

MDX Input

BRIDGE 69801 J, K, L, M, & N
Girder System : Input File : Layout/Slab/Loading Definition

ID: BRIDGE 69801 J, K, L, M, & N
CONDITIONS

APPLY IMPACT AT AXLE LOCATION
AVERAGE SPANS FOR REACTION IMPACT
ENGLISH INPUT
ENGLISH OUTPUT
GRID MODEL
HS20 LOADING
LFD METHOD
LOW RESOLUTION MESH
RATE MODE
RATING PROJECT
SELF WEIGHT FOR DEAD LOAD 1

DATA

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BRINCD 1 87 2 88 3 89 4 90 5 91 6 92 7 93 8 94 9 95 10 96 11 97 12 98
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✓ RAM 1/30/10

[illegible]

✓ RAM 1/20/10

[illegible]

✓ RAM 1/20/10

[illegible][illegible][illegible][illegible]

WCONC 150.

[illegible][illegible]

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1.196 1.181 1.167 1.154 1.143 1.133

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1.515 1.487 1.463 1.437 1.414 2.092 2.066 1.607 1.594 1.584 1.577
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1.549 1.564 1.555 1.545 1.535 1.525 1.515 1.58 1.646 1.711 1.777 1.842
1.806 1.769 1.733 1.696 1.658 1.621 1.583 1.546 1.507 1.469 1.457
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✓ RAM = 13/10

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✓ RAM 1/20/10
✓ RAM 5/3/10

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1.505 1.492 1.482 1.476 1.469 1.457 1.444 1.431 1.418 1.406 1.419
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WPS-2 1.286 1.286 1.286 1.286 1.286 1.286 1.286 1.286 1.286 1.286 1.286
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WPS-3 1.681 1.674 1.668 1.662 1.655 1.649 1.642 1.636 1.629 1.623
2.031 2.122 2.208 2.289 2.365 2.437 2.272 2.112 1.957 1.806 1.66 1.728
2.24 2.316 2.387 2.45 2.276 2.106 1.942 1.782 2.17 2.146 2.119 2.09
2.058 2.023 1.93 1.844 1.762 1.686 1.539 1.588 1.561 1.538 1.515 1.495
1.476 1.459 1.443 1.429 1.416
WPS-4 1.278 1.278 1.278 1.278 1.278 1.278 1.278 1.278 1.278 1.278 1.278
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2.272 2.112 1.957 1.806 1.66 1.728 2.24 2.316 2.387 2.45 2.276 2.106
1.942 1.782 1.628
WPS-5 1.25 1.234 1.229 1.226 1.225 1.226 1.208 1.193 1.181 1.171 1.165
1.184 1.207 1.234 1.265 1.299 1.33 1.364 1.4 1.437 1.475 1.511 1.548
1.173 1.176 1.18 1.179 1.18 1.181 1.182 1.185 1.199 1.213 1.228 1.243
1.323 1.425 1.517 1.597 1.2 1.196 1.249 1.302 1.355 1.457 1.561 1.571
1.571 1.564 1.549 1.501 1.479 1.455 1.43 1.405 1.379 1.376 1.373 1.37

1.366 1.362 1.384 1.405 1.427 1.449 1.47 1.466 1.462 1.457 1.444 1.431
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2.445 2.28 2.119 1.964 1.813 1.664 1.677 1.691 1.704 1.719 1.732 1.744
1.758 1.771 1.784 1.796

WPS-6 1.553 1.56 1.569 1.578 1.586 1.596 1.606 1.616 1.625 1.634 1.641
1.798 1.58 1.723 1.874 2.032 2.058 2.084 2.109 2.134 1.668 1.591 1.574
1.557 1.54 1.521 1.491 1.459 1.427 1.395 1.36 1.423 1.487 1.551 1.617
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1.741 2.254 2.331 2.403 2.467 2.292 2.121 1.956 1.795 2.183 2.159
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1.515 1.487 1.463 1.437 1.414 2.092 2.066 1.607 1.594 1.584 1.577
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WPS-7 1.765 1.341 1.364 1.387 1.413 1.439 1.451 1.465 1.479 1.492
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1.576 1.719 1.869 2.027 2.028 2.027 2.024 2.018 1.557 1.541 1.496
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1.648 1.699 1.738 1.778 1.817 1.856 1.895 1.83 1.764 1.699 1.634 1.568
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WPS-8 1.359 1.486 1.619 1.757 1.901 2.053 2.043 2.032 2.018 2.001
1.609 1.346 1.329 1.308 1.283 1.255 1.269 1.281 1.291 1.3 1.308 1.342
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GO

BRIDGE 69801 J, K, L, M, & N
Girder 1 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N
CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS ONE SIDE OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BCOVB 11. 11. 11.
BCOVSP 51.487 16. 58.359 16. 683.946 12.
BCOVT 0.75 0.75 0.625
BR 14.864 14.8765 14.886 14.8737 14.8372 14.89 14.8609 14.8921 14.8465
14.8825 14.8696 14.866 13.2569 3.327 8.2294 12.4245 12.4567 12.4623
12.4368 12.4498 12.4605 12.447 12.4334 12.4558 11.6546 11.6529 11.6304
11.6147 11.6616 11.6184 11.6351 11.6535 11.6123 11.6324 11.6532
11.6438 11.9181 11.9414 11.9338 11.9276 11.9222 11.9482 11.9134
10.5664 10.5646 10.5633 10.5939 7.0313 3.3438 6.3127 16.1587 16.1313
16.1686 16.1457 16.1563 16.1108 16.1028 16.0999 16.0691 16.1074 6.9606
2.0585 12.0471 12.9989 13.0156 12.9976 13.0223 16.1042 16.1097 16.1069
16.0944 16.0551 16.0397 16.0364 16.0553 17.0699 17.0963 17.0582 4.8514
2.0703 9.6345 10.6539 10.6331 10.6362 10.645
BSPL 193.331 8.417 94.533 9. 20. 6. 113.653 27. 72.501 3. 4. 37.971
68.761 10. 20. 10. 68.542 78.082 38.412 7. 12. 52.177 12. 51.149
COMSPC 0.1 1.9 42.487 30. 44.359 30. 42.485 16.917 74.033 63. 85.653
59. 36.501 25. 35.971 18.042 52.719 40. 52.501 18.04 50.082 30. 34.412
26. 38.177 27. 27.237 17.911 49.209 2.
ESLABW 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 102. 102. 102.
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90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 89.7 86.57 81.18 75.24 68.75
61.72 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
FILLET 1.
FPC 4.
HINGE 193.331 396.076 177.303 250.82
IGIRD 1
LLDLIM 800
RAD 811.511 811.511 811.511 811.511 811.511 811.511 811.511 811.511 811.511
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SLABT 8. 8. 8. 9. 9. 9. 9. 8. 8. 8. 8. 8. 8. 8. 8.

SLABWEAR 0.5
SPL 193.331 8.417 111.033 5. 134.653 5. 79.001 11. 125.732 10. 73.001
5. 5.542 78.082 38.412
SPLBFT 0.94 0.875 0.875 1.5 2.25 1.375 0.875 1.75 0.875 0.875
0.875 0.75 1.5 1.5 2. 1.5 1.5 1.1 0.794 1. 1.375 1. 1.375 1. 1.75
SPLBFW 11.972 12. 18. 18. 18. 18. 18. 18. 18. 12. 12. 12. 12. 12.
12. 12. 12.027 11.945 12. 12. 12. 12. 12.
SPLTFT 0.94 0.875 0.875 1.5 2.25 1.375 0.875 1.75 0.875 0.875
0.875 0.625 0.75 1.375 2. 1.5 0.875 1.1 0.794 0.625 1.375 0.625
1.375 0.625 0.75
SPLTFW 11.972 12. 18. 18. 18. 18. 18. 18. 18. 18. 12. 12. 12. 12.
12. 12. 12.027 11.945 12. 12. 12. 12. 12.
SPLTST 0.5
SPLTSW 7.
SPLWT 0.625 0.5 0.5 1. 0.5 1. 0.5 0.5 0.4375 0.5 0.4375 0.75
0.75 0.68 0.598 0.375
SPN 59.5001 74.3268 69.4314 112.0268 139.6629 83.5048 58.976 80.7607
80.49 73.1005 64.4153 64.1865 51.2244 59.1247
SS 1.
STFGAP 0.
SUPBST 0.5 0.625 0.625 0.75 1. 1. 0.75 0.5 1. 1. 1. 0.5 0.5
0.5 0.5
SUPBSW 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 5.
TCOV 11. 11. 11.
TCOVSP 51.487 16. 58.359 16. 683.946 12.
TCOVT 0.75 0.75 0.625
TSLABW 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 152. 152. 152. 152.
152. 152. 152. 152. 152. 152. 152. 152. 152. 152. 152. 152. 152.
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152. 152. 152. 152. 152. 152. 152. 152. 152. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 97.8
96.96 95.88 94.92 94.92 94.92 95.28 95.28 94.92 93.36 91.8 89.76 87.24
84.6 81.6 78.36 74.88 101.28 100.2 99.24 98.64 98.28 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98.
TSPL 193.331 8.417 94.533 9. 20. 6. 113.653 27. 72.501 3. 4. 37.971
68.761 10. 20. 10. 68.542 78.082 38.412 7. 12. 52.177 12. 51.149
TSSP 178.344 178.5 178.5 356.808 178.5 178.5 178.5 356.82 178.5 178.5
159. 39.996 173.196 74.7 74.688 74.688 74.688 74.688 74.688 74.688
74.688 74.688 74.688 74.688 33.72 74.688 40.968 74.688 74.688 74.688
144.672 69.984 69.816 69.816 47.544 61.032 31.044 69.816 69.816 69.816
69.816 69.816 69.816 69.816 69.816 69.816 69.816 69.816 42.252
69.816 27.564 69.816 69.816 69.816 141.408 71.592 71.592 71.592
143.184 143.184 143.184 143.184 269.772 126.876 126.876 126.876 84.648
39.996 269.64 193.752 193.752 193.752 387.492 193.068 193.068 193.068
276.564 24.996 144.252 156.168 156.192 156.192 349.38 193.188 193.248
385.932 192.504 192.504 397.344 204.996 262.932 24.996 115.62 127.692
127.692 127.692
WCONC 150.
WEBSP 193.331 8.417 255.686 79.001 224.729 5.542 304.03
WEBV 33.96 33.96 78. 78. 42. 42. 33.96 33.96

GO

BRIDGE 69801 J, K, L, M, & N
Girder 2 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N

CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS BOTH SIDES OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
ROLLED SHAPES GIRDER
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES
W36X150

DATA

BCOVB 11. 11.
BCOVSP 52.147 16. 59.183 16.
BCOVT 0.75 0.75
BR 15.046 15.0278 15.0374 15.0483 15.0195 15.0343 15.0323 15.0645
15.0158 15.055 15.0362 15.0327 13.3945
COMSPC 0.1 1.9 43.147 30. 45.183 30.
ESLABW 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
FILLET 1.
FLGEXT 0.
FPC 4.
IBRNG 1 1 1 1
IGIRD 2
LLDLIM 800
RAD 820.511
SLABT 8. 8. 8.
SLABWEAR 0.5
SPLBFT 0.94
SPLBFW 11.972
SPLTFT 0.94
SPLTFW 11.972
SPLTST 0.5
SPLTSW 7.
SPN 60.1595 75.1664 58.5184
SS 1.
STFGAP 0.
SUPBST 0.5 0.625 0.62 1.
SUPBSW 7. 7. 7. 7.
TCOVB 11. 11.
TCOVSP 52.147 16. 59.183 16.
TCOVT 0.75 0.75
TSLABW 108.
TSSP 180.444 180.432 180.432 360.888 180.432 180.432 180.432 360.876
180.432 180.432
WCONC 150.

GO

✓ RAM 1/21/10

BRIDGE 69801 J, K, L, M, & N
Girder 3 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N
CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS BOTH SIDES OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BR 6.3128 16.2525 16.2565 16.232 16.24 16.2513 16.3002 16.2621 16.2277
16.2618 16.237 6.9626 2.0928 12.1348 13.1577 13.1742 13.164 13.15
16.2092 16.2126 16.2094
BSPL 67.568 10. 20. 10. 69.336 60.797 10.
COMSPC 0.1 14.23 53.235 40. 53.294 18.042 50.797 32.
ESLABW 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 89.76 85.68 90.
90. 90. 90. 90. 89.64 85.2 81.12 77.28 73.8 71.64 69.72 67.8 66. 64.44
62.88 61.44 60.24 59.04 58.08
FILLET 1.
FPC 4.
HINGE 178.611
IGIRD 3
LLDLIM 800
RAD 1434.394 1434.394 1434.394 1434.394 1434.394 1434.394 1434.394 1434.394
1434.394 1434.394 1434.394 1434.394 1434.394 1434.394 1434.394
1434.394 1434.394 1434.394 1434.394 1434.394 956.93 956.93 956.93
956.93 956.93 956.93 956.93 956.93 956.93 956.93 956.93 956.93 956.93
956.93 956.93 315.02 315.02 315.02 315.02 315.02 315.02 315.02 315.02
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SLABT 8. 8. 8. 8.
SLABWEAR 0.5
SPL 82.568 10. 78.797 5.542 60.823 10.
SPLBFT 1.375 1.375 2. 1.5 1.5 1.02 1.25 1.02
SPLBFW 12.
SPLTFT 0.75 1.375 2. 1.5 0.875 1.02 1.25 1.02
SPLTFW 12.
SPLTST 0.5
SPLTSW 7.
SPLWT 0.4375 0.5 0.4375 0.4375 0.653 0.6875 0.653
SPN 6.3128 81.2323 81.2888 73.8362 48.6313
SS 1.
STFGAP 0.
SUPBST 1. 0.5 1. 1. 1. 1.
SUPBSW 7. 7. 7. 7. 7. 7.
TSLABW 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
108. 108. 108. 108. 108. 108. 108. 108. 107.52 106.68 105.48
103.92 101.88 99.36 96.6 93.36 89.76 85.68 112.92 108.48 103.92 99.
94.2 89.64 85.2 81.12 77.28 73.8 71.64 69.72 67.8 66. 64.44 62.88
61.44 60.24 59.04 58.08
TSPL 67.568 10. 20. 10. 69.336 60.797 10.
TSSP 271.056 194.94 194.94 194.94 390.468 195. 195. 195. 278.508

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24.996 145.56 158.004 158.004 158.004 352.488 194.46

WCONC 150.

WEBSP 171.365 5.542 114.474

WEBV 42. 42. 33.96 33.96

GO

BRIDGE 69801 J, K, L, M, & N
Girder 4 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N
CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS ONE SIDE OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BCOVB 11. 11.
BCOVSP 52.806 16. 60.008 16.
BCOVT 0.75 0.75
BR 15.2009 15.2025 15.1918 15.2269 15.1879 15.2123 15.18 15.2055
15.2137 15.1981 15.2082 15.1974 13.5907 3.2999 8.459 12.7206 12.7193
12.7244 12.701 12.7388 12.7509 12.7038 12.7223 12.7112 11.8459 11.7816
11.8205 11.8047 11.7888 11.8064 11.7941 11.8116 11.8006 11.8206
11.7793 11.801 12.1058 12.0668 12.0904 12.0842 12.0787 12.1047 12.0386
10.7225 10.6897 10.7195 10.6876 9.0938 3.3438 6.3127 16.3466 16.3818
16.326 16.366 16.3462 16.3842 16.3165 16.3318 16.332 16.3491
BSPL 197.62 8.635 94.018 10. 22. 8. 113.653 27. 61.556 12. 3. 5.
39.543 79.789 20. 14.
COMSPC 0.1 1.9 43.806 30. 46.008 30. 43.806 21.135 72.518 63. 87.653
59. 37.556 26. 37.543 18.04 55.749 42. 55.706 2.
ESLABW 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 102. 102. 102.
102. 102. 102. 102. 102. 102. 102. 102. 102. 102. 102. 102. 102.
102. 102. 102. 102. 102. 102. 102. 102. 102. 102. 102. 102. 102.
102. 102. 102. 102. 102. 102. 102. 102. 90. 90. 90. 90. 90. 90.
88.92 86.4 84. 81.84 80.04 78.6 77.52 76.92 90. 90. 87.72 83.16 78.36
73.56 68.64 63.72
FILLET 1.
FPC 4.
HINGE 197.62 404.406
IGIRD 4
LLDLIM 800
RAD 829.511 829.511 829.511 829.511 829.511 829.511 829.511 829.511
829.511 829.511 829.511 829.511 829.511 829.511 829.511 829.511
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493.706 493.706 493.706 493.706 493.706 493.706 493.706 493.706
493.706 493.706 493.706
SLABT 8. 8. 8. 9. 9. 9. 8. 8.
SLABWEAR 0.5
SPL 197.62 8.635 113.518 5. 136.653 5. 80.056 11. 129.332 10.
SPLBFT 0.94 0.875 0.875 1.625 2.75 1.625 1.125 2. 0.875 1. 1. 1.
0.875 1.375 1.75 1.25 1.25
SPLBFW 11.975 12. 18. 18. 18. 18. 18. 18. 18. 18. 12. 12. 12. 12.

✓ RAM 1/21/10

GO

GO

BRIDGE 69801 J, K, L, M, & N
Girder 5 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N

CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS ONE SIDE OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BR 11.5659 11.5574 11.5566 11.5553 11.5836 11.6074 11.5736 11.5952
11.5862 11.6327 11.7232 11.7147 10.729 2.0864 5.1428 11.9478 11.9466
11.9378 11.9375 11.9249 12.1518 13.0928 11.3633 11.3567 11.334 11.3558
11.3593 4.9085 2.0948 15.2259 16.2577 16.2575 16.2577 16.1951 16.1949
16.1953 16.1949 16.1951 15.8823 15.8825 15.8823 15.8838 15.8904
15.8987 16.4106 16.393 16.4406 14.7927 3.3297 6.3107 16.3579 16.3269
16.3579 16.3579 16.3573 16.4211
BSPL 41.229 10. 47.946 10. 41.801 73.078 10. 70.85 58. 15. 55. 10. 17.
10. 57.298 10. 16. 13. 125.447
COMSPC 0.1 1.9 32.229 24. 33.946 24. 32.801 13.234 52.844 28. 50.85
13. 50. 29. 42. 42. 57.298 38. 44.672 18. 57.775 32.401
ESLABW 51.97 53.1 55.62 59.04 63.24 68.58 74.64 78.96 78.84 78.84 79.2
79.8 80.76 81.96 83.4 85.44 87. 88.92 90.24 91.8 93. 93. 93. 51.48
50.04 49.2 48.96 49.2 49.92 51.24 53.04 56.28 60.6 65.76 72. 79.08
87.24 92.14 93. 57.84 63. 66.96 70.92 74.52 77.76 80.64 83.16 85.44
87.24 88.32 88.92 89.4 89.88 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 85.92 81.
76.08 71.28 66.36 61.44 56.64 55.8 54.84 54. 53.16 52.32 51.6 50.76
50.04 49.32 48.6
FILLET 1.
FPC 4.
HINGE 150.975 153.928 306.969
IGIRD 5
LLDLIM 800
RAD -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31
-325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31
-325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31
-325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31
-325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31
-325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31 -325.31
-325.31 -325.31 -325.31 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 1425.394 1425.394
1425.394 1425.394 1425.394 1425.394 1425.394 1425.394 1425.394 1425.394
1425.394 1425.394 1425.394 1425.394 1425.394 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0.
SLABT 8.25 8.25 8.25 8.25 8.25 8. 8. 8. 8. 8. 8.
SLABWEAR 0.5
SPL 224.053 10. 70.85 52. 339.743 10.
SPLBFT 1. 1.375 1. 1.375 1. 1.875 2.5 1.875 0.875 1.25 0.625 1. 1.75
0.75 1.125 0.75 1.75 1.125 0.75 1.25
SPLBFW 12.
SPLTFT 0.625 1.375 0.625 1.375 0.625 1.25 2.5 1.25 0.625 1.25
0.625 1. 1.75 0.75 0.625 0.75 1.75 1.125 0.625 1.25
SPLTFW 12.
SPLTST 0.5
SPLTSW 7.
SPLWT 0.375 0.75 0.375 0.4375 0.4375 0.5 0.4375
SPN 46.2351 57.9459 53.0289 71.8463 69.8619 71.0019 80.9752 95.3199

73.6771 81.7579 16.4211

SS 1.

STFGAP 0.

SUPBST 0.5 0.5 0.5 0.5 1. 0.5 0.625 0.75 0.75 0.5 1. 1.

SUPBSW 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7.

TSLABW 51.48 53.16 55.56 59.04 63.36 68.52 74.64 81.6 89.64 86.16

83.64 84. 84.36 84.96 85.68 86.64 87.72 88.92 90.24 91.8 93.48 95.16

96.84 69.72 69. 68.64 68.52 68.64 69. 69.6 70.56 72.12 74.28 76.92

80.04 83.52 87.6 92.16 97.08 72.96 75.48 77.52 79.44 81.24 82.92 84.36

85.56 86.64 87.6 88.32 88.92 89.4 89.88 90.36 90.84 91.32 91.8 92.28

92.76 93.24 93.72 94.2 94.8 95.28 95.88 96.36 96.96 97.44 98. 98. 98.

98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.

98. 109.92 105.6 100.56 95.76 90.84 85.92 81. 76.08 71.28 66.36 61.44

56.64 55.8 54.84 54. 53.16 52.32 51.6 50.76 50.04 49.32 48.6

TSPL 41.229 10. 47.946 10. 41.801 73.078 10. 70.85 58. 15. 55. 10. 17.

10. 57.298 10. 16. 13. 125.447

TSSP 138.684 138.684 138.684 277.788 139.068 139.068 139.068 278.736

140.688 140.628 128.628 24.996 205.188 143.244 143.256 143.244 143.256

302.952 136.308 136.128 136.068 136.104 195.396 24.996 183. 195. 195.

389.496 194.376 194.376 194.376 384.816 190.62 190.62 190.62 190.62

387.636 197.004 197.004 177.564 39.996 271.8 196.248 196.248 196.248

WCONC 150.

WEBSP 304.903 52. 361.1682

WEBV 34. 34. 42. 42.

GO

SPLBFW 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12.
 12. 12. 12. 12.027 12. 12.072 12. 12. 12. 12. 12. 12.
 SPLTFT 0.875 2. 1. 0.625 1.25 0.625 1. 1.75 0.75 0.625 0.75 1.75
 1.125 0.625 0.75 1.375 1.875 1.625 1. 1.1 1.5 1.18 0.75 1.5 0.75
 1.375 0.625 0.875
 SPLTFW 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12. 12.
 12. 12. 12. 12.027 12. 12.072 12. 12. 12. 12. 12. 12.
 SPLTST 0.5
 SPLTSW 7.
 SPLWT 0.375 0.75 0.375 0.4375 0.4375 0.5 0.4375 0.4375 0.68
 0.6875 0.725 0.375
 SPN 11.8512 69.1296 71.0134 80.9887 95.5698 74.1582 82.1022 82.1649
 74.1832 65.1679 65.2122 52.2097 60.2687
 SS 1.
 STFGAP 0.
 SUPBST 1. 1. 0.5 0.625 0.75 0.75 0.5 1. 1. 1. 0.5 0.5 0.5 0.5
 SUPBSW 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 5.
 TSLABW 54.24 55.08 55.92 56.76 57.6 58.44 59.28 60.12 60.96 61.8 62.64
 66.84 70.8 74.4 77.64 80.64 83.16 85.44 87.24 88.8 89.88 90.84 91.8
 92.76 93.72 94.68 95.64 96.48 97.44 98.4 99.48 100.44 101.52 102.12
 103.68 104.76 105.84 106.92 108. 108. 108. 108. 108. 108. 108. 108.
 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
 107.4 106.56 105.36 103.92 102.24 100.2 97.92 95.4 92.52 89.4 85.92
 82.32 102.6 99.36 96.48 93.96 91.68 89.76 88.2 86.88 117.72 113.16
 109.56 105.84 102.12 97.8 92.52 87.84 83.76 80.4 78.36 77.28 76.8 76.8
 77.28 78.36 79.8 81.84 111.24 110.16 109.32 108.6 108.24 108. 108.
 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
 TSPL 6.867 10. 70.126 57.004 16. 55.004 10. 17. 10. 57.565 10. 16. 13.
 46.138 72.113 8. 20. 11. 69.175 61.18 10. 47.159 8. 10. 54.23 14.
 50.241
 TSSP 292.656 135.816 135.816 135.816 135.816 195.012 24.996 183.084
 194.988 194.988 389.472 194.4 194.4 194.4 385.632 191.112 191.112
 191.112 191.1 389.508 198.408 198.408 178.944 39.996 272.628 197.064
 197.064 197.052 393.972 197.412 197.328 197.268 280.164 24.996 146.664
 158.88 158.88 158.88 354. 195.132 195.12 392.232 195.684 195.684
 404.544 208.872 268.152 24.996 118.032 130.152 130.152 130.152
 WCONC 150.
 WEBS 86.993 52.004 430.375 5.5 309.1478
 WEBV 34. 34. 42. 42. 33.96 33.96

GO

BRIDGE 69801 J, K, L, M, & N
Girder 7 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N

CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS ONE SIDE OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BCOVB 11.
BCOVSP 735.957 14.
BCOVT 1.
BR 11.5441 11.5399 10.5555 2.0697 5.0628 11.6618 11.6371 11.6147 11.57
11.5251 11.6331 11.9805 11.2852 11.324 11.3053 11.2917 11.2841 4.9377
2.0626 15.2818 16.2505 16.2506 16.2506 16.2193 16.1881 16.188 16.2193
16.1952 15.9762 15.9762 15.9762 15.9773 15.9529 15.9616 16.6618
16.6432 16.6603 15.0131 3.3311 6.2875 16.5522 16.5128 16.5374 16.5344
16.5027 16.5336 16.6046 16.6086 16.6152 16.6028 6.9219 2.0751 12.4387
13.3788 13.4078 13.3874 13.3914 16.4485 16.4429 16.4387 16.5466
16.5636 16.5705 16.5749 16.5673 17.7322 17.7449 17.7366 5.058 2.0703
10.0328 11.0415 11.0678 11.0524 11.0441
BSPL 34.634 70.776 10. 69.485 58.016 14. 56.015 10. 17. 10. 57.833 10.
16. 13. 46.604 68.627 12. 20. 10. 70.969 79.997 39.873 7. 14. 52.283
14. 51.333
COMSPC 0.1 1.9 30.634 13.123 50.654 27. 50.483 13.002 50.016 29.
42.015 42. 57.833 38. 45.604 17.997 52.63 42. 54.972 18. 51.997 29.
36.873 26. 42.283 25. 31.198 16.135 51.246 2.
ESLABW 53.28 54.72 56.16 57.84 59.52 61.2 63. 64.92 66.96 68.88 71.04
74.76 78.72 82.8 87.12 91.68 93. 93. 93. 82.68 85.8 88.92 63.6 66.6
69.96 73.56 77.52 81.84 86.52 91.44 93. 90. 90. 90. 90. 90. 90.
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90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90.
FILLET 1.
FPC 4.
HINGE 34.634 150.261 308.469 181.596 258.487
IGIRD 7
LLDLIM 800
RAD -211.785 -211.785 -211.785 -211.785 -211.785 -211.785 -211.785
-211.785 -211.785 -211.785 -211.785 -211.785 -211.785 -211.785
-211.785 -211.785 -211.785 -211.785 -211.785 -520.599 -520.599
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1443.394 1443.394 1443.394 1443.394 1443.394 1443.394 1443.394
1443.394 1443.394 1443.394 1443.394 1443.394 1443.394 1443.394
1443.394 1443.394 1443.394 1443.394 829.511 829.511 829.511 829.511
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488.465

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GO

✓ COK 1/25/10

BRIDGE 69801 J, K, L, M, & N
Girder 8 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N

CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS ONE SIDE OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BCOVB 11. 11. 11. 9. 9. 9.
BCOVSP 184.12 13. 106.017 13. 57.347 13. 100.546 12. 50.274 12. 50.
12.
BCOVT 0.625 0.625 0.5 0.875 1. 0.75
BR 11.3172 11.3208 11.3135 11.3263 11.3284 4.9753 2.081 10.4442
11.5097 11.4949 11.5112 11.4976 17.7495 17.7514 17.7495 17.7532
18.6733 18.6754 18.6433 4.9214 2.1007 17.6557 18.6754 18.6756 17.8351
17.846 17.8257 17.8375 18.7615 18.7568 18.7583 3.9401 2.0728 16.0902
17.0957 17.0613 15.5835 15.5641 15.5749 15.5561 15.5012 15.4985
15.5015 15.5019 17.2657 17.2908 17.2631
BSPL 62.66 51.443 13. 7. 307.68 38.185 63.305
COMSPC 0.1 1.9 49.589 13.072 40.443 29. 43.017 29. 33. 16. 40.017 28.
43.347 28. 36.274 13.026 34.247 27. 36.274 26. 36. 27.
ESLABW 56.52 58.08 60.12 62.4 65.04 68.16 71.52 75.24 79.44 84. 88.2
75. 76.8 78.72 80.64 82.56 84.48 86.28 88.08 89.04 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98.
FILLET 1.
FPC 4.
HINGE 62.66 190.461 188.662
IGIRD 8
LLDLIM 800
RAD -265.97 -265.97 -265.97 -265.97 -265.97 -265.97 -265.97 -265.97
-265.97 -265.97 -265.97 -265.97 -265.97 -265.97 -265.97 -265.97
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. -1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394
-1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394
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-1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394
-1439.394 -1439.394 -1439.394 -1439.394 -1439.394 -1439.394 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0.
SLABT 8.25 8. 8. 8. 8. 8. 8. 8.75 8.75 8.75 8.75
SLABWEAR 0.5
SPL 62.66 71.443 307.677 38.185 63.305
SPLBFT 1. 1.5 1.875 1.5 0.794 1. 0.93 0.85
SPLBFW 12. 12. 12. 12. 11.945 10.551 10.521 10.5
SPLTFT 0.625 1. 1.875 1. 0.794 1. 0.93 0.85
SPLTFW 12. 12. 12. 12. 11.945 10.551 10.521 10.5
SPLTST 0.5
SPLTSW 7.
SPLWT 0.375 0.4375 0.598 0.615 0.585 0.564
SPN 56.6062 63.5138 71.0036 55.992 62.0287 71.3442 56.2767 56.2601
62.2785 62.0031 51.8196

```

SS 1.
STFGAP 0.
SUPBST 1. 0.5 0.625 0.5 0.5 0.625 0.625 0.5 0.75 0.75 0.75
0.625
SUPBSW 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7.
TCOVB 11. 11. 11. 9. 9. 9.
TCOVSP 184.12 13. 106.017 13. 57.347 13. 100.546 12. 50.274 12. 50.
12.
TCOVT 0.625 0.625 0.5 0.875 1. 0.75
TSLABW 56.52 58.08 60.12 62.4 65.04 68.16 71.52 75.24 79.44 84. 88.2
93.96 101.52 83.4 84.36 85.32 86.16 87.12 88.08 89.04 90. 91.08 92.16
93.24 94.32 95.4 96.48 97.44 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98. 98.
98. 98. 98. 98. 98.
TSPL 62.66 51.443 13. 7. 307.68 38.185 63.305
TSSP 135.816 135.816 135.816 135.816 195.672 24.996 125.316 138. 138.
138. 351.072 213.072 141.072 437.016 224.004 282.996 24.996 212.064
224.064 438.036 214.068 214.068 439.128 225.06 272.472 24.996 192.996
204.984 391.86 186.804 186.804 372.804 186. 186. 393.276 207.252
WCONC 150.
WEBSP 438.225 3.526 227.3755
WEBV 33.96 33.96 28.3 28.3

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GO

✓ LDK 1/25/10

BRIDGE 69801 J, K, L, M, & N
Girder 9 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N

CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS BOTH SIDES OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BCOVB 11. 11. 11. 9. 9. 9.
BCOVSP 411.769 13. 105.996 11. 59.901 12. 99.845 12. 49.922 12. 50.
12.
BCOVT 0.625 0.5 0.5 0.875 0.75 0.625
BR 10.97 10.9829 11.0032 11.0195 11.2781 11.2763 11.2684 11.2622
11.2488 11.258 11.2592 11.263 10.2219 2.1033 4.8405 11.2955 11.2542
11.2342 11.2059 11.1667 11.2673 11.1251 11.3321 11.3457 11.3185
11.3448 11.3309 4.9936 2.0891 10.0534 11.1341 11.0273 10.983 11.0249
17.7272 17.7529 17.7569 17.7527 18.6733 18.6733 18.6454 4.9214 2.0986
17.6598 18.6711 18.6754 17.7075 17.7145 17.7233 17.7379 18.6565 18.625
18.6241 3.9368 2.0751 15.9855 16.9647 16.9844 15.4846 15.4623 15.473
15.5101 15.4738 15.5262 15.4738 15.5262 17.0588 17.1508 17.0908
BSPL 95.309 10. 40.004 68.343 10. 68.904 49.208 13. 7. 306.814 37.943
COMSPC 0.1 1.9 29.974 24. 33.335 22. 32.004 12.945 49.398 26. 49.805
13.101 38.208 29. 43. 29. 33. 16. 39.996 28. 42.901 28. 35.922 12.995
33.927 27. 35.922 26. 36. 27.
ESLABW 84.84 84.48 84.24 84.12 84. 84. 84.12 84.36 84.6 84.96 85.44
86.04 86.88 87.84 89.04 90.24 91.68 93. 93. 93. 93. 93. 78.72 81.6
84.24 86.88 89.28 91.56 93. 93. 93. 93. 93. 93. 93. 93. 93. 93.
93. 93. 82.08 83.16 84.12 85.2 86.28 87.36 88.44 89.52 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90. 90.
90. 90. 90. 90. 90. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99.
99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99.
99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99. 99.
Fillet 1.
FPC 4.
HINGE 145.312 147.248 188.21 187.812
IGIRD 9
LLDLIM 800
RAD -254.915 -254.915 -254.915 -254.915 -254.915 -254.915 -254.915
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-1430.394 -1430.394 -1430.394 -1430.394 -1430.394 -1430.394 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0.
SLABT 8.25 8.25 8.25 8.25 8. 8. 8. 8. 8. 8. 8.75 8.75 8.75 8.75
SLABWEAR 0.5
SPL 213.655 10. 68.905 69.208 306.818 37.943

✓CDK 11/25/10

SPLBFT 1. 1.375 1. 1.625 2.25 2.25 1.125 1.5 1.125 0.794 1. 0.93
SPLBFW 12. 12. 12. 12. 12. 12. 12. 12. 12. 11.945 10.551 10.521
SPLTFT 0.625 1.375 0.625 1. 2.25 1.375 0.75 1.5 0.75 0.794 1.
0.93
SPLTFW 12. 12. 12. 12. 12. 12. 12. 12. 12. 11.945 10.551 10.521
SPLTST 0.5
SPLTSW 7.
SPLWT 0.375 0.75 0.4375 0.375 0.598 0.615 0.585
SPN 43.9755 56.3338 50.9459 67.4238 67.7971 61.3054 70.9897 55.992
62.0262 70.8831 55.9056 55.9465 61.93 62. 51.3005
SS 1.
STFGAP 0.
SUPBST 0.5 0.5 0.5 0.5 1. 0.5 0.5 0.5 0.5 0.625 0.5 0.5
0.625 0.625 0.625 0.625
SUPBSW 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7.
TCOV 11. 11. 11. 9. 9. 9.
TCOVSP 411.769 13. 105.996 11. 59.901 12. 99.845 12. 49.922 12. 50.
12.
TCOVT 0.625 0.5 0.5 0.875 0.75 0.625
TSLABW 84.84 84.48 84.24 84.12 84. 84. 84.12 84.36 84.6 84.96 85.44
86.04 86.88 87.84 89.04 90.24 91.68 93.12 94.8 96.6 98.52 100.32
102.36 78.72 81.6 84.24 86.88 89.28 91.56 93.72 95.64 98.04 100.08
101.88 103.32 104.52 105.48 106.08 106.32 106.56 107.4 108.48 82.08
83.16 84.12 85.2 86.28 87.36 88.44 89.52 90.6 91.56 92.52 93.48 94.44
95.4 96.24 97.2 98.16 99.12 99.96 101.04 102.12 103.2 104.28 105.36
106.44 107.52 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108. 108.
108. 108.
TSPL 95.309 10. 40.004 68.343 10. 68.904 49.208 13. 7. 306.814 37.943
TSSP 131.496 131.856 132.096 267.576 135.3 135.228 135.132 270.
135.276 135. 122.784 24.996 192.996 134.808 134.808 134.808 134.808
268.548 135.996 135.996 135.996 135.996 196.188 24.996 120.708 133.596
132.06 132.06 345.06 213. 213. 437.016 224.004 282.996 24.996 212.004
223.968 436.62 212.724 212.724 436.38 223.656 270.684 24.996 191.712
203.712 389.52 185.748 185.748 371.748 186. 186. 390.9 205.752
WCONC 150.
WEBSP 665.089 3.495 226.182
WEBV 33.96 33.96 28.3 28.3

GO

✓CHK 4/20/10

BRIDGE 69801 J, K, L, M, & N
Girder 10 : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N

CONDITIONS

A36 STEEL
A36 STIFFENER STEEL
ASSUME SLAB ON FLANGE FOR SECTION PROPERTIES
AWS MINIMUM WELDS
ENGLISH INPUT
ENGLISH OUTPUT
FULL DEPTH CONNECTION PLATES
IGNORE CURVED COMPOSITE REGION RESTRICTION
IGNORE FATIGUE
IGNORE MOMENT SHIFTING
INCLUDE SLAB FILLER IN SECTION PROPERTIES
INTERMEDIATE TRANSVERSE STIFFENERS ONE SIDE OF WEB
LFD METHOD
LIMIT TO ELASTIC STRENGTH
LINEAR INTERPOLATION
RATE MODE
SINGLE BEARING STIFFENERS EACH SIDE
STANDARD RESOLUTION OUTPUT
SYSTEM FORCES

DATA

BCOVB 11. 11. 11. 9. 9. 9.
BCOVSP 399.927 13. 105.976 11. 60.455 10. 100.141 12. 49.569 12. 50.
12.
BCOVT 0.625 0.5 0.5 0.875 0.875 0.75
BR 10.3801 10.407 10.413 10.3895 10.9245 10.9242 10.8985 10.9433
10.9214 10.8797 10.9161 10.8849 9.8524 2.1004 4.66 10.8738 10.8459
10.8637 10.8425 10.8723 10.8515 10.3688 11.3307 11.3141 11.3516
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18.519 3.8757 2.1016 15.8568 16.8598 16.8821 15.3798 15.3915 15.3995
15.4052 15.4738 15.5046 15.5262 15.4738 16.9085 16.982 16.9715
BSPL 139.761 65.895 10. 68.152 46.12 13. 7. 305.964
COMSPC 0.1 1.9 27.601 24. 31.607 22. 30.552 12.75 47.144 26. 49.042
13.11 35.12 29. 43. 29. 33. 16. 39.976 28. 42.455 28. 35.57 12.964
33.607 27. 35.569 26. 36. 27.
ESLABW 85.92 85.8 86.4 87.12 87.84 88.2 88.56 88.92 89.16 89.52 89.76
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SLABWEAR 0.5
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SPLBFT 1. 1.625 2. 1.625 1. 1.375 1. 0.794 0.85
SPLBFW 12. 12. 12. 12. 12. 12. 12. 11.945 10.5
SPLTFT 0.625 1. 2. 1. 0.625 1.375 0.625 0.794 0.85

✓CDK 4/20/10

SPLTFW 12. 12. 12. 12. 12. 12. 12. 11.945 10.5
SPLTST 0.5
SPLTSW 7.
SPLWT 0.375 0.75 0.375 0.598 0.564
SPN 41.5896 54.6119 49.2934 65.1497 67.0242 58.2546 70.9898 55.9919
61.9936 70.4493 55.5687 55.576 61.576 61.9784 50.8621
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STFGAP 0.
SUPBST 0.5 0.5 0.5 0.5 1. 0.5 0.5 0.5 0.5 0.625 0.5 0.5
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12.
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TSLABW 86.52 86.88 87.24 87.6 87.96 88.2 88.56 88.92 89.16 89.52 89.76
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93.84 94.08 94.32 94.44 94.68 94.8 95.04 95.16 95.4 95.52 95.76 96.
96.12 96.24 96.48 96.6 96.72 96.84 96.96 97.2 97.32 97.32 97.44 97.56
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TSPL 139.761 65.895 10. 68.152 46.12 13. 7. 305.964
TSSP 124.776 124.812 124.812 255.852 131.064 131.064 131.064 261.756
130.692 130.62 118.62 24.996 186.42 130.248 130.248 130.248 130.248
254.628 135.996 135.996 135.996 135.996 196.5 24.996 113.436 125.004
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211.932 223.872 435.204 211.38 211.38 433.632 222.252 268.896 24.996
190.428 202.428 387.18 184.692 184.704 370.692 186. 186. 388.896
203.868
WCONC 150.
WEBSP 652.427 3.464 225.025
WEBV 33.96 33.96 28.3 28.3

GO

✓ CDK 1/25/10

BRIDGE 69801 J, K, L, M, & N
Bracing : Input File : Definition

ID: BRIDGE 69801 J, K, L, M, & N
CONDITIONS

A36. STEEL

DIAPHRAGM C15X33.9 FOR GROUP 1

DIAPHRAGM MC18X42.7 FOR GROUP 2

DIAPHRAGM C12X20.7 FOR GROUP 3

DIAPHRAGM W24X68 FOR GROUP 4

DIAPHRAGM W21X55 FOR GROUP 5

DIAPHRAGM W14X61 FOR GROUP 6

DIAPHRAGM W36X135 FOR GROUP 7

DIAPHRAGM W21X55 EMBEDDED FOR GROUP 21

ENGLISH INPUT

ENGLISH OUTPUT

IGNORE FATIGUE

LFD METHOD

RATE MODE

TYPE D BRACING FOR GROUP 1

TYPE D BRACING FOR GROUP 2

TYPE D BRACING FOR GROUP 3

TYPE D BRACING FOR GROUP 4

TYPE D BRACING FOR GROUP 5

TYPE D BRACING FOR GROUP 6

TYPE D BRACING FOR GROUP 7

TYPE D BRACING FOR GROUP 21

DATA

BRL-1 9.0017 8.9947 9.0007 9.0096 8.9992 9.006 9.0113 9.0037 9.0011
8.9952 8.9996 8.9932 8.99 9.001 18.0085 18.0003 17.997 17.9964 17.9977
18.0103 17.9999 17.9993 17.9972 17.9992 17.9987 17.9991 18.007 18.0046
18.0042 18.0085 17.9975 18.0066 18.0103 18.0054 18.0016 18.0058 18.008
18.0018 18.002 18.001 18.0019 18.0027 18.0058 18.0103 18.0002 18.0066
18.0068 18.0005 18.1094 9.0565 9.0492 9.0541 9.0622 9.0493 9.0494
9.0428 9.0441 9.0358 9.0307 9.0222 9.0137 9.0009 8.9881 8.6958 8.3916
8.5715 8.5638 8.2331 7.415 6.2532 4.8124 9.222 9.0122 9.008 8.9967
8.9981 8.9924 8.9848 8.9954 9.0023 8.9965 9.0039 8.984 9.0051 9.0096
9.015
BRL-2 9.0025 9.0107 8.9948 9.0087 9.0052 8.9867 8.9892 9.0042 9.0083
8.9894 9.0043 9.0104 9.0017 8.9908
BRL-3 9.0462 9.0462 9.0415 9.0444 9.0493 9.0466 9.0408 8.8075 8.3273
7.5782 6.5695 5.3077 9.9041 9.6965 8.7002 7.5991 6.0489 4.8379 4.0892
3.7828 4.0502 4.8291
BRL-4 9.2462 8.6959 7.4126 6.2939 5.3779 4.6463 4.1198 4.0588 7.0772
6.2884 5.6993 5.3266
BRL-5 7.1544 6.8515 6.6541 6.5647 6.5878 6.7217 6.9495 7.2674 7.7006
8.23 4.4307 4.1517 4.0945 4.2303 4.2636 4.4292 4.9224 5.6275 6.5675
7.6997 4.5269 5.257 5.9165 6.3812 6.7556 7.0786 7.3221 7.4885 7.5378
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BRL-6 4.5204 5.208 5.8673 6.3402 6.7483 7.0652 7.3226 7.4949 7.552
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BRL-8 4.7736 5.0279 5.2897 5.5692 5.8703 6.1894 6.3236 6.3792 6.6136
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8.9903 8.9973 9.0005 8.9928 8.9982 8.9925 9.0059 8.9887 8.999 9.0042
9.0101 8.9892 9.004 8.9896 9.004 8.9831 8.9935 8.9992 9.0146
BRL-9 7.1825 7.2585 7.3791 7.5234 7.6317 7.7711 7.8848 7.9932 8.108
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8.7314 8.7767 8.8154 8.8575 8.8848 8.9127 8.9693 9.0313 9.1089 9.1523
9.1796 9.1289 9.0807 9.0562 9.0169 9.0026 8.9956 8.9931 8.9956 9.003
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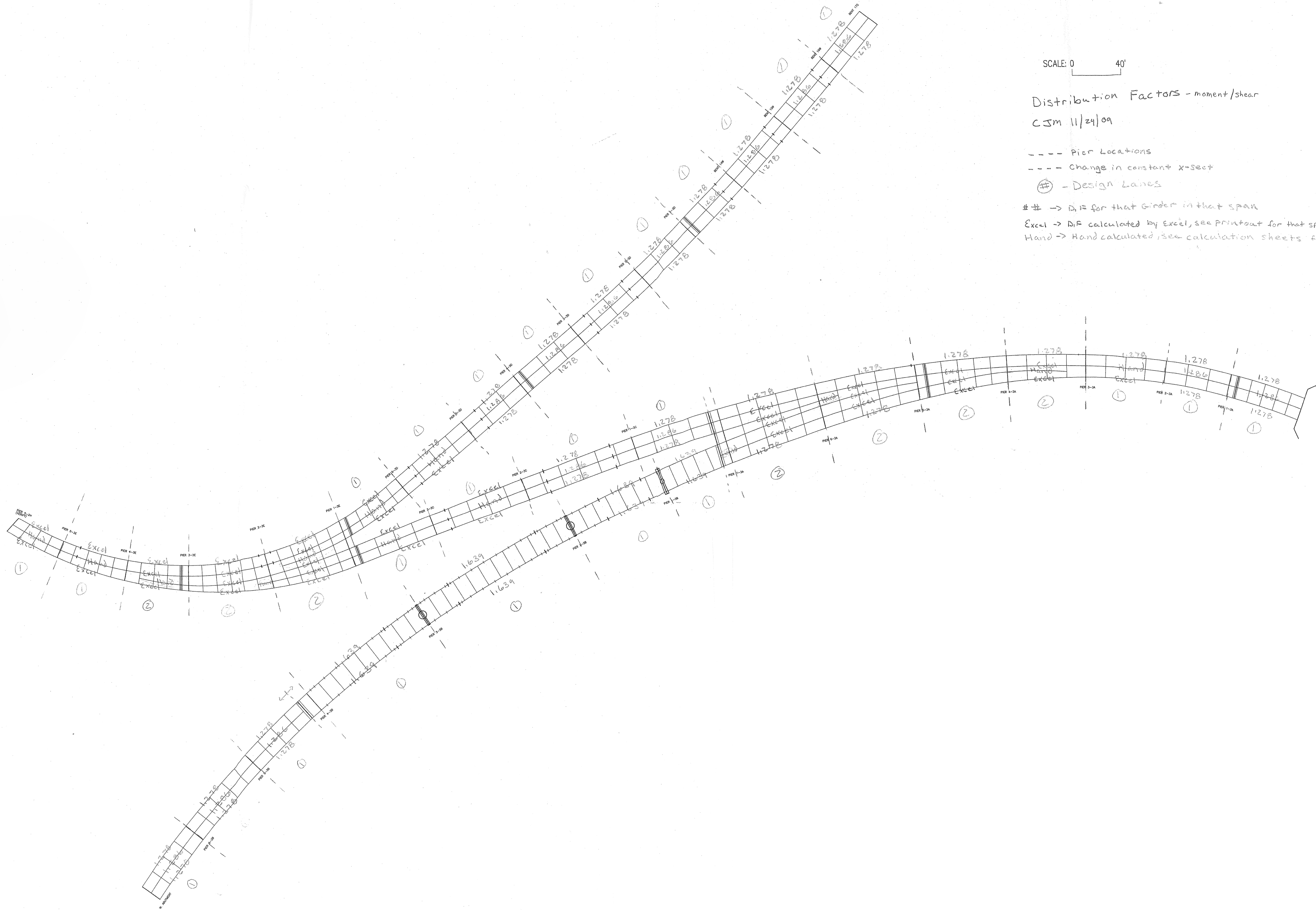
GO

Gilder Definition
(Calculation)

Distribution

Factor

Layout

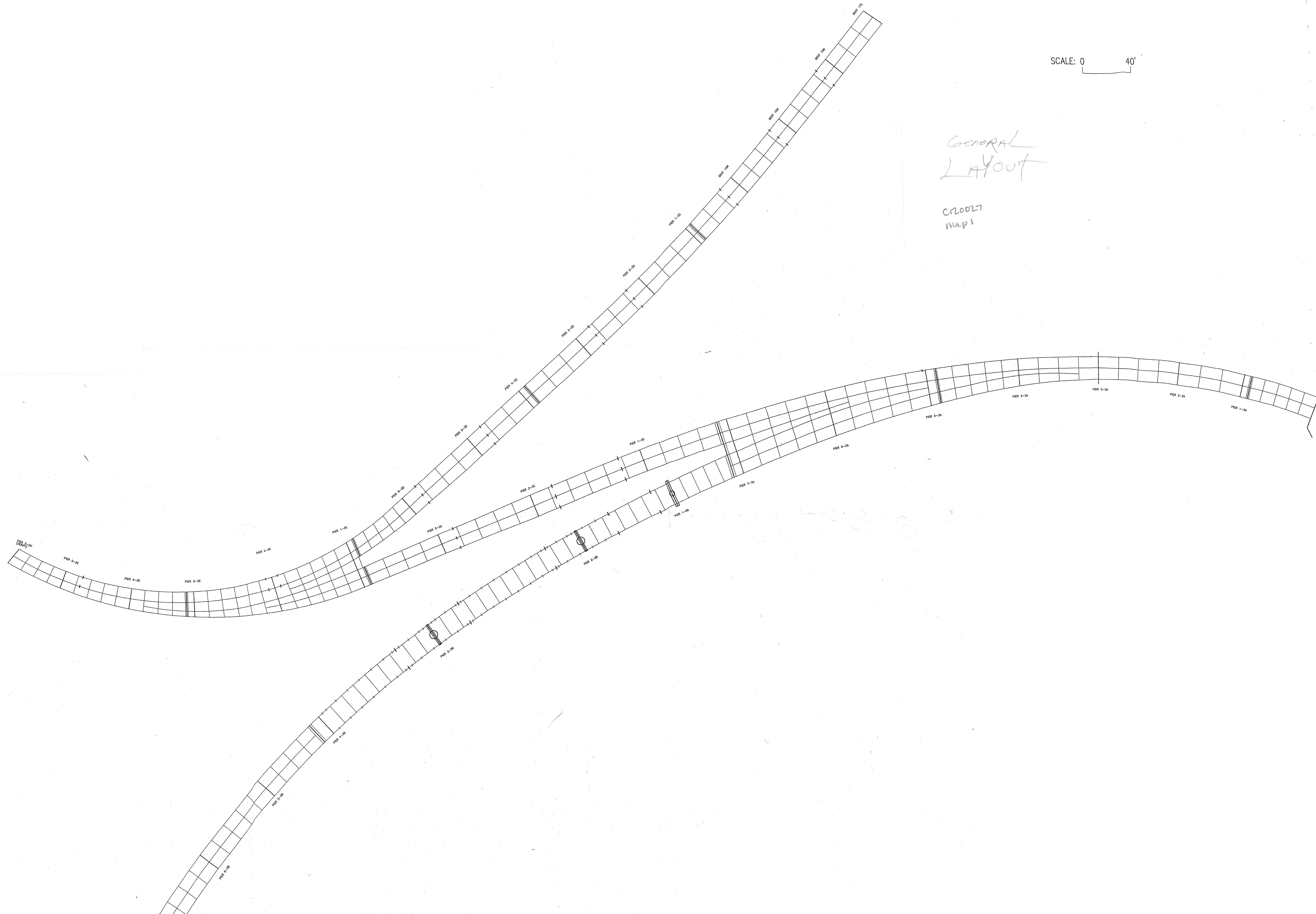


General
Layout

SCALE: 0 40'

General
Layout

CR0027
Map 1





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PROJECT Special Structures Rating - Whole Bridge System

PROJECT # 090147 DATE 11/6/09 BY CJM SHEET NO. 1 OF 3
✓ CDK 12/22/09

Hinge Location

- Hinge locations are measured starting at far left bearing, then distance in between hinges

Girder 1

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 193.331 ✓ |
| 2 ✓ | 396.076 ✓ |
| 3 ✓ | 177.303 ✓ |
| 4 ✓ | 250.820 ✓ |

Girder 2

- No Hinges in girder 2, starts at abutment + ends at a Hinge ✓

Girder 3

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 178.611 ✓ |

Girder 4

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 197.620 ✓ |
| 2 ✓ | 404.406 ✓ |



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PROJECT Special Structure Rating - whole Bridge System

PROJECT # 090147 DATE 11/6/09 BY CJM SHEET NO. 2 OF 3
11/8/10

Hinge locations continue

Girder 5

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 150.975 ✓ |
| 2 ✓ | 153.928 ✓ |
| 3 ✓ | 306.969 ✓ |

Girder 6

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 86.993 ✓ |
| 2 ✓ | 307.711 ✓ |
| 3 ✓ | 180.288 ✓ |
| 4 ✓ | 254.1810 ✓ |

Girder 7

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 34.634 ✓ |
| 2 ✓ | 150.261 ✓ |
| 3 ✓ | 308.469 ✓ |
| 4 ✓ | 181.596 ✓ |
| 5 ✓ | 258.487 ✓ |



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PROJECT Special Structures Rating - Whole Bridge System
PROJECT # 090147 DATE 11/6/09 BY CJM SHEET NO. 3 OF 3
✓ CDK 12/22/09

Hinge location Cont...

Girder 8

| <u>Hinge</u> | <u>Distance (ft)</u> |
|--------------|----------------------|
| 1 ✓ | 62.660 ✓ |
| 2 ✓ | 190.461 ✓ |
| 3 ✓ | 188.662 ✓ |

Girder 9

| <u>Hinge</u> | <u>Distance</u> |
|--------------|-----------------|
| 1 ✓ | 145.312 ✓ |
| 2 ✓ | 147,248 ✓ |
| 3 ✓ | 188,210 ✓ |
| 4 ✓ | 187.812 ✓ |

Girder 10

| <u>Hinge</u> | <u>Distance</u> |
|--------------|-----------------|
| 1 ✓ | 139,761 ✓ |
| 2 ✓ | 144,047 ✓ |
| 3 ✓ | 185,121 ✓ |
| 4 ✓ | 186,962 ✓ |



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 11/11/09 BY CJM SHEET NO. 1 OF 10

✓ RAM 1/14/10

Composite Dead Load

- Composite Dead Load will include Rail Loads + 3 psf for utilities (per MN/DOT LRFD Bridge Design Manual) ✓
- See attached Drawings for Rail cross section. ✓

Bridge 69801 J

Rail cross sect (from AutoCAD = $577 \text{ in}^2/\text{ft}$)

$$1 \text{ Rail load} = 577 \text{ in}^2 \cdot \frac{1 \text{ ft}^2}{144 \text{ in}^2} \cdot 150 \text{ lb/ft}^3 = 601.04 \text{ lb/ft} \checkmark$$

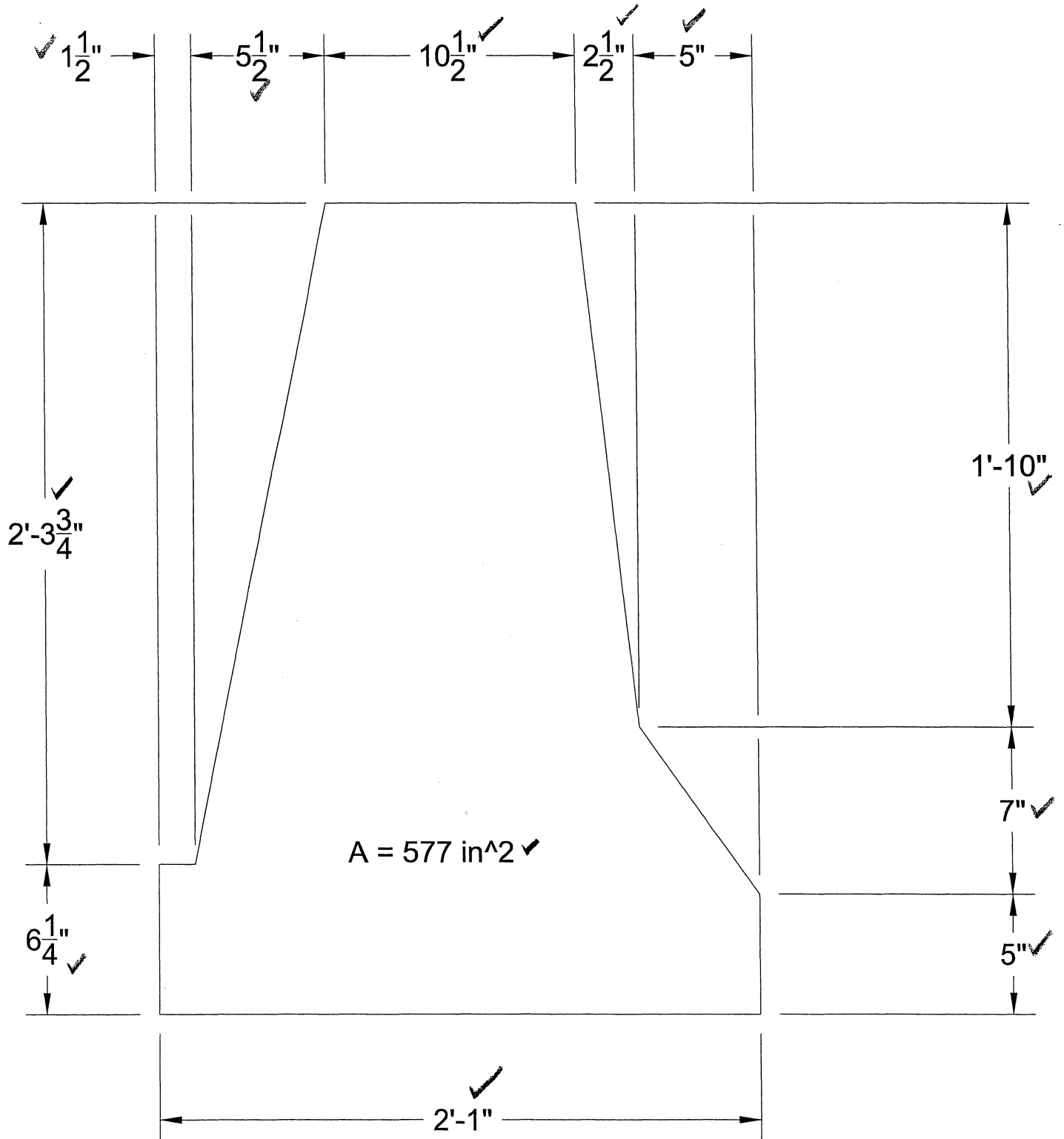
$$\text{Total Rail load} = 2(601.04) = 1202.08 \Rightarrow \text{Say } 1202 \text{ PLF} \checkmark$$

Bridge 69801 K, L, M + 69881 A

- Similar to 69801 J

$$\text{Rail load} = 1202 \text{ PLF}$$

- Bridges 69801 K, L, M have different cross sect @ Interchange (nose) load of 601 PLF per rail will be OK for Entire Bridge length ✓
- loads will be distributed Evenly over Girders. AASHTO 3, 23.2, 3.1.1 ✓
- Cross Sections Found in 2001 Rehab for Br 69801 W + 2066 for BR 69801 J, K, L, M + 69881 A ✓

RAILING BRIDGE 69801J, K, L, M
BRIDGE 69881A



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/20/09 BY CJM SHEET NO. 3 OF 10

✓ RAM 1/14/10

Composite Dead Load

Utility Load

- From Mn/DOT LRFD Bridge Design Manual - 15.3 - use 3 psf for utilities in city/urban areas. ✓
- With only 3 psf load, averaging Deck widths in areas of interchanges (varying Deck widths) will be adequate ✓
- Loads will be evenly Distributed over all Girders in Span. ✓

Bridge 69801 J

- Eas + Abutment to Pier 1 - 3A, 20.000 Girders
 - Constant width = $25'-4" = 18'-0" + 2(3'-8")$
 - Load = $(3 \text{ psf})(25'-4") = 76 \text{ PLF}$ ✓ ↳ std overhang
- Pier 1 - 3A to Pier 2 - 3A
 - Constant width = $25'-4"$
 - Load = 76 PLF ✓
- Pier 2 - 3A to Pier 3 - 3A
 - Pier 2 - 3A = $(18'-0") + 2(3'-8") = 25'-4"$ ✓
 - Pier 3 - 3A = $(18'-2\frac{1}{2}") + 2(3'-8") = 25'-6\frac{1}{2}"$ ✓
 - Load = $\frac{1}{2}[25'-4" + 25'-6\frac{1}{2}"] \cdot 3 \text{ psf} = 76.3 \text{ psf}$ ✓
- Pier 3 - 3A to Pier 4 - 3A
 - Pier 3 - 3A = $25'-6\frac{1}{2}"$ ✓
 - Pier 4 - 3A = $21'-3\frac{13}{16}" + 2(3'-8") = 28'-7\frac{13}{16}"$ ✓
 - Load = $\frac{1}{2}[25'-6\frac{1}{2}" + 28'-7\frac{13}{16}"] \cdot 3 \text{ psf} = 81.3 \text{ psf}$ ✓



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PROJECT Special Structure Rating

PROJECT # 090147 DATE 11/20/09 BY CJM SHEET NO. 4 OF 10

✓ RAM 1/14/10

Composite Dead Load - Utilities - Cont...

Bridge 69801 J - Cont...

- Pier 4-3A to Pier 5-3A

$$\text{- Pier 4-3A} = 28' - 7\frac{13}{16}" \quad \checkmark$$

$$\text{- Pier 5-3A} = 28' - 7\frac{11}{16}" + 2(3' - 8") = 35' - 11\frac{11}{16}" \quad \checkmark$$

$$\text{Load} = \frac{1}{2} [28' - 7\frac{13}{16}" + 35' - 11\frac{11}{16}"] \cdot 3 \text{ psf} = 96.9 \text{ psf} \quad \checkmark$$

- Pier 5-3A to Pier 6-3A

$$\text{- Pier 5-3A} = 35' - 11\frac{11}{16}" \quad \checkmark$$

$$\text{- Pier 6-3A} = 36' - 6\frac{5}{16}" + 2(3' - 8") = 43' - 10\frac{5}{16}" \quad \checkmark$$

$$\text{Load} = \frac{1}{2} [35' - 11\frac{11}{16}" + 43' - 10\frac{5}{16}"] \cdot 3 \text{ psf} = 119.8 \text{ psf} \quad \checkmark$$

- Pier 6-3A to Pier 7-3A

$$\text{- Pier 6-3A} = 43' - 10\frac{5}{16}" \quad \checkmark$$

$$\text{- Pier 7-3A} = 44' - 8\frac{1}{4}" + 2(3' - 8") = 52' - 0\frac{1}{4}" \quad \checkmark$$

$$\text{Load} = \frac{1}{2} [43' - 10\frac{5}{16}" + 52' - 0\frac{1}{4}"] \cdot 3 \text{ psf} = 143.8 \text{ psf} \quad \checkmark$$

- for Pier 7-3A to Exp. Joint, take width at Exp Jt for adjoining bridges ✓

Bridge 69801 K

- Constant 18'-0" width from Exterior girder to Exterior girder over Entire length of Bridge ✓

$$\text{- Load} = [18' - 0" + 2(3' - 8")] \cdot 3 \text{ psf} = 76 \text{ psf} \quad \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 11/20/09 BY CJM SHEET NO. 5 OF 10

✓ RAM 1/14/10

Composite DeadLoad - utilities - cont...

Bridge 69801 L

- East Expansion joint to Pier 2-3C
- Constant 18'-0" Ext girder to Ext girder $\Rightarrow$ width = 25'-4"
- Load = 76 PLF ✓

- Pier 2-3C to Pier 3-3C

- Pier 2-3C = 25'-4" ✓

- Pier 3-3C = 16' - 6³/₄" + 2(3'-8") = 23'-10³/₄" ✓

Load = $\frac{1}{2} [25'-4" + 23'-10\frac{3}{4}"] \cdot 3 \text{ psf} = 73.8 \text{ psf}$ ✓

- Pier 3-3C to w. Exp joint - assume Load to pier 1-3E

- Pier 3-3C = 23'-10³/₄" ✓

- Exp joint = 15' - 1³/₈" + 2(3'-8") = 22'-5³/₈" - assume constant 3'-8" overhang at nose of interchange

Load = $\frac{1}{2} [23'-10\frac{3}{4}" + 22'-5\frac{3}{8}"] \cdot 3 \text{ psf} = 69.5 \text{ psf}$ ✓

Bridge 69801 N

- Pier 1-3E to pier 2-3E

- Pier 1-3E = 38' - 11¹/₁₆" + 2(3'-8") = 46' - 3¹/₁₆" ✓

- Pier 2-3E = 28'-3⁷/₈" + 2(3'-8") = 35' - 7⁷/₈"

Load = $\frac{1}{2} [46' - 3\frac{1}{16}" + 35' - 7\frac{7}{8}"] \cdot 3 \text{ psf} = 122.9 \text{ PLF}$

- Pier 2-3E to pier 3-3E

- Pier 2-3E = 35' - 7⁷/₈"

- Pier 3-3E = 20' - 4⁷/₁₆" + 2(3'-8") = 27' - 8⁷/₁₆"

Load = $\frac{1}{2} [35' - 7\frac{7}{8}" + 27' - 8\frac{7}{16}"] \cdot 3 \text{ psf} = 95.0 \text{ PLF}$



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PROJECT Special Structures Rating

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✓ RAM 1/14/10

Composite DL - utilities - cont...

Bridge 69801 N - Cont...

- Pier 3-3E to Pier 4-3E

- Pier 3-3E = $27'-8\frac{7}{16}"$

- Pier 4-3E = $16'-5\frac{1}{8}" + 2(3'-8") = 23'-9\frac{1}{8}"$ ✓

Load = $\frac{1}{2}[27'-8\frac{7}{16}" + 23'-9\frac{1}{8}"] \cdot 3 \text{ psf} = 77.2 \text{ PLF}$

- Pier 4-3E to Pier 5-3E

- Pier 4-3E = $23'-9\frac{1}{8}"$ ✓

- Pier 5-3E = $14'-2\frac{13}{16}" + 2(3'-8") = 21'-6\frac{13}{16}"$

Load = $\frac{1}{2}[23'-9\frac{1}{8}" + 21'-6\frac{13}{16}"] \cdot 3 \text{ psf} = 68.10 \text{ PLF}$ ✓

- Pier 5-3E to East Abutment
Overhang)

- Pier 5-3E = $21'-6\frac{13}{16}"$

- E. Abutment = $14'-3\frac{7}{8}" + 9" + 3'-8" = 18'-8\frac{7}{8}"$ ✓

Load = $\frac{1}{2}(21'-6\frac{13}{16}" + 18'-8\frac{7}{8}"). 3 \text{ psf} = 60.5 \text{ PLF}$ ✓

Bridge 69801 M

- W. Exp Joint to Pier 6-3D - assume width Exp Jnt to be sufficient

- E-Exp Jnt = $15'-6\frac{1}{4}" + 2(3'-8") = 22'-10\frac{1}{4}"$ ✓

- Pier 6-3D = $16'-8" + 2(3'-8") = 24'-0"$ ✓

Load = $\frac{1}{2}(22'-10\frac{1}{4}" + 24'-0"). 3 \text{ psf} = 70.3 \text{ psf}$ ✓

- Pier 6-3D to Pier 5-3D

- Pier 6-3D = $24'-0"$ ✓

- Pier 5-3D = $18'-0" + 2(3'-8") = 25'-4"$ ✓

Load = $\frac{1}{2}(24'-0" + 25'-4"). 3 \text{ psf} = 74 \text{ psf}$ ✓



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PROJECT Special Structures Rating

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✓ RAM 1/14/10

Composite DL - Utilities - Contin.

Bridge 69801M - contin.

- Pier S-3D to E. End of Bridge 69801M has constant Girder Spacing of 18'-0" Ext girder to Ext girder ✓

$$\text{Load} = [18'-0" + 2(3'-8")] \cdot 3 \text{ psf} = 76 \text{ PLF} \checkmark$$

Bridge 69881A

- Bridge has constant Ext girder to Ext girder spacing of 18'-0"
 $\text{Load} = (18'-0" + 2(3'-8")) \cdot 3 \text{ psf} = 76 \text{ PLF} \checkmark$

- See next sheet for summary of Composite Dead Load by span

Project: Special Structures Rating

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Composite Dead Load

| Span/Section | Railing Comp Load
(PLF) | Utility Comp Load
(PLF) | Total (PLF) |
|-----------------------------|----------------------------|----------------------------|-------------|
| Bridge 69801 J | | | |
| East Abutment to Pier 1-3A | 1202.0 | 76.0 | 1278.0 |
| Pier 1-3A to Pier 2-3A | 1202.0 | 76.0 | 1278.0 |
| Pier 2-3A to Pier 3-3A | 1202.0 | 76.3 | 1278.3 |
| Pier 3-3A to Pier 4-3A | 1202.0 | 81.3 | 1283.3 |
| Pier 4-3A to Pier 5-3A | 1202.0 | 96.9 | 1298.9 |
| Pier 5-3A to Pier 6-3A | 1202.0 | 119.8 | 1321.8 |
| Pier 6-3A to Pier 7-3A | 1202.0 | 143.8 | 1345.8 |
| Bridge 69801 K | | | |
| Entire Bridge | 1202.0 | 76.0 | 1278.0 |
| Bridge 69801 L | | | |
| E. Exp. Jt. To Pier 2-3C | 1202.0 | 76.0 | 1278.0 |
| Pier 2-3C to Pier 3-3C | 1202.0 | 73.8 | 1275.8 |
| Pier 3-3C to W. Exp. Jt. | 1202.0 | 69.5 | 1271.5 |
| Bridge 69801 N | | | |
| Pier 1-3E to Pier 2-3E | 1202.0 | 122.9 | 1324.9 |
| Pier 2-3E to Pier 3-3E | 1202.0 | 95.0 | 1297.0 |
| Pier 3-3E to Pier 4-3E | 1202.0 | 77.2 | 1279.2 |
| Pier 4-3E to Pier 5-3E | 1202.0 | 68.0 | 1270.0 |
| Pier 5-3E to Pier 5-2H | 1202.0 | 60.5 | 1262.5 |
| Bridge 69801 M | | | |
| W. Exp. Jt. To Pier 6-3D | 1202.0 | 70.3 | 1272.3 |
| Pier 6-3D to Pier 5-3D | 1202.0 | 74.0 | 1276.0 |
| Pier 5-3D to E. Exp Jt | 1202.0 | 76.0 | 1278.0 |
| Bridge 69881A (Dummy Spans) | | | |
| Entire Bridge | 1202.0 | 76.0 | 1278.0 |

-When load varies at a pier, Use heavier of the two loads.



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PROJECT Special Structures Rating - whole Bridge System

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Composite D.L. - cont.

- See AutoCAD Dwg for Loads/Span + Loads/Girder
- Calculate 10th point of adjacent Girder in Span of terminating Girder

Bridge 69801 K

- Span from Pier 4-3B to Pier 5-3B - Girder 2 Terminates
 - Girder 2 10th point = $57.88' / 69.40' = .83$ ✓ (Span point 3.83) ✓
 - Girder 4 10th point = $59.16' / 70.94' = .83$ ✓ (Span point 3.8) ✓
 - Adjust Both @ 3.8 from 426 PLF to 639 PLF ✓

Bridge 69801 J

- Span from Pier 3-3A to Pier 4-3A - Girder 3 terminates
 - Girder 2 = $48.44' / 64.41' = 0.75$ ✓ (Span point 11.75) ✓
 - Girder 6 = $48.85' / 65.16' = 0.75$ ✓ (Span point 10.75)
 - Girder 7 = $49.38' / 65.87' = 0.75$ ✓ (Span point 11.75) ✓
 - Adjust all @ .75 span point from 320.8 PLF to 427.8 PLF ✓
- Span from pier 5-3A to 6-3A - Girder 5 terminates
 - Girder 2 = $18.22' / 80.50' = 0.23$ ✓ (Span point 9.23) ✓
 - Girder 3 = $17.48' / 81.29' = 0.22$ ✓ (Span point 3.22) ✓
 - Girder 4 = $16.66' / 81.71' = 0.20$ ✓ (Span point 9.20) ✓
 - Girder 6 = $16.42' / 82.18' = 0.20$ ✓ (Span point 8.20) ✓
 - Girder 7 = $16.52' / 82.97' = 0.20$ ✓ (Span point 9.20) ✓
 - Adjust all @ 0.20 point, .23 is close to .2 + Δ Load = 40 PLF ✓



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PROJECT Special Structures Rating

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✓ RAM 1/14/10

Composite DL - cont...

Bridge 64801 K

- Span from Pier 2-3B to Pier 7-3A - Girder 3 Begins
- Girder 2 = $53.63' / 59.01' = 0.91$ ✓ (Span point 7.91) ✓
- Girder 4 = $54.30' / 61.58' = .88$ ✓ (Span Point 7.88) ✓
- Adjust both girders @ span point 7.9 to transition from 639 PLF to 426 PLF ✓



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✓ RAM 11/14/10

Composite Dead Load + Cont...

Bridge 69801 N

- Span from pier 1-3E to pier 2-3E - Girder 8 Begins
 - Girder 5 = $10.04' / 69.85' = 0.14$ ✓ (Span point = 5.14) ✓
 - Girder 6 = $11.07' / 69.13' = 0.16$ ✓ (Span point = 2.16) ✓
 - Girder 7 = $11.56' / 68.48' = 0.17$ ✓ (Span point = 3.17) ✓
 - Girder 9 = $11.37' / 67.81' = 0.17$ ✓ (Span point = 5.17) ✓
 - Girder 10 = $10.97' / 67.04' = 0.16$ ✓ (Span point = 5.17) ✓
 - Adjust all to span point 0.2 to transition from:
265.0 PLF to 220.8 PLF
- Span from Pier 2-3E to Pier 3-3E - Girder 6 Begins
 - Girder 5 = $59.13' / 71.84' = 0.82$ ✓ (Span point = 4.82) ✓
 - Girder 7 = $58.03' / 69.65' = 0.83$ ✓ (Span point = 2.83) ✓
 - Girder 9 = $56.21' / 67.40' = 0.83$ ✓ (Span point = 4.83) ✓
 - Girder 10 = $54.29' / 65.14' = 0.83$ ✓ (Span point = 4.83) ✓
 - adjust all to span point 0.9 to transition
from 324.3 PLF to 259.4 PLF (more conservative)
- Span from Pier 3-3E to pier 4-3E - Girder 7 Begins
 - Girder 5 = $11.35' / 53.04' = 0.21$ ✓ (Span point 3.21) ✓
 - Girder 9 = $11.28' / 50.95' = 0.22$ ✓ (Span point 3.22) ✓
 - Girder 10 = $10.89' / 49.3' = 0.22$ ✓ (Span point 3.22) ✓
 - Adjust all span points to 3.3 to transition from ✓
426.4 PLF to 319.8 PLF (more conservative)



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PROJECT Special Structures Rating - whole Bridge System
PROJECT # 090147 DATE 11/24/09 BY CJM SHEET NO. 1 OF 19

VRAM 1/11/10

Live Load Distribution Factors.

- Distribution Factors will be calculated in accordance with AASHTO Standard Specification - section 3.23 ✓
- Gutter to Gutter width varies with minimum of 21'-6". AASHTO Std. Spec. 3.6.3 states roadway widths 20'-0" to 24'-0" to have 2 designed Traffic lanes. After conversation with Mn/DOT Bridge office, Ramps can be considered single lane in nature, off/on Ramp stripping for 1 lane. In areas of interchanges, 2 lane criteria will be used. See AutoCAD Drawing for areas of 1 + 2 lane Rating ✓

Distribution of Loads

Reactions - 3.23.1.2 - floor acts as simple span between Girders,
(mpx-wdr) Position load for Greatest effect (Statics) ✓

Moments/Shear - Interior Beams - ^(3.23.2.2) AASHTO Standard Specification
(mpx-wds) Table 3.23.1 ✓

Moment/Shear - Exterior beams - 3.23.2.3 - Slab acts as a simple
(mpx-wds) span between beams, Position Load for greatest effect (Statics) ✓

Deflection + fatigue Distribution Factors shall be the same as Distribution Factors for moment + Shear ✓



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PROJECT Special Structures Rating - whole Bridge System

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VRAM 1/11/10

Live Load Distribution Factors - Cont...

- Bridge 69801 J, K, L, M, N, + 69831A have areas of constant Gutter to Gutter width of 21'-6" with areas having either 3 Girders @ 9'-0" on center or 2 Girders @ 18'-0" on center ✓

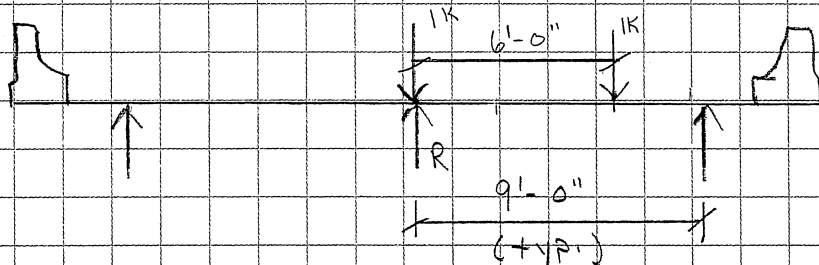
Area 1

- 21'-6" Gutter to Gutter spacing w/ 9'-0" center to center spacing. These Areas will be considered single Lane Loading ✓

Interior Girders

moment / shear $\Rightarrow D.F. = S/7 = 9'-0"/7 = 1.286$ wheels ✓

Reaction $\Rightarrow$ use lever Rule (statics)



$$R = 1K + \frac{(9'-0'' - 6'-0'')}{9'-0''} \cdot 1K = 1.333 \text{ wheels } \checkmark$$



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PROJECT Special Structures Rating - Whole Bridge System

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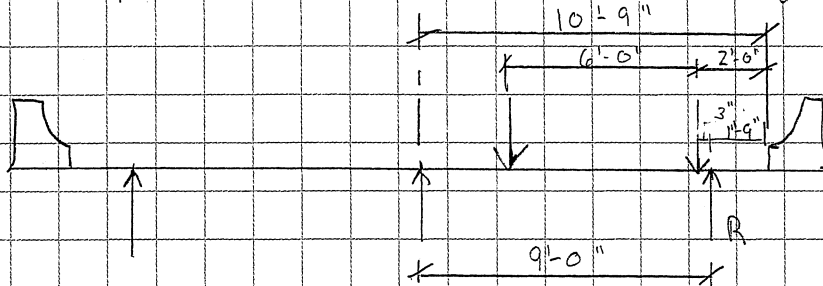
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Live Load Distribution Factors - Cont...

Area 1 Cont...

Exterior Girders

Moment/Shear $\Rightarrow$ use Lever Rule (Statics)



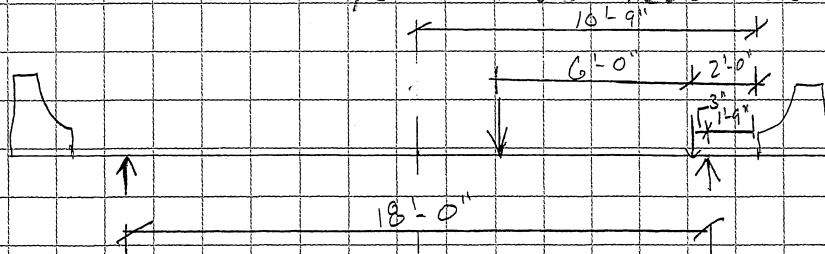
$$R = \frac{(9'-0'' - 3'') \cdot 1 \text{ k}}{9'-0''} + \frac{(9'-0'' - 6'-3'') \cdot 1 \text{ k}}{9'-0''} = 1.278 \text{ wheels } \checkmark$$

Reaction $\Rightarrow$ cannot get wheel closer to Girder $\Rightarrow$ D.F = 1.278 wheels $\checkmark$

Area 2

- 2 1'-6" Gutter to Gutter w/ 18'-0" Girder spacing. This area will be considered Single lane Loading, No Interior Girder

Reaction = Moment/Shear $\Rightarrow$ use Lever Rule (Statics)



$$R = \frac{(18'-0'' - 3'') \cdot 1 \text{ k}}{18'-0''} + \frac{(18'-0'' - 6'-3'') \cdot 1 \text{ k}}{18'-0''} = 1.639 \text{ wheels } \checkmark$$



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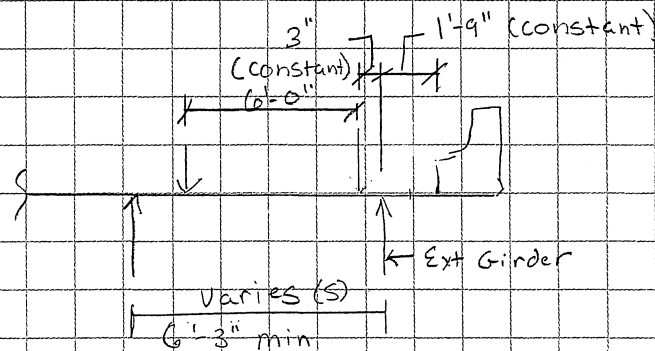
✓ RAM 1/11/10

Live Load Distribution Factors Cont...

Non constant Girder Spacing

Exterior Girder can be simplified into an Equation based on Beam spacing to next interior Girder. Only up to a certain Distance in areas of 2 Design Lanes. ✓

Single Lane Loading



$$(1) DF = \frac{(S-3'') \cdot 1^k}{S} + \frac{(S-6'-3'') \cdot 1^k}{S} \quad (\text{Including } S=6'-3'' + \text{Greater}) \quad \checkmark$$

$$(2) - \text{For under } 6'-3'' \Rightarrow DF = \frac{S-3''}{S} \cdot 1^k \quad \checkmark$$

Two Lane Loading

- Equation will work for under 6'-3" ✓
- Equation will work for > 6'-3" ✓
 - Equation (1) will work for 10'-3" ≥ S ≥ 6'-3" ✓
- no C. to C. Beam spacing greater than 10'-3". No other Equations needed ✓

* See Excel Sheet for Exterior Beam D.F. in areas of varying girder spacing ✓



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Live Load Distribution Factors-Cont...

- Exterior Girder Distribution Factors will be calculated in Excel spreadsheet in areas of varying Girder Spacing ✓
- Below are areas needed to be calculated by the excel spreadsheet for Exterior Girders ✓

Girder 1

- Constant 9'-0" Spacing to span point 3.83 (adjust to 3.8) ✓
- Constant 18'-0" spacing from span point 3.9 to 7.89 (adjust to 7.9) ✓
- Constant 9'-0" spacing from 8.0 to 9.9 ✓
- Variable Spacing from 10.0 to 12.2 ✓
- constant 9'-0" Spacing from 12.3 to End ✓

Girder 2 + 3

- Interior Girder, not applicable ✓

Girder 4

- Constant 9'-0" Spacing to span point 3.83 (adjust to 3.8) ✓
- Constant 18'-0" spacing from span point 3.9 to 7.89 (adjust to 7.9) ✓
- From 8.0 to End, interior girder - not applicable ✓

Girder 5

- Variable girder Spacing from beginning to span point 7.9
- Constant 9'-0" spacing from 8.0 to 9.9 ✓
- From 10.0 to End - interior girder - not applicable ✓

Girder 6

- Interior Girder, not applicable ✓



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PROJECT Special Structures Rating

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Live Load Distribution Factors - Cont...

Girder 7

- Interior girder from start to span point 4.07 (adjust to 4.0) ✓
- Exterior w/ varying spacing from 4.1 to 5.9 ✓
- Constant 9'-0" from 6.0 to 7.9
- Variable Girder Spacing from 8.0 to 12.9 - 9'-0" to int Beam $\rightarrow DF = 1.278$
- Constant 9'-0" spacing from 13.0 to End

Girder 8

- Interior girder from start to span point 2.07 (adjust to 2.0) ✓
- variable spacing from 2.1 to 3.9 ✓
- constant 9'-0" spacing from 4.0 to End ✓

Girder 9

- Interior girder - not applicable ✓

Girder 10

- variable spacing from beginning to 6.9 ✓
- constant 9'-0" spacing from 7.0 to End ✓

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Girder 1

| Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. |
|------------|--------------|---------------------------|-------|
| 10.0 | 2 | 8.97 | 1.275 |
| 10.1 | 2 | 8.97 | 1.275 |
| 10.2 | 2 | 8.83 | 1.264 |
| 10.3 | 2 | 8.65 | 1.249 |
| 10.4 | 2 | 8.48 | 1.233 |
| 10.5 | 2 | 8.36 | 1.222 |
| 10.6 | 2 | 8.48 | 1.233 |
| 10.7 | 2 | 8.54 | 1.239 |
| 10.8 | 2 | 8.54 | 1.239 |
| 10.9 | 2 | 8.49 | 1.234 |
| 11.0 | 2 | 8.23 | 1.210 |
| 11.1 | 2 | 7.97 | 1.185 |
| 11.2 | 2 | 7.62 | 1.147 |
| 11.3 | 2 | 7.21 | 1.099 |
| 11.4 | 2 | 6.77 | 1.039 |
| 11.5 | 2 | 6.27 | 0.963 |
| 11.6 | 2 | 5.73 | 0.956 |
| 11.7 | 2 | 5.14 | 0.951 |
| 11.8 | 2 | 9.54 | 1.319 |
| 11.9 | 1 | 9.36 | 1.305 |
| 12.0 | 1 | 9.21 | 1.295 |
| 12.1 | 1 | 9.11 | 1.286 |
| 12.2 | 1 | 9.04 | 1.281 |
| 12.3 | 1 | 9.00 | 1.278 |
| 12.4 | 1 | 9.00 | 1.278 |
| 12.5 | 1 | 9.00 | 1.278 |
| 12.6 | 1 | 9.00 | 1.278 |
| 12.7 | 1 | 9.00 | 1.278 |
| 12.8 | 1 | 9.00 | 1.278 |
| 12.9 | 1 | 9.00 | 1.278 |

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Girder 5

| Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. | Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. |
|------------|--------------|---------------------------|-------|------------|--------------|---------------------------|-------|
| 1.0 | 1 | 7.16 | 1.092 | 4.5 | 2 | 6.59 | 1.014 |
| 1.1 | 1 | 6.97 | 1.068 | 4.6 | 2 | 7.27 | 1.106 |
| 1.2 | 1 | 6.87 | 1.053 | 4.7 | 2 | 8.02 | 1.189 |
| 1.3 | 1 | 6.78 | 1.041 | 4.8 | 2 | 8.85 | 1.265 |
| 1.4 | 1 | 6.70 | 1.030 | 4.9 | 2 | 4.82 | 0.948 |
| 1.5 | 1 | 6.64 | 1.022 | 5.0 | 2 | 5.25 | 0.952 |
| 1.6 | 1 | 6.60 | 1.015 | 5.1 | 2 | 5.58 | 0.955 |
| 1.7 | 1 | 6.58 | 1.012 | 5.2 | 2 | 5.91 | 0.958 |
| 1.8 | 1 | 6.57 | 1.010 | 5.3 | 2 | 6.21 | 0.960 |
| 1.9 | 1 | 6.57 | 1.011 | 5.4 | 2 | 6.48 | 0.997 |
| 2.0 | 1 | 6.60 | 1.015 | 5.5 | 2 | 6.72 | 1.033 |
| 2.1 | 1 | 6.65 | 1.022 | 5.6 | 2 | 6.93 | 1.062 |
| 2.2 | 1 | 6.73 | 1.034 | 5.7 | 2 | 7.12 | 1.086 |
| 2.3 | 1 | 6.83 | 1.048 | 5.8 | 2 | 7.27 | 1.106 |
| 2.4 | 1 | 6.96 | 1.065 | 5.9 | 2 | 7.39 | 1.121 |
| 2.5 | 1 | 7.11 | 1.085 | 6.0 | 1 | 7.49 | 1.132 |
| 2.6 | 1 | 7.28 | 1.108 | 6.1 | 1 | 7.57 | 1.142 |
| 2.7 | 1 | 7.49 | 1.132 | 6.2 | 1 | 7.65 | 1.150 |
| 2.8 | 1 | 7.71 | 1.157 | 6.3 | 1 | 7.73 | 1.159 |
| 2.9 | 1 | 7.97 | 1.184 | 6.4 | 1 | 7.81 | 1.168 |
| 3.0 | 2 | 8.24 | 1.211 | 6.5 | 1 | 7.89 | 1.176 |
| 3.1 | 2 | 8.52 | 1.237 | 6.6 | 1 | 7.97 | 1.184 |
| 3.2 | 2 | 8.81 | 1.262 | 6.7 | 1 | 8.05 | 1.192 |
| 3.3 | 2 | 4.29 | 0.942 | 6.8 | 1 | 8.12 | 1.200 |
| 3.4 | 2 | 4.17 | 0.940 | 6.9 | 1 | 8.20 | 1.208 |
| 3.5 | 2 | 4.10 | 0.939 | 7.0 | 1 | 8.28 | 1.215 |
| 3.6 | 2 | 4.08 | 0.939 | 7.1 | 1 | 8.37 | 1.224 |
| 3.7 | 2 | 4.10 | 0.939 | 7.2 | 1 | 8.46 | 1.232 |
| 3.8 | 2 | 4.16 | 0.940 | 7.3 | 1 | 8.55 | 1.240 |
| 3.9 | 2 | 4.27 | 0.941 | 7.4 | 1 | 8.64 | 1.248 |
| 4.0 | 2 | 4.42 | 0.943 | 7.5 | 1 | 8.73 | 1.255 |
| 4.1 | 2 | 4.69 | 0.947 | 7.6 | 1 | 8.82 | 1.263 |
| 4.2 | 2 | 5.05 | 0.950 | 7.7 | 1 | 8.91 | 1.270 |
| 4.3 | 2 | 5.48 | 0.954 | 7.8 | 1 | 9.00 | 1.278 |
| 4.4 | 2 | 6.00 | 0.958 | 7.9 | 1 | 9.00 | 1.278 |

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Girder 7

| Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. |
|------------|--------------|---------------------------|-------|
| 4.1 | 1 | 7.57 | 1.142 |
| 4.2 | 1 | 7.65 | 1.150 |
| 4.3 | 1 | 7.73 | 1.159 |
| 4.4 | 1 | 7.81 | 1.168 |
| 4.5 | 1 | 7.89 | 1.176 |
| 4.6 | 1 | 7.97 | 1.184 |
| 4.7 | 1 | 8.05 | 1.192 |
| 4.8 | 1 | 8.12 | 1.200 |
| 4.9 | 1 | 8.20 | 1.208 |
| 5.0 | 1 | 8.28 | 1.215 |
| 5.1 | 1 | 8.37 | 1.224 |
| 5.2 | 1 | 8.46 | 1.232 |
| 5.3 | 1 | 8.55 | 1.240 |
| 5.4 | 1 | 8.64 | 1.248 |
| 5.5 | 1 | 8.73 | 1.256 |
| 5.6 | 1 | 8.82 | 1.263 |
| 5.7 | 1 | 8.91 | 1.271 |
| 5.8 | 1 | 9.00 | 1.278 |
| 5.9 | 1 | 9.00 | 1.278 |

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Completed By: CJM

Completed on: 11/20/09

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Checked By: RAM

Checked on: 01/11/10

Girder 8

| Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. |
|------------|--------------|---------------------------|-------|
| 2.1 | 1 | 6.25 | 0.960 |
| 2.2 | 1 | 6.40 | 0.985 |
| 2.3 | 1 | 6.56 | 1.009 |
| 2.4 | 1 | 6.72 | 1.032 |
| 2.5 | 1 | 6.88 | 1.055 |
| 2.6 | 1 | 7.04 | 1.076 |
| 2.7 | 1 | 7.19 | 1.096 |
| 2.8 | 1 | 7.35 | 1.116 |
| 2.9 | 1 | 7.51 | 1.135 |
| 3.0 | 1 | 7.67 | 1.152 |
| 3.1 | 1 | 7.85 | 1.172 |
| 3.2 | 1 | 8.03 | 1.190 |
| 3.3 | 1 | 8.20 | 1.208 |
| 3.4 | 1 | 8.38 | 1.224 |
| 3.5 | 1 | 8.56 | 1.240 |
| 3.6 | 1 | 8.74 | 1.256 |
| 3.7 | 1 | 8.91 | 1.271 |
| 3.8 | 1 | 9.00 | 1.278 |
| 3.9 | 1 | 9.00 | 1.278 |

Girder 10

| Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. | Span Point | Lanes Loaded | Space to Int. Girder (FT) | D.F. |
|------------|--------------|---------------------------|-------|------------|--------------|---------------------------|-------|
| 1.0 | 1 | 7.16 | 1.092 | 4.5 | 2 | 8.68 | 1.251 |
| 1.1 | 1 | 7.15 | 1.090 | 4.6 | 2 | 8.71 | 1.254 |
| 1.2 | 1 | 7.20 | 1.098 | 4.7 | 2 | 8.74 | 1.256 |
| 1.3 | 1 | 7.26 | 1.105 | 4.8 | 2 | 8.77 | 1.258 |
| 1.4 | 1 | 7.32 | 1.112 | 4.9 | 2 | 8.79 | 1.260 |
| 1.5 | 1 | 7.37 | 1.118 | 5.0 | 2 | 8.81 | 1.263 |
| 1.6 | 1 | 7.43 | 1.125 | 5.1 | 2 | 8.84 | 1.264 |
| 1.7 | 1 | 7.48 | 1.131 | 5.2 | 2 | 8.86 | 1.266 |
| 1.8 | 1 | 7.53 | 1.137 | 5.3 | 2 | 8.88 | 1.268 |
| 1.9 | 1 | 7.58 | 1.143 | 5.4 | 2 | 8.89 | 1.269 |
| 2.0 | 1 | 7.63 | 1.149 | 5.5 | 2 | 8.91 | 1.271 |
| 2.1 | 1 | 7.70 | 1.156 | 5.6 | 2 | 8.93 | 1.272 |
| 2.2 | 1 | 7.76 | 1.162 | 5.7 | 2 | 8.94 | 1.273 |
| 2.3 | 1 | 7.82 | 1.169 | 5.8 | 2 | 8.95 | 1.274 |
| 2.4 | 1 | 7.88 | 1.175 | 5.9 | 2 | 8.97 | 1.275 |
| 2.5 | 1 | 7.94 | 1.181 | 6.0 | 1 | 8.98 | 1.276 |
| 2.6 | 1 | 7.99 | 1.187 | 6.1 | 1 | 8.98 | 1.276 |
| 2.7 | 1 | 8.05 | 1.192 | 6.2 | 1 | 8.99 | 1.277 |
| 2.8 | 1 | 8.10 | 1.197 | 6.3 | 1 | 8.99 | 1.277 |
| 2.9 | 1 | 8.15 | 1.202 | 6.4 | 1 | 9.00 | 1.278 |
| 3.0 | 2 | 8.20 | 1.207 | 6.5 | 1 | 9.00 | 1.278 |
| 3.1 | 2 | 8.24 | 1.211 | 6.6 | 1 | 9.00 | 1.278 |
| 3.2 | 2 | 8.28 | 1.215 | 6.7 | 1 | 9.00 | 1.278 |
| 3.3 | 2 | 8.31 | 1.218 | 6.8 | 1 | 9.00 | 1.278 |
| 3.4 | 2 | 8.35 | 1.221 | 6.9 | 1 | 9.00 | 1.278 |
| 3.5 | 2 | 8.38 | 1.225 | | | | |
| 3.6 | 2 | 8.42 | 1.228 | | | | |
| 3.7 | 2 | 8.45 | 1.230 | | | | |
| 3.8 | 2 | 8.47 | 1.233 | | | | |
| 3.9 | 2 | 8.50 | 1.235 | | | | |
| 4.0 | 2 | 8.53 | 1.238 | | | | |
| 4.1 | 2 | 8.56 | 1.241 | | | | |
| 4.2 | 2 | 8.59 | 1.244 | | | | |
| 4.3 | 2 | 8.63 | 1.246 | | | | |
| 4.4 | 2 | 8.66 | 1.249 | | | | |



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DATE 11/25/09

BY CJM

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✓RAM 1/11/10

Live Load Distribution Factors - Cont

Interior Girders

- Start with areas that are single lane loaded with only 1 interior girder. (Girder 6 + 9)
- use $S/7$ S = average stringer (girder) spacing in FT

Girder 6

- Pier 1-3E to 3-3C

$$3.0 = (1/2 \cdot 38.92') / 7 = 1.112 \checkmark \quad 3.5 = (1/2 \cdot 15.774') / 7 = 1.127 \checkmark$$

$$3.1 = (1/2 \cdot 15.144') / 7 = 1.082 \checkmark \quad 3.6 = (1/2 \cdot 15.932') / 7 = 1.138 \checkmark$$

$$3.2 = (1/2 \cdot 15.302') / 7 = 1.093 \checkmark \quad 3.7 = (1/2 \cdot 16.089') / 7 = 1.149 \checkmark$$

$$3.3 = (1/2 \cdot 15.459') / 7 = 1.104 \checkmark \quad 3.8 = (1/2 \cdot 16.246') / 7 = 1.160 \checkmark$$

$$3.4 = (1/2 \cdot 15.617') / 7 = 1.116 \checkmark \quad 3.9 = (1/2 \cdot 16.404') / 7 = 1.172 \checkmark$$

- Pier 3-3C to 2-3C

$$4.0 = (1/2 \cdot 16.562') / 7 = 1.183 \checkmark \quad 4.5 = (1/2 \cdot 17.46') / 7 = 1.247 \checkmark$$

$$4.1 = (1/2 \cdot 16.741') / 7 = 1.196 \checkmark \quad 4.6 = (1/2 \cdot 17.639') / 7 = 1.260 \checkmark$$

$$4.2 = (1/2 \cdot 16.921') / 7 = 1.209 \checkmark \quad 4.7 = (1/2 \cdot 17.819') / 7 = 1.273 \checkmark$$

$$4.3 = (1/2 \cdot 17.10') / 7 = 1.221 \checkmark \quad 4.8 = (1/2 \cdot 18'-0") / 7 = 1.286 \checkmark$$

$$4.4 = (1/2 \cdot 17.28') / 7 = 1.234 \checkmark \quad 4.9 = (1/2 \cdot 18.0') / 7 = 1.286 \checkmark$$

- Pier 3-3A to pier 2-3A

$$11.0 = 1/2 (18.216') / 7 = 1.301 \checkmark \quad 11.5 = 1.286 \checkmark$$

$$11.1 = 1/2 (18.109') / 7 = 1.294 \checkmark \quad 11.6 = " \checkmark$$

$$11.2 = 1/2 (18.039') / 7 = 1.289 \checkmark \quad 11.7 = " \checkmark$$

$$11.3 = 1/2 (18.006') / 7 = 1.286 \checkmark \quad 11.8 = " \checkmark$$

$$11.4 = 9'-0" / 7 = 1.286 \checkmark \quad 11.9 = " \checkmark$$



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Live Load Distribution Factor - cont...

Girder 9

- From Pier 5-24 to Pier 5-36

$$\begin{aligned} 1.0 &= (1/2 \cdot 14.133') / 7 = 1.010 \checkmark & 1.5 &= (1/2 \cdot 14.004') / 7 = 1.000 \checkmark \\ 1.1 &= (1/2 \cdot 14.079') / 7 = 1.006 \checkmark & 1.6 &= (1/2 \cdot 14.021') / 7 = 1.002 \checkmark \\ 1.2 &= (1/2 \cdot 14.039') / 7 = 1.003 \checkmark & 1.7 &= (1/2 \cdot 14.052') / 7 = 1.004 \checkmark \\ 1.3 &= (1/2 \cdot 14.013') / 7 = 1.001 \checkmark & 1.8 &= (1/2 \cdot 14.098') / 7 = 1.007 \checkmark \\ 1.4 &= (1/2 \cdot 14.00') / 7 = 1.0 \checkmark & 1.9 &= (1/2 \cdot 14.157') / 7 = 1.011 \checkmark \end{aligned}$$

- Pier 5-36 to pier 4-36

$$\begin{aligned} 2.0 &= (1/2 \cdot 14.231') / 7 = 1.017 \checkmark & 2.5 &= (1/2 \cdot 15.04') / 7 = 1.074 \checkmark \\ 2.1 &= (1/2 \cdot 14.347') / 7 = 1.025 \checkmark & 2.6 &= (1/2 \cdot 15.27') / 7 = 1.091 \checkmark \\ 2.2 &= (1/2 \cdot 14.485') / 7 = 1.035 \checkmark & 2.7 &= (1/2 \cdot 15.524') / 7 = 1.109 \checkmark \\ 2.3 &= (1/2 \cdot 14.647') / 7 = 1.046 \checkmark & 2.8 &= (1/2 \cdot 15.801') / 7 = 1.129 \checkmark \\ 2.4 &= (1/2 \cdot 14.832') / 7 = 1.059 \checkmark & 2.9 &= (1/2 \cdot 16.101') / 7 = 1.150 \checkmark \end{aligned}$$

- Pier 1-36 to pier 6-30

$$\begin{aligned} 6.0 &= (1/2 \cdot 15.292') / 7 = 1.092 \checkmark & 6.5 &= (1/2 \cdot 15.892') / 7 = 1.135 \checkmark \\ 6.1 &= (1/2 \cdot 15.251') / 7 = 1.089 \checkmark & 6.6 &= (1/2 \cdot 16.051') / 7 = 1.147 \checkmark \\ 6.2 &= (1/2 \cdot 15.412') / 7 = 1.101 \checkmark & 6.7 &= (1/2 \cdot 16.21') / 7 = 1.158 \checkmark \\ 6.3 &= (1/2 \cdot 15.572') / 7 = 1.112 \checkmark & 6.8 &= (1/2 \cdot 16.363') / 7 = 1.169 \checkmark \\ 6.4 &= (1/2 \cdot 15.732') / 7 = 1.124 \checkmark & 6.9 &= (1/2 \cdot 16.515') / 7 = 1.180 \checkmark \end{aligned}$$



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Live Load Distribution Factors - cont...

Girder 9 - cont

- Pier 6-3D to pier 5-3D

$$7.0 = (1/2 \cdot 16.667') / 7 = 1.191 \checkmark \quad 7.5 = (1/2 \cdot 17.556') / 7 = 1.254 \checkmark$$

$$7.1 = (1/2 \cdot 16.844') / 7 = 1.203 \checkmark \quad 7.6 = (1/2 \cdot 17.733') / 7 = 1.267 \checkmark$$

$$7.2 = (1/2 \cdot 17.022') / 7 = 1.216 \checkmark \quad 7.7 = (1/2 \cdot 17.911') / 7 = 1.279 \checkmark$$

$$7.3 = (1/2 \cdot 17.20') / 7 = 1.229 \checkmark \quad 7.8 = 9'-0" / 7 = 1.286 \checkmark$$

$$7.4 = (1/2 \cdot 17.378') / 7 = 1.241 \checkmark \quad 7.9 = 9'-0" / 7 = 1.286 \checkmark$$

Remaining Interior Girders - in two lane areas

- Excel sheets can be utilized for girders that go whole length of span
- hand calcs will be used for girder starting + terminating mid span
- D.F. will be broke up between Piers not by Girder

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| Pier 4-3E to Pier 3-3E | | | | | Pier 2-3E to Pier 1-3E | | | | |
|------------------------|--------------------|----------------------|--------------------------------|-------|------------------------|--------------------|----------------------|--------------------------------|-------|
| Girder No. 9 | | | | | Girder No. 6, 7, 9 | | | | |
| Span Point | Length (L)
(FT) | Number of
Girders | Avg Girder
Spacing (S) (FT) | D.F. | Span Point | Length (L)
(FT) | Number of
Girders | Avg Girder
Spacing (S) (FT) | D.F. |
| 0 | 16.427 | 3 | 8.214 | 1.493 | 0 | 28.369 | 5 | 7.092 | 1.290 |
| 1 | 16.741 | 3 | 8.371 | 1.522 | 1 | 29.238 | 5 | 7.310 | 1.329 |
| 2 | 17.073 | 3 | 8.537 | 1.552 | 2 | 30.188 | 6 | 6.038 | 1.098 |
| 3 | 17.423 | 4 | 5.808 | 1.056 | 3 | 31.17 | 6 | 6.234 | 1.133 |
| 4 | 17.792 | 4 | 5.931 | 1.078 | 4 | 32.184 | 6 | 6.437 | 1.170 |
| 5 | 18.178 | 4 | 6.059 | 1.102 | 5 | 33.229 | 6 | 6.646 | 1.208 |
| 6 | 18.582 | 4 | 6.194 | 1.126 | 6 | 34.305 | 6 | 6.861 | 1.247 |
| 7 | 19.003 | 4 | 6.334 | 1.152 | 7 | 35.412 | 6 | 7.082 | 1.288 |
| 8 | 19.441 | 4 | 6.480 | 1.178 | 8 | 36.551 | 6 | 7.310 | 1.329 |
| 9 | 19.897 | 4 | 6.632 | 1.206 | 9 | 37.719 | 6 | 7.544 | 1.372 |
| Pier 3-3E to Pier 2-3E | | | | | Pier 7-3A to Pier 6-3A | | | | |
| Girder No. 7, 9 | | | | | Girder No. 3, 4, 5, 6 | | | | |
| 0 | 20.37 | 4 | 6.790 | 1.235 | 0 | 44.692 | 6 | 8.938 | 1.625 |
| 1 | 21.037 | 4 | 7.012 | 1.275 | 1 | 43.878 | 6 | 8.776 | 1.596 |
| 2 | 21.735 | 4 | 7.245 | 1.317 | 2 | 43.063 | 6 | 8.613 | 1.566 |
| 3 | 22.463 | 4 | 7.488 | 1.361 | 3 | 42.247 | 6 | 8.449 | 1.536 |
| 4 | 23.22 | 4 | 7.740 | 1.407 | 4 | 41.431 | 6 | 8.286 | 1.507 |
| 5 | 24.004 | 4 | 8.001 | 1.455 | 5 | 40.614 | 6 | 8.123 | 1.477 |
| 6 | 24.814 | 4 | 8.271 | 1.504 | 6 | 39.797 | 6 | 7.959 | 1.447 |
| 7 | 25.652 | 4 | 8.551 | 1.555 | 7 | 38.979 | 6 | 7.796 | 1.417 |
| 8 | 26.515 | 4 | 8.838 | 1.607 | 8 | 38.161 | 6 | 7.632 | 1.388 |
| 9 | 27.405 | 5 | 6.851 | 1.246 | 9 | 37.342 | 6 | 7.468 | 1.358 |

Girder 7 & 8 at Pier 1-3E - $L=38.918'$ $\Rightarrow S = 7.784'$ $\Rightarrow D.F. = 1.112$ (single lane)

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| Pier 6-3A to Pier 5-3A | | | | | Pier 4-3A to Pier 3-3A | | | | |
|------------------------|--------------------|----------------------|--------------------------------|-------|------------------------|--------------------|----------------------|--------------------------------|-------|
| Girder No. 3, 4, 6 | | | | | Girder No. 6 | | | | |
| Span Point | Length (L)
(FT) | Number of
Girders | Avg Girder
Spacing (S) (FT) | D.F. | Span Point | Length (L)
(FT) | Number of
Girders | Avg Girder
Spacing (S) (FT) | D.F. |
| 0 | 36.525 | 6 | 7.305 | 1.328 | 0 | 21.319 | 4 | 7.106 | 1.292 |
| 1 | 35.729 | 6 | 7.146 | 1.299 | 1 | 20.843 | 4 | 6.948 | 1.263 |
| 2 | 34.956 | 5 | 8.739 | 1.589 | 2 | 20.403 | 4 | 6.801 | 1.237 |
| 3 | 34.203 | 5 | 8.551 | 1.555 | 3 | 20 | 4 | 6.667 | 1.212 |
| 4 | 33.446 | 5 | 8.362 | 1.520 | 4 | 19.634 | 4 | 6.545 | 1.190 |
| 5 | 32.667 | 5 | 8.167 | 1.485 | 5 | 19.305 | 4 | 6.435 | 1.170 |
| 6 | 31.895 | 5 | 7.974 | 1.450 | 6 | 19.013 | 4 | 6.338 | 1.152 |
| 7 | 31.101 | 5 | 7.775 | 1.414 | 7 | 18.758 | 4 | 6.253 | 1.137 |
| 8 | 30.295 | 5 | 7.574 | 1.377 | 8 | 18.54 | 3 | 9.270 | 1.685 |
| 9 | 29.476 | 5 | 7.369 | 1.340 | 9 | 18.359 | 3 | 9.180 | 1.669 |
| Pier 5-3A to Pier 4-3A | | | | | | | | | |
| Girder No. 3, 6 | | | | | | | | | |
| 0 | 28.645 | 4 | 9.548 | 1.736 | | | | | |
| 1 | 27.88 | 4 | 9.293 | 1.690 | | | | | |
| 2 | 27.105 | 4 | 9.035 | 1.643 | | | | | |
| 3 | 26.321 | 4 | 8.774 | 1.595 | | | | | |
| 4 | 25.527 | 4 | 8.509 | 1.547 | | | | | |
| 5 | 24.724 | 4 | 8.241 | 1.498 | | | | | |
| 6 | 23.948 | 4 | 7.983 | 1.451 | | | | | |
| 7 | 23.22 | 4 | 7.740 | 1.407 | | | | | |
| 8 | 22.539 | 4 | 7.513 | 1.366 | | | | | |
| 9 | 21.905 | 4 | 7.302 | 1.328 | | | | | |

Girder 4 at pier 5-3A - L = 28.645' => S=7.16' => D.F. = 1.302 (two lane)



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Live Load Distribution Factors - Cont...

Terminating interior Girders

- Girder 3 - From Hinge to pier 7-3A + Pier 7-3A to End ✓
- Girder 5 - From Pier 6-3A to End ✓
- Girder 6 - From beginning to pier 2-3E ✓
- Girder 7 - From beginning to Pier 3-3E ✓
- Girder 8 - From Beginning to pier 2-3E ✓

Girder 3

- Beginning to pier 7-3A (Single Lane)
- Width varies from 9'-0⁵/₈" to 9'-0⁹/₁₆" on Each ✓
Side of Girders - Use 9'-0⁵/₈" for entire length

$$D.I.F = 9'-0^{5/8} / 7 = 1.293 \checkmark$$

- Pier 4-3A to End (Two Lane)

$$S_0 = (1/3 \cdot 20.31') / 5.5 = 1.231 \checkmark \quad S_5 = (1/3 \cdot 19.732') / 5.5 = 1.196 \checkmark$$

$$S_1 = (1/3 \cdot 20.95') / 5.5 = 1.270 \checkmark \quad S_6 = (1/3 \cdot 19.481') / 5.5 = 1.181 \checkmark$$

$$S_2 = (1/3 \cdot 20.614') / 5.5 = 1.249 \checkmark \quad S_7 = (1/3 \cdot 19.25') / 5.5 = 1.167 \checkmark$$

$$S_3 = (1/3 \cdot 20.298') / 5.5 = 1.230 \checkmark \quad S_8 = (1/3 \cdot 19.044') / 5.5 = 1.154 \checkmark$$

$$S_4 = (1/3 \cdot 20.00') / 5.5 = 1.212 \checkmark \quad S_9 = (1/3 \cdot 18.858') / 5.5 = 1.143 \checkmark$$

$$6.0 = (1/3 \cdot 18.693') / 5.5 = 1.133 \checkmark$$



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Live Load Distribution Factor - cont...

Girder 5

- From Pier 6-3A to End (Two Lane)

| | |
|---|---|
| $11.0 = (1/5 \cdot 36.461') / 5.5 = 1.326 \checkmark$ | $11.6 = (1/5 \cdot 35.511') / 5.5 = 1.291 \checkmark$ |
| $11.1 = (1/5 \cdot 36.30') / 5.5 = 1.320 \checkmark$ | $11.7 = (1/5 \cdot 35.356') / 5.5 = 1.286 \checkmark$ |
| $11.2 = (1/5 \cdot 36.14') / 5.5 = 1.314 \checkmark$ | $11.8 = (1/5 \cdot 35.202') / 5.5 = 1.280 \checkmark$ |
| $11.3 = (1/5 \cdot 35.981') / 5.5 = 1.308 \checkmark$ | $11.9 = (1/5 \cdot 35.049') / 5.5 = 1.275 \checkmark$ |
| $11.4 = (1/5 \cdot 35.824') / 5.5 = 1.303 \checkmark$ | $12.0 = (1/5 \cdot 34.897') / 5.5 = 1.269 \checkmark$ |
| $11.5 = (1/5 \cdot 35.667') / 5.5 = 1.297 \checkmark$ | |

Girder 6

- From beginning to pier 2-3C (Two Lane)

| | |
|--|--|
| $1.0 = (1/4 \cdot 26.809') / 5.5 = 1.219 \checkmark$ | $1.5 = (1/4 \cdot 27.594') / 5.5 = 1.254 \checkmark$ |
| $1.1 = (1/4 \cdot 26.96') / 5.5 = 1.225 \checkmark$ | $1.6 = (1/4 \cdot 27.764') / 5.5 = 1.262 \checkmark$ |
| $1.2 = (1/4 \cdot 27.112') / 5.5 = 1.232 \checkmark$ | $1.7 = (1/4 \cdot 27.929') / 5.5 = 1.270 \checkmark$ |
| $1.3 = (1/4 \cdot 27.265') / 5.5 = 1.239 \checkmark$ | $1.8 = (1/4 \cdot 28.091') / 5.5 = 1.277 \checkmark$ |
| $1.4 = (1/4 \cdot 27.42') / 5.5 = 1.246 \checkmark$ | $1.9 = (1/4 \cdot 28.248') / 5.5 = 1.284 \checkmark$ |

Girder 7

- From beginning to pier 3-3C (Two Lanes)

| |
|--|
| $1.0 = (1/3 \cdot 17.198') / 5.5 = 1.042 \checkmark$ |
| $1.1 = (1/3 \cdot 17.468') / 5.5 = 1.059 \checkmark$ |
| $1.2 = (1/3 \cdot 17.748') / 5.5 = 1.076 \checkmark$ |
| $1.3 = (1/3 \cdot 18.04') / 5.5 = 1.093 \checkmark$ |
| $1.4 = (1/3 \cdot 18.342') / 5.5 = 1.112 \checkmark$ |
| $1.5 = (1/3 \cdot 18.655') / 5.5 = 1.131 \checkmark$ |
| $1.6 = (1/3 \cdot 18.979') / 5.5 = 1.150 \checkmark$ |
| $1.7 = (1/3 \cdot 19.314') / 5.5 = 1.171 \checkmark$ |
| $1.8 = (1/3 \cdot 19.66') / 5.5 = 1.192 \checkmark$ |
| $1.9 = (1/3 \cdot 20.016') / 5.5 = 1.213 \checkmark$ |



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Live Load Distribution Factors - Cont...

Girder 8

- from beginning to Pier 1-38

$$1.0 \Rightarrow (1/5 \cdot 29.904') / 5.5 = 1.087 \checkmark$$

$$1.1 = (1/5 \cdot 30.727') / 5.5 = 1.117 \checkmark \quad 1.6 = (1/5 \cdot 35.114') / 5.5 = 1.277 \checkmark$$

$$1.2 = (1/5 \cdot 31.569') / 5.5 = 1.148 \checkmark \quad 1.7 = (1/5 \cdot 36.044') / 5.5 = 1.311 \checkmark$$

$$1.3 = (1/5 \cdot 32.429') / 5.5 = 1.179 \checkmark \quad 1.8 = (1/5 \cdot 36.99') / 5.5 = 1.345 \checkmark$$

$$1.4 = (1/5 \cdot 33.306') / 5.5 = 1.211 \checkmark \quad 1.9 = (1/5 \cdot 37.953') / 5.5 = 1.380 \checkmark$$

$$1.5 = (1/5 \cdot 34.202') / 5.5 = 1.244 \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 12/7/09

BY CJM

SHEET NO. 2

OF 22

✓ RAM 11/2/10

Centrifugal Force Adjustment

Pier 5-3E

- Assume 30 mph Design ✓

- $e = 2.0\%$ (Girder 10 to 9) + 1.4% (Girder 9 to 5) assume 1.5%
(To have Round number + conservative)

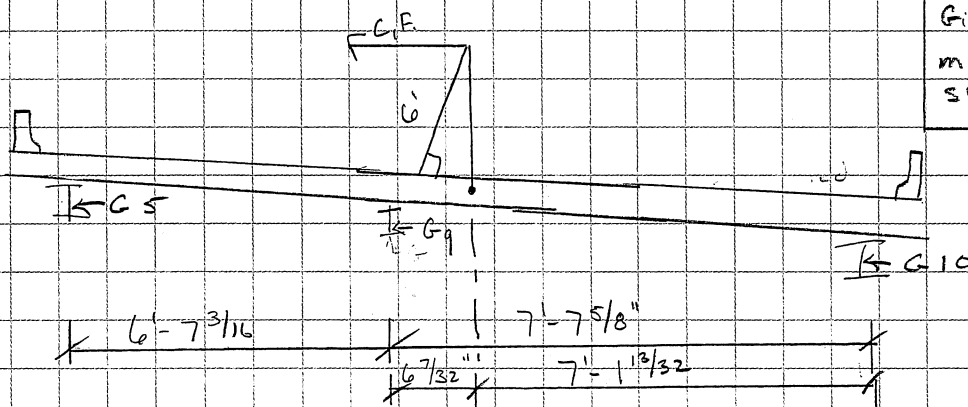
- $R = 262 \text{ ft}$ ✓

- single lane ✓

$$C = \frac{6.68 (30)^2}{262} = 22.95\% \checkmark$$

$$C.F. = 1(22.95 - 15) = 21.45\% \text{ or } .2145 \text{ lanes } \checkmark$$

- C.F. was taken
about 4 Bridge
+ Not N.A. of
Girders - 4 Bridge
more conservative
see sheet 4



$$\text{Pile group - overall width} = 14' - 2 \frac{3}{16}'' \checkmark$$

$$= 2(7' - 1 \frac{13}{32}'')^2 + (6 \frac{7}{32}'')^2 = 101.58 \text{ ft}^2 \checkmark$$

$$C.F. - G5 = \frac{0.2145 (7' - 1 \frac{13}{32}'') (6.34')}{101.58 \text{ ft}^2} = 0.0953 \text{ lanes} = 0.0476 \text{ wheels } \checkmark$$

$$C.F. - G9 = \frac{0.2145 (6 \frac{7}{32}'') (6.34')}{101.58 \text{ ft}^2} = 0.0069 \text{ lanes} = 0.0035 \text{ wheels } \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 12/7/09 BY CJM SHEET NO. 3 OF 22

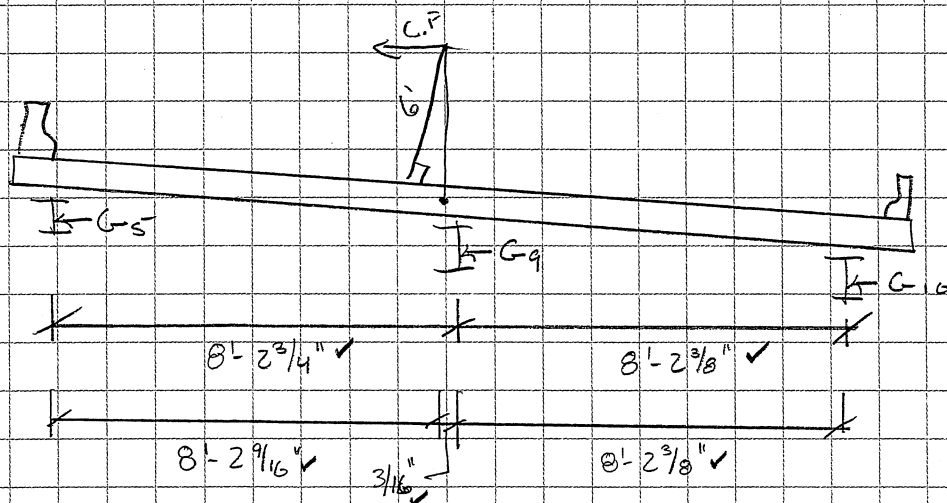
✓ RAM 1/12/10

Centrifugal Force Adjustment

Pier 4-3E

- Assume Design speed = 30 mph ✓
- $e = 1.5\% (G_{10} - G_9) + 2.1\% (G_9 - G_5)$ - say $e = 1.5\%$ ✓
- $R = 262 \text{ ft}$ ✓

C. F. = 21.45% or .2145 lanes (see previous sheet) ✓



- C.F. was taken about $\frac{1}{2}$ Bridge of piers + not W.A. - E Bridge more conservative see sheet 4

$$I = 2(8'-2\frac{9}{16}")^2 + (3\frac{1}{16}")^2 = 134.9 \text{ ft}^2 \checkmark$$

$$C.F. - G_5 = \frac{0.2145 (6.34') (8'-2\frac{9}{16}")}{134.9} = 0.0827 \text{ lanes} = .04135 \text{ wheels (Pier 5 to 4)} \\ = 2(.04135) = .0827 \text{ lanes Pier 4 to 3} \checkmark$$

Pier 3-3E

- Assume Design speed = 30 mph ✓
- $e = 2\% (G_{10} - G_9), 2.3\% (G_9 - G_7), 1.6\% (G_7 - G_5)$ assume 2% ✓
- $R = 262'$ ✓
- Two Lanes ✓



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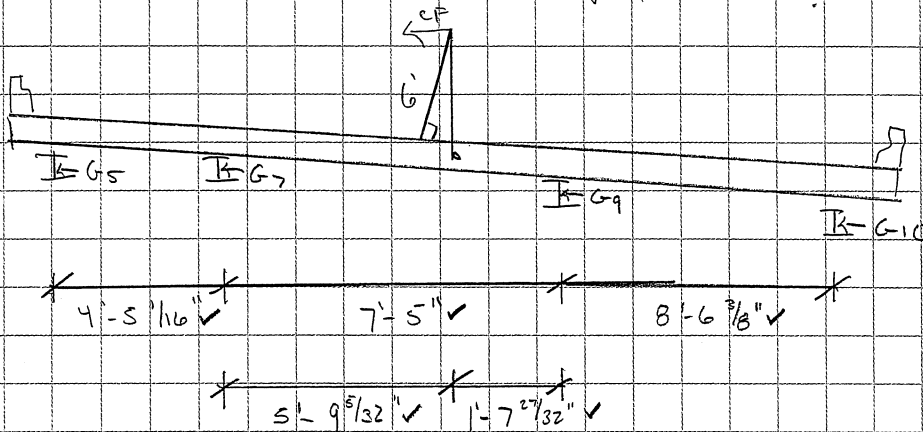
PROJECT # 090147 DATE 12/7/09 BY CJM SHEET NO. 4 OF 22

✓ RAM 1/12/10

Centrifugal Adjustment

Pier 3-3E cont. C.F. was applied @ Bridge + Not at Beam W.A.
- @ Bridge more conservative

$$C.F. = 20.95\% \text{ or } .2095 \text{ lanes single lanes} \Rightarrow C.F. = .419 \text{ lanes}^2 \checkmark$$



$$I = (10' - 2\frac{7}{32}")^2 + (5' - 9\frac{5}{32}")^2 + (1' - 7\frac{27}{32}")^2 + (10' - 2\frac{7}{32}")^2 = 243.41 \text{ ft}^2 \checkmark$$

$$C.F. - G.5 = \frac{.419 (6.34) (10' - 2\frac{7}{32}")}{243.41 \text{ ft}^2} = 0.1112 \text{ lanes} = 0.0556 \text{ wheels} \checkmark$$

N.A. = 0.0509 wheels

$$C.F. - G.7 = \frac{.419 (6.34) (5' - 9\frac{5}{32}")}{243.41 \text{ ft}^2} = 0.0629 \text{ lanes} = 0.0314 \text{ wheels} \checkmark$$

N.A. = 0.0263 wheels

$$C.F. G.9 + G.10 = 0 \text{ Due to uplift action} \checkmark$$

Pier 2-3E

- Design speed = 30 mph ✓
- e = 2% ✓
- R = 262 ft ✓
- Two Lanes ✓



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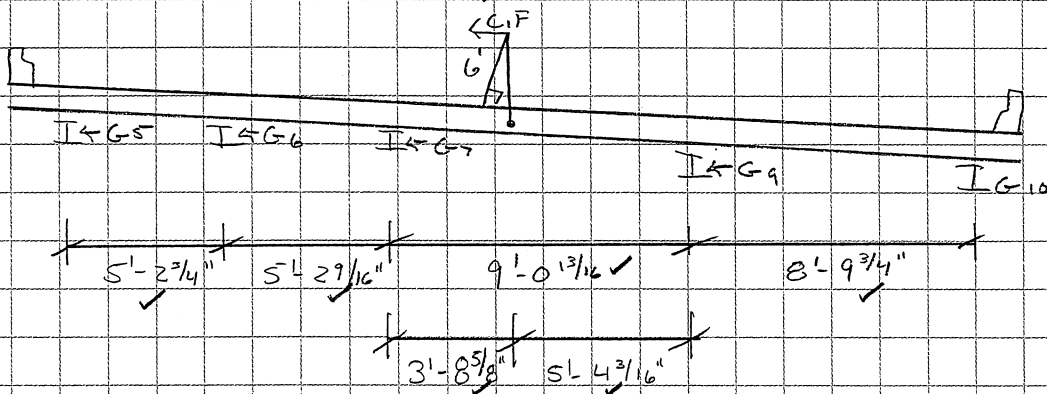
PROJECT # 090147 DATE 12/7/09 BY CJM SHEET NO. 5 OF 22

✓ RAM 1/12/10

Centrifugal Forces Cont...

Pier 2-3E Cont... (C.F. was placed @ E Bridge + not girder N.A.
- E Bridge more conservative)

C.F. = .419 lanes - see pier 3-3E



$$I = (14' - 1^{15/16}'')^2 + (8' - 11^{3/16}'')^2 + (3' - 8^{5/8}'')^2 + (5' - 4^{3/16}'')^2 + (14' - 1^{15/16}'')^2 = 523.32 \text{ ft}^2$$

$$C.F. \text{ G. 5} = \frac{.419 (6.34) (14' - 1^{15/16}'')}{523.32 \text{ ft}^2} = .072 \text{ lanes} = .036 \text{ wheels} \checkmark$$

N.A. = 0.033 wheels

$$C.F. \text{ Girder 6} = \frac{.419 (6.34) (8' - 11^{3/16}'')}{523.32 \text{ ft}^2} = .0453 \text{ lanes} = .0227 \text{ wheels} \checkmark$$

N.A. = 0.019 wheels

$$C.F. \text{ Girder 7} = \frac{.419 (6.34) (3' - 8^{5/8}'')}{523.32 \text{ ft}^2} = .019 \text{ lanes} = .0095 \text{ wheels} \checkmark$$

N.A. = 0.0059 wheels

C.F. Girder 9 + 10 - up 1 ft C.F. = 0 ✓



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PROJECT # 090147 DATE 12/7/09 BY CJM SHEET NO. 6 OF 22

✓ RAM 1/12/10

Centrifugal Force - cont...

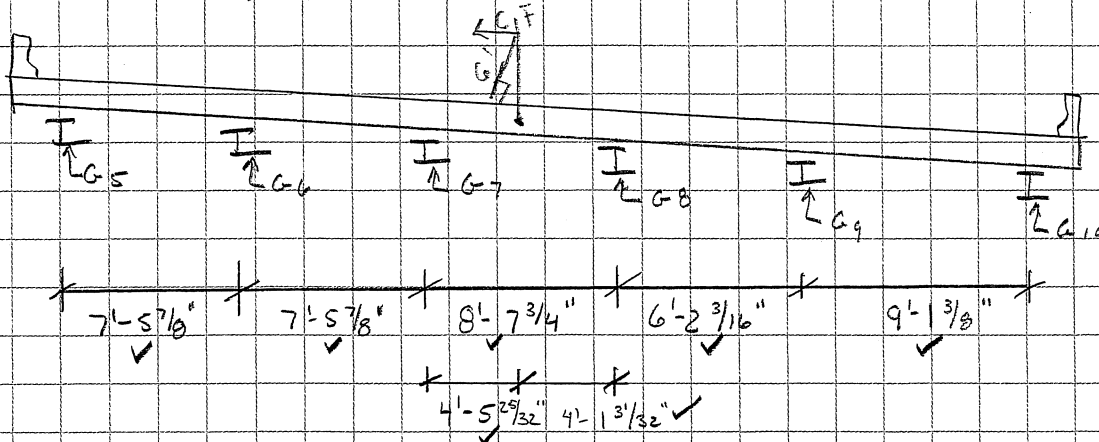
Pier 1 - 3E

- Design Speed = 30 mph ✓
- e - Varies between Girders - Assume 2.5% ✓
- R = 262 f + ✓
- Three Lane - Gutter to Gutter 36' < x < 48' ✓

- C.F. taken about
G Bridge + not
Girder N.A. - G
Bridge more conservative
- see sh + 4

C = 22.95%

C.F. = 3 lanes (22.95 - 2.5) = 61.35% or .6135 lanes ✓



$$I_{\text{group}} = 2(19'-5'17/32")^2 + (11'-11'21/32")^2 + (4'-5'25/32")^2 + (4'-1'31/32")^2 + (10'-4'51/32")^2$$

$$= 1045.2 \text{ ft}^2 \checkmark$$

$$\text{C.F. - Girder 5} = \frac{.6135 (6.34') (19'-5'17/32")}{1045.2} = .072 \text{ lane} = .036 \text{ wheels} \checkmark$$

$$\text{C.F. - Girder 6} = \frac{.6135 (6.34') (11'-11'21/32")}{1045.2} = .044 \text{ lane} = .022 \text{ wheels} \checkmark$$



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SHEET NO. 7 OF 22

✓ RAM 1/12/10

Centrifugal Force Cont.
Pier 1-3 E cont

$$C.F. - \text{Girder 7} = \frac{.6135 (6.34) (4 - 5^{25/32})}{1095.2} = .017 \text{ lanes} = .0085 \text{ wheels } \checkmark$$

G.F. Girder 8-10 - uplift $\Rightarrow$ C.F. = 0 ✓



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PROJECT SPECIAL STRUCTURES

PROJECT # 090147 DATE 12/7/09 BY JWS SHEET NO. 8 OF 27

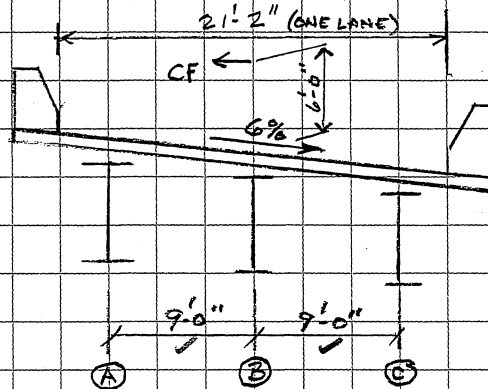
✓ RAM 1/13/10

COMPUTE ADJUSTMENTS TO DISTRIBUTION FACTORS FOR CENTRIFUGAL FORCES. REF. U.S. STEEL MANUAL FOR STEEL BRIDGE DESIGN

BRIDGE 69801J - E. ABUT. TO PIER 3-3A

COMPUTE AT ABUTMENT END ON EAST SIDE. FOR RADIUS OF $\sim 480'$ ✓
AND SUPERELEVATION OF 6% ✓, ASSUME DESIGN SPEED = 40 MPH ✓

FOR LOADING SYSTEM THUS:



$$C = \frac{6.68 S^2}{R}$$

$$C = \frac{6.68 (40)^2}{480} = 22.3\% \checkmark$$

⇒ CENTRIFUGAL LOAD WILL BE 22.3% OF LIVE LOAD. THIS LOAD IS BALANCED OUT PARTIALLY BY THE SUPERELEVATION OF 6%

$$\therefore CF = 22.3\% - 6\% = 16.3\% = 0.163 \text{ LANES} \checkmark$$

USE MECHANICS TO COMPUTE VERTICAL COMPONENT OF LOAD AT (A). WILL BE ZERO AT (B) & (C).

$$I_{\text{GROUP}} = 2 (9)^2 = 162 \text{ FT}^2 \checkmark$$

$$CF_{(A)} = \frac{M_C}{I} = \frac{(6'-4'')(9'-0'')}{162 \text{ FT}^2} (0.163 \text{ LANES}) = 0.057 \text{ LANES} \checkmark$$

$$= 0.029 \text{ WHEELS} \checkmark$$

⇒ ADD 0.029 WHEELS TO DISTRIBUTION FACTOR COMPUTED FOR GIRDER 7 (N. FASCIA) FROM PIER 3-3A TO E. ABUT. ✓



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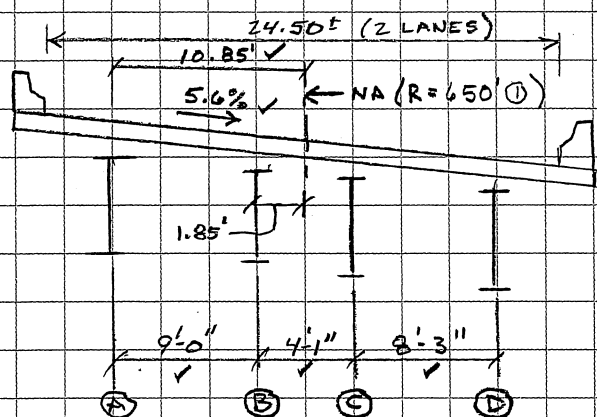
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PROJECT SPECIAL STRUCTURES

PROJECT # 090147 DATE 12/7/09 BY JWS SHEET NO. 9 OF 22

✓ RAM 1/13/10

BRIDGE 69801 J - PIER 4-3A



① RADIUS TAKEN AS AVERAGE
OF 818' & 478' @ PIER 4-3A ✓

FOR 650' RADIUS AND
5.6% SUPER, USE DESIGN
SPEED OF 45 MPH ✓

$$C = \frac{6.68 S^2}{R} = \frac{6.68 (45)^2}{650} = 20.8 \checkmark, \quad CF = 20.8 - 5.6 = 15.2\% \checkmark$$

= 0.152 LANES ✓

FOR 2 LANES IN THIS AREA OF THE BRIDGE, = 2(0.152) = 0.304 LANE ✓

$$I_{\text{group}} = 10.85^2 + 1.85^2 + 2.23^2 + 10.48^2 = 236 \text{ FT}^2 \checkmark$$

$$CF_A = \frac{6'-4" (10.85)}{236} (0.304) = 0.089 \text{ LANES } \checkmark$$

= 0.044 WHEELS ✓

$$CF_B = \frac{6'-4" (1.85)}{236} (0.304) = 0.015 \text{ LANES } \checkmark$$

= 0.008 WHEELS (IGNORE FOR RATING) ✓

$$CF_C = CF_D = 0$$



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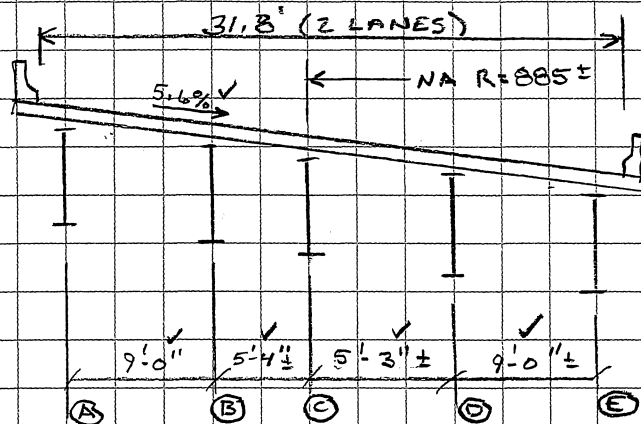
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PROJECT SPECIAL STRUCTURES

PROJECT # 090147 DATE 12/7/09 BY JWS SHEET NO. 10 OF 22

BRIDGE 69801J - PIER 5-3A

✓ RAM 1/13/10



① AVG. OF 955' & 818' ✓

FOR $e = 5.6\%$ & $R = 885'$ ✓
USE $S = 50$ MPH ✓

$$C = \frac{6.68 (50)^2}{885} = 18.9 \checkmark, \quad CF = (18.9 - 5.6) 2 \text{ LANES} = 26.6 \checkmark \\ = 0.266 \text{ LANES}$$

$$I_{\text{group}} = 2(5'-3\frac{1}{2})^2 + 2(5'-3\frac{1}{2} + 9)^2 = 464.5 \text{ FT}^2 \checkmark$$

$$CF_{\text{A}} = \frac{(9'-0" + 5'-3\frac{1}{2}) (6'-4")}{464.5} (0.266) = 0.052 \text{ LANES} = 0.026 \text{ WHEEL} \checkmark$$

$$CF_{\text{B}} = \frac{(5'-3\frac{1}{2}) (6'-4")}{464.5} (0.266) = 0.019 \text{ LANES} = 0.010 \text{ WHEELS} \checkmark$$



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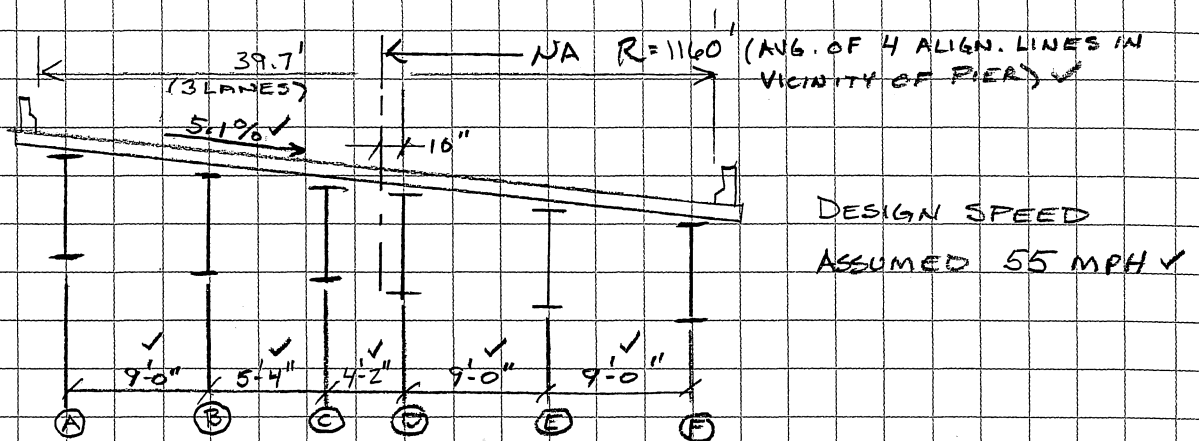
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PROJECT SPECIAL STRUCTURES

PROJECT # 090147 DATE 12/7/09 BY JWS SHEET NO. 11 OF 22

BRIDGE 69801 J- PIER 6-3A

✓ RAM 1/13/10



$$C = \frac{6.68(55)^2}{1160} = 17.4 \checkmark, \quad CF = (0.174 - 0.051) 3 \text{ LANES} = 0.369 \text{ LANES} \checkmark$$

$$I_{\text{group}} = (3'-4")^2 + (8'-8")^2 + (17'-8")^2 + (10")^2 + (9'-10")^2 + (8'-10")^2 = 850 \text{ FT}^2 \checkmark$$

$$CF_{\text{A}} = \frac{17'-8" (6'-4")}{850} (0.369) = \frac{0.049}{0.052} \text{ LANES} = \frac{0.024}{0.026} \text{ WHEELS}$$

$$CF_{\text{B}} = \frac{8'-8" (6'-4")}{850} (0.369) = 0.024 \text{ LANES} = 0.012 \text{ WHEELS} \checkmark$$

$$CF_{\text{C}} = \frac{3'-4" (6'-4")}{850} (0.369) = 0.009 \text{ LANES} = 0.005 \text{ WHEELS} \checkmark$$



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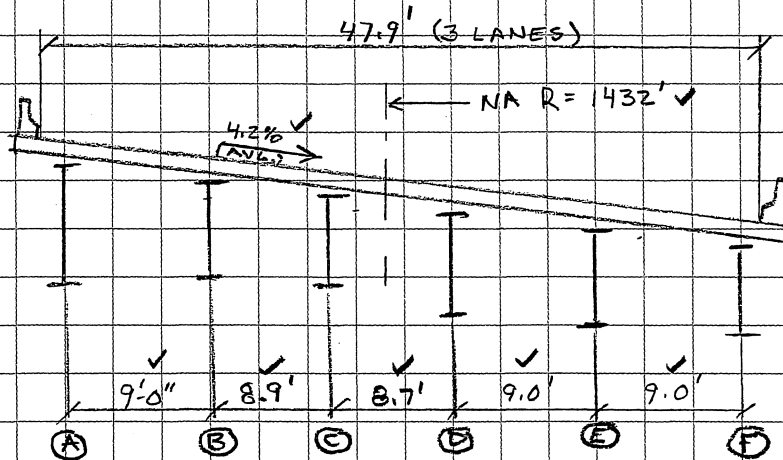
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PROJECT SPECIAL STRUCTURES

