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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 | 1.33 | -- | 1.75 | 0.770 | 1.60 | A | E | 42.08 | 1.010 | 1.33 | B | I | 73.36 | 0.80 | 0.710 | 1.41 | A | I | 42.08 | |
| | | HL-93 (OPERATING) | N/A | | 1.41 | -- | 1.35 | 0.770 | 2.07 | A | E | 45.58 | 1.010 | 1.76 | B | I | 73.36 | N/A | -- | -- | -- | -- | -- | |
| | | HS-20 (INVENTORY) | 36.000 | 2 | 1.74 | 62.640 | 1.75 | 0.770 | 2.15 | A | E | 45.58 | 1.010 | 1.74 | B | I | 73.36 | 0.80 | 0.710 | 1.90 | A | I | 42.08 | |
| | | HS-20 (OPERATING) | 36.000 | | 1.90 | 68.400 | 1.35 | 0.770 | 2.78 | A | E | 45.58 | 1.010 | 2.29 | B | I | 73.36 | N/A | -- | -- | -- | -- | -- | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 4.40 | 59.400 | 1.40 | 0.770 | 6.22 | A | E | 45.58 | 1.010 | 5.51 | B | I | 73.36 | 0.80 | 0.710 | 4.40 | A | I | 42.08 | |
| | | SNGARBS2 | 20.000 | | 3.23 | 64.600 | 1.40 | 0.770 | 4.56 | A | E | 45.58 | 1.010 | 3.86 | B | I | 73.36 | 0.80 | 0.710 | 3.23 | A | I | 42.08 | |
| | | SNAGRIS2 | 22.000 | | 3.04 | 66.880 | 1.40 | 0.770 | 4.29 | A | E | 45.58 | 1.010 | 3.56 | A | I | 73.36 | 0.80 | 0.710 | 3.04 | A | I | 42.08 | |
| | | SNCOTTS3 | 27.250 | | 2.19 | 59.678 | 1.40 | 0.770 | 3.09 | A | E | 45.58 | 1.010 | 2.68 | B | I | 73.36 | 0.80 | 0.710 | 2.19 | A | I | 42.08 | |
| | | SNAGGRS4 | 34.925 | | 1.81 | 63.214 | 1.40 | 0.770 | 2.56 | A | E | 45.58 | 1.010 | 2.19 | B | I | 73.36 | 0.80 | 0.710 | 1.81 | A | I | 42.08 | |
| | | SNS5A | 35.550 | | 1.77 | 62.924 | 1.40 | 0.770 | 2.50 | A | E | 45.58 | 1.010 | 2.21 | B | I | 73.36 | 0.80 | 0.710 | 1.77 | A | I | 42.08 | |
| | | SNS6A | 39.950 | | 1.62 | 64.719 | 1.40 | 0.770 | 2.29 | A | E | 45.58 | 1.010 | 2.00 | B | I | 73.36 | 0.80 | 0.710 | 1.62 | A | I | 42.08 | |
| | | SNS7B | 42.000 | | 1.54 | 64.680 | 1.40 | 0.770 | 2.18 | A | E | 45.58 | 1.010 | 1.95 | B | I | 73.36 | 0.80 | 0.710 | 1.54 | A | I | 42.08 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.97 | 65.010 | 1.40 | 0.770 | 2.78 | A | E | 45.58 | 1.010 | 2.40 | B | I | 73.36 | 0.80 | 0.710 | 1.97 | A | I | 42.08 | |
| | | TNT4A | 33.075 | | 1.98 | 65.489 | 1.40 | 0.770 | 2.79 | A | E | 45.58 | 1.010 | 2.35 | A | I | 73.36 | 0.80 | 0.710 | 1.98 | A | I | 42.08 | |
| | | TNT6A | 41.600 | | 1.61 | 66.976 | 1.40 | 0.770 | 2.27 | A | E | 45.58 | 1.010 | 2.07 | B | I | 73.36 | 0.80 | 0.710 | 1.61 | A | I | 42.08 | |
| | | TNT7A | 42.000 | | 1.61 | 67.620 | 1.40 | 0.770 | 2.28 | A | E | 45.58 | 1.010 | 2.03 | B | I | 73.36 | 0.80 | 0.710 | 1.61 | A | I | 42.08 | |
| | | TNT7B | 42.000 | | 1.66 | 69.720 | 1.40 | 0.770 | 2.34 | A | E | 45.58 | 1.010 | 1.91 | A | I | 73.36 | 0.80 | 0.710 | 1.66 | A | I | 42.08 | |
| | | TNAGRIT4 | 43.000 | | 1.59 | 68.370 | 1.40 | 0.770 | 2.24 | A | E | 45.58 | 1.010 | 1.84 | B | I | 73.36 | 0.80 | 0.710 | 1.59 | A | I | 42.08 | |
| | | TNAGT5A | 45.000 | | 1.50 | 67.500 | 1.40 | 0.770 | 2.12 | A | E | 45.58 | 1.010 | 1.82 | A | I | 73.36 | 0.80 | 0.710 | 1.50 | A | I | 42.08 | |
| | | TNAGT5B | 45.000 | 3 | 1.48 | 66.600 | 1.40 | 0.770 | 2.10 | A | E | 45.58 | 1.010 | 1.75 | B | I | 73.36 | 0.80 | 0.710 | 1.48 | A | I | 42.08 | |
| EMERGENCY VEHICLE (EV) | | EV2 | 28.750 | | 2.28 | 65.550 | 1.30 | 0.770 | 3.47 | A | E | 42.08 | 1.010 | 2.98 | A | I | 67.76 | 0.80 | 0.710 | 2.28 | A | I | 42.08 | |
| | | EV3 | 43.000 | 4 | 1.50 | 64.500 | 1.30 | 0.770 | 2.28 | A | E | 42.08 | 1.010 | 1.97 | A | I | 67.76 | 0.80 | 0.710 | 1.50 | A | I | 42.08 | |

