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# LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

| LEVEL | | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING (#) | MINIMUM RATING FACTORS (RF) | TONS = W × RF | STRENGTH I LIMIT STATE | | | | | | | | | | | SERVICE III LIMIT STATE | | | | | | COMMENT NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MOMENT | | | | | SHEAR | | | | | | MOMENT | | | | | |
| | | | | | | | LIVE-LOAD FACTORS $\gamma_{(LL)}$ | 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) | LIVE-LOAD FACTORS $\gamma_{(LL)}$ | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | | HL-93 (INVENTORY) | N/A | 1 | 1.17 | -- | 1.75 | 0.930 | 1.18 | B | EL | 44.9 | 0.930 | 1.26 | B | EL | 26.7 | 0.80 | 0.930 | 1.17 | A | EL | 44.4 | |
| | | HL-93 (OPERATING) | N/A | | 1.53 | -- | 1.35 | 0.930 | 1.53 | B | EL | 44.9 | 0.930 | 2.13 | B | EL | 81.4 | N/A | -- | -- | -- | -- | -- | |
| | | HS-20 (INVENTORY) | 36.000 | 2 | 1.35 | 48.60 | 1.75 | 0.930 | 1.53 | D | EL | 27.2 | 0.930 | 1.91 | D | EL | 38.3 | 0.80 | 0.930 | 1.35 | B | EL | 44.9 | |
| | | HS-20 (OPERATING) | 36.000 | | 1.99 | 71.64 | 1.35 | 0.930 | 1.99 | D | EL | 27.2 | 0.930 | 2.79 | D | EL | 43.9 | N/A | -- | -- | -- | -- | -- | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 3.18 | 42.93 | 1.40 | 0.930 | 4.13 | D | EL | 27.2 | 0.930 | 6.60 | D | EL | 43.9 | 0.80 | 0.930 | 3.18 | B | EL | 44.9 | |
| | | SNGARBS2 | 20.000 | | 2.31 | 46.20 | 1.40 | 0.930 | 3.15 | D | EL | 27.2 | 0.930 | 4.80 | D | EL | 43.9 | 0.80 | 0.930 | 2.31 | B | EL | 44.9 | |
| | | SNAGRIS2 | 22.000 | | 2.17 | 47.74 | 1.40 | 0.930 | 3.00 | D | EL | 27.2 | 0.930 | 4.50 | D | EL | 43.9 | 0.80 | 0.930 | 2.17 | B | EL | 44.9 | |
| | | SNCOTTS3 | 27.250 | | 1.63 | 44.42 | 1.40 | 0.930 | 2.03 | D | EL | 27.2 | 0.930 | 3.12 | D | EL | 43.9 | 0.80 | 0.930 | 1.63 | D | EL | 27.2 | |
| | | SNAGGRS4 | 34.925 | | 1.30 | 45.40 | 1.40 | 0.930 | 1.74 | D | EL | 27.2 | 0.930 | 2.54 | D | EL | 43.9 | 0.80 | 0.930 | 1.30 | B | EL | 44.9 | |
| | | SNS5A | 35.550 | | 1.30 | 46.22 | 1.40 | 0.930 | 1.70 | D | EL | 27.2 | 0.930 | 2.67 | B | EL | 17.5 | 0.80 | 0.930 | 1.30 | B | EL | 44.9 | |
| | | SNS6A | 39.950 | | 1.27 | 50.74 | 1.40 | 0.930 | 1.57 | D | EL | 27.2 | 0.930 | 2.49 | D | EL | 43.9 | 0.80 | 0.930 | 1.27 | D | EL | 27.2 | |
| | | SNS7B | 42.000 | | 1.20 | 50.40 | 1.40 | 0.930 | 1.49 | D | EL | 27.2 | 0.930 | 2.49 | D | EL | 43.9 | 0.80 | 0.930 | 1.20 | D | EL | 27.2 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.41 | 46.53 | 1.40 | 0.930 | 1.93 | D | EL | 27.2 | 0.930 | 2.90 | B | EL | 72.3 | 0.80 | 0.930 | 1.41 | B | EL | 44.9 | |
| | | TNT4A | 33.075 | | 1.41 | 46.64 | 1.40 | 0.930 | 1.93 | D | EL | 27.2 | 0.930 | 2.82 | D | EL | 43.9 | 0.80 | 0.930 | 1.41 | B | EL | 44.9 | |
| | | TNT6A | 41.600 | | 1.15 | 47.84 | 1.40 | 0.930 | 1.59 | D | EL | 27.2 | 0.930 | 2.51 | B | EL | 81.4 | 0.80 | 0.930 | 1.15 | B | EL | 44.9 | |
| | | TNT7A | 42.000 | | 1.15 | 48.30 | 1.40 | 0.930 | 1.61 | D | EL | 27.2 | 0.930 | 2.46 | B | EL | 8.4 | 0.80 | 0.930 | 1.15 | B | EL | 44.9 | |
| | | TNT7B | 42.000 | | 1.18 | 49.56 | 1.40 | 0.930 | 1.68 | D | EL | 27.2 | 0.930 | 2.33 | B | EL | 17.5 | 0.80 | 0.930 | 1.18 | B | EL | 44.9 | |
| | | TNAGRIT4 | 43.000 | | 1.13 | 48.59 | 1.40 | 0.930 | 1.59 | D | EL | 27.2 | 0.930 | 2.23 | D | EL | 38.3 | 0.80 | 0.930 | 1.13 | B | EL | 44.9 | |
| | | TNAGT5A | 45.000 | | 1.07 | 48.15 | 1.40 | 0.930 | 1.49 | D | EL | 27.2 | 0.930 | 2.18 | B | EL | 72.3 | 0.80 | 0.930 | 1.07 | B | EL | 44.9 | |
| | | TNAGT5B | 45.000 | 3 | 1.06 | 47.70 | 1.40 | 0.930 | 1.47 | D | EL | 27.2 | 0.930 | 1.96 | D | EL | 38.3 | 0.80 | 0.930 | 1.06 | B | EL | 44.9 | 1 |