PROJECT # 090147 DATE 12/7/09 BY JWS SHEET NO. 12 OF 22

BRIDGE 69801J - PIER 7-3A

✓ RAM 1/13/10



DESIGN SPEED
ASSUMED 60 MPH ✓

$$C = \frac{6.68(60)^2}{1432} = (0.168 - 0.042)(3 \text{ LANES}) = 0.378 \text{ LANES} ✓$$

$$I_{\text{group}} = (4.35^2 + 13.25^2 + 22.25^2)2 = 1379 \text{ FT}^2 ✓$$

$$CF_A = \frac{22.2(6'-4'')(0.378)}{1379} = 0.039 \text{ LANES} = 0.019 \text{ WHEELS} ✓$$

$$CF_B = \frac{13.2(6'-4'')(0.378)}{1379} (1/2) = 0.011 \text{ WHEELS} ✓$$

$$CF_C = \frac{4.35(6'-4'')(0.378)}{1379} (1/2) = 0.004 \text{ WHEELS} ✓$$



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PROJECT Special structures Rating

PROJECT # 090147 DATE 12/16/09 BY CJM SHEET NO. 13 OF 22

✓ RAM 1/13/10

Design speed Calcs

Bridge 69801L

- Curvature starts in span between Piers 2-3C + 1-3C ✓
 - $e @ \text{ Pier 1-3C } = 1.3\% \checkmark$
 - $e @ \text{ Pier 7-3A } = \sim 4.0\% \checkmark$
- } say $2.5\% \checkmark$

Design speeds calculated From AASHTO Road Design Manual
Table 3-2.03A + Figure 3-3.03A (chart) ✓

Design speed - Chart $\sim 55 \text{ mph}$

- Eq. $\Rightarrow V^2 = 15(1434')(0.025 + 0.13) \Rightarrow V = 57 \text{ mph} \checkmark$
- use $55 \text{ mph} \checkmark$

Bridge 69801M

- Neglect Centrifugal Force in Span from Pier 1-3E to Pier 6-3D
- Tangent From $\sim$ Pier 6-3D to Pier 3-3D
- Will only be added to Girder 8 @ span point 5.95 (adjust to 5.9)
- $e = 2.7\% @ \text{ Pier 3-3D } + 3.3\% @ \text{ Piers 2-3D } + 1-3D \checkmark$
- use 3% Super elevation for Remainder ✓
- $R = 1430' \checkmark$

Design Speed - Chart $\sim 57 \text{ mph}$

- Eq. $\Rightarrow V^2 = 15(1430')(0.03 + 0.13) \Rightarrow V = 58.6 \checkmark$
- use 55 mph (± 35 posted speed) ✓



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 12/15/09 BY CJM SHEET NO. 14 OF 22

✓ RAM 1/13/10

Distribution Factor - Centrifugal Force Adjustment

Bridge 69801 L

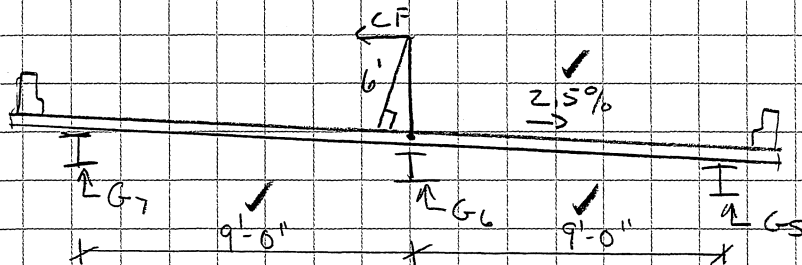
Centrifugal Force will affect Girder 7 at span point 6.55 (adjust to span point 6.5). will apply to end of BR69801 L - See prev for 69801T

- Design speed = 55 mph Based on ✓
- e = 1.3% @ Pier 1-3C + ~ 4% @ Pier 7-3A - assume 2.5% ✓
- R = ~1434' ✓
- Single lane ✓

$$C = \frac{6.68 (55)^2}{1434'} = 14.1\% \checkmark$$

$$C.F. = 1 (14.1 - 2.5) = 11.6\% \text{ or } 0.116 \text{ lanes} \checkmark$$

Pile Group Distribution



$$I_{\text{group}} = 2 (9'-0")^2 = 162 \text{ ft}^2 \checkmark$$

$$C.F. - G_7 = \frac{.116 (6.33') (1) (9'-0")}{162 \text{ ft}^2} = .0408 \text{ lanes} = .02 \text{ wheels} \checkmark$$

G₆ - 0.0 wheels ✓

G₅ - uplift - use 0.00 wheels ✓



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PROJECT # 090147

DATE 12/16/09

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SHEET NO. 15 OF 22

✓ RAM 1/13/10

Distribution Factor - centrifugal Force Adjustment

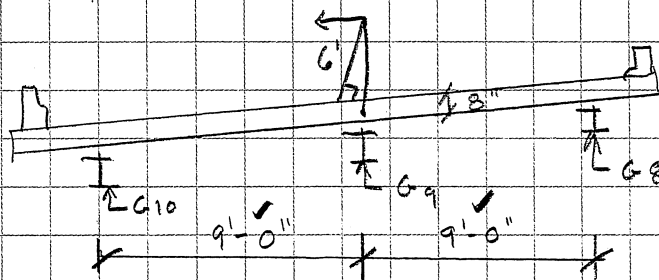
Bridge 69801 M

- Centrifugal Force will affect G-inder @ span Point S. 9
- Design speed = 55 mph ✓
- e = 3% ✓
- R = 1430' ✓
- Single lane ✓

$$C = \frac{6.68 (55)^2}{1430'} = 14.13\% \checkmark$$

$$C F = 14.13\% - 3\% = 11.13\% \text{ or } .1113 \text{ lanes } \checkmark$$

Girder Group Distribution



$$I_{\text{group}} = 2 (9'-0'')^2 = 162 \text{ ft}^2 \checkmark$$

$$C.F. - G_8 = \frac{.1113 (6'-4'') (1) (9'-0'')}{162 \text{ ft}^2} = .039 \text{ lanes} = .02 \text{ wheels } \checkmark$$

$$C.F. - G_9 = 0 \checkmark$$

$$C.F. - G_{10} - \text{Uplift} = 0 \text{ wheels } \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 12/16/09 BY CJM SHEET NO. 16 OF 22

✓ RAM 1/13/10

According to "AASHTO Guide Specifications for Horizontally Curved Steel Girder Highway Bridges - 2003" C1.1, "Any Superstructure containing a curved girder segment is to be designed according to these provisions. The effect of curvature on the support reactions + Girder Deflections, as well as effects of Lateral Flange Bending, usually Extend Beyond the curved segment."

- Based on this, Centrifugal Force will be Extended Beyond areas of curvature into straight areas.

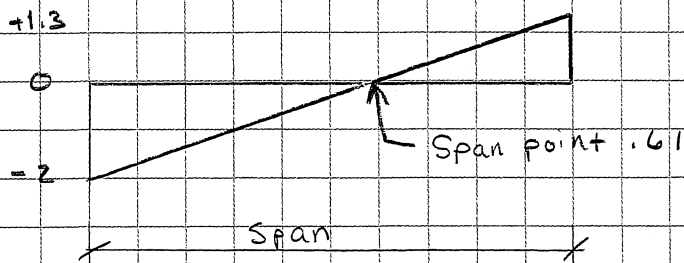
Bridge 69801 J + Bridge 69801 N

- whole Bridge curved, Does Not apply ✓

Bridge 69801 L

Straight from pier 1-3C to midway between Piers 2-3C + 1-3C

- Apply Centrifugal Force to higher Girder
- $e = 2\%$ @ Pier 2-3C ✓ + 1.3% @ Pier 1-3C ✓
(Sloping North) (Sloping South)



- Load applied to Girder 7 @ span point 6.5 ✓
 - apply load to Girder 5 from span point 6.0 to 8.5 ✓
 - use Radius of 398' (Radius of Girder 6 in BR69801 N) ✓
- } Same Location
Between Pier
2-3C + Pier
1-3C
(Approx location
of P.C.)



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 12/16/09 BY CJM SHEET NO. 17 OF 22

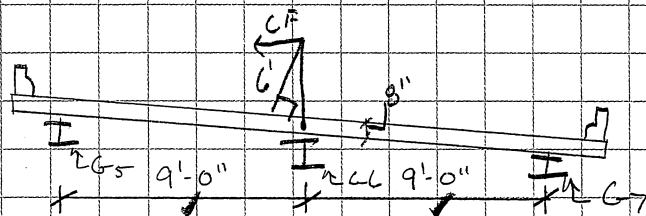
✓ RAM 1/13/10

Bridge 69801 L - Straight Section

- Design speed = 30 mph (Design speed use in Bridge 69801 W) ✓
- $e = 2\%$ ✓
- $R = 398'$ ✓
- Single Lane ✓

$$C = \frac{6.68(30)^2}{398} = 15.1\% \quad \checkmark$$

$$CF = 15.1\% - 2\% = 13.1\% \text{ or } .131 \text{ lanes} \quad \checkmark$$



Pile Group Distribution

$$I_{\text{group}} = 2(9'-0'')^2 = 162 \text{ ft}^2 \quad \checkmark$$

$$C_{F-G5} = \frac{.131(6.33')(9'-0'')}{162 \text{ ft}^2} = 0.046 \text{ lanes} = .023 \text{ wheels} \quad \checkmark$$

$$C_{F-G6} = 0 \quad \checkmark$$

$$C_{F-G7} = 0 \text{ (uplift)} \quad \checkmark$$



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✓ RAM 1/13/10

Bridge 69801 W

- Load applied to Girder 8 From span point 2.0 to 5.8
- Use Design Speed + Radius from Bridge 69801 W for span points 2.0 to 3.9 + Design speed + radius from curved section of Bridge 69801 W From span point 4.0 to 5.8 ✓

Span Point 2.0 to 3.9

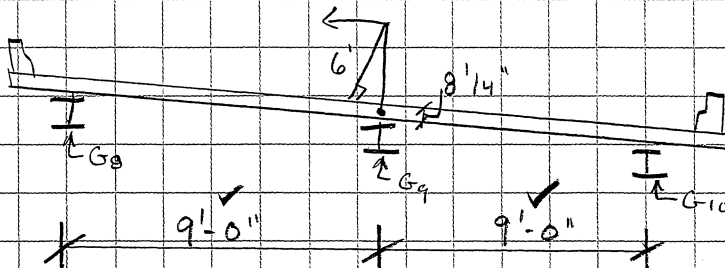
- Design speed = 30 mph ✓
- $R = 262'$ ✓
- $e = \sim 2\%$ ✓
- Single lane ✓

$$C = \frac{6.68 (30)^2}{262} = 22.95\% \checkmark$$

$$C.F = 22.95 - 2 = 20.95\% \text{ or } .2095 \text{ lanes } \checkmark$$

Pile Group Spacing

- Assume typical cross section in Tapered Area, affect will be minimal





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✓ RAM 1/13/10

Bridge 69801 M-cont...

$$I_{\text{group}} = 2 (9'-0")^2 = 162 \text{ ft}^2 \quad \checkmark$$

$$C.F.-G_8 = \frac{.2095 (6.34') (9'-0")}{162 \text{ ft}^2} = .074 \text{ lanes} = .637 \text{ wheels} \quad \checkmark$$

$$C.F.-G_9 = 0 \text{ wheels} \quad \checkmark$$

$$C.F.-G_{10} = 0 \text{ wheels (uplift)} \quad \checkmark$$

Span Point 4.0 to 5.8

- Design Speed = 55 mph $\checkmark$
- $e = \sim 2\%$ $\checkmark$
- $R = 1430 \text{ ft}$ $\checkmark$
- Single Lane $\checkmark$
- Same Girder Spacing as span points 2.0 to 3.9 $\checkmark$

$$C = \frac{6.68 (55)^2}{1430} = 14.1\% \quad \checkmark$$

$$C.F. = 14.1\% - 2\% = 12.1\% \text{ or } .121 \text{ lanes} \quad \checkmark$$

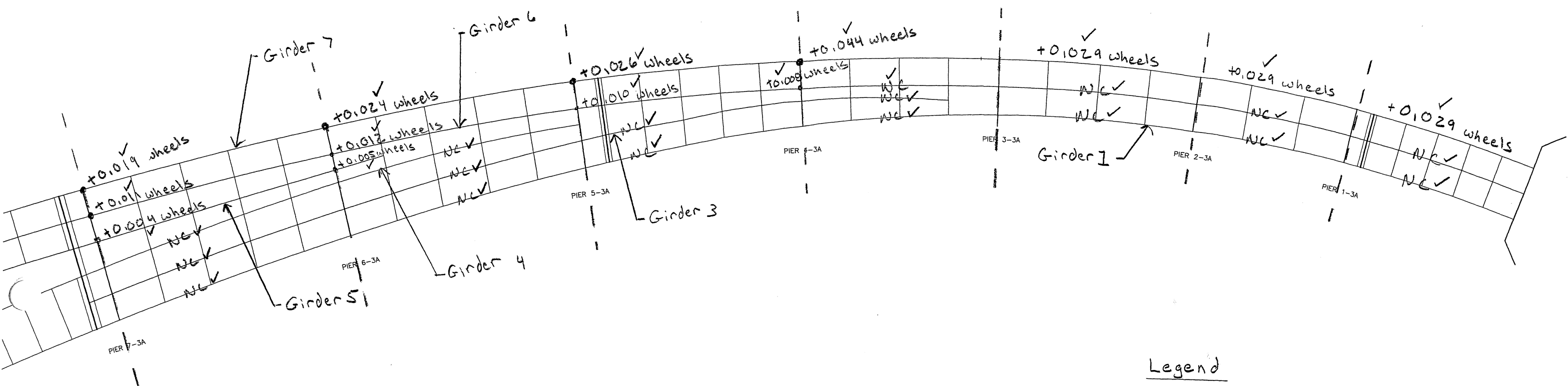
$$I_{\text{group}} = 162 \text{ ft}^2 \quad \checkmark$$

$$C.F.-G_8 = \frac{.121 (6.34') (9'-0")}{162} = .043 \text{ lanes} = .021 \text{ wheels} \quad \checkmark$$

$$C.F.-G_9 = 0 \quad \checkmark$$

$$C.F.-G_{10} = 0 \text{ (uplift)} \quad \checkmark$$

Bridge 69801 J
 12/16/09 - Cjm
 V RAM 1/15/10



Legend

- Pier
- # # Centrifugal Force (calc by Jws)
- NC No change

Average Centrifugal Force For Girders 5-7

- Girder 5 = +0.005 wheels ✓
- Girder 6 = +0.010 wheels ✓
- Girder 7 = +0.029 wheels ✓

Bridge 69801 N

12/16/09 - CJM

✓RAM 1/15/10

Legend

----- Pier

- Centrifugal Force
(calcs by CJM)

NC - no change

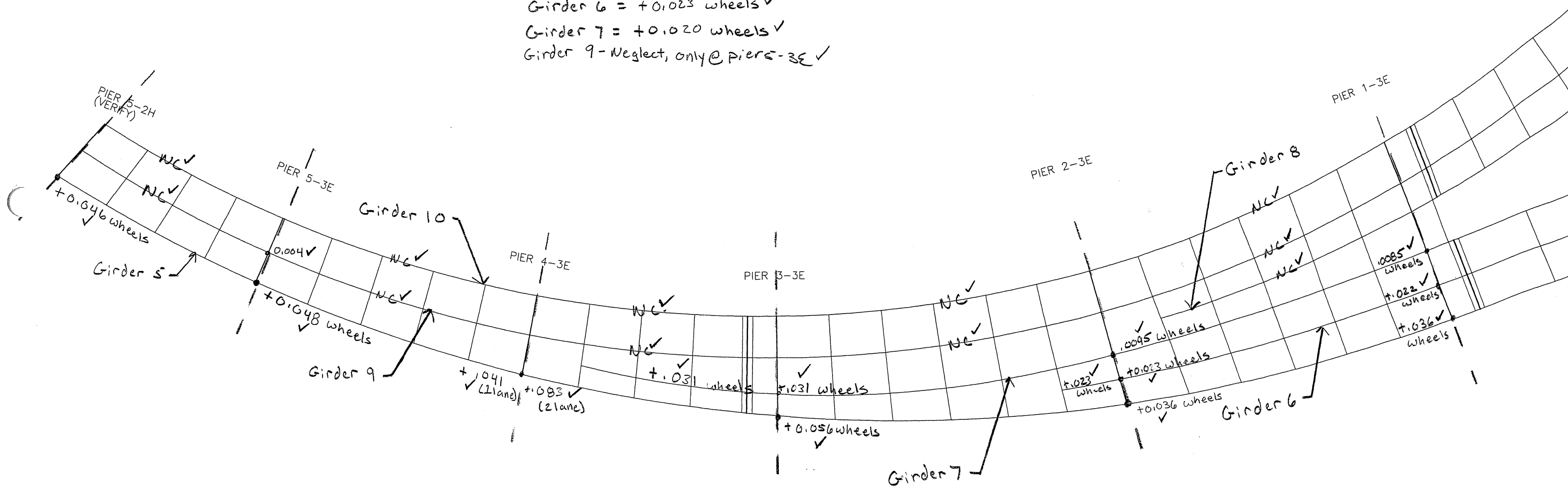
Average Centrifugal Force Girders 5-7

Girder 5 = +0.044 wheels ✓

Girder 6 = +0.023 wheels ✓

Girder 7 = +0.020 wheels ✓

Girder 9 - Neglect, only @ Piers 5-3E ✓





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CDK 1/15/10

Splitting of Girders Between Bridge

Girder 1

Beginning to Span point 7.8 - Bridge 69801 K
Span point 7.9 to End - Bridge 69801 J

SPAN POINT (X.XX)
(7.86)

Girder 2

Whole girder Bridge 69801 K

Girder 3

Whole girder Bridge 69801 J

Girder 4

Beginning to span point 7.8 - Bridge 69801 K (7.87)
Span point 7.9 to End - Bridge 69801 J

Girder 5

Beginning to Span point 6.0 - Bridge 69801 N (6.08)
Span point 6.1 to Span point 9.8 - Bridge 69801 L (9.89)
Span point 9.9 to end - Bridge 69801 J

Girder 6

Beginning to span point 3.0 - Bridge 69801 N (3.08)
Span point 3.1 to Span point 6.8 - Bridge 69801 L (6.89)
Span point 6.9 to End - Bridge 69801 J

Girder 7

Beginning to Span point 4.0 - Bridge 69801 N (4.08)
Span point 4.1 to Span point 7.8 - Bridge 69801 L (7.89)
Span point 7.9 to End - Bridge 69801 J



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 12/3/09 BY CJM SHEET NO. 2 OF 2
ZAK 1/15/10

Splitting of Girders Between Bridges - continu.

Girder 8

Beginning to span point 2.0 - Bridge 69801 N (2.095) ✓

Span point 2.1 to span point 8.0 - Bridge 69801 M (8.09) ✓

Span point 8.1 to End - Bridge 69881 A (Dummy span) ✓

Girder 9

Beginning to span point 6.0 - Bridge 69801 N (6.0995) ✓

Span point 6.1 to span point 12.0 - Bridge 69801 M (12.69) ✓

Span point 12.1 to End - Bridge 69881 A (Dummy spans) ✓

Girder 10

Beginning to span point 6.1 - Bridge 69801 N (6.105) ✓

Span point 6.2 to span point 12.0 - Bridge 69801 M (12.089) ✓

Span point 12.1 to End - Bridge 69881 A (Dummy spans) ✓



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 11/16/09 BY CJM SHEET NO. 1 OF 16

✓ RAM 1/8/10

Effective Slab width

- Per AASHTO Standard Spect - 10.38.3.1 ✓
- Shall not exceed the following
 - 1) $\frac{1}{4}$ of span length ✓
 - 2) The Distance center to center of Girders ✓
 - 3) 12 times the least thickness of Slab ✓
- See 10.38.3.2 for Exterior Girders (3'-8" max for overhang) ✓

Girder 1

Span 1 - uniform Girder spacing

- span length = 59.487' $\Rightarrow \frac{1}{4} (59.487') \cdot 12" = 178.5"$ ✓
- Distance c. to c. girder = $\frac{1}{2} (9'-0") + 3'-8" = 98"$ ✓
- 12 times thickness = $12 (7\frac{1}{2}") = 90"$ * Controls ✓

Span 2 - uniform Girder spacing

- Span length greater than Span 1, all other criteria similar ✓

Effective slab width = 90" ✓

- Span 3 - up to 10th point 3.86 (Hinge Point) ✓
- Similar to span 1 + 2 - Effective slab width = 90" ✓

- Span 3 after 3.86 - Start @ 3.9

- Span length = $\sqrt{6} 9.402 \Rightarrow \frac{1}{4} (59.485') \cdot 12" = 178.5"$ (Span length from Pier to Hinge) ✓
- Distance c. to c. girder = $\frac{1}{2} (18'-0") + 3'-8" = 152"$ ✓
- 12 times thickness = $12 (8\frac{1}{2}") = 102"$ * Controls ✓



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✓ RAM 1/8/10

Effective slab width - cont.

Girder 1

Span 4

- Span length = $\frac{1}{4}(112') \cdot 12" = 336" \checkmark$
- Distance C. to C. of Girder = $\frac{1}{2}(18'-0") + 3'-8" = 15'2" \checkmark$
- 12 times slab thickness = $12(8\frac{1}{2}") = 102" \neq \text{Controls} \checkmark$

Span 5

- Span length greater than Span 4; all other criteria similar to span 4 ✓
- Effective slab width = 102" ✓

Span 6

- span length = 83.5' ; all other criteria similar to span 4 ✓
- $\frac{1}{4}(83.5')(12") = 250.5" \checkmark$
- Effective slab width = 102" ✓

Span 7 - up to 10th point 7.86 - stop 7.8 ✓

- span length (Pier to Hinge) = 50.97' ; all other criteria similar to span 4
- $\frac{1}{4}(50.97')(12") = 152.9" \checkmark$

Effective slab width = 102" ✓

Span 7 after 10th point 7.86 - Start 7.9

- span length (pier to hinge) = 50.97' $\Rightarrow \frac{1}{4}(50.97')(12") = 152.9" \checkmark$
- Distance C. to C. of Girder = $[\frac{1}{2}(9'-0") + 3'-8"] \cdot 12" = 98" \checkmark$
- 12 times slab thickness = $12(7\frac{1}{2}") = 90" \neq \text{Controls} \checkmark$



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SHEET NO. 3 OF 16

✓ RAM 1/8/10

Effective Slab width - cont...

Girder 1

Span 8 - from Ext Girder to interior girder $\approx 9'-0"$ ✓

- $\frac{1}{4}$ Span length = $\frac{1}{4}(80.719') (12'') = 242.2''$ ✓
- Distance C. to C. Girders = $[\frac{1}{2}(9'-0'') + 3'-8''] (12'') = 98''$ ✓
- 12 times Slab thickness = $12(7\frac{1}{2}'') = 90''$ * Controls ✓

Span 9 - from Ext Girder to interior girder $\approx 9'-0"$ ✓

- $\frac{1}{4}$ Span length = $\frac{1}{4}(80.5') (12'') = 241.5''$ ✓
- Distance C. to C. Girder = $[\frac{1}{2}(9'-0'') + 3'-8''] (12'') = 98''$ ✓
- 12 times Slab thickness = $12(7\frac{1}{2}'') = 90''$ * Controls ✓

Span 10 - from Ext to int girder $\approx 8'-3"$ (min)

- $\frac{1}{4}$ span length (from pier to hinge) = $\frac{1}{4}(65.082') (12'') = 195.2''$ ✓
- Distance C to C girder = $[\frac{1}{2}(8'-3'') + 3'-8''] = 93.5''$
- 12 times slab thickness = $12(7\frac{1}{2}'') = 90''$ * controls

Span 11 - Dist from Ext to int varies from 8,229' to 4,821' ✓

- Will control over 12-slab thickness for spacing of 7'-8" + less
- C. to C. distance less than 7'-8" @ Span 11.2, greater than 7'-8" after span point 11.7

Constant factors = Span length + Slab thickness

- $\frac{1}{4}$ Span length = $\frac{1}{4}(64.412') (12'') = 193.2''$ ✓
- $12(7\frac{1}{2}'') = 90''$ ✓

Span points 11.0 + 11.1 $\Rightarrow$ effective width = 90" ✓



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SHEET NO. 4 OF 16

✓ RAM 1/8/10

Effective slab width - cont...

Span 11 cont...

Center to center spacing - Based on AASHTO 10.38.3.2

$$11.2 = \frac{1}{2} (7.6'6") + 3'-8" = 89.7" \checkmark$$

$$11.3 = 7.214' = 86.57" \checkmark$$

$$11.4 = 6.765' = 81.18" \checkmark$$

$$11.5 = 6.270' = 75.24" \checkmark$$

$$11.6 = 5.729' = 68.75" \checkmark$$

$$11.7 = 5.143' = 61.72" \checkmark$$

$\frac{1}{2}$ center to center of girder less than
than 3'-8" - use $\frac{1}{2}$ center to center on both
sides of girder for effective slab width.

$$11.8 + 11.9 = 90" \checkmark$$

Span 12 - Center to center spacing ranges from 9'-2 1/2" to 9'-0" ✓

$$- \frac{1}{4} \text{ span length} = \frac{1}{4} (64.177') (12'') = 192.5" \checkmark$$

$$- \text{Center to center distance (assume 9'-0")} = \left[\frac{1}{2} (9'-0") + 3'-8" \right] = 98" \checkmark$$

$$- 12 \text{ times slab thickness} = 12 (7 \frac{1}{2} ") = 90" \neq \text{controls} \checkmark$$

Span 13

$$- \frac{1}{2} \text{ span length} = \frac{1}{4} (51.237') (12'') = 153.7" \checkmark$$

$$- \text{center to center} = \left[\frac{1}{2} (9'-0") + 3'-8" \right] \cdot 12' = 98" \checkmark$$

$$- 12 \text{ times slab thickness} = 12 (7 \frac{1}{2} ") = 90" \neq \text{controls} \checkmark$$

Span 14

$$- \text{span length (abutment to hinge)} = 53.21'; \text{ all other criteria similar } \checkmark$$

to Span 13

$$- \frac{1}{4} (53.21') (12'') = 159.6" \checkmark$$

$$- \text{Effective width} = 90" \checkmark$$



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✓ RAM 1/8/10

Effective slab width - Cont...

Girder 2

- Span lengths vary along Girder, shortest span is 58.521' (from Pier to hinge in 3rd span), Slab thickness constant 7 1/2". Constant Girder spacing = 9'-0" ✓

$$\begin{aligned} 1/4 \text{ span length} &= 1/4 (58.521') (12'') = 175.6'' \text{ (will not control for any spans)} \\ \text{center to center girder length} &= 9'-0'' \cdot 12'' = 108'' \checkmark \\ 12 \text{ times slab thickness} &= 12 (7'1/2'') = 90'' \neq \text{Controls} \checkmark \end{aligned}$$

- Since span criteria does not control for shortest span, effective slab width for all of Girder 2 = 90" ✓

Girder 4

Span 1

- 1/4 span length = 1/4 (60.806') (12'') = 182.4'' ✓
- C. to c. girder sp = [1/2 · (9'-0'') + 3'-8''] = 98'' ✓
- 12 times slab thickness = 12 (7 1/2'') = 90'' ≠ Controls ✓

Span 2 - Span length greater than Span 1, all other criteria similar

- Effective slab width = 90'' ✓

Span 3 - up to Span Point 3.86 - to span point 3.8

- Span length from pier to hinge = 60.806' - same as span 1; all other criteria similar
- Effective slab width = 90'' ✓

Span 3 - after 3.86 - after span point 3.9

- 1/4 span length = 1/4 (60.806') (12'') = 182.4'' ✓
- C. to c. girder sp = [1/2 (18'-0'') + 3'-8''] = 152'' ✓
- 12 times slab thickness = 12 (8 1/2'') = 102'' ≠ Controls ✓

See Silt
SA for
Girder 3



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✓ RAM 1/11/10

Effective Slab width

Girder 3

Span 1

- Span length criteria not used since span is ~ 8' cantilever
- Center to center $9'-0\frac{9}{16}" = 108.56"$ [width @ Pier] ✓
- 12 times thickness = $12(7\frac{1}{2}) = 90"$ * controls ✓

Span 2

- Span length = 81.235; all other criteria similar to Span 1
 $\frac{1}{4}(81.235')(12\frac{1}{4}) = 243.7"$ ✓

Effective slab width = 90" ✓

Span 3

- $\frac{1}{4}$ span length = $\frac{1}{4}(81.294')(12\frac{1}{4}) = 243.9"$ ✓
- 12 times slab thickness = $12(7\frac{1}{2}) = 90"$ ✓
- C. to C. varies - see CDK calcs for tributary slab width
- Effective slab width will be lesser value of 90" + tributary slab width as calculated by CDK ✓

Span 4

- $\frac{1}{4}$ span length (Pier to hinge) = $\frac{1}{4}(65.797')(12\frac{1}{4}) = 197.4"$ ✓
- 12 times slab thickness = $12(7\frac{1}{2}) = 90"$ ✓
- C. to C. varies - see CDK calcs for tributary width
- Effective slab width will be lesser of 90" + tributary slab width as calculated by CDK ✓

Span 5 - Span length will not be used - Cantilever Beam; C to C. varies see CDK

- $12(7\frac{1}{2}) = 90"$ ✓
- Effective slab width will be lesser of 90" + tributary slab width as calculated by CDK ✓



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SHEET NO. 6 OF 16

✓ RAM 1/9/10

Effective slab width - cont...

Girder 4 - cont...

Span 4 - Span length = 114.518; all other criteria similar to Span 3
after span point 3.86, span length will not control ✓

Effective slab width = 102" ✓

Span 5 - Span length = 141.653; all other criteria similar ✓
to Span 3 after span point 3.86, span length will not control

Effective slab width = 102" ✓

Span 6 - span length = 84.56'; all other criteria similar to ✓
Span 3 after span point 3.86; span length will not control

Effective slab width = 102" ✓

Span 7 - up to span point 7.87 - span length = 53.54'; all other
criteria similar to span 3 after span point 3.86
→ Pier to hinge

$$\frac{1}{4} (53.54') (12'') = 160.6' - 12 \times \text{slab thickness controls } \checkmark$$

Effective slab width = 102" ✓

Span 7 after span point 7.87 - Start @ span point 7.9

$$\frac{1}{4} \text{ span length (see above)} = 160.6' \checkmark$$

$$C. \text{ to } C. \text{ Girder} = 9'-0'' = 108'' \checkmark$$

$$12 \text{ times slab thickness} = 12 (7\frac{1}{2}'') = 90'' \checkmark$$



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VRAM 1/11/10

Effective slab width - continue

Girder 4 - continue

Span 8

- $\frac{1}{4}$ Span length = $\frac{1}{4} (81.75') \cdot 12" = 245.25" \checkmark$
- 12 times slab thickness = $12 (7\frac{1}{2} ") = 90" \checkmark$
- C. to C. girder spacing varies - use tributary slab width per CDK calcs
- Effective slab width will be lesser of $90" + \text{tributary slab width} \checkmark$

Span 9

- $\frac{1}{4}$ Span length = $\frac{1}{4} (81.706') (12") = 245.12" \checkmark$
- 12 times slab thickness = $12 (7\frac{1}{2} ") = 90" \checkmark$
- C. to C. girder spacing varies - use tributary slab width per CDK calcs
- Effective slab width will be lesser of $90" + \text{tributary slab width} \checkmark$

Girder 5

- Shortest span along Girder 5 is span 1 (46.229'), accept 16.4' cantilever at end of Girder which will not be considered. Slab thickness varies, thickness = $7\frac{3}{4} " \checkmark + 7\frac{1}{2} " \checkmark$ (changes @ 6.08)
- $\frac{1}{4}$ Span length = $\frac{1}{4} (46.229') (12") = 138.7" - \text{will never control for any span} \checkmark$
- 12 time slab thickness = $12 (7\frac{3}{4} ") = 93" \checkmark + 12 (7\frac{1}{2} ") = 90"$
- C. to C. Girder spacing varies - see CDK tributary slab calcs
 - From AASHTO standard spec 10.38.3.2, only ^{up to} $\frac{1}{2}$ C. to C. girder can be used. ^{for overhang} Only valid when Exterior Girder, up to span point 9.89, After span point 9.89 use tributary slab width
- Tributary width valid from 88" (2'-8") to 90" or 93" (less than thickness criteria) for spans up to 9.89. Values less than 88" will be calculated in accordance to 10.38.3.2 (AASHTO std. spec.)



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SHEET NO. 8 OF 16

✓ RAM 1/13/10

Effective slab width - Cont...

Girder 5 cont...

Span 1 ($\frac{1}{2}$ C. to C. Girder + less of overhang + $\frac{1}{2}$ C. to C. Girder)

$$1.0 = [\frac{1}{2}(7'-1\frac{15}{16}) + 9"] \cdot 12" = 51.97" \checkmark$$

$$1.5 = [\frac{1}{2}(6.65') + 2.39'] \cdot 12" = 68.58" \checkmark$$

$$1.1 = [\frac{1}{2}(6.97') + 0.94'] \cdot 12" = 53.1" \checkmark$$

$$1.6 = [\frac{1}{2}(6.60') + 2.92'] \cdot 12" = 74.64" \checkmark$$

$$1.2 = [\frac{1}{2}(6.87') + 1.20'] \cdot 12" = 55.62" \checkmark$$

$$1.7 = 6.58' \cdot 12" = 78.96" \checkmark$$

$$1.3 = [\frac{1}{2}(6.78') + 1.53'] \cdot 12" = 59.04" \checkmark$$

$$1.8 = 6.57' \cdot 12" = 78.84" \checkmark$$

$$1.4 = [\frac{1}{2}(6.70') + 1.92'] \cdot 12" = 63.24" \checkmark$$

$$1.9 = 6.57' \cdot 12" = 78.84" \checkmark$$

* All above Effective widths will control over other criteria

Span 2 ($\frac{1}{2}$ C. to C. Girder + lesser of overhang + $\frac{1}{2}$ C. to C. Girder)

$$2.0 = 2 \cdot \frac{1}{2} \cdot (6.66') \cdot (12") = 79.2" \checkmark$$

$$2.4 = 2 \cdot \frac{1}{2} \cdot (6.95') \cdot (12") = 83.4" \checkmark$$

$$2.1 = 2 \cdot \frac{1}{2} \cdot (6.65') \cdot (12") = 79.8" \checkmark$$

$$2.5 = 2 \cdot \frac{1}{2} \cdot (7.12') \cdot (12") = 85.44" \checkmark$$

$$2.2 = 2 \cdot \frac{1}{2} \cdot (6.73') \cdot (12") = 80.76" \checkmark$$

$$2.6 = 2 \cdot \frac{1}{2} \cdot (7.25') \cdot (12") = 87" \checkmark$$

$$2.3 = 2 \cdot \frac{1}{2} \cdot (6.83') \cdot (12") = 81.96" \checkmark$$

$$2.7 = \frac{1}{2}(7.49') + 3'-8" = 88.94" \checkmark$$

$$2.8 = \frac{1}{2}(7.71') + 3'-8" = 90.26" < 93" \therefore \text{use } 90.26" \checkmark$$

$$2.9 = \frac{1}{2}(7.97') + 3'-8" = 91.82" < 93" \therefore \text{use } 91.82" \checkmark$$

Span 3 - ($\frac{1}{2}$ girder to girder + lesser of overhang + $\frac{1}{2}$ C. to center girder)

3.0, 3.1, 3.2 - Tributary width greater than 93" $\Rightarrow$ use 93" effective width $\checkmark$

$$3.3 = 2 \cdot \frac{1}{2} \cdot (4.29') \cdot (12") = 51.48" \checkmark$$

$$3.7 = 2 \cdot \frac{1}{2} \cdot (4.10') \cdot (12") = 49.2" \checkmark$$

$$3.4 = 2 \cdot \frac{1}{2} \cdot (4.17') \cdot (12") = 50.04" \checkmark$$

$$3.8 = 2 \cdot \frac{1}{2} \cdot (4.16') \cdot (12") = 49.92" \checkmark$$

$$3.5 = 2 \cdot \frac{1}{2} \cdot (4.10') \cdot (12") = 49.2" \checkmark$$

$$3.9 = 2 \cdot \frac{1}{2} \cdot (4.27') \cdot (12") = 51.24" \checkmark$$

$$3.6 = 2 \cdot \frac{1}{2} \cdot (4.08') \cdot (12") = 48.96" \checkmark$$



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PROJECT Special Structures Rating

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SHEET NO. 9

OF 16

✓ RAM 1/12/10

Effective slab width - cont...

Girder 5 Cont...

Span 4

$$4.0 = 2 \cdot \frac{1}{2} (4.42') (12'') = 53.04'' \checkmark$$

$$4.1 = 2 \cdot \frac{1}{2} (4.64') (12'') = 56.28'' \checkmark$$

$$4.2 = 2 \cdot \frac{1}{2} (5.05') (12'') = 60.6'' \checkmark$$

$$4.3 = 2 \cdot \frac{1}{2} (5.48') (12'') = 65.76'' \checkmark$$

$$4.4 = 2 \cdot \frac{1}{2} (6.0') (12'') = 72'' \checkmark$$

$$4.5 = 2 \cdot \frac{1}{2} (6.59') (12'') = 79.08'' \checkmark$$

$$4.6 = 2 \cdot \frac{1}{2} (7.27') (12'') = 87.24'' \checkmark$$

$$4.7 = \frac{1}{2} (8.02') + 3'-8'' = 92.14'' \checkmark$$

$$4.9 = 2 \cdot \frac{1}{2} (4.82') = 57.84'' \checkmark$$

$$4.8 = \frac{1}{2} (8.85') + 3'-8'' = 97.10'' \text{ (use 93'')} \checkmark$$

Span 5

$$5.0 = 2 \cdot \frac{1}{2} (5.25') (12'') = 63'' \checkmark$$

$$5.1 = 2 \cdot \frac{1}{2} (5.58') (12'') = 66.96'' \checkmark$$

$$5.2 = 2 \cdot \frac{1}{2} (5.91') (12'') = 70.92'' \checkmark$$

$$5.3 = 2 \cdot \frac{1}{2} (6.21') (12'') = 74.52'' \checkmark$$

$$5.4 = 2 \cdot \frac{1}{2} (6.48') (12'') = 77.76'' \checkmark$$

$$5.5 = 2 \cdot \frac{1}{2} (6.72') (12'') = 80.64'' \checkmark$$

$$5.6 = 2 \cdot \frac{1}{2} (6.93') (12'') = 83.16'' \checkmark$$

$$5.7 = 2 \cdot \frac{1}{2} (7.12') (12'') = 85.44'' \checkmark$$

$$5.8 = 2 \cdot \frac{1}{2} (7.27') (12'') = 87.24'' \checkmark$$

$$5.9 = \frac{1}{2} (7.39') + 3'-8'' = 88.34'' \checkmark$$

Span 6

6.0, 6.1, 6.2 - use tributary width

6.3 - 6.9 - Tributary width greater than 90" $\therefore$ use 90" $\checkmark$

Span 7

- Tributary width greater than 90" - use 90" effective width $\checkmark$

Span 8

- Tributary width greater than 90" - use 90" effective width $\checkmark$

Span 9

- Tributary width greater than 90" - use 90" effective width $\checkmark$



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SHEET NO. 10 OF 16

✓ RAM 1/12/10

Effective slab width - cont...

Girder 5 cont...

Span 10 - Girder 5 now interior Beam - AASHTO 10.38.3.2
no longer applies, use 10.38.3.1

- use lesser of 90" + tributary slab width per CDK calcs ✓

Span 11 - similar to span 10

- use lesser of 90" + tributary slab width per CDK calcs ✓

Girder 6

- Smallest span along Girder 6 = 52.217' - Span 12 ✓

- Varying slab thickness - Span point 1.0 + 3.0 = $8\frac{1}{4}" - \frac{1}{2}" c.c. = 7\frac{3}{4}"$ ✓ Span point 3.1 to End = $8\frac{1}{4}" - \frac{1}{2}" = 7\frac{1}{2}"$ ✓

- Interior girder - use tributary slab width for C. to C. girder spacing per CDK calcs

- Span 7 (11.87' cantilever) will not be used in span criteria ✓

- Since Girder 6 is always an interior girder AASHTO 10.38.3.1 will apply ✓

- $\frac{1}{4}$ span length = $\frac{1}{4} (52.217') (12\frac{1}{2}) = 156.7"$ - will never control ✓

- C. to C. Girder - varies, use tributary slab width per CDK calcs

- 12 times slab thickness = $12 (7\frac{3}{4}) = 93"$ + $12 (7\frac{1}{2}) = 90"$
(1.0 to 3.0) ✓ (3.1 to End) ✓

- Span points 1.0 to 3.0 - use lesser of 93" + Tributary width ✓

- Span points 3.1 to End - use lesser of 90" + Tributary width ✓



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SHEET NO. 11

OF 16

Effective slab width - cont...

VRAM 1/12/10

Girder 7

- Smallest span along Girder 7 = 53.198' - Span 13 ✓
- Varying slab thickness - 1.0 to 4.0 = $8\frac{1}{4}" - \frac{1}{2}" = 7\frac{3}{4}"$; 4.1 to end = $8" - \frac{1}{2}" = 7\frac{1}{2}"$ ✓
- Interior + Exterior Girder
 - use tributary slab width when girder is an interior girder
 - when girder is exterior use effective slab width per AASHTO 10.58.3.2
 - see Girder 5 Effective slab width calc for further explanation
 - Girder goes from interior beam to exterior at span point 4.08
- Span 1 from start of girder to hinge is ignored for span length criteria. ✓
- $\frac{1}{4}$ span length = $\frac{1}{4} (53.198') (12") = 159.6$ ✓ - will never control for Girder 7
- 12 times slab thickness = $12 (7\frac{3}{4}) = 93"$ ✓

Span 1, 2, 3 + span point 4.0

- use lesser of 93' + Tributary slab width ✓

Span 4 (remaining) per AASHTO 10.38.3.2 - C to C. criteria

$$4.1 = 2 \cdot \frac{1}{2} \cdot (7.57') \cdot (12") = 90.84" > 90" \Rightarrow \text{use } 90" (12 \cdot 7\frac{1}{2}" = 90") \checkmark$$

$$4.2 = 2 \cdot \frac{1}{2} \cdot (7.65') \cdot (12") = 91.8" > 90" \Rightarrow \text{use } 90" \checkmark$$

$$4.3 = [3'-8" + \frac{1}{2} (7.73')] \cdot 12" = 90.4" > 90" \Rightarrow \text{use } 90" \checkmark$$

$$4.4 = [3'-8" + \frac{1}{2} (7.81')] \cdot 12" = 90.86" > 90" \Rightarrow \text{use } 90" \checkmark$$

4.5 - 4.9 - C. to C. Girders spacing greater than 7.81' ∴ use 90" effective width ✓

Spans 5 - 14

- center to center girder spacing not less than 7'-8", overhang constant 3'-8" $\Rightarrow [3'-8" + \frac{1}{2} (7'-8")] \cdot 12" = 90" \checkmark$
- 90" effective slab width will be use remainder of Girder ✓



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PROJECT Special Structures Rating

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✓ RAM 1/9/10

Effective slab width - cont...

Girder 8

- Smallest span along girder 8 = 51.815' ✓
- Slab width varies from 8" to 8 1/4" to 8 3/4" (minus 1/2" wearcourse)
(7 1/2", 7 3/4", 8 1/4") ✓
- Interior & Exterior girder
 - for c.t.c. girder spacing, use tributary slab width for interior girder
 - When Girder 8 is exterior girder use provisions in AASHTO 10.3.3.3
See Girder 5 Effective slab width calcs for further explanation
 - Girder 8 goes from interior girder to exterior girder
@ span point 2.1

- 1/4 span length = 1/4 (51.815') (12 1/4") = 155.5" - will never control for ✓
- 12 times slab thickness = 12 (7 3/4") = 93" (span 1) girder 8 ✓
= 12 (7 1/2") = 90" (spans 2-7) ✓
= 12 (8 1/4") = 99" (span 8-11) ✓

Span 1

- use lesser of tributary slab width & 93" ✓

Span 2

- | | |
|--|--|
| 2.0 - use tributary slab width ✓ | 2.5 = 2 * 1/2 (6.88') (12 1/4") = 82.56" ✓ |
| 2.1 = 2 * 1/2 (6.25') (12 1/4") = 75" ✓ | 2.6 = 2 * 1/2 (7.04') (12 1/4") = 84.48" ✓ |
| 2.2 = 2 * 1/2 (6.40') (12 1/4") = 76.8" ✓ | 2.7 = 2 * 1/2 (7.19') (12 1/4") = 86.28" ✓ |
| 2.3 = 2 * 1/2 (6.56') (12 1/4") = 78.72" ✓ | 2.8 = [3'-8" + 1/2 (7.35')] * 12 1/4" = 88.10" ✓ |
| 2.4 = 2 * 1/2 (6.72') (12 1/4") = 80.64" ✓ | 2.9 = [3'-8" + 1/2 (7.51')] * 12 1/4" = 89.06" ✓ |



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VRAM 1/9/10

Effective slab width + cont...

Girder 8 - cont...

Span 3

$$3.0 = [\frac{1}{2}(7'-8") + 3'-8"] \cdot 12" = 90" \checkmark$$

$$3.1 = [\frac{1}{2}(7.85') + 3'-8"] \cdot 12" = 91.10" \checkmark > 90" \Rightarrow \text{use } 90" \checkmark$$

$$3.2 = [\frac{1}{2}(8.03') + 3'-8"] \cdot 12" = 92.18" > 90" \Rightarrow \text{use } 90" \checkmark$$

$$3.3 = [\frac{1}{2}(8.20') + 3'-8"] \cdot 12" = 93.2" > 90" \Rightarrow \text{use } 90" \checkmark$$

3.4 - 3.9 $\Rightarrow$ c. to c. girder spacing greater than span point 3.3; use 90" effective slab width $\checkmark$

Span 4-7

- c. to c. girder spacing = 9'-0" $\Rightarrow$ effective width = $\frac{1}{2} \cdot 9'-0" + 3'-8" = 98"$
- Use 90" effective slab width
 $\hookrightarrow$ slab criteria

Span 8-11

- c. to c. Girder Spacing = 9'-0" $\Rightarrow$ effective width = 98"
- use 98" effective slab width, $98" < 99" \checkmark$
 $\hookrightarrow$ slab criteria $\checkmark$

Girder 9

- Smallest Span along girder 9 = 43.974' - Span 1 $\checkmark$
- Slab width varies 8" (7 1/2"), 8 1/4" (7 3/4"), + 8 3/4" (8 1/4") $\checkmark$
- Interior Girder, use tributary slab width for c. to c. Girder Spacing - see CDK's calcs
- 1/4 span length = $\frac{1}{4}(43.974')(12") = 131.92"$ - will never control for $\checkmark$
- 12 times slab thickness = $12(7 1/2") = 93"$ (Spans 1-5) $\checkmark$ Girder 9
 $= 12(7 3/4") = 90"$ (Span 6-11) $\checkmark$
 $= 12(8 1/4") = 99"$ (Spans 12-15) $\checkmark$



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✓ RAM 1/9/10

Effective slab width - cont...

Girder 9 - cont...

Spans 1 to 5

- Variable Center to Center girder spacing
- use lesser of 93" + tributary slab width per CDK's calcs ✓

Span 6

- variable center to center girder spacing
- use lesser of 90" + tributary slab width per CDK's calcs ✓

Span 7

- Variable center to center spacing; min = 9'-0" + 7'-8" ✓
- $\frac{1}{2} (9'-0" + 7'-8") \cdot 12" = 100" > 90"$ ✓
- use 90" effective slab width for span 7 ✓

Spans 8 - 11

- constant 9'-0" center to center girder spacing both sides
- $(9'-0") (12") = 108" > 90"$ ✓
- use 90" for effective slab width for spans 8 - 11 ✓

Spans 12 - 15

- constant 9'-0" center to center girder spacing both sides
- $(9'-0") (12") = 108" > 99"$ ✓
- use 99" for effective slab width for spans 12 - 15 ✓



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SHEET NO. 15 OF 16

✓ RAM 1/9/10

Effective slab width - continue

Girder 10

- Smallest span along girder 10 = 41.601' - Span 1 ✓
- Slab width varies - 8 1/4" (7 3/4"), 8" (7 1/2"), 8 3/4" (8 1/4") ✓
- Exterior Girder, Provisions in both AASHTO 10.38.3.1 + 10.38.3.2 will apply (1/2 c.to c. Girders spacing plus lesser of overhang + 1/2 c.to c.)
- 1/4 span length = 1/4 (41.601') (12") = 124.8" - will never control for Girder 10.
- 12 times slab thickness = 12 (7 3/4") = 93" (spans 1-5) ✓
= 12 (7 1/2") = 90" (spans 6-11) ✓
= 12 (8 1/4") = 99" (spans 12-15) ✓

Span 1 -

| | |
|--|--|
| 1.0 = 2 · 1/2 · (7.16') (12") = 85.92" ✓ | 1.5 = [1/2 (7.37') + 3'-8"] · 12" = 88.22" ✓ |
| 1.1 = 2 · 1/2 · (7.15') (12") = 85.8" ✓ | 1.6 = [1/2 (7.43') + 3'-8"] · 12" = 88.58" ✓ |
| 1.2 = 2 · 1/2 · (7.20') (12") = 86.4" ✓ | 1.7 = [1/2 (7.48') + 3'-8"] · 12" = 88.88" ✓ |
| 1.3 = 2 · 1/2 · (7.26') (12") = 87.12" ✓ | 1.8 = [1/2 (7.53') + 3'-8"] · 12" = 89.18" ✓ |
| 1.4 = 2 · 1/2 · (7.32') (12") = 87.84" ✓ | 1.9 = [1/2 (7.58') + 3'-8"] · 12" = 89.48" ✓ |

- C.to c. criteria controls in span 1, use above values for Effective width ✓

Span 2 -

| | |
|--------------------------------------|--------------------------------------|
| 2.0 = 1/2 (7.63') + 3'-8" = 89.78" ✓ | 2.5 = 1/2 (7.94') + 3'-8" = 91.64" ✓ |
| 2.1 = 1/2 (7.70') + 3'-8" = 90.20" ✓ | 2.6 = 1/2 (7.99') + 3'-8" = 91.94" ✓ |
| 2.2 = 1/2 (7.76') + 3'-8" = 90.56" ✓ | 2.7 = 1/2 (8.05') + 3'-8" = 92.30" ✓ |
| 2.3 = 1/2 (7.82') + 3'-8" = 90.92" ✓ | 2.8 = 1/2 (8.10') + 3'-8" = 92.60" ✓ |
| 2.4 = 1/2 (7.88') + 3'-8" = 91.28" ✓ | 2.9 = 1/2 (8.15') + 3'-8" = 92.90" ✓ |



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SHEET NO. 16 OF 16

✓ RAM 1/9/10

Effective Slab width - Cont...

Girder 10 - cont.

Span 3-5

- no c. to c. girder spacing under 8.20' $\Rightarrow \left[\frac{1}{2}(8.20') + 3'-8" \right] \cdot 12" = 93.20'$ ✓
c. to c. criteria will not control
- use effective width = 93" ✓

Span 6-11

- no c. to c. spacing under 7'-8" - from span Pt 6.5 on
typ. c. to c. spacing = 9'-0" ✓
- $\left[\frac{1}{2}(7'-8") + 3'-8" \right] \cdot 12" = 90"$ (c. to c. criteria will not control) ✓
- use 90" effective slab width for spans 6-11 ✓

Span 12-15

- Typ c. to c. spacing = 9'-0" ✓
- $\left[\frac{1}{2}(9'-0") + 3'-8" \right] = 98"$ * Controls ✓
- slab criteria = 99" ✓
- use 98" effective slab width for spans 12-15 ✓



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 11/11/09 BY CJM SHEET NO. 1 OF 5

✓ RAM 1/8/10

Slab Definition

Bridge 69801 J

- Original slab thickness = $6\frac{1}{2}$ " min ✓
- from 1985 rehab - Scarify $\frac{1}{2}$ " ; 2" low slump concrete wear course.

$$\text{Deck thickness} = 6\frac{1}{2}" - \frac{1}{2}" + 2" = 8" \text{ Deck } \checkmark$$

Bridge 69801 L

- Original slab thickness = $6\frac{1}{2}$ " min ✓
- From 1985 rehab - Scarify $\frac{1}{2}$ " ; 2" low slump concrete wear course

$$\text{Deck thickness} = 6\frac{1}{2}" - \frac{1}{2}" + 2" = 8" \text{ Deck } \checkmark$$

Bridge 69801 K

Unit L

- Original thickness = $7\frac{1}{2}$ " ✓
- From 1985 rehab - Scarify $\frac{1}{2}$ " ; 2" low slump concrete wear course

$$\text{Deck thickness} = 7\frac{1}{2}" - \frac{1}{2}" + 2" = 9" \text{ Deck } \checkmark$$



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✓ RAM 1/3/10

Slab Definition - cont...

Bridge 69801 K - cont...

Unit 2

- Original thickness = $6\frac{1}{2}$ " min ✓

- From 1985 rehab - Scarify $\frac{1}{2}$ "; 2" low slump concrete wear course

Deck thickness = $6\frac{1}{2}" - \frac{1}{2}" + 2" = 8"$ Deck ✓

Bridge 69801 M

- Original thickness = $6\frac{1}{2}"$ ✓

- From 1979 rehab - Scarify $\frac{1}{2}"$; 2" low slump concrete overlay

Deck thickness = $6\frac{1}{2}" - \frac{1}{2}" + 2" = 8"$ ✓

Bridge 69801 N

- original thickness = $6\frac{1}{2}"$ minimum ✓

- from

- From 2001 rehab - Remove $\frac{3}{4}"$ latex modified concrete overlay;
Scarify bridge deck $\frac{1}{4}"$; 2" concrete overlay

Deck thickness = $6\frac{1}{2}" + \frac{3}{4}" - \frac{3}{4}" - \frac{1}{4}" + 2" = 8\frac{1}{4}"$ Deck ✓



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✓ RAM 1/8/10

Slab thickness Cont...

Bridge 69881 A

- Original Deck thickness = $7\frac{1}{4}"$ min ✓
- from 1979 rehab - Scarify $\frac{1}{2}"$; 2" low slump overlay

$$\text{Deck thickness} = 7\frac{1}{4}" - \frac{1}{2}" + 2" = 8\frac{3}{4}" \checkmark$$



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✓ RAM 1/8/10

Slab thickness cont.

- Slab thickness is assigned by span for MDX input. Thickness varies per span between bridges. Thickness will be assigned on thickness for majority of span

Girder 1

| <u>Location</u> | <u>Slab thickness</u> | <u>Span Adjusted</u> |
|-----------------|-----------------------|----------------------|
| 1.0 ✓ | 8" ✓ | 1 ✓ |
| 3.86 ✓ | 9" ✓ | 4 ✓ |
| 7.86 ✓ | 8" ✓ | 8 ✓ |

Girder 2

- Constant 8" ✓

Girder 3

- Constant 8" ✓

Girder 4

| <u>Location</u> | <u>Slab Thickness</u> | <u>Span Adjusted</u> |
|-----------------|-----------------------|----------------------|
| 1.0 ✓ | 8" ✓ | 1 ✓ |
| 3.86 ✓ | 9" ✓ | 4 ✓ |
| 7.87 ✓ | 8" ✓ | 8 ✓ |

Girder 5

| <u>Location</u> | <u>Slab thickness</u> | <u>Span Adjusted</u> |
|-----------------|-----------------------|----------------------|
| 1.0 ✓ | 8 1/4" ✓ | 1 ✓ |
| 6.08 ✓ | 8" ✓ | 6 ✓ |



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✓ RAM 1/8/10

Slab Thickness Cont...

Girder 6

Location

1.0 ✓

3.08 ✓

Slab Thickness

8 1/4" ✓

8" ✓

Span Adjusted

1 ✓

3 ✓

Girder 7

Location

1.0 ✓

4.08 ✓

Slab Thickness

8 1/4" ✓

8" ✓

Span Adjusted

1 ✓

4 ✓

Girder 8

Location

1.0 ✓

2.1 ✓

8.09 ✓

Slab thickness

8 1/4" ✓

8" ✓

8 3/4" ✓

Span Adjusted

1 ✓

2 ✓

8 ✓

Girder 9

Location

1.0 ✓

6.1 ✓

12.09 ✓

Slab Thickness

8 1/4" ✓

8" ✓

8 3/4" ✓

Span Adjusted

1 ✓

6 ✓

12 ✓

Girder 10

Location

1.0 ✓

6.1 ✓

12.09 ✓

Slab Thickness

8 1/4" ✓

8" ✓

8 3/4" ✓

Span Adjusted

1 ✓

6 ✓

12 ✓



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PROJECT Special Structures Rating - whole Bridge System

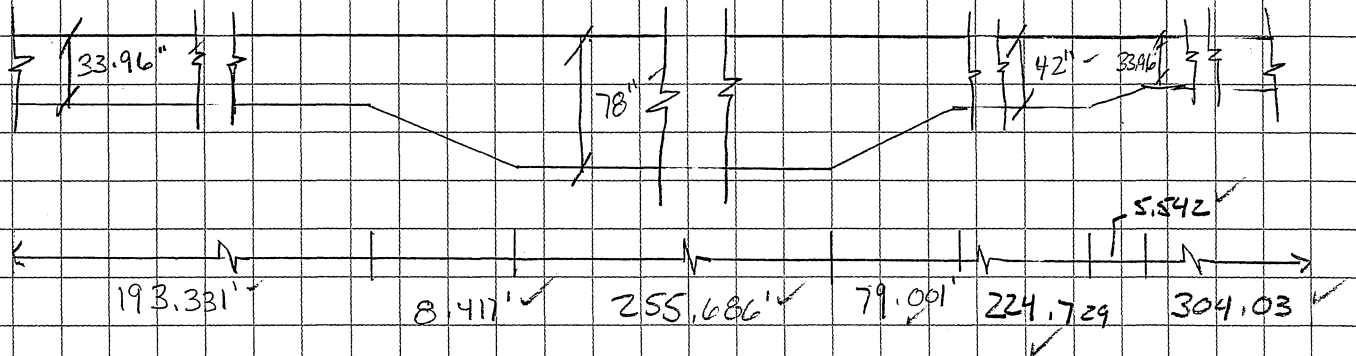
PROJECT # 090147 DATE 11/6/09 BY CJM SHEET NO. 1 OF 3

✓ 20K 11/4/10

Web depths, for varying Girders

- lengths begin from left bearing ✓
- Rolled beams have web depth ~ 33.96" - Areas with Plate Girders with 34" + Rolled beams with web depth ~ 34" → use 33.96" for simplicity + to be conservative ✓

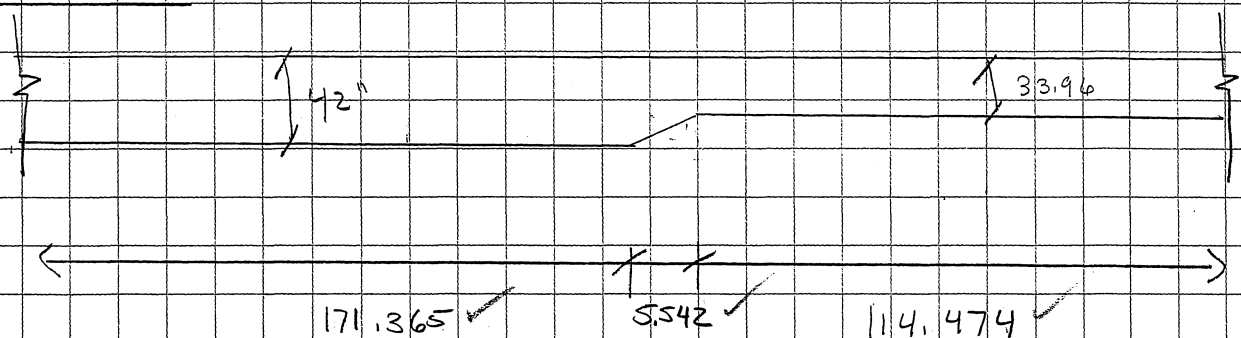
Girder 1 ✓



Girder 2

- constant depth of 33.96 in ✓

Girder 3





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PROJECT Special Structure Rating - whole Bridge System

PROJECT # 090147

DATE 11/6/09

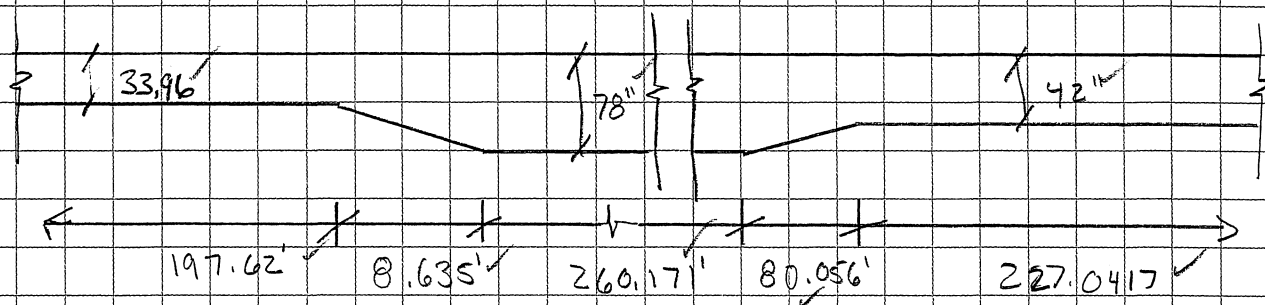
BY CJM

SHEET NO. 2 OF 3

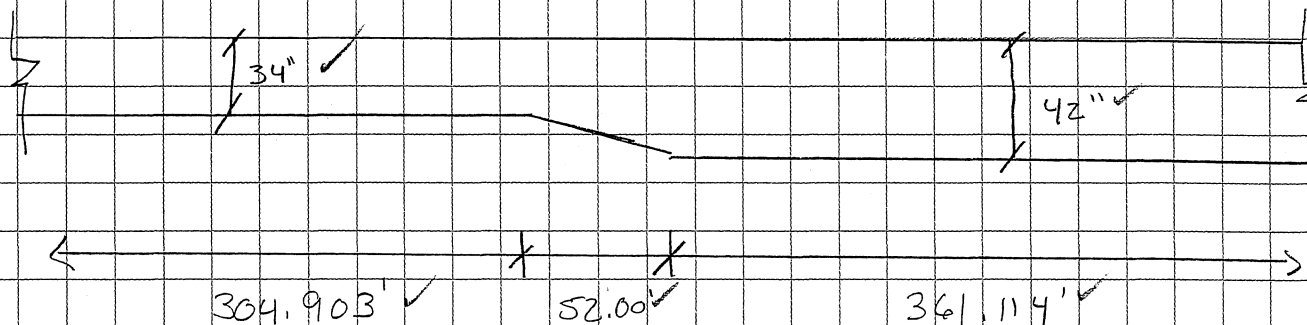
✓ CDR 1/4/10

Web depths - cont.

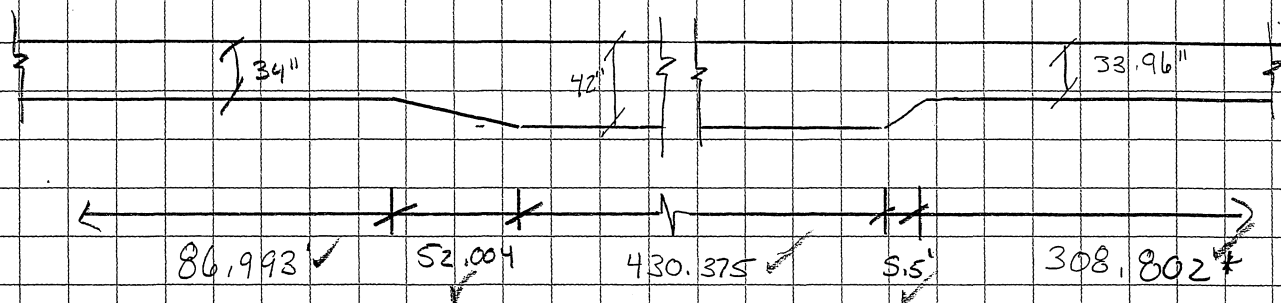
Girder 4



Girder 5



Girder 6



* Span From pier 2-34 to 3-34 could not be matched into, 308.802 is based off plan lengths, $MDR = 309.1478'$



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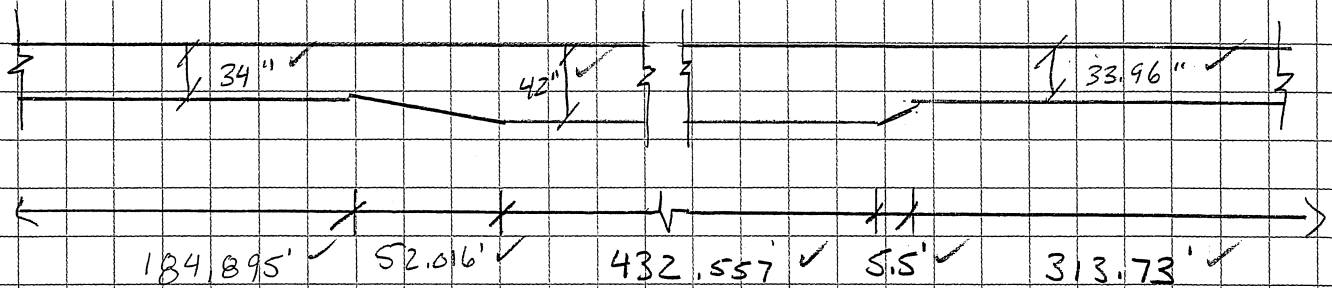
PROJECT Special Structures Rating- whole Bridge System

PROJECT # 090147 DATE 11/6/09 BY CJM SHEET NO. 3 OF 3

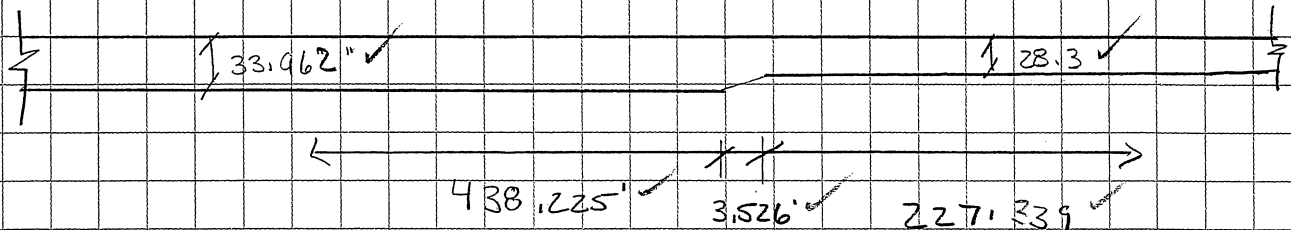
✓ CDK 1/4/10

Web depth cont.

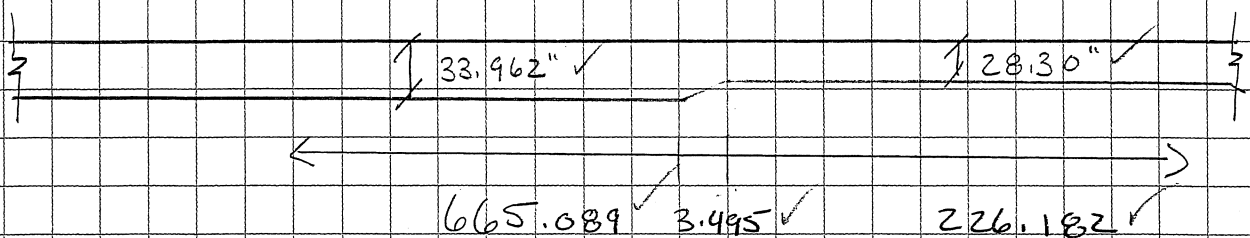
Girder 7



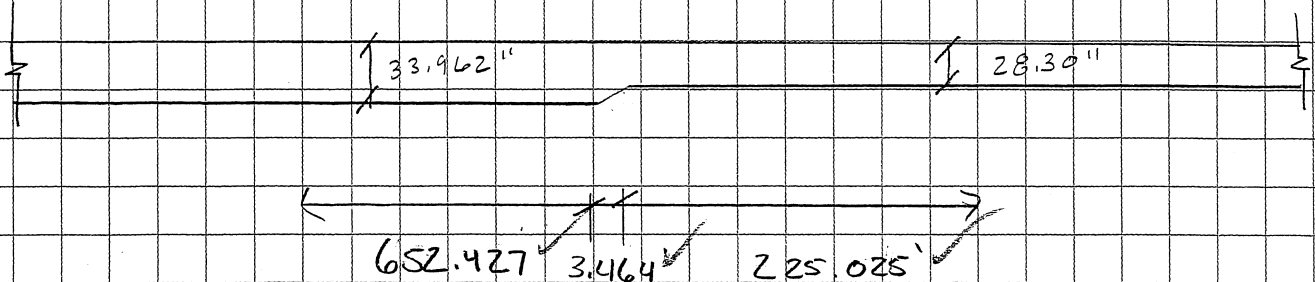
Girder 8



Girder 9



Girder 10





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PROJECT Special Structure Rating - Whole Bridge System

PROJECT # 090147.00 DATE 11/5/09 BY CTM SHEET NO. 1 OF 2
✓ LOK 12/22/09

Radius of Curvature in Girders

- Radius will differ by 10th point. When change in Radius is between 10th points, Radius 10th point will be adjusted for Greater affect
- Positive radius value for clockwise curvature from beginning of bridge, Negative radius value for counter Clock wise.

Girder 1

| <u>Location</u> | <u>XX.X span</u> | <u>Radius</u> | <u>10th point Radius is adjusted</u> |
|-----------------|----------------------------|---------------|---|
| 1.0 (0) ✓ | (44.4 10 th pt) | + 811.511 ✓ | 1.0 (0) ✓ |
| 5.17 (41.7) ✓ | | + 1425.394 ✓ | 5.2 (42) ✓ |
| 8.96 (79.6) ✓ | | + 947.930 ✓ | 8.9 (79) ✓ |
| 10.48 (94.8) ✓ | | + 470.465 ✓ | 10.4 (94) ✓ |

Girder 2

| <u>Location</u> | <u>Radius</u> | <u>10th point Radius is adjusted</u> |
|-----------------|---------------|---|
| 1.0 ✓ | + 820.511 ✓ | 1.0 (0) ✓ |

Girder 3

| <u>Location</u> | <u>Radius</u> | <u>10th Point Radius is adjusted</u> |
|-----------------|---------------|---|
| 1.0 (0) ✓ | + 1434.394 ✓ | 1.0 (0) ✓ |
| 2.95 (19.5) ✓ | + 956.930 ✓ | 2.9 (19) ✓ |
| 4.47 (34.7) ✓ | + 315.020 ✓ | 4.4 (34) ✓ |

Girder 4

| <u>Location</u> | <u>Radius</u> | <u>10th point Radius is Adjusted</u> |
|-----------------|---------------|---|
| 1.0 (0) ✓ | + 829.511 ✓ | 1.0 (0) ✓ |
| 5.18 (41.8) ✓ | + 1443.394 ✓ | 5.2 (42) ✓ |
| 8.94 (79.4) ✓ | + 493.706 ✓ | 8.9 (79) ✓ |



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PROJECT Special Structures Rating - Whole Bridge System

PROJECT # 090147

DATE 11/2/09

BY CJM

SHEET NO. 2 OF 3

✓ OK 12/22/09

Radius of Curvature in Girders - cont.,

Girder 5

| <u>Location</u> | <u>Radius</u> | <u>10th point Radius is adjusted</u> |
|-----------------|---------------|---|
| 1.0 (0) ✓ | - 325.310 ✓ | 1.0 (0) ✓ |
| 6.02 (50.2) ✓ | 0.00 ✓ | 6.1 (51) ✓ |
| 8.55 (75.5) ✓ | + 1425.394 ✓ | 8.5 (75) ✓ |
| 9.89 (88.9) ✓ | 0.00 ✓ | 9.9 (89) ✓ |

Girder 6

| <u>Location</u> | <u>Radius</u> | <u>10th point Radius is adjusted</u> |
|-----------------|---------------|---|
| 1.0 (0) ✓ | - 397.615 ✓ | 1.0 (0) ✓ |
| 3.02 (20.2) ✓ | 0.00 ✓ | 3.1 (21) ✓ |
| 5.55 (45.5) ✓ | + 1434.394 ✓ | 5.5 (45) ✓ |
| 8.27 (72.7) ✓ | + 820.511 ✓ | 8.2 (72) ✓ |
| 11.33 (103.3) ✓ | + 479.465 ✓ | 11.3 (103) ✓ |

Girder 7

| <u>Location</u> | <u>Radius</u> | <u>10th point Radius is adjusted</u> |
|-----------------|---------------|---|
| 1.0 (0) ✓ | - 211.785 ✓ | 1.0 (0) ✓ |
| 2.83 (18.3) ✓ | - 520.599 ✓ | 2.9 (19) ✓ |
| 4.02 (30.2) ✓ | 0.00 ✓ | 4.1 (31) ✓ |
| 6.55 (55.5) ✓ | + 1443.394 ✓ | 6.5 (55) ✓ |
| 9.27 (82.7) ✓ | + 829.511 ✓ | 9.2 (82) ✓ |
| 12.34 (113.4) ✓ | + 488.465 ✓ | 12.3 (113) ✓ |



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PROJECT Special Structures Ratings - whole Bridge System

PROJECT # 090147 DATE 11/2/09 BY GJM SHEET NO. 3 OF 3
LDK 12/2/09

Radius of Curvature in Girders - cont...

Girder 8

| <u>Location</u> | <u>Radius</u> | <u>10th Point Radius is adjusted</u> |
|-----------------|---------------|---|
| 1.0 (0) ✓ | - 265.970 ✓ | 1.0 (0) ✓ |
| 2.73 (17.3) ✓ | 0.00 ✓ | 2.8 (18) ✓ |
| 5.95 (49.5) ✓ | - 1439.394 ✓ | 5.9 (49) ✓ |
| 9.90 (89) ✓ | 0.00 ✓ | 9.9 (89) ✓ |

Girder 9

| <u>Location</u> | <u>Radius</u> | <u>10th Point Radius to be adjusted</u> |
|-----------------|---------------|--|
| 1.0 (0) ✓ | - 254.915 ✓ | 1.0 (0) ✓ |
| 3.88 (28.8) ✓ | - 257.954 ✓ | 3.9 (29) ✓ |
| 6.72 (57.2) ✓ | 0.00 ✓ | 6.8 (58) ✓ |
| 9.95 (89.5) ✓ | - 1430.394 ✓ | 9.9 (89) ✓ |
| 13.90 (129) ✓ | 0.00 ✓ | 13.9 (129) ✓ |

Girder 10

| <u>Location</u> | <u>Radius</u> | <u>10th Point Radius to be adjusted</u> |
|------------------------|---------------|--|
| 1.0 (0) ✓ | - 251.00 ✓ | 1.0 (0) ✓ |
| 6.170 (57) ✓ | 0.00 ✓ | 6.7 (57) ✓ |
| 9.95 (89.5) ✓ | - 1421.394 ✓ | 9.9 (89) ✓ |
| 13.89 (128.9) ✓
9.5 | 0.00 ✓ | 13.9 (129) ✓ |



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PROJECT Bridge 69801

PROJECT # 090147

DATE 11/4/09

BY CJM

SHEET NO. 1

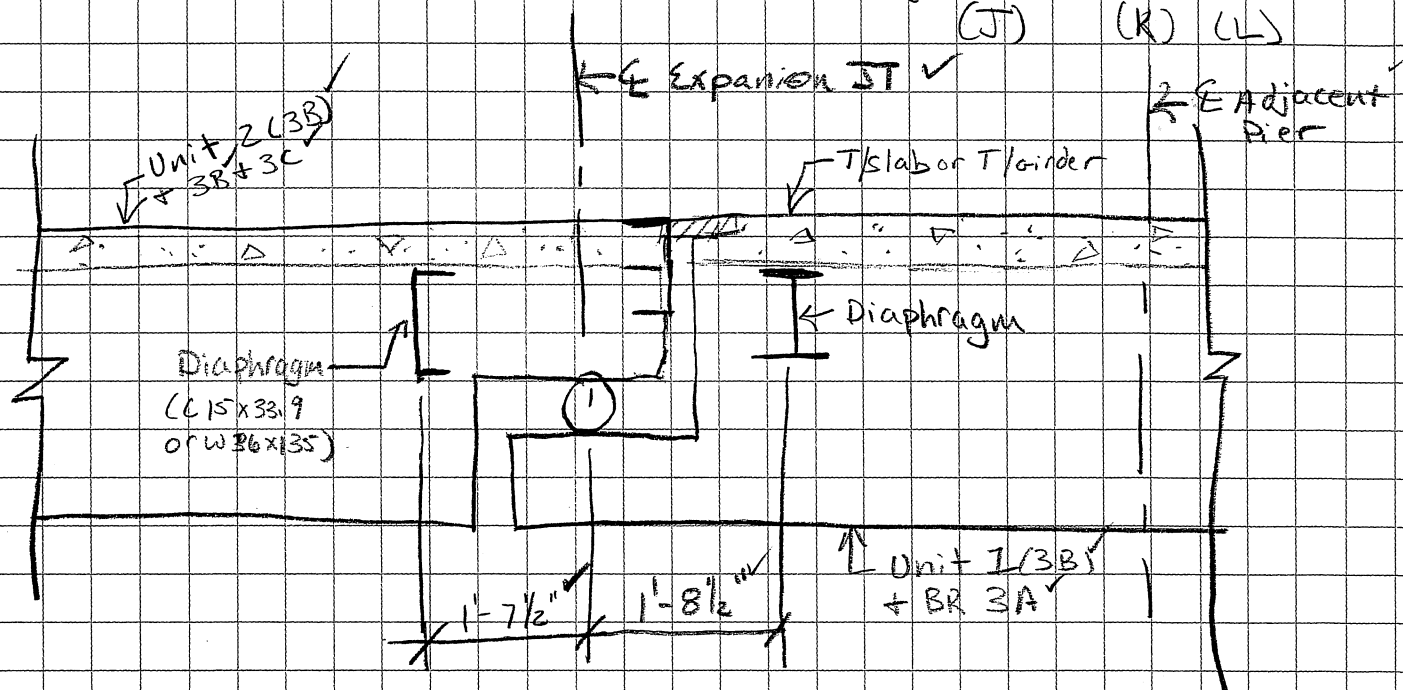
OF 2

✓ LOK 1/15/10

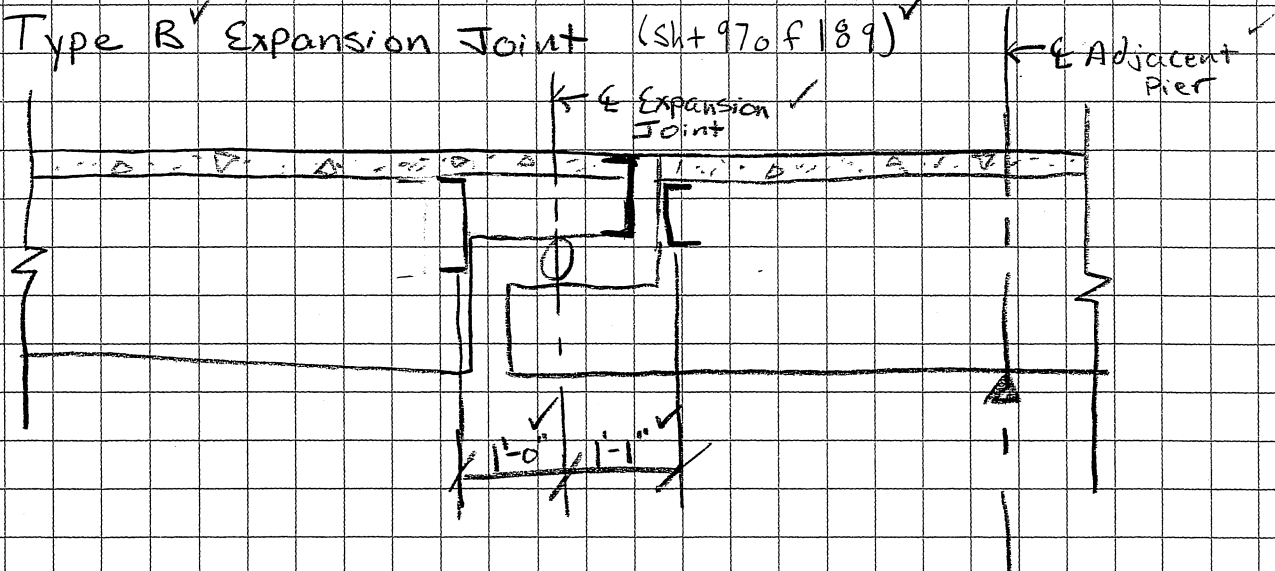
Expansion joint details.

Expansion joint - Type ID - Between unit 1 + 2 Bridge 3B (69801)
(Sht 99 of 189)

- Junction Bridge 3A ✓ with 3B ✓ + 3C ✓
(J) (K) (L)



Type B Expansion Joint (Sht 97 of 189)





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PROJECT Bridge 69801

PROJECT # 090147

DATE 11/4/09

BY CJM

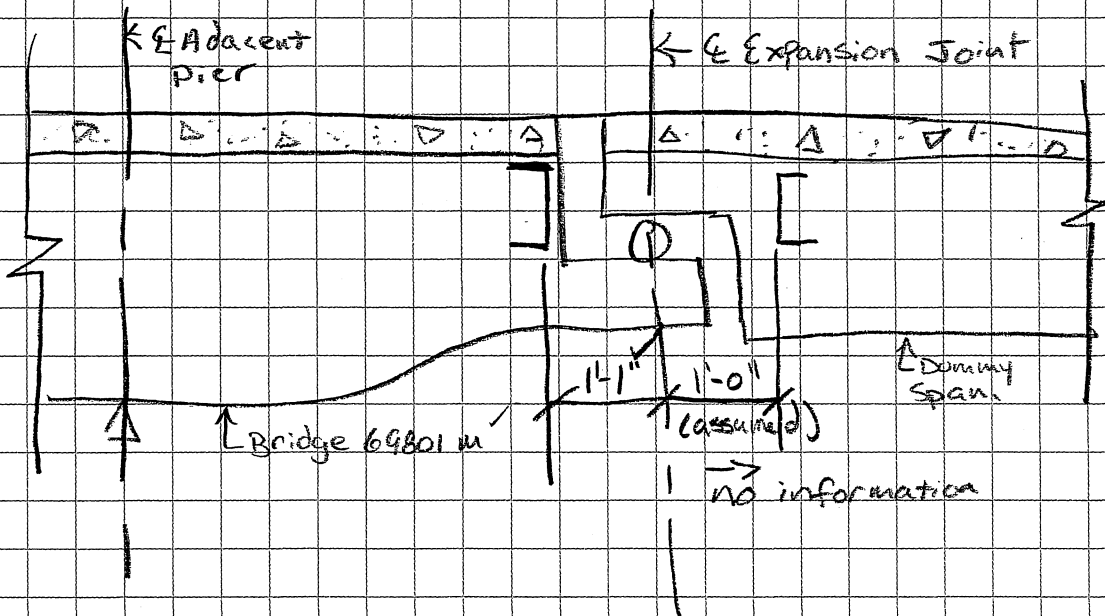
SHEET NO. 2

OF 2

CDK 1/15/10

Expansion Joint type H

In between Bridge 69801 M + Dummy Span
(Sht 100 of 189)





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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/11/09

BY CJM

SHEET NO. 1

OF 5

✓ 20K 1/13/10

Non composite Dead Load - Additional Steel Weight

- Per Mn/DOT LRFD Bridge Design Manual [15.37]
use 2% 5% of the main member for welds, splices,
bolts, connection plates, ect...

Girder 1

Typical Plate Girder in Span 4 - 18" x 7/8" T+B Flange Plates
78 x 1/2" Web Plate

$$Area = 2(18")(7/8") + (78")(1/2") = 70.5 in^2 = 0.49 ft^2$$

$$Load/FT = (0.49 ft^2)(490 pcf) = 240.1 PLF$$

$$2\% = 0.02(240.1 PLF) = 4.8 PLF \quad 5\% = 0.05(240.1 PLF) = 12.0 PLF$$

Largest Rolled beam $\Rightarrow$ W36 x 170

$$2\% = 0.02(170 PLF) = 3.4 PLF \quad 5\% = 0.05(170 PLF) = 8.5 PLF$$

Say 10 PLF Additional Steel weight for Girder 1

Girder 2

W36 x 150

$$2\% = 0.02(150 PLF) = 3 PLF \quad 5\% = 0.05(150 PLF) = 7.5 PLF$$

Say 10 PLF Additional Steel weight for Girder 2



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 11/12/09 BY CJM SHEET NO. 2 OF 5
✓ 20K 11/5/10

Non composite Dead Load - Additional Steel weight

Girder 3

use W36x160

$$2\% = .02 (160 \text{ PLF}) = 3.2 \text{ PLF} \quad 5\% = 0.05 (160 \text{ PLF}) = 8 \text{ PLF}$$

Say 10 PLF Additional steel weight for Girder 3

Girder 4

- Similar to Girder 3 - Say 10 PLF Additional steel weight

Girder 5

- use Typ. Section Span 4 - 34" x 3/8" web Top Flange = 12 x 1 1/4" Bot = 12 x 1 7/8"

$$\text{Weight} = [34" \cdot 3/8" + 12" \cdot 1 1/4" + 12" \cdot 1 7/8"] \cdot 1/144 \text{ in}^2 \cdot 490 \text{ pcf} = 171 \text{ PLF}$$

$$2\% = 0.02 (171 \text{ PLF}) = 3.4 \text{ PLF} \quad 5\% = .05 (171 \text{ PLF}) = 8.6 \text{ PLF}$$

Say 10 PLF Additional steel weight for Girder 5

Girder 6

use W36x182

$$2\% = .02 (182 \text{ PLF}) = 3.6 \text{ PLF} \quad 5\% = .05 (182) = 9.1 \text{ PLF}$$

Say 10 PLF Additional steel weight for Girder 6



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 11/12/09 BY CJM SHEET NO. 3 OF 5
✓CDK 1/5/10

Non composite Dead Load - Additional Steel weight (cont...)

Girder 7

Use W36 x 194 ✓

$$2\% = 0.02(194 \text{ PLF}) = 3.9 \text{ PLF} \quad 5\% = 0.05(194 \text{ PLF}) = 9.7 \text{ PLF} \quad \checkmark$$

Say 10 PLF Additional steel weight Girder 7 ✓

Girder 8

Use typical section Span 2 $\Rightarrow$ Web = $34 \times 7/16$ ✓ Top flange = 12×1 ✓
Bottom flange = $12 \times 1 1/2$ ✓

$$\text{Weight} = [34 \times 7/16 + 12 \times 1 + 12 \times 1 1/2] \times 1 \text{ ft}^2 / 144 \text{ in}^2 \times 490 \text{ pcf} = 152.7 \text{ PLF} \quad \checkmark$$

$$2\% = 0.02(152.7 \text{ PLF}) = 3.0 \text{ PLF} \quad \checkmark \quad 5\% = 0.05(152.7 \text{ PLF}) = 7.6 \text{ PLF} \quad \checkmark$$

Say 10 PLF Additional steel weight for Girder 8 ✓

Girder 9

Use typical section from span 5 $\Rightarrow$ Web = $34 \times 7/16$ ✓ Top flange = $12 \times 1 3/8$ ✓
Bottom flange = $12 \times 2 1/4$ ✓

$$\text{Weight} = [34 \times 7/16 + 12 \times 1 3/8 + 12 \times 2 1/4] \times \frac{1 \text{ ft}^2}{144 \text{ in}^2} \times 490 \text{ pcf} = 198.6 \text{ PLF} \quad \checkmark$$

$$2\% = 0.02(198.6 \text{ PLF}) = 4.0 \text{ PLF} \quad \checkmark \quad 5\% = 0.05(198.6 \text{ PLF}) = 9.9 \text{ PLF} \quad \checkmark$$

Say 10 PLF Additional steel weight for Girder 9 ✓



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/2/09

BY CJM
✓ EOM 1/5/10

SHEET NO. 4 OF 5

Non composite Dead Load - Additional Steel weight (Cont.)

Girder 10

Use typical section from Span 5 $\Rightarrow$ Web = $34" \times \frac{3}{8}"$ ✓
Top Flange = $12" \times 1"$ ✓
Bottom Flange = $12" \times \frac{15}{8}"$ ✓

$$\text{Weight} = [34" \cdot \frac{3}{8}" + 12" \cdot 1" + 12" \cdot \frac{15}{8}"] \cdot \frac{147 \text{ lb}}{144 \text{ in}^2} \cdot 490 \text{ pcf} = 150.6 \text{ PLF} \checkmark$$

$$2\% = .02(150.6 \text{ PLF}) = 3.0 \text{ PLF} \checkmark \quad 5\% = .05(150.6 \text{ PLF}) = 7.5 \text{ PLF} \checkmark$$

Say 10 PLF Additional steel weight for Girder 10 ✓



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/10/09

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EDK 1/5/10

SHEET NO. 5 OF 5

Non Composite D11 - Additional Steel Wt

- Wind Bracing on Bridge (9801 K (Bridge 3B-unit I))
 - Typ. Bracing is ST 4 WF 8.5 (8.5 PLF) ✓
- Bracing from pier 4-3B to Expansion Joint between Pier I-3B + Pier 7-3A
- Due to small load compared to overall system make load a uniform load + not concentrated load
- Average length = $\left[(18'-0")^2 + (12'-0")^2 \right]^{1/2} = 21.6' \Rightarrow \text{say } 22'$ ✓
↳ Approx avg spacing along Girders
- Weight per cross brace = $(22'-0") (8.5 \text{ PLF}) = 187 \text{ lbs per support}$ ✓
- 2 Braces per connection space ✓
- Uniform load = $\frac{1/2 \cdot 2 \cdot 187 \text{ lbs}}{12'-0"} = 15.6 \text{ PLF}$ ✓

length of Additional Load

Girder I - Span 4-6 + Span 7 up to span point 7.9 ✓

Girder 4 - Span 4-6 + span 7 up to span point 7.9 ✓

Total Load in wind Bracing area = $10 \text{ PLF} + 15.6 \text{ PLF} = 25.6 \text{ PLF}$ ✓
↳ See above
↳ See Previous shts ✓



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/11/09

BY CJM

✓CDK 1/13/10

SHEET NO. 1

OF 5

Non Composite Dead Load - Additional Concrete weight

- non composite Dead Load accounts for flair from exterior girder haunch to edge of slab (see slab cross section)
- $1\frac{1}{2}$ " fillet assumed for flairs

Bridge 69801 J - original plan - sht 126 of 189 ✓

Depth @ Girder haunch (per original cross section)

$$= 6\frac{1}{2}" + 1\frac{1}{2}" + 1" = 9"$$

↳ Deck

↳ fillet

↳ assumed Average Flange thickness

Depth @ Edge of Deck = $6\frac{3}{4}"$ ✓

$$\text{Average Depth} = (9" + 6\frac{3}{4}") \frac{1}{2} = 7\frac{7}{8}"$$

$$\text{Average Flair Depth} = 7\frac{7}{8}" - 6\frac{1}{2}" = 1\frac{3}{8}"$$

↳ slab depth

$$\text{Flair cross section} = (1\frac{3}{8}")(3'-2") = 52.25 \text{ in}^2 = 0.363 \text{ ft}^2$$

↳ overhang width minus $\frac{1}{2}$ bf

$$\text{Load} = (0.363 \text{ ft}^2)(150 \text{ pcf}) = 54.5 \text{ PLF (only for exterior Girders)}$$

↳ use SS PLF ✓

Bridge 69801 K (unit 2), L, M, W

Similar Flair - use SS PLF for exterior girder Noncomp. P.C. ✓

69801 K (unit 2) - original plan - sht 129 of 189 ✓

69801 L - original plan sht 130 of 189 ✓

69801 M - original plan sht 131 of 189 ✓

69801 W - original plan sht 132 of 189 (refer to sht 130 of 189) ✓



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PROJECT Special Structures Rating

PROJECT # 690147

DATE 11/11/09

BY CJM

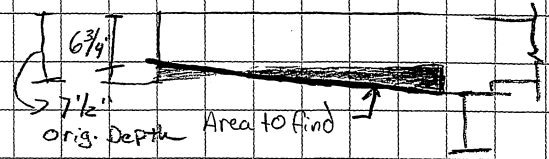
SHEET NO. 2

OF 5

✓CDK 1/13/10

Bridge 69801 K (Unit 1) - original plan sheet 128 of 189
(refers to sheet 121 of 218)

Depth @ Girder haunch (per original plans)
= $7\frac{1}{2}" + 1\frac{1}{2}" + 1" = 10"$
↳ Slab depth ↳ Fillet ↳ Assumed average flange thickness



Depth @ Edge of Deck = $6\frac{3}{4}"$ ✓

Average Depth = $\frac{1}{2}(10" + 6\frac{3}{4}") = 8\frac{3}{8}"$ ✓

Average fillet Depth = $8\frac{3}{8}" - 7\frac{1}{2}" = 7\frac{1}{8}"$ ✓
↳ slab thickness

Flair cross section = $(3'-2")(\frac{7}{8}") = 33.25 \text{ in}^2 = 0.231 \text{ ft}^2$ ✓
↳ overhang width minus $\frac{1}{2}$ bf

Load = $(0.231 \text{ ft}^2)(150 \text{ pcf}) = 34.7 \text{ PLF}$ ✓
PLF ⇒ say 35 PLF ✓

Bridge 69881 A - original plan sheet 37 of 67 ✓

Depth @ Girder haunch (per original plan) = $7\frac{1}{4}" + 1\frac{1}{2}" + 7\frac{1}{8}" = 9\frac{5}{8}"$ ✓
↳ slab depth ↳ fillet ↳ assume top flange thickness

Depth @ Edge of slab = $7\frac{1}{4}"$ ✓

Average Depth = $\frac{1}{2}(9\frac{5}{8}" + 7\frac{1}{4}") = 8\frac{7}{16}"$ ✓

Average fillet depth = $8\frac{7}{16}" - 7\frac{1}{4}" = 1\frac{3}{16}"$ ✓
↳ Deck thickness ✓

Flair cross section = $(3'-8")(\frac{13}{16}") = 46.02 \text{ in}^2 = 0.32 \text{ ft}^2$ ✓
↳ overhang width minus $\frac{1}{2}$ bf = $(3'-8") - \frac{1}{2} \cdot 16" = 38.75"$

Load = $(0.320 \text{ ft}^2)(150 \text{ pcf}) = 48.0 \text{ PLF}$ ✓



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PROJECT Bridge 69801

PROJECT # 090147 DATE 11/11/09 BY CJM SHEET NO. 4 OF 5
CDK 1/13/10

Non Composite Dead Load - Cont... (Additional Concrete weight)

- Noncomposite Dead Load will differ by 10th point + per Girder
- 10th point location will be adjusted for Greatest Effect when load changes between 10th points

Girder 1

| <u>Location - Span Point (10th Point)</u> | <u>Load (PLF)</u> | <u>10th point adjustment</u> |
|--|-------------------|---|
| 1.0 (0) | 67.5 PLF ✓ | 1.0 (0) ✓ |
| 3.86 (28.6) ✓ | 47.5 PLF ✓ | 3.9 (29) ✓ |
| 7.86 (68.6) ✓ | 67.5 PLF ✓ | 7.8 (68) ✓ |

Girder 2

- 12.5 PLF uniform ✓

Girder 3

- 12.5 PLF uniform ✓

Girder 4

| <u>Location</u> | <u>Load (PLF)</u> | <u>10th point adjustment</u> |
|-----------------|-------------------|---|
| 1.0 (0) | 67.5 PLF ✓ | 1.0 (0) |
| 3.86 (28.6) ✓ | 47.5 PLF ✓ | 3.9 (29) ✓ |
| 7.87 (68.7) ✓ | 12.5 PLF ✓ | 7.9 (69) ✓ |

Girder 5

| <u>Location</u> | <u>Load</u> | <u>10th Point Adjustment</u> |
|-----------------|-------------|---|
| 1.0 (0) | 67.5 PLF ✓ | 1.0 (0) |
| 9.89 (88.9) ✓ | 12.5 PLF ✓ | 9.9 (89) ✓ |



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/11/09

BY CJM

SHEET NO. 5 OF 5

✓ 20K 1/13/10

Non Composite Dead Load - cont... (additional concrete weight)

Girder 6

- 12.5 PLF uniform noncomp conk Load ✓

Girder 7

Location

1.0 (0)

4.08 (30.8) ✓

Load (PLF)

12.5 PLF ✓

67.5 PLF ✓

10th point Adjustment

1.0 (0)

4.0 (30) ✓

Girder 8

Location

1.0 (0)

2.10 (11)

8.09 (70.9)

Load (PLF)

12.5 PLF ✓

67.5 PLF ✓

60.5 PLF ✓

10th point Adjustment

1.0 (0)

2.1 (11) ✓

8.1 (71) ✓

Girder 9

- 12.5 PLF uniform ✓

Girder 10

Location

1.0 (0)

12.09 (110.9)

Load

67.5 PLF ✓

60.5 PLF ✓

10th point Adjustment

1.0 (0)

12.1 (111) ✓



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/5/09

BY CJM

SHEET NO. 1

OF 3

✓ LOK 12/21/09

Beam Dimensions used in Bridge 69801

- MDX Does not allow both plate girders + rolled shape girders.
Dimensions from AISC 6th Ed (1963) were used to make rolled shapes into plate girders. Design dimensions were used + not detailing dimensions

W 36 x 135 ✓ (36 WF 135)

$$b_f = 11.945 \text{ in} ✓$$

$$t_f = 0.794 \text{ in} ✓$$

$$t_w = 0.598 \text{ in} ✓$$

$$h_w = d - 2(t_f) = 35.55 - 2(0.794) = 33.962 \text{ in} ✓$$

W 36 x 150 ✓ (36 WF 150)

$$b_f = 11.972 \text{ in} ✓$$

$$t_f = 0.940 \text{ in} ✓$$

$$t_w = 0.625 \text{ in} ✓$$

$$h_w = 35.84 - 2(0.940) = 33.96 \text{ in} ✓$$

W 36 x 160 ✓ (36 WF 160)

$$b_f = 12.00 \text{ in} ✓$$

$$t_f = 1.02 \text{ in} ✓$$

$$t_w = 0.653 \text{ in} ✓$$

$$h_w = 36.00 - 2(1.02) = 33.96 \text{ in} ✓$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/5/09

BY CJM

SHEET NO. 2 OF 3

✓ LAK 12/21/09

Rolled Beam Dimensions Cont...

W36 x 170 (36WF170)

$$b_f = 12.027 \text{ in} \checkmark$$

$$t_f = 1.10 \text{ in} \checkmark$$

$$t_w = 0.680 \text{ in} \checkmark$$

$$h_w = 36.16 - 2(1.10) = 33.96 \text{ in} \checkmark$$

W36 x 182 (36WF182)

$$b_f = 12.072 \text{ in} \checkmark$$

$$t_f = 1.18 \text{ in} \checkmark$$

$$t_w = 0.725 \text{ in} \checkmark$$

$$h_w = 36.32 - 2(1.18) = 33.96 \text{ in} \checkmark$$

W36 x 194 (36WF194)

$$b_f = 12.117 \text{ in} \checkmark$$

$$t_f = 1.26 \text{ in} \checkmark$$

$$t_w = 0.77 \text{ in} \checkmark$$

$$h_w = 36.48 - 2(1.26) = 33.96 \text{ in} \checkmark$$

W30 x 116 (30WF116)

$$b_f = 16.5 \text{ in} \checkmark$$

$$t_f = 0.85 \text{ in} \checkmark$$

$$t_w = 0.564 \text{ in} \checkmark$$

$$h_w = 30.00 - 2(0.85) = 28.3 \text{ in} \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/5/09

BY CJM

SHEET NO. 3

OF 3

✓CDK 12/21/09

Rolled Beam Dimensions cont...

W30 x 124 (30WF124)

$$b_f = 10.521 \text{ in} \checkmark$$

$$t_f = 0.930 \checkmark$$

$$t_w = 0.585 \checkmark$$

$$h_w = 30.16 - 2(0.930) = 28.30 \text{ in} \checkmark$$

W30 x 132 (30WF132)

$$b_f = 10.551 \text{ in} \checkmark$$

$$t_f = 1.0 \text{ in} \checkmark$$

$$t_w = 0.615 \text{ in} \checkmark$$

$$h_w = 30.30 - 2(1.0) = 28.3 \text{ in} \checkmark$$



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATING - 1/3TH POST NOTES

PROJECT # 090147 DATE 11/15/09 BY C.DK SHEET NO. 1 OF 27
✓ CSM 12/23/09

PIER 5-3B TO PIER 4-3B

BM #1 LENGTH = 69.402 ✓ $\frac{1}{15}^{TH}$ @ 6.94'

PIER 4-3B TO HINGE = 9.917 ✓ $\therefore 69.402 - 9.917 = 59.485' ✓$

$\frac{1}{15}^{TH}$ PT. 8.57 + 20 = 28.57 ✓ $\frac{1}{15}^{TH}$ POST
Adjust to 28

BM #4 LENGTH = 70.941 ✓ $\frac{1}{15}^{TH}$ @ 7.09'

PIER 5-3B TO HINGE = 60.806 $\therefore$ 60.806(10) 8.571

70.941

OK

$\frac{1}{15}^{TH}$ PT. 8.571 + 20 = 28.571 $\frac{1}{15}^{TH}$ POST
Adjust to 28

PIER 1-3B TO PIER 7-3A

BM #1 LENGTH = 59.013 ✓ $\therefore \frac{1}{15}^{TH}$ POSTS = 5.901

PIER 1-3B TO HINGE = 50.971 ✓ $\therefore$ 50.971 (10) 8.637 POST
59.013

8.64 OK

$\frac{1}{15}^{TH}$ POST: 60 + 8.637 = 68.64 ✓

BM #4 LENGTH = 61.580 ✓ $\therefore \frac{1}{15}^{TH}$ POSTS = 6.158

adjust to 69

PIER 1-3B TO HINGE = 53.543 ✓ $\therefore$ 53.543 (10) 8.69 POST
61.580

$\frac{1}{15}^{TH}$ POST: 60 + 8.69 = 68.69

adjust to
69



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATING 1/2TH PNT NOTES
PROJECT # 090147 DATE 11/10/09 BY CAK SHEET NO. 2 OF 27
VC+M 12/23/09

BEAM #4

PIER 1-3B TO PIER 7.3A

ADDITIONAL WIDTH FOR SHOULDER WIDTH RADIUS

STA 13+35.399 @ 5:0 RADIAL TO R

FROM SKT 001

EXPANSION JOINT (HINGE) = $53.543 - 50 (10) = 7.88$
 (61.530)

$\frac{1}{10}$ PNT: $60 + 7.88 = 67.88$
LESS 67 $\frac{1}{10}$ PNT

EFFECTIVE WIDTH: $5 + 9' = 14.0' \checkmark$

EAST OF HINGE @

EFFECTIVE WIDTH: $9.0 +$

BM #4

AT EXPANSION JOINT: $4.694 + \frac{1}{2}(9.0) = 9.194 \checkmark$
[X3-3A]

AT PIER 7.3A: $8.725 \checkmark + 9.0 \checkmark = 8.8625 \checkmark$
2

BM #4 PIER 7.3A TO L-3A

LENGTH = 81.749 $\frac{1}{10}$ @ 81.749

ANGLE: $39^{\circ}14'42.69''$

| | S | N | Avg |
|----|-------------------|--------------------|-------------------|
| 70 | 8.99 $\checkmark$ | 8.724 $\checkmark$ | 8.86 $\checkmark$ |
| 71 | " $\checkmark$ | 8.050 $\checkmark$ | 8.52 $\checkmark$ |
| 72 | 9.0 $\checkmark$ | 7.423 $\checkmark$ | 8.21 $\checkmark$ |
| 73 | 9.0 $\checkmark$ | 6.842 $\checkmark$ | 7.92 $\checkmark$ |
| 74 | 9.0 $\checkmark$ | 6.309 $\checkmark$ | 7.65 $\checkmark$ |
| 75 | 9.0 $\checkmark$ | 5.823 $\checkmark$ | 7.41 $\checkmark$ |
| 76 | 9.0 $\checkmark$ | 5.402 $\checkmark$ | 7.20 $\checkmark$ |
| 77 | 9.0 $\checkmark$ | 4.990 $\checkmark$ | 7.00 $\checkmark$ |
| 78 | 9.0 $\checkmark$ | 4.644 $\checkmark$ | 6.82 $\checkmark$ |
| 79 | 9.0 $\checkmark$ | 4.344 $\checkmark$ | 6.67 $\checkmark$ |
| 80 | 000 $\checkmark$ | 4.111 $\checkmark$ | 6.55 $\checkmark$ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATINGS - 1/2" PWT BONES

PROJECT # 090147 DATE 11/10/09 BY LOL SHEET NO. 3 OF 27
/CSM 12/23/09

BRAM #4 PIER 6.3A TO PIER 5.3A

SECTION LENGTH = 81.706' ✓

RADIUS: 493.706' ✓

1/2" Ø 81.706

ANGLE: 9°28'55.45" ✓

| PWT | S | N | AVE |
|-----|---------|---------|--------|
| 80 | 8.988 ✓ | 4.11 ✓ | — |
| 81 | 8.914 ✓ | 4.01 ✓ | 6.46 ✓ |
| 82 | 8.775 ✓ | 4.04 ✓ | 6.41 ✓ |
| 83 | 8.570 ✓ | 7.576 ✓ | 8.07 ✓ |
| 84 | 8.299 ✓ | 7.894 ✓ | 7.70 ✓ |
| 85 | 7.962 ✓ | 6.666 ✓ | 7.31 ✓ |
| 86 | 7.560 ✓ | 6.291 ✓ | 6.93 ✓ |
| 87 | 7.092 ✓ | 5.971 ✓ | 6.53 ✓ |
| 88 | 6.557 ✓ | 5.704 ✓ | 6.13 ✓ |
| 89 | 5.957 ✓ | 5.491 ✓ | 5.72 ✓ |
| 90 | 5.289 ✓ | 5.331 ✓ | 5.31 ✓ |



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PROJECT MN DOT - SPECIAL BEAM STRUCTURE RATING 13TH PNT NOTES

PROJECT # 090147 DATE 11/11/09 BY CLK SHEET NO. 4 OF 27
✓ CSM 12/23/09

BEAM #1

PIER 5-3A TO PIER 4-3A

SECTION LENGTH 73.122' ✓

13TH PNT @ 7.312'

BEAM

ANGLE

RADIUS #1 = 947.930' 2° 8' 16.50"

RADIUS #2 = 470.465' 4° 35' 51.42"

PNT

S ✓

N

S + 1/2 N USE

ANGLE #1 = 180°

90

3.667

8.969 ✓

8.15 8.167

PI

91

3.667

8.966 ✓

8.5 ✓

A° = 180° (7.312) 0.4419

92

3.667

8.928 ✓

8.08 ✓

π (947.96)

93

3.667

8.654 ✓

7.99 ✓

26° 31'

94

3.667

8.474 ✓

7.91 ✓

95

3.667

8.358 ✓

7.85

7.91 OK

REMAINING 0° 22' 12.50"

96

3.667

8.480 ✓

7.91 ✓

97

3.667

8.542 ✓

7.94 ✓

a. π (947.96) (0.3751°)

98

3.667

8.544 ✓

7.94 ✓

180

99

3.667

8.486 ✓

7.91 ✓

a. 6.124

100

3.667

8.233 ✓

7.78 ✓

REMAINING 7.312

6.124

1.188

A° = 180° (1.188) 0.1446°

π (470.46)

→ 0° 08' 42.50"

REMAINING 4° 27' 10.42"



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PROJECT MNDOT - SPECIAL BRIDGE STRUCTURE RATING - 15TH PNT ADJUST

PROJECT # 29047 DATE 11/11/09 BY CAK SHEET NO. 5 OF 27
✓ CSM 12/23/09

BEAM #1

PIER 4-3A TO PIER 3-3A

SECTION LENGTH = 64.412'
15TH PNT @ 6.441'

RADIUS = 470.46'
ANGLE = 7°50'40.31"

| PNT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 100 | 3.667 | 8.233 ✓ | 7.78 ✓ |
| 101 | 3.667 | 7.973 ✓ | 7.65 ✓ |
| 102 | 3.667 | 7.616 ✓ | 7.48 ✓ |
| 103 | 3.667 | 7.214 ✓ | 7.27 ✓ |
| 104 | 3.667 | 6.765 ✓ | 7.05 ✓ |
| 105 | 3.667 | 6.270 ✓ | 6.80 ✓ |
| 106 | 3.667 | 5.729 ✓ | 6.53 ✓ |
| 107 | 3.667 | 5.143 ✓ | 6.24 ✓ |
| 108 | 3.667 | 4.542 ✓ | 5.94 ✓ |
| 109 | 3.667 | 3.958 ✓ | 5.35 ✓ |
| 110 | 3.667 | 3.214 ✓ | 5.27 ✓ |

PIER 3-3A TO PIER 2-3A

SECTION LENGTH = 64.177'
15TH PNT @ 6.418'

RADIUS =
ANGLE = 7°43'57.31"

| PNT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 110 | 3.667 | 9.212 ✓ | 5.27 ✓ |
| 111 | 3.667 | 9.107 ✓ | 5.22 ✓ |
| 112 | 3.667 | 9.036 ✓ | 5.19 ✓ |
