66.21 | 1.30 | 1.54 | 1 | TOP SLAB | 5.70 | 1.54 | 1 | BOTTOM SLAB | 11.67 | | |

LOAD FACTORS:

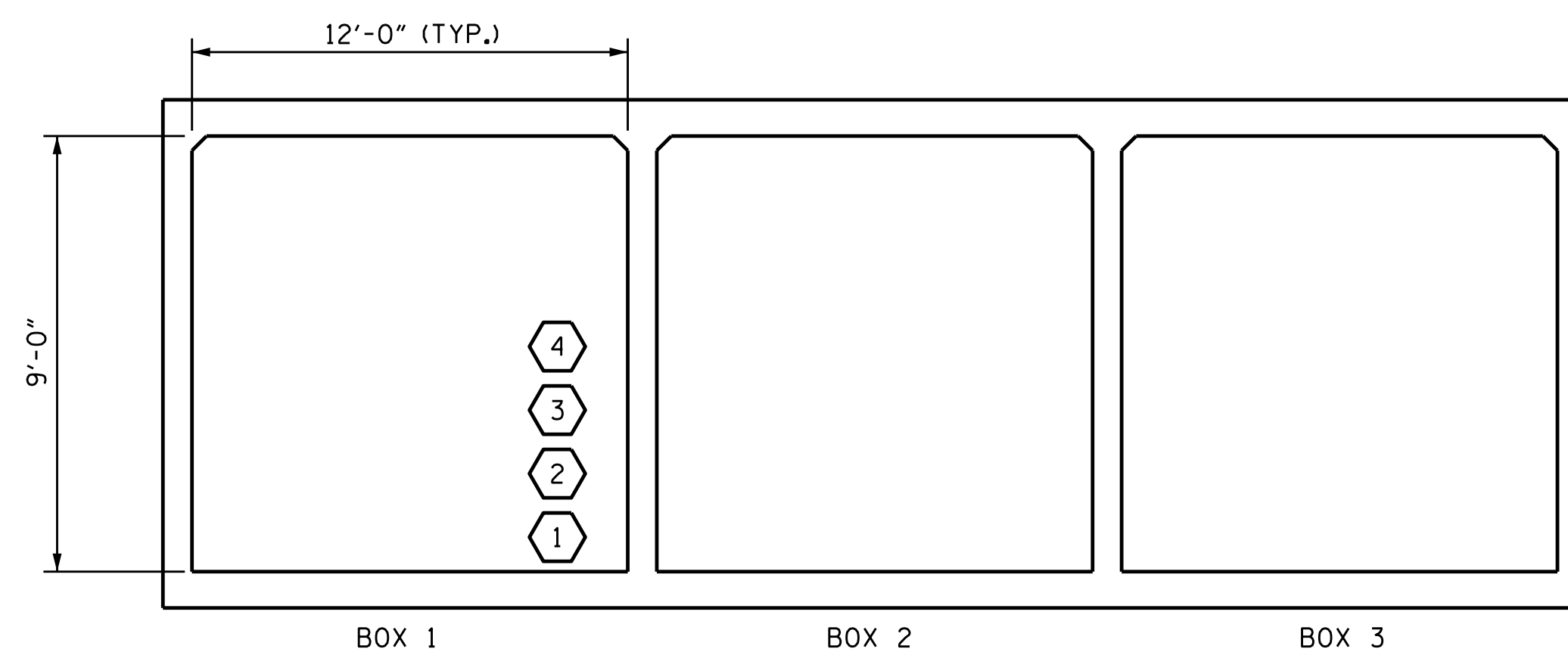
DESIGN LOAD RATING FACTORS

| 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.

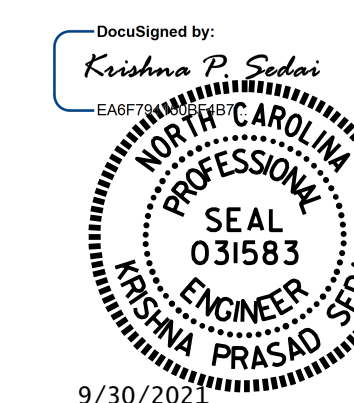
| | |
|-------------------------------|-------------------------------|
| ① | CONTROLLING LOAD RATING |
| ① | DESIGN LOAD RATING (HL-93) |
| ② | DESIGN LOAD RATING (HS-20) |
| ③ | LEGAL LOAD RATING ** |
| ④ | EMERGENCY VEH. LOAD RATING ** |
| ** SEE CHART FOR VEHICLE TYPE | |



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. BR-0035
MOORE COUNTY
 STATION: 23+12.00 -L-

SHEET 2 OF 8



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS**
 (NON-INTERSTATE TRAFFIC)

DRAWN BY : A. SORSENGINH DATE : 08/2021
 CHECKED BY : M. G. SHAIKH DATE : 08/2021
 DESIGN ENGINEER OF RECORD: A. YASMEEN DATE : 08/2021

30-SEP-2021 07:58
 K:\Structures\Final Plans\411.005.BR-0035.SMU.CU.002.620024.dgn
 ksedai

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | C-2 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 8 |

STD. NO. LRFR5