## LOAD FACTORS:

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

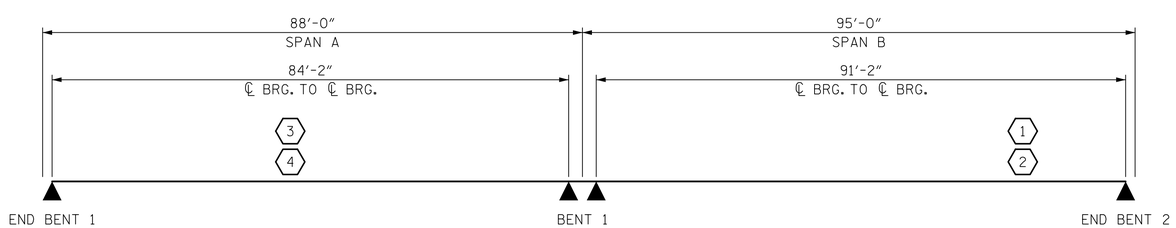
## NOTES:

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.

## 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 |
| **GIRDER LOCATION** |
| I - INTERIOR GIRDER |
| E - EXTERIOR GIRDER |




LRFR SUMMARY

PROJECT NO. B-4654

WAKE COUNTY

STATION: 22+71.80 -L-

AECOM
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 030474 ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison 9F23075CFC8F4F... 8/24/2023

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: | S-04 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 49 |

STD. NO. LRFR1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | |
|---|---|
| ASSEMBLED BY : K. MUENCH | DATE : 05/2022 |
| CHECKED BY : J.C. MORRISON | DATE : 05/2022 |
| 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: 8/24/2023
TIME: 8:23:59 AM
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DGN: \\bzdcomet.com\fs\AMER\Raleigh-USRAL3\Legacy\Projects\60435695_B-4654\900_Work\90_CAD\70_NCDOT_TIP\Structures\04_Drawings\2022_Updates\400_07_S04_B4654_SM0_LRFR.dgn