| 113 | 3.667 | 9.00 ✓ | 5.167 ✓ |
| 114 | 3.667 | 9.00 ✓ | 5.167 ✓ |
| 115 | 3.667 | 9.00 ✓ | " ✓ |
| 116 | 3.667 | 9.00 ✓ | " ✓ |
| 117 | 3.667 | 9.00 ✓ | " ✓ |
| 118 | 3.667 | 9.00 ✓ | " ✓ |
| 119 | 3.667 | 9.00 ✓ | " ✓ |
| 120 | 3.667 | 9.00 ✓ | " ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE SPECIAL RATINGS - 1/25TH PNT LOCUS

PROJECT # 09047 DATE 11/11/09 BY CDK SHEET NO. 6 OF 27
✓ 15m 12/23/09

BEAM #3 PIER 6-3A TO PIER 5-3A BEAM ANGLE
SECTION LENGTH: 81.254' ✓ RAD#1: 956.93" 4°52' 2.74"
1/25TH PNT @ 8.124'

| PNT | S | N | Avg |
|-----|---------|---------|--------|
| 20 | 9.0 ✓ | 8.99 ✓ | 9.0 ✓ |
| 21 | 9.0 ✓ | 8.924 ✓ | 8.96 ✓ |
| 22 | 8.997 ✓ | 8.790 ✓ | 8.89 ✓ |
| 23 | 8.993 ✓ | 8.589 ✓ | 8.79 ✓ |
| 24 | 8.990 ✓ | 8.321 ✓ | 8.66 ✓ |
| 25 | 8.986 ✓ | 7.987 ✓ | 8.49 ✓ |
| 26 | 8.983 ✓ | 7.586 ✓ | 8.28 ✓ |
| 27 | 8.979 ✓ | 7.118 ✓ | 8.05 ✓ |
| 28 | 8.976 ✓ | 6.584 ✓ | 7.78 ✓ |
| 29 | 8.972 ✓ | 5.984 ✓ | 7.48 ✓ |
| 30 | 8.969 ✓ | 5.317 ✓ | 7.14 ✓ |

BEAM #3 PIER 5-3A TO PIER 4-3A BEAM ANGLE
SECTION LENGTH: 73.839' ✓ RAD#1: 73.839"
1/25TH PNT @ 7.384'

| PNT | S | N | Avg |
|-----|-------------|---------|--------|
| 30 | 8.969 ✓ | 5.316 ✓ | 7.14 ✓ |
| 31 | 8.965 ✓ | 4.856 ✓ | 6.91 ✓ |
| 32 | 8.809 ✓ | 4.269 ✓ | 6.54 ✓ |
| 33 | 8.663 014 ✓ | 3.660 ✓ | 6.16 ✓ |
| 34 | 8.459 ✓ | 3.038 ✓ | 5.75 ✓ |
| 35 | 8.379 ✓ | 2.314 ✓ | 5.35 ✓ |
| 36 | 8.492 ✓ | 1.447 ✓ | 4.97 ✓ |
| 37 | 8.546 ✓ | 0.658 ✓ | 4.60 ✓ |
| 38 | 8.541 ✓ | 0.079 ✓ | 4.31 ✓ |
| 39 | 8.478 ✓ | 0.408 ✓ | 4.44 ✓ |
| 40 | 8.207 ✓ | 0.095 ✓ | 4.15 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATING - 1/25TH PNT ALYPS
PROJECT # 090147 DATE 11/10/09 BY LOK SHEET NO. 7 OF 27
16TH 12/23/09

BEAM #3 PIER 4-3A TO END PNT 50

SECTION LENGTH = 48.632' ✓ [48.8125']

RAD: 315.15'

1/25TH PNT @ 4.863'

ANGLE: 8° 50' 24.35"

| PNT | S | N | AVE |
|-----|---------|---------|--------|
| 40 | 8.214 ✓ | 4.091 ✓ | 6.15 ✓ |
| 41 | 8.033 ✓ | 3.914 ✓ | 5.97 ✓ |
| 42 | 7.784 ✓ | 3.828 ✓ | 5.81 ✓ |
| 43 | 7.506 ✓ | 3.740 ✓ | 5.65 ✓ |
| 44 | 7.204 ✓ | 3.80 ✓ | 5.50 ✓ |
| 45 | 6.893 ✓ | 3.555 ✓ | 5.37 ✓ |
| 46 | 6.519 ✓ | 3.957 ✓ | 5.24 ✓ |
| 47 | 6.132 ✓ | 4.126 ✓ | 5.12 ✓ |
| 48 | 5.732 ✓ | 4.301 ✓ | 5.02 ✓ |
| 49 | 5.30 ✓ | 4.542 ✓ | 4.92 ✓ |
| 50 | 4.842 ✓ | 4.831 ✓ | 4.84 ✓ |



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PROJECT MIN DOT - SPECIAL BRIDGE STRUCTURE RATINGS - 1/2" PNT NOTES
PROJECT # 0910147 DATE 11/11/09 BY LDK SHEET NO. 8 OF 27
VCJM 12/23/09

BEAM #5 PIER S-24 TO PIER S-3E

SECTION LENGTH = 46.229
1/2" PNT @ 4.623

RADIUS 325.310' ✓
ANGLE = 8° 8' 31.65"

| PNT | S | N | S + 1/2 N |
|-----|---------|---------|-----------|
| 0 | 0.744 ✓ | 7.093 ✓ | 4.29 ✓ |
| 1 | 0.939 ✓ | 6.974 ✓ | 4.43 ✓ |
| 2 | 1.201 ✓ | 6.865 ✓ | 4.63 ✓ |
| 3 | 1.529 ✓ | 6.775 ✓ | 4.92 ✓ |
| 4 | 1.924 ✓ | 6.702 ✓ | 5.28 ✓ |
| 5 | 2.386 ✓ | 6.646 ✓ | 5.71 ✓ |
| 6 | 2.916 ✓ | 6.602 ✓ | 6.22 ✓ |
| 7 | 3.514 ✓ | 6.577 ✓ | 6.80 ✓ |
| 8 | 4.181 ✓ | 6.568 ✓ | 7.47 ✓ |
| 9 | 3.873 ✓ | 6.574 ✓ | 7.18 ✓ |
| 10 | 3.667 ✓ | 6.597 ✓ | 6.97 ✓ |

BEAM #5 PIER S-3E TO PIER 4-3E

SECTION LENGTH = 57.946' ✓
1/2" PNT @ 5.795'

RADIUS = 325.310
ANGLE = 10° 12' 20.86" ✓

| PNT | S ✓ | N | S + 1/2 N |
|-----|-------|------------------------|-------------------------|
| 10 | 3.667 | 6.598 ✓ | 6.97 ✓ |
| 11 | 3.667 | 6.649 ✓ | 7.00 ✓ |
| 12 | ' | 6.726 ✓ | 7.03 ✓ |
| 13 | | 6.827 ✓ | 7.08 ✓ |
| 14 | | 6.955 ^{6.955} | 7.14 ^{7.14} OK |
| 15 | | 7.107 ✓ | 7.22 ✓ |
| 16 | | 7.284 ^{7.284} | 7.31 ^{7.31} OK |
| 17 | | 7.487 ✓ | 7.41 ✓ |
| 18 | | 7.714 ✓ | 7.52 ✓ |
| 19 | | 7.966 ✓ | 7.65 ✓ |
| 20 | | 8.242 ✓ | 7.79 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATINGS - 1/8TH PUT NOTES
PROJECT # 090147 DATE 11/11/09 BY CAK SHEET NO. 9 OF 27
✓ LJM 12/23/09

BEAM #5 PIER 4-3E TO PIER 3-3E

SECTION LENGTH = 53.035'
1/8TH PUT @ 5.30'

RAD - 325.310'
ANGLE: 9° 20' 27.29"

| PUT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 20 | 3.667 | 8.242 ✓ | 7.788 ✓ |
| 21 | 3.667 | 8.517 ✓ | 7.93 ✓ |
| 22 | " | 8.82 ✓ | 8.09 ✓ |
| 23 | " | 4.29 ✓ | 5.82 ✓ |
| 24 | " | 4.172 ✓ | 5.75 ✓ |
| 25 | " | 4.102 ✓ | 5.72 ✓ |
| 26 | " | 4.077 ✓ | 5.71 ✓ |
| 27 | " | 4.096 ✓ | 5.72 ✓ |
| 28 | " | 4.159 ✓ | 5.75 ✓ |
| 29 | " | 4.269 ✓ | 5.80 ✓ |
| 30 | ✓ | 4.418 ✓ | 5.876 ✓ |

BEAM #5 PIER 3-3E TO PIER 2-3E

SECTION LENGTH = 71.844'
1/8TH PUT @ 7.184

RADIUS = 325.310'
ANGLE = 12° 39' 12.87"

| PUT | S | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 30 | 3.667 | 4.418 ✓ | 5.88 ✓ |
| 31 | 3.667 | 4.688 ✓ | 6.01 ✓ |
| 32 | " | 5.048 ✓ | 6.19 ✓ |
| 33 | " | 5.423 ✓ | 6.41 ✓ |
| 34 | " | 6.00 ✓ | 6.67 ✓ |
| 35 | " | 6.594 ✓ | 6.96 ✓ |
| 36 | " | 7.267 ✓ | 7.30 ✓ |
| 37 | " | 8.09 ✓ | 7.68 ✓ |
| 38 | " | 8.848 ✓ | 8.09 ✓ |
| 39 | " | 4.819 ✓ | 6.08 ✓ |
| 40 | ✓ | 5.249 ✓ | 6.29 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATING - 1/2 TH PUT 12/9/85

PROJECT # 09047 DATE 11/11/09 BY CDK SHEET NO. 10 OF 27
VCJm 12/28/09

BRAM #5 PIER 2-32 TO PIER 1-32

SECTION LENGTH = 69.850' ✓
1/2 TH PUT ④ 6.935'

RAD = 325.31'
ANGLE = 12°18' 8.93"

| PUT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 40 | 3.667 | 5.249 ✓ | 6.29 ✓ |
| 41 | " | 5.577 ✓ | 6.46 ✓ |
| 42 | " | 5.907 ✓ | 6.62 ✓ |
| 43 | " | 6.207 ✓ | 6.77 ✓ |
| 44 | " | 6.495 ✓ | 6.91 ✓ |
| 45 | " | 6.720 ✓ | 7.03 ✓ |
| 46 | " | 6.932 ✓ | 7.13 ✓ |
| 47 | " | 7.115 ✓ | 7.22 ✓ |
| 48 | " | 7.269 ✓ | 7.30 ✓ |
| 49 | " | 7.393 ✓ | 7.36 ✓ |
| 50 | " | 7.488 ✓ | 7.41 ✓ |

BRAM #5 PIER 1-32 TO PIER 3-32

SECTION LENGTH = 71.0' ✓
1/2 TH PUT ④ 7.10'

RAD 0°0'0"

| PUT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 50 | 3.667 | 7.438 ✓ | 7.41 ✓ |
| 51 | " | 7.572 ✓ | 7.45 ✓ |
| 52 | " | 7.651 ✓ | 7.49 ✓ |
| 53 | " | 7.730 ✓ | 7.53 ✓ |
| 54 | " | 7.809 ✓ | 7.57 ✓ |
| 55 | " | 7.887 ✓ | 7.61 ✓ |
| 56 | " | 7.966 ✓ | 7.65 ✓ |
| 57 | " | 8.045 ✓ | 7.69 ✓ |
| 58 | " | 8.124 ✓ | 7.73 ✓ |
| 59 | " | 8.202 ✓ | 7.77 ✓ |
| 60 | " | 8.281 ✓ | 7.81 ✓ |



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PROJECT MND DOT - SPECIAL BRIDGE STRUCTURE RATING - 1/2" PNT WORKS
PROJECT # 09047 DATE 11/11/09 BY CAK SHEET NO. 11.A. OF 27
1/2" PNT 12/28/09

BEAM #5 PIER 3-3L TO PIER 2-3L

SECTION LENGTH = 81.0
1/2" PNT @ 8.10

RAD = 0°0'0"

| PNT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 60 | 3.667 | 8.281 ✓ | 7.81 ✓ |
| 61 | " | 8.370 ✓ | 7.85 ✓ |
| 62 | " | 8.461 ✓ | 7.90 ✓ |
| 63 | " | 8.551 ✓ | 7.94 ✓ |
| 64 | " | 8.641 ✓ | 7.99 ✓ |
| 65 | " | 8.73 ✓ | 8.03 ✓ |
| 66 | " | 8.82 ✓ | 8.08 ✓ |
| 67 | " | 8.91 ✓ | 8.12 ✓ |
| 68 | " | 9.00 ✓ | 8.17 ✓ |
| 69 | " | 9.0 ✓ | 8.17 ✓ |
| 70 | " | 9.0 ✓ | 8.17 ✓ |

BEAM #5 PIER 1-3L TO PIER 7-3A

SECTION LENGTH = 73.672 ✓
1/2" PNT @ 7.367'

RAD = 1425.390' ✓
ANGLE = 2°57'40.72"

| PNT | S | N ✓ | S + 1/2 N |
|-----|---------------|--------|-----------|
| 80 | 3.667 ✓ | 9.0 | 8.167 ✓ |
| 81 | " | 9.0 | " |
| 82 | " | " | " |
| 83 | " | " | " |
| 84 | " | " | " |
| 85 | " | " | " |
| 86 | " | " | " |
| 87 | " | " | 8.167 ✓ |
| 88 | 3.667 ✓ | 9.00 ✓ | 8.167 ✓ |
| 89 | 9.335 (1/2) ✓ | 8.994 | 9.16 ✓ |
| 90 | 8.694 (1/2) ✓ | 8.902 | 8.80 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATINGS 1/27TH POST NOTES

PROJECT # 04047 DATE 11/12/09 BY CDK SHEET NO. 11.3 OF 27
VCIM 12/28/09

BEAM #5 PIER 7-3A TO PIER 6-3A

SECTION LENGTH = 8.775

RAD = 0

1/27TH POST ① 8.178

| POST | S | N | AVE |
|------|--------------------------|--------------------------|---------------------------|
| 90 | 8.682 ✓ | 8.903 ✓ | 8.79 ✓ use 8.80 ✓ |
| 91 | 8.012 ✓ | 8.756 ✓ | 8.38 ✓ |
| 92 | 7.389 ✓ | 8.564 ✓ | 7.98 ✓ |
| 93 | 6.812 ✓ | 8.324 ✓ | 7.57 ✓ |
| 94 | 6.283 ^{6.283} ✓ | 8.038 ^{8.038} ✓ | 7.167 ^{7.167} ok |
| 95 | 5.799 ✓ | 7.705 ✓ | 6.75 ✓ |
| 96 | 5.363 ✓ | 7.325 ^{7.325} ✓ | 6.34 ^{6.34} ok |
| 97 | 4.973 ✓ | 6.879 ✓ | 5.94 ✓ |
| 98 | 4.629 ✓ | 6.426 ✓ | 5.53 ✓ |
| 99 | 4.332 ✓ | 5.906 ✓ | 5.12 ✓ |
| 100 | 4.103 ✓ | 5.339 ✓ | 4.72 ✓ |

4.72
use 4.72

BEAM #5 PIER 6-3A TO END

SECTION LENGTH = 16.412 ✓

RAD = 0

1/27TH POST ② 1.641

| POST | S | N | AVE |
|------|----------------|----------------|----------------|
| 100 | 4.103 ✓ | 5.339 ✓ | 4.72 ✓ |
| 101 | 4.073 ✓ | 5.219 ✓ | 4.65 ✓ |
| 102 | 4.048 ✓ | 5.098 ✓ | 4.57 ✓ |
| 103 | 4.028 ✓ | 4.974 ✓ | 4.50 ✓ |
| 104 | 4.014 ✓ | 4.849 ✓ | 4.43 ✓ |
| 105 | 4.006 ✓ | 4.722 ✓ | 4.36 ✓ |
| 106 | 4.003 ✓ | 4.593 ✓ | 4.30 ✓ |
| 107 | 4.005 ✓ | 4.463 ✓ | 4.23 ✓ |
| 108 | 4.013 ✓ | 4.332 ✓ | 4.17 ✓ |
| 109 | 4.026 ✓ | 4.195 ✓ | 4.11 ✓ |
| 110 | 4.045
4.045 | 4.059
4.059 | 4.05 ✓
4.05 |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATINGS - 1/27TH PNT NOTES

PROJECT # 09047 DATE 11/12/09 BY CDL SHEET NO. 12 OF 27
VCsm 12/28/09

BEAM #6 SE END TO PIER 2-3E

SECTION LENGTH = 11.865 ✓
1/2TH PNT @ 1.865 ✓

RADIUS = 397.615' ✓
ANGLE = 1°42'34.91" ✓

| PNT | S | N | AUE |
|-----|---------|---------|---------|
| 0 | 4.520 ✓ | 4.532 ✓ | 4.52' ✓ |
| 1 | 4.572 ✓ | 4.605 ✓ | 4.59 ✓ |
| 2 | 4.644 ✓ | 4.677 ✓ | 4.66 ✓ |
| 3 | 4.715 ✓ | 4.748 ✓ | 4.73 ✓ |
| 4 | 4.785 ✓ | 4.818 ✓ | 4.80 ✓ |
| 5 | 4.855 ✓ | 4.887 ✓ | 4.87 ✓ |
| 6 | 4.926 ✓ | 4.959 ✓ | 4.94 ✓ |
| 7 | 5.006 ✓ | 5.022 ✓ | 5.01 ✓ |
| 8 | 5.082 ✓ | 5.085 ✓ | 5.08 ✓ |
| 9 | 5.153 ✓ | 5.149 ✓ | 5.15 ✓ |
| 10 | 5.220 ✓ | 5.212 ✓ | 5.22 ✓ |

BEAM #6 PIER 2-3E TO PIER 1-3E

SECTION LENGTH = 69.128'
1/2 PNT @ 6.913

RADIUS = 397.615'
ANGLE = 9°57'40.44" ✓

| PNT | S | N | AUE |
|-----|---------|---------|--------|
| 10 | 5.220 ✓ | 5.212 ✓ | 5.22 ✓ |
| 11 | 5.552 ✓ | 5.580 ✓ | 5.57 ✓ |
| 12 | 5.885 ✓ | 5.911 ✓ | 5.90 ✓ |
| 13 | 6.159 ✓ | 6.212 ✓ | 6.20 ✓ |
| 14 | 6.464 ✓ | 6.483 ✓ | 6.47 ✓ |
| 15 | 6.709 ✓ | 6.725 ✓ | 6.72 ✓ |
| 16 | 6.925 ✓ | 6.938 ✓ | 6.93 ✓ |
| 17 | 7.111 ✓ | 7.121 ✓ | 7.12 ✓ |
| 18 | 7.266 ✓ | 7.274 ✓ | 7.27 ✓ |
| 19 | 7.393 ✓ | 7.398 ✓ | 7.40 ✓ |
| 20 | 7.489 ✓ | 7.492 ✓ | 7.49 ✓ |



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PROJECT MND DOT - SPECIAL BRIDGE STRUCTURE RATINGS - 1/5TH PNT NOTES

PROJECT # 090147 DATE 11/12/09 BY CAK SHEET NO. 13 OF 27
✓com 12/23/09

BEAM #6 PIER 1-3E TO PIER #3-3C

SECTION LENGTH = 71.005
1/5TH PNT @ 7.10

RADIUS = 0

| PNT | S | N | AVER |
|-----|---------|---------|--------|
| 20 | 7.489 ✓ | 7.492 ✓ | 7.49 ✓ |
| 21 | 7.573 ✓ | 7.571 ✓ | 7.57 ✓ |
| 22 | 7.652 ✓ | 7.650 ✓ | 7.65 ✓ |
| 23 | 7.730 ✓ | 7.729 ✓ | 7.73 ✓ |
| 24 | 7.809 ✓ | 7.807 ✓ | 7.81 ✓ |
| 25 | 7.888 ✓ | 7.886 ✓ | 7.89 ✓ |
| 26 | 7.967 ✓ | 7.965 ✓ | 7.97 ✓ |
| 27 | 8.045 ✓ | 8.043 ✓ | 8.04 ✓ |
| 28 | 8.124 ✓ | 8.122 ✓ | 8.12 ✓ |
| 29 | 8.203 ✓ | 8.201 ✓ | 8.20 ✓ |
| 30 | 8.282 ✓ | 8.280 ✓ | 8.29 ✓ |

BEAM #6 PIER #3-3C TO PIER 2-3C

SECTION LENGTH = 81.003
1/5TH PNT @ 8.10

RADIUS = 0

| PNT | S | N | AVER |
|-----|---------|---------|--------|
| 30 | 8.282 ✓ | 8.280 ✓ | 8.28 ✓ |
| 31 | 8.372 ✓ | 8.370 ✓ | 8.37 ✓ |
| 32 | 8.461 ✓ | 8.459 ✓ | 8.46 ✓ |
| 33 | 8.551 ✓ | 8.459 ✓ | 8.51 ✓ |
| 34 | 8.641 ✓ | 8.639 ✓ | 8.64 ✓ |
| 35 | 8.731 ✓ | 8.729 ✓ | 8.73 ✓ |
| 36 | 8.821 ✓ | 8.819 ✓ | 8.82 ✓ |
| 37 | 8.911 ✓ | 8.908 ✓ | 8.91 ✓ |
| 38 | 9.00 ✓ | 8.998 ✓ | 9.0 ✓ |
| 39 | 9.00 ✓ | 9.00 ✓ | 9.0 ✓ |
| 40 | 9.00 ✓ | 9.00 ✓ | 9.0 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATINGS 15TH PNT NOTES

PROJECT # 090147 DATE 11/12/09 BY CAK SHEET NO. 14 OF 27
105M 12/23/09

BRAM #6 PIER 1-3A TO PIER 7-3A

SECTION LENGTH = 74.136 ✓
1ST PNT @ 7.41

RADIUS: 1434.390' ✓
ANGLE: 2°57'40.72"

| PNT | S | N ✓ | AUG |
|-----|---------|------|--------|
| 50 | 9.0 | 9.0 | 9.0 ✓ |
| 51 | " | " | 9.0 ✓ |
| 52 | " | " | 9.0 ✓ |
| 53 | " | " | 9.0 ✓ |
| 54 | " | " | 9.0 ✓ |
| 55 | " | " | 9.0 ✓ |
| 56 | " | " | 9.0 ✓ |
| 57 | " | " | 9.0 ✓ |
| 58 | " | " | 9.0 ✓ |
| 59 | 8.994 ✓ | 9.00 | 9.0 ✓ |
| 60 | 8.902 ✓ | 9.00 | 8.95 ✓ |

BRAM #6 PIER 7-3A TO PIER 6-3A

SECTION LENGTH = 82.115
1ST PNT @ 8.211

RADIUS = 1434.394' ✓
ANGLE = 3°16'48.09" ✓

| PNT | S | N ✓ | AUG |
|-----|---------|------|-----------|
| 60 | 8.902 ✓ | 9.00 | 8.951 ✓ |
| 61 | 8.755 ✓ | 9.00 | 8.88 ✓ |
| 62 | 8.561 ✓ | 9.00 | 8.78 8.78 |
| 63 | 8.321 ✓ | 9.00 | 8.60 ✓ |
| 64 | 8.034 ✓ | 9.00 | 8.52 ✓ |
| 65 | 7.702 ✓ | 9.00 | 8.35 ✓ |
| 66 | 7.319 ✓ | 9.00 | 8.16 ✓ |
| 67 | 6.891 ✓ | 9.00 | 7.95 ✓ |
| 68 | 6.416 ✓ | 9.00 | 7.71 ✓ |
| 69 | 5.894 ✓ | 9.00 | 7.45 ✓ |
| 70 | 5.325 ✓ | 9.00 | 7.16 ✓ |



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PROJECT MNDOT - SPECIAL BRIDGE STRUCTURE RATING - TYPICAL

PROJECT # 090147 DATE 11/12/09 BY LDK SHEET NO. 15.1 OF 27

VCM 12/28/09

BEAM #6 PIER 6.3A TO PIER 5.3A

SECTION LENGTH: 82.175
1/3TH PNT @ 8.218

RADIUS = 1434.394'
ANGLE = 5°44'17.17"

| PNT | S | N | Avg |
|-----|---------|-------|--------|
| 70 | 5.32 ✓ | 9.0 ✓ | 7.16 ✓ |
| 71 | 4.71 ✓ | 9.0 ✓ | 6.86 ✓ |
| 72 | 8.10 ✓ | 9.0 ✓ | 8.55 ✓ |
| 73 | 7.558 ✓ | 9.0 ✓ | 8.28 ✓ |
| 74 | 7.080 ✓ | 9.0 ✓ | 8.04 ✓ |
| 75 | 6.654 ✓ | 9.0 ✓ | 7.83 ✓ |
| 76 | 6.285 ✓ | 9.0 ✓ | 7.64 ✓ |
| 77 | 5.966 ✓ | 9.0 ✓ | 7.48 ✓ |
| 78 | 5.701 ✓ | 9.0 ✓ | 7.35 ✓ |
| 79 | 5.489 ✓ | 9.0 ✓ | 7.24 ✓ |
| 80 | 5.330 ✓ | 9.0 ✓ | 7.17 ✓ |

BEAM #6 PIER 5.3A TO PIER 4.3A

SECTION LENGTH = 66.180
1/3TH PNT @ 6.618

RADIUS = 820.51
ANGLE = 5°10'47.78"

| PNT | S | N | Avg |
|-----|----------|---------|--------|
| 80 | 10.628 ✓ | 9.0 ✓ | 9.81 ✓ |
| 81 | 9.856 ✓ | 9.012 ✓ | 9.43 ✓ |
| 82 | 9.242 ✓ | 9.011 ✓ | 9.13 ✓ |
| 83 | 8.634 ✓ | 9.010 ✓ | 8.82 ✓ |
| 84 | 8.016 ✓ | 9.008 ✓ | 8.51 ✓ |
| 85 | 7.298 ✓ | 9.007 ✓ | 8.15 ✓ |
| 86 | 6.413 ✓ | 9.006 ✓ | 7.71 ✓ |
| 87 | 5.434 ✓ | 9.004 ✓ | 7.32 ✓ |
| 88 | 4.463 ✓ | 9.003 ✓ | 6.98 ✓ |
| 89 | 4.398 ✓ | 9.002 ✓ | 6.70 ✓ |
| 90 | 4.087 ✓ | 9.002 ✓ | 6.54 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURE RATINGS - 1/2 TH PWT WONES

PROJECT # 09047 DATE 11/10/09 BY CLM SHEET NO. 15.2 OF 27
VCm 12/28/09

BRAM #6 PIER 4-3A TO PIER 3-3A

SECTION LENGTH = 65.159 ✓
1/2 TH PWT @ 6.52

RADIUS = 820.510 ✓
ANGLE:

| PWT | S | N | AVER |
|-----|---------|---------|--------|
| 90 | 4.089 ✓ | 9.002 ✓ | 6.55 ✓ |
| 91 | 3.878 ✓ | 9.002 ✓ | 6.44 ✓ |
| 92 | 3.798 ✓ | 9.002 ✓ | 6.40 ✓ |
| 93 | 3.800 ✓ | 9.002 ✓ | 6.40 ✓ |
| 94 | 3.883 ✓ | 9.002 ✓ | 6.44 ✓ |
| 95 | 4.049 ✓ | 9.002 ✓ | 6.53 ✓ |
| 96 | 4.297 ✓ | 9.003 ✓ | 6.65 ✓ |
| 97 | 4.627 ✓ | 9.003 ✓ | 6.82 ✓ |
| 98 | 4.538 ✓ | 9.003 ✓ | 9.27 ✓ |
| 99 | 9.358 ✓ | 9.003 ✓ | 9.18 ✓ |
| 100 | 9.212 ✓ | 9.003 ✓ | 9.11 ✓ |

BRAM #6 PIER 3-3A TO PIER 2-3A

SECTION LENGTH = 65.231 [4.99 PWT]
1/2 TH PWT @ 6.52

RADIUS #1 820.510 ✓
RADIUS #2 479.460 ✓
ANGLE 0°56'10.14" ✓
6°13'42.60" ✓

| PWT | S | N | AVER |
|-----|---------|---------|-----------------------|
| 100 | 9.212 ✓ | 9.003 ✓ | 9.11 ✓ |
| 101 | 9.105 ✓ | 9.003 ✓ | 9.05 ₉₀₅ ✓ |
| 102 | 9.035 ✓ | 9.004 ✓ | 9.02 ✓ |
| 103 | 9.003 ✓ | 9.004 ✓ | 9.0 ✓ |
| 104 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |
| 105 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |
| 106 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |
| 107 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |
| 108 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |
| 109 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |
| 110 | 9.0 ✓ | 9.0 ✓ | 9.0 ✓ |

$$A^{\circ} = \frac{180(6.52)}{\pi(820.510)} = 0^{\circ}27'19''$$

$$\text{REMAINING} = 0^{\circ}1'32.14''$$



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PROJECT MN DOT - SPECIAL BRIDGE STRUCTURAL RATING - 15TH DIST ROUTES

PROJECT # 090147 DATE 11/10/09 BY CDL SHEET NO. 16 OF 27
1/15/12/28/09

BEAM #7 WEST RND TO PIER 3-3E

SECTION LENGTH = 40.756

1/10 TH PNT @ 4.076

RADIUS = 211.785

ANGLE = 11° 1' 34.01"

| PNT | S | N | AVE |
|-----|---------|---------|--------|
| 0 | 4.427 ✓ | 4.448 ✓ | 4.44 ✓ |
| 1 | 4.298 ✓ | 4.814 ✓ | 4.56 ✓ |
| 2 | 4.202 ✓ | 5.165 ✓ | 4.68 ✓ |
| 3 | 4.134 ✓ | 5.501 ✓ | 4.82 ✓ |
| 4 | 4.092 ✓ | 5.822 ✓ | 4.96 ✓ |
| 5 | 4.077 ✓ | 6.128 ✓ | 5.10 ✓ |
| 6 | 4.089 ✓ | 6.419 ✓ | 5.25 ✓ |
| 7 | 4.123 ✓ | 6.695 ✓ | 5.41 ✓ |
| 8 | 4.194 ✓ | 6.956 ✓ | 5.58 ✓ |
| 9 | 4.287 ✓ | 7.201 ✓ | 5.74 ✓ |
| 10 | 4.407 ✓ | 7.431 ✓ | 5.92 ✓ |

BEAM #7 PIER 3-3E TO PIER 2-3E

SECTION LENGTH = 69.653

1/12 TH PNT @ 6.965

RADIUS = 211.785

ANGLE = 18° 50' 33.14"

| PNT | S | N | AVE |
|-----|----------|---------|--------|
| 10 | 4.407 ✓ | 7.431 ✓ | 5.92 ✓ |
| 11 | 4.674 ✓ | 7.786 ✓ | 6.23 ✓ |
| 12 | 5.020 ✓ | 8.094 ✓ | 6.56 ✓ |
| 13 | 5.445 ✓ | 8.356 ✓ | 6.90 ✓ |
| 14 | 5.949 ✓ | 8.572 ✓ | 7.26 ✓ |
| 15 | 6.532 ✓ | 8.740 ✓ | 7.64 ✓ |
| 16 | 7.194 ✓ | 8.862 ✓ | 8.03 ✓ |
| 17 | 7.936 ✓ | 8.936 ✓ | 8.44 ✓ |
| 18 | 8.758 ✓ | 8.964 ✓ | 8.86 ✓ |
| 19 | 9.611 ✓ | 8.975 ✓ | 9.29 ✓ |
| 20 | 10.506 ✓ | 9.093 ✓ | 9.75 ✓ |



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PROJECT MNDOT- SPECIAL BRIDGE STRUCTURAL RATING - 1/2" PWT DECK

PROJECT # 090147 DATE 11/10/09 BY ZDK SHEET NO. 17 OF 21
✓ 5m 12/28/09

BEAM # 7 PIER 2-3E TO PIER 1-3E

SECTION LENGTH = 63.484
1/2" PWT @ 6.848

RADIUS = 520.599 ✓
ANGLE = 79°32'13.68"

| PWT | S | N | Avg |
|-----|---------|---------|--------|
| 20 | 5.198 ✓ | 9.092 ✓ | 7.15 ✓ |
| 21 | 5.568 ✓ | 9.250 ✓ | 7.41 ✓ |
| 22 | 5.901 ✓ | 4.693 ✓ | 5.30 ✓ |
| 23 | 6.204 ✓ | 4.891 ✓ | 5.55 ✓ |
| 24 | 6.477 ✓ | 5.173 ✓ | 5.83 ✓ |
| 25 | 6.721 ✓ | 5.539 ✓ | 6.13 ✓ |
| 26 | 6.935 ✓ | 5.988 ✓ | 6.46 ✓ |
| 27 | 7.120 ✓ | 6.522 ✓ | 6.82 ✓ |
| 28 | 7.274 ✓ | 7.39 ✓ | 7.21 ✓ |
| 29 | 7.399 ✓ | 7.839 ✓ | 7.62 ✓ |
| 30 | 7.493 ✓ | 8.623 ✓ | 8.06 ✓ |

BEAM # 7 PIER 1-3E TO PIER 3-3C

SECTION LENGTH = 71.018
1/2" PWT @ 7.102

RADIUS : NOT USED

| PWT | S | N | 1/2" S+N |
|-----|---------|---------|----------|
| 30 | 7.493 ✓ | 4.318 ✓ | 8.06 ✓ |
| 31 | 7.572 ✓ | 4.814 ✓ | 8.60 ✓ |
| 32 | 7.651 ✓ | 5.317 ✓ | 9.14 ✓ |
| 33 | 7.73 ✓ | 3.667 ✓ | 7.53 ✓ |
| 34 | 7.809 ✓ | 3.667 ✓ | 7.57 ✓ |
| 35 | 7.888 ✓ | 3.667 ✓ | 7.61 ✓ |
| 36 | 7.966 ✓ | 3.667 ✓ | 7.65 ✓ |
| 37 | 8.045 ✓ | 3.667 ✓ | 7.69 ✓ |
| 38 | 8.124 ✓ | 3.667 ✓ | 7.73 ✓ |
| 39 | 8.203 ✓ | 3.667 ✓ | 7.77 ✓ |
| 40 | 8.281 ✓ | 3.667 ✓ | 7.81 ✓ |



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PROJECT MNDOT - SPECIAL BRIDGE STRUCTURAL RATINGS - 1/8TH POST HOLES
PROJECT # 090147 DATE 11/10/09 BY CDK SHEET NO. 18 OF 27
✓com 12/28/09

BEAM #7 PIER 3-36 TO PIER 2-36

SECTION LENGTH = 81.015
1/8TH POST @ 8.101'

RADIUS = 0

| POST | S | N ✓ | 1/2 S + N |
|------|---------|-------|-----------|
| 40 | 8.281 ✓ | 3.667 | 7.81 ✓ |
| 41 | 8.371 ✓ | 3.667 | 7.85 ✓ |
| 42 | 8.461 ✓ | } | 7.90 ✓ |
| 43 | 8.551 ✓ | | 7.94 ✓ |
| 44 | 8.641 ✓ | | 7.99 ✓ |
| 45 | 8.730 ✓ | | 8.03 ✓ |
| 46 | 8.820 ✓ | | 8.08 ✓ |
| 47 | 8.910 ✓ | | 8.12 ✓ |
| 48 | 9.002 ✓ | | 8.17 ✓ |
| 49 | 9.00 ✓ | } | 8.17 ✓ |
| 50 | 9.00 ✓ | | 8.17 ✓ |



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PROJECT M.W. DOT. SPECIAL BRIDGE STRUCTURE RATING - 1/2 PWT 12425

PROJECT # 890147 DATE 11/14/09 BY LAK SHEET NO. 19 OF 27
VCsm 12/28/09

BEAM # B START (0) TO PIER 1-3E

SECTION LENGTH = 56.589 ✓
1/2 PWT @ 5.659 ✓

RADIUS = 245.970 ✓
ANGLE = 12° 11' 25.44"

| PWT | S | N | Ave |
|------------------|---------|---------|------------------------------|
| 0 | 4.644 ✓ | 4.773 ✓ | 4.71 ✓ |
| 1 | 4.788 ✓ | 4.899 ✓ | 4.84 ✓ |
| 2 | 4.985 ✓ | 5.027 ✓ | 5.01 ✓ |
| 3 | 5.242 ✓ | 5.156 ✓ | 5.20 ✓ |
| 4 | 5.558 ✓ | 5.287 ✓ | 5.42 ✓ |
| 5 | 5.933 ✓ | 5.419 ✓ | 5.68 ✓ |
| 6 | 6.368 ✓ | 5.552 ✓ | 5.96 ✓ |
| 7 | 6.863 ✓ | 5.686 ✓ | 6.27 ✓ |
| 8 | 7.417 ✓ | 5.821 ✓ | 6.62 ✓ |
| 9 | 8.032 ✓ | 5.957 ✓ | 7.00 ✓ |
| 10 | 4.307 ✓ | 6.093 ✓ | 4.307 + (1/2) 6.093 = 7.35 ✓ |
| 2 Full
LENGTH | | | |

BEAM # B PIER 1-3E TO PIER 6-3D

SECTION LENGTH = 63.514
1/2 PWT @ 6.351 ✓

RADIUS #1 = 265.970
ANGLE #1 = 9° 56' 16.96"

| PWT | S | N | S + 1/2 N | A° = $\frac{180(6.351)}{\pi(265.970)}$ = <u>1° 22' 05"</u> |
|-----|---------|---------|-----------|--|
| 10 | 4.307 ✓ | 6.093 ✓ | 7.35 ✓ | |
| 11 | 4.706 ✓ | 6.248 ✓ | 7.83 ✓ | |
| 12 | 5.260 ✓ | 6.404 ✓ | 8.46 ✓ | |
| 13 | 3.667 ✓ | 6.560 ✓ | 6.95 ✓ | |
| 14 | 3.667 ✓ | 6.718 ✓ | 7.03 ✓ | |
| 15 | | 6.876 ✓ | 7.11 ✓ | |
| 16 | | 7.034 ✓ | 7.18 ✓ | |
| 17 | | 7.194 ✓ | 7.26 ✓ | |
| 18 | | 7.352 ✓ | 7.34 ✓ | |
| 19 | | 7.511 ✓ | 7.42 ✓ | |
| 20 | | 7.669 ✓ | 7.50 ✓ | |



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PROJECT MN DOT - SPRUCE BRIDGE STRUCTURE RATING TO TRUCK DESIGNS

PROJECT # 090147 DATE 11/14/09 BY LDK SHEET NO. 20 OF 27
VCIM 12128109

BEAM # 8 PIER 6-30 TO PIER 5-30

SECTION LENGTH = 71.017

RAD = 0°0'0" ✓

15TH PNT @ 71.02 ✓

| PNT | S ✓ | N | S + 1/2 N |
|-----|-------|---------|-----------|
| 20 | 3.667 | 7.669 ✓ | 7.50 ✓ |
| 21 | | 7.847 ✓ | 7.59 ✓ |
| 22 | | 8.025 ✓ | 7.68 ✓ |
| 23 | | 8.243 ✓ | 7.77 ✓ |
| 24 | | 8.380 ✓ | 7.86 ✓ |
| 25 | | 8.558 ✓ | 7.95 ✓ |
| 26 | | 8.736 ✓ | 8.04 ✓ |
| 27 | | 8.914 ✓ | 8.12 ✓ |
| 28 | | 9.00 ✓ | 8.167 ✓ |
| 29 | | 9.00 ✓ | 8.167 ✓ |
| 30 | ✓ | 9.00 ✓ | 8.167 ✓ |



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PROJECT MNDOT - SPECIAL BRIDGE RATING - 1ST PUT 100PS

PROJECT # 29017 DATE 4/14/09 BY CRK SHEET NO. 21 OF 29
✓com 12/28/09

BEAM #9 PIER 5.2# TO PIER 5.3E

SECTION LENGTH = 43.974 ✓
1ST PUT @ 4.39

RADIUS = 254.915
ANGLE = 9° 53' 1.22"

| POST | S | N | Ave |
|------|---------|---------|--------|
| 0 | 7.062 ✓ | 7.071 ✓ | 7.07 ✓ |
| 1 | 6.947 ✓ | 7.132 ✓ | 7.04 ✓ |
| 2 | 6.847 ✓ | 7.192 ✓ | 7.02 ✓ |
| 3 | 6.762 ✓ | 7.251 ✓ | 7.01 ✓ |
| 4 | 6.693 ✓ | 7.309 ✓ | 7.00 ✓ |
| 5 | 6.639 ✓ | 7.366 ✓ | 7.00 ✓ |
| 6 | 6.600 ✓ | 7.421 ✓ | 7.01 ✓ |
| 7 | 6.576 ✓ | 7.476 ✓ | 7.03 ✓ |
| 8 | 6.568 ✓ | 7.532 ✓ | 7.05 ✓ |
| 9 | 6.575 ✓ | 7.583 ✓ | 7.08 ✓ |
| 10 | 6.597 ✓ | 7.634 ✓ | 7.12 ✓ |

BEAM #9 PIER 5.3E TO PIER 4.3E

SECTION LENGTH = 56.335 ✓
1ST PUT @

RADIUS = 254.915
ANGLE = 12° 39' 43.26"

| POST | S | N | Ave |
|------|---------|---------|---------|
| 10 | 6.597 ✓ | 7.635 ✓ | 7.116 ✓ |
| 11 | 6.647 ✓ | 7.699 ✓ | 7.17 ✓ |
| 12 | 6.723 ✓ | 7.762 ✓ | 7.24 ✓ |
| 13 | 6.824 ✓ | 7.823 ✓ | 7.32 ✓ |
| 14 | 6.950 ✓ | 7.882 ✓ | 7.42 ✓ |
| 15 | 7.100 ✓ | 7.939 ✓ | 7.52 ✓ |
| 16 | 7.276 ✓ | 7.994 ✓ | 7.64 ✓ |
| 17 | 7.477 ✓ | 8.048 ✓ | 7.76 ✓ |
| 18 | 7.703 ✓ | 8.099 ✓ | 7.90 ✓ |
| 19 | 7.953 ✓ | 8.148 ✓ | 8.05 ✓ |
| 20 | 8.228 ✓ | 8.195 ✓ | 8.21 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE RATING - 15TH PNT NOTES

PROJECT # 090147 DATE 11/14/09 BY CLL SHEET NO. 22 OF 27
VLM 12/28/09

BEAM #9 PIER 4-3E TO PIER 3-3E

SECTION LENGTH = 50.948' ✓
15TH PNT @ 5.095' ✓

RADIUS = 254.915' ✓
ANGLE = 11° 27' 4.97" ✓

| PNT | S | N | AWE |
|-----|---------|---------|--------|
| 20 | 8.228 ✓ | 8.195 ✓ | 8.21 ✓ |
| 21 | 8.490 ✓ | 8.237 ✓ | 8.36 ✓ |
| 22 | 8.789 ✓ | 8.275 ✓ | 8.53 ✓ |
| 23 | 4.797 ✓ | 8.303 ✓ | 6.56 ✓ |
| 24 | 5.243 ✓ | 8.348 ✓ | 6.80 ✓ |
| 25 | 5.666 ✓ | 8.382 ✓ | 7.02 ✓ |
| 26 | 6.065 ✓ | 8.415 ✓ | 7.24 ✓ |
| 27 | 6.440 ✓ | 8.445 ✓ | 7.44 ✓ |
| 28 | 6.791 ✓ | 8.474 ✓ | 7.63 ✓ |
| 29 | 7.117 ✓ | 8.501 ✓ | 7.81 ✓ |
| 30 | 7.419 ✓ | 8.527 ✓ | 7.97 ✓ |

BEAM #9 PIER 3-3E TO PIER 2-3E

SECTION LENGTH = 67.398' ✓
15TH PNT @ 6.740' ✓

RADIUS = 257.954' ✓
ANGLE = 14° 58' 12.80" ✓

| PNT | S | N | AWE |
|-----|---------|---------|--------|
| 30 | 7.419 ✓ | 8.527 ✓ | 7.97 ✓ |
| 31 | 7.774 ✓ | 8.561 ✓ | 8.17 ✓ |
| 32 | 8.085 ✓ | 8.593 ✓ | 8.34 ✓ |
| 33 | 8.349 ✓ | 8.625 ✓ | 8.49 ✓ |
| 34 | 8.566 ✓ | 8.655 ✓ | 8.61 ✓ |
| 35 | 8.737 ✓ | 8.684 ✓ | 8.71 ✓ |
| 36 | 8.860 ✓ | 8.713 ✓ | 8.79 ✓ |
| 37 | 8.936 ✓ | 8.739 ✓ | 8.84 ✓ |
| 38 | 8.964 ✓ | 8.765 ✓ | 8.86 ✓ |
| 39 | 8.975 ✓ | 8.789 ✓ | 8.88 ✓ |
| 40 | 9.092 ✓ | 8.814 ✓ | 8.95 ✓ |



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PROJECT MN DOT. SPECIAL BRIDGE RATINGS - 1/3 TH PNT NOTES

PROJECT # 09047 DATE 11/14/09 BY CALL SHEET NO. 23 OF 27
VCm12/29/09

BEAM #9 PIER 2-3E TO PIER 1-3E

SECTION LENGTH = 67.805' ✓
1/3 TH PNT @ 6.78

RADIUS = 257.954' ✓
ANGLE = 150° 3' 38.2" ✓

| PNT | S | N | AVE |
|-----|---------|---------|--------|
| 40 | 9.091 ✓ | 8.814 ✓ | 8.95 ✓ |
| 41 | 9.249 ✓ | 8.835 ✓ | 9.04 ✓ |
| 42 | 4.821 ✓ | 8.855 ✓ | 6.84 ✓ |
| 43 | 4.977 ✓ | 8.875 ✓ | 6.93 ✓ |
| 44 | 5.134 ✓ | 8.893 ✓ | 7.01 ✓ |
| 45 | 5.293 ✓ | 8.910 ✓ | 7.10 ✓ |
| 46 | 5.455 ✓ | 8.925 ✓ | 7.19 ✓ |
| 47 | 5.618 ✓ | 8.939 ✓ | 7.28 ✓ |
| 48 | 5.783 ✓ | 8.952 ✓ | 7.37 ✓ |
| 49 | 5.949 ✓ | 8.963 ✓ | 7.46 ✓ |
| 50 | 6.117 ✓ | 8.973 ✓ | 7.55 ✓ |

BEAM #9 BEAM 1-3E TO PIER 6-3D

SECTION LENGTH = 61.309' ✓
1/3 TH PNT @ 6.131

RADIUS #1 = 257.954' ✓
ANGLE #1 = 130° 36' 42.84" ±

| PNT | S | N | AVE |
|-----|---------|---------|--------|
| 50 | 6.117 ✓ | 8.973 ✓ | 7.55 ✓ |
| 51 | 6.270 ✓ | 8.981 ✓ | 7.63 ✓ |
| 52 | 6.424 ✓ | 8.987 ✓ | 7.71 ✓ |
| 53 | 6.579 ✓ | 8.993 ✓ | 7.79 ✓ |
| 54 | 6.735 ✓ | 8.997 ✓ | 7.87 ✓ |
| 55 | 6.892 ✓ | 9.000 ✓ | 7.95 ✓ |
| 56 | 7.049 ✓ | 9.002 ✓ | 8.02 ✓ |
| 57 | 7.207 ✓ | 9.002 ✓ | 8.10 ✓ |
| 58 | 7.366 ✓ | 9.000 ✓ | 8.18 ✓ |
| 59 | 7.514 ✓ | 9.000 ✓ | 8.26 ✓ |
| 60 | 7.667 ✓ | 9.000 ✓ | 8.33 ✓ |



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PROJECT MN DOT- SPECIAL BRIDGE RATING 1/27th PNT NOTES
PROJECT # 090147 DATE 11/14/09 BY CLK SHEET NO. 24 OF 27
VERMIL/29/09

BRAM # 9 BRAM 6.30 TO P.102 5.30

SECTIONS LENGTH = 71.00 ✓

RADIUS = 0' ✓

10th PNT @ 7.10'

| <u>PNT</u> | <u>S</u> | <u>N ✓</u> | <u>AWE</u> |
|------------|----------|------------|------------|
| 60 | 7.667 ✓ | 9.00 ✓ | 8.33 ✓ |
| 61 | 7.845 ✓ | } | 8.42 ✓ |
| 62 | 8.025 ✓ | | 8.51 ✓ |
| 63 | 8.200 ✓ | | 8.60 ✓ |
| 64 | 8.378 ✓ | | 8.69 ✓ |
| 65 | 8.556 ✓ | 9.00 ✓ | 8.78 ✓ |
| 66 | 8.733 ✓ | } | 8.87 ✓ |
| 67 | 8.911 ✓ | | 8.96 ✓ |
| 68 | 9.00 ✓ | | 9.00 ✓ |
| 69 | 9.00 ✓ | | 9.00 ✓ |
| 70 | 9.00 ✓ | 9.00 ✓ | 9.00 ✓ |



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PROJECT IND DOT - SPECIAL BRIDGE RATING TO PNT NOTES

PROJECT # 090147 DATE 11/14/09 BY CLK SHEET NO. 25 OF 27

1/5/12/29/09

BEAM #10 PIER 5.24 TO PIER 5.32

SECTION LENGTH = 41.601

10TH PNT @ 41.6

RADIUS = 251.00'

ANGLE = 9°29'46.38"

| PNT | S | N ✓ | 1/2 S + N |
|-----|---------|-------|-----------|
| 0 | 7.086 ✓ | 3.667 | 7.21 ✓ |
| 1 | 7.145 ✓ | " | 7.24 ✓ |
| 2 | 7.203 ✓ | " | 7.27 ✓ |
| 3 | 7.261 ✓ | " | 7.30 ✓ |
| 4 | 7.317 ✓ | " | 7.33 ✓ |
| 5 | 7.372 ✓ | " | 7.35 ✓ |
| 6 | 7.427 ✓ | " | 7.38 ✓ |
| 7 | 7.480 ✓ | " | 7.41 ✓ |
| 8 | 7.532 ✓ | " | 7.43 ✓ |
| 9 | 7.584 ✓ | " | 7.46 ✓ |
| 10 | 7.634 ✓ | 1 | 7.48 ✓ |

BEAM #10 PIER 5.32 TO PIER 4.32

SECTION LENGTH = 54.607'

10TH PNT @ 5.461'

RADIUS = 251.00'

ANGLE = 12°27'54.71"

| PNT | S | N ✓ | 1/2 S + N |
|-----|---------|-------|-----------|
| 10 | 7.634 ✓ | 3.667 | 7.48 ✓ |
| 11 | 7.699 ✓ | " | 7.52 ✓ |
| 12 | 7.761 ✓ | " | 7.55 ✓ |
| 13 | 7.822 ✓ | " | 7.58 ✓ |
| 14 | 7.881 ✓ | " | 7.61 ✓ |
| 15 | 7.939 ✓ | " | 7.64 ✓ |
| 16 | 7.994 ✓ | " | 7.66 ✓ |
| 17 | 8.047 ✓ | " | 7.69 ✓ |
| 18 | 8.095 ✓ | " | 7.72 ✓ |
| 19 | 8.145 ✓ | " | 7.74 ✓ |
| 20 | 8.195 ✓ | 1 | 7.76 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE RATING - 10TH PNT NOTES

PROJECT # 090147 DATE 11/14/09 BY LOL SHEET NO. 26 OF 27
vcfm 12/29/09

BEAM #10 PIER 4.3E TO PIER 3.3E

SECTION LENGTH = 49.342

10TH PNT @ 4.93

RADIUS = 251.00

ANGLE: 11° 15' 15.27"

| PNT | S | N | 1/2 S+N |
|-----|---------|-------|---------|
| 20 | 8.195 ✓ | 3.667 | 7.76 ✓ |
| 21 | 8.236 ✓ | | 7.79 ✓ |
| 22 | 8.275 ✓ | | 7.80 ✓ |
| 23 | 8.312 ✓ | | 7.82 ✓ |
| 24 | 8.348 ✓ | | 7.84 ✓ |
| 25 | 8.382 ✓ | | 7.86 ✓ |
| 26 | 8.415 ✓ | | 7.87 ✓ |
| 27 | 8.445 ✓ | | 7.89 ✓ |
| 28 | 8.474 ✓ | | 7.90 ✓ |
| 29 | 8.501 ✓ | | 7.92 ✓ |
| 30 | 8.527 ✓ | | 7.93 ✓ |

BEAM #10 PIER 3.3E TO PIER 2.3E

SECTION LENGTH = 65.144

10TH PNT @ 6.514

RADIUS = 251.00

ANGLE: 14° 52' 14.14"

| PNT | S | N | 1/2 S+N |
|-----|---------|-------|---------|
| 30 | 8.527 ✓ | 3.667 | 7.93 ✓ |
| 31 | 8.561 ✓ | | 7.95 ✓ |
| 32 | 8.593 ✓ | | 7.96 ✓ |
| 33 | 8.625 ✓ | | 7.98 ✓ |
| 34 | 8.655 ✓ | | 8.00 ✓ |
| 35 | 8.684 ✓ | | 8.01 ✓ |
| 36 | 8.712 ✓ | | 8.02 ✓ |
| 37 | 8.739 ✓ | | 8.04 ✓ |
| 38 | 8.765 ✓ | | 8.05 ✓ |
| 39 | 8.789 ✓ | | 8.06 ✓ |
| 40 | 8.814 ✓ | | 8.07 ✓ |



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PROJECT MN DOT - SPECIAL BRIDGE RATING TEST PNT NOTES

PROJECT # 090147

DATE 11/14/09

BY EL

SHEET NO. 27 OF 27

10/29/09

BEAM #12 PIER 2-3E TO PIER 1-3E

SECTION LENGTH = 67.042

10TH PNT @ 6.704

RADIUS = 251.00

ANGLE = 15° 18' 13.72"

| PNT | S | N | $\frac{1}{2} S + N$ |
|-----|---------|-------|---------------------|
| 40 | 8.814 ✓ | 3.667 | 8.07 ✓ |
| 41 | 8.835 ✓ | " | 8.08 ✓ |
| 42 | 8.856 ✓ | " | 8.10 ✓ |
| 43 | 8.876 ✓ | " | 8.11 ✓ |
| 44 | 8.894 ✓ | " | 8.11 ✓ |
| 45 | 8.912 ✓ | " | 8.12 ✓ |
| 46 | 8.927 ✓ | " | 8.13 ✓ |
| 47 | 8.941 ✓ | " | 8.14 ✓ |
| 48 | 8.954 ✓ | " | 8.14 ✓ |
| 49 | 8.966 ✓ | " | 8.15 ✓ |
| 50 | 8.975 ✓ | " | 8.15 ✓ |

BEAM #10 PIER 1-3E TO PIER 6-3E

SECTION LENGTH = 58.230

10TH PNT @

RADIUS = 251.00

ANGLE = 13° 17' 18.63"

| PNT | S | N | $\frac{1}{2} S + N$ |
|-----|---------|-------|---------------------|
| 50 | 8.975 ✓ | 3.667 | 8.15 ✓ |
| 51 | 8.983 ✓ | " | 8.16 ✓ |
| 52 | 8.989 ✓ | " | 8.16 ✓ |
| 53 | 8.994 ✓ | " | 8.16 ✓ |
| 54 | 8.997 ✓ | " | 8.167 ✓ |
| 55 | 9.00 ✓ | " | 8.167 ✓ |
| 56 | " ✓ | " | " |
| 57 | " ✓ | " | " |
| 58 | " ✓ | " | " |
| 59 | " ✓ | " | " |
| 60 | 9.00 ✓ | " | " |



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/19/09

BY CSM

SHEET NO. 1

OF 27

JEAN 11/21/10

Bracing Group Characteristics

Bracing Groups

1 - C 15 x 33.9 ✓

2 - MC 18 x 42.7 ✓

3 - C 12 x 20.7 ✓

4 - W 24 x 68 ✓

5 - W 21 x 55 - J ✓

6 - W 14 x 61 ✓

7 - W 36 x 135 ✓

8 - 42" x 7 1/16" R - 12" x 5/8" T + B Flange ✓ (to end of Girder 5) ✓ - See Risa Section for properties ✓

9 - 20 Steel cap piers, see Risa Sect for properties ✓

21 - W 21 x 55 - H (top flange embedded to simulate shear studs on top flange) ✓

22 - 42" x 7 1/16" R - 12" x 5/8" T + B Flange (at start of Girder 3) ✓

Group 8 - 42" x 7 1/16" w 12" x 5/8" T + B Flange

$$I_{xx} = 9514.95 \text{ in}^4 \checkmark$$

$$J = 3.07 \text{ in}^4 \checkmark$$

$$W_t = (33.375 \text{ in}^2) \cdot \left(\frac{1 \text{ ft}^2}{144 \text{ in}^2} \right) (490 \text{ pcf}) (4.05') = 460 \text{ lbs} \checkmark$$

→ Approx Diaphragm length

Group 9 - SP1a - Pier 6-3A

$$I_{xx} = 224400 \text{ in}^4 \checkmark$$

$$J = 92.610 \text{ in}^4 \checkmark$$

$$W_t = (195 \text{ in}^2) \left(\frac{1 \text{ ft}^2}{144 \text{ in}^2} \right) (490 \text{ pcf}) (9'-0") = 5975 \text{ lbs} \checkmark$$

Group 10 - SP-1b - Pier 6-3A

$$I_{xx} = 224400 \text{ in}^4 \checkmark$$

$$J = 92.610 \text{ in}^4 \checkmark$$

$$W_t = (195 \text{ in}^2) \left(\frac{1 \text{ ft}^2}{144 \text{ in}^2} \right) (490 \text{ pcf}) \left[\frac{1}{2} (5'-4" + 4'-1 \frac{1}{2}") \right] = 3140 \text{ lbs} \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/19/09

BY CJM
✓CDK 1/21/10

SHEET NO. 2 OF 27

Bracing Group Characteristics - cont.

Group 11 - SP-2a - Pier S-3A - See AutoCAD DWG

$$I_{xx} = 31960 \text{ in}^4 \checkmark$$

$$J = 13.594 \text{ in}^4 \checkmark$$

$$W_t = (96.69 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (9'-0") = 2965 \text{ lbs} \checkmark$$

Group 12 - SP-2b - Pier S-3A - See AutoCAD DWG

$$I_{xx} = 92480 \text{ in}^4 \checkmark$$

$$J = 49.77 \text{ in}^4 \checkmark$$

$$W_t = (142.06 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (5'-3\frac{7}{8}") = 2573 \text{ lbs} \checkmark$$

Group 13 SP-2c - Pier S-3A - See AutoCAD DWG

$$I_{xx} = 29380 \text{ in}^4 \checkmark$$

$$J = 13.458 \text{ in}^4 \checkmark$$

$$W_t = (95.063 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (9'-0\frac{3}{4}") = 2935 \text{ lbs} \checkmark$$

Group 14 SP-3a - Pier 4-3A - See AutoCAD DWG

$$I_{xx} = 18690 \text{ in}^4 \checkmark$$

$$J = 11.237 \text{ in}^4 \checkmark$$

$$W_t = (79.453 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (9'-0") = 2435 \text{ lbs} \checkmark$$

Group - 15 SP-3b - Pier 4-3A - See AutoCAD DWG

$$I_{xx} = 70420 \text{ in}^4 \checkmark$$

$$J = 395.92 \text{ in}^4 \checkmark$$

$$W_t = (238.88 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (4'-1\frac{3}{16}") = 3335 \text{ lbs} \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 11/19/09

BY CJM

SHEET NO. 3

OF 27

✓ CDK 1/21/10

Bracing Group Characteristics - cont...

Group 16 - SP-3c - Pier 4-3A - Sec Auto CAD Data

$$I_{xx} = 16660 \text{ in}^4 \checkmark$$

$$J = 11.173 \text{ in}^4 \checkmark$$

$$W_t = (78.094 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (8' - 2 \frac{7}{8}") = 2190 \text{ lbs} \checkmark$$

Group 17 - SP4a - Pier 2-3E

$$I_{xx} = 97950 \text{ in}^4 \checkmark$$

$$J = 48.22 \text{ in}^4 \checkmark$$

$$W_t = (135 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (9' - 0") = 4135 \text{ lbs} \checkmark$$

Group 18 - SP-4b - Pier 2-3E

$$I_{xx} = 97950 \text{ in}^4 \checkmark$$

$$J = 48.22 \text{ in}^4 \checkmark$$

$$W_t = (135 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (\frac{1}{2} (5' - 2 \frac{1}{16}" + 5' - 2 \frac{3}{4}")) = 2400 \text{ lbs} \checkmark$$

Group 19 - SP5a - Pier 2-3B

$$I_{xx} = 102400 \text{ in}^4 \checkmark$$

$$J = 11.973 \text{ in}^4 \checkmark$$

$$W_t = (115 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (17' - 11") = 7015 \text{ lbs} \checkmark$$

Group 20 - SP5b - Pier 3-3b

$$I_{xx} = 107000 \text{ in}^4 \checkmark$$

$$J = 12.098 \text{ in}^4 \checkmark$$

$$W_t = (116.52 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (17' - 11") = 7105 \text{ lbs} \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/21/10 BY CJM SHEET NO. 4 OF 27
✓CDK 1/21/10

Bracing Group Characteristics - cont...

Group 22 - 42" x 7/16" web + 12" x 5/8" T + B Flange

$$I_x = 9514.95 \text{ in}^4$$

$$I_y = 3.07 \text{ in}^4$$

$$W_t = (33.375 \text{ in}^2) (1 \text{ ft}^2 / 144 \text{ in}^2) (490 \text{ pcf}) (9'-0") = 1025 \text{ lbs}$$

- Properties for Bracing on Hammerhead steel piers are taken at 1/3 the distance between girders on the smaller side of the pier. Smaller area/wt will not affect loads since loads go straight to bearings.

Company : LHB
Designer : CJM
Job Number: 090147.00

Jan 18, 2010
15:20 PM
Checked By: _____

Project Information

Project: Mn/DOT Special Structures Rating
Remarks: Section Properties for bracing - BR69801

Company : LHB
 Designer : CJM
 Job Number: 090147.00

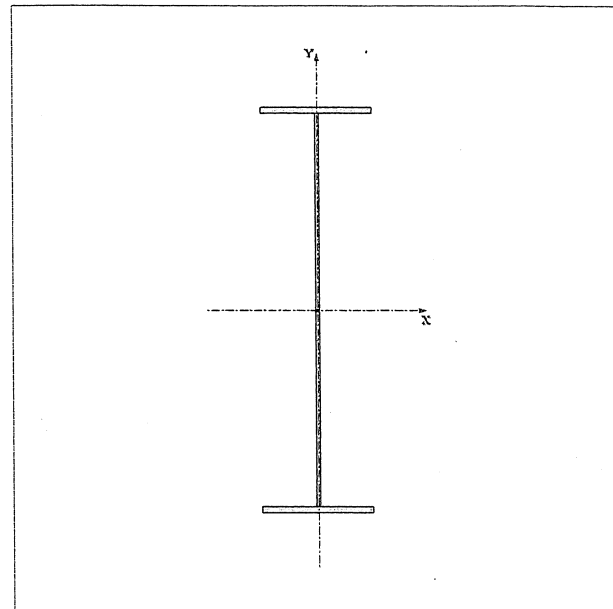
Jan 21, 2010
 09:28 AM
 Checked By: EDK
1/25/10

Section Properties: Diaphragm "L" - GRP8 + 22

| | | | |
|------------------|---|----------|----|
| Number of Shapes | = | 3 | |
| Total Width | = | 12.000 ✓ | in |
| Total Height | = | 43.250 ✓ | in |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 6.000 ✓ | in |
| X-bar(Left) | = | 6.000 ✓ | in |
| Y-bar(Top) | = | 21.625 | in |
| Y-bar(Bot) | = | 21.625 | in |

Equivalent Properties:

| | | | |
|---------------------|---|-----------|------|
| Area, Ax | = | 33.375 ✓ | in^2 |
| Inertia, Ixx | = | 9514.95 ✓ | in^4 |
| Inertia, Iyy | = | 180.29 | in^4 |
| Inertia, Ixy | = | 0.000 | in^4 |
| Modulus, Sx(Top) | = | 440.00 | in^3 |
| Modulus, Sx(Bot) | = | 440.00 | in^3 |
| Modulus, Sy(Left) | = | 30.049 | in^3 |
| Modulus, Sy(Right) | = | 30.049 | in^3 |
| Radius, rx | = | 16.885 | in |
| Radius, ry | = | 2.324 | in |
| Plastic Modulus, Zx | = | 512.63 | in^3 |
| Plastic Modulus, Zy | = | 47.010 | in^3 |
| Torsional, J | = | 3.070 | in^4 |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

Jan 21, 2010

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1/25/10

1x22
Basic Properties of Shapes in Section: Diaphragm "L" - GRP8 (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 |
|-------------|-----------|-----------|-----------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 |
| Width (in) | 0.438 ✓ | 12.000 ✓ | 12.000 ✓ |
| Height (in) | 42.000 ✓ | 0.625 ✓ | 0.625 ✓ |
| Xo (in) | 0.000 | 0.000 | 0.000 |
| Yo (in) | 0.000 | 21.313 ✓ | -21.313 ✓ |
| Ax (in^2) | 18.375 ✓ | 7.500 ✓ | 7.500 ✓ |
| Ixx (in^4) | 2701.13 ✓ | 0.244 | 0.244 |
| Iyy (in^4) | 0.293 | 90.000 | 90.000 |

Additional Properties of Shapes in Section: Diaphragm "L" - GRP8 (Local Axis, for n=1)

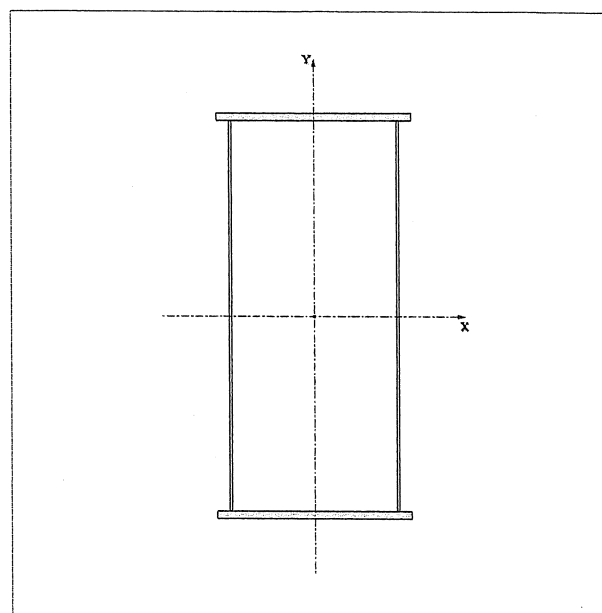
| | | | |
|-----------------|------------|------------|------------|
| Sx-Top (in^3) | 128.63 | 0.781 | 0.781 |
| Sy-Right (in^3) | 1.340 | 15.000 | 15.000 |
| rx (in) | 12.124 | 0.180 | 0.180 |
| ry (in) | 0.126 | 3.464 | 3.464 |
| Zx (in^3) | 192.94 | 1.172 | 1.172 |
| Zy (in^3) | 2.010 | 22.500 | 22.500 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 |

Section Properties: Pier 6-3a - SP-1

| | | | |
|------------------|---|----------|----|
| Number of Shapes | = | 4 ✓ | |
| Total Width | = | 39.000 ✓ | in |
| Total Height | = | 81.000 ✓ | in |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 19.500 ✓ | in |
| X-bar(Left) | = | 19.500 ✓ | in |
| Y-bar(Top) | = | 40.500 ✓ | in |
| Y-bar(Bot) | = | 40.500 ✓ | in |

Equivalent Properties:

| | | | |
|---------------------|---|------------|------|
| Area, Ax | = | 195.00 ✓ | in^2 |
| Inertia, Ixx | = | 2.244E+005 | in^4 |
| Inertia, Iyy | = | 3.672E+004 | in^4 |
| Inertia, Ixy | = | 0.000 | in^4 |
| Modulus, Sx(Top) | = | 5541.61 | in^3 |
| Modulus, Sx(Bot) | = | 5541.61 | in^3 |
| Modulus, Sy(Left) | = | 1882.83 | in^3 |
| Modulus, Sy(Right) | = | 1882.83 | in^3 |
| Radius, rx | = | 33.926 | in |
| Radius, ry | = | 13.722 | in |
| Plastic Modulus, Zx | = | 6171.75 | in^3 |
| Plastic Modulus, Zy | = | 2447.25 | in^3 |
| Torsional, J | = | 92.610 | in^4 |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

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Basic Properties of Shapes in Section: Pier 6-3a - SP-1 (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|------------|------------|-----------|-----------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 0.500 ✓ | 0.500 ✓ | 39.000 ✓ | 39.000 ✓ |
| Height (in) | 78.000 ✓ | 78.000 ✓ | 1.500 ✓ | 1.500 ✓ |
| Xo (in) | 16.750 ✓ | -16.750 ✓ | 0.000 | 0.000 |
| Yo (in) | 0.000 | 0.000 | 39.750 ✓ | -39.750 ✓ |
| Ax (in^2) | 39.000 ✓ | 39.000 ✓ | 58.500 ✓ | 58.500 ✓ |
| Ixx (in^4) | 1.977E+004 | 1.977E+004 | 10.969 | 10.969 |
| Iyy (in^4) | 0.813 | 0.813 | 7414.88 | 7414.88 |

Additional Properties of Shapes in Section: Pier 6-3a - SP-1 (Local Axis, for n=1)

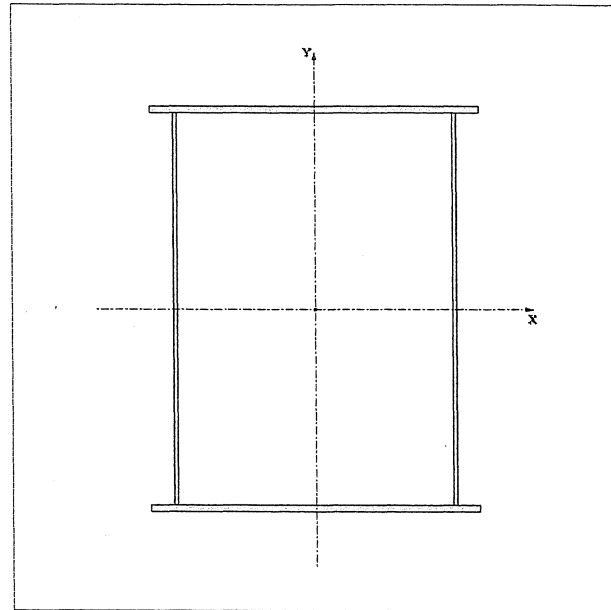
| | | | | |
|-----------------|------------|------------|------------|------------|
| Sx-Top (in^3) | 507.00 | 507.00 | 14.625 | 14.625 |
| Sy-Right (in^3) | 3.250 | 3.250 | 380.25 | 380.25 |
| rx (in) | 22.517 | 22.517 | 0.433 | 0.433 |
| ry (in) | 0.144 | 0.144 | 11.258 | 11.258 |
| Zx (in^3) | 760.50 | 760.50 | 21.938 | 21.938 |
| Zy (in^3) | 4.875 | 4.875 | 570.38 | 570.38 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |

Section Properties: Pier 5-3A - SP-2a

| | | | |
|------------------|---|---------------------|----------------------------|
| Number of Shapes | = | 4 | |
| Total Width | = | 36.000 ✓ | in |
| Total Height | = | 44.188 <u>125</u> ✓ | in ✓ $\Delta = \pm 1/16$ ✓ |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 18.000 ✓ | in |
| X-bar(Left) | = | 18.000 ✓ | in |
| Y-bar(Top) | = | 22.094 | in |
| Y-bar(Bot) | = | 22.094 | in |

Equivalent Properties:

| | | | |
|---------------------|---|------------|------|
| Area, Ax | = | 96.688 ✓ | in^2 |
| Inertia, Ixx | = | 3.196E+004 | in^4 |
| Inertia, Iyy | = | 1.576E+004 | in^4 |
| Inertia, Ixy | = | 0.000 | in^4 |
| Modulus, Sx(Top) | = | 1446.43 | in^3 |
| Modulus, Sx(Bot) | = | 1446.43 | in^3 |
| Modulus, Sy(Left) | = | 875.58 | in^3 |
| Modulus, Sy(Right) | = | 875.58 | in^3 |
| Radius, rx | = | 18.180 | in |
| Radius, ry | = | 12.767 | in |
| Plastic Modulus, Zx | = | 1628.37 | in^3 |
| Plastic Modulus, Zy | = | 1136.99 | in^3 |
| Torsional, J | = | 13.594 | in^4 |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

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Basic Properties of Shapes in Section: Pier 5-3A - SP-2a (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-------------------|--------------------|-------------------|--------------------------------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 36.000 ✓ | 36.000 ✓ | 0.500 ✓ | 0.500 ✓ |
| Height (in) | 0.750 ✓ | 0.750 ✓ | 42.688 ✓
0.625 | 42.688 ✓
0.625 A: ± 1/16 in |
| Xo (in) | 0.000 ✓ | 0.000 ✓ | 15.250 ✓ | -15.250 ✓ |
| Yo (in) | 21.719 ✓
0.625 | -21.719 ✓
0.625 | 0.000 | 0.000 A: ± 1/16 in |
| Ax (in^2) | 27.000 ✓ | 27.000 ✓ | 21.344 ✓ | 21.344 ✓ |
| Ixx (in^4) | 1.266 | 1.266 | 3241.20 | 3241.20 |
| Iyy (in^4) | 2916.00 | 2916.00 | 0.445 | 0.445 |

Additional Properties of Shapes in Section: Pier 5-3A - SP-2a (Local Axis, for n=1)

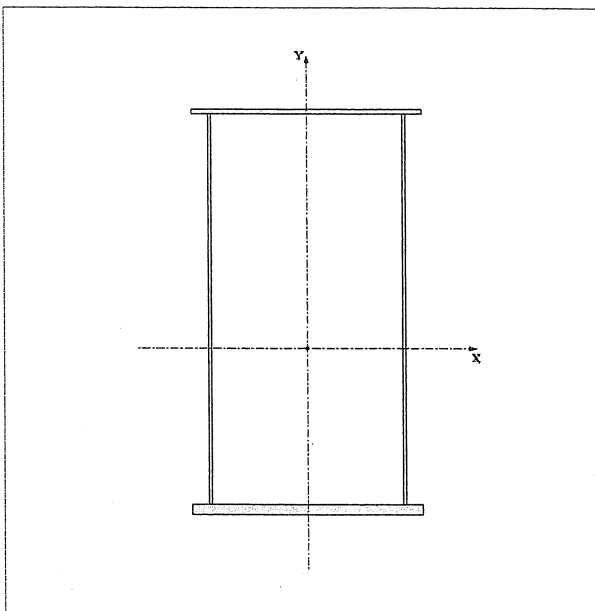
| | | | | |
|-----------------|------------|------------|------------|------------|
| Sx-Top (in^3) | 3.375 | 3.375 | 151.86 | 151.86 |
| Sy-Right (in^3) | 162.00 | 162.00 | 1.779 | 1.779 |
| rx (in) | 0.217 | 0.217 | 12.323 | 12.323 |
| ry (in) | 10.392 | 10.392 | 0.144 | 0.144 |
| Zx (in^3) | 5.063 | 5.063 | 227.78 | 227.78 |
| Zy (in^3) | 243.00 | 243.00 | 2.668 | 2.668 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |

Section Properties: Pier 5-3A - SP-2b

| | | | |
|------------------|---|----------|----|
| Number of Shapes | = | 4 | |
| Total Width | = | 36.000 ✓ | in |
| Total Height | = | 63.316 ✓ | in |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 18.000 ✓ | in |
| X-bar(Left) | = | 18.000 ✓ | in |
| Y-bar(Top) | = | 37.301 ✓ | in |
| Y-bar(Bot) | = | 26.015 ✓ | in |

Equivalent Properties:

| | | | |
|---------------------|---|------------|------|
| Area, Ax | = | 142.06 ✓ | in^2 |
| Inertia, Ixx | = | 9.248E+004 | in^4 |
| Inertia, Iyy | = | 2.295E+004 | in^4 |
| Inertia, Ixy | = | 0.000 | in^4 |
| Modulus, Sx(Top) | = | 2479.30 | in^3 |
| Modulus, Sx(Bot) | = | 3554.82 | in^3 |
| Modulus, Sy(Left) | = | 1275.01 | in^3 |
| Modulus, Sy(Right) | = | 1275.01 | in^3 |
| Radius, rx | = | 25.514 | in |
| Radius, ry | = | 12.710 | in |
| Plastic Modulus, Zx | = | 3273.77 | in^3 |
| Plastic Modulus, Zy | = | 1660.21 | in^3 |
| Torsional, J | = | 49.769 | in^4 |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

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Checked By: *6.11/17/20/10*

Basic Properties of Shapes in Section: Pier 5-3A - SP-2b (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-----------|-----------|-----------|-----------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 ✓ | 1.000 ✓ | 1.000 ✓ | 1.000 ✓ |
| Width (in) | 36.000 ✓ | 36.000 ✓ | 0.500 ✓ | 0.500 ✓ |
| Height (in) | 0.750 | 1.500 | 61.063 ✓ | 61.063 ✓ |
| Xo (in) | 0.000 | 0.000 | 15.250 ✓ | -15.250 |
| Yo (in) | 36.926 ✓ | -25.265 ✓ | 6.016 ✓ | 6.016 ✓ |
| Ax (in^2) | 27.000 ✓ | 54.000 ✓ | 30.531 ✓ | 30.531 ✓ |
| Ixx (in^4) | 1.266 | 10.125 | 9486.88 | 9486.88 |
| Iyy (in^4) | 2916.00 | 5832.00 | 0.636 | 0.636 |

Additional Properties of Shapes in Section: Pier 5-3A - SP-2b (Local Axis, for n=1)

| | | | | |
|-----------------|--------|--------|--------|--------|
| Sx-Top (in^3) | 3.375 | 13.500 | 310.72 | 310.72 |
| Sy-Right (in^3) | 162.00 | 324.00 | 2.544 | 2.544 |
| rx (in) | 0.217 | 0.433 | 17.627 | 17.627 |
| ry (in) | 10.392 | 10.392 | 0.144 | 0.144 |
| Zx (in^3) | 5.063 | 20.250 | 466.09 | 466.09 |
| Zy (in^3) | 243.00 | 486.00 | 3.816 | 3.816 |
| J (in^4) | 5.024 | 39.665 | 2.541 | 2.541 |

Company : LHB
 Designer : CJM
 Job Number: 090147.00

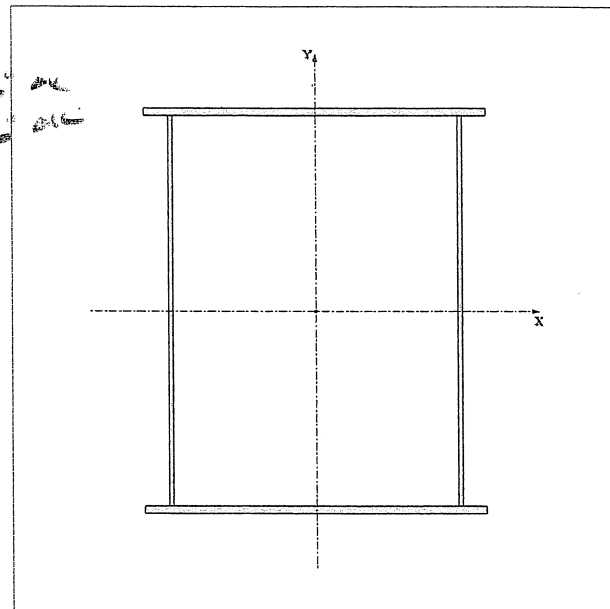
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1/25/10

Section Properties: Pier 5-3A - SP-2c

| | | | |
|------------------|---|----------|-----------------------|
| Number of Shapes | = | 4 | |
| Total Width | = | 36.000 ✓ | in |
| Total Height | = | 42.570 ✓ | in $\Delta \pm 1/16"$ |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 18.000 ✓ | in |
| X-bar(Left) | = | 18.000 ✓ | in |
| Y-bar(Top) | = | 21.285 ✓ | in $\Delta \pm 1/16"$ |
| Y-bar(Bot) | = | 21.285 ✓ | in $\Delta \pm 1/16"$ |

Equivalent Properties:

| | | | |
|---------------------|---|------------|-----------------|
| Area, Ax | = | 95.063 ✓ | in ² |
| Inertia, Ixx | = | 2.938E+004 | in ⁴ |
| Inertia, Iyy | = | 1.538E+004 | in ⁴ |
| Inertia, Ixy | = | 0.000 | in ⁴ |
| Modulus, Sx(Top) | = | 1380.45 | in ³ |
| Modulus, Sx(Bot) | = | 1380.45 | in ³ |
| Modulus, Sy(Left) | = | 854.59 | in ³ |
| Modulus, Sy(Right) | = | 854.59 | in ³ |
| Radius, rx | = | 17.581 | in |
| Radius, ry | = | 12.721 | in |
| Plastic Modulus, Zx | = | 1550.83 | in ³ |
| Plastic Modulus, Zy | = | 1112.21 | in ³ |
| Torsional, J | = | 13.458 | in ⁴ |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

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Basic Properties of Shapes in Section: Pier 5-3A - SP-2c (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-------------------------------|--------------------------------|-----------|-------------------------------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 ✓ | 1.000 ✓ | 1.000 ✓ | 1.000 ✓ |
| Width (in) | 36.000 ✓ | 36.000 ✓ | 0.500 ✓ | 0.500 ✓ |
| Height (in) | 0.750 | 0.750 | 41.063 ✓ | 41.063 $\Delta = \pm 1/16"$ ✓ |
| Xo (in) | 0.000 | 0.000 | 15.250 ✓ | -15.250 ✓ |
| Yo (in) | 20.910 $\Delta = \pm 1/16"$ ✓ | -20.910 $\Delta = \pm 1/16"$ ✓ | 0.000 | 0.000 $\Delta = \pm 1/16"$ ✓ |
| Ax (in^2) | 27.000 ✓ | 27.000 ✓ | 20.531 ✓ | 20.531 ✓ |
| Ixx (in^4) | 1.266 | 1.266 | 2884.97 | 2884.97 |
| Iyy (in^4) | 2916.00 | 2916.00 | 0.428 | 0.428 |

Additional Properties of Shapes in Section: Pier 5-3A - SP-2c (Local Axis, for n=1)

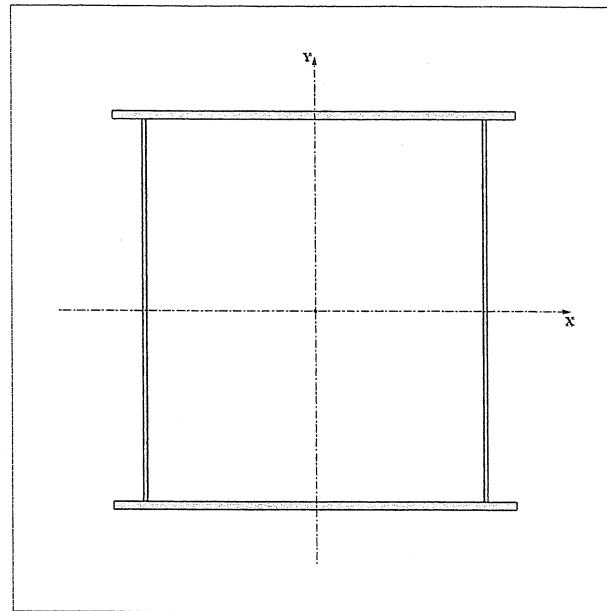
| | | | | |
|-----------------|--------|--------|--------|--------|
| Sx-Top (in^3) | 3.375 | 3.375 | 140.51 | 140.51 |
| Sy-Right (in^3) | 162.00 | 162.00 | 1.711 | 1.711 |
| rx (in) | 0.217 | 0.217 | 11.854 | 11.854 |
| ry (in) | 10.392 | 10.392 | 0.144 | 0.144 |
| Zx (in^3) | 5.063 | 5.063 | 210.77 | 210.77 |
| Zy (in^3) | 243.00 | 243.00 | 2.566 | 2.566 |
| J (in^4) | 5.024 | 5.024 | 1.706 | 1.706 |

Section Properties: Pier 4-3A - SP-3a

| | | | |
|------------------|---|-------------|-------------------------------|
| Number of Shapes | = | 4 | |
| Total Width | = | 36.000 | in |
| Total Height | = | 35(438).375 | in $A = \pm 1/16" \checkmark$ |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 18.000 | in $\checkmark$ |
| X-bar(Left) | = | 18.000 | in $\checkmark$ |
| Y-bar(Top) | = | 17.719 | in $\checkmark$ |
| Y-bar(Bot) | = | 17.719 | in $\checkmark$ |

Equivalent Properties:

| | | | |
|---------------------|---|------------|------------------------------|
| Area, Ax | = | 79.453 | in ² $\checkmark$ |
| Inertia, Ixx | = | 1.869E+004 | in ⁴ |
| Inertia, Iyy | = | 1.170E+004 | in ⁴ |
| Inertia, Ixy | = | 0.000 | in ⁴ |
| Modulus, Sx(Top) | = | 1054.77 | in ³ |
| Modulus, Sx(Bot) | = | 1054.77 | in ³ |
| Modulus, Sy(Left) | = | 650.19 | in ³ |
| Modulus, Sy(Right) | = | 650.19 | in ³ |
| Radius, rx | = | 15.337 | in |
| Radius, ry | = | 12.137 | in |
| Plastic Modulus, Zx | = | 1152.52 | in ³ |
| Plastic Modulus, Zy | = | 872.58 | in ³ |
| Torsional, J | = | 11.237 | in ⁴ |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

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Basic Properties of Shapes in Section: Pier 4-3A - SP-3a (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|--------------------|---------------------|--------------------|--|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 36.000 ✓ | 36.000 ✓ | 0.375 | 0.375 |
| Height (in) | 0.750 ✓ | 0.750 ✓ | 33.938 <i>.575</i> | 33.938 <i>.575</i> $\Delta = \pm 1/16"$ OK |
| Xo (in) | 0.000 ✓ | 0.000 ✓ | 15.188 ✓ | -15.188 ✓ |
| Yo (in) | 17.344 <i>.313</i> | -17.344 <i>.313</i> | 0.000 | 0.000 $\Delta = \pm 1/16"$ OK |
| Ax (in^2) | 27.000 ✓ | 27.000 ✓ | 12.727 ✓ | 12.727 ✓ |
| Ixx (in^4) | 1.266 | 1.266 | 1221.54 | 1221.54 |
| Iyy (in^4) | 2916.00 | 2916.00 | 0.149 | 0.149 |

Additional Properties of Shapes in Section: Pier 4-3A - SP-3a (Local Axis, for n=1)

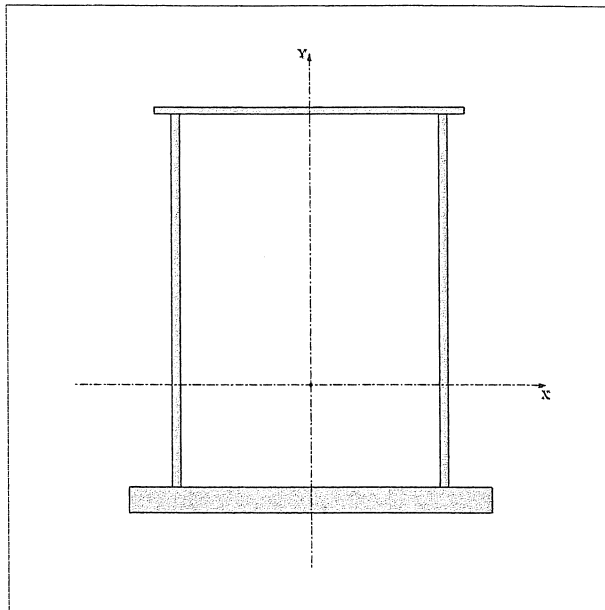
| | | | | |
|-----------------|------------|------------|------------|------------|
| Sx-Top (in^3) | 3.375 | 3.375 | 71.987 | 71.987 |
| Sy-Right (in^3) | 162.00 | 162.00 | 0.795 | 0.795 |
| rx (in) | 0.217 | 0.217 | 9.797 | 9.797 |
| ry (in) | 10.392 | 10.392 | 0.108 | 0.108 |
| Zx (in^3) | 5.063 | 5.063 | 107.98 | 107.98 |
| Zy (in^3) | 243.00 | 243.00 | 1.193 | 1.193 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |

Section Properties: Pier 4-3A - SP-3b

| | | | |
|------------------|---|--------|----|
| Number of Shapes | = | 4 | |
| Total Width | = | 42.000 | in |
| Total Height | = | 46.688 | in |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | -0.000 | in |
| X-bar(Right) | = | 21.000 | in |
| X-bar(Left) | = | 21.000 | in |
| Y-bar(Top) | = | 31.865 | in |
| Y-bar(Bot) | = | 14.822 | in |

Equivalent Properties:

| | | | |
|---------------------|---|------------|-----------------|
| Area, Ax | = | 238.88 | in ² |
| Inertia, Ixx | = | 7.042E+004 | in ⁴ |
| Inertia, Iyy | = | 4.208E+004 | in ⁴ |
| Inertia, Ixy | = | 0.075 | in ⁴ |
| Modulus, Sx(Top) | = | 2209.86 | in ³ |
| Modulus, Sx(Bot) | = | 4750.76 | in ³ |
| Modulus, Sy(Left) | = | 2003.65 | in ³ |
| Modulus, Sy(Right) | = | 2003.66 | in ³ |
| Radius, rx | = | 17.169 | in |
| Radius, ry | = | 13.272 | in |
| Plastic Modulus, Zx | = | 3201.05 | in ³ |
| Plastic Modulus, Zy | = | 2897.07 | in ³ |
| Torsional, J | = | 395.92 | in ⁴ |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

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Basic Properties of Shapes in Section: Pier 4-3A - SP-3b (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-----------|------------|-----------|-----------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 36.000 ✓ | 42.000 ✓ | 1.000 ✓ | 1.000 ✓ |
| Height (in) | 0.750 ✓ | 3.000 ✓ | 42.938 ✓ | 42.938 ✓ |
| Xo (in) | 0.000 | 0.000 | 15.500 ✓ | -15.500 ✓ |
| Yo (in) | 31.490 ✓ | -13.323 ✓ | 9.646 ✓ | 9.646 ✓ |
| Ax (in^2) | 27.000 ✓ | 126.00 ✓ | 42.938 ✓ | 42.938 ✓ |
| Ixx (in^4) | 1.266 | 94.500 | 6596.96 | 6596.73 |
| Iyy (in^4) | 2916.00 | 1.852E+004 | 3.578 | 3.578 |

Additional Properties of Shapes in Section: Pier 4-3A - SP-3b (Local Axis, for n=1)

| | | | | |
|-----------------|--------|---------|--------|--------|
| Sx-Top (in^3) | 3.375 | 63.000 | 307.28 | 307.27 |
| Sy-Right (in^3) | 162.00 | 882.00 | 7.156 | 7.156 |
| rx (in) | 0.217 | 0.866 | 12.395 | 12.395 |
| ry (in) | 10.392 | 12.124 | 0.289 | 0.289 |
| Zx (in^3) | 5.063 | 94.500 | 460.92 | 460.91 |
| Zy (in^3) | 243.00 | 1323.00 | 10.734 | 10.734 |
| J (in^4) | 5.024 | 362.54 | 14.181 | 14.181 |

Company : LHB
 Designer : CJM
 Job Number: 090147.00

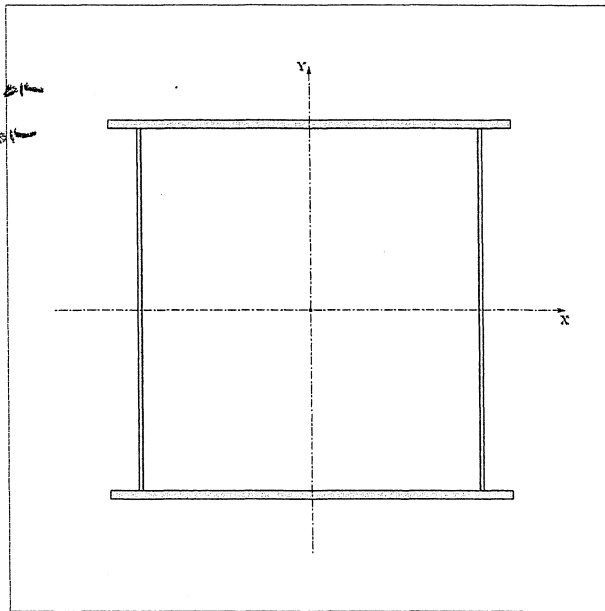
Jan 18, 2010
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 Checked By: CJM
1/20/10

Section Properties: Pier 4-3A - SP-3c

| | | | |
|------------------|---|--------------|-------------------------|
| Number of Shapes | = | 4 | |
| Total Width | = | 36.000 ✓ | in |
| Total Height | = | 33.625, 54.3 | in $\Delta = \pm 1/16"$ |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 18.000 ✓ | in |
| X-bar(Left) | = | 18.000 ✓ | in |
| Y-bar(Top) | = | 16.813, 7.81 | in $\Delta = \pm 1/16"$ |
| Y-bar(Bot) | = | 16.813, 7.81 | in $\Delta = \pm 1/16"$ |

Equivalent Properties:

| | | | |
|---------------------|---|------------|-----------------|
| Area, Ax | = | 78.094 ✓ | in ² |
| Inertia, Ixx | = | 1.666E+004 | in ⁴ |
| Inertia, Iyy | = | 1.139E+004 | in ⁴ |
| Inertia, Ixy | = | 0.000 | in ⁴ |
| Modulus, Sx(Top) | = | 991.22 | in ³ |
| Modulus, Sx(Bot) | = | 991.22 | in ³ |
| Modulus, Sy(Left) | = | 632.76 | in ³ |
| Modulus, Sy(Right) | = | 632.76 | in ³ |
| Radius, rx | = | 14.608 | in |
| Radius, ry | = | 12.077 | in |
| Plastic Modulus, Zx | = | 1081.13 | in ³ |
| Plastic Modulus, Zy | = | 851.92 | in ³ |
| Torsional, J | = | 11.173 | in ⁴ |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

Jan 18, 2010
 15:20 PM
 Checked By: *CDK*
1/20/10

Basic Properties of Shapes in Section: Pier 4-3A - SP-3c (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|---------------|----------------|---------------|--------------------------------------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 36.000 ✓ | 36.000 ✓ | 0.375 ✓ | 0.375 ✓ |
| Height (in) | 0.750 ✓ | 0.750 ✓ | 32(125).003 ✓ | 32(125).003 ✓ <i>Δ = 5 1/16" dia</i> |
| Xo (in) | 0.000 | 0.000 | 15.188 ✓ | -15.188 ✓ |
| Yo (in) | 16(438).404 ✓ | -16(438).404 ✓ | 0.000 | 0.000 <i>Δ = 3 1/16" dia</i> |
| Ax (in^2) | 27.000 ✓ | 27.000 ✓ | 12.047 ✓ | 12.047 ✓ |
| Ixx (in^4) | 1.266 | 1.266 | 1036.05 | 1036.05 |
| Iyy (in^4) | 2916.00 | 2916.00 | 0.141 | 0.141 |

Additional Properties of Shapes in Section: Pier 4-3A - SP-3c (Local Axis, for n=1)

| | | | | |
|-----------------|------------|------------|------------|------------|
| Sx-Top (in^3) | 3.375 | 3.375 | 64.501 | 64.501 |
| Sy-Right (in^3) | 162.00 | 162.00 | 0.753 | 0.753 |
| rx (in) | 0.217 | 0.217 | 9.274 | 9.274 |
| ry (in) | 10.392 | 10.392 | 0.108 | 0.108 |
| Zx (in^3) | 5.063 | 5.063 | 96.751 | 96.751 |
| Zy (in^3) | 243.00 | 243.00 | 1.129 | 1.129 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |

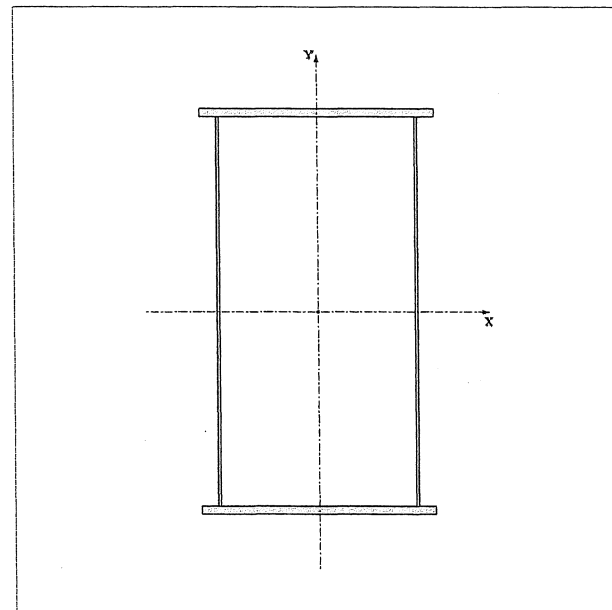
Section Properties: Pier 2-3E - SP4

| | | | |
|------------------|---|---------------------|----|
| Number of Shapes | = | 4 | |
| Total Width | = | 36.000 | in |
| Total Height | = | 62.510 <i>5.500</i> | in |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 18.000 ✓ | in |
| X-bar(Left) | = | 18.000 ✓ | in |
| Y-bar(Top) | = | 31.2550 ✓ | in |
| Y-bar(Bot) | = | 31.2550 ✓ | in |

Δ = 5 7/16" o/c

Equivalent Properties:

| | | | |
|---------------------|---|------------|------|
| Area, Ax | = | 135.00 ✓ | in^2 |
| Inertia, Ixx | = | 9.795E+004 | in^4 |
| Inertia, Iyy | = | 2.010E+004 | in^4 |
| Inertia, Ixy | = | 0.000 | in^4 |
| Modulus, Sx(Top) | = | 3133.88 | in^3 |
| Modulus, Sx(Bot) | = | 3133.88 | in^3 |
| Modulus, Sy(Left) | = | 1116.68 | in^3 |
| Modulus, Sy(Right) | = | 1116.68 | in^3 |
| Radius, rx | = | 26.936 | in |
| Radius, ry | = | 12.202 | in |
| Plastic Modulus, Zx | = | 3431.92 | in^3 |
| Plastic Modulus, Zy | = | 1493.44 | in^3 |
| Torsional, J | = | 48.220 | in^4 |



Section Diagram

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Basic Properties of Shapes in Section: Pier 2-3E - SP4 (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-----------------------|------------------------|-----------|-----------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 36.000 ✓ | 36.000 ✓ | 0.375 ✓ | 0.375 ✓ |
| Height (in) | 1.250 ✓ | 1.250 ✓ | 60.000 ✓ | 60.000 ✓ |
| Xo (in) | 0.000 | 0.000 | 15.188 ✓ | -15.188 ✓ |
| Yo (in) | 30.630 ✓ <i>1.625</i> | -30.630 ✓ <i>1.625</i> | 0.000 ✓ | 0.000 |
| Ax (in^2) | 45.000 ✓ | 45.000 ✓ | 22.500 ✓ | 22.500 ✓ |
| Ixx (in^4) | 5.859 | 5.859 | 6750.00 | 6750.00 |
| Iyy (in^4) | 4860.00 | 4860.00 | 0.264 | 0.264 |

Additional Properties of Shapes in Section: Pier 2-3E - SP4 (Local Axis, for n=1)

| | | | | |
|-----------------|------------|------------|------------|------------|
| Sx-Top (in^3) | 9.375 | 9.375 | 225.00 | 225.00 |
| Sy-Right (in^3) | 270.00 | 270.00 | 1.406 | 1.406 |
| rx (in) | 0.361 | 0.361 | 17.321 | 17.321 |
| ry (in) | 10.392 | 10.392 | 0.108 | 0.108 |
| Zx (in^3) | 14.063 | 14.063 | 337.50 | 337.50 |
| Zy (in^3) | 405.00 | 405.00 | 2.109 | 2.109 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |

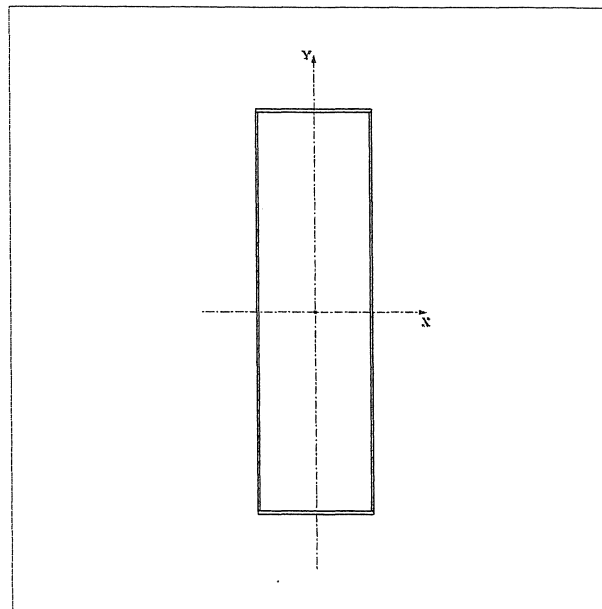
Section Properties: Pier 2-3B - SP5a

| | | | |
|------------------|---|----------|----|
| Number of Shapes | = | 4 ✓ | |
| Total Width | = | 24.000 ✓ | in |
| Total Height | = | 83.368 ✓ | in |
| Center, Xo | = | 0.000 | in |
| Center, Yo | = | 0.000 | in |
| X-bar(Right) | = | 12.000 ✓ | in |
| X-bar(Left) | = | 12.000 ✓ | in |
| Y-bar(Top) | = | 41.684 ✓ | in |
| Y-bar(Bot) | = | 41.684 ✓ | in |

A = 115.02 in^2

Equivalent Properties:

| | | | |
|---------------------|---|------------|------|
| Area, Ax | = | 115.02 ✓ | in^2 |
| Inertia, Ixx | = | 1.024E+005 | in^4 |
| Inertia, Iyy | = | 1.291E+004 | in^4 |
| Inertia, Ixy | = | 0.000 | in^4 |
| Modulus, Sx(Top) | = | 2456.26 | in^3 |
| Modulus, Sx(Bot) | = | 2456.26 | in^3 |
| Modulus, Sy(Left) | = | 1075.67 | in^3 |
| Modulus, Sy(Right) | = | 1075.67 | in^3 |
| Radius, rx | = | 29.835 | in |
| Radius, ry | = | 10.593 | in |
| Plastic Modulus, Zx | = | 3045.89 | in^3 |
| Plastic Modulus, Zy | = | 1161.65 | in^3 |
| Torsional, J | = | 11.973 | in^4 |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

Jan 18, 2010
 15:20 PM
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1/20/10

Basic Properties of Shapes in Section: Pier 2-3B - SP5a (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-----------|-----------|------------|------------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 24.000 ✓ | 24.000 ✓ | 0.500 ✓ | 0.500 ✓ |
| Height (in) | 0.688 ✓ | 0.688 ✓ | 82.000 ✓ | 82.000 ✓ |
| Xo (in) | 0.000 | 0.000 | 11.750 ✓ | -11.750 ✓ |
| Yo (in) | 41.340 ✓ | -41.340 ✓ | 0.000 | 0.000 |
| Ax (in^2) | 16.512 ✓ | 16.512 ✓ | 41.000 ✓ | 41.000 ✓ |
| Ixx (in^4) | 0.651 | 0.651 | 2.297E+004 | 2.297E+004 |
| Iyy (in^4) | 792.58 | 792.58 | 0.854 | 0.854 |

Additional Properties of Shapes in Section: Pier 2-3B - SP5a (Local Axis, for n=1)

| | | | | |
|-----------------|------------|------------|------------|------------|
| Sx-Top (in^3) | 1.893 | 1.893 | 560.33 | 560.33 |
| Sy-Right (in^3) | 66.048 | 66.048 | 3.417 | 3.417 |
| rx (in) | 0.199 | 0.199 | 23.671 | 23.671 |
| ry (in) | 6.928 | 6.928 | 0.144 | 0.144 |
| Zx (in^3) | 2.840 | 2.840 | 840.50 | 840.50 |
| Zy (in^3) | 99.072 | 99.072 | 5.125 | 5.125 |
| J (in^4) | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |

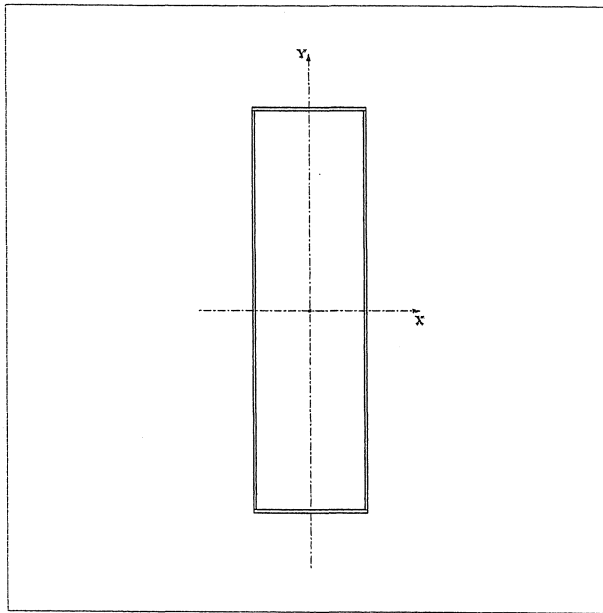
Section Properties: Pier 3-3B - SP5b

| | | | | |
|------------------|---|--------|---|----|
| Number of Shapes | = | 4 | ✓ | |
| Total Width | = | 24.000 | ✓ | in |
| Total Height | = | 84.868 | ✓ | in |
| Center, Xo | = | 0.000 | | in |
| Center, Yo | = | 0.000 | | in |
| X-bar(Right) | = | 12.000 | ✓ | in |
| X-bar(Left) | = | 12.000 | ✓ | in |
| Y-bar(Top) | = | 42.434 | ✓ | in |
| Y-bar(Bot) | = | 42.434 | ✓ | in |

$\Delta = \pm 1/16"$

Equivalent Properties:

| | | | | |
|---------------------|---|------------|---|------|
| Area, Ax | = | 116.52 | ✓ | in^2 |
| Inertia, Ixx | = | 1.070E+005 | | in^4 |
| Inertia, Iyy | = | 1.312E+004 | | in^4 |
| Inertia, Ixy | = | 0.000 | | in^4 |
| Modulus, Sx(Top) | = | 2522.06 | | in^3 |
| Modulus, Sx(Bot) | = | 2522.06 | | in^3 |
| Modulus, Sy(Left) | = | 1092.93 | | in^3 |
| Modulus, Sy(Right) | = | 1092.93 | | in^3 |
| Radius, rx | = | 30.306 | | in |
| Radius, ry | = | 10.609 | | in |
| Plastic Modulus, Zx | = | 3132.72 | | in^3 |
| Plastic Modulus, Zy | = | 1179.27 | | in^3 |
| Torsional, J | = | 12.098 | | in^4 |



Section Diagram

Company : LHB
 Designer : CJM
 Job Number: 090147.00

Jan 18, 2010
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Checked By: CDK
1/20/10

Basic Properties of Shapes in Section: Pier 3-3B - SP5b (Local Axis, for n=1)

| Sh.No. | 1 | 2 | 3 | 4 |
|-------------|-----------|-----------|------------|------------|
| Shape | XSHRSolid | XSHRSolid | XSHRSolid | XSHRSolid |
| Ratio(n) | 1.000 | 1.000 | 1.000 | 1.000 |
| Width (in) | 24.000 ✓ | 24.000 ✓ | 0.500 ✓ | 0.500 ✓ |
| Height (in) | 0.688 ✓ | 0.688 ✓ | 83.500 ✓ | 83.500 ✓ |
| Xo (in) | 0.000 | 0.000 | 11.750 ✓ | -11.750 ✓ |
| Yo (in) | 42.090 ✓ | -42.090 ✓ | 0.000 | 0.000 |
| Ax (in^2) | 16.512 ✓ | 16.512 ✓ | 41.750 ✓ | 41.750 ✓ |
| Ixx (in^4) | 0.651 | 0.651 | 2.426E+004 | 2.426E+004 |
| Iyy (in^4) | 792.58 | 792.58 | 0.870 | 0.870 |

Additional Properties of Shapes in Section: Pier 3-3B - SP5b (Local Axis, for n=1)

| | | | | |
|-----------------|--------|--------|--------|--------|
| Sx-Top (in^3) | 1.893 | 1.893 | 581.02 | 581.02 |
| Sy-Right (in^3) | 66.048 | 66.048 | 3.479 | 3.479 |
| rx (in) | 0.199 | 0.199 | 24.104 | 24.104 |
| ry (in) | 6.928 | 6.928 | 0.144 | 0.144 |
| Zx (in^3) | 2.840 | 2.840 | 871.53 | 871.53 |
| Zy (in^3) | 99.072 | 99.072 | 5.219 | 5.219 |
| J (in^4) | 2.573 | 2.573 | 3.476 | 3.476 |



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 2/3/10

BY LSM

SHEET NO. 1 OF 10

✓RAM 2/5/10

Bracing Group Capacities

| Group # | Shape | Moment Cap (K-ft) | Shear Capacity (K) |
|---------|--------------------------|-------------------|--------------------|
| 1 | C 15 x 33.9 ✓ | 126.0 (MDX) ✓ | 114.4 (MDX) ✓ |
| 2 | MC 18 x 42.7 ✓ | 184.8 (MDX) ✓ | 157.4 (MDX) ✓ |
| 3 | C 12 x 20.7 ✓ | 64.5 (MDX) ✓ | 64.76 (MDX) ✓ |
| 4 * | W 24 x 68 ✓ | — | — |
| 5 | W 21 x 55 ✓ | 330.0 (MDX) ✓ | 154.69 (MDX) ✓ |
| 6 | W 14 x 61 ✓ | 306.0 (MDX) ✓ | 98.66 (MDX) ✓ |
| 7 | W 36 x 135 ✓ | 1527.0 (MDX) ✓ | 425.58 (MDX) ✓ |
| 8 | 42" FL w/ 12x5/8" | 1320.0 (Hand) ✓ | 260.9 (Hand) ✓ |
| 9 ** | SP 1-a | 16,622.1 (Hand) ✓ | 418.6 (Hand) ✓ |
| 10 ** | SP 1-b | 16,622.1 (Hand) ✓ | 418.6 (Hand) ✓ |
| 11 ** | SP 2-a | 5326.8 (Hand) ✓ | 739.8 (Hand) |