## LOAD FACTORS:

| DESIGN LOAD RATING FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|---|---|---|---|
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

## NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

EXISTING GIRDERS ARE NOT INCLUDED IN THIS LRFR SUMMARY.

## COMMENTS:

1. THE CONTROLLING RATING FACTOR OCCURS AT SPAN B, EXTERIOR GIRDER.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

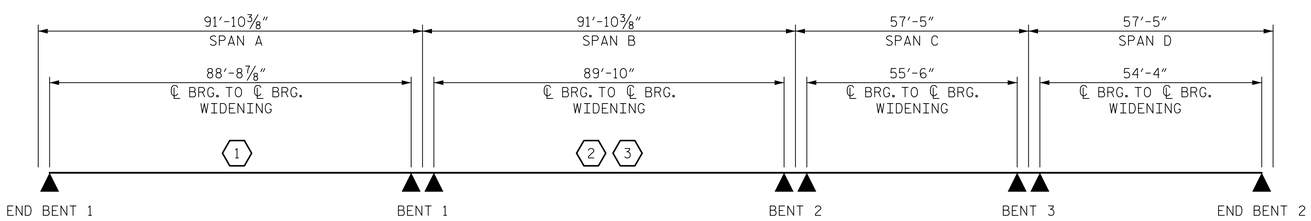
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER




## LRFR SUMMARY

PROJECT NO. U-5748
WAKE COUNTY
STATION: 24+88.00 -L-

AECOM
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NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison 2/10/2023
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S2-05 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 119 |

STD. NO. LRFR1

| | |
|---|---|
| ASSEMBLED BY : D.R. DRUM | DATE : 05/2021 |
| CHECKED BY : J.C. MORRISON | DATE : 05/2021 |
| DRAWN BY : MAA 1/08 | REV. 11/12/08RR MAA/GM |
| CHECKED BY : GM/DI 2/08 | REV. 10/1/11 MAA/GM |
| | REV. 12/17 MAA/THC |

DATE: 2/9/2023
TIME: 12:59:22 PM
USER: caterm
DGN: pw:\\aecom-na-pw.bentley.com:AECOM_DS21_NA_2020\Documents\60609754-U-5748 Ligon Mill\900-CAD GIS\910_CAD\70_NCDOT_TIP\Structures\04 Drawings\402_011_U-5748_SMU_LRFR_S2-05_910131