| 12 ** | SP 2-b | 7437.9 (Hand) ✓ | 534.2 (Hand) ✓ |
| 13 ** | SP 2-c | 4140.9 (Hand) ✓ | 737.4 (Hand) ✓ |
| 14 ** | SP 3-a | 3164.4 (Hand) ✓ | 403.9 (Hand) ✓ |
| 15 ** | SP 3-b | 6629.7 (Hand) ✓ | 1793.1 (Hand) ✓ |
| 16 ** | SP 3-c | 2972.7 (Hand) ✓ | 417.6 (Hand) ✓ |
| 17 ** | SP 4-a | 9401.7 (Hand) ✓ | 229.3 (Hand) ✓ |
| 18 ** | SP 4-b | 9401.7 (Hand) ✓ | 229.3 (Hand) ✓ |
| 19 ** | SP 5-a | 7369.8 (Hand) ✓ | 397.2 (Hand) ✓ |
| 20 ** | SP 5-b | 7564.8 (Hand) ✓ | 390.5 (Hand) ✓ |
| 21 | W 21 x 55 (4mb) | 330.0 (MDX) ✓ | 154.69 (MDX) ✓ |
| 22 | 42" FL w/ 12x5/8" Flange | 1320.0 (Hand) ✓ | 260.9 (Hand) ✓ |

* Bridge system does not contain any W 24 x 60 Diaphragms

(MDX) - Capacities calculated by MDX + Used for Rating Factors.

** Capacities are approx, R. F. will not be valid, use R. F. from Full

Fracture Critical Pier Rating (Performed by JDF).

(Hand) - Capacities Hand calculated, see sheets 2-10.



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 1/25/10

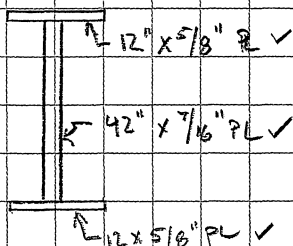
BY CTM

SHEET NO. 2 OF 10

✓RAM 2/8/10

Capacity of Bracing Groups Defined by Section Properties

Group B + 22



* For Flexure - assume Braced + non compact
(use S_x) - Conservative, IF Brace
Controls. Look into Capacity.

** Bracing groups Capacities for steel
Piers are approx, R.F. will not be
used for these Braces, R.F. will be

Section Properties: (from RisaSection) determined from pier analysis.

$$I_{xx} = 9514.95 \text{ in}^4 \checkmark$$

$$y_{top} = 21.625 \text{ in} \checkmark$$

$$y_{bot} = 21.625 \text{ in} \checkmark$$

$$(10-93) \frac{b}{t} = \frac{12/5/8}{1/16} = 19.2 \leq \frac{4110}{\sqrt{F_y}} = 21.66 \checkmark \quad (89\%)$$

$$F_y = 36 \text{ ksi} \checkmark$$

$$S_{xt} = 9514.95 / 21.625 = 440.0 \text{ in}^3$$

$$S_{xc} = 440.0 \text{ in}^3$$

$$(10-94) \frac{D}{t_w} = 96 \leq \frac{19,230}{\sqrt{36,000}} = 101.35 \checkmark \quad (94.7\%)$$

$$(10-95) \frac{D}{t_w} + 4.48 \frac{b}{t_f} < \frac{33650}{\sqrt{F_y}} \Rightarrow 185.9 > 177 \checkmark$$

$$\text{Flexural cap} = (36 \text{ ksi})(440.0 \text{ in}^3)(1 \text{ ft}/12 \text{ in}) = 1320 \text{ k-ft} \checkmark \quad \text{use Eq 10-98}$$

Shear Strength: (LFD 16.48.8)

$$V_{all} = C V_p = C (0.58 \cdot F_y \cdot D \cdot t_w) \checkmark$$

$$D/t_w = 42/0.4375 = 96 \checkmark$$

$$\frac{6000 \sqrt{K}}{\sqrt{F_y}} = \frac{6000 \sqrt{5}}{\sqrt{36000}} = 70.7 \checkmark$$

$$\frac{7500 \sqrt{K}}{\sqrt{F_y}} = \frac{7500 \sqrt{5}}{\sqrt{36000}} = 88.4 \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/25/10 BY CJM SHEET NO. 3 OF 10

✓ RAM 2/8/10

Group 8 Bracing Capacities

Shear Cap -

$$D/t_w > 7500 \sqrt{K} / \sqrt{F_y} \therefore \text{use Eq 10-117} \checkmark$$

$$C = \frac{4.5 \times 10^7 \cdot K}{\left(\frac{D}{t_w}\right)^2 F_y} = \frac{4.5 \times 10^7 \cdot 5}{\left(\frac{D}{t_w}\right)^2 36,000} = 0.68 \checkmark$$

$$V_{all} = 0.68 (1.58) (36 \text{ ksi}) (42") (1.4375") = 260.9 \text{ K} \checkmark$$

Group 9 - SP1 a - Pier 6 - RA + Group 10 - SP1 - b

$$I = 224400 \text{ in}^4 \checkmark$$

$$y_{Top} = 40.5 \text{ in} \checkmark$$

$$y_{Bot} = 40.5 \text{ in} \checkmark$$

$$S_x = 224400 / 40.5 = 5540.7 \text{ in}^3 \checkmark$$

$$S_{xc} = 5540.7 \text{ in}^3 \checkmark$$

$$Cap = 36 \text{ ksi} (5540.7 \text{ in}^3) (1^{\frac{1}{4}} / 12 \text{ in}) = 16,622.1 \text{ K-ft} \checkmark$$

Web = 2 - 78" x 1/2" plates ✓

$$D = 78" \checkmark$$

$$t_w = 1/2" \text{ (2 - 1/2" plates)} \checkmark$$

$$D/t_w = 156 > \frac{7500 \sqrt{K}}{\sqrt{F_y}} \therefore \text{use Eq 10-117 for } C \text{ (assumed unstiffened - conservative)}$$



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PROJECT # 090147 DATE 1/26/10 BY CTM SHEET NO. 4 OF 10

✓ RAM 2/8/10

Group 9^{#10} Contin

$$C = \frac{4.5 \times 10^7 \cdot K}{\left(\frac{D}{t_w}\right)^2 F_y} = \frac{4.5 \times 10^7 \cdot 5}{(78\frac{1}{2})^2 \cdot 36,000} = 0.1257 \checkmark$$

$$U_n = 0.1257 (1.58) (36 \text{ ksi}) (78") (\frac{1}{2} \cdot 2 \text{ webs}) = 418.6 \text{ K} \checkmark$$

Group 11 - SP24 - Pier 5-3a

$$I = 31,960 \text{ in}^4 \checkmark$$

$$y_{\text{Top}} = 18 \text{ in} \checkmark$$

$$y_{\text{Bot}} = 18 \text{ in} \checkmark$$

$$S_{xT} = 31,960 \text{ in}^4 / 18" = 1,775.6 \text{ in}^3 \checkmark$$

$$S_{xL} = 1,775.6 \text{ in}^3 \checkmark$$

$$C_{ap} = (36 \text{ ksi}) (1,775.6 \text{ in}^3) (\frac{1^4}{12 \text{ in}}) = 5326.8 \text{ K-ft} \checkmark$$

$$\text{Web} = 42\frac{5}{8}" \text{ b} \times \frac{1}{2}"$$

$$D = 42.6875" \quad 42.625"$$

$$t_w = \frac{1}{2}" \checkmark$$

$$D/t_w = 42.6875 / \frac{1}{2} = 85.375$$

$$\frac{6000 \sqrt{K}}{\sqrt{F_y}} \leq 85.375 \leq \frac{7500 \sqrt{K}}{\sqrt{F_y}} \checkmark \quad \therefore \text{use Eq 10-116 for } C$$

$$C = \frac{6000 \sqrt{K}}{\left(\frac{D}{t_w}\right) \sqrt{F_y}} = \frac{6000 \sqrt{5}}{\left(\frac{42.6875}{\frac{1}{2}}\right) \sqrt{36,000}} = 0.83 \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/27/10 BY CTM SHEET NO. 5 OF 10

✓ RAM 2/8/10

Bracing Group Capacities - Contin.

Group 11 - Contin.

$$V_u = 0.83(0.58)(36 \text{ ksi})(42.6875'')(\frac{1}{2}'')(2) = 739.8 \text{ K} \quad \text{✓ SAY OK}$$

Group 12 - Sp 26 - Piers - 3A

$$I = 92480 \text{ in}^4 \quad \checkmark$$

$$y_{\text{top}} = 37.301 \text{ in} \quad \checkmark$$

$$y_{\text{bot}} = 26.015 \text{ in} \quad \checkmark$$

$$S_{xT} = 92480 \text{ in}^4 / 37.301'' = 2479.3 \text{ in}^3 \quad \checkmark \quad \times \text{ use } y_{\text{top}}$$

$$S_{xc} = 92480 \text{ in}^4 / 26.015'' = 3554.9 \text{ in}^3 \quad \checkmark$$

$$\text{moment cap} = (2479.3 \text{ in}^3)(36 \text{ ksi})(1 \text{ ft} / 12 \text{ in}) = 7437.9 \text{ K-ft} \quad \checkmark$$

Shear capacity:

$$\text{web} \Rightarrow 61.116'' \times \frac{1}{2}'' \text{ web (2 webs)} \quad \checkmark$$

$$D/t_w = 61.0625'' / 0.5'' = 122.125 \quad \checkmark > \frac{7500 \sqrt{K}}{\sqrt{F_y}} \quad \therefore \text{use Eq 10-117 for } C$$

$$C = \frac{4.5 \times 10^7 \cdot K}{\left(\frac{D}{t_w}\right)^2 F_y} = \frac{4.5 \times 10^7 \cdot 5}{\left(\frac{61.0625}{\frac{1}{2}}\right)^2 \cdot 36000} = 0.419 \quad \checkmark$$

$$V_u = 0.419(0.58)(36 \text{ ksi})(61.0625'')(\frac{1}{2}'')(2) = 534.2 \text{ K} \quad \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 1/27/10

BY CJM

SHEET NO. 6 OF 10

✓RAM 2/8/10

Bracing Group Capacities - Cont...

Group 13 - Sp-Zc - Piers 5-3A

$$I = 29,380 \text{ in}^4 \checkmark$$

$$Y_{\text{top}} = 21.285 \text{ in} \checkmark \text{ say OK}$$

$$Y_{\text{bot}} = 21.285 \text{ in} \checkmark \text{ say OK}$$

$$S_{xt} = 29,380 \text{ in}^4 / 21.285 \text{ in} = 1380.3 \text{ in}^3 \checkmark$$

$$S_{xc} = 1380.3 \text{ in}^3 \checkmark$$

$$\text{moment capacity} = (1380.3 \text{ in}^3)(36 \text{ ksi})(1 \text{ ft} / 12 \text{ in}) = 4140.9 \text{ K-ft} \checkmark$$

Shear capacity:

$$\text{web} = 2 - 41 \frac{1}{16} \text{ in} \times \frac{1}{2} \text{ in} \checkmark$$

$$D/t_w = 41.0625 \text{ in} / 0.5 \text{ in} = 82.125 \checkmark$$

$$\frac{6000 \sqrt{F_y}}{\sqrt{F_y}} < \frac{D}{t_w} < \frac{7500 \sqrt{F_y}}{\sqrt{F_y}} \checkmark \therefore \text{use Eq 10-116 for } C$$

$$C = \frac{6000 \cdot \sqrt{F_y}}{\left(\frac{P}{F_y}\right) \sqrt{F_y}} = \frac{6000 \cdot \sqrt{36}}{\left(\frac{41 \frac{1}{16}}{\frac{1}{2}}\right) \sqrt{36000}} = 0.86 \checkmark$$

$$U_u = 0.86(0.58)(36 \text{ ksi})(41.0625 \text{ in})(\frac{1}{2} \text{ in})(2) = 737.35 \text{ K} \checkmark$$



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DATE 1/27/10

BY CSM

SHEET NO. 7 OF 10

✓ RAM 2/10/10

Bracing Group capacities

Group 14 - Sp3a - Pier 4-3A

$$I = 18690 \text{ in}^4 \checkmark$$

$$y_{\text{top}} = 17.719 \text{ in} \checkmark$$

$$y_{\text{bot}} = 17.719 \text{ in} \checkmark$$

$$S_{xT} = 18690 \text{ in}^4 / 17.719 \text{ in} = 1054.8 \text{ in}^3 \checkmark$$

$$S_{xc} = 1054.8 \text{ in}^3 \checkmark$$

$$\text{Capacity} = (1054.8 \text{ in}^3)(36 \text{ ksi})(1 \text{ ft}/12 \text{ in}) = 3164.4 \text{ k-ft} \checkmark$$

Shear capacity

$$\text{web} = 2 - 33 \frac{17}{16} \text{ in} \times \frac{3}{8} \text{ in}$$

$$D/t_w = 33.9375 / .375 = 90.5 \checkmark > \frac{7500 \sqrt{K}}{\sqrt{F_y}} \therefore \text{use Eq 10-117 for C}$$

$$C = \frac{4.5 \times 10^7 \text{ K}}{\left(\frac{D}{t_w}\right)^2 F_y} = \frac{4.5 \times 10^7 \cdot .5}{\left(\frac{33.9375}{.375}\right)^2 (36,000)} = 0.76 \checkmark$$

$$V_u = 0.76 \cdot (0.58)(36 \text{ ksi})(33.9375 \text{ in})\left(\frac{3}{8} \text{ in}\right)^2 = 463.9 \text{ k} \checkmark$$

say OK

Group 15 - Sp3b - Pier 4-3A

$$I = 70420 \text{ in}^4 \checkmark$$

$$y_{\text{top}} = 31.865 \text{ in} \checkmark$$

$$y_{\text{bot}} = 14.822 \text{ in} \checkmark$$

$$S_{x\text{top}} = 70420 \text{ in}^4 / 31.865 \text{ in} = 2209.9 \text{ in}^3 \checkmark \quad \# \text{ controls}$$

$$S_{x\text{bot}} = 70420 \text{ in}^4 / 14.822 \text{ in} = 4751.0 \text{ in}^3 \checkmark$$



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BY CTM

SHEET NO. 8

OF 10

✓ RAM 2/8/10

Bracing Group Capacities - cont

Group 15 - cont...

$$\text{Moment capacity} = (36 \text{ ksi})(2209.9 \text{ in}^3)(1 \text{ ft} + 12 \text{ in}) = 6629.7 \text{ K-ft}$$

Shear capacity:

$$\text{web} = 42.5/16" \times 1" - 2 \text{ webs} \checkmark$$

$$D/tw = 42.9375/1 = 42.9375 < \frac{6000 \sqrt{K}}{\sqrt{F_y}} \therefore C = 1.0 \checkmark$$

$$U_u = 1.0(0.58)(36 \text{ ksi})(42.9375 \text{ in})(1 \text{ in})^2 = 1793.1 \text{ K} \checkmark$$

Group 16 - Sp-3c - Pier 4-3A

$$I = 16660 \text{ in}^4 \checkmark$$

$$y_{\text{top}} = 16.813 \text{ in} \checkmark$$

$$y_{\text{bot}} = 16.813 \text{ in} \checkmark$$

$$S_{xT} = 16660 \text{ in}^4 / 16.813 \text{ in} = 990.9 \text{ in}^3 \checkmark$$

$$S_{xL} = 990.9 \text{ in}^3 \checkmark$$

$$\text{Moment capacity} = (990.9 \text{ in}^3)(36 \text{ ksi})(1 \text{ ft} + 12 \text{ in}) = 2972.7 \text{ K-ft}$$

Shear capacity:

$$\text{web} = 32.125/16" \times 3/8" \checkmark$$

$$D/tw = 32.125/.375 = 85.7 \Rightarrow \text{use Eq 10-11.6 for } C$$

$$C = \frac{6000 \sqrt{K}}{(32.125) \sqrt{36000}} = 0.83 \checkmark \Rightarrow U_u = 0.83(0.58)(36 \text{ ksi})(32.125 \text{ in})(.375) = 417.6 \text{ K} \checkmark$$



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PROJECT # 090147 DATE 1/27/10 BY CJM SHEET NO. 9 OF 10

✓ RAM 2/8/10

Bracing group characteristics - cont...

Group 17 + 18 - Pier 2-3E - SP4a + SP4B

$$I = 97,950 \text{ in}^4 \checkmark$$

$$y_{\text{top}} = 31.255 \text{ in} \checkmark$$

$$y_{\text{bot}} = 31.255 \text{ in} \checkmark$$

$$S_{xT} = 97,950 \text{ in}^4 / 31.255 \text{ in} = 3133.9 \text{ in}^3 \checkmark$$

$$S_{xL} = 3133.9 \text{ in}^3 \checkmark$$

$$\text{moment cap} = (3133.9 \text{ in}^3)(36 \text{ ksi})(1 \text{ ft} + 1/2 \text{ in}) = 9401.7 \text{ k-ft} \checkmark$$

Shear:

$$\text{web} = 2 - 60" \times 3/8" \checkmark$$

$$D/t_w = 60" / .375" = 160 \checkmark > \frac{7500 \text{ ksi}}{F_y} \therefore \text{use Eq 10-117 for } C$$

$$C = \frac{4.5 \times 10^{-5}}{\left(\frac{60}{.375}\right)^2 \cdot 36000} = 0.244 \checkmark$$

$$V_u = 0.244(0.52)(36 \text{ ksi})(60")(3/8")2 = 229.26 \text{ k} \checkmark$$

Group 19 - Pier 2-3B

$$I = 102400 \text{ in}^4 \checkmark$$

$$y_{\text{top}} = 41.684 \text{ in} \checkmark$$

$$y_{\text{bot}} = 41.684 \text{ in} \checkmark$$

$$S_{xT} = 102400 \text{ in}^4 / 41.684 \text{ in} = 2456.6 \text{ in}^3 \checkmark$$

$$S_{xL} = 2456.6 \text{ in}^3 \checkmark$$

$$\text{moment cap} = (2456.6 \text{ in}^3)(36 \text{ ksi})(1 \text{ ft} + 1/2 \text{ in}) = 7369.8 \text{ k-ft} \checkmark$$



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PROJECT Special Structures Rating

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✓ BAM 2/8/10

Bracing Group Capacities - cont.

Group 19 - cont

Shear:

$$\text{web} = 82" \times 1/2" - 2 \checkmark$$

$$D/t_w = 82" / 0.5" = 164 \checkmark > \frac{7500 \sqrt{K}}{\sqrt{F_y}} \therefore \text{use } \text{Eq 10-117 for } C$$

$$C = \frac{4.5 \times 10^7 \cdot 5}{(164^2) 36000} = 0.232 \checkmark$$

$$V_u = 0.232 (0.58) (82") (1/2") (2) (36 \text{ ksi}) = 397.2 \checkmark \text{ k}$$

Group 20 - Pier 3-3b

$$I = 167000 \text{ in}^4 \checkmark$$

$$Y_{\text{top}} = Y_{\text{bot}} = 42.434 \text{ in} \checkmark$$

$$S_{xt} = S_{xc} = 107,000 / 42.434 = 2521.6 \text{ in}^3 \checkmark$$

$$\text{moment cap} = (2521.6 \text{ in}^3) (36 \text{ ksi}) (1 \text{ ft} + 1/2 \text{ in}) = 7564.8 \text{ k-ft} \checkmark$$

Shear

$$\text{web} = 2 \cdot 83 1/2" \times 1/2" \checkmark$$

$$D/t_w = 83.5" / 0.5" = 167 \checkmark > \frac{7500 \sqrt{K}}{\sqrt{F_y}} \therefore \text{use } \text{Eq 10-117 for } C$$

$$C = \frac{4.5 \times 10^7 \cdot 5}{167^2 \cdot 36000} = 0.224 \checkmark$$

$$V_u = 0.224 (0.58) (36 \text{ ksi}) (83.5") (1/2") (2) = 390.5 \text{ k} \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147

DATE 1/14/09

BY CJM

SHEET NO. 1 OF

Intermediate Web Stiffeners

- Connection Plates for Diaphragms are considered web stiffeners.
- For Exterior Girders, only 1 stiffener on 1 side of Girder.
- Girders 1 + 4 have Intermediate stiffeners Between Diaphragms on Both sides of Girder
- MDX only allows stiffeners on 1 OR 2 sides of web and Not Both.
- When Girder is an exterior AND interior girder set MDX to have stiffener on 1 side of web

Girder 1 - Stiffener on 1 side

Girder 2 - Stiffeners on Both sides

Girder 3 - Stiffener on Both sides

Girder 4 - Stiffeners on 1 side

Girder 5 - Stiffener on 1 side

Girder 6 - Stiffeners on Both sides

Girder 7 - Stiffener on 1 side

Girder 8 - Stiffener on 1 side

Girder 9 - Stiffener on Both sides

Girder 10 - Stiffener on 1 side

- If controlling member/location is in an Area with Stiffeners on Both sides but defined as 1 side, this will be looked into further.

Girdel Definition
(Excel)

Project: Special Structures Rating

Sheet: 1 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/12/09

Checked on: 01/08/10

| Girder 1 - Web | | | | Girder 2 - Web | | | | Girder 4 - Web | | | |
|----------------|----------------|------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|------------------|----------------|
| Section | t _w | h _w * | Length of Sect | Section | t _w | h _w * | Length of Sect | Section | t _w | h _w * | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.6250 | 33.96 | 193.331 | 1 | 0.625 | 33.96 | 193.851 | 1 | 0.625 | 33.96 | 197.620 |
| 2 | 0.5000 | 34 ->78 | 8.417 | | | | | 2 | 0.5 | 34->78 | 8.635 |
| 3 | 0.5000 | 78.00 | 111.033 | Girder 3 - Web | | | | 3 | 0.5000 | 78.00 | 113.518 |
| 4 | 1.0000 | 78.00 | 5.000 | 1 | 0.4375 | 42.00 | 82.568 | 4 | 1 | 78.00 | 5.000 |
| 5 | 0.5000 | 78.00 | 134.653 | 2 | 0.5 | 42.00 | 10.000 | 5 | 0.5000 | 78.00 | 136.653 |
| 6 | 1.0000 | 78.00 | 5.000 | 3 | 0.4375 | 42.00 | 78.797 | 6 | 1.0000 | 78.00 | 5.000 |
| 7 | 0.5000 | 78 -> 42 | 79.001 | 4 | 0.4375 | 42->33.96 | 5.542 | 7 | 0.5000 | 78 -> 42 | 80.056 |
| 8 | 0.5000 | 42.00 | 11.000 | 5 | 0.6530 | 33.96 | 60.823 | 8 | 0.5 | 42.00 | 11.000 |
| 9 | 0.4375 | 42.00 | 125.732 | 6 | 0.6875 | 34.00 | 10.000 | 9 | 0.4375 | 42.00 | 129.332 |
| 10 | 0.5000 | 42.00 | 10.000 | 7 | 0.653 | 33.96 | 43.651 | 10 | 0.5000 | 42.00 | 10.000 |
| 11 | 0.4375 | 42.00 | 73.001 | | | | | 11 | 0.4375 | 42.00 | 76.706 |
| 12 | 0.7500 | 42.00 | 5.000 | | | | | | | | |
| 13 | 0.7500 | 42->33.96 | 5.542 | | | | | | | | |
| 14 | 0.6800 | 33.96 | 78.082 | | | | | | | | |
| 15 | 0.5980 | 33.962 | 38.412 | | | | | | | | |
| 16 | 0.3750 | 34.00 | 187.535 | | | | | | | | |

* For reference only. Web depth defined in calc sheet - "Web Depths for Varying Girders"

Project: Special Structures Rating

Sheet: 2 of 3

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 5 - Web | | | | Girder 6 - Web | | | | Girder 7 - Web | | | |
|----------------|----------------|------------------|----------------|----------------|----------------|------------------|----------------|----------------|----------------|------------------|----------------|
| Section | t _w | h _w * | Length of Sect | Section | t _w | h _w * | Length of Sect | Section | t _w | h _w * | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.3750 | 34.00 | 224.053 | 1 | 0.3750 | 34.00 | 6.867 | 1 | 0.3750 | 34.00 | 105.410 |
| 2 | 0.75 | 34.00 | 10.000 | 2 | 0.75 | 34.00 | 10.000 | 2 | 0.75 | 34.00 | 10.000 |
| 3 | 0.3750 | 34.00 | 70.850 | 3 | 0.3750 | 34.00 | 70.126 | 3 | 0.4375 | 34.00 | 69.485 |
| 4 | 0.4375 | 34 -> 42 | 52.000 | 4 | 0.4375 | 34 -> 42 | 52.004 | 4 | 0.4375 | 34 -> 42 | 52.016 |
| 5 | 0.4375 | 42.00 | 339.743 | 5 | 0.4375 | 42.00 | 340.820 | 5 | 0.4375 | 42.00 | 342.080 |
| 6 | 0.5 | 42.00 | 10.000 | 6 | 0.5 | 42.00 | 10.000 | 6 | 0.5 | 42.00 | 10.000 |
| 7 | 0.4375 | 42.00 | 11.417 | 7 | 0.4375 | 42.00 | 79.677 | 7 | 0.4375 | 42.00 | 75.472 |
| | | | | 8 | 0.4375 | 42->33.96 | 5.500 | 8 | 0.7500 | 42.00 | 5.000 |
| | | | | 9 | 0.6800 | 33.96 | 61.180 | 9 | 0.7500 | 42->33.96 | 5.500 |
| | | | | 10 | 0.6875 | 34.00 | 10.000 | 10 | 0.7700 | 33.96 | 79.997 |
| | | | | 11 | 0.725 | 33.96 | 47.159 | 11 | 0.625 | 33.96 | 39.873 |
| | | | | 12 | 0.3750 | 34.00 | 190.699 | 12 | 0.4375 | 34.00 | 138.617 |
| | | | | | | | | 13 | 0.3750 | 34.00 | 55.246 |

* For reference only. Web depth defined in calc sheet - "Web Depths for Varying Girders"

Project: Special Structures Rating

Sheet: 3 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 8 - Web | | | | Girder 9 - Web | | | | Girder 10 - Web | | | |
|----------------|----------------|------------------|----------------|----------------|----------------|------------------|----------------|-----------------|----------------|------------------|----------------|
| Section | t _w | h _w * | Length of Sect | Section | t _w | h _w * | Length of Sect | Section | t _w | h _w * | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.3750 | 34.00 | 62.66 | 1 | 0.3750 | 34.00 | 213.655 | 1 | 0.3750 | 34.00 | 205.655 |
| 2 | 0.4375 | 34.00 | 71.443 | 2 | 0.75 | 34.00 | 10.000 | 2 | 0.75 | 34.00 | 10.000 |
| 3** | 0.598 | 33.962 | 307.677 | 3 | 0.4375 | 34.00 | 68.905 | 3 | 0.3750 | 34.00 | 134.272 |
| | | 33.962->28.3 | | 4 | 0.3750 | 34.00 | 69.208 | 4**** | 0.598 | 33.962 | 305.959 |
| 4 | 0.6150 | 28.30 | 38.185 | 5*** | 0.598 | 33.962 | 306.818 | | | 33.962->28.3 | |
| 5 | 0.585 | 28.30 | 63.305 | | | 33.962->28.3 | | 5 | 0.564 | 28.30 | 225.024 |
| 6 | 0.5640 | 28.30 | 125.846 | 6 | 0.6150 | 28.30 | 37.943 | | | | |
| | | | | 8 | 0.5850 | 28.30 | 188.237 | | | | |

* For reference only. Web depth defined in calc sheet - "Web Depths for Varying Girders

**Girder 8 - Section 3 - 33.962" for 304.151 ft and tapers from 33.962" to 28.30" for 3.526 ft. Total = 307.677 ft

*** Girder 9 - Section 5 - 33.962" for 303.323 ft and tapers from 33.962" to 28.30" for 3.495 ft. Total = 306.818 ft.

**** Girdge 10 - Section 4 - 33.962" for 302.495 ft and tapers from 33.962" to 28.30" for 3.464 ft. Total = 305.959 Ft

Project: Special Structures Rating

Sheet: 4 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 1 - Top Flange | | | | Girder 2 - Top Flange | | | | Girder 4 - Top Flange | | | |
|-----------------------|----------------|----------------|----------------|-----------------------|----------------|----------------|----------------|-----------------------|----------------|----------------|----------------|
| Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.94 | 11.972 | 193.331 | 1 | 0.94 | 11.972 | 193.851 | 1 | 0.94 | 11.972 | 197.62 |
| 2 | 0.875 | 12->18 | 8.417 | | | | | 2 | 0.875 | 12->18 | 8.635 |
| 3 | 0.875 | 18 | 94.533 | | | | | 3 | 0.875 | 18 | 94.018 |
| 4 | 1.5 | 18 | 9.000 | Girder 3 - Top Flange | | | | 4 | 1.625 | 18 | 10.000 |
| 5 | 2.25 | 18 | 20.000 | 1 | 0.750 | 12 | 67.5680 | 5 | 2.750 | 18 | 22.000 |
| 6 | 1.375 | 18 | 6.000 | 2 | 1.375 | 12 | 10.0000 | 6 | 1.625 | 18 | 8.000 |
| 7 | 0.875 | 18 | 113.653 | 3 | 2.000 | 12 | 20.0000 | 7 | 0.875 | 18 | 113.653 |
| 8 | 1.75 | 18 | 27.000 | 4 | 1.500 | 12 | 10.0000 | 8 | 2.000 | 18 | 27.000 |
| 9 | 0.875 | 18 | 72.501 | 5 | 0.875 | 12 | 69.3360 | 9 | 0.875 | 18 | 61.556 |
| 10 | 0.875 | 18 -> 12 | 3.000 | 6 | 1.020 | 12 | 60.7970 | 10 | 1.000 | 18 | 12.000 |
| 11 | 0.875 | 12 | 4.000 | 7 | 1.250 | 12 | 10.0000 | 11 | 1.000 | 18 -> 12 | 3.000 |
| 12 | 0.625 | 12 | 37.971 | 8 | 1.020 | 12 | 43.6320 | 12 | 1.000 | 12 | 5.000 |
| 13 | 0.75 | 12 | 68.761 | | | | | 13 | 0.625 | 12 | 39.543 |
| 14 | 1.375 | 12 | 10.000 | | | | | 14 | 0.750 | 12 | 79.789 |
| 15 | 2 | 12 | 20.000 | | | | | 15 | 1.750 | 12 | 20.000 |
| 16 | 1.5 | 12 | 10.000 | | | | | 16 | 1.25 | 12 | 14.000 |
| 17 | 0.875 | 12 | 68.542 | | | | | 17 | 0.75 | 12 | 57.706 |
| 18 | 1.1 | 12.027 | 78.082 | | | | | | | | |
| 19 | 0.794 | 11.945 | 38.412 | | | | | | | | |
| 20 | 0.625 | 12 | 7.000 | | | | | | | | |
| 21 | 1.375 | 12 | 12.000 | | | | | | | | |
| 22 | 0.625 | 12 | 52.177 | | | | | | | | |
| 23 | 1.375 | 12 | 12.000 | | | | | | | | |
| 24 | 0.625 | 12 | 51.149 | | | | | | | | |
| 25 | 0.75 | 12 | 53.209 | | | | | | | | |

Project: Special Structures Rating

Sheet: 5 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 5 - Top Flange | | | | Girder 6 - Top Flange | | | | Girder 7 - Top Flange | | | |
|-----------------------|----------------|----------------|----------------|-----------------------|----------------|----------------|----------------|-----------------------|----------------|----------------|----------------|
| Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.625 | 12 | 41.229 | 1 | 0.875 | 12 | 6.867 | 1 | 0.625 | 12 | 34.634 |
| 2 | 1.375 | 12 | 10.000 | 2 | 2 | 12 | 10.000 | 2 | 0.75 | 12 | 70.776 |
| 3 | 0.625 | 12 | 47.946 | 3 | 1 | 12 | 70.126 | 3 | 1.75 | 12 | 10.000 |
| 4 | 1.375 | 12 | 10.000 | 4 | 0.625 | 12 | 57.004 | 4 | 1.25 | 12 | 69.485 |
| 5 | 0.625 | 12 | 41.801 | 5 | 1.25 | 12 | 16.000 | 5 | 0.625 | 12 | 58.016 |
| 6 | 1.25 | 12 | 73.078 | 6 | 0.625 | 12 | 55.004 | 6 | 1.25 | 12 | 14.000 |
| 7 | 2.5 | 12 | 10.000 | 7 | 1 | 12 | 10.000 | 7 | 0.625 | 12 | 56.015 |
| 8 | 1.25 | 12 | 70.850 | 8 | 1.75 | 12 | 17.000 | 8 | 1 | 12 | 10.000 |
| 9 | 0.625 | 12 | 58.000 | 9 | 0.75 | 12 | 10.000 | 9 | 1.75 | 12 | 17.000 |
| 10 | 1.25 | 12 | 15.000 | 10 | 0.625 | 12 | 57.565 | 10 | 0.75 | 12 | 10.000 |
| 11 | 0.625 | 12 | 55.000 | 11 | 0.75 | 12 | 10.000 | 11 | 0.625 | 12 | 57.833 |
| 12 | 1 | 12 | 10.000 | 12 | 1.75 | 12 | 16.000 | 12 | 0.75 | 12 | 10.000 |
| 13 | 1.75 | 12 | 17.000 | 13 | 1.125 | 12 | 13.000 | 13 | 1.875 | 12 | 16.000 |
| 14 | 0.75 | 12 | 10.000 | 14 | 0.625 | 12 | 46.138 | 14 | 1.25 | 12 | 13.000 |
| 15 | 0.625 | 12 | 57.298 | 15 | 0.75 | 12 | 72.113 | 15 | 0.625 | 12 | 46.604 |
| 16 | 0.75 | 12 | 10.000 | 16 | 1.375 | 12 | 8.000 | 16 | 0.875 | 12 | 68.627 |
| 17 | 1.75 | 12 | 16.000 | 17 | 1.875 | 12 | 20.000 | 17 | 1.5 | 12 | 12.000 |
| 18 | 1.125 | 12 | 13.000 | 18 | 1.625 | 12 | 11.000 | 18 | 2.25 | 12 | 20.000 |
| 19 | 0.625 | 12 | 125.447 | 19 | 1 | 12 | 69.175 | 19 | 1.75 | 12 | 10.000 |
| 20 | 1.25 | 12 | 26.401 | 20 | 1.1 | 12.027 | 61.180 | 20 | 1 | 12 | 70.969 |
| | | | | 21 | 1.5 | 12 | 10.000 | 21 | 1.26 | 12.117 | 79.997 |
| | | | | 22 | 1.18 | 12.072 | 47.159 | 22 | 0.94 | 11.97 | 39.873 |
| | | | | 23 | 0.75 | 12 | 8.000 | 23 | 0.75 | 12 | 7.000 |
| | | | | 24 | 1.5 | 12 | 10.000 | 24 | 1.625 | 12 | 14.000 |
| | | | | 25 | 0.75 | 12 | 54.230 | 25 | 0.75 | 12 | 52.283 |
| | | | | 26 | 1.375 | 12 | 14.000 | 26 | 1.625 | 12 | 14.000 |
| | | | | 27 | 0.625 | 12 | 50.241 | 27 | 0.625 | 12 | 51.333 |
| | | | | 28 | 0.875 | 12 | 54.228 | 28 | 1.375 | 12 | 55.247 |

Project: Special Structures Rating

Sheet: 6 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 8 - Top Flange | | | | Girder 9 - Top Flange | | | | Girder 10 - Top Flange | | | |
|-----------------------|----------------|----------------|----------------|-----------------------|----------------|----------------|----------------|------------------------|----------------|----------------|----------------|
| Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.625 | 12 | 62.660 | 1 | 0.625 | 12 | 95.309 | 1 | 0.625 | 12 | 139.7610 |
| 2 | 1.000 | 12 | 51.443 | 2 | 1.375 | 12 | 10.000 | 2 | 1.000 | 12 | 65.8950 |
| 3 | 1.875 | 12 | 13.000 | 3 | 0.625 | 12 | 40.004 | 3 | 2.000 | 12 | 10.0000 |
| 4 | 1.000 | 12 | 7.000 | 4 | 1.000 | 12 | 68.343 | 4 | 1.000 | 12 | 68.1520 |
| 5 | 0.794 | 11.945 | 307.680 | 5 | 2.250 | 12 | 10.000 | 5 | 0.625 | 12 | 46.1200 |
| 6 | 1.000 | 10.551 | 38.185 | 6 | 1.375 | 12 | 68.904 | 6 | 1.375 | 12 | 13.0000 |
| 7 | 0.930 | 10.521 | 63.305 | 7 | 0.750 | 12 | 49.208 | 7 | 0.625 | 12 | 7.0000 |
| 8 | 0.850 | 10.5 | 125.846 | 8 | 1.500 | 12 | 13.000 | 8 | 0.794 | 11.945 | 305.9640 |
| 9 | | | | 9 | 0.750 | 12 | 7.000 | 9 | 0.850 | 10.5 | 225.0230 |
| 10 | | | | 10 | 0.794 | 11.945 | 306.814 | 10 | | | |
| 11 | | | | 11 | 1.000 | 10.551 | 37.943 | 11 | | | |
| 12 | | | | 12 | 0.930 | 10.521 | 188.237 | 12 | | | |

Project: Special Structures Rating

Sheet: 7 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 1 - Bottom Flange | | | | Girder 2 - Bottom Flange | | | | Girder 4 - Bottom Flange | | | |
|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|
| Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 0.94 | 11.972 | 193.331 | 1 | 0.94 | 11.972 | 193.851 | 1 | 0.94 | 11.975 | 197.62 |
| 2 | 0.875 | 12->18 | 8.417 | | | | | 2 | 0.875 | 12->18 | 8.635 |
| 3 | 0.875 | 18 | 94.533 | Girder 3 - Bottom Flange | | | | 3 | 0.875 | 18 | 94.018 |
| 4 | 1.5 | 18 | 9.000 | 1 | 1.375 | 12 | 67.568 | 4 | 1.625 | 18 | 10.000 |
| 5 | 2.25 | 18 | 20.000 | 2 | 1.375 | 12 | 10.000 | 5 | 2.75 | 18 | 22.000 |
| 6 | 1.375 | 18 | 6.000 | 3 | 2.000 | 12 | 20.000 | 6 | 1.625 | 18 | 8.000 |
| 7 | 0.875 | 18 | 113.653 | 4 | 1.500 | 12 | 10.000 | 7 | 1.125 | 18 | 113.653 |
| 8 | 1.75 | 18 | 27.000 | 5 | 1.500 | 12 | 69.336 | 8 | 2 | 18 | 27.000 |
| 9 | 0.875 | 18 | 72.501 | 6 | 1.020 | 12 | 60.797 | 9 | 0.875 | 18 | 61.556 |
| 10 | 0.875 | 18->12 | 3.000 | 7 | 1.250 | 12 | 10.000 | 10 | 1 | 18 | 12.000 |
| 11 | 0.875 | 12 | 4.000 | 8 | 1.020 | 12 | 43.632 | 11 | 1 | 18->12 | 3.000 |
| 12 | 0.75 | 12 | 37.971 | | | | | 12 | 1 | 12 | 5.000 |
| 13 | 1.5 | 12 | 68.761 | | | | | 13 | 0.875 | 12 | 39.543 |
| 14 | 1.5 | 12 | 10.000 | | | | | 14 | 1.375 | 12 | 79.789 |
| 15 | 2 | 12 | 20.000 | | | | | 15 | 1.75 | 12 | 20.000 |
| 16 | 1.5 | 12 | 10.000 | | | | | 16 | 1.25 | 12 | 14.000 |
| 17 | 1.5 | 12 | 68.542 | | | | | 17 | 1.25 | 12 | 57.706 |
| 18 | 1.1 | 12.027 | 78.082 | | | | | | | | |
| 19 | 0.794 | 11.945 | 38.412 | | | | | | | | |
| 20 | 1 | 12 | 7.000 | | | | | | | | |
| 21 | 1.375 | 12 | 12.000 | | | | | | | | |
| 22 | 1 | 12 | 52.177 | | | | | | | | |
| 23 | 1.375 | 12 | 12.000 | | | | | | | | |
| 24 | 1 | 12 | 51.149 | | | | | | | | |
| 25 | 1.75 | 12 | 53.209 | | | | | | | | |

Project: Special Structures Rating

Sheet: 8 of 8

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 5 - Bottom Flange | | | | Girder 6 - Bottom Flange | | | | Girder 7 - Bottom Flange | | | |
|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|
| Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 1 | 12 | 41.229 | 1 | 1.375 | 12 | 6.867 | 1 | 1 | 12 | 34.634 |
| 2 | 1.375 | 12 | 10.000 | 2 | 2 | 12 | 10.000 | 2 | 1.25 | 12 | 70.776 |
| 3 | 1 | 12 | 47.946 | 3 | 1.625 | 12 | 70.126 | 3 | 1.75 | 12 | 10.000 |
| 4 | 1.375 | 12 | 10.000 | 4 | 0.875 | 12 | 57.004 | 4 | 1.875 | 12 | 69.485 |
| 5 | 1 | 12 | 41.801 | 5 | 1.25 | 12 | 16.000 | 5 | 0.875 | 12 | 58.016 |
| 6 | 1.875 | 12 | 73.078 | 6 | 0.875 | 12 | 55.004 | 6 | 1.25 | 12 | 14.000 |
| 7 | 2.5 | 12 | 10.000 | 7 | 1 | 12 | 10.000 | 7 | 0.625 | 12 | 56.015 |
| 8 | 1.875 | 12 | 70.850 | 8 | 1.75 | 12 | 17.000 | 8 | 1 | 12 | 10.000 |
| 9 | 0.875 | 12 | 58.000 | 9 | 0.75 | 12 | 10.000 | 9 | 1.75 | 12 | 17.000 |
| 10 | 1.25 | 12 | 15.000 | 10 | 1.25 | 12 | 57.565 | 10 | 0.75 | 12 | 10.000 |
| 11 | 0.625 | 12 | 55.000 | 11 | 0.75 | 12 | 10.000 | 11 | 1.25 | 12 | 57.833 |
| 12 | 1 | 12 | 10.000 | 12 | 1.75 | 12 | 16.000 | 12 | 0.75 | 12 | 10.000 |
| 13 | 1.75 | 12 | 17.000 | 13 | 1.125 | 12 | 13.000 | 13 | 1.875 | 12 | 16.000 |
| 14 | 0.75 | 12 | 10.000 | 14 | 0.875 | 12 | 46.138 | 14 | 1.25 | 12 | 13.000 |
| 15 | 1.125 | 12 | 57.298 | 15 | 1.375 | 12 | 72.114 | 15 | 0.875 | 12 | 46.604 |
| 16 | 0.75 | 12 | 10.000 | 16 | 1.375 | 12 | 8.000 | 16 | 1.5 | 12 | 68.627 |
| 17 | 1.75 | 12 | 16.000 | 17 | 1.875 | 12 | 20.000 | 17 | 1.5 | 12 | 12.000 |
| 18 | 1.125 | 12 | 13.000 | 18 | 1.625 | 12 | 11.000 | 18 | 2.25 | 12 | 20.000 |
| 19 | 0.75 | 12 | 125.447 | 19 | 1.625 | 12 | 69.175 | 19 | 1.75 | 12 | 10.000 |
| 20 | 1.25 | 12 | 26.401 | 20 | 1.1 | 12.027 | 61.180 | 20 | 1.75 | 12 | 70.969 |
| | | | | 21 | 1.5 | 12 | 10.000 | 21 | 1.26 | 12.117 | 79.997 |
| | | | | 22 | 1.18 | 12.072 | 47.159 | 22 | 0.94 | 11.972 | 39.873 |
| | | | | 23 | 1.125 | 12 | 8.000 | 23 | 1.125 | 12 | 7.000 |
| | | | | 24 | 1.5 | 12 | 10.000 | 24 | 1.625 | 12 | 14.000 |
| | | | | 25 | 1.125 | 12 | 54.230 | 25 | 1.125 | 12 | 52.283 |
| | | | | 26 | 1.375 | 12 | 14.000 | 26 | 1.625 | 12 | 14.000 |
| | | | | 27 | 1 | 12 | 50.241 | 27 | 1 | 12 | 51.333 |
| | | | | 28 | 1.375 | 12 | 54.228 | 28 | 2 | 12 | 55.247 |

Project: Special Structures Rating

Sheet: 9 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/30/09

Checked on: 01/08/10

| Girder 8 - Bottom Flange | | | | Girder 9 - Bottom Flange | | | | Girder 10 - Bottom Flange | | | |
|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|---------------------------|----------------|----------------|----------------|
| Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect | Section | t _f | b _f | Length of Sect |
| | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) | | (inches) | (inches) | (feet) |
| 1 | 1.000 | 12 | 62.660 | 1 | 1.000 | 12 | 95.309 | 1 | 1.000 | 12 | 139.7610 |
| 2 | 1.500 | 12 | 51.443 | 2 | 1.375 | 12 | 10.000 | 2 | 1.625 | 12 | 65.8950 |
| 3 | 1.875 | 12 | 13.000 | 3 | 1.000 | 12 | 40.004 | 3 | 2.000 | 12 | 10.0000 |
| 4 | 1.500 | 12 | 7.000 | 4 | 1.625 | 12 | 68.343 | 4 | 1.625 | 12 | 68.1520 |
| 5 | 0.794 | 11.945 | 307.680 | 5 | 2.250 | 12 | 10.000 | 5 | 1.000 | 12 | 46.1200 |
| 6 | 1.000 | 10.551 | 38.185 | 6 | 2.250 | 12 | 68.904 | 6 | 1.375 | 12 | 13.0000 |
| 7 | 0.930 | 10.521 | 63.305 | 7 | 1.125 | 12 | 49.208 | 7 | 1.000 | 12 | 7.0000 |
| 8 | 0.850 | 10.5 | 125.846 | 8 | 1.500 | 12 | 13.000 | 8 | 0.794 | 11.945 | 305.9640 |
| | | | | 9 | 1.125 | 12 | 7.000 | 9 | 0.850 | 10.5 | 225.0230 |
| | | | | 10 | 0.794 | 11.945 | 306.814 | | | | |
| | | | | 11 | 1.000 | 10.551 | 37.943 | | | | |
| | | | | 12 | 0.930 | 10.521 | 188.237 | | | | |

Project: Special Structures Rating

Sheet: 10 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 11/2/09

Checked on: 01/08/10

Cover Plates

| Plate No. | Dist. From | Length | Top Flange | Top Flange | Bot. Flange | Bot. Flange |
|-----------|---------------|----------|------------|------------|-------------|-------------|
| | Prev to Start | of Plate | Width | Thickness | Width | Thickness |
| | (feet) | (feet) | (inches) | (inches) | (inches) | (inches) |
| Girder 1 | | | | | | |
| 1 | 51.487 | 16 | 11 | 0.75 | 11 | 0.75 |
| 2 | 58.359 | 16 | 11 | 0.75 | 11 | 0.75 |
| 3 | 683.946 | 12 | 11 | 0.625 | 11 | 0.625 |
| Girder 2 | | | | | | |
| 1 | 52.147 | 16 | 11 | 0.75 | 11 | 0.75 |
| 2 | 59.183 | 16 | 11 | 0.75 | 11 | 0.75 |
| Girder 4 | | | | | | |
| 1 | 52.806 | 16 | 11 | 0.75 | 11 | 0.75 |
| 2 | 60.008 | 16 | 11 | 0.75 | 11 | 0.75 |
| Girder 7 | | | | | | |
| 1 | 735.957 | 14 | 11 | 1 | 11 | 1 |
| Girder 8 | | | | | | |
| 1 | 184.120 | 13 | 11 | 0.625 | 11 | 0.625 |
| 2 | 106.017 | 13 | 11 | 0.625 | 11 | 0.625 |
| 3 | 57.347 | 13 | 11 | 0.5 | 11 | 0.5 |
| 4 | 100.546 | 12 | 9 | 0.875 | 9 | 0.875 |
| 5 | 50.274 | 12 | 9 | 1 | 9 | 1 |
| 6 | 50.00 | 12 | 9 | 0.75 | 9 | 0.75 |
| Girder 9 | | | | | | |
| 1 | 411.769 | 13 | 11 | 0.625 | 11 | 0.625 |
| 2 | 105.996 | 11 | 11 | 0.5 | 11 | 0.5 |
| 3 | 59.901 | 12 | 11 | 0.5 | 11 | 0.5 |
| 4 | 99.845 | 12 | 9 | 0.875 | 9 | 0.875 |
| 5 | 49.922 | 12 | 9 | 0.75 | 9 | 0.75 |
| 6 | 50.00 | 12 | 9 | 0.625 | 9 | 0.625 |
| Girder 10 | | | | | | |
| 1 | 399.927 | 13 | 11 | 0.625 | 11 | 0.625 |
| 2 | 105.976 | 11 | 11 | 0.5 | 11 | 0.5 |
| 3 | 60.455 | 10 | 11 | 0.5 | 11 | 0.5 |
| 4 | 100.141 | 12 | 9 | 0.875 | 9 | 0.875 |
| 5 | 49.569 | 12 | 9 | 0.875 | 9 | 0.875 |
| 6 | 50.00 | 12 | 9 | 0.75 | 9 | 0.75 |

(GIRDER 3,5 & 6 DO NOT HAVE COVER PLATES.)

Project: Special Structures Rating

Sheet: 11 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 11/3/09

Checked on: 01/15/10

| Girder 1 | | Girder 2 | | Girder 4 | |
|-------------------------|-------------|-------------------------|-------------|-------------------------|-------------|
| Section | Length (ft) | Section | Length (ft) | Section | Length (ft) |
| Composite Region 1* | 0.100 | Composite Region 1* | 0.100 | Composite Region 1* | 0.100 |
| Non Composite Region 1* | 1.900 | Non Composite Region 1* | 1.900 | Non Composite Region 1* | 1.900 |
| Composite Region 2 | 42.487 | Composite Region 2 | 43.147 | Composite Region 2 | 43.806 |
| Non Composite Region 2 | 30.000 | Non Composite Region 2 | 30.000 | Non Composite Region 2 | 30.000 |
| Composite Region 3 | 44.359 | Composite Region 3 | 45.183 | Composite Region 3 | 46.008 |
| Non Composite Region 3 | 30.000 | Non Composite Region 3 | 30.000 | Non Composite Region 3 | 30.000 |
| Composite Region 4 | 42.485 | | | Composite Region 4 | 43.806 |
| Non Composite Region 4 | 16.917 | | | Non Composite Region 4 | 21.135 |
| Composite Region 5 | 74.033 | | | Composite Region 5 | 72.518 |
| Non Composite Region 5 | 63.000 | | | Non Composite Region 5 | 63.000 |
| Composite Region 6 | 85.653 | | | Composite Region 6 | 87.653 |
| Non Composite Region 6 | 59.000 | | | Non Composite Region 6 | 59.000 |
| Composite Region 7 | 36.501 | Girder 3 | | Composite Region 7 | 37.556 |
| Non Composite Region 7 | 25.000 | | | Non Composite Region 7 | 26.000 |
| Composite Region 8 | 35.971 | Composite Region 1* | 0.100 | Composite Region 8 | 37.543 |
| Non Composite Region 8 | 18.042 | Non Composite Region 1* | 14.230 | Non Composite Region 8 | 18.040 |
| Composite Region 9 | 52.719 | Composite Region 2 | 53.235 | Composite Region 9 | 55.749 |
| Non Composite Region 9 | 40.000 | Non Composite Region 2 | 40.000 | Non Composite Region 9 | 42.000 |
| Composite Region 10 | 52.501 | Composite Region 3 | 53.294 | Composite Region 10 | 55.706 |
| Non Composite Region 10 | 18.040 | Non Composite Region 3 | 18.042 | Non Composite Region 10 | 2.000 |
| Composite Region 11 | 50.082 | Composite Region 4 | 50.797 | | |
| Non Composite Region 11 | 30.000 | Non Composite Region 4 | 32.000 | | |
| Composite Region 12 | 34.412 | | | | |
| Non Composite Region 12 | 26.000 | | | | |
| Composite Region 13 | 38.177 | | | | |
| Non Composite Region 13 | 27.000 | | | | |
| Composite Region 14 | 27.237 | | | | |
| Non Composite Region 14 | 17.911 | | | | |
| Composite Region 15 | 49.209 | | | | |
| Non Composite Region 15 | 2.000 | | | | |

*Girders start with non composite region, MDX requires a composite region at the beginning, 0.1 foot composite region to start each girder then remaining non composite section.

Project: Special Structures Rating

Sheet: 12 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 11/3/09

Checked on: 01/15/10

| Girder 5 | | Girder 6 | | Girder 7 | |
|-------------------------|-------------|-------------------------|-------------|-------------------------|-------------|
| Section | Length (ft) | Section | Length (ft) | Section | Length (ft) |
| Composite Region 1* | 0.100 | Composite Region 1* | 0.100 | Composite Region 1* | 0.100 |
| Non Composite Region 1* | 1.900 | Non Composite Region 1* | 24.767 | Non Composite Region 1* | 1.900 |
| Composite Region 2 | 32.229 | Composite Region 2 | 51.125 | Composite Region 2 | 30.634 |
| Non Composite Region 2 | 24.000 | Non Composite Region 2 | 13.001 | Non Composite Region 2 | 13.123 |
| Composite Region 3 | 33.946 | Composite Region 3 | 50.004 | Composite Region 3 | 50.654 |
| Non Composite Region 3 | 24.000 | Non Composite Region 3 | 29.000 | Non Composite Region 3 | 27.000 |
| Composite Region 4 | 32.801 | Composite Region 4 | 42.004 | Composite Region 4 | 50.483 |
| Non Composite Region 4 | 13.234 | Non Composite Region 4 | 42.000 | Non Composite Region 4 | 13.002 |
| Composite Region 5 | 52.844 | Composite Region 5 | 57.565 | Composite Region 5 | 50.016 |
| Non Composite Region 5 | 28.000 | Non Composite Region 5 | 38.000 | Non Composite Region 5 | 29.000 |
| Composite Region 6 | 50.850 | Composite Region 6 | 45.138 | Composite Region 6 | 42.015 |
| Non Composite Region 6 | 13.000 | Non Composite Region 6 | 16.998 | Non Composite Region 6 | 42.000 |
| Composite Region 7 | 50.000 | Composite Region 7 | 57.115 | Composite Region 7 | 57.833 |
| Non Composite Region 7 | 29.000 | Non Composite Region 7 | 39.000 | Non Composite Region 7 | 38.000 |
| Composite Region 8 | 42.000 | Composite Region 8 | 53.175 | Composite Region 8 | 45.604 |
| Non Composite Region 8 | 42.000 | Non Composite Region 8 | 18.000 | Non Composite Region 8 | 17.997 |
| Composite Region 9 | 57.298 | Composite Region 9 | 50.180 | Composite Region 9 | 52.630 |
| Non Composite Region 9 | 38.000 | Non Composite Region 9 | 32.000 | Non Composite Region 9 | 42.000 |
| Composite Region 10 | 44.672 | Composite Region 10 | 33.159 | Composite Region 10 | 54.972 |
| Non Composite Region 10 | 18.000 | Non Composite Region 10 | 27.000 | Non Composite Region 10 | 18.000 |
| Composite Region 11 | 57.775 | Composite Region 11 | 39.230 | Composite Region 11 | 51.997 |
| Non Composite Region 11 | 32.401 | Non Composite Region 11 | 27.000 | Non Composite Region 11 | 29.000 |
| | | Composite Region 12 | 30.217 | Composite Region 12 | 36.873 |
| | | Non Composite Region 12 | 16.023 | Non Composite Region 12 | 26.000 |
| | | Composite Region 13 | 50.228 | Composite Region 13 | 42.283 |
| | | Non Composite Region 13 | 2.000 | Non Composite Region 13 | 25.000 |
| | | | | Composite Region 14 | 31.198 |
| | | | | Non Composite Region 14 | 16.135 |
| | | | | Composite Region 15 | 51.246 |
| | | | | Non Composite Region 15 | 2.000 |

*Girders start with non composite region, MDX requires a composite region at the beginning, 0.1 foot composite region to start each girder then remaining non composite section.

Project: Special Structures Rating

LHB Proj. No. - 090147.00

Completed By: CJM

Completed on: 11/3/09

Sheet: 13 of 53

Checked By: CDK

Checked on: 01/15/10

| Girder 8 | | Girder 9 | | Girder 10 | |
|-------------------------|-------------|-------------------------|-------------|-------------------------|-------------|
| Section | Length (ft) | Section | Length (ft) | Section | Length (ft) |
| Composite Region 1* | 0.100 | Composite Region 1* | 0.100 | Composite Region 1* | 0.100 |
| Non Composite Region 1* | 1.900 | Non Composite Region 1* | 1.900 | Non Composite Region 1* | 1.900 |
| Composite Region 2 | 49.589 | Composite Region 2 | 29.974 | Composite Region 2 | 27.601 |
| Non Composite Region 2 | 13.072 | Non Composite Region 2 | 24.000 | Non Composite Region 2 | 24.000 |
| Composite Region 3 | 40.443 | Composite Region 3 | 33.335 | Composite Region 3 | 31.607 |
| Non Composite Region 3 | 29.000 | Non Composite Region 3 | 22.000 | Non Composite Region 3 | 22.000 |
| Composite Region 4 | 43.017 | Composite Region 4 | 32.004 | Composite Region 4 | 30.552 |
| Non Composite Region 4 | 29.000 | Non Composite Region 4 | 12.945 | Non Composite Region 4 | 12.750 |
| Composite Region 5 | 33.000 | Composite Region 5 | 49.398 | Composite Region 5 | 47.144 |
| Non Composite Region 5 | 16.000 | Non Composite Region 5 | 26.000 | Non Composite Region 5 | 26.000 |
| Composite Region 6 | 40.017 | Composite Region 6 | 49.805 | Composite Region 6 | 49.042 |
| Non Composite Region 6 | 28.000 | Non Composite Region 6 | 13.101 | Non Composite Region 6 | 13.110 |
| Composite Region 7 | 43.347 | Composite Region 7 | 38.208 | Composite Region 7 | 35.120 |
| Non Composite Region 7 | 28.000 | Non Composite Region 7 | 29.000 | Non Composite Region 7 | 29.000 |
| Composite Region 8 | 36.274 | Composite Region 8 | 43.000 | Composite Region 8 | 43.000 |
| Non Composite Region 8 | 13.026 | Non Composite Region 8 | 29.000 | Non Composite Region 8 | 29.000 |
| Composite Region 9 | 34.247 | Composite Region 9 | 33.000 | Composite Region 9 | 33.000 |
| Non Composite Region 9 | 27.000 | Non Composite Region 9 | 16.000 | Non Composite Region 9 | 16.000 |
| Composite Region 10 | 36.274 | Composite Region 10 | 39.996 | Composite Region 10 | 39.976 |
| Non Composite Region 10 | 26.000 | Non Composite Region 10 | 28.000 | Non Composite Region 10 | 28.000 |
| Composite Region 11 | 36.000 | Composite Region 11 | 42.901 | Composite Region 11 | 42.455 |
| Non Composite Region 11 | 27.000 | Non Composite Region 11 | 28.000 | Non Composite Region 11 | 28.000 |
| | | Composite Region 12 | 35.922 | Composite Region 12 | 35.570 |
| | | Non Composite Region 12 | 12.995 | Non Composite Region 12 | 12.964 |
| | | Composite Region 13 | 33.927 | Composite Region 13 | 33.607 |
| | | Non Composite Region 13 | 27.000 | Non Composite Region 13 | 27.000 |
| | | Composite Region 14 | 35.922 | Composite Region 14 | 35.569 |
| | | Non Composite Region 14 | 26.000 | Non Composite Region 14 | 26.000 |
| | | Composite Region 15 | 36.000 | Composite Region 15 | 36.000 |
| | | Non Composite Region 15 | 27.000 | Non Composite Region 15 | 27.000 |

*Girders start with non composite region, MDX requires a composite region at the beginning, 0.1 foot composite region to start each girder then remaining non composite section.

Project: Special Structures Rating

Sheet: 14 of 23

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: CDK

Completed on: 10/12/09

Checked on: 01/08/10

Bearing Stiffener Thickness*

| Support | Girder 1 | Girder 2 | Girder 3 | Girder 4 | Girder 5 | Girder 6 | Girder 7 | Girder 8 | Girder 9 | Girder 10 |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 1 | 0.5 | 0.5 | P.S. | 0.5 | 0.5 | P.S. | P.S. | P.S. | 0.5 | 0.5 |
| 2 | 0.625 | 0.625 | 0.5 | 0.625 | 0.5 | S.P. | 0.5 | 0.5 | 0.5 | 0.5 |
| 3 | 0.625 | 0.625 | S.P. | 0.625 | 0.5 | 0.5 | S.P. | 0.625 | 0.5 | 0.5 |
| 4 | 0.75 | P.S. | S.P. | 0.75 | 0.5 | 0.625 | 0.5 | 0.5 | 0.5 | 0.5 |
| 5 | S.P. | | S.P. | S.P. | S.P. | 0.75 | 0.625 | 0.5 | S.P. | S.P. |
| 6 | S.P. | | P.S. | S.P. | 0.5 | 0.75 | 0.75 | 0.625 | 0.5 | 0.5 |
| 7 | 0.75 | | | 0.75 | 0.625 | 0.5 | 0.875 | 0.625 | 0.5 | 0.5 |
| 8 | 0.5 | | | 0.5 | 0.75 | S.P. | 0.5 | 0.5 | 0.5 | 0.5 |
| 9 | S.P. | | | S.P. | 0.75 | S.P. | S.P. | 0.75 | 0.5 | 0.5 |
| 10 | S.P. | | | S.P. | 0.5 | S.P. | S.P. | 0.75 | 0.625 | 0.625 |
| 11 | S.P. | | | | S.P. | 0.5 | S.P. | 0.75 | 0.5 | 0.5 |
| 12 | 0.5 | | | | P.S. | 0.5 | 0.5 | 0.625** | 0.5 | 0.5 |
| 13 | 0.5 | | | | | 0.5 | 0.5 | | 0.625 | 0.625 |
| 14 | 0.5 | | | | | 0.5* | 0.5 | | 0.625 | 0.625 |
| 15 | 0.5* | | | | | | 0.5* | | 0.625 | 0.75 |
| 16 | | | | | | | | | 0.625** | 0.625** |

S.P. - Steel Cap Pier. No bearing stiffener along support centerline. Thickness set to 1"

P.S. - Pseudo Support - use 1" thickness at these locations.

* Width assumed to be 7" (same as diaphragm connection stiffener.) (Girder 1, 6 & 7 call out 5" x 1/2" stiffener

** Part of dummy span. Dummy span ends at BR 69881A Hinge, Bearing stiffener thickness used from next pier.

| Project: Special Structures Rating | | | | | | | Sheet: 15 of 53 | | | |
|------------------------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|----------------------|----------------------|---------------------|----------------------|
| LHB Proj. No. - 090147.00 | | | | | | | | | | |
| Completed By: CJM | | | | | | | Checked By: CDK | | | |
| Completed on: 11/18/09 | | | | | | | Checked on: 01/19/10 | | | |
| Span Point | Girder 1 | | Girder 2 | | Girder 3 | | Girder 4 | | Girder 5 | |
| | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) |
| 1.0 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 51.48 | 51.97 |
| 1.1 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 53.16 | 53.10 |
| 1.2 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 55.56 | 55.62 |
| 1.3 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 59.04 | 59.04 |
| 1.4 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 63.36 | 63.24 |
| 1.5 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 68.52 | 68.58 |
| 1.6 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 74.64 | 74.64 |
| 1.7 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 81.60 | 78.96 |
| 1.8 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 89.64 | 78.84 |
| 1.9 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 86.16 | 78.84 |
| 2.0 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 83.64 | 79.20 |
| 2.1 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 84.00 | 79.80 |
| 2.2 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 84.36 | 80.76 |
| 2.3 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 84.96 | 81.96 |
| 2.4 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 85.68 | 83.40 |
| 2.5 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 86.64 | 85.44 |
| 2.6 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 87.72 | 87.00 |
| 2.7 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 88.92 | 88.92 |
| 2.8 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 90.24 | 90.24 |
| 2.9 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 91.80 | 91.80 |
| 3.0 | 98.00 | 90.00 | 108.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | 93.48 | 93.00 |
| 3.1 | 98.00 | 90.00 | 108.00 | 90.00 | 107.52 | 90.00 | 98.00 | 90.00 | 95.16 | 93.00 |
| 3.2 | 98.00 | 90.00 | 108.00 | 90.00 | 106.68 | 90.00 | 98.00 | 90.00 | 96.84 | 93.00 |
| 3.3 | 98.00 | 90.00 | 108.00 | 90.00 | 105.48 | 90.00 | 98.00 | 90.00 | 69.72 | 51.48 |
| 3.4 | 98.00 | 90.00 | 108.00 | 90.00 | 103.92 | 90.00 | 98.00 | 90.00 | 69.00 | 50.04 |
| 3.5 | 98.00 | 90.00 | 108.00 | 90.00 | 101.88 | 90.00 | 98.00 | 90.00 | 68.64 | 49.20 |
| 3.6 | 98.00 | 90.00 | 108.00 | 90.00 | 99.36 | 90.00 | 98.00 | 90.00 | 68.52 | 48.96 |
| 3.7 | 98.00 | 90.00 | 108.00 | 90.00 | 96.60 | 90.00 | 98.00 | 90.00 | 68.64 | 49.20 |
| 3.8 | 152.00 | 90.00 | 108.00 | 90.00 | 93.36 | 90.00 | 152.00 | 90.00 | 69.00 | 49.92 |
| 3.9 | 152.00 | 102.00 | 108.00 | 90.00 | 89.76 | 89.76 | 152.00 | 102.00 | 69.60 | 51.24 |
| 4.0 | 152.00 | 102.00 | 108.00 | 90.00 | 85.68 | 85.68 | 152.00 | 102.00 | 70.56 | 53.04 |
| 4.1 | 152.00 | 102.00 | | | 112.92 | 90.00 | 152.00 | 102.00 | 72.12 | 56.28 |
| 4.2 | 152.00 | 102.00 | | | 108.48 | 90.00 | 152.00 | 102.00 | 74.28 | 60.60 |
| 4.3 | 152.00 | 102.00 | | | 103.92 | 90.00 | 152.00 | 102.00 | 76.92 | 65.76 |
| 4.4 | 152.00 | 102.00 | | | 99.00 | 90.00 | 152.00 | 102.00 | 80.04 | 72.00 |
| 4.5 | 152.00 | 102.00 | | | 94.20 | 90.00 | 152.00 | 102.00 | 83.52 | 79.08 |
| 4.6 | 152.00 | 102.00 | | | 89.64 | 89.64 | 152.00 | 102.00 | 87.60 | 87.24 |
| 4.7 | 152.00 | 102.00 | | | 85.20 | 85.20 | 152.00 | 102.00 | 92.16 | 92.14 |
| 4.8 | 152.00 | 102.00 | | | 81.12 | 81.12 | 152.00 | 102.00 | 97.08 | 93.00 |
| 4.9 | 152.00 | 102.00 | | | 77.28 | 77.28 | 152.00 | 102.00 | 72.96 | 57.84 |
| 5.0 | 152.00 | 102.00 | | | 73.80 | 73.80 | 152.00 | 102.00 | 75.48 | 63.00 |
| 5.1 | 152.00 | 102.00 | | | 71.64 | 71.64 | 152.00 | 102.00 | 77.52 | 66.96 |
| 5.2 | 152.00 | 102.00 | | | 69.72 | 69.72 | 152.00 | 102.00 | 79.44 | 70.92 |
| 5.3 | 152.00 | 102.00 | | | 67.80 | 67.80 | 152.00 | 102.00 | 81.24 | 74.52 |
| 5.4 | 152.00 | 102.00 | | | 66.00 | 66.00 | 152.00 | 102.00 | 82.92 | 77.76 |
| 5.5 | 152.00 | 102.00 | | | 64.44 | 64.44 | 152.00 | 102.00 | 84.36 | 80.64 |
| 5.6 | 152.00 | 102.00 | | | 62.88 | 62.88 | 152.00 | 102.00 | 85.56 | 83.16 |
| 5.7 | 152.00 | 102.00 | | | 61.44 | 61.44 | 152.00 | 102.00 | 86.64 | 85.44 |
| 5.8 | 152.00 | 102.00 | | | 60.24 | 60.24 | 152.00 | 102.00 | 87.60 | 87.24 |
| 5.9 | 152.00 | 102.00 | | | 59.04 | 59.04 | 152.00 | 102.00 | 88.32 | 88.32 |
| 6.0 | 152.00 | 102.00 | | | 58.08 | 58.08 | 152.00 | 102.00 | 88.92 | 88.92 |
| 6.1 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 89.40 | 89.40 |
| 6.2 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 89.88 | 89.88 |
| 6.3 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 90.36 | 90.00 |
| 6.4 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 90.84 | 90.00 |
| 6.5 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 91.32 | 90.00 |
| 6.6 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 91.80 | 90.00 |
| 6.7 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 92.28 | 90.00 |
| 6.8 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 92.76 | 90.00 |
| 6.9 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 93.24 | 90.00 |
| 7.0 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 93.72 | 90.00 |
| 7.1 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 94.20 | 90.00 |
| 7.2 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 94.80 | 90.00 |
| 7.3 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 95.28 | 90.00 |
| 7.4 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 95.88 | 90.00 |
| 7.5 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 96.36 | 90.00 |
| 7.6 | 152.00 | 102.00 | | | | | 152.00 | 102.00 | 96.96 | 90.00 |
| 7.7 | 152.00 | 102.00 | | | | | 168.00 | 102.00 | 97.44 | 90.00 |
| 7.8 | 152.00 | 102.00 | | | | | 168.00 | 102.00 | 98.00 | 90.00 |
| 7.9 | 152.00 | 90.00 | | | | | 110.28 | 90.00 | 98.00 | 90.00 |
| 8.0 | 98.00 | 90.00 | | | | | 106.32 | 90.00 | 98.00 | 90.00 |
| 8.1 | 98.00 | 90.00 | | | | | 102.24 | 90.00 | 98.00 | 90.00 |
| 8.2 | 98.00 | 90.00 | | | | | 98.52 | 90.00 | 98.00 | 90.00 |
| 8.3 | 98.00 | 90.00 | | | | | 95.04 | 90.00 | 98.00 | 90.00 |
| 8.4 | 98.00 | 90.00 | | | | | 91.80 | 90.00 | 98.00 | 90.00 |
| 8.5 | 98.00 | 90.00 | | | | | 88.92 | 88.92 | 98.00 | 90.00 |

-Slight variations in effective width from calcultions due to rounding. When value withing ~0.04", use tributary width.

Sheet: 16 of 53

Checked By: CDK

Checked on: 01/19/10

| | |
|------|----|
| er 4 | Gi |
|------|----|

-Slight variations in effective width from calculations due to rounding.
When value withing $\sim 0.04''$, use tributary width.

| Project: Special Structures Rating | | | | | | | | | | | | Sheet: 17 of 53 | |
|------------------------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|--|----------------------|--|
| LHB Proj. No. - 090147.00 | | | | | | | | | | | | Checked By: CDK | |
| Completed By: CIM | | | | | | | | | | | | Checked on: 01/19/10 | |
| Completed on: 11/18/09 | | | | | | | | | | | | | |
| Span Point | Girder 6 | | Girder 7 | | Girder 8 | | Girder 9 | | Girder 10 | | | | |
| | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | | | |
| 1.0 | 54.24 | 54.24 | 53.28 | 53.28 | 56.52 | 56.52 | 84.84 | 84.84 | 86.52 | 85.92 | | | |
| 1.1 | 55.08 | 55.08 | 54.72 | 54.72 | 58.08 | 58.08 | 84.48 | 84.48 | 86.88 | 85.80 | | | |
| 1.2 | 55.92 | 55.92 | 56.16 | 56.16 | 60.12 | 60.12 | 84.24 | 84.24 | 87.24 | 86.40 | | | |
| 1.3 | 56.76 | 56.76 | 57.84 | 57.84 | 62.40 | 62.40 | 84.12 | 84.12 | 87.60 | 87.12 | | | |
| 1.4 | 57.60 | 57.60 | 59.52 | 59.52 | 65.04 | 65.04 | 84.00 | 84.00 | 87.96 | 87.84 | | | |
| 1.5 | 58.44 | 58.44 | 61.20 | 61.20 | 68.16 | 68.16 | 84.00 | 84.00 | 88.20 | 88.20 | | | |
| 1.6 | 59.28 | 59.28 | 63.00 | 63.00 | 71.52 | 71.52 | 84.12 | 84.12 | 88.56 | 88.56 | | | |
| 1.7 | 60.12 | 60.12 | 64.92 | 64.92 | 75.24 | 75.24 | 84.36 | 84.36 | 88.92 | 88.92 | | | |
| 1.8 | 60.96 | 60.96 | 66.96 | 66.96 | 79.44 | 79.44 | 84.60 | 84.60 | 89.16 | 89.16 | | | |
| 1.9 | 61.80 | 61.80 | 68.88 | 68.88 | 84.00 | 84.00 | 84.96 | 84.96 | 89.52 | 89.52 | | | |
| 2.0 | 62.64 | 62.64 | 71.04 | 71.04 | 88.20 | 88.20 | 85.44 | 85.44 | 89.76 | 89.76 | | | |
| 2.1 | 66.84 | 66.84 | 74.76 | 74.76 | 93.96 | 75.00 | 86.04 | 86.04 | 90.24 | 90.24 | | | |
| 2.2 | 70.80 | 70.80 | 78.72 | 78.72 | 101.52 | 76.80 | 86.88 | 86.88 | 90.60 | 90.60 | | | |
| 2.3 | 74.40 | 74.40 | 82.80 | 82.80 | 83.40 | 78.72 | 87.84 | 87.84 | 90.96 | 90.96 | | | |
| 2.4 | 77.64 | 77.64 | 87.12 | 87.12 | 84.36 | 80.64 | 89.04 | 89.04 | 91.32 | 91.32 | | | |
| 2.5 | 80.64 | 80.64 | 91.68 | 91.68 | 85.32 | 82.56 | 90.24 | 90.24 | 91.68 | 91.68 | | | |
| 2.6 | 83.16 | 83.16 | 96.36 | 93.00 | 86.16 | 84.48 | 91.68 | 91.68 | 91.92 | 91.92 | | | |
| 2.7 | 85.44 | 85.44 | 101.28 | 93.00 | 87.12 | 86.28 | 93.12 | 93.00 | 92.28 | 92.28 | | | |
| 2.8 | 87.24 | 87.24 | 106.32 | 93.00 | 88.08 | 88.08 | 94.80 | 93.00 | 92.64 | 92.64 | | | |
| 2.9 | 88.80 | 88.80 | 82.68 | 82.68 | 89.04 | 89.04 | 96.60 | 93.00 | 92.88 | 92.88 | | | |
| 3.0 | 89.88 | 89.88 | 85.80 | 85.80 | 90.00 | 90.00 | 98.52 | 93.00 | 93.12 | 93.00 | | | |
| 3.1 | 90.84 | 90.00 | 88.92 | 88.92 | 91.08 | 90.00 | 100.32 | 93.00 | 93.48 | 93.00 | | | |
| 3.2 | 91.80 | 90.00 | 63.60 | 63.60 | 92.16 | 90.00 | 102.36 | 93.00 | 93.60 | 93.00 | | | |
| 3.3 | 92.76 | 90.00 | 66.60 | 66.60 | 93.24 | 90.00 | 78.72 | 78.72 | 93.84 | 93.00 | | | |
| 3.4 | 93.72 | 90.00 | 69.96 | 69.96 | 94.32 | 90.00 | 81.60 | 81.60 | 94.08 | 93.00 | | | |
| 3.5 | 94.68 | 90.00 | 73.56 | 73.56 | 95.40 | 90.00 | 84.24 | 84.24 | 94.32 | 93.00 | | | |
| 3.6 | 95.64 | 90.00 | 77.52 | 77.52 | 96.48 | 90.00 | 86.88 | 86.88 | 94.44 | 93.00 | | | |
| 3.7 | 96.48 | 90.00 | 81.84 | 81.84 | 97.44 | 90.00 | 89.28 | 89.28 | 94.68 | 93.00 | | | |
| 3.8 | 97.44 | 90.00 | 86.52 | 86.52 | 98.00 | 90.00 | 91.56 | 91.56 | 94.80 | 93.00 | | | |
| 3.9 | 98.40 | 90.00 | 91.44 | 91.44 | 98.00 | 90.00 | 93.72 | 93.00 | 95.04 | 93.00 | | | |
| 4.0 | 99.48 | 90.00 | 96.72 | 93.00 | 98.00 | 90.00 | 95.64 | 93.00 | 95.16 | 93.00 | | | |
| 4.1 | 100.44 | 90.00 | 103.20 | 90.00 | 98.00 | 90.00 | 98.04 | 93.00 | 95.40 | 93.00 | | | |
| 4.2 | 101.52 | 90.00 | 109.68 | 90.00 | 98.00 | 90.00 | 100.08 | 93.00 | 95.52 | 93.00 | | | |
| 4.3 | 102.12 | 90.00 | 90.36 | 90.00 | 98.00 | 90.00 | 101.88 | 93.00 | 95.76 | 93.00 | | | |
| 4.4 | 103.68 | 90.00 | 90.84 | 90.00 | 98.00 | 90.00 | 103.32 | 93.00 | 96.00 | 93.00 | | | |
| 4.5 | 104.76 | 90.00 | 91.32 | 90.00 | 98.00 | 90.00 | 104.52 | 93.00 | 96.12 | 93.00 | | | |
| 4.6 | 105.84 | 90.00 | 91.80 | 90.00 | 98.00 | 90.00 | 105.48 | 93.00 | 96.24 | 93.00 | | | |
| 4.7 | 106.92 | 90.00 | 92.28 | 90.00 | 98.00 | 90.00 | 106.08 | 93.00 | 96.48 | 93.00 | | | |
| 4.8 | 108.00 | 90.00 | 92.76 | 90.00 | 98.00 | 90.00 | 106.32 | 93.00 | 96.60 | 93.00 | | | |
| 4.9 | 108.00 | 90.00 | 93.24 | 90.00 | 98.00 | 90.00 | 106.56 | 93.00 | 96.72 | 93.00 | | | |
| 5.0 | 108.00 | 90.00 | 93.72 | 90.00 | 98.00 | 90.00 | 107.40 | 93.00 | 96.84 | 93.00 | | | |
| 5.1 | 108.00 | 90.00 | 94.20 | 90.00 | 98.00 | 90.00 | 108.48 | 93.00 | 96.96 | 93.00 | | | |
| 5.2 | 108.00 | 90.00 | 94.80 | 90.00 | 98.00 | 90.00 | 82.08 | 82.08 | 97.20 | 93.00 | | | |
| 5.3 | 108.00 | 90.00 | 95.28 | 90.00 | 98.00 | 90.00 | 83.16 | 83.16 | 97.32 | 93.00 | | | |
| 5.4 | 108.00 | 90.00 | 95.88 | 90.00 | 98.00 | 90.00 | 84.12 | 84.12 | 97.32 | 93.00 | | | |
| 5.5 | 108.00 | 90.00 | 96.36 | 90.00 | 98.00 | 90.00 | 85.20 | 85.20 | 97.44 | 93.00 | | | |
| 5.6 | 108.00 | 90.00 | 96.96 | 90.00 | 98.00 | 90.00 | 86.28 | 86.28 | 97.56 | 93.00 | | | |
| 5.7 | 108.00 | 90.00 | 97.44 | 90.00 | 98.00 | 90.00 | 87.36 | 87.36 | 97.68 | 93.00 | | | |
| 5.8 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 88.44 | 88.44 | 97.68 | 93.00 | | | |
| 5.9 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 89.52 | 89.52 | 97.80 | 93.00 | | | |
| 6.0 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 90.60 | 90.00 | 97.80 | 90.00 | | | |
| 6.1 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 91.56 | 90.00 | 98.00 | 90.00 | | | |
| 6.2 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 92.52 | 90.00 | 98.00 | 90.00 | | | |
| 6.3 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 93.48 | 90.00 | 98.00 | 90.00 | | | |
| 6.4 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 94.44 | 90.00 | 98.00 | 90.00 | | | |
| 6.5 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 95.40 | 90.00 | 98.00 | 90.00 | | | |
| 6.6 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 96.24 | 90.00 | 98.00 | 90.00 | | | |
| 6.7 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 97.20 | 90.00 | 98.00 | 90.00 | | | |
| 6.8 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 98.16 | 90.00 | 98.00 | 90.00 | | | |
| 6.9 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 99.12 | 90.00 | 98.00 | 90.00 | | | |
| 7.0 | 107.40 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 99.96 | 90.00 | 98.00 | 90.00 | | | |
| 7.1 | 106.56 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 101.04 | 90.00 | 98.00 | 90.00 | | | |
| 7.2 | 105.36 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 102.12 | 90.00 | 98.00 | 90.00 | | | |
| 7.3 | 103.92 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 103.20 | 90.00 | 98.00 | 90.00 | | | |
| 7.4 | 102.24 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 104.28 | 90.00 | 98.00 | 90.00 | | | |
| 7.5 | 100.20 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 105.36 | 90.00 | 98.00 | 90.00 | | | |
| 7.6 | 97.92 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 106.44 | 90.00 | 98.00 | 90.00 | | | |
| 7.7 | 95.40 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 107.52 | 90.00 | 98.00 | 90.00 | | | |
| 7.8 | 92.52 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 7.9 | 89.40 | 89.40 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.0 | 85.92 | 85.92 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.1 | 82.32 | 82.32 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.2 | 102.60 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.3 | 99.36 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.4 | 96.48 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.5 | 93.96 | 90.00 | 98.00 | 90.00 | 98.00 | 90.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |

-Slight variations in effective width from calculations due to rounding. When value withing ~0.04", use tributary width.

| Project: Special Structures Rating | | | | | | | | | | Sheet: 18 of 33 | | | |
|------------------------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|--|--|--|
| LHB Proj. No. - 090147.00 | | | | | | | | | | Checked By: CDK | | | |
| Completed By: CJM | | | | | | | | | | Checked on: 01/19/10 | | | |
| Completed on: 11/18/09 | | | | | | | | | | | | | |
| Span Point | Girder 6 | | Girder 7 | | Girder 8 | | Girder 9 | | Girder 10 | | | | |
| | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | Tributay Width (in) | Effective Width (in) | | | |
| 8.6 | 91.68 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.7 | 89.76 | 89.76 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.8 | 88.20 | 88.20 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 8.9 | 86.88 | 86.88 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.0 | 117.72 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.1 | 113.16 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.2 | 109.56 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.3 | 105.84 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.4 | 102.12 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.5 | 97.80 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.6 | 92.52 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.7 | 87.84 | 87.84 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.8 | 83.76 | 83.76 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 9.9 | 80.40 | 80.40 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.0 | 78.36 | 78.36 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.1 | 77.28 | 77.28 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.2 | 76.80 | 76.80 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.3 | 76.80 | 76.80 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.4 | 77.28 | 77.28 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.5 | 78.36 | 78.36 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.6 | 79.80 | 79.80 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.7 | 81.84 | 81.84 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.8 | 111.24 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 10.9 | 110.16 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.0 | 109.32 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.1 | 108.60 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.2 | 108.24 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.3 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.4 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.5 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.6 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.7 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.8 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 11.9 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 90.00 | 98.00 | 90.00 | | | |
| 12.0 | 108.00 | 90.00 | 98.00 | 90.00 | 98.00 | 98.00 | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.1 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.2 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.3 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.4 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.5 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.6 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.7 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.8 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 12.9 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.0 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.1 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.2 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.3 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.4 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.5 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.6 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.7 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.8 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 13.9 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.0 | 108.00 | 90.00 | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.1 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.2 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.3 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.4 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.5 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.6 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.7 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.8 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 14.9 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.0 | | | 98.00 | 90.00 | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.1 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.2 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.3 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.4 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.5 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.6 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.7 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.8 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 15.9 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |
| 16.0 | | | | | | | 108.00 | 99.00 | 98.00 | 98.00 | | | |

-Slight variations in effective width from calculations due to rounding. When value withing ~0.04", use tributary width.

Project: Special Structures Rating

Sheet: 19 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/14/10

Composite Dead Load - Girder 1

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 1.0 | 426.0 | 5.0 | 639.0 | 9.0 | 224.3 | 13.0 | 426.1 |
| 1.1 | 426.0 | 5.1 | 639.0 | 9.1 | 220.3 | 13.1 | 426.0 |
| 1.2 | 426.0 | 5.2 | 639.0 | 9.2 | 264.4 | 13.2 | 426.0 |
| 1.3 | 426.0 | 5.3 | 639.0 | 9.3 | 264.4 | 13.3 | 426.0 |
| 1.4 | 426.0 | 5.4 | 639.0 | 9.4 | 264.4 | 13.4 | 426.0 |
| 1.5 | 426.0 | 5.5 | 639.0 | 9.5 | 264.4 | 13.5 | 426.0 |
| 1.6 | 426.0 | 5.6 | 639.0 | 9.6 | 264.4 | 13.6 | 426.0 |
| 1.7 | 426.0 | 5.7 | 639.0 | 9.7 | 264.4 | 13.7 | 426.0 |
| 1.8 | 426.0 | 5.8 | 639.0 | 9.8 | 264.4 | 13.8 | 426.0 |
| 1.9 | 426.0 | 5.9 | 639.0 | 9.9 | 264.4 | 13.9 | 426.0 |
| 2.0 | 426.0 | 6.0 | 639.0 | 10.0 | 324.7 | 14.0 | 426.0 |
| 2.1 | 426.0 | 6.1 | 639.0 | 10.1 | 324.7 | 14.1 | 426.0 |
| 2.2 | 426.0 | 6.2 | 639.0 | 10.2 | 324.7 | 14.2 | 426.0 |
| 2.3 | 426.0 | 6.3 | 639.0 | 10.3 | 324.7 | 14.3 | 426.0 |
| 2.4 | 426.0 | 6.4 | 639.0 | 10.4 | 324.7 | 14.4 | 426.0 |
| 2.5 | 426.0 | 6.5 | 639.0 | 10.5 | 324.7 | 14.5 | 426.0 |
| 2.6 | 426.0 | 6.6 | 639.0 | 10.6 | 324.7 | 14.6 | 426.0 |
| 2.7 | 426.0 | 6.7 | 639.0 | 10.7 | 324.7 | 14.7 | 426.0 |
| 2.8 | 426.0 | 6.8 | 639.0 | 10.8 | 324.7 | 14.8 | 426.0 |
| 2.9 | 426.0 | 6.9 | 639.0 | 10.9 | 324.7 | 14.9 | 426.0 |
| 3.0 | 426.0 | 7.0 | 639.0 | 11.0 | 324.7 | 15.0 | 426.0 |
| 3.1 | 426.0 | 7.1 | 639.0 | 11.1 | 320.8 | | |
| 3.2 | 426.0 | 7.2 | 639.0 | 11.2 | 320.8 | | |
| 3.3 | 426.0 | 7.3 | 639.0 | 11.3 | 320.8 | | |
| 3.4 | 426.0 | 7.4 | 639.0 | 11.4 | 320.8 | | |
| 3.5 | 426.0 | 7.5 | 639.0 | 11.5 | 320.8 | | |
| 3.6 | 426.0 | 7.6 | 639.0 | 11.6 | 320.8 | | |
| 3.7 | 426.0 | 7.7 | 639.0 | 11.7 | 427.8 | | |
| 3.8 | 639.0 | 7.8 | 639.0 | 11.8 | 427.8 | | |
| 3.9 | 639.0 | 7.9 | 426.0 | 11.9 | 427.8 | | |
| 4.0 | 639.0 | 8.0 | 426.0 | 12.0 | 427.8 | | |
| 4.1 | 639.0 | 8.1 | 224.3 | 12.1 | 426.1 | | |
| 4.2 | 639.0 | 8.2 | 224.3 | 12.2 | 426.1 | | |
| 4.3 | 639.0 | 8.3 | 224.3 | 12.3 | 426.1 | | |
| 4.4 | 639.0 | 8.4 | 224.3 | 12.4 | 426.1 | | |
| 4.5 | 639.0 | 8.5 | 224.3 | 12.5 | 426.1 | | |
| 4.6 | 639.0 | 8.6 | 224.3 | 12.6 | 426.1 | | |
| 4.7 | 639.0 | 8.7 | 224.3 | 12.7 | 426.1 | | |
| 4.8 | 639.0 | 8.8 | 224.3 | 12.8 | 426.1 | | |
| 4.9 | 639.0 | 8.9 | 224.3 | 12.9 | 426.1 | | |

Project: Special Structures Rating

Sheet: 20 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/14/10

Composite Dead Load

| Girder 2 | | Girder 3 | | | |
|------------|------------|------------|------------|------------|------------|
| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
| 1.0 | 426.0 | 1.0 | 426.0 | 5.0 | 324.7 |
| 1.1 | 426.0 | 1.1 | 426.0 | 5.1 | 320.8 |
| 1.2 | 426.0 | 1.2 | 426.0 | 5.2 | 320.8 |
| 1.3 | 426.0 | 1.3 | 426.0 | 5.3 | 320.8 |
| 1.4 | 426.0 | 1.4 | 426.0 | 5.4 | 320.8 |
| 1.5 | 426.0 | 1.5 | 426.0 | 5.5 | 320.8 |
| 1.6 | 426.0 | 1.6 | 426.0 | 5.6 | 320.8 |
| 1.7 | 426.0 | 1.7 | 426.0 | 5.7 | 320.8 |
| 1.8 | 426.0 | 1.8 | 426.0 | 5.8 | 320.8 |
| 1.9 | 426.0 | 1.9 | 426.0 | 5.9 | 320.8 |
| 2.0 | 426.0 | 2.0 | 426.0 | 6.0 | 320.8 |
| 2.1 | 426.0 | 2.1 | 224.3 | | |
| 2.2 | 426.0 | 2.2 | 224.3 | | |
| 2.3 | 426.0 | 2.3 | 224.3 | | |
| 2.4 | 426.0 | 2.4 | 224.3 | | |
| 2.5 | 426.0 | 2.5 | 224.3 | | |
| 2.6 | 426.0 | 2.6 | 224.3 | | |
| 2.7 | 426.0 | 2.7 | 224.3 | | |
| 2.8 | 426.0 | 2.8 | 224.3 | | |
| 2.9 | 426.0 | 2.9 | 224.3 | | |
| 3.0 | 426.0 | 3.0 | 224.3 | | |
| 3.1 | 426.0 | 3.1 | 220.3 | | |
| 3.2 | 426.0 | 3.2 | 264.4 | | |
| 3.3 | 426.0 | 3.3 | 264.4 | | |
| 3.4 | 426.0 | 3.4 | 264.4 | | |
| 3.5 | 426.0 | 3.5 | 264.4 | | |
| 3.6 | 426.0 | 3.6 | 264.4 | | |
| 3.7 | 426.0 | 3.7 | 264.4 | | |
| 3.8 | 426.0 | 3.8 | 264.4 | | |
| 3.9 | 426.0 | 3.9 | 264.4 | | |
| 4.0 | 426.0 | 4.0 | 324.7 | | |
| | | 4.1 | 324.7 | | |
| | | 4.2 | 324.7 | | |
| | | 4.3 | 324.7 | | |
| | | 4.4 | 324.7 | | |
| | | 4.5 | 324.7 | | |
| | | 4.6 | 324.7 | | |
| | | 4.7 | 324.7 | | |
| | | 4.8 | 324.7 | | |
| | | 4.9 | 324.7 | | |

Project: Special Structures Rating

Sheet: 21 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/14/10

Composite Dead Load - Girder 4

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|
| 1.0 | 426.0 | 5.0 | 639.0 | 9.0 | 224.3 |
| 1.1 | 426.0 | 5.1 | 639.0 | 9.1 | 220.3 |
| 1.2 | 426.0 | 5.2 | 639.0 | 9.2 | 264.4 |
| 1.3 | 426.0 | 5.3 | 639.0 | 9.3 | 264.4 |
| 1.4 | 426.0 | 5.4 | 639.0 | 9.4 | 264.4 |
| 1.5 | 426.0 | 5.5 | 639.0 | 9.5 | 264.4 |
| 1.6 | 426.0 | 5.6 | 639.0 | 9.6 | 264.4 |
| 1.7 | 426.0 | 5.7 | 639.0 | 9.7 | 264.4 |
| 1.8 | 426.0 | 5.8 | 639.0 | 9.8 | 264.4 |
| 1.9 | 426.0 | 5.9 | 639.0 | 9.9 | 264.4 |
| 2.0 | 426.0 | 6.0 | 639.0 | 10.0 | 264.4 |
| 2.1 | 426.0 | 6.1 | 639.0 | | |
| 2.2 | 426.0 | 6.2 | 639.0 | | |
| 2.3 | 426.0 | 6.3 | 639.0 | | |
| 2.4 | 426.0 | 6.4 | 639.0 | | |
| 2.5 | 426.0 | 6.5 | 639.0 | | |
| 2.6 | 426.0 | 6.6 | 639.0 | | |
| 2.7 | 426.0 | 6.7 | 639.0 | | |
| 2.8 | 426.0 | 6.8 | 639.0 | | |
| 2.9 | 426.0 | 6.9 | 639.0 | | |
| 3.0 | 426.0 | 7.0 | 639.0 | | |
| 3.1 | 426.0 | 7.1 | 639.0 | | |
| 3.2 | 426.0 | 7.2 | 639.0 | | |
| 3.3 | 426.0 | 7.3 | 639.0 | | |
| 3.4 | 426.0 | 7.4 | 639.0 | | |
| 3.5 | 426.0 | 7.5 | 639.0 | | |
| 3.6 | 426.0 | 7.6 | 639.0 | | |
| 3.7 | 426.0 | 7.7 | 639.0 | | |
| 3.8 | 639.0 | 7.8 | 639.0 | | |
| 3.9 | 639.0 | 7.9 | 426.0 | | |
| 4.0 | 639.0 | 8.0 | 426.0 | | |
| 4.1 | 639.0 | 8.1 | 224.3 | | |
| 4.2 | 639.0 | 8.2 | 224.3 | | |
| 4.3 | 639.0 | 8.3 | 224.3 | | |
| 4.4 | 639.0 | 8.4 | 224.3 | | |
| 4.5 | 639.0 | 8.5 | 224.3 | | |
| 4.6 | 639.0 | 8.6 | 224.3 | | |
| 4.7 | 639.0 | 8.7 | 224.3 | | |
| 4.8 | 639.0 | 8.8 | 224.3 | | |
| 4.9 | 639.0 | 8.9 | 224.3 | | |

Project: Special Structures Rating

Sheet: 22 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/14/10

Composite Dead Load - Girder 5

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|
| 1.0 | 420.8 | 5.0 | 265.0 | 9.0 | 426.0 |
| 1.1 | 420.8 | 5.1 | 265.0 | 9.1 | 426.0 |
| 1.2 | 420.8 | 5.2 | 220.8 | 9.2 | 426.0 |
| 1.3 | 420.8 | 5.3 | 220.8 | 9.3 | 426.0 |
| 1.4 | 420.8 | 5.4 | 220.8 | 9.4 | 426.0 |
| 1.5 | 420.8 | 5.5 | 220.8 | 9.5 | 426.0 |
| 1.6 | 420.8 | 5.6 | 220.8 | 9.6 | 426.0 |
| 1.7 | 420.8 | 5.7 | 220.8 | 9.7 | 426.0 |
| 1.8 | 420.8 | 5.8 | 220.8 | 9.8 | 426.0 |
| 1.9 | 420.8 | 5.9 | 220.8 | 9.9 | 426.0 |
| 2.0 | 423.3 | 6.0 | 423.8 | 10.0 | 426.0 |
| 2.1 | 423.3 | 6.1 | 423.8 | 10.1 | 224.3 |
| 2.2 | 423.3 | 6.2 | 423.8 | 10.2 | 224.3 |
| 2.3 | 423.3 | 6.3 | 423.8 | 10.3 | 224.3 |
| 2.4 | 423.3 | 6.4 | 423.8 | 10.4 | 224.3 |
| 2.5 | 423.3 | 6.5 | 423.8 | 10.5 | 224.3 |
| 2.6 | 423.3 | 6.6 | 423.8 | 10.6 | 224.3 |
| 2.7 | 423.3 | 6.7 | 423.8 | 10.7 | 224.3 |
| 2.8 | 423.3 | 6.8 | 423.8 | 10.8 | 224.3 |
| 2.9 | 423.3 | 6.9 | 423.8 | 10.9 | 224.3 |
| 3.0 | 426.4 | 7.0 | 425.3 | 11.0 | 224.3 |
| 3.1 | 426.4 | 7.1 | 425.3 | 11.1 | 220.3 |
| 3.2 | 426.4 | 7.2 | 425.3 | 11.2 | 220.3 |
| 3.3 | 319.8 | 7.3 | 425.3 | 11.3 | 220.3 |
| 3.4 | 319.8 | 7.4 | 425.3 | 11.4 | 220.3 |
| 3.5 | 319.8 | 7.5 | 425.3 | 11.5 | 220.3 |
| 3.6 | 319.8 | 7.6 | 425.3 | 11.6 | 220.3 |
| 3.7 | 319.8 | 7.7 | 425.3 | 11.7 | 220.3 |
| 3.8 | 319.8 | 7.8 | 425.3 | 11.8 | 220.3 |
| 3.9 | 319.8 | 7.9 | 425.3 | 11.9 | 220.3 |
| 4.0 | 324.3 | 8.0 | 426.0 | 12.0 | 220.3 |
| 4.1 | 324.3 | 8.1 | 426.0 | | |
| 4.2 | 324.3 | 8.2 | 426.0 | | |
| 4.3 | 324.3 | 8.3 | 426.0 | | |
| 4.4 | 324.3 | 8.4 | 426.0 | | |
| 4.5 | 324.3 | 8.5 | 426.0 | | |
| 4.6 | 324.3 | 8.6 | 426.0 | | |
| 4.7 | 324.3 | 8.7 | 426.0 | | |
| 4.8 | 324.3 | 8.8 | 426.0 | | |
| 4.9 | 259.4 | 8.9 | 426.0 | | |

Project: Special Structures Rating

Sheet: 23 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Composite Dead Load - Girder 6

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 1.0 | 259.4 | 5.0 | 426.0 | 9.0 | 324.7 | 13.0 | 426.0 |
| 1.1 | 259.4 | 5.1 | 426.0 | 9.1 | 324.7 | 13.1 | 426.0 |
| 1.2 | 259.4 | 5.2 | 426.0 | 9.2 | 324.7 | 13.2 | 426.0 |
| 1.3 | 259.4 | 5.3 | 426.0 | 9.3 | 324.7 | 13.3 | 426.0 |
| 1.4 | 259.4 | 5.4 | 426.0 | 9.4 | 324.7 | 13.4 | 426.0 |
| 1.5 | 259.4 | 5.5 | 426.0 | 9.5 | 324.7 | 13.5 | 426.0 |
| 1.6 | 259.4 | 5.6 | 426.0 | 9.6 | 324.7 | 13.6 | 426.0 |
| 1.7 | 259.4 | 5.7 | 426.0 | 9.7 | 324.7 | 13.7 | 426.0 |
| 1.8 | 259.4 | 5.8 | 426.0 | 9.8 | 324.7 | 13.8 | 426.0 |
| 1.9 | 259.4 | 5.9 | 426.0 | 9.9 | 324.7 | 13.9 | 426.0 |
| 2.0 | 265.0 | 6.0 | 426.0 | 10.0 | 324.7 | 14.0 | 426.0 |
| 2.1 | 265.0 | 6.1 | 426.0 | 10.1 | 320.8 | | |
| 2.2 | 220.8 | 6.2 | 426.0 | 10.2 | 320.8 | | |
| 2.3 | 220.8 | 6.3 | 426.0 | 10.3 | 320.8 | | |
| 2.4 | 220.8 | 6.4 | 426.0 | 10.4 | 320.8 | | |
| 2.5 | 220.8 | 6.5 | 426.0 | 10.5 | 320.8 | | |
| 2.6 | 220.8 | 6.6 | 426.0 | 10.6 | 320.8 | | |
| 2.7 | 220.8 | 6.7 | 426.0 | 10.7 | 427.8 | | |
| 2.8 | 220.8 | 6.8 | 426.0 | 10.8 | 427.8 | | |
| 2.9 | 220.8 | 6.9 | 426.0 | 10.9 | 427.8 | | |
| 3.0 | 423.8 | 7.0 | 426.0 | 11.0 | 427.8 | | |
| 3.1 | 423.8 | 7.1 | 224.3 | 11.1 | 426.1 | | |
| 3.2 | 423.8 | 7.2 | 224.3 | 11.2 | 426.1 | | |
| 3.3 | 423.8 | 7.3 | 224.3 | 11.3 | 426.1 | | |
| 3.4 | 423.8 | 7.4 | 224.3 | 11.4 | 426.1 | | |
| 3.5 | 423.8 | 7.5 | 224.3 | 11.5 | 426.1 | | |
| 3.6 | 423.8 | 7.6 | 224.3 | 11.6 | 426.1 | | |
| 3.7 | 423.8 | 7.7 | 224.3 | 11.7 | 426.1 | | |
| 3.8 | 423.8 | 7.8 | 224.3 | 11.8 | 426.1 | | |
| 3.9 | 423.8 | 7.9 | 224.3 | 11.9 | 426.1 | | |
| 4.0 | 425.3 | 8.0 | 224.3 | 12.0 | 426.1 | | |
| 4.1 | 425.3 | 8.1 | 220.3 | 12.1 | 426.0 | | |
| 4.2 | 425.3 | 8.2 | 264.4 | 12.2 | 426.0 | | |
| 4.3 | 425.3 | 8.3 | 264.4 | 12.3 | 426.0 | | |
| 4.4 | 425.3 | 8.4 | 264.4 | 12.4 | 426.0 | | |
| 4.5 | 425.3 | 8.5 | 264.4 | 12.5 | 426.0 | | |
| 4.6 | 425.3 | 8.6 | 264.4 | 12.6 | 426.0 | | |
| 4.7 | 425.3 | 8.7 | 264.4 | 12.7 | 426.0 | | |
| 4.8 | 425.3 | 8.8 | 264.4 | 12.8 | 426.0 | | |
| 4.9 | 425.3 | 8.9 | 264.4 | 12.9 | 426.0 | | |

Project: Special Structures Rating

Sheet: 24 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Composite Dead Load - Girder 7

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 1.0 | 319.8 | 5.0 | 425.3 | 9.0 | 224.3 | 13.0 | 426.0 |
| 1.1 | 319.8 | 5.1 | 425.3 | 9.1 | 220.3 | 13.1 | 426.0 |
| 1.2 | 319.8 | 5.2 | 425.3 | 9.2 | 264.4 | 13.2 | 426.0 |
| 1.3 | 319.8 | 5.3 | 425.3 | 9.3 | 264.4 | 13.3 | 426.0 |
| 1.4 | 319.8 | 5.4 | 425.3 | 9.4 | 264.4 | 13.4 | 426.0 |
| 1.5 | 319.8 | 5.5 | 425.3 | 9.5 | 264.4 | 13.5 | 426.0 |
| 1.6 | 319.8 | 5.6 | 425.3 | 9.6 | 264.4 | 13.6 | 426.0 |
| 1.7 | 319.8 | 5.7 | 425.3 | 9.7 | 264.4 | 13.7 | 426.0 |
| 1.8 | 319.8 | 5.8 | 425.3 | 9.8 | 264.4 | 13.8 | 426.0 |
| 1.9 | 319.8 | 5.9 | 425.3 | 9.9 | 264.4 | 13.9 | 426.0 |
| 2.0 | 324.3 | 6.0 | 426.0 | 10.0 | 324.7 | 14.0 | 426.0 |
| 2.1 | 324.3 | 6.1 | 426.0 | 10.1 | 324.7 | 14.1 | 426.0 |
| 2.2 | 324.3 | 6.2 | 426.0 | 10.2 | 324.7 | 14.2 | 426.0 |
| 2.3 | 324.3 | 6.3 | 426.0 | 10.3 | 324.7 | 14.3 | 426.0 |
| 2.4 | 324.3 | 6.4 | 426.0 | 10.4 | 324.7 | 14.4 | 426.0 |
| 2.5 | 324.3 | 6.5 | 426.0 | 10.5 | 324.7 | 14.5 | 426.0 |
| 2.6 | 324.3 | 6.6 | 426.0 | 10.6 | 324.7 | 14.6 | 426.0 |
| 2.7 | 324.3 | 6.7 | 426.0 | 10.7 | 324.7 | 14.7 | 426.0 |
| 2.8 | 324.3 | 6.8 | 426.0 | 10.8 | 324.7 | 14.8 | 426.0 |
| 2.9 | 259.4 | 6.9 | 426.0 | 10.9 | 324.7 | 14.9 | 426.0 |
| 3.0 | 265.0 | 7.0 | 426.0 | 11.0 | 324.7 | 15.0 | 426.0 |
| 3.1 | 265.0 | 7.1 | 426.0 | 11.1 | 320.8 | | |
| 3.2 | 220.8 | 7.2 | 426.0 | 11.2 | 320.8 | | |
| 3.3 | 220.8 | 7.3 | 426.0 | 11.3 | 320.8 | | |
| 3.4 | 220.8 | 7.4 | 426.0 | 11.4 | 320.8 | | |
| 3.5 | 220.8 | 7.5 | 426.0 | 11.5 | 320.8 | | |
| 3.6 | 220.8 | 7.6 | 426.0 | 11.6 | 320.8 | | |
| 3.7 | 220.8 | 7.7 | 426.0 | 11.7 | 427.8 | | |
| 3.8 | 220.8 | 7.8 | 426.0 | 11.8 | 427.8 | | |
| 3.9 | 220.8 | 7.9 | 426.0 | 11.9 | 427.8 | | |
| 4.0 | 423.8 | 8.0 | 426.0 | 12.0 | 427.8 | | |
| 4.1 | 423.8 | 8.1 | 224.3 | 12.1 | 426.1 | | |
| 4.2 | 423.8 | 8.2 | 224.3 | 12.2 | 426.1 | | |
| 4.3 | 423.8 | 8.3 | 224.3 | 12.3 | 426.1 | | |
| 4.4 | 423.8 | 8.4 | 224.3 | 12.4 | 426.1 | | |
| 4.5 | 423.8 | 8.5 | 224.3 | 12.5 | 426.1 | | |
| 4.6 | 423.8 | 8.6 | 224.3 | 12.6 | 426.1 | | |
| 4.7 | 423.8 | 8.7 | 224.3 | 12.7 | 426.1 | | |
| 4.8 | 423.8 | 8.8 | 224.3 | 12.8 | 426.1 | | |
| 4.9 | 423.8 | 8.9 | 224.3 | 12.9 | 426.1 | | |

Project: Special Structures Rating

Sheet: 25 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Composite Dead Load - Girder 8

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|
| 1.0 | 220.8 | 5.0 | 426.0 | 9.0 | 426.0 |
| 1.1 | 220.8 | 5.1 | 426.0 | 9.1 | 426.0 |
| 1.2 | 220.8 | 5.2 | 426.0 | 9.2 | 426.0 |
| 1.3 | 220.8 | 5.3 | 426.0 | 9.3 | 426.0 |
| 1.4 | 220.8 | 5.4 | 426.0 | 9.4 | 426.0 |
| 1.5 | 220.8 | 5.5 | 426.0 | 9.5 | 426.0 |
| 1.6 | 220.8 | 5.6 | 426.0 | 9.6 | 426.0 |
| 1.7 | 220.8 | 5.7 | 426.0 | 9.7 | 426.0 |
| 1.8 | 220.8 | 5.8 | 426.0 | 9.8 | 426.0 |
| 1.9 | 220.8 | 5.9 | 426.0 | 9.9 | 426.0 |
| 2.0 | 424.1 | 6.0 | 426.0 | 10.0 | 426.0 |
| 2.1 | 424.1 | 6.1 | 426.0 | 10.1 | 426.0 |
| 2.2 | 424.1 | 6.2 | 426.0 | 10.2 | 426.0 |
| 2.3 | 424.1 | 6.3 | 426.0 | 10.3 | 426.0 |
| 2.4 | 424.1 | 6.4 | 426.0 | 10.4 | 426.0 |
| 2.5 | 424.1 | 6.5 | 426.0 | 10.5 | 426.0 |
| 2.6 | 424.1 | 6.6 | 426.0 | 10.6 | 426.0 |
| 2.7 | 424.1 | 6.7 | 426.0 | 10.7 | 426.0 |
| 2.8 | 424.1 | 6.8 | 426.0 | 10.8 | 426.0 |
| 2.9 | 424.1 | 6.9 | 426.0 | 10.9 | 426.0 |
| 3.0 | 425.3 | 7.0 | 426.0 | 11.0 | 426.0 |
| 3.1 | 425.3 | 7.1 | 426.0 | 11.1 | 426.0 |
| 3.2 | 425.3 | 7.2 | 426.0 | 11.2 | 426.0 |
| 3.3 | 425.3 | 7.3 | 426.0 | 11.3 | 426.0 |
| 3.4 | 425.3 | 7.4 | 426.0 | 11.4 | 426.0 |
| 3.5 | 425.3 | 7.5 | 426.0 | 11.5 | 426.0 |
| 3.6 | 425.3 | 7.6 | 426.0 | 11.6 | 426.0 |
| 3.7 | 425.3 | 7.7 | 426.0 | 11.7 | 426.0 |
| 3.8 | 425.3 | 7.8 | 426.0 | 11.8 | 426.0 |
| 3.9 | 425.3 | 7.9 | 426.0 | 11.9 | 426.0 |
| 4.0 | 426.0 | 8.0 | 426.0 | 12.0 | 426.0 |
| 4.1 | 426.0 | 8.1 | 426.0 | | |
| 4.2 | 426.0 | 8.2 | 426.0 | | |
| 4.3 | 426.0 | 8.3 | 426.0 | | |
| 4.4 | 426.0 | 8.4 | 426.0 | | |
| 4.5 | 426.0 | 8.5 | 426.0 | | |
| 4.6 | 426.0 | 8.6 | 426.0 | | |
| 4.7 | 426.0 | 8.7 | 426.0 | | |
| 4.8 | 426.0 | 8.8 | 426.0 | | |
| 4.9 | 426.0 | 8.9 | 426.0 | | |

Project: Special Structures Rating

Sheet: 26 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Composite Dead Load - Girder 9

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 1.0 | 420.8 | 5.0 | 265.0 | 9.0 | 426.0 | 13.0 | 426.0 |
| 1.1 | 420.8 | 5.1 | 265.0 | 9.1 | 426.0 | 13.1 | 426.0 |
| 1.2 | 420.8 | 5.2 | 220.8 | 9.2 | 426.0 | 13.2 | 426.0 |
| 1.3 | 420.8 | 5.3 | 220.8 | 9.3 | 426.0 | 13.3 | 426.0 |
| 1.4 | 420.8 | 5.4 | 220.8 | 9.4 | 426.0 | 13.4 | 426.0 |
| 1.5 | 420.8 | 5.5 | 220.8 | 9.5 | 426.0 | 13.5 | 426.0 |
| 1.6 | 420.8 | 5.6 | 220.8 | 9.6 | 426.0 | 13.6 | 426.0 |
| 1.7 | 420.8 | 5.7 | 220.8 | 9.7 | 426.0 | 13.7 | 426.0 |
| 1.8 | 420.8 | 5.8 | 220.8 | 9.8 | 426.0 | 13.8 | 426.0 |
| 1.9 | 420.8 | 5.9 | 220.8 | 9.9 | 426.0 | 13.9 | 426.0 |
| 2.0 | 423.3 | 6.0 | 424.1 | 10.0 | 426.0 | 14.0 | 426.0 |
| 2.1 | 423.3 | 6.1 | 424.1 | 10.1 | 426.0 | 14.1 | 426.0 |
| 2.2 | 423.3 | 6.2 | 424.1 | 10.2 | 426.0 | 14.2 | 426.0 |
| 2.3 | 423.3 | 6.3 | 424.1 | 10.3 | 426.0 | 14.3 | 426.0 |
| 2.4 | 423.3 | 6.4 | 424.1 | 10.4 | 426.0 | 14.4 | 426.0 |
| 2.5 | 423.3 | 6.5 | 424.1 | 10.5 | 426.0 | 14.5 | 426.0 |
| 2.6 | 423.3 | 6.6 | 424.1 | 10.6 | 426.0 | 14.6 | 426.0 |
| 2.7 | 423.3 | 6.7 | 424.1 | 10.7 | 426.0 | 14.7 | 426.0 |
| 2.8 | 423.3 | 6.8 | 424.1 | 10.8 | 426.0 | 14.8 | 426.0 |
| 2.9 | 423.3 | 6.9 | 424.1 | 10.9 | 426.0 | 14.9 | 426.0 |
| 3.0 | 426.4 | 7.0 | 425.3 | 11.0 | 426.0 | 15.0 | 426.0 |
| 3.1 | 426.4 | 7.1 | 425.3 | 11.1 | 426.0 | 15.1 | 426.0 |
| 3.2 | 426.4 | 7.2 | 425.3 | 11.2 | 426.0 | 15.2 | 426.0 |
| 3.3 | 319.8 | 7.3 | 425.3 | 11.3 | 426.0 | 15.3 | 426.0 |
| 3.4 | 319.8 | 7.4 | 425.3 | 11.4 | 426.0 | 15.4 | 426.0 |
| 3.5 | 319.8 | 7.5 | 425.3 | 11.5 | 426.0 | 15.5 | 426.0 |
| 3.6 | 319.8 | 7.6 | 425.3 | 11.6 | 426.0 | 15.6 | 426.0 |
| 3.7 | 319.8 | 7.7 | 425.3 | 11.7 | 426.0 | 15.7 | 426.0 |
| 3.8 | 319.8 | 7.8 | 425.3 | 11.8 | 426.0 | 15.8 | 426.0 |
| 3.9 | 319.8 | 7.9 | 425.3 | 11.9 | 426.0 | 15.9 | 426.0 |
| 4.0 | 324.3 | 8.0 | 426.0 | 12.0 | 426.0 | 16.0 | 426.0 |
| 4.1 | 324.3 | 8.1 | 426.0 | 12.1 | 426.0 | | |
| 4.2 | 324.3 | 8.2 | 426.0 | 12.2 | 426.0 | | |
| 4.3 | 324.3 | 8.3 | 426.0 | 12.3 | 426.0 | | |
| 4.4 | 324.3 | 8.4 | 426.0 | 12.4 | 426.0 | | |
| 4.5 | 324.3 | 8.5 | 426.0 | 12.5 | 426.0 | | |
| 4.6 | 324.3 | 8.6 | 426.0 | 12.6 | 426.0 | | |
| 4.7 | 324.3 | 8.7 | 426.0 | 12.7 | 426.0 | | |
| 4.8 | 324.3 | 8.8 | 426.0 | 12.8 | 426.0 | | |
| 4.9 | 259.4 | 8.9 | 426.0 | 12.9 | 426.0 | | |

Project: Special Structures Rating

Sheet: 27 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Composite Dead Load - Girder 10

| Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) | Span Point | Load (PLF) |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 1.0 | 420.8 | 5.0 | 265.0 | 9.0 | 426.0 | 13.0 | 426.0 |
| 1.1 | 420.8 | 5.1 | 265.0 | 9.1 | 426.0 | 13.1 | 426.0 |
| 1.2 | 420.8 | 5.2 | 220.8 | 9.2 | 426.0 | 13.2 | 426.0 |
| 1.3 | 420.8 | 5.3 | 220.8 | 9.3 | 426.0 | 13.3 | 426.0 |
| 1.4 | 420.8 | 5.4 | 220.8 | 9.4 | 426.0 | 13.4 | 426.0 |
| 1.5 | 420.8 | 5.5 | 220.8 | 9.5 | 426.0 | 13.5 | 426.0 |
| 1.6 | 420.8 | 5.6 | 220.8 | 9.6 | 426.0 | 13.6 | 426.0 |
| 1.7 | 420.8 | 5.7 | 220.8 | 9.7 | 426.0 | 13.7 | 426.0 |
| 1.8 | 420.8 | 5.8 | 220.8 | 9.8 | 426.0 | 13.8 | 426.0 |
| 1.9 | 420.8 | 5.9 | 220.8 | 9.9 | 426.0 | 13.9 | 426.0 |
| 2.0 | 423.3 | 6.0 | 424.1 | 10.0 | 426.0 | 14.0 | 426.0 |
| 2.1 | 423.3 | 6.1 | 424.1 | 10.1 | 426.0 | 14.1 | 426.0 |
| 2.2 | 423.3 | 6.2 | 424.1 | 10.2 | 426.0 | 14.2 | 426.0 |
| 2.3 | 423.3 | 6.3 | 424.1 | 10.3 | 426.0 | 14.3 | 426.0 |
| 2.4 | 423.3 | 6.4 | 424.1 | 10.4 | 426.0 | 14.4 | 426.0 |
| 2.5 | 423.3 | 6.5 | 424.1 | 10.5 | 426.0 | 14.5 | 426.0 |
| 2.6 | 423.3 | 6.6 | 424.1 | 10.6 | 426.0 | 14.6 | 426.0 |
| 2.7 | 423.3 | 6.7 | 424.1 | 10.7 | 426.0 | 14.7 | 426.0 |
| 2.8 | 423.3 | 6.8 | 424.1 | 10.8 | 426.0 | 14.8 | 426.0 |
| 2.9 | 423.3 | 6.9 | 424.1 | 10.9 | 426.0 | 14.9 | 426.0 |
| 3.0 | 426.4 | 7.0 | 425.3 | 11.0 | 426.0 | 15.0 | 426.0 |
| 3.1 | 426.4 | 7.1 | 425.3 | 11.1 | 426.0 | 15.1 | 426.0 |
| 3.2 | 426.4 | 7.2 | 425.3 | 11.2 | 426.0 | 15.2 | 426.0 |
| 3.3 | 319.8 | 7.3 | 425.3 | 11.3 | 426.0 | 15.3 | 426.0 |
| 3.4 | 319.8 | 7.4 | 425.3 | 11.4 | 426.0 | 15.4 | 426.0 |
| 3.5 | 319.8 | 7.5 | 425.3 | 11.5 | 426.0 | 15.5 | 426.0 |
| 3.6 | 319.8 | 7.6 | 425.3 | 11.6 | 426.0 | 15.6 | 426.0 |
| 3.7 | 319.8 | 7.7 | 425.3 | 11.7 | 426.0 | 15.7 | 426.0 |
| 3.8 | 319.8 | 7.8 | 425.3 | 11.8 | 426.0 | 15.8 | 426.0 |
| 3.9 | 319.8 | 7.9 | 425.3 | 11.9 | 426.0 | 15.9 | 426.0 |
| 4.0 | 324.3 | 8.0 | 426.0 | 12.0 | 426.0 | 16.0 | 426.0 |
| 4.1 | 324.3 | 8.1 | 426.0 | 12.1 | 426.0 | | |
| 4.2 | 324.3 | 8.2 | 426.0 | 12.2 | 426.0 | | |
| 4.3 | 324.3 | 8.3 | 426.0 | 12.3 | 426.0 | | |
| 4.4 | 324.3 | 8.4 | 426.0 | 12.4 | 426.0 | | |
| 4.5 | 324.3 | 8.5 | 426.0 | 12.5 | 426.0 | | |
| 4.6 | 324.3 | 8.6 | 426.0 | 12.6 | 426.0 | | |
| 4.7 | 324.3 | 8.7 | 426.0 | 12.7 | 426.0 | | |
| 4.8 | 324.3 | 8.8 | 426.0 | 12.8 | 426.0 | | |
| 4.9 | 259.4 | 8.9 | 426.0 | 12.9 | 426.0 | | |

| Web Stiffeners - Girder 1 * | | | | | | | | | |
|-----------------------------|--------------------|----------|---------------|--------------------|----------|---------------|--------------------|----------|--------------------|
| Stiffener No. | Dist. From Prev to | | Stiffener No. | Dist. From Prev to | | Stiffener No. | Dist. From Prev to | | Dist. From Prev to |
| | (feet) | (inches) | | (feet) | (inches) | | (feet) | (inches) | |
| 1 | 14.862 | 178.344 | 51 | 5.818 | 69.816 | 101 | Pier 2-3A | | |
| 2 | 14.875 | 178.500 | 52 | 5.818 | 69.816 | 102 | 33.112 | 397.344 | |
| 3 | 14.875 | 178.500 | 53 | 5.818 | 69.816 | 103 | 17.083 | 204.996 | |
| 4 | Pier 6-3B | | 54 | 3.521 | 42.252 | 104 | Pier 1-3A | | |
| 5 | 29.734 | 356.808 | 55 | 5.818 | 69.816 | 105 | 21.911 | 262.932 | |
| 6 | 14.875 | 178.500 | 56 | 2.297 | 27.564 | 106 | 2.083 | 24.996 | |
| 7 | 14.875 | 178.500 | 57 | 5.818 | 69.816 | 107 | 9.635 | 115.620 | |
| 8 | 14.875 | 178.500 | 58 | 5.818 | 69.816 | 108 | 10.641 | 127.692 | |
| 9 | Pier 5-3B | | 59 | 5.818 | 69.816 | 109 | 10.641 | 127.692 | |
| 10 | 29.735 | 356.820 | 60 | Pier 2-3B | | 110 | 10.641 | 127.692 | |
| 11 | 14.875 | 178.500 | 61 | 11.784 | 141.408 | | | | |
| 12 | 14.875 | 178.500 | 62 | 5.966 | 71.592 | | | | |
| 13 | 13.250 | 159.000 | 63 | 5.966 | 71.592 | | | | |
| 14 | 3.333 | 39.996 | 64 | 5.966 | 71.592 | | | | |
| 15 | Pier 4-3B | | 65 | 11.932 | 143.184 | | | | |
| 16 | 14.433 | 173.196 | 66 | 11.932 | 143.184 | | | | |
| 17 | 6.225 | 74.700 | 67 | 11.932 | 143.184 | | | | |
| 18 | 6.224 | 74.688 | 68 | 11.932 | 143.184 | | | | |
| 19 | 6.224 | 74.688 | 69 | Pier 1-3B | | | | | |
| 20 | 6.224 | 74.688 | 70 | 22.481 | 269.772 | | | | |
| 21 | 6.224 | 74.688 | 71 | 10.573 | 126.876 | | | | |
| 22 | 6.224 | 74.688 | 72 | 10.573 | 126.876 | | | | |
| 23 | 6.224 | 74.688 | 73 | 10.573 | 126.876 | | | | |
| 24 | 6.224 | 74.688 | 74 | 7.054 | 84.648 | | | | |
| 25 | 6.224 | 74.688 | 75 | 3.333 | 39.996 | | | | |
| 26 | 6.224 | 74.688 | 76 | Pier 7-3A | | | | | |
| 27 | 6.224 | 74.688 | 77 | 22.470 | 269.640 | | | | |
| 28 | 2.810 | 33.720 | 78 | 16.146 | 193.752 | | | | |
| 29 | 6.224 | 74.688 | 79 | 16.146 | 193.752 | | | | |
| 30 | 3.414 | 40.968 | 80 | 16.146 | 193.752 | | | | |
| 31 | 6.224 | 74.688 | 81 | Pier 6-3A | | | | | |
| 32 | 6.224 | 74.688 | 82 | 32.291 | 387.492 | | | | |
| 33 | 6.224 | 74.688 | 83 | 16.089 | 193.068 | | | | |
| 34 | Pier 3-3B | | 84 | 16.089 | 193.068 | | | | |
| 35 | 12.056 | 144.672 | 85 | 16.089 | 193.068 | | | | |
| 36 | 5.832 | 69.984 | 86 | Pier 5-3A | | | | | |
| 37 | 5.818 | 69.816 | 87 | 23.047 | 276.564 | | | | |
| 38 | 5.818 | 69.816 | 88 | 2.083 | 24.996 | | | | |
| 39 | 3.962 | 47.544 | 89 | 12.021 | 144.252 | | | | |
| 40 | 5.086 | 61.032 | 90 | 13.014 | 156.168 | | | | |
| 41 | 2.587 | 31.044 | 91 | 13.016 | 156.192 | | | | |
| 42 | 5.818 | 69.816 | 92 | 13.016 | 156.192 | | | | |
| 43 | 5.818 | 69.816 | 93 | Pier 4-3A | | | | | |
| 44 | 5.818 | 69.816 | 94 | 29.115 | 349.380 | | | | |
| 45 | 5.818 | 69.816 | 95 | 16.099 | 193.188 | | | | |
| 46 | 5.818 | 69.816 | 96 | 16.104 | 193.248 | | | | |
| 47 | 5.818 | 69.816 | 97 | Pier 3-3A | | | | | |
| 48 | 5.818 | 69.816 | 98 | 32.161 | 385.932 | | | | |
| 49 | 5.818 | 69.816 | 99 | 16.042 | 192.504 | | | | |
| 50 | 5.818 | 69.816 | 100 | 16.042 | 192.504 | | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

| Project: Special Structures Rating | | | | Sheet: 30 of 31 | |
|------------------------------------|----------------|-----------------------------|---------------|-----------------|-----------------------------|
| LHB Proj. No. - 090147.00 | | | | | |
| Completed By: CJM | | Checked By: CDK | | | |
| Completed on: 11/23/09 | | Checked on: 01/13/10 | | | |
| Web Stiffeners - Girder 4 * | | | | | |
| Stiffener No. | Dist. From | | Stiffener No. | Dist. From | |
| | Prev to (feet) | Dist. From Prev to (inches) | | Prev to (feet) | Dist. From Prev to (inches) |
| 1 | 15.197 | 182.364 | 51 | 5.901 | 70.812 |
| 2 | 15.203 | 182.436 | 52 | 5.901 | 70.812 |
| 3 | 15.203 | 182.436 | 53 | 5.901 | 70.812 |
| 4 | Pier 6-3B | | 54 | 5.901 | 70.812 |
| 5 | 30.399 | 364.788 | 55 | 5.901 | 70.812 |
| 6 | 15.203 | 182.436 | 56 | 5.901 | 70.812 |
| 7 | 15.203 | 182.436 | 57 | 3.597 | 43.164 |
| 8 | 15.203 | 182.436 | 58 | 5.901 | 70.812 |
| 9 | Pier 5-3B | | 59 | 2.305 | 27.660 |
| 10 | 30.400 | 364.800 | 60 | 5.901 | 70.812 |
| 11 | 15.203 | 182.436 | 61 | 5.901 | 70.812 |
| 12 | 15.203 | 182.436 | 62 | 3.934 | 47.208 |
| 13 | 13.578 | 162.936 | 63 | 3.934 | 47.208 |
| 14 | 3.333 | 39.996 | 64 | Pier 2-3B | |
| 15 | Pier 4-3B | | 65 | 9.976 | 119.712 |
| 16 | 12.669 | 152.028 | 66 | 6.042 | 72.504 |
| 17 | 4.242 | 50.904 | 67 | 6.042 | 72.504 |
| 18 | 4.242 | 50.904 | 68 | 6.042 | 72.504 |
| 19 | 6.362 | 76.344 | 69 | 12.083 | 144.996 |
| 20 | 6.362 | 76.344 | 70 | 12.083 | 144.996 |
| 21 | 6.362 | 76.344 | 71 | 12.083 | 144.996 |
| 22 | 6.362 | 76.344 | 72 | 12.083 | 144.996 |
| 23 | 6.362 | 76.344 | 73 | Pier 1-3B | |
| 24 | 6.362 | 76.344 | 74 | 22.765 | 273.180 |
| 25 | 6.362 | 76.344 | 75 | 10.708 | 128.496 |
| 26 | 6.362 | 76.344 | 76 | 10.708 | 128.496 |
| 27 | 6.362 | 76.344 | 77 | 10.708 | 128.496 |
| 28 | 6.362 | 76.344 | 78 | 9.084 | 109.008 |
| 29 | 2.870 | 34.440 | 79 | 3.333 | 39.996 |
| 30 | 6.362 | 76.344 | 80 | Pier 7-3A | |
| 31 | 3.429 | 41.148 | 81 | 22.685 | 272.220 |
| 32 | 6.362 | 76.344 | 82 | 16.349 | 196.188 |
| 33 | 6.362 | 76.344 | 83 | 16.349 | 196.188 |
| 34 | 4.241 | 50.892 | 84 | 16.349 | 196.188 |
| 35 | 4.241 | 50.892 | 85 | Pier 6-3A | |
| 36 | Pier 3-3B | | 86 | 32.726 | 392.712 |
| 37 | 8.185 | 98.220 | 87 | 16.328 | 195.936 |
| 38 | 3.943 | 47.316 | 88 | 16.333 | 195.996 |
| 39 | 3.943 | 47.316 | 89 | 16.333 | 195.996 |
| 40 | 5.901 | 70.812 | | | |
| 41 | 5.901 | 70.812 | | | |
| 42 | 4.269 | 51.228 | | | |
| 43 | 5.003 | 60.036 | | | |
| 44 | 2.530 | 30.360 | | | |
| 45 | 5.901 | 70.812 | | | |
| 46 | 5.901 | 70.812 | | | |
| 47 | 5.901 | 70.812 | | | |
| 48 | 5.901 | 70.812 | | | |
| 49 | 5.901 | 70.812 | | | |
| 50 | 5.901 | 70.812 | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

| Project: Special Structures Rating | | | | Sheet: 31 of 33 | | | |
|------------------------------------|----------------|----------------------|-----------------------------|-----------------|----------------|------------------|-----------------------------|
| LHB Proj. No. - 090147.00 | | | | | | | |
| Completed By: CJM | | Checked By: CDK | | | | | |
| Completed on: 11/23/09 | | Checked on: 01/13/10 | | | | | |
| Web Stiffeners - Girder 5 * | | | | | | | |
| Stiffener No. | Dist. From | | Dist. From Prev to (inches) | Stiffener No. | Dist. From | | Dist. From Prev to (inches) |
| | Prev to (feet) | Prev to (inches) | | | Prev to (feet) | Prev to (inches) | |
| 1 | 11.557 | 138.684 | | 51 | 22.650 | 271.800 | |
| 2 | 11.557 | 138.684 | | 52 | 16.354 | 196.248 | |
| 3 | 11.557 | 138.684 | | 53 | 16.354 | 196.248 | |
| 4 | Pier 5-3E | | | 54 | 16.354 | 196.248 | |
| 5 | 23.149 | 277.788 | | 55 | Pier 6-3A | | |
| 6 | 11.589 | 139.068 | | | | | |
| 7 | 11.589 | 139.068 | | | | | |
| 8 | 11.589 | 139.068 | | | | | |
| 9 | Pier 4-3E | | | | | | |
| 10 | 23.228 | 278.736 | | | | | |
| 11 | 11.724 | 140.688 | | | | | |
| 12 | 11.719 | 140.628 | | | | | |
| 13 | 10.719 | 128.628 | | | | | |
| 14 | 2.083 | 24.996 | | | | | |
| 15 | Pier 3-3E | | | | | | |
| 16 | 17.099 | 205.188 | | | | | |
| 17 | 11.937 | 143.244 | | | | | |
| 18 | 11.938 | 143.256 | | | | | |
| 19 | 11.937 | 143.244 | | | | | |
| 20 | 11.938 | 143.256 | | | | | |
| 21 | Pier 2-3E | | | | | | |
| 22 | 25.246 | 302.952 | | | | | |
| 23 | 11.359 | 136.308 | | | | | |
| 24 | 11.344 | 136.128 | | | | | |
| 25 | 11.339 | 136.068 | | | | | |
| 26 | 11.342 | 136.104 | | | | | |
| 27 | Pier 1-3E | | | | | | |
| 28 | 16.283 | 195.396 | | | | | |
| 29 | 2.083 | 24.996 | | | | | |
| 30 | 15.250 | 183.000 | | | | | |
| 31 | 16.250 | 195.000 | | | | | |
| 32 | 16.250 | 195.000 | | | | | |
| 33 | Pier 3-3C | | | | | | |
| 34 | 32.458 | 389.496 | | | | | |
| 35 | 16.198 | 194.376 | | | | | |
| 36 | 16.198 | 194.376 | | | | | |
| 37 | 16.198 | 194.376 | | | | | |
| 38 | Pier 2-3C | | | | | | |
| 39 | 32.068 | 384.816 | | | | | |
| 40 | 15.885 | 190.620 | | | | | |
| 41 | 15.885 | 190.620 | | | | | |
| 42 | 15.885 | 190.620 | | | | | |
| 43 | 15.885 | 190.620 | | | | | |
| 44 | Pier 1-3C | | | | | | |
| 45 | 32.303 | 387.636 | | | | | |
| 46 | 16.417 | 197.004 | | | | | |
| 47 | 16.417 | 197.004 | | | | | |
| 48 | 14.797 | 177.564 | | | | | |
| 49 | 3.333 | 39.996 | | | | | |
| 50 | Pier 7-3A | | | | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

| Web Stiffeners - Girder 6* | | | | | | | | |
|----------------------------|--------------------|----------|--------------------|---------------|--------------------|----------|--------------------|--|
| Stiffener No. | Dist. From Prev to | | Dist. From Prev to | Stiffener No. | Dist. From Prev to | | Dist. From Prev to | |
| | (feet) | (inches) | | | (feet) | (inches) | | |
| 1 | Pier 2-3E | | | 51 | Pier 3-3A | | | |
| 2 | 24.388 | 292.656 | | 52 | 32.686 | 392.232 | | |
| 3 | 11.318 | 135.816 | | 53 | 16.307 | 195.684 | | |
| 4 | 11.318 | 135.816 | | 54 | 16.307 | 195.684 | | |
| 5 | 11.318 | 135.816 | | 55 | Pier 2-3A | | | |
| 6 | 11.318 | 135.816 | | 56 | 33.712 | 404.544 | | |
| 7 | Pier 1-3E | | | 57 | 17.406 | 208.872 | | |
| 8 | 16.251 | 195.012 | | 58 | Pier 1-3A | | | |
| 9 | 2.083 | 24.996 | | 59 | 22.346 | 268.152 | | |
| 10 | 15.257 | 183.084 | | 60 | 2.083 | 24.996 | | |
| 11 | 16.249 | 194.988 | | 61 | 9.836 | 118.032 | | |
| 12 | 16.249 | 194.988 | | 62 | 10.846 | 130.152 | | |
| 13 | Pier 3-3C | | | 63 | 10.846 | 130.152 | | |
| 14 | 32.456 | 389.472 | | 64 | 10.846 | 130.152 | | |
| 15 | 16.200 | 194.400 | | | | | | |
| 16 | 16.200 | 194.400 | | | | | | |
| 17 | 16.200 | 194.400 | | | | | | |
| 18 | Pier 2-3C | | | | | | | |
| 19 | 32.136 | 385.632 | | | | | | |
| 20 | 15.926 | 191.112 | | | | | | |
| 21 | 15.926 | 191.112 | | | | | | |
| 22 | 15.926 | 191.112 | | | | | | |
| 23 | 15.925 | 191.100 | | | | | | |
| 24 | Pier 1-3C | | | | | | | |
| 25 | 32.459 | 389.508 | | | | | | |
| 26 | 16.534 | 198.408 | | | | | | |
| 27 | 16.534 | 198.408 | | | | | | |
| 28 | 14.912 | 178.944 | | | | | | |
| 29 | 3.333 | 39.996 | | | | | | |
| 30 | Pier 7-3A | | | | | | | |
| 31 | 22.719 | 272.628 | | | | | | |
| 32 | 16.422 | 197.064 | | | | | | |
| 33 | 16.422 | 197.064 | | | | | | |
| 34 | 16.421 | 197.052 | | | | | | |
| 35 | Pier 6-3A | | | | | | | |
| 36 | 32.831 | 393.972 | | | | | | |
| 37 | 16.451 | 197.412 | | | | | | |
| 38 | 16.444 | 197.328 | | | | | | |
| 39 | 16.439 | 197.268 | | | | | | |
| 40 | Pier 5-3A | | | | | | | |
| 41 | 23.347 | 280.164 | | | | | | |
| 42 | 2.083 | 24.996 | | | | | | |
| 43 | 12.222 | 146.664 | | | | | | |
| 44 | 13.240 | 158.880 | | | | | | |
| 45 | 13.240 | 158.880 | | | | | | |
| 46 | 13.240 | 158.880 | | | | | | |
| 47 | Pier 4-3A | | | | | | | |
| 48 | 29.500 | 354.000 | | | | | | |
| 49 | 16.261 | 195.132 | | | | | | |
| 50 | 16.260 | 195.120 | | | | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

| Project: Special Structures Rating | | | | Sheet: 33 of 33 | | | | | | | |
|------------------------------------|------------|--------------------|---------------|----------------------|--------------------|---------------|------------|--------------------|-----------------------------|------------|----------|
| LHB Proj. No. - 090147.00 | | | | Checked By: CDK | | | | | | | |
| Completed By: CJM | | | | Checked on: 01/13/10 | | | | | | | |
| Completed on: 11/23/09 | | | | | | | | | | | |
| Web Stiffeners - Girder 7* | | | | | | | | | Web Stiffeners - Girder 8 * | | |
| Stiffener No. | Dist. From | | Stiffener No. | Dist. From | | Stiffener No. | Dist. From | | Stiffener No. | Dist. From | |
| | Prev to | Dist. From Prev to | | Prev to | Dist. From Prev to | | Prev to | Dist. From Prev to | | | |
| 1 | (feet) | (inches) | 51 | (feet) | (inches) | 51 | (feet) | (inches) | 1 | (feet) | (inches) |
| 2 | 11.551 | 138.612 | 51 | 23.531 | 282.372 | 51 | 23.531 | 282.372 | 1 | 11.318 | 135.816 |
| 3 | 11.546 | 138.552 | 52 | 2.083 | 24.996 | 52 | 2.083 | 24.996 | 2 | 11.318 | 135.816 |
| 4 | 10.537 | 126.444 | 53 | 12.414 | 148.968 | 53 | 12.414 | 148.968 | 3 | 11.318 | 135.816 |
| 5 | 2.083 | 24.996 | 54 | 13.396 | 160.752 | 54 | 13.396 | 160.752 | 4 | 11.318 | 135.816 |
| 6 | Pier 3-3E | | 55 | 13.396 | 160.752 | 55 | 13.396 | 160.752 | 5 | Pier 1-3E | |
| 7 | 16.722 | 200.664 | 56 | 13.396 | 160.752 | 56 | 13.396 | 160.752 | 6 | 16.306 | 195.672 |
| 8 | 11.641 | 139.692 | 57 | Pier 4-3A | | 57 | Pier 4-3A | | 7 | 2.083 | 24.996 |
| 9 | 11.605 | 139.260 | 58 | 29.832 | 357.984 | 58 | 29.832 | 357.984 | 8 | 10.443 | 125.316 |
| 10 | 11.567 | 138.804 | 59 | 16.438 | 197.256 | 59 | 16.438 | 197.256 | 9 | 11.500 | 138.000 |
| 11 | 11.529 | 138.348 | 60 | 16.448 | 197.376 | 60 | 16.448 | 197.376 | 10 | 11.500 | 138.000 |
| 12 | Pier 2-3E | | 61 | Pier 3-3A | | 61 | Pier 3-3A | | 11 | 11.500 | 138.000 |
| 13 | 23.607 | 283.284 | 62 | 33.116 | 397.392 | 62 | 33.116 | 397.392 | 12 | Pier 6-3D | |
| 14 | 11.294 | 135.528 | 63 | 16.573 | 198.876 | 63 | 16.573 | 198.876 | 13 | 29.256 | 351.072 |
| 15 | 11.303 | 135.636 | 64 | 16.573 | 198.876 | 64 | 16.573 | 198.876 | 14 | 17.756 | 213.072 |
| 16 | 11.305 | 135.660 | 65 | Pier 2-3A | | 65 | Pier 2-3A | | 15 | 11.756 | 141.072 |
| 17 | 11.299 | 135.588 | 66 | 34.312 | 411.744 | 66 | 34.312 | 411.744 | 16 | Pier 5-3D | |
| 18 | Pier 1-3E | | 67 | 17.729 | 212.748 | 67 | 17.729 | 212.748 | 17 | 36.418 | 437.016 |
| 19 | 16.222 | 194.664 | 68 | Pier 1-3A | | 68 | Pier 1-3A | | 18 | 18.667 | 224.004 |
| 20 | 2.083 | 24.996 | 69 | 22.782 | 273.384 | 69 | 22.782 | 273.384 | 19 | Pier 4-3D | |
| 21 | 15.266 | 183.192 | 70 | 2.083 | 24.996 | 70 | 2.083 | 24.996 | 20 | 23.583 | 282.996 |
| 22 | 16.250 | 195.000 | 71 | 10.036 | 120.432 | 71 | 10.036 | 120.432 | 21 | 2.083 | 24.996 |
| 23 | 16.250 | 195.000 | 72 | 11.052 | 132.624 | 72 | 11.052 | 132.624 | 22 | 17.672 | 212.064 |
| 24 | Pier 3-3C | | 73 | 11.052 | 132.624 | 73 | 11.052 | 132.624 | 23 | 18.672 | 224.064 |
| 25 | 32.458 | 389.496 | 74 | 11.052 | 132.624 | 74 | 11.052 | 132.624 | 24 | Pier 3-3D | |
| 26 | 16.203 | 194.436 | | | | | | | 25 | 36.503 | 438.036 |
| 27 | 16.203 | 194.436 | | | | | | | 26 | 17.839 | 214.068 |
| 28 | Pier 2-3C | | | | | | | | 27 | 17.839 | 214.068 |
| 29 | 32.172 | 386.064 | | | | | | | 28 | Pier 2-3D | |
| 30 | 15.974 | 191.688 | | | | | | | 29 | 36.594 | 439.128 |
| 31 | 15.974 | 191.688 | | | | | | | 30 | 18.755 | 225.060 |
| 32 | 15.974 | 191.688 | | | | | | | 31 | Pier 1-3D | |
| 33 | 15.974 | 191.688 | | | | | | | 32 | 22.706 | 272.472 |
| 34 | Pier 1-3C | | | | | | | | 33 | 2.083 | 24.996 |
| 35 | 32.614 | 391.368 | | | | | | | 34 | 16.083 | 192.996 |
| 36 | 16.651 | 199.812 | | | | | | | 35 | 17.082 | 204.984 |
| 37 | 16.651 | 199.812 | | | | | | | 36 | Bent 14W | |
| 38 | 15.026 | 180.312 | | | | | | | 37 | 32.655 | 391.860 |
| 39 | 3.333 | 39.996 | | | | | | | 38 | 15.567 | 186.804 |
| 40 | Pier 7-3A | | | | | | | | 39 | 15.567 | 186.804 |
| 41 | 22.815 | 273.780 | | | | | | | 40 | Bent 15W | |
| 42 | 16.526 | 198.312 | | | | | | | 41 | 31.067 | 372.804 |
| 43 | 16.526 | 198.312 | | | | | | | 42 | 15.500 | 186.000 |
| 44 | 16.526 | 198.312 | | | | | | | 43 | 15.500 | 186.000 |
| 45 | Pier 6-3A | | | | | | | | 44 | Bent 16W | |
| 46 | 33.052 | 396.624 | | | | | | | 45 | 32.773 | 393.276 |
| 47 | 16.607 | 199.284 | | | | | | | 46 | 17.271 | 207.252 |
| 48 | 16.608 | 199.296 | | | | | | | | | |
| 49 | 16.614 | 199.368 | | | | | | | | | |
| 50 | Pier 5-3A | | | | | | | | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphram and intermediate stiffeners

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

Web Stiffeners - Girder 9*

| Stiffener No. | Dist. From Prev to | | Dist. From Prev to | Stiffener No. | Dist. From Prev to | |
|---------------|--------------------|----------|--------------------|---------------|--------------------|----------|
| | (feet) | (inches) | | | (feet) | (inches) |
| 1 | 10.958 | 131.496 | | 51 | 36.365 | 436.380 |
| 2 | 10.988 | 131.856 | | 52 | 18.638 | 223.656 |
| 3 | 11.008 | 132.096 | | 53 | Pier 1-3D | |
| 4 | Pier 5-3E | | | 54 | 22.557 | 270.684 |
| 5 | 22.298 | 267.576 | | 55 | 2.083 | 24.996 |
| 6 | 11.275 | 135.300 | | 56 | 15.976 | 191.712 |
| 7 | 11.269 | 135.228 | | 57 | 16.976 | 203.712 |
| 8 | 11.261 | 135.132 | | 58 | Bent 14W | |
| 9 | Pier 4-3E | | | 59 | 32.460 | 389.520 |
| 10 | 22.500 | 270.000 | | 60 | 15.479 | 185.748 |
| 11 | 11.273 | 135.276 | | 61 | 15.479 | 185.748 |
| 12 | 11.250 | 135.000 | | 62 | Bent 15W | |
| 13 | 10.232 | 122.784 | | 63 | 30.979 | 371.748 |
| 14 | 2.083 | 24.996 | | 64 | 15.500 | 186.000 |
| 15 | Pier 3-3E | | | 65 | 15.500 | 186.000 |
| 16 | 16.083 | 192.996 | | 66 | Bent 16W | |
| 17 | 11.234 | 134.808 | | 67 | 32.575 | 390.900 |
| 18 | 11.234 | 134.808 | | 68 | 17.146 | 205.752 |
| 19 | 11.234 | 134.808 | | | | |
| 20 | 11.234 | 134.808 | | | | |
| 21 | Pier 2-3E | | | | | |
| 22 | 22.379 | 268.548 | | | | |
| 23 | 11.333 | 135.996 | | | | |
| 24 | 11.333 | 135.996 | | | | |
| 25 | 11.333 | 135.996 | | | | |
| 26 | 11.333 | 135.996 | | | | |
| 27 | Pier 1-3E | | | | | |
| 28 | 16.349 | 196.188 | | | | |
| 29 | 2.083 | 24.996 | | | | |
| 30 | 10.059 | 120.708 | | | | |
| 31 | 11.133 | 133.596 | | | | |
| 32 | 11.005 | 132.060 | | | | |
| 33 | 11.005 | 132.060 | | | | |
| 34 | Pier 6-3D | | | | | |
| 35 | 28.755 | 345.060 | | | | |
| 36 | 17.750 | 213.000 | | | | |
| 37 | 17.750 | 213.000 | | | | |
| 38 | Pier 5-3D | | | | | |
| 39 | 36.418 | 437.016 | | | | |
| 40 | 18.667 | 224.004 | | | | |
| 41 | Pier 4-3D | | | | | |
| 42 | 23.583 | 282.996 | | | | |
| 43 | 2.083 | 24.996 | | | | |
| 44 | 17.667 | 212.004 | | | | |
| 45 | 18.664 | 223.968 | | | | |
| 46 | Pier 3-3D | | | | | |
| 47 | 36.385 | 436.620 | | | | |
| 48 | 17.727 | 212.724 | | | | |
| 49 | 17.727 | 212.724 | | | | |
| 50 | Pier 2-3D | | | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

| Project: Special Structures Rating | | | | Sheet: 35 of 33 | |
|------------------------------------|----------------|----------------------|---------------|-----------------|------------------|
| LHB Proj. No. - 090147.00 | | | | | |
| Completed By: CJM | | Checked By: CDK | | | |
| Completed on: 11/23/09 | | Checked on: 01/13/10 | | | |
| Web Stiffeners - Girder 10* | | | | | |
| Stiffener No. | Dist. From | | Stiffener No. | Dist. From | |
| | Prev to (feet) | Prev to (inches) | | Prev to (feet) | Prev to (inches) |
| 1 | 10.398 | 124.776 | 51 | 36.136 | 433.632 |
| 2 | 10.401 | 124.812 | 52 | 18.521 | 222.252 |
| 3 | 10.401 | 124.812 | 53 | Pier 1-3D | |
| 4 | Pier 5-3E | | 54 | 22.408 | 268.896 |
| 5 | 21.321 | 255.852 | 55 | 2.083 | 24.996 |
| 6 | 10.922 | 131.064 | 56 | 15.869 | 190.428 |
| 7 | 10.922 | 131.064 | 57 | 16.869 | 202.428 |
| 8 | 10.922 | 131.064 | 58 | Bent 14W | |
| 9 | Pier 4-3E | | 59 | 32.265 | 387.180 |
| 10 | 21.813 | 261.756 | 60 | 15.391 | 184.692 |
| 11 | 10.891 | 130.692 | 61 | 15.392 | 184.704 |
| 12 | 10.885 | 130.620 | 62 | Bent 15W | |
| 13 | 9.885 | 118.620 | 63 | 30.891 | 370.692 |
| 14 | 2.083 | 24.996 | 64 | 15.500 | 186.000 |
| 15 | Pier 3-3E | | 65 | 15.500 | 186.000 |
| 16 | 15.535 | 186.420 | 66 | Bent 16W | |
| 17 | 10.854 | 130.248 | 67 | 32.408 | 388.896 |
| 18 | 10.854 | 130.248 | 68 | 16.989 | 203.868 |
| 19 | 10.854 | 130.248 | | | |
| 20 | 10.854 | 130.248 | | | |
| 21 | Pier 2-3E | | | | |
| 22 | 21.219 | 254.628 | | | |
| 23 | 11.333 | 135.996 | | | |
| 24 | 11.333 | 135.996 | | | |
| 25 | 11.333 | 135.996 | | | |
| 26 | 11.333 | 135.996 | | | |
| 27 | Pier 1-3E | | | | |
| 28 | 16.375 | 196.500 | | | |
| 29 | 2.083 | 24.996 | | | |
| 30 | 9.453 | 113.436 | | | |
| 31 | 10.417 | 125.004 | | | |
| 32 | 10.417 | 125.004 | | | |
| 33 | 10.417 | 125.004 | | | |
| 34 | Pier 6-3D | | | | |
| 35 | 28.167 | 338.004 | | | |
| 36 | 17.750 | 213.000 | | | |
| 37 | 17.750 | 213.000 | | | |
| 38 | Pier 5-3D | | | | |
| 39 | 36.418 | 437.016 | | | |
| 40 | 18.667 | 224.004 | | | |
| 41 | Pier 4-3D | | | | |
| 42 | 23.583 | 282.996 | | | |
| 43 | 2.083 | 24.996 | | | |
| 44 | 17.661 | 211.932 | | | |
| 45 | 18.656 | 223.872 | | | |
| 46 | Pier 3-3D | | | | |
| 47 | 36.267 | 435.204 | | | |
| 48 | 17.615 | 211.380 | | | |
| 49 | 17.615 | 211.380 | | | |
| 50 | Pier 2-3D | | | | |

* Web stiffeners will entered into MDX as 7" x 1/2" since MDX does not allow different input between diaphragm and intermediate stiffeners

Project: Special Structures Rating

Sheet: 36 of 33

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Live Load Distribution Factor - Wheel Load - Girder 1

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.278 | 0.000 | 1.278 | 5.0 | 1.639 | 0.000 | 1.639 | 9.0 | 1.278 | 0.000 | 1.278 | 13.0 | 1.278 | 0.000 | 1.278 |
| 1.1 | 1.278 | 0.000 | 1.278 | 5.1 | 1.639 | 0.000 | 1.639 | 9.1 | 1.278 | 0.000 | 1.278 | 13.1 | 1.278 | 0.000 | 1.278 |
| 1.2 | 1.278 | 0.000 | 1.278 | 5.2 | 1.639 | 0.000 | 1.639 | 9.2 | 1.278 | 0.000 | 1.278 | 13.2 | 1.278 | 0.000 | 1.278 |
| 1.3 | 1.278 | 0.000 | 1.278 | 5.3 | 1.639 | 0.000 | 1.639 | 9.3 | 1.278 | 0.000 | 1.278 | 13.3 | 1.278 | 0.000 | 1.278 |
| 1.4 | 1.278 | 0.000 | 1.278 | 5.4 | 1.639 | 0.000 | 1.639 | 9.4 | 1.278 | 0.000 | 1.278 | 13.4 | 1.278 | 0.000 | 1.278 |
| 1.5 | 1.278 | 0.000 | 1.278 | 5.5 | 1.639 | 0.000 | 1.639 | 9.5 | 1.278 | 0.000 | 1.278 | 13.5 | 1.278 | 0.000 | 1.278 |
| 1.6 | 1.278 | 0.000 | 1.278 | 5.6 | 1.639 | 0.000 | 1.639 | 9.6 | 1.278 | 0.000 | 1.278 | 13.6 | 1.278 | 0.000 | 1.278 |
| 1.7 | 1.278 | 0.000 | 1.278 | 5.7 | 1.639 | 0.000 | 1.639 | 9.7 | 1.278 | 0.000 | 1.278 | 13.7 | 1.278 | 0.000 | 1.278 |
| 1.8 | 1.278 | 0.000 | 1.278 | 5.8 | 1.639 | 0.000 | 1.639 | 9.8 | 1.278 | 0.000 | 1.278 | 13.8 | 1.278 | 0.000 | 1.278 |
| 1.9 | 1.278 | 0.000 | 1.278 | 5.9 | 1.639 | 0.000 | 1.639 | 9.9 | 1.278 | 0.000 | 1.278 | 13.9 | 1.278 | 0.000 | 1.278 |
| 2.0 | 1.278 | 0.000 | 1.278 | 6.0 | 1.639 | 0.000 | 1.639 | 10.0 | 1.275 | 0.000 | 1.275 | 14.0 | 1.278 | 0.000 | 1.278 |
| 2.1 | 1.278 | 0.000 | 1.278 | 6.1 | 1.639 | 0.000 | 1.639 | 10.1 | 1.275 | 0.000 | 1.275 | 14.1 | 1.278 | 0.000 | 1.278 |
| 2.2 | 1.278 | 0.000 | 1.278 | 6.2 | 1.639 | 0.000 | 1.639 | 10.2 | 1.264 | 0.000 | 1.264 | 14.2 | 1.278 | 0.000 | 1.278 |
| 2.3 | 1.278 | 0.000 | 1.278 | 6.3 | 1.639 | 0.000 | 1.639 | 10.3 | 1.249 | 0.000 | 1.249 | 14.3 | 1.278 | 0.000 | 1.278 |
| 2.4 | 1.278 | 0.000 | 1.278 | 6.4 | 1.639 | 0.000 | 1.639 | 10.4 | 1.233 | 0.000 | 1.233 | 14.4 | 1.278 | 0.000 | 1.278 |
| 2.5 | 1.278 | 0.000 | 1.278 | 6.5 | 1.639 | 0.000 | 1.639 | 10.5 | 1.222 | 0.000 | 1.222 | 14.5 | 1.278 | 0.000 | 1.278 |
| 2.6 | 1.278 | 0.000 | 1.278 | 6.6 | 1.639 | 0.000 | 1.639 | 10.6 | 1.233 | 0.000 | 1.233 | 14.6 | 1.278 | 0.000 | 1.278 |
| 2.7 | 1.278 | 0.000 | 1.278 | 6.7 | 1.639 | 0.000 | 1.639 | 10.7 | 1.239 | 0.000 | 1.239 | 14.7 | 1.278 | 0.000 | 1.278 |
| 2.8 | 1.278 | 0.000 | 1.278 | 6.8 | 1.639 | 0.000 | 1.639 | 10.8 | 1.239 | 0.000 | 1.239 | 14.8 | 1.278 | 0.000 | 1.278 |
| 2.9 | 1.278 | 0.000 | 1.278 | 6.9 | 1.639 | 0.000 | 1.639 | 10.9 | 1.234 | 0.000 | 1.234 | 14.9 | 1.278 | 0.000 | 1.278 |
| 3.0 | 1.278 | 0.000 | 1.278 | 7.0 | 1.639 | 0.000 | 1.639 | 11.0 | 1.210 | 0.000 | 1.210 | 15.0 | 1.278 | 0.000 | 1.278 |
| 3.1 | 1.278 | 0.000 | 1.278 | 7.1 | 1.639 | 0.000 | 1.639 | 11.1 | 1.185 | 0.000 | 1.185 | | | | |
| 3.2 | 1.278 | 0.000 | 1.278 | 7.2 | 1.639 | 0.000 | 1.639 | 11.2 | 1.147 | 0.000 | 1.147 | | | | |
| 3.3 | 1.278 | 0.000 | 1.278 | 7.3 | 1.639 | 0.000 | 1.639 | 11.3 | 1.099 | 0.000 | 1.099 | | | | |
| 3.4 | 1.278 | 0.000 | 1.278 | 7.4 | 1.639 | 0.000 | 1.639 | 11.4 | 1.039 | 0.000 | 1.039 | | | | |
| 3.5 | 1.278 | 0.000 | 1.278 | 7.5 | 1.639 | 0.000 | 1.639 | 11.5 | 0.963 | 0.000 | 0.963 | | | | |
| 3.6 | 1.278 | 0.000 | 1.278 | 7.6 | 1.639 | 0.000 | 1.639 | 11.6 | 0.956 | 0.000 | 0.956 | | | | |
| 3.7 | 1.278 | 0.000 | 1.278 | 7.7 | 1.639 | 0.000 | 1.639 | 11.7 | 0.951 | 0.000 | 0.951 | | | | |
| 3.8 | 1.278 | 0.000 | 1.278 | 7.8 | 1.639 | 0.000 | 1.639 | 11.8 | 1.319 | 0.000 | 1.319 | | | | |
| 3.9 | 1.639 | 0.000 | 1.639 | 7.9 | 1.639 | 0.000 | 1.639 | 11.9 | 1.305 | 0.000 | 1.305 | | | | |
| 4.0 | 1.639 | 0.000 | 1.639 | 8.0 | 1.278 | 0.000 | 1.278 | 12.0 | 1.295 | 0.000 | 1.295 | | | | |
| 4.1 | 1.639 | 0.000 | 1.639 | 8.1 | 1.278 | 0.000 | 1.278 | 12.1 | 1.286 | 0.000 | 1.286 | | | | |
| 4.2 | 1.639 | 0.000 | 1.639 | 8.2 | 1.278 | 0.000 | 1.278 | 12.2 | 1.281 | 0.000 | 1.281 | | | | |
| 4.3 | 1.639 | 0.000 | 1.639 | 8.3 | 1.278 | 0.000 | 1.278 | 12.3 | 1.278 | 0.000 | 1.278 | | | | |
| 4.4 | 1.639 | 0.000 | 1.639 | 8.4 | 1.278 | 0.000 | 1.278 | 12.4 | 1.278 | 0.000 | 1.278 | | | | |
| 4.5 | 1.639 | 0.000 | 1.639 | 8.5 | 1.278 | 0.000 | 1.278 | 12.5 | 1.278 | 0.000 | 1.278 | | | | |
| 4.6 | 1.639 | 0.000 | 1.639 | 8.6 | 1.278 | 0.000 | 1.278 | 12.6 | 1.278 | 0.000 | 1.278 | | | | |
| 4.7 | 1.639 | 0.000 | 1.639 | 8.7 | 1.278 | 0.000 | 1.278 | 12.7 | 1.278 | 0.000 | 1.278 | | | | |
| 4.8 | 1.639 | 0.000 | 1.639 | 8.8 | 1.278 | 0.000 | 1.278 | 12.8 | 1.278 | 0.000 | 1.278 | | | | |
| 4.9 | 1.639 | 0.000 | 1.639 | 8.9 | 1.278 | 0.000 | 1.278 | 12.9 | 1.278 | 0.000 | 1.278 | | | | |

Project: Special Structures Rating

Sheet: 37 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Live Load Distribution Factor - Wheel Loads

| Girder 2 | | | | Girder 3 | | | | | | | |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
| 1.0 | 1.286 | 0.000 | 1.286 | 1.0 | 1.293 | 0.000 | 1.293 | 5.0 | 1.231 | 0.000 | 1.231 |
| 1.1 | 1.286 | 0.000 | 1.286 | 1.1 | 1.293 | 0.000 | 1.293 | 5.1 | 1.270 | 0.000 | 1.270 |
| 1.2 | 1.286 | 0.000 | 1.286 | 1.2 | 1.293 | 0.000 | 1.293 | 5.2 | 1.249 | 0.000 | 1.249 |
| 1.3 | 1.286 | 0.000 | 1.286 | 1.3 | 1.293 | 0.000 | 1.293 | 5.3 | 1.230 | 0.000 | 1.230 |
| 1.4 | 1.286 | 0.000 | 1.286 | 1.4 | 1.293 | 0.000 | 1.293 | 5.4 | 1.212 | 0.000 | 1.212 |
| 1.5 | 1.286 | 0.000 | 1.286 | 1.5 | 1.293 | 0.000 | 1.293 | 5.5 | 1.196 | 0.000 | 1.196 |
| 1.6 | 1.286 | 0.000 | 1.286 | 1.6 | 1.293 | 0.000 | 1.293 | 5.6 | 1.181 | 0.000 | 1.181 |
| 1.7 | 1.286 | 0.000 | 1.286 | 1.7 | 1.293 | 0.000 | 1.293 | 5.7 | 1.167 | 0.000 | 1.167 |
| 1.8 | 1.286 | 0.000 | 1.286 | 1.8 | 1.293 | 0.000 | 1.293 | 5.8 | 1.154 | 0.000 | 1.154 |
| 1.9 | 1.286 | 0.000 | 1.286 | 1.9 | 1.293 | 0.000 | 1.293 | 5.9 | 1.143 | 0.000 | 1.143 |
| 2.0 | 1.286 | 0.000 | 1.286 | 2.0 | 1.625 | 0.000 | 1.625 | 6.0 | 1.133 | 0.000 | 1.133 |
| 2.1 | 1.286 | 0.000 | 1.286 | 2.1 | 1.596 | 0.000 | 1.596 | | | | |
| 2.2 | 1.286 | 0.000 | 1.286 | 2.2 | 1.566 | 0.000 | 1.566 | | | | |
| 2.3 | 1.286 | 0.000 | 1.286 | 2.3 | 1.536 | 0.000 | 1.536 | | | | |
| 2.4 | 1.286 | 0.000 | 1.286 | 2.4 | 1.507 | 0.000 | 1.507 | | | | |
| 2.5 | 1.286 | 0.000 | 1.286 | 2.5 | 1.477 | 0.000 | 1.477 | | | | |
| 2.6 | 1.286 | 0.000 | 1.286 | 2.6 | 1.447 | 0.000 | 1.447 | | | | |
| 2.7 | 1.286 | 0.000 | 1.286 | 2.7 | 1.417 | 0.000 | 1.417 | | | | |
| 2.8 | 1.286 | 0.000 | 1.286 | 2.8 | 1.388 | 0.000 | 1.388 | | | | |
| 2.9 | 1.286 | 0.000 | 1.286 | 2.9 | 1.358 | 0.000 | 1.358 | | | | |
| 3.0 | 1.286 | 0.000 | 1.286 | 3.0 | 1.328 | 0.000 | 1.328 | | | | |
| 3.1 | 1.286 | 0.000 | 1.286 | 3.1 | 1.299 | 0.000 | 1.299 | | | | |
| 3.2 | 1.286 | 0.000 | 1.286 | 3.2 | 1.589 | 0.000 | 1.589 | | | | |
| 3.3 | 1.286 | 0.000 | 1.286 | 3.3 | 1.555 | 0.000 | 1.555 | | | | |
| 3.4 | 1.286 | 0.000 | 1.286 | 3.4 | 1.520 | 0.000 | 1.520 | | | | |
| 3.5 | 1.286 | 0.000 | 1.286 | 3.5 | 1.485 | 0.000 | 1.485 | | | | |
| 3.6 | 1.286 | 0.000 | 1.286 | 3.6 | 1.450 | 0.000 | 1.450 | | | | |
| 3.7 | 1.286 | 0.000 | 1.286 | 3.7 | 1.414 | 0.000 | 1.414 | | | | |
| 3.8 | 1.286 | 0.000 | 1.286 | 3.8 | 1.377 | 0.000 | 1.377 | | | | |
| 3.9 | 1.286 | 0.000 | 1.286 | 3.9 | 1.340 | 0.000 | 1.340 | | | | |
| 4.0 | 1.286 | 0.000 | 1.286 | 4.0 | 1.736 | 0.000 | 1.736 | | | | |
| | | | | 4.1 | 1.690 | 0.000 | 1.690 | | | | |
| | | | | 4.2 | 1.643 | 0.000 | 1.643 | | | | |
| | | | | 4.3 | 1.595 | 0.000 | 1.595 | | | | |
| | | | | 4.4 | 1.547 | 0.000 | 1.547 | | | | |
| | | | | 4.5 | 1.498 | 0.000 | 1.498 | | | | |
| | | | | 4.6 | 1.451 | 0.000 | 1.451 | | | | |
| | | | | 4.7 | 1.407 | 0.000 | 1.407 | | | | |
| | | | | 4.8 | 1.366 | 0.000 | 1.366 | | | | |
| | | | | 4.9 | 1.328 | 0.000 | 1.328 | | | | |

Project: Special Structures Rating

Sheet: 38 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/15/10

Live Load Distribution Factor - Wheel Load - Girder 4

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.278 | 0.000 | 1.278 | 5.0 | 1.639 | 0.000 | 1.639 | 9.0 | 1.328 | 0.000 | 1.328 |
| 1.1 | 1.278 | 0.000 | 1.278 | 5.1 | 1.639 | 0.000 | 1.639 | 9.1 | 1.299 | 0.000 | 1.299 |
| 1.2 | 1.278 | 0.000 | 1.278 | 5.2 | 1.639 | 0.000 | 1.639 | 9.2 | 1.589 | 0.000 | 1.589 |
| 1.3 | 1.278 | 0.000 | 1.278 | 5.3 | 1.639 | 0.000 | 1.639 | 9.3 | 1.555 | 0.000 | 1.555 |
| 1.4 | 1.278 | 0.000 | 1.278 | 5.4 | 1.639 | 0.000 | 1.639 | 9.4 | 1.520 | 0.000 | 1.520 |
| 1.5 | 1.278 | 0.000 | 1.278 | 5.5 | 1.639 | 0.000 | 1.639 | 9.5 | 1.485 | 0.000 | 1.485 |
| 1.6 | 1.278 | 0.000 | 1.278 | 5.6 | 1.639 | 0.000 | 1.639 | 9.6 | 1.450 | 0.000 | 1.450 |
| 1.7 | 1.278 | 0.000 | 1.278 | 5.7 | 1.639 | 0.000 | 1.639 | 9.7 | 1.414 | 0.000 | 1.414 |
| 1.8 | 1.278 | 0.000 | 1.278 | 5.8 | 1.639 | 0.000 | 1.639 | 9.8 | 1.377 | 0.000 | 1.377 |
| 1.9 | 1.278 | 0.000 | 1.278 | 5.9 | 1.639 | 0.000 | 1.639 | 9.9 | 1.340 | 0.000 | 1.340 |
| 2.0 | 1.278 | 0.000 | 1.278 | 6.0 | 1.639 | 0.000 | 1.639 | 10.0 | 1.302 | 0.000 | 1.302 |
| 2.1 | 1.278 | 0.000 | 1.278 | 6.1 | 1.639 | 0.000 | 1.639 | | | | |
| 2.2 | 1.278 | 0.000 | 1.278 | 6.2 | 1.639 | 0.000 | 1.639 | | | | |
| 2.3 | 1.278 | 0.000 | 1.278 | 6.3 | 1.639 | 0.000 | 1.639 | | | | |
| 2.4 | 1.278 | 0.000 | 1.278 | 6.4 | 1.639 | 0.000 | 1.639 | | | | |
| 2.5 | 1.278 | 0.000 | 1.278 | 6.5 | 1.639 | 0.000 | 1.639 | | | | |
| 2.6 | 1.278 | 0.000 | 1.278 | 6.6 | 1.639 | 0.000 | 1.639 | | | | |
| 2.7 | 1.278 | 0.000 | 1.278 | 6.7 | 1.639 | 0.000 | 1.639 | | | | |
| 2.8 | 1.278 | 0.000 | 1.278 | 6.8 | 1.639 | 0.000 | 1.639 | | | | |
| 2.9 | 1.278 | 0.000 | 1.278 | 6.9 | 1.639 | 0.000 | 1.639 | | | | |
| 3.0 | 1.278 | 0.000 | 1.278 | 7.0 | 1.639 | 0.000 | 1.639 | | | | |
| 3.1 | 1.278 | 0.000 | 1.278 | 7.1 | 1.639 | 0.000 | 1.639 | | | | |
| 3.2 | 1.278 | 0.000 | 1.278 | 7.2 | 1.639 | 0.000 | 1.639 | | | | |
| 3.3 | 1.278 | 0.000 | 1.278 | 7.3 | 1.639 | 0.000 | 1.639 | | | | |
| 3.4 | 1.278 | 0.000 | 1.278 | 7.4 | 1.639 | 0.000 | 1.639 | | | | |
| 3.5 | 1.278 | 0.000 | 1.278 | 7.5 | 1.639 | 0.000 | 1.639 | | | | |
| 3.6 | 1.278 | 0.000 | 1.278 | 7.6 | 1.639 | 0.000 | 1.639 | | | | |
| 3.7 | 1.278 | 0.000 | 1.278 | 7.7 | 1.639 | 0.000 | 1.639 | | | | |
| 3.8 | 1.278 | 0.000 | 1.278 | 7.8 | 1.639 | 0.000 | 1.639 | | | | |
| 3.9 | 1.639 | 0.000 | 1.639 | 7.9 | 1.639 | 0.000 | 1.639 | | | | |
| 4.0 | 1.639 | 0.000 | 1.639 | 8.0 | 1.625 | 0.000 | 1.625 | | | | |
| 4.1 | 1.639 | 0.000 | 1.639 | 8.1 | 1.596 | 0.000 | 1.596 | | | | |
| 4.2 | 1.639 | 0.000 | 1.639 | 8.2 | 1.566 | 0.000 | 1.566 | | | | |
| 4.3 | 1.639 | 0.000 | 1.639 | 8.3 | 1.536 | 0.000 | 1.536 | | | | |
| 4.4 | 1.639 | 0.000 | 1.639 | 8.4 | 1.507 | 0.000 | 1.507 | | | | |
| 4.5 | 1.639 | 0.000 | 1.639 | 8.5 | 1.477 | 0.000 | 1.477 | | | | |
| 4.6 | 1.639 | 0.000 | 1.639 | 8.6 | 1.447 | 0.000 | 1.447 | | | | |
| 4.7 | 1.639 | 0.000 | 1.639 | 8.7 | 1.417 | 0.000 | 1.417 | | | | |
| 4.8 | 1.639 | 0.000 | 1.639 | 8.8 | 1.388 | 0.000 | 1.388 | | | | |
| 4.9 | 1.639 | 0.000 | 1.639 | 8.9 | 1.358 | 0.000 | 1.358 | | | | |

Project: Special Structures Rating

Sheet: 39 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/18/10

Live Load Distribution Factor - Wheel Load - Girder 5

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.092 | 0.044 | 1.136 | 5.0 | 0.952 | 0.044 | 0.996 | 9.0 | 1.278 | 0.000 | 1.278 |
| 1.1 | 1.068 | 0.044 | 1.112 | 5.1 | 0.955 | 0.044 | 0.999 | 9.1 | 1.278 | 0.000 | 1.278 |
| 1.2 | 1.053 | 0.044 | 1.097 | 5.2 | 0.958 | 0.044 | 1.002 | 9.2 | 1.278 | 0.000 | 1.278 |
| 1.3 | 1.041 | 0.044 | 1.085 | 5.3 | 0.960 | 0.044 | 1.004 | 9.3 | 1.278 | 0.000 | 1.278 |
| 1.4 | 1.030 | 0.044 | 1.074 | 5.4 | 0.997 | 0.044 | 1.041 | 9.4 | 1.278 | 0.000 | 1.278 |
| 1.5 | 1.022 | 0.044 | 1.066 | 5.5 | 1.033 | 0.044 | 1.077 | 9.5 | 1.278 | 0.000 | 1.278 |
| 1.6 | 1.015 | 0.044 | 1.059 | 5.6 | 1.062 | 0.044 | 1.106 | 9.6 | 1.278 | 0.000 | 1.278 |
| 1.7 | 1.012 | 0.044 | 1.056 | 5.7 | 1.086 | 0.044 | 1.130 | 9.7 | 1.278 | 0.000 | 1.278 |
| 1.8 | 1.010 | 0.044 | 1.054 | 5.8 | 1.106 | 0.044 | 1.150 | 9.8 | 1.278 | 0.000 | 1.278 |
| 1.9 | 1.011 | 0.044 | 1.055 | 5.9 | 1.121 | 0.044 | 1.165 | 9.9 | 1.278 | 0.000 | 1.278 |
| 2.0 | 1.015 | 0.044 | 1.059 | 6.0 | 1.132 | 0.023 | 1.155 | 10.0 | 1.625 | 0.005 | 1.630 |
| 2.1 | 1.022 | 0.044 | 1.066 | 6.1 | 1.142 | 0.023 | 1.165 | 10.1 | 1.596 | 0.005 | 1.601 |
| 2.2 | 1.034 | 0.044 | 1.078 | 6.2 | 1.150 | 0.023 | 1.173 | 10.2 | 1.566 | 0.005 | 1.571 |
| 2.3 | 1.048 | 0.044 | 1.092 | 6.3 | 1.159 | 0.023 | 1.182 | 10.3 | 1.536 | 0.005 | 1.541 |
| 2.4 | 1.065 | 0.044 | 1.109 | 6.4 | 1.168 | 0.023 | 1.191 | 10.4 | 1.507 | 0.005 | 1.512 |
| 2.5 | 1.085 | 0.044 | 1.129 | 6.5 | 1.176 | 0.023 | 1.199 | 10.5 | 1.477 | 0.005 | 1.482 |
| 2.6 | 1.108 | 0.044 | 1.152 | 6.6 | 1.184 | 0.023 | 1.207 | 10.6 | 1.447 | 0.005 | 1.452 |
| 2.7 | 1.132 | 0.044 | 1.176 | 6.7 | 1.192 | 0.023 | 1.215 | 10.7 | 1.417 | 0.005 | 1.422 |
| 2.8 | 1.157 | 0.044 | 1.201 | 6.8 | 1.200 | 0.023 | 1.223 | 10.8 | 1.388 | 0.005 | 1.393 |
| 2.9 | 1.184 | 0.044 | 1.228 | 6.9 | 1.208 | 0.023 | 1.231 | 10.9 | 1.358 | 0.005 | 1.363 |
| 3.0 | 1.211 | 0.044 | 1.255 | 7.0 | 1.215 | 0.023 | 1.238 | 11.0 | 1.326 | 0.005 | 1.331 |
| 3.1 | 1.237 | 0.044 | 1.281 | 7.1 | 1.224 | 0.023 | 1.247 | 11.1 | 1.320 | 0.005 | 1.325 |
| 3.2 | 1.262 | 0.044 | 1.306 | 7.2 | 1.232 | 0.023 | 1.255 | 11.2 | 1.314 | 0.005 | 1.319 |
| 3.3 | 0.942 | 0.044 | 0.986 | 7.3 | 1.240 | 0.023 | 1.263 | 11.3 | 1.308 | 0.005 | 1.313 |
| 3.4 | 0.940 | 0.044 | 0.984 | 7.4 | 1.248 | 0.023 | 1.271 | 11.4 | 1.303 | 0.005 | 1.308 |
| 3.5 | 0.939 | 0.044 | 0.983 | 7.5 | 1.255 | 0.023 | 1.278 | 11.5 | 1.297 | 0.005 | 1.302 |
| 3.6 | 0.939 | 0.044 | 0.983 | 7.6 | 1.263 | 0.023 | 1.286 | 11.6 | 1.291 | 0.005 | 1.296 |
| 3.7 | 0.939 | 0.044 | 0.983 | 7.7 | 1.270 | 0.023 | 1.293 | 11.7 | 1.286 | 0.005 | 1.291 |
| 3.8 | 0.940 | 0.044 | 0.984 | 7.8 | 1.278 | 0.023 | 1.301 | 11.8 | 1.280 | 0.005 | 1.285 |
| 3.9 | 0.941 | 0.044 | 0.985 | 7.9 | 1.278 | 0.023 | 1.301 | 11.9 | 1.275 | 0.005 | 1.280 |
| 4.0 | 0.943 | 0.044 | 0.987 | 8.0 | 1.278 | 0.023 | 1.301 | 12.0 | 1.269 | 0.005 | 1.274 |
| 4.1 | 0.947 | 0.044 | 0.991 | 8.1 | 1.278 | 0.023 | 1.301 | | | | |
| 4.2 | 0.950 | 0.044 | 0.994 | 8.2 | 1.278 | 0.023 | 1.301 | | | | |
| 4.3 | 0.954 | 0.044 | 0.998 | 8.3 | 1.278 | 0.023 | 1.301 | | | | |
| 4.4 | 0.958 | 0.044 | 1.002 | 8.4 | 1.278 | 0.023 | 1.301 | | | | |
| 4.5 | 1.014 | 0.044 | 1.058 | 8.5 | 1.278 | 0.000 | 1.278 | | | | |
| 4.6 | 1.106 | 0.044 | 1.150 | 8.6 | 1.278 | 0.000 | 1.278 | | | | |
| 4.7 | 1.189 | 0.044 | 1.233 | 8.7 | 1.278 | 0.000 | 1.278 | | | | |
| 4.8 | 1.265 | 0.044 | 1.309 | 8.8 | 1.278 | 0.000 | 1.278 | | | | |
| 4.9 | 0.948 | 0.044 | 0.992 | 8.9 | 1.278 | 0.000 | 1.278 | | | | |

Project: Special Structures Rating

Sheet: 40 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/18/10

Live Load Distribution Factor - Wheel Load - Girder 6

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.219 | 0.023 | 1.242 | 5.0 | 1.286 | 0.000 | 1.286 | 9.0 | 1.736 | 0.010 | 1.746 | 13.0 | 1.286 | 0.000 | 1.286 |
| 1.1 | 1.225 | 0.023 | 1.248 | 5.1 | 1.286 | 0.000 | 1.286 | 9.1 | 1.690 | 0.010 | 1.700 | 13.1 | 1.286 | 0.000 | 1.286 |
| 1.2 | 1.232 | 0.023 | 1.255 | 5.2 | 1.286 | 0.000 | 1.286 | 9.2 | 1.643 | 0.010 | 1.653 | 13.2 | 1.286 | 0.000 | 1.286 |
| 1.3 | 1.239 | 0.023 | 1.262 | 5.3 | 1.286 | 0.000 | 1.286 | 9.3 | 1.595 | 0.010 | 1.605 | 13.3 | 1.286 | 0.000 | 1.286 |
| 1.4 | 1.246 | 0.023 | 1.269 | 5.4 | 1.286 | 0.000 | 1.286 | 9.4 | 1.547 | 0.010 | 1.557 | 13.4 | 1.286 | 0.000 | 1.286 |
| 1.5 | 1.254 | 0.023 | 1.277 | 5.5 | 1.286 | 0.000 | 1.286 | 9.5 | 1.498 | 0.010 | 1.508 | 13.5 | 1.286 | 0.000 | 1.286 |
| 1.6 | 1.262 | 0.023 | 1.285 | 5.6 | 1.286 | 0.000 | 1.286 | 9.6 | 1.451 | 0.010 | 1.461 | 13.6 | 1.286 | 0.000 | 1.286 |
| 1.7 | 1.270 | 0.023 | 1.293 | 5.7 | 1.286 | 0.000 | 1.286 | 9.7 | 1.407 | 0.010 | 1.417 | 13.7 | 1.286 | 0.000 | 1.286 |
| 1.8 | 1.277 | 0.023 | 1.300 | 5.8 | 1.286 | 0.000 | 1.286 | 9.8 | 1.366 | 0.010 | 1.376 | 13.8 | 1.286 | 0.000 | 1.286 |
| 1.9 | 1.284 | 0.023 | 1.307 | 5.9 | 1.286 | 0.000 | 1.286 | 9.9 | 1.328 | 0.010 | 1.338 | 13.9 | 1.286 | 0.000 | 1.286 |
| 2.0 | 1.290 | 0.023 | 1.313 | 6.0 | 1.286 | 0.000 | 1.286 | 10.0 | 1.292 | 0.000 | 1.292 | 14.0 | 1.286 | 0.000 | 1.286 |
| 2.1 | 1.329 | 0.023 | 1.352 | 6.1 | 1.286 | 0.000 | 1.286 | 10.1 | 1.263 | 0.000 | 1.263 | | | | |
| 2.2 | 1.098 | 0.023 | 1.121 | 6.2 | 1.286 | 0.000 | 1.286 | 10.2 | 1.237 | 0.000 | 1.237 | | | | |
| 2.3 | 1.133 | 0.023 | 1.156 | 6.3 | 1.286 | 0.000 | 1.286 | 10.3 | 1.212 | 0.000 | 1.212 | | | | |
| 2.4 | 1.170 | 0.023 | 1.193 | 6.4 | 1.286 | 0.000 | 1.286 | 10.4 | 1.190 | 0.000 | 1.190 | | | | |
| 2.5 | 1.208 | 0.023 | 1.231 | 6.5 | 1.286 | 0.000 | 1.286 | 10.5 | 1.170 | 0.000 | 1.170 | | | | |
| 2.6 | 1.247 | 0.023 | 1.270 | 6.6 | 1.286 | 0.000 | 1.286 | 10.6 | 1.152 | 0.000 | 1.152 | | | | |
| 2.7 | 1.288 | 0.023 | 1.311 | 6.7 | 1.286 | 0.000 | 1.286 | 10.7 | 1.137 | 0.000 | 1.137 | | | | |
| 2.8 | 1.329 | 0.023 | 1.352 | 6.8 | 1.286 | 0.000 | 1.286 | 10.8 | 1.685 | 0.000 | 1.685 | | | | |
| 2.9 | 1.372 | 0.023 | 1.395 | 6.9 | 1.286 | 0.000 | 1.286 | 10.9 | 1.669 | 0.000 | 1.669 | | | | |
| 3.0 | 1.112 | 0.000 | 1.112 | 7.0 | 1.625 | 0.010 | 1.635 | 11.0 | 1.301 | 0.000 | 1.301 | | | | |
| 3.1 | 1.082 | 0.000 | 1.082 | 7.1 | 1.596 | 0.010 | 1.606 | 11.1 | 1.294 | 0.000 | 1.294 | | | | |
| 3.2 | 1.093 | 0.000 | 1.093 | 7.2 | 1.566 | 0.010 | 1.576 | 11.2 | 1.289 | 0.000 | 1.289 | | | | |
| 3.3 | 1.104 | 0.000 | 1.104 | 7.3 | 1.536 | 0.010 | 1.546 | 11.3 | 1.286 | 0.000 | 1.286 | | | | |
| 3.4 | 1.116 | 0.000 | 1.116 | 7.4 | 1.507 | 0.010 | 1.517 | 11.4 | 1.286 | 0.000 | 1.286 | | | | |
| 3.5 | 1.127 | 0.000 | 1.127 | 7.5 | 1.477 | 0.010 | 1.487 | 11.5 | 1.286 | 0.000 | 1.286 | | | | |
| 3.6 | 1.138 | 0.000 | 1.138 | 7.6 | 1.447 | 0.010 | 1.457 | 11.6 | 1.286 | 0.000 | 1.286 | | | | |
| 3.7 | 1.149 | 0.000 | 1.149 | 7.7 | 1.417 | 0.010 | 1.427 | 11.7 | 1.286 | 0.000 | 1.286 | | | | |
| 3.8 | 1.160 | 0.000 | 1.160 | 7.8 | 1.388 | 0.010 | 1.398 | 11.8 | 1.286 | 0.000 | 1.286 | | | | |
| 3.9 | 1.172 | 0.000 | 1.172 | 7.9 | 1.358 | 0.010 | 1.368 | 11.9 | 1.286 | 0.000 | 1.286 | | | | |
| 4.0 | 1.183 | 0.000 | 1.183 | 8.0 | 1.328 | 0.010 | 1.338 | 12.0 | 1.286 | 0.000 | 1.286 | | | | |
| 4.1 | 1.196 | 0.000 | 1.196 | 8.1 | 1.299 | 0.010 | 1.309 | 12.1 | 1.286 | 0.000 | 1.286 | | | | |
| 4.2 | 1.209 | 0.000 | 1.209 | 8.2 | 1.589 | 0.010 | 1.599 | 12.2 | 1.286 | 0.000 | 1.286 | | | | |
| 4.3 | 1.221 | 0.000 | 1.221 | 8.3 | 1.555 | 0.010 | 1.565 | 12.3 | 1.286 | 0.000 | 1.286 | | | | |
| 4.4 | 1.234 | 0.000 | 1.234 | 8.4 | 1.520 | 0.010 | 1.530 | 12.4 | 1.286 | 0.000 | 1.286 | | | | |
| 4.5 | 1.247 | 0.000 | 1.247 | 8.5 | 1.485 | 0.010 | 1.495 | 12.5 | 1.286 | 0.000 | 1.286 | | | | |
| 4.6 | 1.260 | 0.000 | 1.260 | 8.6 | 1.450 | 0.010 | 1.460 | 12.6 | 1.286 | 0.000 | 1.286 | | | | |
| 4.7 | 1.273 | 0.000 | 1.273 | 8.7 | 1.414 | 0.010 | 1.424 | 12.7 | 1.286 | 0.000 | 1.286 | | | | |
| 4.8 | 1.286 | 0.000 | 1.286 | 8.8 | 1.377 | 0.010 | 1.387 | 12.8 | 1.286 | 0.000 | 1.286 | | | | |
| 4.9 | 1.286 | 0.000 | 1.286 | 8.9 | 1.340 | 0.010 | 1.350 | 12.9 | 1.286 | 0.000 | 1.286 | | | | |

Project: Special Structures Rating

Sheet: 41 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/18/10

Live Load Distribution Factor - Wheel Load - Girder 7

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.402 | 0.020 | 1.422 | 5.0 | 1.215 | 0.000 | 1.215 | 9.0 | 1.278 | 0.029 | 1.307 | 13.0 | 1.278 | 0.029 | 1.307 |
| 1.1 | 1.059 | 0.020 | 1.079 | 5.1 | 1.224 | 0.000 | 1.224 | 9.1 | 1.278 | 0.029 | 1.307 | 13.1 | 1.278 | 0.029 | 1.307 |
| 1.2 | 1.076 | 0.020 | 1.096 | 5.2 | 1.232 | 0.000 | 1.232 | 9.2 | 1.278 | 0.029 | 1.307 | 13.2 | 1.278 | 0.029 | 1.307 |
| 1.3 | 1.093 | 0.020 | 1.113 | 5.3 | 1.240 | 0.000 | 1.240 | 9.3 | 1.278 | 0.029 | 1.307 | 13.3 | 1.278 | 0.029 | 1.307 |
| 1.4 | 1.112 | 0.020 | 1.132 | 5.4 | 1.248 | 0.000 | 1.248 | 9.4 | 1.278 | 0.029 | 1.307 | 13.4 | 1.278 | 0.029 | 1.307 |
| 1.5 | 1.131 | 0.020 | 1.151 | 5.5 | 1.256 | 0.000 | 1.256 | 9.5 | 1.278 | 0.029 | 1.307 | 13.5 | 1.278 | 0.029 | 1.307 |
| 1.6 | 1.150 | 0.020 | 1.170 | 5.6 | 1.263 | 0.000 | 1.263 | 9.6 | 1.278 | 0.029 | 1.307 | 13.6 | 1.278 | 0.029 | 1.307 |
| 1.7 | 1.171 | 0.020 | 1.191 | 5.7 | 1.271 | 0.000 | 1.271 | 9.7 | 1.278 | 0.029 | 1.307 | 13.7 | 1.278 | 0.029 | 1.307 |
| 1.8 | 1.192 | 0.020 | 1.212 | 5.8 | 1.278 | 0.000 | 1.278 | 9.8 | 1.278 | 0.029 | 1.307 | 13.8 | 1.278 | 0.029 | 1.307 |
| 1.9 | 1.213 | 0.020 | 1.233 | 5.9 | 1.278 | 0.000 | 1.278 | 9.9 | 1.278 | 0.029 | 1.307 | 13.9 | 1.278 | 0.029 | 1.307 |
| 2.0 | 1.235 | 0.020 | 1.255 | 6.0 | 1.278 | 0.000 | 1.278 | 10.0 | 1.278 | 0.029 | 1.307 | 14.0 | 1.278 | 0.029 | 1.307 |
| 2.1 | 1.275 | 0.020 | 1.295 | 6.1 | 1.278 | 0.000 | 1.278 | 10.1 | 1.278 | 0.029 | 1.307 | 14.1 | 1.278 | 0.029 | 1.307 |
| 2.2 | 1.317 | 0.020 | 1.337 | 6.2 | 1.278 | 0.000 | 1.278 | 10.2 | 1.278 | 0.029 | 1.307 | 14.2 | 1.278 | 0.029 | 1.307 |
| 2.3 | 1.361 | 0.020 | 1.381 | 6.3 | 1.278 | 0.000 | 1.278 | 10.3 | 1.278 | 0.029 | 1.307 | 14.3 | 1.278 | 0.029 | 1.307 |
| 2.4 | 1.407 | 0.020 | 1.427 | 6.4 | 1.278 | 0.000 | 1.278 | 10.4 | 1.278 | 0.029 | 1.307 | 14.4 | 1.278 | 0.029 | 1.307 |
| 2.5 | 1.455 | 0.020 | 1.475 | 6.5 | 1.278 | 0.020 | 1.298 | 10.5 | 1.278 | 0.029 | 1.307 | 14.5 | 1.278 | 0.029 | 1.307 |
| 2.6 | 1.504 | 0.020 | 1.524 | 6.6 | 1.278 | 0.020 | 1.298 | 10.6 | 1.278 | 0.029 | 1.307 | 14.6 | 1.278 | 0.029 | 1.307 |
| 2.7 | 1.555 | 0.020 | 1.575 | 6.7 | 1.278 | 0.020 | 1.298 | 10.7 | 1.278 | 0.029 | 1.307 | 14.7 | 1.278 | 0.029 | 1.307 |
| 2.8 | 1.607 | 0.020 | 1.627 | 6.8 | 1.278 | 0.020 | 1.298 | 10.8 | 1.278 | 0.029 | 1.307 | 14.8 | 1.278 | 0.029 | 1.307 |
| 2.9 | 1.246 | 0.020 | 1.266 | 6.9 | 1.278 | 0.020 | 1.298 | 10.9 | 1.278 | 0.029 | 1.307 | 14.9 | 1.278 | 0.029 | 1.307 |
| 3.0 | 1.290 | 0.020 | 1.310 | 7.0 | 1.278 | 0.020 | 1.298 | 11.0 | 1.278 | 0.029 | 1.307 | 15.0 | 1.278 | 0.029 | 1.307 |
| 3.1 | 1.329 | 0.020 | 1.349 | 7.1 | 1.278 | 0.020 | 1.298 | 11.1 | 1.278 | 0.029 | 1.307 | | | | |
| 3.2 | 1.098 | 0.020 | 1.118 | 7.2 | 1.278 | 0.020 | 1.298 | 11.2 | 1.278 | 0.029 | 1.307 | | | | |
| 3.3 | 1.133 | 0.020 | 1.153 | 7.3 | 1.278 | 0.020 | 1.298 | 11.3 | 1.278 | 0.029 | 1.307 | | | | |
| 3.4 | 1.170 | 0.020 | 1.190 | 7.4 | 1.278 | 0.020 | 1.298 | 11.4 | 1.278 | 0.029 | 1.307 | | | | |
| 3.5 | 1.208 | 0.020 | 1.228 | 7.5 | 1.278 | 0.020 | 1.298 | 11.5 | 1.278 | 0.029 | 1.307 | | | | |
| 3.6 | 1.247 | 0.020 | 1.267 | 7.6 | 1.278 | 0.020 | 1.298 | 11.6 | 1.278 | 0.029 | 1.307 | | | | |
| 3.7 | 1.288 | 0.020 | 1.308 | 7.7 | 1.278 | 0.020 | 1.298 | 11.7 | 1.278 | 0.029 | 1.307 | | | | |
| 3.8 | 1.329 | 0.020 | 1.349 | 7.8 | 1.278 | 0.020 | 1.298 | 11.8 | 1.278 | 0.029 | 1.307 | | | | |
| 3.9 | 1.372 | 0.020 | 1.392 | 7.9 | 1.278 | 0.020 | 1.298 | 11.9 | 1.278 | 0.029 | 1.307 | | | | |
| 4.0 | 1.112 | 0.000 | 1.112 | 8.0 | 1.278 | 0.029 | 1.307 | 12.0 | 1.278 | 0.029 | 1.307 | | | | |
| 4.1 | 1.142 | 0.000 | 1.142 | 8.1 | 1.278 | 0.029 | 1.307 | 12.1 | 1.278 | 0.029 | 1.307 | | | | |
| 4.2 | 1.150 | 0.000 | 1.150 | 8.2 | 1.278 | 0.029 | 1.307 | 12.2 | 1.278 | 0.029 | 1.307 | | | | |
| 4.3 | 1.159 | 0.000 | 1.159 | 8.3 | 1.278 | 0.029 | 1.307 | 12.3 | 1.278 | 0.029 | 1.307 | | | | |
| 4.4 | 1.168 | 0.000 | 1.168 | 8.4 | 1.278 | 0.029 | 1.307 | 12.4 | 1.278 | 0.029 | 1.307 | | | | |
| 4.5 | 1.176 | 0.000 | 1.176 | 8.5 | 1.278 | 0.029 | 1.307 | 12.5 | 1.278 | 0.029 | 1.307 | | | | |
| 4.6 | 1.184 | 0.000 | 1.184 | 8.6 | 1.278 | 0.029 | 1.307 | 12.6 | 1.278 | 0.029 | 1.307 | | | | |
| 4.7 | 1.192 | 0.000 | 1.192 | 8.7 | 1.278 | 0.029 | 1.307 | 12.7 | 1.278 | 0.029 | 1.307 | | | | |
| 4.8 | 1.200 | 0.000 | 1.200 | 8.8 | 1.278 | 0.029 | 1.307 | 12.8 | 1.278 | 0.029 | 1.307 | | | | |
| 4.9 | 1.208 | 0.000 | 1.208 | 8.9 | 1.278 | 0.029 | 1.307 | 12.9 | 1.278 | 0.029 | 1.307 | | | | |

Project: Special Structures Rating

Sheet: 42 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/18/10

Live Load Distribution Factor - Wheel Load - Girder 8

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.087 | 0.000 | 1.087 | 5.0 | 1.278 | 0.021 | 1.299 | 9.0 | 1.278 | 0.000 | 1.278 |
| 1.1 | 1.117 | 0.000 | 1.117 | 5.1 | 1.278 | 0.021 | 1.299 | 9.1 | 1.278 | 0.000 | 1.278 |
| 1.2 | 1.148 | 0.000 | 1.148 | 5.2 | 1.278 | 0.021 | 1.299 | 9.2 | 1.278 | 0.000 | 1.278 |
| 1.3 | 1.179 | 0.000 | 1.179 | 5.3 | 1.278 | 0.021 | 1.299 | 9.3 | 1.278 | 0.000 | 1.278 |
| 1.4 | 1.211 | 0.000 | 1.211 | 5.4 | 1.278 | 0.021 | 1.299 | 9.4 | 1.278 | 0.000 | 1.278 |
| 1.5 | 1.244 | 0.000 | 1.244 | 5.5 | 1.278 | 0.021 | 1.299 | 9.5 | 1.278 | 0.000 | 1.278 |
| 1.6 | 1.277 | 0.000 | 1.277 | 5.6 | 1.278 | 0.021 | 1.299 | 9.6 | 1.278 | 0.000 | 1.278 |
| 1.7 | 1.311 | 0.000 | 1.311 | 5.7 | 1.278 | 0.021 | 1.299 | 9.7 | 1.278 | 0.000 | 1.278 |
| 1.8 | 1.345 | 0.000 | 1.345 | 5.8 | 1.278 | 0.021 | 1.299 | 9.8 | 1.278 | 0.000 | 1.278 |
| 1.9 | 1.380 | 0.000 | 1.380 | 5.9 | 1.278 | 0.020 | 1.298 | 9.9 | 1.278 | 0.000 | 1.278 |
| 2.0 | 1.112 | 0.037 | 1.149 | 6.0 | 1.278 | 0.020 | 1.298 | 10.0 | 1.278 | 0.000 | 1.278 |
| 2.1 | 0.960 | 0.037 | 0.997 | 6.1 | 1.278 | 0.020 | 1.298 | 10.1 | 1.278 | 0.000 | 1.278 |
| 2.2 | 0.985 | 0.037 | 1.022 | 6.2 | 1.278 | 0.020 | 1.298 | 10.2 | 1.278 | 0.000 | 1.278 |
| 2.3 | 1.009 | 0.037 | 1.046 | 6.3 | 1.278 | 0.020 | 1.298 | 10.3 | 1.278 | 0.000 | 1.278 |
| 2.4 | 1.032 | 0.037 | 1.069 | 6.4 | 1.278 | 0.020 | 1.298 | 10.4 | 1.278 | 0.000 | 1.278 |
| 2.5 | 1.055 | 0.037 | 1.092 | 6.5 | 1.278 | 0.020 | 1.298 | 10.5 | 1.278 | 0.000 | 1.278 |
| 2.6 | 1.076 | 0.037 | 1.113 | 6.6 | 1.278 | 0.020 | 1.298 | 10.6 | 1.278 | 0.000 | 1.278 |
| 2.7 | 1.096 | 0.037 | 1.133 | 6.7 | 1.278 | 0.020 | 1.298 | 10.7 | 1.278 | 0.000 | 1.278 |
| 2.8 | 1.116 | 0.037 | 1.153 | 6.8 | 1.278 | 0.020 | 1.298 | 10.8 | 1.278 | 0.000 | 1.278 |
| 2.9 | 1.135 | 0.037 | 1.172 | 6.9 | 1.278 | 0.020 | 1.298 | 10.9 | 1.278 | 0.000 | 1.278 |
| 3.0 | 1.152 | 0.037 | 1.189 | 7.0 | 1.278 | 0.020 | 1.298 | 11.0 | 1.278 | 0.000 | 1.278 |
| 3.1 | 1.172 | 0.037 | 1.209 | 7.1 | 1.278 | 0.020 | 1.298 | 11.1 | 1.278 | 0.000 | 1.278 |
| 3.2 | 1.190 | 0.037 | 1.227 | 7.2 | 1.278 | 0.020 | 1.298 | 11.2 | 1.278 | 0.000 | 1.278 |
| 3.3 | 1.208 | 0.037 | 1.245 | 7.3 | 1.278 | 0.020 | 1.298 | 11.3 | 1.278 | 0.000 | 1.278 |
| 3.4 | 1.224 | 0.037 | 1.261 | 7.4 | 1.278 | 0.020 | 1.298 | 11.4 | 1.278 | 0.000 | 1.278 |
| 3.5 | 1.240 | 0.037 | 1.277 | 7.5 | 1.278 | 0.020 | 1.298 | 11.5 | 1.278 | 0.000 | 1.278 |
| 3.6 | 1.256 | 0.037 | 1.293 | 7.6 | 1.278 | 0.020 | 1.298 | 11.6 | 1.278 | 0.000 | 1.278 |
| 3.7 | 1.271 | 0.037 | 1.308 | 7.7 | 1.278 | 0.020 | 1.298 | 11.7 | 1.278 | 0.000 | 1.278 |
| 3.8 | 1.278 | 0.037 | 1.315 | 7.8 | 1.278 | 0.020 | 1.298 | 11.8 | 1.278 | 0.000 | 1.278 |
| 3.9 | 1.278 | 0.037 | 1.315 | 7.9 | 1.278 | 0.020 | 1.298 | 11.9 | 1.278 | 0.000 | 1.278 |
| 4.0 | 1.278 | 0.021 | 1.299 | 8.0 | 1.278 | 0.000 | 1.278 | 12.0 | 1.278 | 0.000 | 1.278 |
| 4.1 | 1.278 | 0.021 | 1.299 | 8.1 | 1.278 | 0.000 | 1.278 | | | | |
| 4.2 | 1.278 | 0.021 | 1.299 | 8.2 | 1.278 | 0.000 | 1.278 | | | | |
| 4.3 | 1.278 | 0.021 | 1.299 | 8.3 | 1.278 | 0.000 | 1.278 | | | | |
| 4.4 | 1.278 | 0.021 | 1.299 | 8.4 | 1.278 | 0.000 | 1.278 | | | | |
| 4.5 | 1.278 | 0.021 | 1.299 | 8.5 | 1.278 | 0.000 | 1.278 | | | | |
| 4.6 | 1.278 | 0.021 | 1.299 | 8.6 | 1.278 | 0.000 | 1.278 | | | | |
| 4.7 | 1.278 | 0.021 | 1.299 | 8.7 | 1.278 | 0.000 | 1.278 | | | | |
| 4.8 | 1.278 | 0.021 | 1.299 | 8.8 | 1.278 | 0.000 | 1.278 | | | | |
| 4.9 | 1.278 | 0.021 | 1.299 | 8.9 | 1.278 | 0.000 | 1.278 | | | | |

Project: Special Structures Rating

Sheet: 43 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/18/10

Live Load Distribution Factor - Wheel Load - Girder 9

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.010 | 0.000 | 1.010 | 5.0 | 1.290 | 0.000 | 1.290 | 9.0 | 1.286 | 0.000 | 1.286 | 13.0 | 1.286 | 0.000 | 1.286 |
| 1.1 | 1.006 | 0.000 | 1.006 | 5.1 | 1.329 | 0.000 | 1.329 | 9.1 | 1.286 | 0.000 | 1.286 | 13.1 | 1.286 | 0.000 | 1.286 |
| 1.2 | 1.003 | 0.000 | 1.003 | 5.2 | 1.098 | 0.000 | 1.098 | 9.2 | 1.286 | 0.000 | 1.286 | 13.2 | 1.286 | 0.000 | 1.286 |
| 1.3 | 1.001 | 0.000 | 1.001 | 5.3 | 1.133 | 0.000 | 1.133 | 9.3 | 1.286 | 0.000 | 1.286 | 13.3 | 1.286 | 0.000 | 1.286 |
| 1.4 | 1.000 | 0.000 | 1.000 | 5.4 | 1.170 | 0.000 | 1.170 | 9.4 | 1.286 | 0.000 | 1.286 | 13.4 | 1.286 | 0.000 | 1.286 |
| 1.5 | 1.000 | 0.000 | 1.000 | 5.5 | 1.208 | 0.000 | 1.208 | 9.5 | 1.286 | 0.000 | 1.286 | 13.5 | 1.286 | 0.000 | 1.286 |
| 1.6 | 1.002 | 0.000 | 1.002 | 5.6 | 1.247 | 0.000 | 1.247 | 9.6 | 1.286 | 0.000 | 1.286 | 13.6 | 1.286 | 0.000 | 1.286 |
| 1.7 | 1.004 | 0.000 | 1.004 | 5.7 | 1.288 | 0.000 | 1.288 | 9.7 | 1.286 | 0.000 | 1.286 | 13.7 | 1.286 | 0.000 | 1.286 |
| 1.8 | 1.007 | 0.000 | 1.007 | 5.8 | 1.329 | 0.000 | 1.329 | 9.8 | 1.286 | 0.000 | 1.286 | 13.8 | 1.286 | 0.000 | 1.286 |
| 1.9 | 1.011 | 0.000 | 1.011 | 5.9 | 1.372 | 0.000 | 1.372 | 9.9 | 1.286 | 0.000 | 1.286 | 13.9 | 1.286 | 0.000 | 1.286 |
| 2.0 | 1.017 | 0.000 | 1.017 | 6.0 | 1.092 | 0.000 | 1.092 | 10.0 | 1.286 | 0.000 | 1.286 | 14.0 | 1.286 | 0.000 | 1.286 |
| 2.1 | 1.025 | 0.000 | 1.025 | 6.1 | 1.089 | 0.000 | 1.089 | 10.1 | 1.286 | 0.000 | 1.286 | 14.1 | 1.286 | 0.000 | 1.286 |
| 2.2 | 1.035 | 0.000 | 1.035 | 6.2 | 1.101 | 0.000 | 1.101 | 10.2 | 1.286 | 0.000 | 1.286 | 14.2 | 1.286 | 0.000 | 1.286 |
| 2.3 | 1.046 | 0.000 | 1.046 | 6.3 | 1.112 | 0.000 | 1.112 | 10.3 | 1.286 | 0.000 | 1.286 | 14.3 | 1.286 | 0.000 | 1.286 |
| 2.4 | 1.059 | 0.000 | 1.059 | 6.4 | 1.124 | 0.000 | 1.124 | 10.4 | 1.286 | 0.000 | 1.286 | 14.4 | 1.286 | 0.000 | 1.286 |
| 2.5 | 1.074 | 0.000 | 1.074 | 6.5 | 1.135 | 0.000 | 1.135 | 10.5 | 1.286 | 0.000 | 1.286 | 14.5 | 1.286 | 0.000 | 1.286 |
| 2.6 | 1.091 | 0.000 | 1.091 | 6.6 | 1.147 | 0.000 | 1.147 | 10.6 | 1.286 | 0.000 | 1.286 | 14.6 | 1.286 | 0.000 | 1.286 |
| 2.7 | 1.109 | 0.000 | 1.109 | 6.7 | 1.158 | 0.000 | 1.158 | 10.7 | 1.286 | 0.000 | 1.286 | 14.7 | 1.286 | 0.000 | 1.286 |
| 2.8 | 1.129 | 0.000 | 1.129 | 6.8 | 1.169 | 0.000 | 1.169 | 10.8 | 1.286 | 0.000 | 1.286 | 14.8 | 1.286 | 0.000 | 1.286 |
| 2.9 | 1.150 | 0.000 | 1.150 | 6.9 | 1.180 | 0.000 | 1.180 | 10.9 | 1.286 | 0.000 | 1.286 | 14.9 | 1.286 | 0.000 | 1.286 |
| 3.0 | 1.493 | 0.000 | 1.493 | 7.0 | 1.191 | 0.000 | 1.191 | 11.0 | 1.286 | 0.000 | 1.286 | 15.0 | 1.286 | 0.000 | 1.286 |
| 3.1 | 1.522 | 0.000 | 1.522 | 7.1 | 1.203 | 0.000 | 1.203 | 11.1 | 1.286 | 0.000 | 1.286 | 15.1 | 1.286 | 0.000 | 1.286 |
| 3.2 | 1.552 | 0.000 | 1.552 | 7.2 | 1.216 | 0.000 | 1.216 | 11.2 | 1.286 | 0.000 | 1.286 | 15.2 | 1.286 | 0.000 | 1.286 |
| 3.3 | 1.056 | 0.000 | 1.056 | 7.3 | 1.229 | 0.000 | 1.229 | 11.3 | 1.286 | 0.000 | 1.286 | 15.3 | 1.286 | 0.000 | 1.286 |
| 3.4 | 1.078 | 0.000 | 1.078 | 7.4 | 1.241 | 0.000 | 1.241 | 11.4 | 1.286 | 0.000 | 1.286 | 15.4 | 1.286 | 0.000 | 1.286 |
| 3.5 | 1.102 | 0.000 | 1.102 | 7.5 | 1.254 | 0.000 | 1.254 | 11.5 | 1.286 | 0.000 | 1.286 | 15.5 | 1.286 | 0.000 | 1.286 |
| 3.6 | 1.126 | 0.000 | 1.126 | 7.6 | 1.267 | 0.000 | 1.267 | 11.6 | 1.286 | 0.000 | 1.286 | 15.6 | 1.286 | 0.000 | 1.286 |
| 3.7 | 1.152 | 0.000 | 1.152 | 7.7 | 1.279 | 0.000 | 1.279 | 11.7 | 1.286 | 0.000 | 1.286 | 15.7 | 1.286 | 0.000 | 1.286 |
| 3.8 | 1.178 | 0.000 | 1.178 | 7.8 | 1.286 | 0.000 | 1.286 | 11.8 | 1.286 | 0.000 | 1.286 | 15.8 | 1.286 | 0.000 | 1.286 |
| 3.9 | 1.206 | 0.000 | 1.206 | 7.9 | 1.286 | 0.000 | 1.286 | 11.9 | 1.286 | 0.000 | 1.286 | 15.9 | 1.286 | 0.000 | 1.286 |
| 4.0 | 1.235 | 0.000 | 1.235 | 8.0 | 1.286 | 0.000 | 1.286 | 12.0 | 1.286 | 0.000 | 1.286 | 16.0 | 1.286 | 0.000 | 1.286 |
| 4.1 | 1.275 | 0.000 | 1.275 | 8.1 | 1.286 | 0.000 | 1.286 | 12.1 | 1.286 | 0.000 | 1.286 | | | | |
| 4.2 | 1.317 | 0.000 | 1.317 | 8.2 | 1.286 | 0.000 | 1.286 | 12.2 | 1.286 | 0.000 | 1.286 | | | | |
| 4.3 | 1.361 | 0.000 | 1.361 | 8.3 | 1.286 | 0.000 | 1.286 | 12.3 | 1.286 | 0.000 | 1.286 | | | | |
| 4.4 | 1.407 | 0.000 | 1.407 | 8.4 | 1.286 | 0.000 | 1.286 | 12.4 | 1.286 | 0.000 | 1.286 | | | | |
| 4.5 | 1.455 | 0.000 | 1.455 | 8.5 | 1.286 | 0.000 | 1.286 | 12.5 | 1.286 | 0.000 | 1.286 | | | | |
| 4.6 | 1.504 | 0.000 | 1.504 | 8.6 | 1.286 | 0.000 | 1.286 | 12.6 | 1.286 | 0.000 | 1.286 | | | | |
| 4.7 | 1.555 | 0.000 | 1.555 | 8.7 | 1.286 | 0.000 | 1.286 | 12.7 | 1.286 | 0.000 | 1.286 | | | | |
| 4.8 | 1.607 | 0.000 | 1.607 | 8.8 | 1.286 | 0.000 | 1.286 | 12.8 | 1.286 | 0.000 | 1.286 | | | | |
| 4.9 | 1.246 | 0.000 | 1.246 | 8.9 | 1.286 | 0.000 | 1.286 | 12.9 | 1.286 | 0.000 | 1.286 | | | | |

Project: Special Structures Rating

Sheet: 44 of 3

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 11/24/09

Checked on: 01/18/10

Live Load Distribution Factor - Wheel Load - Girder 10

| Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total | Span Point | D.F. LL | D.F. C.F. | D.F. Total |
|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|------------|---------|-----------|------------|
| 1.0 | 1.092 | 0.000 | 1.092 | 5.0 | 1.263 | 0.000 | 1.263 | 9.0 | 1.278 | 0.000 | 1.278 | 13.0 | 1.278 | 0.000 | 1.278 |
| 1.1 | 1.090 | 0.000 | 1.090 | 5.1 | 1.264 | 0.000 | 1.264 | 9.1 | 1.278 | 0.000 | 1.278 | 13.1 | 1.278 | 0.000 | 1.278 |
| 1.2 | 1.098 | 0.000 | 1.098 | 5.2 | 1.266 | 0.000 | 1.266 | 9.2 | 1.278 | 0.000 | 1.278 | 13.2 | 1.278 | 0.000 | 1.278 |
| 1.3 | 1.105 | 0.000 | 1.105 | 5.3 | 1.268 | 0.000 | 1.268 | 9.3 | 1.278 | 0.000 | 1.278 | 13.3 | 1.278 | 0.000 | 1.278 |
| 1.4 | 1.112 | 0.000 | 1.112 | 5.4 | 1.269 | 0.000 | 1.269 | 9.4 | 1.278 | 0.000 | 1.278 | 13.4 | 1.278 | 0.000 | 1.278 |
| 1.5 | 1.118 | 0.000 | 1.118 | 5.5 | 1.271 | 0.000 | 1.271 | 9.5 | 1.278 | 0.000 | 1.278 | 13.5 | 1.278 | 0.000 | 1.278 |
| 1.6 | 1.125 | 0.000 | 1.125 | 5.6 | 1.272 | 0.000 | 1.272 | 9.6 | 1.278 | 0.000 | 1.278 | 13.6 | 1.278 | 0.000 | 1.278 |
| 1.7 | 1.131 | 0.000 | 1.131 | 5.7 | 1.273 | 0.000 | 1.273 | 9.7 | 1.278 | 0.000 | 1.278 | 13.7 | 1.278 | 0.000 | 1.278 |
| 1.8 | 1.137 | 0.000 | 1.137 | 5.8 | 1.274 | 0.000 | 1.274 | 9.8 | 1.278 | 0.000 | 1.278 | 13.8 | 1.278 | 0.000 | 1.278 |
| 1.9 | 1.143 | 0.000 | 1.143 | 5.9 | 1.275 | 0.000 | 1.275 | 9.9 | 1.278 | 0.000 | 1.278 | 13.9 | 1.278 | 0.000 | 1.278 |
| 2.0 | 1.149 | 0.000 | 1.149 | 6.0 | 1.276 | 0.000 | 1.276 | 10.0 | 1.278 | 0.000 | 1.278 | 14.0 | 1.278 | 0.000 | 1.278 |
| 2.1 | 1.156 | 0.000 | 1.156 | 6.1 | 1.276 | 0.000 | 1.276 | 10.1 | 1.278 | 0.000 | 1.278 | 14.1 | 1.278 | 0.000 | 1.278 |
| 2.2 | 1.162 | 0.000 | 1.162 | 6.2 | 1.277 | 0.000 | 1.277 | 10.2 | 1.278 | 0.000 | 1.278 | 14.2 | 1.278 | 0.000 | 1.278 |
| 2.3 | 1.169 | 0.000 | 1.169 | 6.3 | 1.277 | 0.000 | 1.277 | 10.3 | 1.278 | 0.000 | 1.278 | 14.3 | 1.278 | 0.000 | 1.278 |
| 2.4 | 1.175 | 0.000 | 1.175 | 6.4 | 1.278 | 0.000 | 1.278 | 10.4 | 1.278 | 0.000 | 1.278 | 14.4 | 1.278 | 0.000 | 1.278 |
| 2.5 | 1.181 | 0.000 | 1.181 | 6.5 | 1.278 | 0.000 | 1.278 | 10.5 | 1.278 | 0.000 | 1.278 | 14.5 | 1.278 | 0.000 | 1.278 |
| 2.6 | 1.187 | 0.000 | 1.187 | 6.6 | 1.278 | 0.000 | 1.278 | 10.6 | 1.278 | 0.000 | 1.278 | 14.6 | 1.278 | 0.000 | 1.278 |
| 2.7 | 1.192 | 0.000 | 1.192 | 6.7 | 1.278 | 0.000 | 1.278 | 10.7 | 1.278 | 0.000 | 1.278 | 14.7 | 1.278 | 0.000 | 1.278 |
| 2.8 | 1.197 | 0.000 | 1.197 | 6.8 | 1.278 | 0.000 | 1.278 | 10.8 | 1.278 | 0.000 | 1.278 | 14.8 | 1.278 | 0.000 | 1.278 |
| 2.9 | 1.202 | 0.000 | 1.202 | 6.9 | 1.278 | 0.000 | 1.278 | 10.9 | 1.278 | 0.000 | 1.278 | 14.9 | 1.278 | 0.000 | 1.278 |
| 3.0 | 1.207 | 0.000 | 1.207 | 7.0 | 1.278 | 0.000 | 1.278 | 11.0 | 1.278 | 0.000 | 1.278 | 15.0 | 1.278 | 0.000 | 1.278 |
| 3.1 | 1.211 | 0.000 | 1.211 | 7.1 | 1.278 | 0.000 | 1.278 | 11.1 | 1.278 | 0.000 | 1.278 | 15.1 | 1.278 | 0.000 | 1.278 |
| 3.2 | 1.215 | 0.000 | 1.215 | 7.2 | 1.278 | 0.000 | 1.278 | 11.2 | 1.278 | 0.000 | 1.278 | 15.2 | 1.278 | 0.000 | 1.278 |
| 3.3 | 1.218 | 0.000 | 1.218 | 7.3 | 1.278 | 0.000 | 1.278 | 11.3 | 1.278 | 0.000 | 1.278 | 15.3 | 1.278 | 0.000 | 1.278 |
| 3.4 | 1.221 | 0.000 | 1.221 | 7.4 | 1.278 | 0.000 | 1.278 | 11.4 | 1.278 | 0.000 | 1.278 | 15.4 | 1.278 | 0.000 | 1.278 |
| 3.5 | 1.225 | 0.000 | 1.225 | 7.5 | 1.278 | 0.000 | 1.278 | 11.5 | 1.278 | 0.000 | 1.278 | 15.5 | 1.278 | 0.000 | 1.278 |
| 3.6 | 1.228 | 0.000 | 1.228 | 7.6 | 1.278 | 0.000 | 1.278 | 11.6 | 1.278 | 0.000 | 1.278 | 15.6 | 1.278 | 0.000 | 1.278 |
| 3.7 | 1.230 | 0.000 | 1.230 | 7.7 | 1.278 | 0.000 | 1.278 | 11.7 | 1.278 | 0.000 | 1.278 | 15.7 | 1.278 | 0.000 | 1.278 |
| 3.8 | 1.233 | 0.000 | 1.233 | 7.8 | 1.278 | 0.000 | 1.278 | 11.8 | 1.278 | 0.000 | 1.278 | 15.8 | 1.278 | 0.000 | 1.278 |
| 3.9 | 1.235 | 0.000 | 1.235 | 7.9 | 1.278 | 0.000 | 1.278 | 11.9 | 1.278 | 0.000 | 1.278 | 15.9 | 1.278 | 0.000 | 1.278 |
| 4.0 | 1.238 | 0.000 | 1.238 | 8.0 | 1.278 | 0.000 | 1.278 | 12.0 | 1.278 | 0.000 | 1.278 | 16.0 | 1.278 | 0.000 | 1.278 |
| 4.1 | 1.241 | 0.000 | 1.241 | 8.1 | 1.278 | 0.000 | 1.278 | 12.1 | 1.278 | 0.000 | 1.278 | | | | |
| 4.2 | 1.244 | 0.000 | 1.244 | 8.2 | 1.278 | 0.000 | 1.278 | 12.2 | 1.278 | 0.000 | 1.278 | | | | |
| 4.3 | 1.246 | 0.000 | 1.246 | 8.3 | 1.278 | 0.000 | 1.278 | 12.3 | 1.278 | 0.000 | 1.278 | | | | |
| 4.4 | 1.249 | 0.000 | 1.249 | 8.4 | 1.278 | 0.000 | 1.278 | 12.4 | 1.278 | 0.000 | 1.278 | | | | |
| 4.5 | 1.251 | 0.000 | 1.251 | 8.5 | 1.278 | 0.000 | 1.278 | 12.5 | 1.278 | 0.000 | 1.278 | | | | |
| 4.6 | 1.254 | 0.000 | 1.254 | 8.6 | 1.278 | 0.000 | 1.278 | 12.6 | 1.278 | 0.000 | 1.278 | | | | |
| 4.7 | 1.256 | 0.000 | 1.256 | 8.7 | 1.278 | 0.000 | 1.278 | 12.7 | 1.278 | 0.000 | 1.278 | | | | |
| 4.8 | 1.258 | 0.000 | 1.258 | 8.8 | 1.278 | 0.000 | 1.278 | 12.8 | 1.278 | 0.000 | 1.278 | | | | |
| 4.9 | 1.260 | 0.000 | 1.260 | 8.9 | 1.278 | 0.000 | 1.278 | 12.9 | 1.278 | 0.000 | 1.278 | | | | |

Project: Special Structures Rating

Sheet: 45 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 1

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.278 | 0.0 | 1.278 | 5.0 | 1.639 | 0.0 | 1.639 | 9.0 | 1.278 | 20.0 | 1.534 | 13.0 | 1.278 | 10.0 | 1.406 |
| 1.1 | 1.278 | 0.0 | 1.278 | 5.1 | 1.639 | 0.0 | 1.639 | 9.1 | 1.278 | 25.0 | 1.598 | 13.1 | 1.278 | 11.0 | 1.419 |
| 1.2 | 1.278 | 0.0 | 1.278 | 5.2 | 1.639 | 0.0 | 1.639 | 9.2 | 1.278 | 30.0 | 1.661 | 13.2 | 1.278 | 12.0 | 1.431 |
| 1.3 | 1.278 | 0.0 | 1.278 | 5.3 | 1.639 | 0.0 | 1.639 | 9.3 | 1.278 | 35.0 | 1.725 | 13.3 | 1.278 | 13.0 | 1.444 |
| 1.4 | 1.278 | 0.0 | 1.278 | 5.4 | 1.639 | 0.0 | 1.639 | 9.4 | 1.278 | 40.0 | 1.789 | 13.4 | 1.278 | 14.0 | 1.457 |
| 1.5 | 1.278 | 0.0 | 1.278 | 5.5 | 1.639 | 0.0 | 1.639 | 9.5 | 1.278 | 45.0 | 1.853 | 13.5 | 1.278 | 15.0 | 1.470 |
| 1.6 | 1.278 | 0.0 | 1.278 | 5.6 | 1.639 | 0.0 | 1.639 | 9.6 | 1.278 | 40.0 | 1.789 | 13.6 | 1.278 | 14.0 | 1.457 |
| 1.7 | 1.278 | 0.0 | 1.278 | 5.7 | 1.639 | 0.0 | 1.639 | 9.7 | 1.278 | 35.0 | 1.725 | 13.7 | 1.278 | 13.0 | 1.444 |
| 1.8 | 1.278 | 0.0 | 1.278 | 5.8 | 1.639 | 0.0 | 1.639 | 9.8 | 1.278 | 30.0 | 1.661 | 13.8 | 1.278 | 12.0 | 1.431 |
| 1.9 | 1.278 | 0.0 | 1.278 | 5.9 | 1.639 | 0.0 | 1.639 | 9.9 | 1.278 | 25.0 | 1.598 | 13.9 | 1.278 | 11.0 | 1.419 |
| 2.0 | 1.278 | 0.0 | 1.278 | 6.0 | 1.639 | 0.0 | 1.639 | 10.0 | 1.275 | 20.0 | 1.530 | 14.0 | 1.278 | 10.0 | 1.406 |
| 2.1 | 1.278 | 0.0 | 1.278 | 6.1 | 1.639 | 0.0 | 1.639 | 10.1 | 1.275 | 22.0 | 1.556 | 14.1 | 1.278 | 11.0 | 1.419 |
| 2.2 | 1.278 | 0.0 | 1.278 | 6.2 | 1.639 | 0.0 | 1.639 | 10.2 | 1.264 | 24.0 | 1.567 | 14.2 | 1.278 | 12.0 | 1.431 |
| 2.3 | 1.278 | 0.0 | 1.278 | 6.3 | 1.639 | 0.0 | 1.639 | 10.3 | 1.249 | 26.0 | 1.574 | 14.3 | 1.278 | 13.0 | 1.444 |
| 2.4 | 1.278 | 0.0 | 1.278 | 6.4 | 1.639 | 0.0 | 1.639 | 10.4 | 1.233 | 28.0 | 1.579 | 14.4 | 1.278 | 14.0 | 1.457 |
| 2.5 | 1.278 | 0.0 | 1.278 | 6.5 | 1.639 | 0.0 | 1.639 | 10.5 | 1.222 | 30.0 | 1.589 | 14.5 | 1.278 | 15.0 | 1.470 |
| 2.6 | 1.278 | 0.0 | 1.278 | 6.6 | 1.639 | 0.0 | 1.639 | 10.6 | 1.233 | 28.0 | 1.579 | 14.6 | 1.278 | 14.0 | 1.457 |
| 2.7 | 1.278 | 0.0 | 1.278 | 6.7 | 1.639 | 0.0 | 1.639 | 10.7 | 1.239 | 26.0 | 1.561 | 14.7 | 1.278 | 13.0 | 1.444 |
| 2.8 | 1.278 | 0.0 | 1.278 | 6.8 | 1.639 | 0.0 | 1.639 | 10.8 | 1.239 | 24.0 | 1.537 | 14.8 | 1.278 | 12.0 | 1.431 |
| 2.9 | 1.278 | 0.0 | 1.278 | 6.9 | 1.639 | 0.0 | 1.639 | 10.9 | 1.234 | 22.0 | 1.506 | 14.9 | 1.278 | 11.0 | 1.419 |
| 3.0 | 1.278 | 0.0 | 1.278 | 7.0 | 1.639 | 0.0 | 1.639 | 11.0 | 1.210 | 20.0 | 1.453 | 15.0 | 1.278 | 10.0 | 1.406 |
| 3.1 | 1.278 | 0.0 | 1.278 | 7.1 | 1.639 | 0.0 | 1.639 | 11.1 | 1.185 | 20.0 | 1.422 | | | | |
| 3.2 | 1.278 | 0.0 | 1.278 | 7.2 | 1.639 | 0.0 | 1.639 | 11.2 | 1.147 | 20.0 | 1.376 | | | | |
| 3.3 | 1.278 | 0.0 | 1.278 | 7.3 | 1.639 | 0.0 | 1.639 | 11.3 | 1.099 | 20.0 | 1.319 | | | | |
| 3.4 | 1.278 | 0.0 | 1.278 | 7.4 | 1.639 | 0.0 | 1.639 | 11.4 | 1.039 | 20.0 | 1.247 | | | | |
| 3.5 | 1.278 | 0.0 | 1.278 | 7.5 | 1.639 | 0.0 | 1.639 | 11.5 | 0.963 | 20.0 | 1.156 | | | | |
| 3.6 | 1.278 | 0.0 | 1.278 | 7.6 | 1.639 | 0.0 | 1.639 | 11.6 | 0.956 | 19.5 | 1.143 | | | | |
| 3.7 | 1.278 | 0.0 | 1.278 | 7.7 | 1.639 | 0.0 | 1.639 | 11.7 | 0.951 | 19.0 | 1.132 | | | | |
| 3.8 | 1.278 | 0.0 | 1.278 | 7.8 | 1.639 | 0.0 | 1.639 | 11.8 | 1.319 | 18.5 | 1.563 | | | | |
| 3.9 | 1.639 | 0.0 | 1.639 | 7.9 | 1.639 | 25.0 | 2.049 | 11.9 | 1.305 | 18.0 | 1.540 | | | | |
| 4.0 | 1.639 | 0.0 | 1.639 | 8.0 | 1.278 | 20.0 | 1.534 | 12.0 | 1.295 | 17.5 | 1.521 | | | | |
| 4.1 | 1.639 | 0.0 | 1.639 | 8.1 | 1.278 | 25.0 | 1.598 | 12.1 | 1.286 | 17.0 | 1.505 | | | | |
| 4.2 | 1.639 | 0.0 | 1.639 | 8.2 | 1.278 | 30.0 | 1.661 | 12.2 | 1.281 | 16.5 | 1.492 | | | | |
| 4.3 | 1.639 | 0.0 | 1.639 | 8.3 | 1.278 | 35.0 | 1.725 | 12.3 | 1.278 | 16.0 | 1.482 | | | | |
| 4.4 | 1.639 | 0.0 | 1.639 | 8.4 | 1.278 | 40.0 | 1.789 | 12.4 | 1.278 | 15.5 | 1.476 | | | | |
| 4.5 | 1.639 | 0.0 | 1.639 | 8.5 | 1.278 | 45.0 | 1.853 | 12.5 | 1.278 | 15.0 | 1.469 | | | | |
| 4.6 | 1.639 | 0.0 | 1.639 | 8.6 | 1.278 | 40.0 | 1.789 | 12.6 | 1.278 | 14.0 | 1.457 | | | | |
| 4.7 | 1.639 | 0.0 | 1.639 | 8.7 | 1.278 | 35.0 | 1.725 | 12.7 | 1.278 | 13.0 | 1.444 | | | | |
| 4.8 | 1.639 | 0.0 | 1.639 | 8.8 | 1.278 | 30.0 | 1.661 | 12.8 | 1.278 | 12.0 | 1.431 | | | | |
| 4.9 | 1.639 | 0.0 | 1.639 | 8.9 | 1.278 | 25.0 | 1.598 | 12.9 | 1.278 | 11.0 | 1.418 | | | | |

Project: Special Structures Rating

Sheet: 46 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Loads

| Girder 2 | | | | Girder 3 | | | | | | | |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
| 1.0 | 1.286 | 0.0 | 1.286 | 1.0 | 1.293 | 30.0 | 1.681 | 5.0 | 1.231 | 25.0 | 1.539 |
| 1.1 | 1.286 | 0.0 | 1.286 | 1.1 | 1.293 | 29.5 | 1.674 | 5.1 | 1.270 | 25.0 | 1.588 |
| 1.2 | 1.286 | 0.0 | 1.286 | 1.2 | 1.293 | 29.0 | 1.668 | 5.2 | 1.249 | 25.0 | 1.561 |
| 1.3 | 1.286 | 0.0 | 1.286 | 1.3 | 1.293 | 28.5 | 1.662 | 5.3 | 1.230 | 25.0 | 1.538 |
| 1.4 | 1.286 | 0.0 | 1.286 | 1.4 | 1.293 | 28.0 | 1.655 | 5.4 | 1.212 | 25.0 | 1.515 |
| 1.5 | 1.286 | 0.0 | 1.286 | 1.5 | 1.293 | 27.5 | 1.649 | 5.5 | 1.196 | 25.0 | 1.495 |
| 1.6 | 1.286 | 0.0 | 1.286 | 1.6 | 1.293 | 27.0 | 1.642 | 5.6 | 1.181 | 25.0 | 1.476 |
| 1.7 | 1.286 | 0.0 | 1.286 | 1.7 | 1.293 | 26.5 | 1.636 | 5.7 | 1.167 | 25.0 | 1.459 |
| 1.8 | 1.286 | 0.0 | 1.286 | 1.8 | 1.293 | 26.0 | 1.629 | 5.8 | 1.154 | 25.0 | 1.443 |
| 1.9 | 1.286 | 0.0 | 1.286 | 1.9 | 1.293 | 25.5 | 1.623 | 5.9 | 1.143 | 25.0 | 1.429 |
| 2.0 | 1.286 | 0.0 | 1.286 | 2.0 | 1.625 | 25.0 | 2.031 | 6.0 | 1.133 | 25.0 | 1.416 |
| 2.1 | 1.286 | 0.0 | 1.286 | 2.1 | 1.596 | 33.0 | 2.122 | | | | |
| 2.2 | 1.286 | 0.0 | 1.286 | 2.2 | 1.566 | 41.0 | 2.208 | | | | |
| 2.3 | 1.286 | 0.0 | 1.286 | 2.3 | 1.536 | 49.0 | 2.289 | | | | |
| 2.4 | 1.286 | 0.0 | 1.286 | 2.4 | 1.507 | 57.0 | 2.365 | | | | |
| 2.5 | 1.286 | 0.0 | 1.286 | 2.5 | 1.477 | 65.0 | 2.437 | | | | |
| 2.6 | 1.286 | 0.0 | 1.286 | 2.6 | 1.447 | 57.0 | 2.272 | | | | |
| 2.7 | 1.286 | 0.0 | 1.286 | 2.7 | 1.417 | 49.0 | 2.112 | | | | |
| 2.8 | 1.286 | 0.0 | 1.286 | 2.8 | 1.388 | 41.0 | 1.957 | | | | |
| 2.9 | 1.286 | 0.0 | 1.286 | 2.9 | 1.358 | 33.0 | 1.806 | | | | |
| 3.0 | 1.286 | 0.0 | 1.286 | 3.0 | 1.328 | 25.0 | 1.660 | | | | |
| 3.1 | 1.286 | 0.0 | 1.286 | 3.1 | 1.299 | 33.0 | 1.728 | | | | |
| 3.2 | 1.286 | 0.0 | 1.286 | 3.2 | 1.589 | 41.0 | 2.240 | | | | |
| 3.3 | 1.286 | 0.0 | 1.286 | 3.3 | 1.555 | 49.0 | 2.316 | | | | |
| 3.4 | 1.286 | 0.0 | 1.286 | 3.4 | 1.520 | 57.0 | 2.387 | | | | |
| 3.5 | 1.286 | 0.0 | 1.286 | 3.5 | 1.485 | 65.0 | 2.450 | | | | |
| 3.6 | 1.286 | 0.0 | 1.286 | 3.6 | 1.450 | 57.0 | 2.276 | | | | |
| 3.7 | 1.286 | 0.0 | 1.286 | 3.7 | 1.414 | 49.0 | 2.106 | | | | |
| 3.8 | 1.286 | 0.0 | 1.286 | 3.8 | 1.377 | 41.0 | 1.942 | | | | |
| 3.9 | 1.286 | 0.0 | 1.286 | 3.9 | 1.340 | 33.0 | 1.782 | | | | |
| 4.0 | 1.286 | 0.0 | 1.286 | 4.0 | 1.736 | 25.0 | 2.170 | | | | |
| | | | | 4.1 | 1.690 | 27.0 | 2.146 | | | | |
| | | | | 4.2 | 1.643 | 29.0 | 2.119 | | | | |
| | | | | 4.3 | 1.595 | 31.0 | 2.090 | | | | |
| | | | | 4.4 | 1.547 | 33.0 | 2.058 | | | | |
| | | | | 4.5 | 1.498 | 35.0 | 2.023 | | | | |
| | | | | 4.6 | 1.451 | 33.0 | 1.930 | | | | |
| | | | | 4.7 | 1.407 | 31.0 | 1.844 | | | | |
| | | | | 4.8 | 1.366 | 29.0 | 1.762 | | | | |
| | | | | 4.9 | 1.328 | 27.0 | 1.686 | | | | |

Project: Special Structures Rating

Sheet: 47 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 4

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.278 | 0.0 | 1.278 | 5.0 | 1.639 | 0.0 | 1.639 | 9.0 | 1.328 | 25.0 | 1.660 |
| 1.1 | 1.278 | 0.0 | 1.278 | 5.1 | 1.639 | 0.0 | 1.639 | 9.1 | 1.299 | 33.0 | 1.728 |
| 1.2 | 1.278 | 0.0 | 1.278 | 5.2 | 1.639 | 0.0 | 1.639 | 9.2 | 1.589 | 41.0 | 2.240 |
| 1.3 | 1.278 | 0.0 | 1.278 | 5.3 | 1.639 | 0.0 | 1.639 | 9.3 | 1.555 | 49.0 | 2.316 |
| 1.4 | 1.278 | 0.0 | 1.278 | 5.4 | 1.639 | 0.0 | 1.639 | 9.4 | 1.520 | 57.0 | 2.387 |
| 1.5 | 1.278 | 0.0 | 1.278 | 5.5 | 1.639 | 0.0 | 1.639 | 9.5 | 1.485 | 65.0 | 2.450 |
| 1.6 | 1.278 | 0.0 | 1.278 | 5.6 | 1.639 | 0.0 | 1.639 | 9.6 | 1.450 | 57.0 | 2.276 |
| 1.7 | 1.278 | 0.0 | 1.278 | 5.7 | 1.639 | 0.0 | 1.639 | 9.7 | 1.414 | 49.0 | 2.106 |
| 1.8 | 1.278 | 0.0 | 1.278 | 5.8 | 1.639 | 0.0 | 1.639 | 9.8 | 1.377 | 41.0 | 1.942 |
| 1.9 | 1.278 | 0.0 | 1.278 | 5.9 | 1.639 | 0.0 | 1.639 | 9.9 | 1.340 | 33.0 | 1.782 |
| 2.0 | 1.278 | 0.0 | 1.278 | 6.0 | 1.639 | 0.0 | 1.639 | 10.0 | 1.302 | 25.0 | 1.628 |
| 2.1 | 1.278 | 0.0 | 1.278 | 6.1 | 1.639 | 0.0 | 1.639 | | | | |
| 2.2 | 1.278 | 0.0 | 1.278 | 6.2 | 1.639 | 0.0 | 1.639 | | | | |
| 2.3 | 1.278 | 0.0 | 1.278 | 6.3 | 1.639 | 0.0 | 1.639 | | | | |
| 2.4 | 1.278 | 0.0 | 1.278 | 6.4 | 1.639 | 0.0 | 1.639 | | | | |
| 2.5 | 1.278 | 0.0 | 1.278 | 6.5 | 1.639 | 0.0 | 1.639 | | | | |
| 2.6 | 1.278 | 0.0 | 1.278 | 6.6 | 1.639 | 0.0 | 1.639 | | | | |
| 2.7 | 1.278 | 0.0 | 1.278 | 6.7 | 1.639 | 0.0 | 1.639 | | | | |
| 2.8 | 1.278 | 0.0 | 1.278 | 6.8 | 1.639 | 0.0 | 1.639 | | | | |
| 2.9 | 1.278 | 0.0 | 1.278 | 6.9 | 1.639 | 0.0 | 1.639 | | | | |
| 3.0 | 1.278 | 0.0 | 1.278 | 7.0 | 1.639 | 0.0 | 1.639 | | | | |
| 3.1 | 1.278 | 0.0 | 1.278 | 7.1 | 1.639 | 0.0 | 1.639 | | | | |
| 3.2 | 1.278 | 0.0 | 1.278 | 7.2 | 1.639 | 0.0 | 1.639 | | | | |
| 3.3 | 1.278 | 0.0 | 1.278 | 7.3 | 1.639 | 0.0 | 1.639 | | | | |
| 3.4 | 1.278 | 0.0 | 1.278 | 7.4 | 1.639 | 0.0 | 1.639 | | | | |
| 3.5 | 1.278 | 0.0 | 1.278 | 7.5 | 1.639 | 0.0 | 1.639 | | | | |
| 3.6 | 1.278 | 0.0 | 1.278 | 7.6 | 1.639 | 0.0 | 1.639 | | | | |
| 3.7 | 1.278 | 0.0 | 1.278 | 7.7 | 1.639 | 0.0 | 1.639 | | | | |
| 3.8 | 1.278 | 0.0 | 1.278 | 7.8 | 1.639 | 0.0 | 1.639 | | | | |
| 3.9 | 1.639 | 0.0 | 1.639 | 7.9 | 1.639 | 30.0 | 2.131 | | | | |
| 4.0 | 1.639 | 0.0 | 1.639 | 8.0 | 1.625 | 25.0 | 2.031 | | | | |
| 4.1 | 1.639 | 0.0 | 1.639 | 8.1 | 1.596 | 33.0 | 2.122 | | | | |
| 4.2 | 1.639 | 0.0 | 1.639 | 8.2 | 1.566 | 41.0 | 2.208 | | | | |
| 4.3 | 1.639 | 0.0 | 1.639 | 8.3 | 1.536 | 49.0 | 2.289 | | | | |
| 4.4 | 1.639 | 0.0 | 1.639 | 8.4 | 1.507 | 57.0 | 2.365 | | | | |
| 4.5 | 1.639 | 0.0 | 1.639 | 8.5 | 1.477 | 65.0 | 2.437 | | | | |
| 4.6 | 1.639 | 0.0 | 1.639 | 8.6 | 1.447 | 57.0 | 2.272 | | | | |
| 4.7 | 1.639 | 0.0 | 1.639 | 8.7 | 1.417 | 49.0 | 2.112 | | | | |
| 4.8 | 1.639 | 0.0 | 1.639 | 8.8 | 1.388 | 41.0 | 1.957 | | | | |
| 4.9 | 1.639 | 0.0 | 1.639 | 8.9 | 1.358 | 33.0 | 1.806 | | | | |

Project: Special Structures Rating

Sheet: 48 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 5

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.136 | 10.0 | 1.250 | 5.0 | 0.996 | 20.0 | 1.196 | 9.0 | 1.278 | 10.0 | 1.406 |
| 1.1 | 1.112 | 11.0 | 1.234 | 5.1 | 0.999 | 25.0 | 1.249 | 9.1 | 1.278 | 11.0 | 1.419 |
| 1.2 | 1.097 | 12.0 | 1.229 | 5.2 | 1.002 | 30.0 | 1.302 | 9.2 | 1.278 | 12.0 | 1.431 |
| 1.3 | 1.085 | 13.0 | 1.226 | 5.3 | 1.004 | 35.0 | 1.355 | 9.3 | 1.278 | 13.0 | 1.444 |
| 1.4 | 1.074 | 14.0 | 1.225 | 5.4 | 1.041 | 40.0 | 1.457 | 9.4 | 1.278 | 14.0 | 1.457 |
| 1.5 | 1.066 | 15.0 | 1.226 | 5.5 | 1.077 | 45.0 | 1.561 | 9.5 | 1.278 | 15.0 | 1.470 |
| 1.6 | 1.059 | 14.0 | 1.208 | 5.6 | 1.106 | 42.0 | 1.571 | 9.6 | 1.278 | 20.0 | 1.534 |
| 1.7 | 1.056 | 13.0 | 1.193 | 5.7 | 1.130 | 39.0 | 1.571 | 9.7 | 1.278 | 25.0 | 1.598 |
| 1.8 | 1.054 | 12.0 | 1.181 | 5.8 | 1.150 | 36.0 | 1.564 | 9.8 | 1.278 | 30.0 | 1.661 |
| 1.9 | 1.055 | 11.0 | 1.171 | 5.9 | 1.165 | 33.0 | 1.549 | 9.9 | 1.278 | 35.0 | 1.725 |
| 2.0 | 1.059 | 10.0 | 1.165 | 6.0 | 1.155 | 30.0 | 1.501 | 10.0 | 1.630 | 40.0 | 2.282 |
| 2.1 | 1.066 | 11.0 | 1.184 | 6.1 | 1.165 | 27.0 | 1.479 | 10.1 | 1.601 | 45.0 | 2.321 |
| 2.2 | 1.078 | 12.0 | 1.207 | 6.2 | 1.173 | 24.0 | 1.455 | 10.2 | 1.571 | 50.0 | 2.356 |
| 2.3 | 1.092 | 13.0 | 1.234 | 6.3 | 1.182 | 21.0 | 1.430 | 10.3 | 1.541 | 55.0 | 2.389 |
| 2.4 | 1.109 | 14.0 | 1.265 | 6.4 | 1.191 | 18.0 | 1.405 | 10.4 | 1.512 | 60.0 | 2.419 |
| 2.5 | 1.129 | 15.0 | 1.299 | 6.5 | 1.199 | 15.0 | 1.379 | 10.5 | 1.482 | 65.0 | 2.445 |
| 2.6 | 1.152 | 15.5 | 1.330 | 6.6 | 1.207 | 14.0 | 1.376 | 10.6 | 1.452 | 57.0 | 2.280 |
| 2.7 | 1.176 | 16.0 | 1.364 | 6.7 | 1.215 | 13.0 | 1.373 | 10.7 | 1.422 | 49.0 | 2.119 |
| 2.8 | 1.201 | 16.5 | 1.400 | 6.8 | 1.223 | 12.0 | 1.370 | 10.8 | 1.393 | 41.0 | 1.964 |
| 2.9 | 1.228 | 17.0 | 1.437 | 6.9 | 1.231 | 11.0 | 1.366 | 10.9 | 1.363 | 33.0 | 1.813 |
| 3.0 | 1.255 | 17.5 | 1.475 | 7.0 | 1.238 | 10.0 | 1.362 | 11.0 | 1.331 | 25.0 | 1.664 |
| 3.1 | 1.281 | 18.0 | 1.511 | 7.1 | 1.247 | 11.0 | 1.384 | 11.1 | 1.325 | 26.6 | 1.677 |
| 3.2 | 1.306 | 18.5 | 1.548 | 7.2 | 1.255 | 12.0 | 1.405 | 11.2 | 1.319 | 28.2 | 1.691 |
| 3.3 | 0.986 | 19.0 | 1.173 | 7.3 | 1.263 | 13.0 | 1.427 | 11.3 | 1.313 | 29.8 | 1.704 |
| 3.4 | 0.984 | 19.5 | 1.176 | 7.4 | 1.271 | 14.0 | 1.449 | 11.4 | 1.308 | 31.4 | 1.719 |
| 3.5 | 0.983 | 20.0 | 1.180 | 7.5 | 1.278 | 15.0 | 1.470 | 11.5 | 1.302 | 33.0 | 1.732 |
| 3.6 | 0.983 | 20.0 | 1.179 | 7.6 | 1.286 | 14.0 | 1.466 | 11.6 | 1.296 | 34.6 | 1.744 |
| 3.7 | 0.983 | 20.0 | 1.180 | 7.7 | 1.293 | 13.0 | 1.462 | 11.7 | 1.291 | 36.2 | 1.758 |
| 3.8 | 0.984 | 20.0 | 1.181 | 7.8 | 1.301 | 12.0 | 1.457 | 11.8 | 1.285 | 37.8 | 1.771 |
| 3.9 | 0.985 | 20.0 | 1.182 | 7.9 | 1.301 | 11.0 | 1.444 | 11.9 | 1.280 | 39.4 | 1.784 |
| 4.0 | 0.987 | 20.0 | 1.185 | 8.0 | 1.301 | 10.0 | 1.431 | 12.0 | 1.274 | 41.0 | 1.796 |
| 4.1 | 0.991 | 21.0 | 1.199 | 8.1 | 1.301 | 11.0 | 1.444 | | | | |
| 4.2 | 0.994 | 22.0 | 1.213 | 8.2 | 1.301 | 12.0 | 1.457 | | | | |
| 4.3 | 0.998 | 23.0 | 1.228 | 8.3 | 1.301 | 13.0 | 1.470 | | | | |
| 4.4 | 1.002 | 24.0 | 1.243 | 8.4 | 1.301 | 14.0 | 1.483 | | | | |
| 4.5 | 1.058 | 25.0 | 1.323 | 8.5 | 1.278 | 15.0 | 1.470 | | | | |
| 4.6 | 1.150 | 24.0 | 1.425 | 8.6 | 1.278 | 14.0 | 1.457 | | | | |
| 4.7 | 1.233 | 23.0 | 1.517 | 8.7 | 1.278 | 13.0 | 1.444 | | | | |
| 4.8 | 1.309 | 22.0 | 1.597 | 8.8 | 1.278 | 12.0 | 1.431 | | | | |
| 4.9 | 0.992 | 21.0 | 1.200 | 8.9 | 1.278 | 11.0 | 1.419 | | | | |

Project: Special Structures Rating

Sheet: 49 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 6

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.242 | 25.0 | 1.553 | 5.0 | 1.286 | 15.0 | 1.479 | 9.0 | 1.746 | 25.0 | 2.183 | 13.0 | 1.286 | 15.0 | 1.479 |
| 1.1 | 1.248 | 25.0 | 1.560 | 5.1 | 1.286 | 19.0 | 1.530 | 9.1 | 1.700 | 27.0 | 2.159 | 13.1 | 1.286 | 16.4 | 1.497 |
| 1.2 | 1.255 | 25.0 | 1.569 | 5.2 | 1.286 | 23.0 | 1.582 | 9.2 | 1.653 | 29.0 | 2.132 | 13.2 | 1.286 | 17.8 | 1.515 |
| 1.3 | 1.262 | 25.0 | 1.578 | 5.3 | 1.286 | 27.0 | 1.633 | 9.3 | 1.605 | 31.0 | 2.103 | 13.3 | 1.286 | 19.2 | 1.533 |
| 1.4 | 1.269 | 25.0 | 1.586 | 5.4 | 1.286 | 31.0 | 1.685 | 9.4 | 1.557 | 33.0 | 2.071 | 13.4 | 1.286 | 20.6 | 1.551 |
| 1.5 | 1.277 | 25.0 | 1.596 | 5.5 | 1.286 | 35.0 | 1.736 | 9.5 | 1.508 | 35.0 | 2.036 | 13.5 | 1.286 | 22.0 | 1.569 |
| 1.6 | 1.285 | 25.0 | 1.606 | 5.6 | 1.286 | 31.0 | 1.685 | 9.6 | 1.461 | 33.0 | 1.944 | 13.6 | 1.286 | 20.6 | 1.551 |
| 1.7 | 1.293 | 25.0 | 1.616 | 5.7 | 1.286 | 27.0 | 1.633 | 9.7 | 1.417 | 31.0 | 1.857 | 13.7 | 1.286 | 19.2 | 1.533 |
| 1.8 | 1.300 | 25.0 | 1.625 | 5.8 | 1.286 | 23.0 | 1.582 | 9.8 | 1.376 | 29.0 | 1.775 | 13.8 | 1.286 | 17.8 | 1.515 |
| 1.9 | 1.307 | 25.0 | 1.634 | 5.9 | 1.286 | 19.0 | 1.530 | 9.9 | 1.338 | 27.0 | 1.699 | 13.9 | 1.286 | 16.4 | 1.497 |
| 2.0 | 1.313 | 25.0 | 1.641 | 6.0 | 1.286 | 15.0 | 1.479 | 10.0 | 1.292 | 25.0 | 1.615 | 14.0 | 1.286 | 15.0 | 1.479 |
| 2.1 | 1.352 | 33.0 | 1.798 | 6.1 | 1.286 | 19.0 | 1.530 | 10.1 | 1.263 | 25.0 | 1.579 | | | | |
| 2.2 | 1.121 | 41.0 | 1.580 | 6.2 | 1.286 | 23.0 | 1.582 | 10.2 | 1.237 | 25.0 | 1.546 | | | | |
| 2.3 | 1.156 | 49.0 | 1.723 | 6.3 | 1.286 | 27.0 | 1.633 | 10.3 | 1.212 | 25.0 | 1.515 | | | | |
| 2.4 | 1.193 | 57.0 | 1.874 | 6.4 | 1.286 | 31.0 | 1.685 | 10.4 | 1.190 | 25.0 | 1.487 | | | | |
| 2.5 | 1.231 | 65.0 | 2.032 | 6.5 | 1.286 | 35.0 | 1.736 | 10.5 | 1.170 | 25.0 | 1.463 | | | | |
| 2.6 | 1.270 | 62.0 | 2.058 | 6.6 | 1.286 | 38.0 | 1.775 | 10.6 | 1.152 | 24.7 | 1.437 | | | | |
| 2.7 | 1.311 | 59.0 | 2.084 | 6.7 | 1.286 | 41.0 | 1.813 | 10.7 | 1.137 | 24.4 | 1.414 | | | | |
| 2.8 | 1.352 | 56.0 | 2.109 | 6.8 | 1.286 | 44.0 | 1.852 | 10.8 | 1.685 | 24.1 | 2.092 | | | | |
| 2.9 | 1.395 | 53.0 | 2.134 | 6.9 | 1.286 | 47.0 | 1.890 | 10.9 | 1.669 | 23.8 | 2.066 | | | | |
| 3.0 | 1.112 | 50.0 | 1.668 | 7.0 | 1.635 | 50.0 | 2.453 | 11.0 | 1.301 | 23.5 | 1.607 | | | | |
| 3.1 | 1.082 | 47.0 | 1.591 | 7.1 | 1.606 | 53.0 | 2.457 | 11.1 | 1.294 | 23.2 | 1.594 | | | | |
| 3.2 | 1.093 | 44.0 | 1.574 | 7.2 | 1.576 | 56.0 | 2.458 | 11.2 | 1.289 | 22.9 | 1.584 | | | | |
| 3.3 | 1.104 | 41.0 | 1.557 | 7.3 | 1.546 | 59.0 | 2.459 | 11.3 | 1.286 | 22.6 | 1.577 | | | | |
| 3.4 | 1.116 | 38.0 | 1.540 | 7.4 | 1.517 | 62.0 | 2.457 | 11.4 | 1.286 | 22.3 | 1.573 | | | | |
| 3.5 | 1.127 | 35.0 | 1.521 | 7.5 | 1.487 | 65.0 | 2.453 | 11.5 | 1.286 | 22.0 | 1.569 | | | | |
| 3.6 | 1.138 | 31.0 | 1.491 | 7.6 | 1.457 | 57.0 | 2.288 | 11.6 | 1.286 | 20.6 | 1.551 | | | | |
| 3.7 | 1.149 | 27.0 | 1.459 | 7.7 | 1.427 | 49.0 | 2.127 | 11.7 | 1.286 | 19.2 | 1.533 | | | | |
| 3.8 | 1.160 | 23.0 | 1.427 | 7.8 | 1.398 | 41.0 | 1.971 | 11.8 | 1.286 | 17.8 | 1.515 | | | | |
| 3.9 | 1.172 | 19.0 | 1.395 | 7.9 | 1.368 | 33.0 | 1.819 | 11.9 | 1.286 | 16.4 | 1.497 | | | | |
| 4.0 | 1.183 | 15.0 | 1.360 | 8.0 | 1.338 | 25.0 | 1.673 | 12.0 | 1.286 | 15.0 | 1.479 | | | | |
| 4.1 | 1.196 | 19.0 | 1.423 | 8.1 | 1.309 | 33.0 | 1.741 | 12.1 | 1.286 | 16.4 | 1.497 | | | | |
| 4.2 | 1.209 | 23.0 | 1.487 | 8.2 | 1.599 | 41.0 | 2.254 | 12.2 | 1.286 | 17.8 | 1.515 | | | | |
| 4.3 | 1.221 | 27.0 | 1.551 | 8.3 | 1.565 | 49.0 | 2.331 | 12.3 | 1.286 | 19.2 | 1.533 | | | | |
| 4.4 | 1.234 | 31.0 | 1.617 | 8.4 | 1.530 | 57.0 | 2.403 | 12.4 | 1.286 | 20.6 | 1.551 | | | | |
| 4.5 | 1.247 | 35.0 | 1.683 | 8.5 | 1.495 | 65.0 | 2.467 | 12.5 | 1.286 | 22.0 | 1.569 | | | | |
| 4.6 | 1.260 | 31.0 | 1.651 | 8.6 | 1.460 | 57.0 | 2.292 | 12.6 | 1.286 | 20.6 | 1.551 | | | | |
| 4.7 | 1.273 | 27.0 | 1.617 | 8.7 | 1.424 | 49.0 | 2.121 | 12.7 | 1.286 | 19.2 | 1.533 | | | | |
| 4.8 | 1.286 | 23.0 | 1.582 | 8.8 | 1.387 | 41.0 | 1.956 | 12.8 | 1.286 | 17.8 | 1.515 | | | | |
| 4.9 | 1.286 | 19.0 | 1.530 | 8.9 | 1.350 | 33.0 | 1.795 | 12.9 | 1.286 | 16.4 | 1.497 | | | | |

Project: Special Structures Rating

Sheet: 50 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 7

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.422 | 24.1 | 1.765 | 5.0 | 1.215 | 10.0 | 1.337 | 9.0 | 1.307 | 20.0 | 1.568 | 13.0 | 1.307 | 10.0 | 1.438 |
| 1.1 | 1.079 | 24.28 | 1.341 | 5.1 | 1.224 | 11.0 | 1.358 | 9.1 | 1.307 | 25.0 | 1.634 | 13.1 | 1.307 | 11.0 | 1.451 |
| 1.2 | 1.096 | 24.46 | 1.364 | 5.2 | 1.232 | 12.0 | 1.380 | 9.2 | 1.307 | 30.0 | 1.699 | 13.2 | 1.307 | 12.0 | 1.464 |
| 1.3 | 1.113 | 24.64 | 1.387 | 5.3 | 1.240 | 13.0 | 1.401 | 9.3 | 1.307 | 35.0 | 1.764 | 13.3 | 1.307 | 13.0 | 1.477 |
| 1.4 | 1.132 | 24.82 | 1.413 | 5.4 | 1.248 | 14.0 | 1.422 | 9.4 | 1.307 | 40.0 | 1.830 | 13.4 | 1.307 | 14.0 | 1.490 |
| 1.5 | 1.151 | 25.0 | 1.439 | 5.5 | 1.256 | 15.0 | 1.444 | 9.5 | 1.307 | 45.0 | 1.895 | 13.5 | 1.307 | 15.0 | 1.503 |
| 1.6 | 1.170 | 24.0 | 1.451 | 5.6 | 1.263 | 14.0 | 1.440 | 9.6 | 1.307 | 40.0 | 1.830 | 13.6 | 1.307 | 14.0 | 1.490 |
| 1.7 | 1.191 | 23.0 | 1.465 | 5.7 | 1.271 | 13.0 | 1.436 | 9.7 | 1.307 | 35.0 | 1.764 | 13.7 | 1.307 | 13.0 | 1.477 |
| 1.8 | 1.212 | 22.0 | 1.479 | 5.8 | 1.278 | 12.0 | 1.431 | 9.8 | 1.307 | 30.0 | 1.699 | 13.8 | 1.307 | 12.0 | 1.464 |
| 1.9 | 1.233 | 21.0 | 1.492 | 5.9 | 1.278 | 11.0 | 1.418 | 9.9 | 1.307 | 25.0 | 1.634 | 13.9 | 1.307 | 11.0 | 1.451 |
| 2.0 | 1.255 | 20.0 | 1.505 | 6.0 | 1.278 | 10.0 | 1.406 | 10.0 | 1.307 | 20.0 | 1.568 | 14.0 | 1.307 | 10.0 | 1.438 |
| 2.1 | 1.295 | 21.0 | 1.567 | 6.1 | 1.278 | 11.0 | 1.419 | 10.1 | 1.307 | 22.0 | 1.595 | 14.1 | 1.307 | 11.0 | 1.451 |
| 2.2 | 1.337 | 22.0 | 1.631 | 6.2 | 1.278 | 12.0 | 1.431 | 10.2 | 1.307 | 24.0 | 1.621 | 14.2 | 1.307 | 12.0 | 1.464 |
| 2.3 | 1.381 | 23.0 | 1.699 | 6.3 | 1.278 | 13.0 | 1.444 | 10.3 | 1.307 | 26.0 | 1.647 | 14.3 | 1.307 | 13.0 | 1.477 |
| 2.4 | 1.427 | 24.0 | 1.770 | 6.4 | 1.278 | 14.0 | 1.457 | 10.4 | 1.307 | 28.0 | 1.673 | 14.4 | 1.307 | 14.0 | 1.490 |
| 2.5 | 1.475 | 25.0 | 1.843 | 6.5 | 1.298 | 15.0 | 1.493 | 10.5 | 1.307 | 30.0 | 1.699 | 14.5 | 1.307 | 15.0 | 1.503 |
| 2.6 | 1.524 | 25.0 | 1.905 | 6.6 | 1.298 | 14.0 | 1.480 | 10.6 | 1.307 | 28.0 | 1.673 | 14.6 | 1.307 | 14.0 | 1.490 |
| 2.7 | 1.575 | 25.0 | 1.968 | 6.7 | 1.298 | 13.0 | 1.467 | 10.7 | 1.307 | 26.0 | 1.647 | 14.7 | 1.307 | 13.0 | 1.477 |
| 2.8 | 1.627 | 25.0 | 2.034 | 6.8 | 1.298 | 12.0 | 1.454 | 10.8 | 1.307 | 24.0 | 1.621 | 14.8 | 1.307 | 12.0 | 1.464 |
| 2.9 | 1.266 | 25.0 | 1.582 | 6.9 | 1.298 | 11.0 | 1.441 | 10.9 | 1.307 | 22.0 | 1.595 | 14.9 | 1.307 | 11.0 | 1.451 |
| 3.0 | 1.310 | 25.0 | 1.637 | 7.0 | 1.298 | 10.0 | 1.428 | 11.0 | 1.307 | 20.0 | 1.568 | 15.0 | 1.307 | 10.0 | 1.438 |
| 3.1 | 1.349 | 33.0 | 1.794 | 7.1 | 1.298 | 11.0 | 1.441 | 11.1 | 1.307 | 20.0 | 1.568 | | | | |
| 3.2 | 1.118 | 41.0 | 1.576 | 7.2 | 1.298 | 12.0 | 1.454 | 11.2 | 1.307 | 20.0 | 1.568 | | | | |
| 3.3 | 1.153 | 49.0 | 1.719 | 7.3 | 1.298 | 13.0 | 1.467 | 11.3 | 1.307 | 20.0 | 1.568 | | | | |
| 3.4 | 1.190 | 57.0 | 1.869 | 7.4 | 1.298 | 14.0 | 1.480 | 11.4 | 1.307 | 20.0 | 1.568 | | | | |
| 3.5 | 1.228 | 65.0 | 2.027 | 7.5 | 1.298 | 15.0 | 1.493 | 11.5 | 1.307 | 20.0 | 1.568 | | | | |
| 3.6 | 1.267 | 60.0 | 2.028 | 7.6 | 1.298 | 18.0 | 1.532 | 11.6 | 1.307 | 19.5 | 1.562 | | | | |
| 3.7 | 1.308 | 55.0 | 2.027 | 7.7 | 1.298 | 21.0 | 1.571 | 11.7 | 1.307 | 19.0 | 1.555 | | | | |
| 3.8 | 1.349 | 50.0 | 2.024 | 7.8 | 1.298 | 24.0 | 1.610 | 11.8 | 1.307 | 18.5 | 1.549 | | | | |
| 3.9 | 1.392 | 45.0 | 2.018 | 7.9 | 1.298 | 27.0 | 1.648 | 11.9 | 1.307 | 18.0 | 1.542 | | | | |
| 4.0 | 1.112 | 40.0 | 1.557 | 8.0 | 1.307 | 30.0 | 1.699 | 12.0 | 1.307 | 17.5 | 1.536 | | | | |
| 4.1 | 1.142 | 35.0 | 1.541 | 8.1 | 1.307 | 33.0 | 1.738 | 12.1 | 1.307 | 17.0 | 1.529 | | | | |
| 4.2 | 1.150 | 30.0 | 1.496 | 8.2 | 1.307 | 36.0 | 1.778 | 12.2 | 1.307 | 16.5 | 1.523 | | | | |
| 4.3 | 1.159 | 25.0 | 1.449 | 8.3 | 1.307 | 39.0 | 1.817 | 12.3 | 1.307 | 16.0 | 1.516 | | | | |
| 4.4 | 1.168 | 20.0 | 1.401 | 8.4 | 1.307 | 42.0 | 1.856 | 12.4 | 1.307 | 15.5 | 1.510 | | | | |
| 4.5 | 1.176 | 15.0 | 1.352 | 8.5 | 1.307 | 45.0 | 1.895 | 12.5 | 1.307 | 15.0 | 1.503 | | | | |
| 4.6 | 1.184 | 14.0 | 1.350 | 8.6 | 1.307 | 40.0 | 1.830 | 12.6 | 1.307 | 14.0 | 1.490 | | | | |
| 4.7 | 1.192 | 13.0 | 1.347 | 8.7 | 1.307 | 35.0 | 1.764 | 12.7 | 1.307 | 13.0 | 1.477 | | | | |
| 4.8 | 1.200 | 12.0 | 1.344 | 8.8 | 1.307 | 30.0 | 1.699 | 12.8 | 1.307 | 12.0 | 1.464 | | | | |
| 4.9 | 1.208 | 11.0 | 1.340 | 8.9 | 1.307 | 25.0 | 1.634 | 12.9 | 1.307 | 11.0 | 1.451 | | | | |

Project: Special Structures Rating

Sheet: 51 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 8

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.087 | 25.0 | 1.359 | 5.0 | 1.299 | 10.0 | 1.429 | 9.0 | 1.278 | 0.0 | 1.278 |
| 1.1 | 1.117 | 33.0 | 1.486 | 5.1 | 1.299 | 11.0 | 1.442 | 9.1 | 1.278 | 0.0 | 1.278 |
| 1.2 | 1.148 | 41.0 | 1.619 | 5.2 | 1.299 | 12.0 | 1.455 | 9.2 | 1.278 | 0.0 | 1.278 |
| 1.3 | 1.179 | 49.0 | 1.757 | 5.3 | 1.299 | 13.0 | 1.468 | 9.3 | 1.278 | 0.0 | 1.278 |
| 1.4 | 1.211 | 57.0 | 1.901 | 5.4 | 1.299 | 14.0 | 1.481 | 9.4 | 1.278 | 0.0 | 1.278 |
| 1.5 | 1.244 | 65.0 | 2.053 | 5.5 | 1.299 | 15.0 | 1.494 | 9.5 | 1.278 | 0.0 | 1.278 |
| 1.6 | 1.277 | 60.0 | 2.043 | 5.6 | 1.299 | 14.0 | 1.481 | 9.6 | 1.278 | 0.0 | 1.278 |
| 1.7 | 1.311 | 55.0 | 2.032 | 5.7 | 1.299 | 13.0 | 1.468 | 9.7 | 1.278 | 0.0 | 1.278 |
| 1.8 | 1.345 | 50.0 | 2.018 | 5.8 | 1.299 | 12.0 | 1.455 | 9.8 | 1.278 | 0.0 | 1.278 |
| 1.9 | 1.380 | 45.0 | 2.001 | 5.9 | 1.298 | 11.0 | 1.441 | 9.9 | 1.278 | 0.0 | 1.278 |
| 2.0 | 1.149 | 40.0 | 1.609 | 6.0 | 1.298 | 10.0 | 1.428 | 10.0 | 1.278 | 0.0 | 1.278 |
| 2.1 | 0.997 | 35.0 | 1.346 | 6.1 | 1.298 | 11.0 | 1.441 | 10.1 | 1.278 | 0.0 | 1.278 |
| 2.2 | 1.022 | 30.0 | 1.329 | 6.2 | 1.298 | 12.0 | 1.454 | 10.2 | 1.278 | 0.0 | 1.278 |
| 2.3 | 1.046 | 25.0 | 1.308 | 6.3 | 1.298 | 13.0 | 1.467 | 10.3 | 1.278 | 0.0 | 1.278 |
| 2.4 | 1.069 | 20.0 | 1.283 | 6.4 | 1.298 | 14.0 | 1.480 | 10.4 | 1.278 | 0.0 | 1.278 |
| 2.5 | 1.092 | 15.0 | 1.255 | 6.5 | 1.298 | 15.0 | 1.493 | 10.5 | 1.278 | 0.0 | 1.278 |
| 2.6 | 1.113 | 14.0 | 1.269 | 6.6 | 1.298 | 14.0 | 1.480 | 10.6 | 1.278 | 0.0 | 1.278 |
| 2.7 | 1.133 | 13.0 | 1.281 | 6.7 | 1.298 | 13.0 | 1.467 | 10.7 | 1.278 | 0.0 | 1.278 |
| 2.8 | 1.153 | 12.0 | 1.291 | 6.8 | 1.298 | 12.0 | 1.454 | 10.8 | 1.278 | 0.0 | 1.278 |
| 2.9 | 1.172 | 11.0 | 1.300 | 6.9 | 1.298 | 11.0 | 1.441 | 10.9 | 1.278 | 0.0 | 1.278 |
| 3.0 | 1.189 | 10.0 | 1.308 | 7.0 | 1.298 | 10.0 | 1.428 | 11.0 | 1.278 | 0.0 | 1.278 |
| 3.1 | 1.209 | 11.0 | 1.342 | 7.1 | 1.298 | 11.0 | 1.441 | 11.1 | 1.278 | 0.0 | 1.278 |
| 3.2 | 1.227 | 12.0 | 1.374 | 7.2 | 1.298 | 12.0 | 1.454 | 11.2 | 1.278 | 0.0 | 1.278 |
| 3.3 | 1.245 | 13.0 | 1.406 | 7.3 | 1.298 | 13.0 | 1.467 | 11.3 | 1.278 | 0.0 | 1.278 |
| 3.4 | 1.261 | 14.0 | 1.438 | 7.4 | 1.298 | 14.0 | 1.480 | 11.4 | 1.278 | 0.0 | 1.278 |
| 3.5 | 1.277 | 15.0 | 1.469 | 7.5 | 1.298 | 15.0 | 1.493 | 11.5 | 1.278 | 0.0 | 1.278 |
| 3.6 | 1.293 | 14.0 | 1.474 | 7.6 | 1.298 | 14.0 | 1.480 | 11.6 | 1.278 | 0.0 | 1.278 |
| 3.7 | 1.308 | 13.0 | 1.478 | 7.7 | 1.298 | 13.0 | 1.467 | 11.7 | 1.278 | 0.0 | 1.278 |
| 3.8 | 1.315 | 12.0 | 1.473 | 7.8 | 1.298 | 12.0 | 1.454 | 11.8 | 1.278 | 0.0 | 1.278 |
| 3.9 | 1.315 | 11.0 | 1.459 | 7.9 | 1.298 | 11.0 | 1.441 | 11.9 | 1.278 | 0.0 | 1.278 |
| 4.0 | 1.299 | 10.0 | 1.429 | 8.0 | 1.278 | 10.0 | 1.406 | 12.0 | 1.278 | 0.0 | 1.278 |
| 4.1 | 1.299 | 11.0 | 1.442 | 8.1 | 1.278 | 11.0 | 1.419 | | | | |
| 4.2 | 1.299 | 12.0 | 1.455 | 8.2 | 1.278 | 12.0 | 1.431 | | | | |
| 4.3 | 1.299 | 13.0 | 1.468 | 8.3 | 1.278 | 13.0 | 1.444 | | | | |
| 4.4 | 1.299 | 14.0 | 1.481 | 8.4 | 1.278 | 14.0 | 1.457 | | | | |
| 4.5 | 1.299 | 15.0 | 1.494 | 8.5 | 1.278 | 15.0 | 1.470 | | | | |
| 4.6 | 1.299 | 14.0 | 1.481 | 8.6 | 1.278 | 0.0 | 1.278 | | | | |
| 4.7 | 1.299 | 13.0 | 1.468 | 8.7 | 1.278 | 0.0 | 1.278 | | | | |
| 4.8 | 1.299 | 12.0 | 1.455 | 8.8 | 1.278 | 0.0 | 1.278 | | | | |
| 4.9 | 1.299 | 11.0 | 1.442 | 8.9 | 1.278 | 0.0 | 1.278 | | | | |

Project: Special Structures Rating

Sheet: 52 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 9

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.010 | 15.0 | 1.162 | 5.0 | 1.290 | 25.0 | 1.612 | 9.0 | 1.286 | 15.0 | 1.479 | 13.0 | 1.286 | 0.0 | 1.286 |
| 1.1 | 1.006 | 16.4 | 1.171 | 5.1 | 1.329 | 33.0 | 1.768 | 9.1 | 1.286 | 16.4 | 1.497 | 13.1 | 1.286 | 0.0 | 1.286 |
| 1.2 | 1.003 | 17.8 | 1.182 | 5.2 | 1.098 | 41.0 | 1.548 | 9.2 | 1.286 | 17.8 | 1.515 | 13.2 | 1.286 | 0.0 | 1.286 |
| 1.3 | 1.001 | 19.2 | 1.193 | 5.3 | 1.133 | 49.0 | 1.689 | 9.3 | 1.286 | 19.2 | 1.533 | 13.3 | 1.286 | 0.0 | 1.286 |
| 1.4 | 1.000 | 20.6 | 1.206 | 5.4 | 1.170 | 57.0 | 1.837 | 9.4 | 1.286 | 20.6 | 1.551 | 13.4 | 1.286 | 0.0 | 1.286 |
| 1.5 | 1.000 | 22.0 | 1.220 | 5.5 | 1.208 | 65.0 | 1.994 | 9.5 | 1.286 | 22.0 | 1.569 | 13.5 | 1.286 | 0.0 | 1.286 |
| 1.6 | 1.002 | 20.6 | 1.208 | 5.6 | 1.247 | 60.7 | 2.005 | 9.6 | 1.286 | 20.6 | 1.551 | 13.6 | 1.286 | 0.0 | 1.286 |
| 1.7 | 1.004 | 19.2 | 1.197 | 5.7 | 1.288 | 56.4 | 2.014 | 9.7 | 1.286 | 19.2 | 1.533 | 13.7 | 1.286 | 0.0 | 1.286 |
| 1.8 | 1.007 | 17.8 | 1.186 | 5.8 | 1.329 | 52.1 | 2.022 | 9.8 | 1.286 | 17.8 | 1.515 | 13.8 | 1.286 | 0.0 | 1.286 |
| 1.9 | 1.011 | 16.4 | 1.177 | 5.9 | 1.372 | 47.8 | 2.027 | 9.9 | 1.286 | 16.4 | 1.497 | 13.9 | 1.286 | 0.0 | 1.286 |
| 2.0 | 1.017 | 15.0 | 1.170 | 6.0 | 1.092 | 43.5 | 1.567 | 10.0 | 1.286 | 15.0 | 1.479 | 14.0 | 1.286 | 0.0 | 1.286 |
| 2.1 | 1.025 | 16.4 | 1.193 | 6.1 | 1.089 | 39.2 | 1.516 | 10.1 | 1.286 | 16.4 | 1.497 | 14.1 | 1.286 | 0.0 | 1.286 |
| 2.2 | 1.035 | 17.8 | 1.219 | 6.2 | 1.101 | 34.9 | 1.485 | 10.2 | 1.286 | 17.8 | 1.515 | 14.2 | 1.286 | 0.0 | 1.286 |
| 2.3 | 1.046 | 19.2 | 1.247 | 6.3 | 1.112 | 30.6 | 1.452 | 10.3 | 1.286 | 19.2 | 1.533 | 14.3 | 1.286 | 0.0 | 1.286 |
| 2.4 | 1.059 | 20.6 | 1.277 | 6.4 | 1.124 | 26.3 | 1.420 | 10.4 | 1.286 | 20.6 | 1.551 | 14.4 | 1.286 | 0.0 | 1.286 |
| 2.5 | 1.074 | 22.0 | 1.310 | 6.5 | 1.135 | 22.0 | 1.385 | 10.5 | 1.286 | 22.0 | 1.569 | 14.5 | 1.286 | 0.0 | 1.286 |
| 2.6 | 1.091 | 22.3 | 1.334 | 6.6 | 1.147 | 20.6 | 1.383 | 10.6 | 1.286 | 20.6 | 1.551 | 14.6 | 1.286 | 0.0 | 1.286 |
| 2.7 | 1.109 | 22.6 | 1.360 | 6.7 | 1.158 | 19.2 | 1.380 | 10.7 | 1.286 | 19.2 | 1.533 | 14.7 | 1.286 | 0.0 | 1.286 |
| 2.8 | 1.129 | 22.9 | 1.388 | 6.8 | 1.169 | 17.8 | 1.377 | 10.8 | 1.286 | 17.8 | 1.515 | 14.8 | 1.286 | 0.0 | 1.286 |
| 2.9 | 1.150 | 23.2 | 1.417 | 6.9 | 1.180 | 16.4 | 1.374 | 10.9 | 1.286 | 16.4 | 1.497 | 14.9 | 1.286 | 0.0 | 1.286 |
| 3.0 | 1.493 | 23.5 | 1.844 | 7.0 | 1.191 | 15.0 | 1.370 | 11.0 | 1.286 | 15.0 | 1.479 | 15.0 | 1.286 | 0.0 | 1.286 |
| 3.1 | 1.522 | 23.8 | 1.884 | 7.1 | 1.203 | 16.4 | 1.400 | 11.1 | 1.286 | 16.4 | 1.497 | 15.1 | 1.286 | 0.0 | 1.286 |
| 3.2 | 1.552 | 24.1 | 1.926 | 7.2 | 1.216 | 17.8 | 1.432 | 11.2 | 1.286 | 17.8 | 1.515 | 15.2 | 1.286 | 0.0 | 1.286 |
| 3.3 | 1.056 | 24.4 | 1.314 | 7.3 | 1.229 | 19.2 | 1.465 | 11.3 | 1.286 | 19.2 | 1.533 | 15.3 | 1.286 | 0.0 | 1.286 |
| 3.4 | 1.078 | 24.7 | 1.345 | 7.4 | 1.241 | 20.6 | 1.497 | 11.4 | 1.286 | 20.6 | 1.551 | 15.4 | 1.286 | 0.0 | 1.286 |
| 3.5 | 1.102 | 25.0 | 1.377 | 7.5 | 1.254 | 22.0 | 1.530 | 11.5 | 1.286 | 22.0 | 1.569 | 15.5 | 1.286 | 0.0 | 1.286 |
| 3.6 | 1.126 | 24.0 | 1.396 | 7.6 | 1.267 | 20.6 | 1.528 | 11.6 | 1.286 | 20.6 | 1.551 | 15.6 | 1.286 | 0.0 | 1.286 |
| 3.7 | 1.152 | 23.0 | 1.417 | 7.7 | 1.279 | 19.2 | 1.525 | 11.7 | 1.286 | 19.2 | 1.533 | 15.7 | 1.286 | 0.0 | 1.286 |
| 3.8 | 1.178 | 22.0 | 1.437 | 7.8 | 1.286 | 17.8 | 1.515 | 11.8 | 1.286 | 17.8 | 1.515 | 15.8 | 1.286 | 0.0 | 1.286 |
| 3.9 | 1.206 | 21.0 | 1.459 | 7.9 | 1.286 | 16.4 | 1.497 | 11.9 | 1.286 | 16.4 | 1.497 | 15.9 | 1.286 | 0.0 | 1.286 |
| 4.0 | 1.235 | 20.0 | 1.481 | 8.0 | 1.286 | 15.0 | 1.479 | 12.0 | 1.286 | 15.0 | 1.479 | 16.0 | 1.286 | 0.0 | 1.286 |
| 4.1 | 1.275 | 21.0 | 1.543 | 8.1 | 1.286 | 16.4 | 1.497 | 12.1 | 1.286 | 16.4 | 1.497 | | | | |
| 4.2 | 1.317 | 22.0 | 1.607 | 8.2 | 1.286 | 17.8 | 1.515 | 12.2 | 1.286 | 17.8 | 1.515 | | | | |
| 4.3 | 1.361 | 23.0 | 1.675 | 8.3 | 1.286 | 19.2 | 1.533 | 12.3 | 1.286 | 19.2 | 1.533 | | | | |
| 4.4 | 1.407 | 24.0 | 1.745 | 8.4 | 1.286 | 20.6 | 1.551 | 12.4 | 1.286 | 20.6 | 1.551 | | | | |
| 4.5 | 1.455 | 25.0 | 1.818 | 8.5 | 1.286 | 22.0 | 1.569 | 12.5 | 1.286 | 22.0 | 1.569 | | | | |
| 4.6 | 1.504 | 25.0 | 1.880 | 8.6 | 1.286 | 20.6 | 1.551 | 12.6 | 1.286 | 0.0 | 1.286 | | | | |
| 4.7 | 1.555 | 25.0 | 1.943 | 8.7 | 1.286 | 19.2 | 1.533 | 12.7 | 1.286 | 0.0 | 1.286 | | | | |
| 4.8 | 1.607 | 25.0 | 2.009 | 8.8 | 1.286 | 17.8 | 1.515 | 12.8 | 1.286 | 0.0 | 1.286 | | | | |
| 4.9 | 1.246 | 25.0 | 1.557 | 8.9 | 1.286 | 16.4 | 1.497 | 12.9 | 1.286 | 0.0 | 1.286 | | | | |

Project: Special Structures Rating

Sheet: 53 of 53

LHB Proj. No. - 090147.00

Completed By: CJM

Checked By: RAM

Completed on: 03/04/10

Checked on: 4-30-10

Single Lane Permit Truck Live Load Distribution Factor - Wheel Load - Girder 10

| Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. | Span Point | AASHTO LL D.F. | % Increase | Permit D.F. |
|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|------------|----------------|------------|-------------|
| 1.0 | 1.092 | 10.0 | 1.202 | 5.0 | 1.263 | 20.0 | 1.515 | 9.0 | 1.278 | 10.0 | 1.406 | 13.0 | 1.278 | 0.0 | 1.278 |
| 1.1 | 1.090 | 11.0 | 1.210 | 5.1 | 1.264 | 25.0 | 1.580 | 9.1 | 1.278 | 11.0 | 1.419 | 13.1 | 1.278 | 0.0 | 1.278 |
| 1.2 | 1.098 | 12.0 | 1.229 | 5.2 | 1.266 | 30.0 | 1.646 | 9.2 | 1.278 | 12.0 | 1.431 | 13.2 | 1.278 | 0.0 | 1.278 |
| 1.3 | 1.105 | 13.0 | 1.248 | 5.3 | 1.268 | 35.0 | 1.711 | 9.3 | 1.278 | 13.0 | 1.444 | 13.3 | 1.278 | 0.0 | 1.278 |
| 1.4 | 1.112 | 14.0 | 1.267 | 5.4 | 1.269 | 40.0 | 1.777 | 9.4 | 1.278 | 14.0 | 1.457 | 13.4 | 1.278 | 0.0 | 1.278 |
| 1.5 | 1.118 | 15.0 | 1.286 | 5.5 | 1.271 | 45.0 | 1.842 | 9.5 | 1.278 | 15.0 | 1.470 | 13.5 | 1.278 | 0.0 | 1.278 |
| 1.6 | 1.125 | 14.0 | 1.282 | 5.6 | 1.272 | 42.0 | 1.806 | 9.6 | 1.278 | 14.0 | 1.457 | 13.6 | 1.278 | 0.0 | 1.278 |
| 1.7 | 1.131 | 13.0 | 1.278 | 5.7 | 1.273 | 39.0 | 1.769 | 9.7 | 1.278 | 13.0 | 1.444 | 13.7 | 1.278 | 0.0 | 1.278 |
| 1.8 | 1.137 | 12.0 | 1.273 | 5.8 | 1.274 | 36.0 | 1.733 | 9.8 | 1.278 | 12.0 | 1.431 | 13.8 | 1.278 | 0.0 | 1.278 |
| 1.9 | 1.143 | 11.0 | 1.269 | 5.9 | 1.275 | 33.0 | 1.696 | 9.9 | 1.278 | 11.0 | 1.419 | 13.9 | 1.278 | 0.0 | 1.278 |
| 2.0 | 1.149 | 10.0 | 1.263 | 6.0 | 1.276 | 30.0 | 1.658 | 10.0 | 1.278 | 10.0 | 1.406 | 14.0 | 1.278 | 0.0 | 1.278 |
| 2.1 | 1.156 | 11.0 | 1.283 | 6.1 | 1.276 | 27.0 | 1.621 | 10.1 | 1.278 | 11.0 | 1.419 | 14.1 | 1.278 | 0.0 | 1.278 |
| 2.2 | 1.162 | 12.0 | 1.302 | 6.2 | 1.277 | 24.0 | 1.583 | 10.2 | 1.278 | 12.0 | 1.431 | 14.2 | 1.278 | 0.0 | 1.278 |
| 2.3 | 1.169 | 13.0 | 1.321 | 6.3 | 1.277 | 21.0 | 1.546 | 10.3 | 1.278 | 13.0 | 1.444 | 14.3 | 1.278 | 0.0 | 1.278 |
| 2.4 | 1.175 | 14.0 | 1.340 | 6.4 | 1.278 | 18.0 | 1.507 | 10.4 | 1.278 | 14.0 | 1.457 | 14.4 | 1.278 | 0.0 | 1.278 |
| 2.5 | 1.181 | 15.0 | 1.358 | 6.5 | 1.278 | 15.0 | 1.469 | 10.5 | 1.278 | 15.0 | 1.470 | 14.5 | 1.278 | 0.0 | 1.278 |
| 2.6 | 1.187 | 15.5 | 1.371 | 6.6 | 1.278 | 14.0 | 1.457 | 10.6 | 1.278 | 14.0 | 1.457 | 14.6 | 1.278 | 0.0 | 1.278 |
| 2.7 | 1.192 | 16.0 | 1.383 | 6.7 | 1.278 | 13.0 | 1.444 | 10.7 | 1.278 | 13.0 | 1.444 | 14.7 | 1.278 | 0.0 | 1.278 |
| 2.8 | 1.197 | 16.5 | 1.395 | 6.8 | 1.278 | 12.0 | 1.431 | 10.8 | 1.278 | 12.0 | 1.431 | 14.8 | 1.278 | 0.0 | 1.278 |
| 2.9 | 1.202 | 17.0 | 1.407 | 6.9 | 1.278 | 11.0 | 1.418 | 10.9 | 1.278 | 11.0 | 1.419 | 14.9 | 1.278 | 0.0 | 1.278 |
| 3.0 | 1.207 | 17.5 | 1.418 | 7.0 | 1.278 | 10.0 | 1.406 | 11.0 | 1.278 | 10.0 | 1.406 | 15.0 | 1.278 | 0.0 | 1.278 |
| 3.1 | 1.211 | 18.0 | 1.429 | 7.1 | 1.278 | 11.0 | 1.419 | 11.1 | 1.278 | 11.0 | 1.419 | 15.1 | 1.278 | 0.0 | 1.278 |
| 3.2 | 1.215 | 18.5 | 1.439 | 7.2 | 1.278 | 12.0 | 1.431 | 11.2 | 1.278 | 12.0 | 1.431 | 15.2 | 1.278 | 0.0 | 1.278 |
| 3.3 | 1.218 | 19.0 | 1.449 | 7.3 | 1.278 | 13.0 | 1.444 | 11.3 | 1.278 | 13.0 | 1.444 | 15.3 | 1.278 | 0.0 | 1.278 |
| 3.4 | 1.221 | 19.5 | 1.460 | 7.4 | 1.278 | 14.0 | 1.457 | 11.4 | 1.278 | 14.0 | 1.457 | 15.4 | 1.278 | 0.0 | 1.278 |
| 3.5 | 1.225 | 20.0 | 1.469 | 7.5 | 1.278 | 15.0 | 1.470 | 11.5 | 1.278 | 15.0 | 1.470 | 15.5 | 1.278 | 0.0 | 1.278 |
| 3.6 | 1.228 | 20.0 | 1.473 | 7.6 | 1.278 | 14.0 | 1.457 | 11.6 | 1.278 | 14.0 | 1.457 | 15.6 | 1.278 | 0.0 | 1.278 |
| 3.7 | 1.230 | 20.0 | 1.476 | 7.7 | 1.278 | 13.0 | 1.444 | 11.7 | 1.278 | 13.0 | 1.444 | 15.7 | 1.278 | 0.0 | 1.278 |
| 3.8 | 1.233 | 20.0 | 1.480 | 7.8 | 1.278 | 12.0 | 1.431 | 11.8 | 1.278 | 12.0 | 1.431 | 15.8 | 1.278 | 0.0 | 1.278 |
| 3.9 | 1.235 | 20.0 | 1.482 | 7.9 | 1.278 | 11.0 | 1.419 | 11.9 | 1.278 | 11.0 | 1.419 | 15.9 | 1.278 | 0.0 | 1.278 |
| 4.0 | 1.238 | 20.0 | 1.485 | 8.0 | 1.278 | 10.0 | 1.406 | 12.0 | 1.278 | 10.0 | 1.406 | 16.0 | 1.278 | 0.0 | 1.278 |
| 4.1 | 1.241 | 21.0 | 1.501 | 8.1 | 1.278 | 11.0 | 1.419 | 12.1 | 1.278 | 11.0 | 1.419 | | | | |
| 4.2 | 1.244 | 22.0 | 1.517 | 8.2 | 1.278 | 12.0 | 1.431 | 12.2 | 1.278 | 12.0 | 1.431 | | | | |
| 4.3 | 1.246 | 23.0 | 1.533 | 8.3 | 1.278 | 13.0 | 1.444 | 12.3 | 1.278 | 13.0 | 1.444 | | | | |
| 4.4 | 1.249 | 24.0 | 1.549 | 8.4 | 1.278 | 14.0 | 1.457 | 12.4 | 1.278 | 14.0 | 1.457 | | | | |
| 4.5 | 1.251 | 25.0 | 1.564 | 8.5 | 1.278 | 15.0 | 1.470 | 12.5 | 1.278 | 15.0 | 1.470 | | | | |
| 4.6 | 1.254 | 24.0 | 1.555 | 8.6 | 1.278 | 14.0 | 1.457 | 12.6 | 1.278 | 0.0 | 1.278 | | | | |
| 4.7 | 1.256 | 23.0 | 1.545 | 8.7 | 1.278 | 13.0 | 1.444 | 12.7 | 1.278 | 0.0 | 1.278 | | | | |
| 4.8 | 1.258 | 22.0 | 1.535 | 8.8 | 1.278 | 12.0 | 1.431 | 12.8 | 1.278 | 0.0 | 1.278 | | | | |
| 4.9 | 1.260 | 21.0 | 1.525 | 8.9 | 1.278 | 11.0 | 1.419 | 12.9 | 1.278 | 0.0 | 1.278 | | | | |

Q A



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PROJECT BRIDGE 69801

PROJECT # 090147 DATE 1/4/10 BY JWS SHEET NO. 1 OF 13
VCJM 1/5/10

⇒ VERIFY COMPUTED BEAM CAPACITIES.
MDX PROVIDES RATING FACTORS
BASED ON THE USUAL EQUATION
6-1a FROM THE CONDITION EVALU-
ATION OF BRIDGES.

CAPACITY OF BEAMS IS BASED
ON "ALLOWABLE" STRESS, WHICH
IS ACTUALLY THE "CRITICAL
AVERAGE STRESS", F_{CP} OR F_{CP2}
FROM THE 2003 AASHTO
CURVED GIRDER SPECIFICATIONS.

FOLLOWING IS A CHECK OF
MDX COMPUTED "ALLOWABLE
STRESS" FOR VARIOUS POINTS
ALONG VARIOUS BEAMS FOR
THE BRIDGE

REFER TO ATTACHED MATNCAD
TEMPLATES FOR VERIFICATION
OF MDX OUTPUT.

GIRDER NUMBERS AND TENTH
POINT LOCATIONS ARE BASED
ON THE LHB MODEL

⇒ NON-COMPOSITE CHECK LOCATIONS

GIRDER NO. 1

- TENTH POINT 80 ✓
- TENTH POINT 90 ✓
- TENTH POINT 120 ✓

GIRDER NO. 10

- TENTH POINT 20 ✓
- TENTH POINT 40 ✓
- TENTH POINT 60 ✓



Project: Bridge 69801 Rating
 Project Number: 090147
 Description: Beam Capacity Verification of MDX Software Output
 Design JWS Check CJM
 1/4/10 1/5/10

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY
STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

$G_w := 1$ ✓ Girder Number (From LHB Model)
 $P_i := 80$ ✓ Point Number Along Girder (From LHB Model)
 $N_{loc} := 678.19$ ✓ Location Along Girder (From LHB Model) (Feet)

Enter Girder Geometric Data

$l_w := 16.146$ ✓ Length Between Braces (Feet)
 $R_w := 1060.41$ (947.93) Beam Radius (Feet)
 $b_{fc} := 12$ ✓ No change to FcFL Compression Flange Width (Inches)
 $t_{fc} := 2$ ✓ Compression Flange Thickness (Inches)
 $b_{ft} := 12$ ✓ Tension Flange Width (Inches)
 $t_{ft} := 2$ ✓ Tension Flange Thickness (Inches)
 $f_l := 3460$ ✓ Total Factored Lateral Flange Bending Stress at Point (psi)
 $f_b := 23960$ ✓ Factored Average Flange Stress at Point (psi)
 $F_y := 36000$ ✓ Yield Strength (psi)
 $E := 29000000$ ✓ Elastic Modulus (psi)

✓ 65m 1/5/10

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_f}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

FLANGE = "Compact"

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.181$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

$$F_{bs} = 32459$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.998$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.124$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

$$F_{cr1c} = 32459$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

$$F_{cr2c} = 34847$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 32459$$

MDX GIVES 32.5 KSI

OK



Project: Bridge 69801 Rating
 Project Number: 090147
 Description: Beam Capacity Verification of MDX Software Output
 Design JWS Check CJM
 1/4/10 1/5/10

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

| | |
|-----------------------|---|
| $G := 1$ ✓ | Girder Number (From LHB Model) |
| $P_i := 90$ ✓ | Point Number Along Girder (From LHB Model) |
| $N_{loc} := 758.68$ ✓ | Location Along Girder (From LHB Model) (Feet) |

Enter Girder Geometric Data

| | |
|--------------------------|---|
| $L_w := 16.09$ ✓ | Length Between Braces (Feet) |
| $R_w := 947.96$ ✓ | Beam Radius (Feet) |
| $b_{fc} := 12$ ✓ | Compression Flange Width (Inches) |
| $t_{fc} := 1.375$ 1.5" ✓ | Compression Flange Thickness (Inches) |
| $b_{ft} := 12$ ✓ | Tension Flange Width (Inches) |
| $t_{ft} := 1.5$ 0.875" ✓ | Tension Flange Thickness (Inches) |
| $f_l := 1340$ ✓ | Total Factored Lateral Flange Bending Stress at Point (psi) |
| $f_b := 17550$ ✓ | Factored Average Flange Stress at Point (psi) |
| $F_y := 36000$ ✓ | Yield Strength (psi) |
| $E := 29000000$ ✓ | Elastic Modulus (psi) |

Does Not Affect

Eq. Prev checked
See Skt 3

✓com 1/5/10

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_f}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

FLANGE = "Compact"

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.201$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2) \quad (\text{Equation 5-5})$$

$$F_{bs} = 31658$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.997$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.098$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases} \quad (\text{Equation 5-4})$$

$$F_{cr1c} = 31658$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right| \quad (\text{Equation 5-6})$$

$$F_{cr2c} = 35553$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 31658$$

MDX GIVES 31.6 KSI ✓
OK



Project: Bridge 69801 Rating
 Project Number: 090147
 Description: Beam Capacity Verification of MDX Software Output
 Design JWS Check CSM
 1/4/10 1/5/10

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY
STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

| | |
|-----------------------|---|
| $G_w := 1$ ✓ | Girder Number (From LHB Model) |
| $P_i := 120$ ✓ | Point Number Along Girder (From LHB Model) |
| $N_{loc} := 960.38$ ✓ | Location Along Girder (From LHB Model) (Feet) |

Enter Girder Geometric Data

| | |
|---------------------|---|
| $l_w := 17.07$ ✓ | Length Between Braces (Feet) |
| $R_w := 470.46$ ✓ | Beam Radius (Feet) |
| $b_{fc} := 12$ ✓ | Compression Flange Width (Inches) |
| $t_{fc} := 1.375$ ✓ | Compression Flange Thickness (Inches) |
| $b_{ft} := 12$ ✓ | Tension Flange Width (Inches) |
| $t_{ft} := 1.375$ ✓ | Tension Flange Thickness (Inches) |
| $f_l := 6710$ ✓ | Total Factored Lateral Flange Bending Stress at Point (psi) |
| $f_b := 22600$ ✓ | Factored Average Flange Stress at Point (psi) |
| $F_y := 36000$ ✓ | Yield Strength (psi) |
| $E := 29000000$ ✓ | Elastic Modulus (psi) |

Eq prev checked
see sheet 3
✓com 11/5/10

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_{fc}}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

$$\text{FLANGE} = \text{"Compact"}$$

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.191$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

$$F_{bs} = 32042$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.957$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.106$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

$$F_{cr1c} = 32042$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

$$F_{cr2c} = 33763$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 32042$$

MDX GIVES 32.0 KSI
OIC ✓



Project: Bridge 69801 Rating
 Project Number: 090147
 Description: Beam Capacity Verification of MDX Software Output
 Design JWS Check CSM
1/4/10 1/5/10

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

| | |
|-----------------------------|---|
| $G_{\text{WW}} := 10$ ✓ | Girder Number (From LHB Model) |
| $P_i := 20$ ✓ | Point Number Along Girder (From LHB Model) |
| $N_{\text{loc}} := 96.20$ ✓ | Location Along Girder (From LHB Model) (Feet) |

Enter Girder Geometric Data

| | |
|----------------------------|---|
| $l_{\text{w}} := 10.92$ ✓ | Length Between Braces (Feet) |
| $R_{\text{w}} := 251.0$ ✓ | Beam Radius (Feet) |
| $b_{\text{fc}} := 12$ ✓ | Compression Flange Width (Inches) |
| $t_{\text{fc}} := 1$ ✓ | Compression Flange Thickness (Inches) |
| $b_{\text{ft}} := 12$ ✓ | Tension Flange Width (Inches) |
| $t_{\text{ft}} := 0.625$ ✓ | Tension Flange Thickness (Inches) |
| $f_l := 4930$ ✓ | Total Factored Lateral Flange Bending Stress at Point (psi) |
| $f_b := 20690$ ✓ | Factored Average Flange Stress at Point (psi) |
| $F_y := 36000$ ✓ | Yield Strength (psi) |
| $E := 29000000$ ✓ | Elastic Modulus (psi) |

9/13

Eq prev checked

see sh+3

✓com 1/5/10

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_{fc}}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

$$\text{FLANGE} = \text{"Compact"}$$

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.136$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

$$F_{bs} = 34000$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.96$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.072$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

$$F_{cr1c} = 34000$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

$$F_{cr2c} = 34357$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 34000$$

MDX GIVES 34.0 ksi
OK ✓



Project: Bridge 69801 Rating
Project Number: 090147
Description: Beam Capacity Verification of MDX Software Output
Design JWS Check _____
1/4/10

10/13
JWS 1/5/10

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY
STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

$G := 10$ ✓ Girder Number (From LHB Model)
 $P_i := 40$ ✓ Point Number Along Girder (From LHB Model)
 $N_{loc} := 210.64$ ✓ Location Along Girder (From LHB Model) (Feet)

Enter Girder Geometric Data

$L_w := 10.86$ ✓ Length Between Braces (Feet)
 $R_w := 265.03$ 251.0' ✓ Beam Radius (Feet)
 $b_{fc} := 12$ ✓ Compression Flange Width (Inches)
 $t_{fc} := 2$ ✓ Compression Flange Thickness (Inches)
 $b_{ft} := 12$ ✓ Tension Flange Width (Inches)
 $t_{ft} := 2$ ✓ Tension Flange Thickness (Inches)
 $f_l := 4690$ ✓ Total Factored Lateral Flange Bending Stress at Point (psi)
 $f_b := 19830$ ✓ Factored Average Flange Stress at Point (psi)
 $F_y := 36000$ ✓ Yield Strength (psi)
 $E := 29000000$ ✓ Elastic Modulus (psi)

Does not Affect R_w

Eq Prev checked
See Sht 3✓ C.J.M.
1/5/10**Compact Flanges - Art. 5.2.1**

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_{fc}}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

FLANGE = "Compact"

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.122$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

$$F_{bs} = 34398$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.972$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.078$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

$$F_{cr1c} = 34398$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

$$F_{cr2c} = 34437$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 34398$$

MDX GIVES 34.4 KSI

OK

✓



Project: Bridge 69801 Rating
Project Number: 090147
Description: Beam Capacity Verification of MDX Software Output
Design JWS Check CSM
1/4/10 1/5/10

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY
STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

$G := 10$ ✓

Girder Number (From LHB Model)

$P_i := 60$ ✓

Point Number Along Girder (From LHB Model)

$N_{loc} := 335.92$ ✓

Location Along Girder (From LHB Model) (Feet)

Enter Girder Geometric Data

$L_w := 17.75$ ✓

Length Between Braces (Feet)

$R_w := 16413.75$ OK

Beam Radius (Feet)

$b_{fc} := 12$ ✓

Compression Flange Width (Inches)

$t_{fc} := 1.375$ ✓

Compression Flange Thickness (Inches)

$b_{ft} := 12$ ✓

Tension Flange Width (Inches)

$t_{ft} := 1.375$ ✓

Tension Flange Thickness (Inches)

$f_l := 0$ ✓

Total Factored Lateral Flange Bending Stress at Point (psi)

$f_b := 28950$ ✓

Factored Average Flange Stress at Point (psi)

$F_y := 36000$ ✓

Yield Strength (psi)

$E := 29000000$ ✓

Elastic Modulus (psi)

13/13

Eq Prev checked
See sht 3

✓ Lsm 1/5/10

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_{fc}}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

FLANGE = "Compact"

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

 $\lambda = 0.199$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

 $F_{bs} = 31720$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

 $\rho_{bc} = 0.994$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

 $\rho_{wc} = 1.126$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

 $F_{cr1c} = 31720$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

 $F_{cr2c} = 36000$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

MDX GIVES 31.7 KSI

 $F_{crc} = 31720$

OK

✓

BRIDGE 69801 J, K, L, M, & N

Girder 1 : Rating Output : Bottom Flange Factored Bending Stress - Group I Loa

Girder 1 Grp I Factored Bending Stresses - ksi

| Tenth
Point | Loc | ----- Bottom Flange ----- | | | | | | | | |
|----------------|--------|---------------------------|--------------|-------------|-------------|-------------|------|-------|-------|-------|
| | | Noncomp
Dead | Comp
Dead | Max
LM+I | Min
LL+I | LL+I
Rng | Wind | Tot | Allow | Ratio |
| 0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.0 | 0.000 |
| 1 | 5.95 | 3.6 | 1.1 | 8.9 | -2.0 | 10.9 | 0.0 | 13.7 | 35.5 | 0.385 |
| 2 | 11.90 | 6.0 | 1.9 | 14.9 | -4.0 | 18.9 | 0.0 | 22.8 | 35.6 | 0.641 |
| 3 | 17.85 | 7.2 | 2.3 | 18.4 | -5.8 | 24.1 | 0.0 | 28.0 | 36.0 | 0.777 |
| 4 | 23.80 | 7.4 | 2.4 | 20.2 | -7.4 | 27.6 | 0.0 | 30.0 | 35.2 | 0.853 |
| 5 | 29.75 | 6.3 | 2.2 | 20.1 | -9.0 | 29.2 | 0.0 | 28.6 | 33.9 | 0.843 |
| 6 | 35.70 | 4.1 | 1.6 | 18.6 | -10.2 | 28.8 | 0.0 | 24.3 | 35.4 | 0.687 |
| 7 | 41.65 | 0.8 | 0.7 | 16.2 | -11.4 | 27.6 | 0.0 | 17.7 | 35.8 | 0.494 |
| 8 | 47.60 | -3.8 | -0.8 | 13.7 | -14.2 | 27.9 | 0.0 | -18.7 | 33.0 | 0.567 |
| 9 | 53.55 | -6.2 | -1.9 | 4.3 | -10.0 | 14.3 | 0.0 | -18.0 | 33.0 | 0.545 |
| 10 | 59.50 | -10.7 | -3.5 | 2.8 | -12.7 | 15.5 | 0.0 | -26.9 | 33.0 | 0.817 |
| 11 | 66.93 | -5.3 | -1.5 | 3.3 | -6.6 | 9.9 | 0.0 | -13.4 | 33.0 | 0.405 |
| 12 | 74.37 | -1.5 | 0.2 | 16.3 | -9.9 | 26.2 | 0.0 | 15.0 | 33.0 | 0.456 |
| 13 | 81.80 | 3.1 | 1.6 | 17.9 | -8.2 | 26.1 | 0.0 | 22.6 | 35.3 | 0.640 |
| 14 | 89.23 | 5.9 | 2.3 | 21.8 | -7.7 | 29.4 | 0.0 | 30.0 | 33.8 | 0.887 |
| 15 | 96.66 | 6.9 | 2.6 | 22.2 | -6.6 | 28.8 | 0.0 | 31.7 | 34.9 | 0.909 |
| 16 | 104.10 | 6.1 | 2.3 | 21.4 | -7.9 | 29.2 | 0.0 | 29.8 | 33.8 | 0.881 |
| 17 | 111.53 | 3.5 | 1.5 | 17.6 | -8.5 | 26.1 | 0.0 | 22.7 | 35.3 | 0.643 |
| 18 | 118.96 | -0.9 | 0.3 | 16.0 | -10.3 | 26.3 | 0.0 | 15.4 | 33.0 | 0.468 |
| 19 | 126.39 | -4.7 | -1.4 | 3.5 | -7.0 | 10.5 | 0.0 | -13.0 | 33.0 | 0.394 |
| 20 | 133.83 | -10.1 | -3.4 | 2.8 | -12.9 | 15.6 | 0.0 | -26.4 | 33.0 | 0.800 |
| 21 | 140.77 | -5.0 | -1.5 | 4.5 | -9.7 | 14.2 | 0.0 | -16.2 | 33.0 | 0.491 |
| 22 | 147.71 | -1.6 | 0.0 | 18.4 | -13.6 | 32.0 | 0.0 | 16.8 | 33.0 | 0.509 |
| 23 | 154.66 | 3.0 | 1.4 | 17.6 | -10.7 | 28.4 | 0.0 | 22.0 | 35.3 | 0.624 |
| 24 | 161.60 | 5.9 | 2.2 | 21.0 | -9.4 | 30.4 | 0.0 | 29.1 | 35.2 | 0.826 |
| 25 | 168.54 | 7.2 | 2.5 | 20.7 | -7.5 | 28.2 | 0.0 | 30.4 | 35.3 | 0.861 |
| 26 | 175.49 | 7.0 | 2.4 | 18.3 | -5.3 | 23.5 | 0.0 | 27.6 | 35.9 | 0.771 |
| 27 | 182.43 | 5.2 | 1.7 | 12.6 | -3.1 | 15.7 | 0.0 | 19.5 | 35.9 | 0.544 |
| 28 | 189.37 | 1.5 | 0.5 | 5.2 | -0.8 | 6.0 | 0.0 | 7.2 | 35.8 | 0.201 |
| Bot.Flgspl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.2 | 0.000 |
| Bot.Flgspl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.2 | 0.000 |
| 29 | 196.32 | -4.5 | -1.8 | 1.7 | -11.8 | 13.4 | 0.0 | -18.1 | 33.8 | 0.534 |
| Bot.Flgspl. | | -6.0 | -2.4 | 2.0 | -14.4 | 16.4 | 0.0 | -22.8 | 33.5 | 0.681 |
| Bot.Flgspl. | | -4.5 | -1.8 | 1.5 | -10.9 | 12.4 | 0.0 | -17.3 | 33.4 | 0.517 |
| 30 | 203.26 | -4.8 | -1.9 | 1.6 | -11.6 | 13.1 | 0.0 | -18.3 | 31.4 | 0.584 |
| 31 | 214.46 | 1.6 | 0.4 | 6.9 | -6.4 | 13.3 | 0.0 | 8.9 | 35.9 | 0.248 |
| 32 | 225.66 | 6.0 | 1.8 | 11.6 | -5.7 | 17.2 | 0.0 | 19.3 | 35.9 | 0.538 |
| 33 | 236.87 | 8.4 | 2.6 | 14.6 | -5.5 | 20.1 | 0.0 | 25.7 | 35.8 | 0.717 |
| 34 | 248.07 | 9.0 | 2.9 | 15.9 | -5.8 | 21.6 | 0.0 | 27.8 | 35.6 | 0.780 |
| 35 | 259.27 | 7.7 | 2.6 | 15.7 | -6.6 | 22.3 | 0.0 | 26.1 | 35.6 | 0.733 |
| 36 | 270.47 | 4.5 | 1.8 | 14.5 | -7.4 | 21.9 | 0.0 | 20.8 | 35.7 | 0.582 |
| 37 | 281.68 | -0.7 | 0.4 | 11.8 | -8.4 | 20.2 | 0.0 | 11.6 | 31.5 | 0.368 |
| 38 | 292.88 | -7.9 | -1.9 | 10.4 | -10.2 | 20.5 | 0.0 | -20.0 | 31.4 | 0.637 |
| Bot.Flgspl. | | -10.7 | -2.9 | 8.3 | -11.0 | 19.4 | 0.0 | -24.6 | 31.7 | 0.776 |
| Bot.Flgspl. | | -7.1 | -1.9 | 5.5 | -7.3 | 12.9 | 0.0 | -16.4 | 33.8 | 0.485 |
| 39 | 304.08 | -11.5 | -3.4 | 2.5 | -8.6 | 11.1 | 0.0 | -23.5 | 35.1 | 0.669 |
| Bot.Flgspl. | | -12.3 | -3.7 | 2.3 | -9.2 | 11.5 | 0.0 | -25.2 | 35.1 | 0.717 |
| Bot.Flgspl. | | -8.8 | -2.6 | 1.7 | -6.5 | 8.2 | 0.0 | -17.9 | 35.1 | 0.511 |
| 40 | 315.29 | -12.2 | -3.8 | 0.9 | -8.7 | 9.6 | 0.0 | -24.7 | 35.1 | 0.705 |
| Bot.Flgspl. | | -8.6 | -2.5 | 1.7 | -6.4 | 8.1 | 0.0 | -17.6 | 35.2 | 0.499 |
| Bot.Flgspl. | | -13.0 | -3.8 | 2.6 | -9.6 | 12.2 | 0.0 | -26.4 | 35.2 | 0.751 |
| 41 | 329.25 | -9.9 | -2.7 | 3.0 | -7.5 | 10.6 | 0.0 | -20.2 | 35.2 | 0.574 |
| Bot.Flgspl. | | -8.7 | -2.3 | 3.8 | -7.2 | 11.0 | 0.0 | -18.3 | 33.8 | 0.540 |
| Bot.Flgspl. | | -12.3 | -3.3 | 5.3 | -10.1 | 15.4 | 0.0 | -25.6 | 32.3 | 0.793 |
| 42 | 343.22 | -2.4 | 0.1 | 11.6 | -7.2 | 18.9 | 0.0 | -9.6 | 33.4 | 0.287 |
| 43 | 357.18 | 5.8 | 2.4 | 13.2 | -5.6 | 18.9 | 0.0 | 21.4 | 35.9 | 0.597 |
| 44 | 371.15 | 10.9 | 3.8 | 15.9 | -5.0 | 20.9 | 0.0 | 30.7 | 36.0 | 0.852 |
| 45 | 385.12 | 13.0 | 4.4 | 16.7 | -4.5 | 21.2 | 0.0 | 34.1 | 35.4 | 0.962 |
| 46 | 399.08 | 12.1 | 4.1 | 16.1 | -4.6 | 20.7 | 0.0 | 32.3 | 36.0 | 0.898 |
| 47 | 413.05 | 8.2 | 3.0 | 13.6 | -5.4 | 19.0 | 0.0 | 24.8 | 35.8 | 0.692 |
| 48 | 427.02 | 1.3 | 0.9 | 9.4 | -6.5 | 15.8 | 0.0 | 11.6 | 35.9 | 0.323 |
| 49 | 440.98 | -8.8 | -2.4 | 4.8 | -8.7 | 13.5 | 0.0 | -19.9 | 33.3 | 0.598 |

| | | | | | | | | | | |
|--------------|--------|-------|------|-------|-------|------|-------|-------|-------|-------|
| Bot.Flg.Spl. | -12.6 | -3.8 | 4.2 | -11.4 | 15.6 | 0.0 | -27.8 | 33.4 | 0.832 | |
| Bot.Flg.Spl. | -7.4 | -2.2 | 2.4 | -6.7 | 9.1 | 0.0 | -16.3 | 35.2 | 0.463 | |
| 50 | 454.95 | -11.2 | -3.6 | 1.3 | -9.1 | 10.5 | 0.0 | -24.0 | 33.1 | 0.724 |
| 51 | 463.30 | -9.3 | -2.9 | 2.0 | -7.7 | 9.7 | 0.0 | -19.9 | 33.4 | 0.594 |
| 52 | 471.65 | -6.1 | -1.8 | 3.8 | -5.9 | 9.7 | 0.0 | -13.8 | 35.6 | 0.388 |
| Bot.Flg.Spl. | -6.1 | -1.8 | 3.9 | -5.9 | 9.7 | 0.0 | -13.7 | 35.7 | 0.383 | |
| Bot.Flg.Spl. | -10.5 | -3.1 | 6.7 | -10.1 | 16.8 | 0.0 | -23.6 | 33.5 | 0.705 | |
| 53 | 480.00 | -5.9 | -1.5 | 10.9 | -9.1 | 20.0 | 0.0 | -16.5 | 33.5 | 0.491 |
| 54 | 488.35 | -2.1 | -0.1 | 15.0 | -8.3 | 23.3 | 0.0 | 12.9 | 33.0 | 0.391 |
| 55 | 496.70 | 0.9 | 0.8 | 13.3 | -6.8 | 20.1 | 0.0 | 15.0 | 35.9 | 0.418 |
| 56 | 505.05 | 2.7 | 1.3 | 14.3 | -5.9 | 20.2 | 0.0 | 18.2 | 36.0 | 0.507 |
| 57 | 513.40 | 2.9 | 1.3 | 13.7 | -5.2 | 18.9 | 0.0 | 17.9 | 35.9 | 0.499 |
| 58 | 521.75 | 1.2 | 0.8 | 10.8 | -5.7 | 16.5 | 0.0 | 12.9 | 35.9 | 0.358 |
| 59 | 530.10 | -3.0 | -0.6 | 6.2 | -8.2 | 14.4 | 0.0 | -11.8 | 33.5 | 0.351 |
| 60 | 538.45 | -10.3 | -3.3 | 3.8 | -13.0 | 16.8 | 0.0 | -26.6 | 33.3 | 0.799 |
| 61 | 544.35 | -4.6 | -1.3 | 4.7 | -7.7 | 12.4 | 0.0 | -13.6 | 34.0 | 0.400 |
| Bot.Flg.Spl. | -4.6 | -1.2 | 4.8 | -7.7 | 12.5 | 0.0 | -13.5 | 34.0 | 0.397 | |
| Bot.Flg.Spl. | -4.6 | -1.2 | 4.8 | -7.7 | 12.5 | 0.0 | -13.5 | 34.0 | 0.397 | |
| Bot.Flg.Spl. | -2.3 | -0.4 | 6.8 | -7.1 | 13.9 | 0.0 | -9.8 | 33.7 | 0.291 | |
| Bot.Flg.Spl. | -3.2 | -0.5 | 9.6 | -10.2 | 19.8 | 0.0 | -13.9 | 34.5 | 0.404 | |
| 62 | 550.25 | -0.1 | 0.6 | 12.2 | -9.4 | 21.7 | 0.0 | 12.7 | 36.0 | 0.353 |
| Bot.Flg.Spl. | 0.8 | 0.9 | 13.9 | -9.1 | 23.0 | 0.0 | 15.6 | 35.9 | 0.435 | |
| Bot.Flg.Spl. | 0.9 | 1.1 | 16.0 | -10.5 | 26.6 | 0.0 | 18.0 | 35.9 | 0.502 | |
| 63 | 556.15 | 5.3 | 1.9 | 15.9 | -7.7 | 23.6 | 0.0 | 23.2 | 35.9 | 0.645 |
| 64 | 562.04 | 9.0 | 2.8 | 18.9 | -6.3 | 25.2 | 0.0 | 30.7 | 35.9 | 0.853 |
| 65 | 567.94 | 10.8 | 3.2 | 19.5 | -5.0 | 24.5 | 0.0 | 33.5 | 36.0 | 0.931 |
| 66 | 573.84 | 10.7 | 3.1 | 18.9 | -3.8 | 22.7 | 0.0 | 32.7 | 35.7 | 0.915 |
| 67 | 579.74 | 8.9 | 2.5 | 15.6 | -2.5 | 18.1 | 0.0 | 27.0 | 35.9 | 0.752 |
| 68 | 585.63 | 5.1 | 1.4 | 9.2 | -1.3 | 10.5 | 0.0 | 15.8 | 36.0 | 0.440 |
| Bot.Flg.Spl. | 1.6 | 0.6 | 5.1 | -1.1 | 6.2 | 0.0 | 7.3 | 36.0 | 0.203 | |
| Bot.Flg.Spl. | 1.0 | 0.4 | 3.1 | -0.7 | 3.8 | 0.0 | 4.5 | 36.0 | 0.125 | |
| 69 | 591.53 | -0.2 | -0.1 | 0.2 | -0.6 | 0.7 | 0.0 | -0.9 | 35.3 | 0.025 |
| 70 | 597.43 | -3.5 | -1.2 | 2.7 | -10.9 | 13.6 | 0.0 | -15.7 | 31.6 | 0.496 |
| 71 | 605.50 | 1.4 | -0.1 | 7.2 | -8.5 | 15.6 | 0.0 | 8.4 | 35.6 | 0.237 |
| 72 | 613.58 | 4.9 | 0.5 | 11.4 | -7.5 | 18.9 | 0.0 | 16.8 | 35.4 | 0.475 |
| 73 | 621.66 | 6.9 | 1.0 | 14.5 | -6.6 | 21.2 | 0.0 | 22.4 | 35.6 | 0.630 |
| 74 | 629.73 | 7.6 | 1.1 | 15.6 | -5.8 | 21.4 | 0.0 | 24.4 | 35.1 | 0.695 |
| 75 | 637.81 | 7.0 | 1.1 | 15.7 | -5.4 | 21.1 | 0.0 | 23.8 | 35.6 | 0.670 |
| 76 | 645.89 | 5.0 | 0.9 | 14.4 | -6.2 | 20.6 | 0.0 | 20.3 | 35.2 | 0.575 |
| 77 | 653.96 | 1.7 | 0.4 | 11.9 | -6.6 | 18.5 | 0.0 | 14.0 | 35.7 | 0.391 |
| Bot.Flg.Spl. | -0.8 | 0.1 | 9.8 | -6.9 | 16.7 | 0.0 | -7.6 | 31.6 | 0.242 | |
| Bot.Flg.Spl. | -0.8 | 0.1 | 9.7 | -6.6 | 16.3 | 0.0 | -7.3 | 31.6 | 0.231 | |
| 78 | 662.04 | -2.9 | -0.3 | 9.9 | -7.4 | 17.3 | 0.0 | -10.6 | 31.6 | 0.334 |
| Bot.Flg.Spl. | -7.2 | -1.1 | 5.5 | -7.8 | 13.3 | 0.0 | -16.1 | 31.6 | 0.509 | |
| Bot.Flg.Spl. | -5.5 | -0.8 | 4.2 | -6.0 | 10.2 | 0.0 | -12.4 | 32.5 | 0.381 | |
| 79 | 670.11 | -6.6 | -1.0 | 3.1 | -6.1 | 9.3 | 0.0 | -13.7 | 32.5 | 0.423 |
| 80 | 678.19 | -11.8 | -2.0 | 2.3 | -10.1 | 12.5 | 0.0 | -24.0 | 32.5 | 0.738 |
| 81 | 686.24 | -6.7 | -0.9 | 3.1 | -6.2 | 9.3 | 0.0 | -13.8 | 32.5 | 0.426 |
| Bot.Flg.Spl. | -5.7 | -0.7 | 4.2 | -6.1 | 10.3 | 0.0 | -12.5 | 32.5 | 0.384 | |
| Bot.Flg.Spl. | -7.3 | -0.9 | 5.4 | -7.8 | 13.2 | 0.0 | -16.0 | 32.5 | 0.494 | |
| 82 | 694.29 | -3.2 | 0.0 | 10.1 | -7.2 | 17.3 | 0.0 | -10.4 | 32.5 | 0.322 |
| Bot.Flg.Spl. | -1.2 | 0.4 | 12.4 | -7.0 | 19.3 | 0.0 | -7.8 | 32.5 | 0.240 | |
| Bot.Flg.Spl. | -1.3 | 0.4 | 13.3 | -7.5 | 20.8 | 0.0 | -8.4 | 31.7 | 0.265 | |
| 83 | 702.34 | 0.9 | 0.7 | 11.9 | -6.4 | 18.3 | 0.0 | 13.5 | 35.6 | 0.380 |
| 84 | 710.39 | 4.0 | 1.2 | 14.2 | -6.0 | 20.2 | 0.0 | 19.3 | 34.9 | 0.555 |
| 85 | 718.43 | 5.6 | 1.4 | 15.8 | -5.8 | 21.6 | 0.0 | 22.8 | 35.4 | 0.645 |
| 86 | 726.48 | 5.9 | 1.4 | 16.0 | -6.6 | 22.6 | 0.0 | 23.3 | 34.7 | 0.674 |
| 87 | 734.53 | 5.0 | 1.1 | 15.1 | -7.5 | 22.7 | 0.0 | 21.2 | 35.4 | 0.599 |
| 88 | 742.58 | 2.7 | 0.6 | 12.1 | -8.5 | 20.6 | 0.0 | 15.4 | 35.1 | 0.439 |
| 89 | 750.63 | -0.7 | -0.3 | 7.8 | -9.6 | 17.4 | 0.0 | -10.6 | 31.6 | 0.334 |
| 90 | 758.68 | -5.1 | -1.5 | 2.1 | -11.0 | 13.1 | 0.0 | -17.6 | 31.6 | 0.555 |
| 91 | 765.99 | -0.8 | -0.2 | 0.3 | -1.9 | 2.1 | 0.0 | -3.0 | 34.5 | 0.086 |
| Bot.Flg.Spl. | -0.5 | -0.2 | 0.8 | -1.7 | 2.6 | 0.0 | -2.4 | 34.4 | 0.071 | |
| Bot.Flg.Spl. | -0.7 | -0.2 | 1.0 | -2.1 | 3.2 | 0.0 | -3.0 | 34.4 | 0.086 | |
| 92 | 773.30 | 3.6 | 0.8 | 6.6 | -0.9 | 7.5 | 0.0 | 11.0 | 35.8 | 0.308 |
| 93 | 780.61 | 6.9 | 1.6 | 11.6 | -1.9 | 13.5 | 0.0 | 20.1 | 35.5 | 0.567 |
| 94 | 787.92 | 8.7 | 2.1 | 14.6 | -2.9 | 17.5 | 0.0 | 25.3 | 35.2 | 0.720 |
| 95 | 795.23 | 8.9 | 2.2 | 15.0 | -3.8 | 18.8 | 0.0 | 26.1 | 35.8 | 0.729 |
| 96 | 802.54 | 7.6 | 1.9 | 15.1 | -4.5 | 19.6 | 0.0 | 24.6 | 35.7 | 0.689 |
| 97 | 809.85 | 4.9 | 1.3 | 12.6 | -5.2 | 17.8 | 0.0 | 18.7 | 35.7 | 0.525 |
| 98 | 817.16 | 0.7 | 0.3 | 10.0 | -5.8 | 15.7 | 0.0 | 11.0 | 35.9 | 0.306 |
| 99 | 824.47 | -5.2 | -1.2 | 5.4 | -7.3 | 12.7 | 0.0 | -13.8 | 33.7 | 0.409 |
| 100 | 831.78 | -9.0 | -2.4 | 2.0 | -8.8 | 10.9 | 0.0 | -20.2 | 32.5 | 0.622 |
| 101 | 838.22 | -7.2 | -1.7 | 3.6 | -8.2 | 11.8 | 0.0 | -17.1 | 32.5 | 0.525 |
| 102 | 844.66 | -3.0 | -0.3 | 9.9 | -7.0 | 16.9 | 0.0 | -10.4 | 32.5 | 0.319 |
| Bot.Flg.Spl. | -3.0 | -0.3 | 10.0 | -7.0 | 17.0 | 0.0 | -10.3 | 32.5 | 0.316 | |

| | | | | | | | | | |
|-------------|------|------|------|-------|------|-----|-------|------|-------|
| Bot.Flgspl. | -3.4 | -0.4 | 11.6 | -8.1 | 19.7 | 0.0 | -11.9 | 32.5 | 0.367 |
| 103 851.10 | 0.2 | 0.6 | 10.2 | -6.5 | 16.6 | 0.0 | 11.0 | 35.8 | 0.307 |
| 104 857.55 | 2.4 | 1.2 | 12.1 | -5.8 | 17.9 | 0.0 | 15.7 | 35.3 | 0.447 |
| 105 863.99 | 3.4 | 1.5 | 12.8 | -5.3 | 18.0 | 0.0 | 17.7 | 33.5 | 0.528 |
| 106 870.43 | 3.6 | 1.6 | 13.5 | -6.2 | 19.7 | 0.0 | 18.7 | 35.0 | 0.534 |
| 107 876.87 | 2.7 | 1.3 | 13.5 | -7.8 | 21.3 | 0.0 | 17.5 | 36.0 | 0.487 |
| Bot.Flgspl. | 0.0 | 0.6 | 14.1 | -9.9 | 24.0 | 0.0 | 14.8 | 36.0 | 0.410 |
| Bot.Flgspl. | 0.0 | 0.7 | 15.6 | -10.9 | 26.4 | 0.0 | -10.2 | 31.7 | 0.322 |
| 108 883.31 | -0.1 | 0.7 | 15.5 | -10.9 | 26.4 | 0.0 | 16.1 | 31.7 | 0.508 |
| 109 889.75 | -5.1 | -1.5 | 7.7 | -11.3 | 19.0 | 0.0 | -18.0 | 31.7 | 0.567 |
| Bot.Flgspl. | -5.6 | -1.7 | 7.4 | -11.6 | 19.1 | 0.0 | -18.9 | 31.7 | 0.599 |
| Bot.Flgspl. | -4.0 | -1.2 | 5.3 | -8.3 | 13.6 | 0.0 | -13.5 | 32.5 | 0.416 |
| 110 896.20 | -8.6 | -3.1 | 2.4 | -11.2 | 13.7 | 0.0 | -22.9 | 32.5 | 0.705 |
| Bot.Flgspl. | -4.2 | -1.3 | 3.8 | -7.0 | 10.8 | 0.0 | -12.5 | 32.5 | 0.384 |
| Bot.Flgspl. | -5.9 | -1.9 | 5.3 | -9.8 | 15.1 | 0.0 | -17.5 | 31.7 | 0.554 |
| 111 902.61 | -5.4 | -1.7 | 5.4 | -9.4 | 14.8 | 0.0 | -16.5 | 31.7 | 0.522 |
| 112 909.03 | -0.4 | 0.4 | 17.1 | -8.8 | 25.9 | 0.0 | 17.0 | 31.7 | 0.538 |
| 113 915.45 | 3.4 | 1.5 | 16.4 | -7.0 | 23.4 | 0.0 | 21.3 | 31.7 | 0.670 |
| 114 921.87 | 5.6 | 2.2 | 19.6 | -6.1 | 25.8 | 0.0 | 27.4 | 32.6 | 0.840 |
| 115 928.29 | 6.3 | 2.4 | 20.8 | -5.3 | 26.1 | 0.0 | 29.5 | 32.6 | 0.906 |
| 116 934.71 | 5.8 | 2.2 | 19.2 | -6.0 | 25.2 | 0.0 | 27.2 | 32.6 | 0.836 |
| 117 941.13 | 3.8 | 1.6 | 17.2 | -6.7 | 23.9 | 0.0 | 22.6 | 31.7 | 0.712 |
| 118 947.54 | 0.4 | 0.8 | 13.4 | -8.4 | 21.8 | 0.0 | 14.5 | 31.6 | 0.461 |
| 119 953.96 | -4.5 | -1.2 | 5.8 | -9.1 | 14.9 | 0.0 | -14.8 | 31.7 | 0.466 |
| Bot.Flgspl. | -4.9 | -1.4 | 5.8 | -9.6 | 15.3 | 0.0 | -15.9 | 31.7 | 0.501 |
| Bot.Flgspl. | -3.5 | -1.0 | 4.1 | -6.8 | 10.9 | 0.0 | -11.3 | 32.5 | 0.348 |
| 120 960.38 | -7.9 | -2.7 | 3.2 | -12.0 | 15.2 | 0.0 | -22.6 | 32.0 | 0.705 |
| 121 965.50 | -4.6 | -1.4 | 3.8 | -9.8 | 13.7 | 0.0 | -15.8 | 32.0 | 0.494 |
| Bot.Flgspl. | -4.1 | -1.2 | 4.9 | -9.7 | 14.5 | 0.0 | -15.0 | 32.0 | 0.469 |
| Bot.Flgspl. | -5.8 | -1.7 | 6.8 | -13.6 | 20.4 | 0.0 | -21.1 | 31.1 | 0.678 |
| 122 970.63 | -2.7 | -0.6 | 14.0 | -12.5 | 26.5 | 0.0 | -15.7 | 31.1 | 0.506 |
| 123 975.75 | 0.0 | 0.4 | 14.8 | -9.8 | 24.6 | 0.0 | 15.2 | 31.0 | 0.490 |
| 124 980.87 | 1.9 | 0.8 | 17.2 | -8.7 | 25.8 | 0.0 | 19.8 | 31.1 | 0.639 |
| 125 985.99 | 2.7 | 1.0 | 17.9 | -7.8 | 25.7 | 0.0 | 21.6 | 31.2 | 0.692 |
| 126 991.12 | 2.6 | 0.9 | 18.6 | -9.7 | 28.3 | 0.0 | 22.1 | 31.1 | 0.711 |
| 127 996.24 | 1.5 | 0.6 | 16.7 | -11.7 | 28.4 | 0.0 | 18.8 | 31.9 | 0.588 |
| 128 1001.36 | -0.5 | -0.1 | 13.5 | -13.5 | 27.1 | 0.0 | -14.1 | 31.1 | 0.454 |
| 129 1006.48 | -3.4 | -1.4 | 14.1 | -17.8 | 31.9 | 0.0 | -22.6 | 31.1 | 0.727 |
| 130 1011.61 | -7.3 | -2.9 | 2.9 | -20.0 | 22.9 | 0.0 | -30.3 | 31.1 | 0.972 |
| 131 1017.52 | -1.0 | -0.4 | 0.2 | -2.3 | 2.5 | 0.0 | -3.6 | 35.9 | 0.101 |
| Bot.Flgspl. | -1.0 | -0.4 | 0.2 | -2.3 | 2.5 | 0.0 | -3.6 | 35.9 | 0.101 |
| Bot.Flgspl. | -0.6 | -0.2 | 0.1 | -1.4 | 1.6 | 0.0 | -2.3 | 35.9 | 0.064 |
| 132 1023.43 | 2.6 | 0.8 | 5.0 | -0.7 | 5.7 | 0.0 | 8.4 | 35.9 | 0.234 |
| 133 1029.34 | 5.1 | 1.6 | 8.8 | -1.0 | 9.8 | 0.0 | 15.4 | 35.8 | 0.429 |
| 134 1035.26 | 6.7 | 2.1 | 11.1 | -1.2 | 12.2 | 0.0 | 19.8 | 35.7 | 0.555 |
| 135 1041.17 | 7.6 | 2.3 | 12.2 | -1.2 | 13.4 | 0.0 | 22.1 | 36.0 | 0.613 |
| 136 1047.08 | 7.7 | 2.4 | 12.2 | -1.2 | 13.3 | 0.0 | 22.2 | 36.0 | 0.617 |
| 137 1052.99 | 6.9 | 2.1 | 11.4 | -1.0 | 12.4 | 0.0 | 20.5 | 35.8 | 0.573 |
| 138 1058.91 | 5.4 | 1.7 | 9.2 | -0.7 | 10.0 | 0.0 | 16.3 | 35.8 | 0.457 |
| 139 1064.82 | 3.1 | 1.0 | 5.7 | -0.4 | 6.1 | 0.0 | 9.8 | 35.9 | 0.274 |
| 140 1070.73 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.0 | 0.000 |

Governing expression for allowable compression stress

Tenth Pt Expression

8 compact
9 compact
10 compact
11 compact
12 compact
18 compact
19 compact
20 compact
21 compact
22 compact
29 (5-8)
30 (5-8)
37 (5-8)
38 (5-8)
39 (5-4)
40 compact
41 (5-6)
42 (5-8)
49 (5-8)
50 (5-6)

51 (5-8)
 52 (5-8)
 53 (5-8)
 54 (5-8)
 59 (5-8)
 60 (5-8)
 61 compact
 69 compact
 70 compact
 78 compact
 79 compact
 80 compact
 81 (5-4)
 82 (5-4)
 89 compact
 90 compact
 91 (5-8)
 99 compact
 100 compact
 101 compact
 102 (5-4)
 109 (5-4)
 110 compact
 111 compact
 112 compact
 119 (5-4)
 120 compact
 121 (5-4)
 122 compact
 128 compact
 129 compact
 130 compact
 131 (5-4)

Perf. ratio for compact section is (factored mom/mom strength)
 if this is less than (total stress/allowable stress).

Grp I Bottom Flange Factored Lateral Bending Stress

| Tenth
Pt | Noncomp | | Dead | | Comp Dead | | Max LL+I | | Min LL+I | |
|-------------|---------|------|---------|------|-----------|------|----------|------|----------|------|
| | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw |
| | k-ft | ksi | k-ft | ksi | k-ft | ksi | k-ft | ksi | k-ft | ksi |
| 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1 | -0.58 | 0.31 | -0.22 | 0.12 | -1.90 | 1.02 | -0.44 | 0.24 | | |
| 2 | 0.48 | 0.26 | 0.18 | 0.10 | 1.59 | 0.85 | 0.37 | 0.20 | | |
| 3 | 0.10 | 0.05 | 0.03 | 0.01 | -0.01 | 0.01 | -0.20 | 0.10 | | |
| 4 | -0.92 | 0.49 | -0.36 | 0.19 | -3.33 | 1.78 | -0.95 | 0.51 | | |
| 5 | 2.03 | 1.08 | 0.84 | 0.45 | 8.47 | 4.53 | 3.01 | 1.61 | | |
| 6 | -0.48 | 0.25 | -0.15 | 0.08 | -2.92 | 1.56 | -1.60 | 0.86 | | |
| 7 | -0.27 | 0.14 | -0.15 | 0.08 | -0.35 | 0.19 | 0.34 | 0.18 | | |
| 8 | -0.89 | 0.47 | -0.30 | 0.16 | 0.98 | 0.53 | -0.17 | 0.09 | | |
| 9 | -1.05 | 0.31 | -0.28 | 0.08 | -1.70 | 0.51 | -2.07 | 0.62 | | |
| 10 | 5.39 | 1.60 | 1.63 | 0.48 | 1.30 | 0.39 | 5.80 | 1.72 | | |
| 11 | -1.46 | 0.43 | -0.42 | 0.13 | -1.50 | 0.45 | -2.17 | 0.64 | | |
| 12 | 0.49 | 0.26 | 0.07 | 0.00 | 4.73 | 2.53 | 2.90 | 1.55 | | |
| 13 | -0.61 | 0.32 | -0.24 | 0.13 | -3.52 | 1.88 | -1.39 | 0.74 | | |
| 14 | 1.91 | 1.02 | 0.90 | 0.48 | 9.16 | 4.90 | 2.57 | 1.37 | | |
| 15 | -0.97 | 0.52 | -0.45 | 0.24 | -4.52 | 2.41 | -1.29 | 0.69 | | |
| 16 | 1.97 | 1.05 | 0.90 | 0.48 | 8.98 | 4.80 | 2.62 | 1.40 | | |
| 17 | -0.57 | 0.31 | -0.25 | 0.13 | -3.46 | 1.85 | -1.43 | 0.77 | | |
| 18 | 0.30 | 0.16 | 0.09 | 0.00 | 4.72 | 2.52 | 3.05 | 1.63 | | |
| 19 | -1.33 | 0.40 | -0.42 | 0.12 | -1.48 | 0.44 | -2.22 | 0.66 | | |
| 20 | 5.05 | 1.50 | 1.58 | 0.47 | 1.27 | 0.38 | 5.91 | 1.76 | | |
| 21 | -1.25 | 0.37 | -0.38 | 0.11 | -1.80 | 0.54 | -2.41 | 0.72 | | |
| 22 | -0.13 | 0.07 | -0.06 | 0.00 | 3.87 | 2.07 | 2.34 | 1.25 | | |
| 23 | -0.60 | 0.32 | -0.25 | 0.13 | -3.35 | 1.79 | -1.47 | 0.78 | | |
| 24 | 0.85 | 0.45 | 0.37 | 0.20 | 3.11 | 1.66 | 0.78 | 0.42 | | |
| 25 | -0.74 | 0.40 | -0.30 | 0.16 | -2.63 | 1.40 | -0.66 | 0.35 | | |
| 26 | -0.09 | 0.05 | -0.05 | 0.02 | -0.66 | 0.35 | -0.33 | 0.18 | | |
| 27 | 0.11 | 0.06 | 0.04 | 0.02 | 0.38 | 0.20 | 0.07 | 0.04 | | |
| 28 | -0.23 | 0.12 | -0.09 | 0.00 | -0.76 | 0.41 | -0.17 | 0.09 | | |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | | |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | | |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 29 | -0.04 | 0.02 | -0.02 | 0.01 | -0.01 | 0.01 | -0.10 | 0.06 |
| Bot.Flq.Spl | 0.45 | 0.26 | 0.21 | 0.12 | 0.17 | 0.10 | 1.25 | 0.72 |
| Bot.Flq.Spl | 0.45 | 0.11 | 0.21 | 0.05 | 0.17 | 0.04 | 1.25 | 0.32 |
| 30 | 1.16 | 0.29 | 0.44 | 0.11 | 0.37 | 0.09 | 2.65 | 0.67 |
| 31 | 0.19 | 0.05 | 0.05 | 0.00 | 1.78 | 0.45 | 0.80 | 0.20 |
| 32 | 0.39 | 0.10 | 0.14 | 0.04 | 0.63 | 0.16 | 0.04 | 0.01 |
| 33 | -0.60 | 0.15 | -0.21 | 0.05 | -1.43 | 0.36 | -0.53 | 0.13 |
| 34 | -1.30 | 0.33 | -0.48 | 0.12 | -2.95 | 0.75 | -0.91 | 0.23 |
| 35 | -1.25 | 0.32 | -0.50 | 0.13 | -3.40 | 0.86 | -1.19 | 0.30 |
| 36 | -0.45 | 0.11 | -0.24 | 0.06 | -2.65 | 0.67 | -1.22 | 0.31 |
| 37 | -0.54 | 0.14 | -0.12 | 0.00 | -1.01 | 0.26 | -0.85 | 0.22 |
| 38 | -0.54 | 0.14 | -0.18 | 0.05 | 0.59 | 0.15 | -0.03 | 0.01 |
| Bot.Flq.Spl | -1.98 | 0.50 | -0.51 | 0.13 | -1.28 | 0.32 | -1.86 | 0.47 |
| Bot.Flq.Spl | -1.98 | 0.29 | -0.51 | 0.08 | -1.28 | 0.19 | -1.86 | 0.27 |
| 39 | 2.05 | 0.30 | 0.55 | 0.08 | 0.74 | 0.11 | 1.60 | 0.24 |
| Bot.Flq.Spl | -0.65 | 0.10 | -0.22 | 0.03 | 0.20 | 0.03 | -0.37 | 0.05 |
| Bot.Flq.Spl | -0.65 | 0.06 | -0.22 | 0.02 | 0.20 | 0.02 | -0.37 | 0.04 |
| 40 | 9.34 | 0.92 | 2.79 | 0.28 | 0.66 | 0.06 | 6.45 | 0.64 |
| Bot.Flq.Spl | 0.89 | 0.09 | 0.22 | 0.02 | 0.38 | 0.04 | 0.67 | 0.07 |
| Bot.Flq.Spl | 0.89 | 0.14 | 0.22 | 0.04 | 0.38 | 0.06 | 0.67 | 0.11 |
| 41 | 0.79 | 0.13 | 0.25 | 0.04 | -0.23 | 0.04 | 0.37 | 0.06 |
| Bot.Flq.Spl | -1.17 | 0.19 | -0.28 | 0.04 | -0.87 | 0.14 | -1.13 | 0.18 |
| Bot.Flq.Spl | -1.17 | 0.30 | -0.28 | 0.07 | -0.87 | 0.22 | -1.13 | 0.29 |
| 42 | -0.26 | 0.07 | -0.10 | 0.00 | -0.91 | 0.23 | -0.53 | 0.13 |
| 43 | -0.29 | 0.07 | -0.16 | 0.04 | -1.17 | 0.30 | -0.46 | 0.12 |
| 44 | 0.18 | 0.05 | 0.06 | 0.02 | 0.19 | 0.05 | 0.01 | 0.00 |
| 45 | 2.24 | 0.57 | 0.88 | 0.22 | 3.66 | 0.93 | 0.81 | 0.21 |
| 46 | 0.17 | 0.04 | 0.06 | 0.02 | 0.21 | 0.05 | 0.01 | 0.00 |
| 47 | -0.49 | 0.13 | -0.22 | 0.06 | -1.20 | 0.31 | -0.44 | 0.11 |
| 48 | -0.28 | 0.07 | -0.11 | 0.03 | -0.96 | 0.24 | -0.50 | 0.13 |
| 49 | 0.37 | 0.09 | 0.12 | 0.03 | -0.14 | 0.03 | 0.15 | 0.04 |
| Bot.Flq.Spl | 0.29 | 0.07 | 0.06 | 0.02 | 0.25 | 0.06 | 0.31 | 0.08 |
| Bot.Flq.Spl | 0.29 | 0.04 | 0.06 | 0.01 | 0.25 | 0.03 | 0.31 | 0.04 |
| 50 | 3.91 | 0.50 | 1.21 | 0.15 | 0.44 | 0.06 | 3.06 | 0.39 |
| 51 | -1.04 | 0.13 | -0.32 | 0.04 | -0.12 | 0.02 | -0.81 | 0.10 |
| 52 | -0.73 | 0.09 | -0.20 | 0.03 | -0.60 | 0.08 | -0.76 | 0.10 |
| Bot.Flq.Spl | -0.79 | 0.10 | -0.22 | 0.03 | -0.61 | 0.08 | -0.81 | 0.10 |
| Bot.Flq.Spl | -0.79 | 0.20 | -0.22 | 0.06 | -0.61 | 0.16 | -0.81 | 0.21 |
| 53 | 0.63 | 0.16 | 0.16 | 0.04 | 0.70 | 0.18 | 0.73 | 0.18 |
| 54 | -0.17 | 0.04 | -0.04 | 0.00 | 0.25 | 0.06 | 0.01 | 0.00 |
| 55 | -0.14 | 0.04 | -0.06 | 0.02 | -1.36 | 0.35 | -0.59 | 0.15 |
| 56 | 0.00 | 0.00 | 0.01 | 0.00 | 0.16 | 0.04 | 0.08 | 0.02 |
| 57 | 0.21 | 0.05 | 0.11 | 0.03 | 1.22 | 0.31 | 0.39 | 0.10 |
| 58 | -0.15 | 0.04 | -0.07 | 0.02 | -0.98 | 0.25 | -0.43 | 0.11 |
| 59 | -0.45 | 0.11 | -0.13 | 0.03 | -0.17 | 0.04 | -0.53 | 0.13 |
| 60 | 1.43 | 0.36 | 0.42 | 0.11 | 0.48 | 0.12 | 1.65 | 0.42 |
| 61 | -0.29 | 0.07 | -0.08 | 0.02 | -0.27 | 0.07 | -0.47 | 0.12 |
| Bot.Flq.Spl | -0.29 | 0.07 | -0.08 | 0.02 | -0.27 | 0.07 | -0.47 | 0.12 |
| Bot.Flq.Spl | -0.29 | 0.07 | -0.08 | 0.02 | -0.27 | 0.07 | -0.47 | 0.12 |
| Bot.Flq.Spl | -0.11 | 0.03 | -0.04 | 0.01 | 0.28 | 0.07 | 0.11 | 0.03 |
| Bot.Flq.Spl | -0.11 | 0.06 | -0.04 | 0.02 | 0.28 | 0.16 | 0.11 | 0.06 |
| 62 | 0.00 | 0.00 | -0.02 | 0.01 | 0.23 | 0.13 | 0.32 | 0.18 |
| Bot.Flq.Spl | -0.10 | 0.05 | -0.05 | 0.03 | -0.24 | 0.14 | 0.00 | 0.00 |
| Bot.Flq.Spl | -0.10 | 0.06 | -0.05 | 0.03 | -0.24 | 0.16 | 0.00 | 0.00 |
| 63 | -0.07 | 0.04 | -0.02 | 0.01 | -0.33 | 0.22 | -0.23 | 0.15 |
| 64 | -0.09 | 0.06 | -0.03 | 0.02 | -0.16 | 0.11 | 0.00 | 0.00 |
| 65 | 0.06 | 0.04 | 0.02 | 0.01 | 0.05 | 0.03 | -0.03 | 0.02 |
| 66 | -0.31 | 0.21 | -0.11 | 0.08 | -0.75 | 0.50 | -0.11 | 0.07 |
| 67 | 0.11 | 0.07 | 0.04 | 0.03 | 0.26 | 0.17 | 0.02 | 0.01 |
| 68 | -0.06 | 0.04 | -0.02 | 0.01 | -0.14 | 0.09 | -0.02 | 0.01 |
| Bot.Flq.Spl | 0.01 | 0.01 | 0.00 | 0.00 | 0.03 | 0.02 | 0.01 | 0.00 |
| Bot.Flq.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.03 | 0.01 | 0.01 | 0.00 |
| 69 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.04 | 0.01 |
| 70 | 0.48 | 0.16 | 0.16 | 0.05 | 0.34 | 0.11 | 1.37 | 0.46 |
| 71 | -0.85 | 0.28 | -0.21 | 0.00 | -1.39 | 0.46 | -2.01 | 0.67 |
| 72 | 1.37 | 0.46 | 0.18 | 0.06 | 4.11 | 1.37 | 2.22 | 0.74 |
| 73 | -0.88 | 0.29 | -0.14 | 0.05 | -2.41 | 0.80 | -0.98 | 0.33 |
| 74 | 2.15 | 0.72 | 0.38 | 0.13 | 5.58 | 1.86 | 1.72 | 0.57 |
| 75 | -0.90 | 0.30 | -0.17 | 0.06 | -2.71 | 0.90 | -0.90 | 0.30 |
| 76 | 1.41 | 0.47 | 0.29 | 0.10 | 5.18 | 1.73 | 1.84 | 0.61 |
| 77 | -0.57 | 0.19 | -0.09 | 0.00 | -2.00 | 0.67 | -0.98 | 0.33 |
| Bot.Flq.Spl | -0.19 | 0.06 | -0.05 | 0.00 | -0.76 | 0.25 | -0.14 | 0.05 |
| Bot.Flq.Spl | -0.19 | 0.06 | -0.05 | 0.00 | -0.76 | 0.25 | -0.14 | 0.05 |
| 78 | 0.87 | 0.29 | 0.09 | 0.00 | 2.82 | 0.94 | 2.10 | 0.70 |
| Bot.Flq.Spl | -2.13 | 0.71 | -0.32 | 0.11 | -0.96 | 0.32 | -2.01 | 0.67 |
| Bot.Flq.Spl | -2.13 | 0.53 | -0.32 | 0.08 | -0.96 | 0.24 | -2.01 | 0.50 |

| | | | | | | | | |
|--------------|-------|------|-------|------|-------|------|-------|------|
| 79 | -2.10 | 0.52 | -0.31 | 0.08 | -1.39 | 0.35 | -2.22 | 0.56 |
| 80 | 7.04 | 1.76 | 1.12 | 0.28 | 1.30 | 0.32 | 5.68 | 1.42 |
| 81 | -2.10 | 0.53 | -0.28 | 0.07 | -1.40 | 0.35 | -2.18 | 0.55 |
| Bot.Flgl.Spl | -2.10 | 0.52 | -0.30 | 0.08 | -0.97 | 0.24 | -1.97 | 0.49 |
| Bot.Flgl.Spl | -2.10 | 0.71 | -0.30 | 0.10 | -0.97 | 0.33 | -1.97 | 0.66 |
| 82 | 1.45 | 0.48 | 0.01 | 0.00 | 4.33 | 1.44 | 3.12 | 1.04 |
| Bot.Flgl.Spl | -0.19 | 0.06 | -0.12 | 0.04 | -1.12 | 0.37 | -0.20 | 0.07 |
| Bot.Flgl.Spl | -0.19 | 0.06 | -0.12 | 0.04 | -1.12 | 0.37 | -0.20 | 0.07 |
| 83 | -0.79 | 0.26 | -0.15 | 0.05 | -3.00 | 1.00 | -1.45 | 0.48 |
| 84 | 1.70 | 0.57 | 0.59 | 0.20 | 7.66 | 2.55 | 2.69 | 0.90 |
| 85 | -1.07 | 0.36 | -0.32 | 0.11 | -4.08 | 1.36 | -1.41 | 0.47 |
| 86 | 2.55 | 0.85 | 0.70 | 0.23 | 8.61 | 2.87 | 2.93 | 0.98 |
| 87 | -0.92 | 0.31 | -0.24 | 0.08 | -3.76 | 1.25 | -1.67 | 0.56 |
| 88 | 1.17 | 0.39 | 0.28 | 0.09 | 6.52 | 2.17 | 3.77 | 1.26 |
| 89 | -1.47 | 0.49 | -0.39 | 0.00 | -2.09 | 0.70 | -3.33 | 1.11 |
| 90 | 1.22 | 0.41 | 0.33 | 0.11 | 0.46 | 0.15 | 2.46 | 0.82 |
| 91 | 0.03 | 0.01 | 0.01 | 0.00 | 0.03 | 0.00 | 0.08 | 0.03 |
| Bot.Flgl.Spl | 0.02 | 0.01 | 0.00 | 0.00 | 0.08 | 0.03 | 0.10 | 0.03 |
| Bot.Flgl.Spl | 0.02 | 0.01 | 0.00 | 0.00 | 0.08 | 0.04 | 0.10 | 0.05 |
| 92 | -0.33 | 0.15 | -0.09 | 0.04 | -0.95 | 0.43 | -0.36 | 0.16 |
| 93 | 0.85 | 0.38 | 0.23 | 0.11 | 1.85 | 0.84 | 0.22 | 0.10 |
| 94 | -1.50 | 0.68 | -0.42 | 0.19 | -3.27 | 1.49 | -0.50 | 0.23 |
| 95 | 0.52 | 0.24 | 0.14 | 0.06 | 0.77 | 0.35 | 0.01 | 0.00 |
| 96 | -0.63 | 0.29 | -0.17 | 0.08 | -1.17 | 0.53 | -0.14 | 0.06 |
| 97 | -0.20 | 0.09 | -0.04 | 0.02 | -1.72 | 0.78 | -0.85 | 0.38 |
| 98 | -0.23 | 0.00 | -0.10 | 0.00 | 1.53 | 0.69 | 1.12 | 0.51 |
| 99 | -1.05 | 0.48 | -0.25 | 0.11 | -1.34 | 0.61 | -1.51 | 0.69 |
| 100 | 7.72 | 2.24 | 1.88 | 0.54 | 1.61 | 0.47 | 6.93 | 2.01 |
| 101 | -2.91 | 1.32 | -0.67 | 0.31 | -2.63 | 1.20 | -3.59 | 1.63 |
| 102 | -1.84 | 0.84 | -0.48 | 0.00 | 1.29 | 0.59 | -0.84 | 0.38 |
| Bot.Flgl.Spl | -1.74 | 0.79 | -0.46 | 0.21 | 1.48 | 0.67 | -0.68 | 0.31 |
| Bot.Flgl.Spl | -1.74 | 0.93 | -0.46 | 0.24 | 1.48 | 0.79 | -0.68 | 0.36 |
| 103 | -0.16 | 0.00 | -0.18 | 0.10 | -0.23 | 0.12 | 0.38 | 0.20 |
| 104 | -0.67 | 0.35 | -0.23 | 0.12 | -3.88 | 2.06 | -1.84 | 0.98 |
| 105 | 2.21 | 1.17 | 1.14 | 0.60 | 10.60 | 5.64 | 3.53 | 1.88 |
| 106 | -0.60 | 0.32 | -0.37 | 0.20 | -4.41 | 2.35 | -2.11 | 1.12 |
| 107 | -0.22 | 0.12 | -0.06 | 0.03 | 0.20 | 0.10 | 0.58 | 0.31 |
| Bot.Flgl.Spl | -1.06 | 0.00 | -0.26 | 0.14 | 2.05 | 1.09 | -0.15 | 0.08 |
| Bot.Flgl.Spl | -1.06 | 0.00 | -0.26 | 0.13 | 2.05 | 1.02 | -0.15 | 0.08 |
| 108 | -1.11 | 0.00 | -0.28 | 0.14 | 1.85 | 0.92 | -0.31 | 0.15 |
| 109 | -1.44 | 0.72 | -0.58 | 0.29 | -2.94 | 1.47 | -2.95 | 1.47 |
| Bot.Flgl.Spl | -1.18 | 0.59 | -0.50 | 0.25 | -2.85 | 1.42 | -2.63 | 1.32 |
| Bot.Flgl.Spl | -1.18 | 0.42 | -0.50 | 0.18 | -2.85 | 1.03 | -2.63 | 0.95 |
| 110 | 6.96 | 2.53 | 2.33 | 0.85 | 1.82 | 0.66 | 8.41 | 3.06 |
| Bot.Flgl.Spl | -1.17 | 0.42 | -0.48 | 0.17 | -3.12 | 1.14 | -2.34 | 0.85 |
| Bot.Flgl.Spl | -1.17 | 0.59 | -0.48 | 0.24 | -3.12 | 1.57 | -2.34 | 1.18 |
| 111 | -1.41 | 0.71 | -0.55 | 0.28 | -3.23 | 1.61 | -2.63 | 1.32 |
| 112 | -1.10 | 0.00 | -0.29 | 0.00 | 2.05 | 1.02 | -0.55 | 0.27 |
| 113 | -0.48 | 0.24 | -0.17 | 0.08 | -0.45 | 0.22 | 0.42 | 0.21 |
| 114 | -0.86 | 0.43 | -0.45 | 0.22 | -5.54 | 2.77 | -1.78 | 0.89 |
| 115 | 3.69 | 1.85 | 1.67 | 0.83 | 15.60 | 7.80 | 3.28 | 1.64 |
| 116 | -0.95 | 0.48 | -0.49 | 0.25 | -5.34 | 2.67 | -1.72 | 0.86 |
| 117 | -0.40 | 0.20 | -0.13 | 0.07 | -0.60 | 0.30 | 0.37 | 0.19 |
| 118 | -0.84 | 0.00 | -0.18 | 0.09 | 1.82 | 0.91 | -0.59 | 0.29 |
| 119 | -1.17 | 0.59 | -0.47 | 0.24 | -3.04 | 1.52 | -2.35 | 1.17 |
| Bot.Flgl.Spl | -0.95 | 0.47 | -0.40 | 0.20 | -2.94 | 1.47 | -2.02 | 1.01 |
| Bot.Flgl.Spl | -0.95 | 0.34 | -0.40 | 0.15 | -2.94 | 1.06 | -2.02 | 0.73 |
| 120 | 6.80 | 2.47 | 2.15 | 0.78 | 2.52 | 0.91 | 9.55 | 3.47 |
| 121 | -0.40 | 0.14 | -0.13 | 0.05 | -0.15 | 0.06 | -0.56 | 0.20 |
| Bot.Flgl.Spl | -1.12 | 0.41 | -0.32 | 0.12 | -0.38 | 0.14 | -1.43 | 0.52 |
| Bot.Flgl.Spl | -1.12 | 0.57 | -0.32 | 0.16 | -0.38 | 0.19 | -1.43 | 0.72 |
| 122 | -2.17 | 1.08 | -0.68 | 0.34 | -0.80 | 0.40 | -3.01 | 1.51 |
| 123 | -0.76 | 0.00 | -0.24 | 0.00 | -0.27 | 0.13 | -1.05 | 0.53 |
| 124 | -0.23 | 0.11 | -0.10 | 0.05 | -2.72 | 1.36 | -1.43 | 0.72 |
| 125 | -0.31 | 0.16 | -0.14 | 0.07 | -3.71 | 1.85 | -1.95 | 0.98 |
| 126 | 0.27 | 0.14 | 0.12 | 0.06 | 3.24 | 1.62 | 1.71 | 0.85 |
| 127 | -0.06 | 0.03 | 0.04 | 0.02 | 8.00 | 4.00 | 2.47 | 1.24 |
| 128 | -2.66 | 0.00 | -0.98 | 0.00 | -3.31 | 1.66 | -7.41 | 3.71 |
| 129 | -2.37 | 1.18 | -0.88 | 0.44 | -4.34 | 2.17 | -7.05 | 3.52 |
| 130 | 2.00 | 1.00 | 0.72 | 0.36 | 0.71 | 0.36 | 4.99 | 2.49 |
| 131 | 0.02 | 0.01 | 0.01 | 0.00 | 0.06 | 0.00 | 0.09 | 0.05 |
| Bot.Flgl.Spl | 0.02 | 0.01 | 0.01 | 0.00 | 0.06 | 0.03 | 0.09 | 0.05 |
| Bot.Flgl.Spl | 0.02 | 0.00 | 0.01 | 0.00 | 0.06 | 0.00 | 0.09 | 0.03 |
| 132 | -0.30 | 0.08 | -0.11 | 0.03 | -0.83 | 0.24 | -0.29 | 0.08 |
| 133 | 0.48 | 0.14 | 0.17 | 0.05 | 1.10 | 0.31 | 0.12 | 0.03 |
| 134 | -0.75 | 0.21 | -0.27 | 0.08 | -1.61 | 0.46 | -0.16 | 0.04 |

| | | | | | | | | |
|-----|-------|------|-------|------|-------|------|-------|------|
| 135 | -0.10 | 0.03 | -0.04 | 0.01 | -0.20 | 0.06 | -0.01 | 0.00 |
| 136 | -0.10 | 0.03 | -0.04 | 0.01 | -0.21 | 0.06 | -0.03 | 0.01 |
| 137 | -0.73 | 0.21 | -0.26 | 0.08 | -1.54 | 0.44 | -0.10 | 0.03 |
| 138 | 0.71 | 0.20 | 0.25 | 0.07 | 1.56 | 0.45 | 0.09 | 0.03 |
| 139 | -0.42 | 0.12 | -0.15 | 0.04 | -0.91 | 0.26 | -0.06 | 0.00 |
| 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Dabrowski sign convention: +fw/fb ratio used for allowable stress.
(See 2003 Guide spec. commentary C5.1)

First of two splice entries is to left of splice,
second is to right of splice.

BRIDGE 69801 J, K, L, M, & N
Girder 1 : Rating Output : Lateral Bending in Flanges

Factored Lateral Bending in Bottom Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | compact | |
| 14.86 | 25.38 | 5.33 | 0.210 | 0.420 | compact | |
| 29.74 | 28.60 | 6.08 | 0.213 | 0.425 | compact | |
| 44.63 | 11.30 | 3.18 | 0.282 | 0.564 | compact | |
| 59.50 | 26.94 | 3.81 | 0.141 | 0.283 | compact | |
| 74.34 | 18.04 | 2.86 | 0.159 | 0.317 | compact | |
| 89.23 | 30.02 | 6.41 | 0.213 | 0.427 | compact | |
| 104.09 | 29.81 | 6.35 | 0.213 | 0.426 | compact | |
| 118.98 | 17.24 | 2.73 | 0.158 | 0.317 | compact | |
| 133.83 | 26.38 | 3.73 | 0.141 | 0.283 | compact | |
| 148.71 | 20.49 | 3.25 | 0.159 | 0.317 | compact | |
| 163.58 | 29.47 | 6.26 | 0.212 | 0.425 | compact | |
| 178.45 | 24.19 | 4.54 | 0.188 | 0.375 | compact | |
| 191.70 | 0.09 | 0.01 | 0.111 | 0.223 | compact | |
| 195.03 | 0.18 | 0.00 | 0.026 | 0.051 | compact | |
| 203.26 | 18.31 | 1.07 | 0.058 | 0.117 | 0.059 | 0.059 |
| 215.68 | 10.03 | 1.06 | 0.106 | 0.212 | 0.059 | 0.059 |
| 228.14 | 20.72 | 2.14 | 0.103 | 0.206 | 0.119 | 0.119 |
| 240.60 | 26.37 | 2.71 | 0.103 | 0.205 | 0.150 | 0.150 |
| 253.04 | 27.02 | 2.78 | 0.103 | 0.206 | 0.155 | 0.155 |
| 265.49 | 23.14 | 2.42 | 0.104 | 0.209 | 0.134 | 0.134 |
| 277.95 | 14.64 | 1.60 | 0.109 | 0.218 | 0.089 | 0.089 |
| 290.40 | 16.31 | 1.50 | 0.092 | 0.184 | 0.083 | 0.083 |
| 302.83 | 22.33 | 1.68 | 0.075 | 0.150 | compact | |
| 315.29 | 24.71 | 1.83 | 0.074 | 0.149 | compact | |
| 326.94 | 23.82 | 1.60 | 0.067 | 0.134 | compact | |
| 338.59 | 15.80 | 0.67 | 0.043 | 0.085 | 0.037 | 0.037 |
| 350.22 | 17.67 | 0.75 | 0.042 | 0.084 | 0.041 | 0.041 |
| 361.84 | 24.49 | 1.26 | 0.051 | 0.103 | 0.070 | 0.070 |
| 373.50 | 31.23 | 1.59 | 0.051 | 0.102 | 0.088 | 0.088 |
| 385.12 | 34.08 | 1.72 | 0.050 | 0.101 | 0.095 | 0.095 |
| 396.75 | 32.58 | 1.65 | 0.051 | 0.101 | 0.092 | 0.092 |
| 408.41 | 27.28 | 1.39 | 0.051 | 0.102 | 0.077 | 0.077 |
| 420.02 | 18.20 | 0.94 | 0.052 | 0.104 | 0.052 | 0.052 |
| 431.65 | 5.32 | 0.41 | 0.077 | 0.154 | 0.023 | 0.023 |
| 443.30 | 24.55 | 1.05 | 0.043 | 0.086 | 0.058 | 0.058 |
| 454.95 | 23.97 | 1.04 | 0.043 | 0.087 | compact | |
| 466.87 | 17.38 | 0.66 | 0.038 | 0.076 | compact | |
| 478.81 | 17.58 | 0.76 | 0.043 | 0.086 | 0.042 | 0.042 |
| 490.74 | 17.19 | 0.71 | 0.041 | 0.082 | 0.039 | 0.039 |
| 502.67 | 17.26 | 0.88 | 0.051 | 0.102 | 0.049 | 0.049 |
| 514.59 | 17.25 | 0.85 | 0.049 | 0.099 | 0.047 | 0.047 |
| 526.54 | 7.11 | 0.42 | 0.059 | 0.118 | 0.023 | 0.023 |
| 538.45 | 26.61 | 0.89 | 0.033 | 0.067 | 0.049 | 0.049 |
| 549.02 | 8.97 | 0.51 | 0.057 | 0.114 | compact | |
| 559.58 | 27.53 | 1.71 | 0.062 | 0.124 | 0.095 | 0.095 |
| 570.15 | 33.21 | 2.03 | 0.061 | 0.122 | 0.113 | 0.113 |
| 580.74 | 25.09 | 1.07 | 0.042 | 0.085 | 0.059 | 0.059 |
| 587.77 | 9.50 | 0.15 | 0.015 | 0.031 | 0.008 | 0.008 |
| 591.12 | 0.32 | 0.01 | 0.018 | 0.036 | compact | |
| 597.43 | 15.67 | 0.67 | 0.043 | 0.086 | compact | |
| 613.59 | 16.80 | 1.89 | 0.112 | 0.224 | compact | |
| 629.72 | 24.37 | 2.72 | 0.111 | 0.223 | compact | |
| 645.89 | 20.26 | 2.30 | 0.113 | 0.227 | compact | |
| 662.03 | 13.10 | 1.02 | 0.078 | 0.156 | compact | |
| 678.19 | 23.96 | 3.46 | 0.144 | 0.289 | compact | |
| 694.30 | 13.26 | 1.52 | 0.115 | 0.230 | compact | |

| | | | | | |
|---------|-------|-------|-------|-------|-------------|
| 710.40 | 19.34 | 3.30 | 0.171 | 0.342 | compact |
| 726.50 | 23.35 | 3.94 | 0.169 | 0.337 | compact |
| 742.57 | 15.42 | 2.65 | 0.172 | 0.344 | compact |
| 758.68 | 17.55 | 1.34 | 0.076 | 0.152 | compact |
| 765.64 | 3.65 | 0.04 | 0.012 | 0.023 | compact |
| 767.70 | 0.94 | 0.08 | 0.085 | 0.169 | compact |
| 779.75 | 19.06 | 2.30 | 0.121 | 0.241 | compact |
| 792.74 | 25.82 | 6.77 | 0.262 | 0.524 | compact |
| 805.76 | 22.01 | 5.85 | 0.266 | 0.531 | compact |
| 818.76 | 7.27 | 2.62 | 0.361 | 0.721 | compact |
| 831.78 | 20.19 | 4.79 | 0.237 | 0.475 | compact |
| 847.88 | 9.24 | 4.74 | 0.513 | 1.025 | compact |
| 863.99 | 17.66 | 7.42 | 0.420 | 0.840 | compact |
| 880.10 | 14.06 | 5.96 | 0.424 | 0.848 | 0.331 0.331 |
| 896.20 | 22.90 | 6.42 | 0.280 | 0.561 | compact |
| 912.25 | 22.71 | 6.05 | 0.266 | 0.533 | 0.336 0.336 |
| 928.29 | 29.49 | 10.39 | 0.353 | 0.705 | 0.577 0.577 |
| 944.33 | 16.55 | 5.96 | 0.360 | 0.720 | 0.331 0.331 |
| 960.38 | 22.60 | 6.71 | 0.297 | 0.594 | compact |
| 977.45 | 0.03 | 0.01 | 0.419 | 0.838 | compact |
| 994.55 | 19.86 | 8.17 | 0.412 | 0.823 | 0.454 0.454 |
| 1011.61 | 30.25 | 3.83 | 0.127 | 0.253 | compact |
| 1016.46 | 8.40 | 0.11 | 0.013 | 0.025 | compact |
| 1018.53 | 0.56 | 0.05 | 0.082 | 0.163 | compact |
| 1028.16 | 13.99 | 1.68 | 0.120 | 0.240 | compact |
| 1038.82 | 21.18 | 2.79 | 0.132 | 0.263 | compact |
| 1049.45 | 21.50 | 2.83 | 0.131 | 0.263 | compact |
| 1060.09 | 15.04 | 1.98 | 0.132 | 0.264 | compact |
| 1070.73 | 0.00 | 0.00 | 0.000 | 0.000 | compact |

Factored Lateral Bending in Top Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 44.63 | 2.34 | 3.18 | 1.363 | 2.726 | compact | |
| 59.50 | 26.94 | 3.81 | 0.141 | 0.283 | compact | |
| 74.34 | 18.04 | 2.86 | 0.159 | 0.317 | compact | |
| 118.98 | 17.24 | 2.73 | 0.158 | 0.317 | compact | |
| 133.83 | 26.38 | 3.73 | 0.141 | 0.283 | compact | |
| 148.71 | 20.49 | 3.25 | 0.159 | 0.317 | compact | |
| 191.70 | 0.07 | 0.01 | 0.146 | 0.293 | compact | |
| 195.03 | 0.17 | 0.00 | 0.027 | 0.055 | compact | |
| 203.26 | 18.31 | 1.07 | 0.058 | 0.117 | 0.059 | |
| 290.40 | 16.31 | 1.50 | 0.092 | 0.184 | 0.083 | |
| 302.83 | 22.33 | 1.68 | 0.075 | 0.150 | compact | |
| 315.29 | 24.71 | 1.83 | 0.074 | 0.149 | compact | |
| 326.94 | 23.82 | 1.60 | 0.067 | 0.134 | compact | |
| 338.59 | 15.80 | 0.67 | 0.043 | 0.085 | 0.037 | |
| 431.65 | 4.42 | 0.41 | 0.093 | 0.185 | 0.023 | |
| 443.30 | 24.55 | 1.05 | 0.043 | 0.086 | 0.058 | |
| 454.95 | 23.97 | 1.04 | 0.043 | 0.087 | compact | |
| 466.87 | 17.38 | 0.66 | 0.038 | 0.076 | compact | |
| 478.81 | 17.57 | 0.76 | 0.043 | 0.086 | 0.042 | |
| 526.54 | 7.10 | 0.42 | 0.059 | 0.118 | 0.023 | |
| 538.45 | 26.61 | 0.89 | 0.033 | 0.067 | 0.049 | |
| 549.02 | 8.97 | 0.51 | 0.057 | 0.114 | compact | |
| 587.77 | 3.76 | 0.18 | 0.047 | 0.094 | 0.010 | |
| 591.12 | 0.46 | 0.01 | 0.025 | 0.050 | compact | |
| 597.43 | 22.62 | 1.35 | 0.060 | 0.119 | compact | |
| 662.03 | 13.78 | 1.11 | 0.081 | 0.161 | compact | |
| 678.19 | 23.96 | 3.46 | 0.144 | 0.289 | compact | |
| 694.30 | 13.26 | 1.52 | 0.115 | 0.230 | compact | |
| 758.68 | 21.93 | 2.29 | 0.104 | 0.209 | compact | |
| 765.64 | 4.56 | 0.07 | 0.016 | 0.032 | compact | |
| 767.70 | 0.71 | 0.08 | 0.111 | 0.223 | compact | |
| 831.78 | 20.19 | 4.79 | 0.237 | 0.475 | compact | |
| 847.88 | 2.35 | 4.74 | 2.011 | 4.023 | compact | |

| | | | | | |
|---------|-------|------|-------|-------|---------|
| 896.20 | 22.90 | 6.42 | 0.280 | 0.561 | compact |
| 960.38 | 22.60 | 6.71 | 0.297 | 0.594 | compact |
| 1011.61 | 39.22 | 6.13 | 0.156 | 0.312 | compact |
| 1016.46 | 10.90 | 0.17 | 0.016 | 0.031 | compact |
| 1018.53 | 0.93 | 0.11 | 0.113 | 0.227 | compact |

BRIDGE 69801 J, K, L, M, & N

Girder 10 : Rating Output : Bottom Flange Factored Bending Stress - Group I Lo

Girder 10 Grp I Factored Bending Stresses - ksi

| Tenth
Point | Loc | ----- Bottom Flange ----- | | | | | | | | |
|----------------|--------|---------------------------|--------------|-------------|-------------|-------------|------|-------|-------|-------|
| | | Noncomp
Dead | Comp
Dead | Max
LM+I | Min
LL+I | LL+I
Rng | Wind | Tot | Allow | Ratio |
| 0 | 0.00 | 0.0 | 0.0 | 0.1 | -0.1 | 0.2 | 0.0 | -0.1 | 33.7 | 0.003 |
| 1 | 4.16 | 1.6 | 0.6 | 5.4 | -1.1 | 6.5 | 0.0 | 7.6 | 34.9 | 0.217 |
| 2 | 8.32 | 2.7 | 1.0 | 9.2 | -2.2 | 11.4 | 0.0 | 12.9 | 34.3 | 0.377 |
| 3 | 12.48 | 3.3 | 1.3 | 10.8 | -3.3 | 14.0 | 0.0 | 15.3 | 33.6 | 0.456 |
| 4 | 16.64 | 3.4 | 1.3 | 12.2 | -4.2 | 16.4 | 0.0 | 16.9 | 34.6 | 0.489 |
| 5 | 20.79 | 2.9 | 1.2 | 11.9 | -5.2 | 17.1 | 0.0 | 16.0 | 34.5 | 0.463 |
| 6 | 24.95 | 1.9 | 0.9 | 11.8 | -5.9 | 17.7 | 0.0 | 14.6 | 34.5 | 0.423 |
| 7 | 29.11 | 0.4 | 0.4 | 10.5 | -6.6 | 17.1 | 0.0 | 11.3 | 33.9 | 0.334 |
| 8 | 33.27 | -1.7 | -0.3 | 8.9 | -8.4 | 17.3 | 0.0 | -10.4 | 34.2 | 0.304 |
| 9 | 37.43 | -4.4 | -1.4 | 4.6 | -9.0 | 13.6 | 0.0 | -14.8 | 34.2 | 0.434 |
| 10 | 41.59 | -7.7 | -2.8 | 2.5 | -10.2 | 12.7 | 0.0 | -20.6 | 34.0 | 0.606 |
| 11 | 47.05 | -3.2 | -0.9 | 4.1 | -5.4 | 9.6 | 0.0 | -9.6 | 34.0 | 0.281 |
| 12 | 52.51 | 0.2 | 0.6 | 11.8 | -5.7 | 17.5 | 0.0 | 12.6 | 34.9 | 0.360 |
| 13 | 57.97 | 2.5 | 1.2 | 12.4 | -4.7 | 17.1 | 0.0 | 16.1 | 34.4 | 0.469 |
| 14 | 63.43 | 3.9 | 1.6 | 14.5 | -4.5 | 19.0 | 0.0 | 20.0 | 34.0 | 0.589 |
| 15 | 68.90 | 4.4 | 1.8 | 15.0 | -4.4 | 19.3 | 0.0 | 21.1 | 34.4 | 0.613 |
| 16 | 74.36 | 3.8 | 1.6 | 14.5 | -5.1 | 19.6 | 0.0 | 20.0 | 34.0 | 0.588 |
| 17 | 79.82 | 2.5 | 1.2 | 12.4 | -5.4 | 17.8 | 0.0 | 16.2 | 34.4 | 0.471 |
| 18 | 85.28 | 0.2 | 0.7 | 11.9 | -6.6 | 18.5 | 0.0 | 12.8 | 34.9 | 0.366 |
| 19 | 90.74 | -3.2 | -0.6 | 4.6 | -6.6 | 11.3 | 0.0 | -10.5 | 34.0 | 0.309 |
| 20 | 96.20 | -7.6 | -2.4 | 2.3 | -10.7 | 12.9 | 0.0 | -20.7 | 34.0 | 0.608 |
| 21 | 101.13 | -3.6 | -1.0 | 5.1 | -8.7 | 13.8 | 0.0 | -13.4 | 34.0 | 0.393 |
| 22 | 106.06 | -0.4 | 0.0 | 12.4 | -8.2 | 20.6 | 0.0 | 12.0 | 34.0 | 0.352 |
| 23 | 110.99 | 1.9 | 0.6 | 12.0 | -6.2 | 18.3 | 0.0 | 14.5 | 34.3 | 0.423 |
| 24 | 115.92 | 3.4 | 0.9 | 13.7 | -5.3 | 19.0 | 0.0 | 18.0 | 33.5 | 0.537 |
| 25 | 120.85 | 4.1 | 1.0 | 13.4 | -4.3 | 17.7 | 0.0 | 18.6 | 33.5 | 0.555 |
| 26 | 125.78 | 4.1 | 1.0 | 12.6 | -3.2 | 15.8 | 0.0 | 17.7 | 33.9 | 0.521 |
| 27 | 130.71 | 3.2 | 0.8 | 9.0 | -2.0 | 11.0 | 0.0 | 12.9 | 35.1 | 0.368 |
| 28 | 135.64 | 1.5 | 0.4 | 5.2 | -0.8 | 6.0 | 0.0 | 7.1 | 35.2 | 0.201 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.3 | 0.000 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.9 | 0.000 |
| 29 | 140.57 | -0.7 | -0.2 | 0.6 | -2.6 | 3.2 | 0.0 | -3.5 | 35.9 | 0.098 |
| 30 | 145.49 | -2.9 | -0.9 | 2.4 | -10.3 | 12.7 | 0.0 | -14.1 | 34.0 | 0.416 |
| 31 | 152.01 | 0.5 | 0.2 | 8.1 | -8.4 | 16.5 | 0.0 | 8.8 | 35.3 | 0.248 |
| 32 | 158.52 | 3.0 | 0.8 | 12.4 | -7.6 | 20.0 | 0.0 | 16.2 | 35.9 | 0.450 |
| 33 | 165.04 | 4.5 | 1.2 | 15.1 | -6.8 | 21.9 | 0.0 | 20.9 | 35.8 | 0.583 |
| 34 | 171.55 | 5.1 | 1.4 | 16.5 | -5.9 | 22.3 | 0.0 | 23.0 | 35.1 | 0.655 |
| 35 | 178.07 | 4.7 | 1.4 | 16.2 | -5.4 | 21.5 | 0.0 | 22.3 | 33.9 | 0.658 |
| 36 | 184.58 | 3.5 | 1.2 | 15.1 | -6.0 | 21.1 | 0.0 | 19.9 | 35.2 | 0.565 |
| 37 | 191.10 | 1.3 | 0.8 | 11.7 | -6.7 | 18.4 | 0.0 | 13.9 | 35.8 | 0.387 |
| 38 | 197.61 | -1.9 | 0.2 | 8.5 | -7.3 | 15.8 | 0.0 | -9.0 | 34.0 | 0.265 |
| 39 | 204.13 | -6.3 | -0.9 | 3.6 | -8.6 | 12.2 | 0.0 | -15.8 | 34.0 | 0.465 |
| Bot. Flg. Spl. | | -7.7 | -1.3 | 3.4 | -9.6 | 13.0 | 0.0 | -18.5 | 34.0 | 0.545 |
| Bot. Flg. Spl. | | -5.5 | -0.9 | 2.5 | -7.0 | 9.4 | 0.0 | -13.4 | 33.5 | 0.400 |
| 40 | 210.64 | -8.7 | -1.7 | 1.9 | -9.5 | 11.4 | 0.0 | -19.8 | 34.4 | 0.576 |
| Bot. Flg. Spl. | | -5.6 | -1.1 | 3.0 | -7.2 | 10.2 | 0.0 | -13.9 | 34.0 | 0.408 |
| Bot. Flg. Spl. | | -7.7 | -1.5 | 4.1 | -10.0 | 14.0 | 0.0 | -19.1 | 34.2 | 0.560 |
| 41 | 217.35 | -6.3 | -1.2 | 4.6 | -8.9 | 13.4 | 0.0 | -16.4 | 34.2 | 0.479 |
| 42 | 224.05 | -1.8 | -0.3 | 7.9 | -7.1 | 15.1 | 0.0 | -9.2 | 33.8 | 0.273 |
| 43 | 230.75 | 1.4 | 0.2 | 12.4 | -6.3 | 18.6 | 0.0 | 13.9 | 35.5 | 0.393 |
| 44 | 237.45 | 3.6 | 0.6 | 14.8 | -5.4 | 20.2 | 0.0 | 18.9 | 35.1 | 0.538 |
| 45 | 244.16 | 4.7 | 0.7 | 15.6 | -4.9 | 20.5 | 0.0 | 21.0 | 34.4 | 0.611 |
| 46 | 250.86 | 5.1 | 0.7 | 15.8 | -5.5 | 21.3 | 0.0 | 21.6 | 35.2 | 0.613 |
| 47 | 257.56 | 4.4 | 0.5 | 14.6 | -6.4 | 21.0 | 0.0 | 19.5 | 35.9 | 0.544 |
| 48 | 264.26 | 2.9 | 0.2 | 12.0 | -7.6 | 19.6 | 0.0 | 15.1 | 36.0 | 0.419 |
| 49 | 270.97 | 0.3 | -0.4 | 7.2 | -9.0 | 16.2 | 0.0 | -9.1 | 33.8 | 0.270 |
| 50 | 277.67 | -3.4 | -1.3 | 2.6 | -11.8 | 14.5 | 0.0 | -16.6 | 33.8 | 0.492 |
| 51 | 283.49 | -0.6 | -0.2 | 0.5 | -1.9 | 2.4 | 0.0 | -2.7 | 35.9 | 0.075 |
| Bot. Flg. Spl. | | -0.4 | -0.2 | 0.8 | -1.9 | 2.7 | 0.0 | -2.5 | 35.9 | 0.070 |
| Bot. Flg. Spl. | | -0.7 | -0.3 | 1.2 | -2.9 | 4.1 | 0.0 | -3.8 | 35.9 | 0.107 |
| 52 | 289.32 | 2.3 | 0.7 | 7.2 | -1.7 | 8.9 | 0.0 | 10.2 | 35.6 | 0.288 |
| 53 | 295.15 | 4.3 | 1.3 | 13.3 | -3.8 | 17.1 | 0.0 | 18.9 | 34.6 | 0.546 |

| | | | | | | | | | | |
|--------------|--------|-------|------|-------|-------|------|-------|-------|-------|-------|
| 54 | 300.97 | 5.0 | 1.6 | 16.5 | -5.8 | 22.2 | 0.0 | 23.1 | 34.5 | 0.670 |
| 55 | 306.80 | 4.6 | 1.6 | 17.6 | -7.7 | 25.3 | 0.0 | 23.8 | 33.8 | 0.704 |
| 56 | 312.62 | 3.0 | 1.2 | 17.3 | -9.4 | 26.7 | 0.0 | 21.6 | 33.9 | 0.636 |
| 57 | 318.45 | 0.3 | 0.4 | 14.3 | -11.0 | 25.3 | 0.0 | 15.1 | 36.0 | 0.419 |
| 58 | 324.27 | -3.6 | -0.9 | 15.3 | -14.7 | 30.0 | 0.0 | -19.1 | 34.5 | 0.554 |
| Bot.Flg.Spl. | -8.6 | -2.7 | 6.6 | -16.1 | 22.7 | 0.0 | -27.4 | 34.5 | 0.794 | |
| Bot.Flg.Spl. | -6.1 | -2.0 | 4.7 | -11.5 | 16.2 | 0.0 | -19.5 | 34.5 | 0.566 | |
| 59 | 330.10 | -6.2 | -2.0 | 4.5 | -11.5 | 16.1 | 0.0 | -19.7 | 34.5 | 0.571 |
| 60 | 335.92 | -10.8 | -3.8 | 3.4 | -14.4 | 17.7 | 0.0 | -28.9 | 31.7 | 0.912 |
| Bot.Flg.Spl. | -4.8 | -1.4 | 3.9 | -7.7 | 11.6 | 0.0 | -14.0 | 31.7 | 0.440 | |
| Bot.Flg.Spl. | -6.8 | -2.0 | 5.4 | -10.8 | 16.3 | 0.0 | -19.6 | 31.7 | 0.618 | |
| 61 | 343.02 | -6.7 | -1.9 | 5.4 | -10.7 | 16.2 | 0.0 | -19.3 | 31.7 | 0.609 |
| Bot.Flg.Spl. | -0.3 | 0.5 | 12.9 | -8.6 | 21.5 | 0.0 | 13.2 | 36.0 | 0.367 | |
| Bot.Flg.Spl. | -0.3 | 0.5 | 12.9 | -8.9 | 21.8 | 0.0 | 13.1 | 36.0 | 0.365 | |
| 62 | 350.12 | -0.1 | 0.5 | 13.1 | -8.9 | 22.0 | 0.0 | 13.6 | 36.0 | 0.377 |
| 63 | 357.22 | 5.1 | 1.9 | 18.7 | -8.1 | 26.9 | 0.0 | 25.7 | 36.0 | 0.714 |
| 64 | 364.32 | 8.0 | 2.7 | 22.2 | -6.9 | 29.1 | 0.0 | 32.9 | 36.0 | 0.914 |
| 65 | 371.42 | 9.0 | 3.0 | 23.4 | -6.9 | 30.3 | 0.0 | 35.4 | 36.0 | 0.982 |
| 66 | 378.52 | 7.9 | 2.7 | 22.3 | -8.3 | 30.6 | 0.0 | 32.9 | 36.0 | 0.915 |
| 67 | 385.62 | 4.9 | 1.9 | 18.8 | -9.7 | 28.6 | 0.0 | 25.6 | 36.0 | 0.712 |
| 68 | 392.72 | 0.0 | 0.5 | 11.4 | -10.7 | 22.2 | 0.0 | 11.8 | 36.0 | 0.329 |
| 69 | 399.81 | -7.0 | -2.1 | 7.1 | -13.7 | 20.8 | 0.0 | -22.8 | 31.5 | 0.725 |
| 70 | 406.91 | -10.5 | -3.6 | 3.7 | -14.8 | 18.5 | 0.0 | -28.9 | 31.0 | 0.931 |
| 71 | 412.51 | -6.3 | -2.0 | 3.6 | -10.9 | 14.5 | 0.0 | -19.2 | 31.0 | 0.619 |
| 72 | 418.11 | -4.4 | -1.1 | 15.0 | -15.2 | 30.2 | 0.0 | -20.7 | 31.0 | 0.667 |
| 73 | 423.71 | -0.4 | 0.3 | 15.9 | -12.0 | 27.9 | 0.0 | 15.8 | 31.0 | 0.509 |
| 74 | 429.31 | 2.5 | 0.9 | 18.8 | -10.6 | 29.5 | 0.0 | 22.3 | 36.0 | 0.619 |
| 75 | 434.91 | 4.0 | 1.3 | 20.0 | -9.1 | 29.1 | 0.0 | 25.3 | 36.0 | 0.703 |
| 76 | 440.51 | 4.4 | 1.4 | 20.8 | -10.1 | 30.9 | 0.0 | 26.5 | 36.0 | 0.736 |
| 77 | 446.11 | 3.5 | 1.1 | 18.7 | -12.1 | 30.9 | 0.0 | 23.3 | 36.0 | 0.646 |
| 78 | 451.71 | 1.4 | 0.4 | 15.0 | -13.8 | 28.8 | 0.0 | 16.8 | 36.0 | 0.467 |
| 79 | 457.31 | -1.9 | -0.9 | 15.5 | -18.0 | 33.5 | 0.0 | -20.7 | 31.0 | 0.668 |
| 80 | 462.91 | -6.4 | -2.6 | 4.2 | -20.1 | 24.3 | 0.0 | -29.1 | 31.0 | 0.938 |
| 81 | 469.10 | -0.7 | -0.3 | 0.4 | -2.0 | 2.5 | 0.0 | -3.0 | 34.8 | 0.085 |
| 82 | 475.30 | 3.6 | 1.1 | 8.8 | -1.9 | 10.7 | 0.0 | 13.4 | 36.0 | 0.373 |
| 83 | 481.50 | 6.3 | 1.9 | 15.8 | -4.0 | 19.8 | 0.0 | 24.1 | 36.0 | 0.668 |
| 84 | 487.70 | 7.5 | 2.3 | 19.5 | -6.1 | 25.7 | 0.0 | 29.4 | 36.0 | 0.816 |
| 85 | 493.90 | 7.3 | 2.3 | 20.2 | -7.8 | 28.0 | 0.0 | 29.7 | 36.0 | 0.824 |
| 86 | 500.10 | 5.5 | 1.8 | 19.5 | -9.5 | 29.0 | 0.0 | 26.7 | 36.0 | 0.742 |
| 87 | 506.30 | 2.2 | 0.9 | 16.8 | -11.2 | 28.0 | 0.0 | 19.9 | 36.0 | 0.554 |
| 88 | 512.50 | -2.6 | -0.5 | 14.4 | -14.4 | 28.9 | 0.0 | -17.5 | 31.0 | 0.565 |
| 89 | 518.70 | -8.9 | -2.9 | 6.9 | -16.0 | 23.0 | 0.0 | -27.9 | 31.3 | 0.891 |
| 90 | 524.90 | -11.8 | -4.0 | 3.2 | -15.5 | 18.7 | 0.0 | -31.3 | 31.3 | 1.001 |
| 91 | 531.94 | -7.9 | -2.3 | 5.6 | -13.1 | 18.8 | 0.0 | -23.4 | 31.8 | 0.735 |
| 92 | 538.99 | -1.0 | 0.3 | 13.1 | -10.4 | 23.5 | 0.0 | 12.4 | 31.8 | 0.389 |
| 93 | 546.03 | 4.2 | 1.7 | 18.5 | -9.4 | 27.9 | 0.0 | 24.4 | 35.9 | 0.680 |
| 94 | 553.08 | 7.3 | 2.5 | 22.0 | -8.0 | 30.0 | 0.0 | 31.8 | 35.3 | 0.899 |
| 95 | 560.12 | 8.4 | 2.8 | 23.0 | -6.8 | 29.8 | 0.0 | 34.3 | 33.9 | 1.011 |
| 96 | 567.17 | 7.6 | 2.6 | 22.0 | -7.9 | 30.0 | 0.0 | 32.3 | 35.3 | 0.914 |
| 97 | 574.21 | 4.9 | 1.8 | 18.7 | -9.2 | 27.9 | 0.0 | 25.4 | 35.9 | 0.708 |
| 98 | 581.26 | 0.3 | 0.5 | 11.5 | -10.2 | 21.7 | 0.0 | 12.2 | 35.9 | 0.340 |
| 99 | 588.30 | -6.3 | -2.0 | 6.7 | -12.9 | 19.6 | 0.0 | -21.2 | 31.8 | 0.666 |
| 100 | 595.35 | -10.5 | -3.7 | 3.4 | -14.9 | 18.4 | 0.0 | -29.1 | 31.3 | 0.929 |
| 101 | 600.90 | -8.6 | -2.8 | 5.5 | -15.7 | 21.2 | 0.0 | -27.1 | 31.3 | 0.865 |
| 102 | 606.46 | -3.5 | -0.8 | 14.9 | -14.3 | 29.2 | 0.0 | -18.5 | 31.3 | 0.591 |
| 103 | 612.02 | 0.5 | 0.5 | 15.7 | -11.2 | 26.9 | 0.0 | 16.6 | 35.5 | 0.469 |
| 104 | 617.58 | 3.4 | 1.2 | 18.5 | -10.0 | 28.5 | 0.0 | 23.2 | 36.0 | 0.643 |
| 105 | 623.13 | 5.0 | 1.6 | 19.6 | -8.6 | 28.2 | 0.0 | 26.2 | 35.2 | 0.743 |
| 106 | 628.69 | 5.4 | 1.6 | 20.3 | -8.7 | 29.1 | 0.0 | 27.3 | 35.9 | 0.762 |
| 107 | 634.25 | 4.5 | 1.4 | 18.3 | -10.2 | 28.5 | 0.0 | 24.2 | 35.2 | 0.686 |
| 108 | 639.80 | 2.5 | 0.7 | 14.6 | -11.5 | 26.1 | 0.0 | 17.9 | 35.1 | 0.509 |
| 109 | 645.36 | -0.7 | -0.3 | 14.7 | -15.0 | 29.7 | 0.0 | -16.0 | 31.3 | 0.511 |
| 110 | 650.92 | -5.1 | -2.0 | 2.9 | -16.6 | 19.5 | 0.0 | -23.7 | 32.7 | 0.723 |
| Bot.Flg.Spl. | -0.8 | -0.3 | 0.4 | -2.6 | 3.1 | 0.0 | -3.8 | 34.6 | 0.109 | |
| Bot.Flg.Spl. | -0.9 | -0.4 | 0.5 | -2.9 | 3.4 | 0.0 | -4.2 | 34.5 | 0.121 | |
| 111 | 656.47 | -0.4 | -0.2 | 0.2 | -1.3 | 1.5 | 0.0 | -1.9 | 34.4 | 0.056 |
| 112 | 662.03 | 4.2 | 1.2 | 10.0 | -1.6 | 11.7 | 0.0 | 15.4 | 35.6 | 0.434 |
| 113 | 667.59 | 7.2 | 2.1 | 17.5 | -3.4 | 20.9 | 0.0 | 26.7 | 35.9 | 0.744 |
| 114 | 673.15 | 8.5 | 2.4 | 20.2 | -5.1 | 25.4 | 0.0 | 31.1 | 34.5 | 0.904 |
| 115 | 678.70 | 8.3 | 2.4 | 20.6 | -7.0 | 27.6 | 0.0 | 31.3 | 35.4 | 0.885 |
| 116 | 684.26 | 6.4 | 2.0 | 20.0 | -8.7 | 28.7 | 0.0 | 28.4 | 35.4 | 0.801 |
| 117 | 689.82 | 3.0 | 1.1 | 16.8 | -10.5 | 27.3 | 0.0 | 20.9 | 34.8 | 0.601 |
| 118 | 695.38 | -2.1 | -0.3 | 15.1 | -15.0 | 30.1 | 0.0 | -17.5 | 30.9 | 0.564 |
| 119 | 700.94 | -5.3 | -1.7 | 4.3 | -10.4 | 14.6 | 0.0 | -17.4 | 30.9 | 0.561 |
| 120 | 706.49 | -10.5 | -3.5 | 2.7 | -13.8 | 16.6 | 0.0 | -27.8 | 30.9 | 0.897 |
| 121 | 712.65 | -8.6 | -2.4 | 5.6 | -14.2 | 19.8 | 0.0 | -25.1 | 31.8 | 0.790 |

| | | | | | | | | | | |
|-----|--------|-------|------|------|-------|------|-----|-------|------|-------|
| 122 | 718.81 | -1.7 | 0.2 | 12.9 | -10.1 | 22.9 | 0.0 | -11.5 | 31.8 | 0.362 |
| 123 | 724.97 | 3.6 | 1.5 | 18.7 | -8.4 | 27.2 | 0.0 | 23.8 | 35.9 | 0.664 |
| 124 | 731.12 | 6.5 | 2.3 | 22.5 | -6.8 | 29.3 | 0.0 | 31.3 | 35.5 | 0.883 |
| 125 | 737.28 | 7.4 | 2.6 | 23.9 | -5.6 | 29.5 | 0.0 | 33.9 | 34.3 | 0.990 |
| 126 | 743.44 | 6.4 | 2.3 | 22.7 | -7.5 | 30.2 | 0.0 | 31.4 | 35.4 | 0.885 |
| 127 | 749.60 | 3.4 | 1.5 | 20.3 | -9.4 | 29.7 | 0.0 | 25.1 | 35.9 | 0.700 |
| 128 | 755.75 | -1.7 | 0.1 | 17.6 | -13.6 | 31.2 | 0.0 | 16.0 | 31.8 | 0.503 |
| 129 | 761.91 | -8.8 | -2.6 | 6.9 | -15.9 | 22.8 | 0.0 | -27.3 | 31.6 | 0.864 |
| 130 | 768.07 | -10.8 | -3.7 | 2.2 | -14.3 | 16.5 | 0.0 | -28.8 | 31.5 | 0.914 |
| 131 | 774.27 | -8.9 | -2.6 | 6.5 | -16.6 | 23.2 | 0.0 | -28.2 | 31.5 | 0.893 |
| 132 | 780.46 | -1.9 | 0.2 | 14.1 | -11.9 | 25.9 | 0.0 | -13.6 | 31.5 | 0.431 |
| 133 | 786.66 | 3.5 | 1.5 | 20.1 | -10.0 | 30.1 | 0.0 | 25.1 | 36.0 | 0.698 |
| 134 | 792.86 | 6.6 | 2.4 | 23.7 | -8.1 | 31.8 | 0.0 | 32.6 | 36.0 | 0.905 |
| 135 | 799.06 | 7.6 | 2.7 | 25.0 | -6.2 | 31.2 | 0.0 | 35.3 | 36.0 | 0.980 |
| 136 | 805.26 | 6.4 | 2.4 | 23.6 | -6.4 | 29.9 | 0.0 | 32.4 | 36.0 | 0.900 |
| 137 | 811.45 | 3.3 | 1.6 | 20.9 | -7.9 | 28.8 | 0.0 | 25.8 | 36.0 | 0.717 |
| 138 | 817.65 | -1.9 | 0.3 | 17.9 | -11.4 | 29.2 | 0.0 | 16.3 | 31.5 | 0.516 |
| 139 | 823.85 | -9.2 | -2.4 | 5.9 | -13.1 | 18.9 | 0.0 | -24.7 | 31.5 | 0.783 |
| 140 | 830.05 | -11.9 | -3.8 | 2.8 | -14.2 | 17.0 | 0.0 | -29.9 | 30.7 | 0.974 |
| 141 | 835.13 | -6.8 | -1.9 | 3.5 | -11.5 | 15.0 | 0.0 | -20.1 | 30.7 | 0.656 |
| 142 | 840.22 | -4.0 | -0.5 | 17.9 | -16.0 | 33.9 | 0.0 | -20.5 | 30.7 | 0.670 |
| 143 | 845.31 | 1.3 | 1.0 | 17.8 | -11.6 | 29.4 | 0.0 | 20.1 | 36.0 | 0.558 |
| 144 | 850.39 | 5.4 | 1.9 | 21.3 | -9.9 | 31.2 | 0.0 | 28.5 | 36.0 | 0.793 |
| 145 | 855.48 | 7.9 | 2.5 | 22.6 | -8.2 | 30.8 | 0.0 | 33.0 | 36.0 | 0.917 |
| 146 | 860.56 | 9.1 | 2.8 | 22.6 | -6.5 | 29.1 | 0.0 | 34.4 | 36.0 | 0.956 |
| 147 | 865.65 | 8.9 | 2.6 | 21.0 | -4.9 | 25.9 | 0.0 | 32.6 | 36.0 | 0.904 |
| 148 | 870.74 | 7.3 | 2.1 | 17.0 | -3.3 | 20.2 | 0.0 | 26.4 | 36.0 | 0.732 |
| 149 | 875.82 | 4.3 | 1.2 | 10.3 | -1.6 | 11.9 | 0.0 | 15.8 | 36.0 | 0.440 |
| 150 | 880.91 | 0.0 | 0.0 | 0.1 | -0.1 | 0.2 | 0.0 | -0.1 | 30.6 | 0.003 |

Governing expression for allowable compression stress

| Tenth Pt | Expression |
|----------|------------|
|----------|------------|

| | |
|-----|---------|
| 8 | compact |
| 9 | compact |
| 10 | compact |
| 11 | compact |
| 19 | compact |
| 20 | compact |
| 21 | compact |
| 22 | compact |
| 29 | compact |
| 30 | compact |
| 38 | compact |
| 39 | (5-4) |
| 40 | compact |
| 41 | compact |
| 42 | compact |
| 49 | compact |
| 50 | compact |
| 51 | (5-4) |
| 58 | (5-8) |
| 59 | (5-8) |
| 60 | (5-8) |
| 61 | (5-8) |
| 69 | (5-8) |
| 70 | (5-8) |
| 71 | (5-8) |
| 72 | (5-8) |
| 73 | (5-8) |
| 79 | (5-8) |
| 80 | (5-8) |
| 81 | (5-8) |
| 88 | (5-8) |
| 89 | compact |
| 90 | compact |
| 91 | compact |
| 92 | compact |
| 99 | compact |
| 100 | compact |
| 101 | compact |
| 102 | compact |
| 109 | compact |
| 110 | (5-8) |
| 111 | (5-8) |

118 compact
 119 compact
 120 compact
 121 compact
 122 compact
 128 compact
 129 (5-8)
 130 (5-8)
 131 (5-8)
 132 (5-8)
 138 (5-8)
 139 (5-8)
 140 (5-8)
 141 (5-8)
 142 (5-8)

Perf. ratio for compact section is (factored mom/mom strength)
 if this is less than (total stress/allowable stress).

Grp I Bottom Flange Factored Lateral Bending Stress

| Tenth
Pt | Noncomp | | Dead | | Comp Dead | | Max LL+I | | Min LL+I | |
|-------------|---------|------|---------|------|-----------|------|----------|------|----------|-----|
| | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw |
| | k-ft | ksi | k-ft | ksi | k-ft | ksi | k-ft | ksi | k-ft | ksi |
| 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.04 | 0.00 | | |
| 1 | -0.37 | 0.19 | -0.17 | 0.08 | -1.60 | 0.80 | -0.37 | 0.18 | | |
| 2 | 0.32 | 0.16 | 0.14 | 0.07 | 1.34 | 0.67 | 0.30 | 0.15 | | |
| 3 | 0.06 | 0.03 | 0.01 | 0.01 | -0.02 | 0.01 | -0.18 | 0.09 | | |
| 4 | -0.60 | 0.30 | -0.28 | 0.14 | -2.78 | 1.39 | -0.79 | 0.39 | | |
| 5 | 1.32 | 0.66 | 0.66 | 0.33 | 7.02 | 3.51 | 2.52 | 1.26 | | |
| 6 | -0.31 | 0.15 | -0.13 | 0.06 | -2.54 | 1.27 | -1.35 | 0.68 | | |
| 7 | -0.18 | 0.00 | -0.11 | 0.00 | -0.20 | 0.10 | 0.28 | 0.14 | | |
| 8 | -0.54 | 0.27 | -0.19 | 0.00 | 0.94 | 0.47 | 0.03 | 0.01 | | |
| 9 | -0.57 | 0.28 | -0.18 | 0.09 | -1.48 | 0.74 | -1.50 | 0.75 | | |
| 10 | 3.72 | 1.86 | 1.22 | 0.61 | 1.10 | 0.55 | 4.50 | 2.25 | | |
| 11 | -1.10 | 0.55 | -0.42 | 0.21 | -1.69 | 0.85 | -1.95 | 0.98 | | |
| 12 | 0.10 | 0.00 | 0.26 | 0.13 | 5.50 | 2.75 | 2.63 | 1.32 | | |
| 13 | -0.52 | 0.26 | -0.31 | 0.16 | -3.75 | 1.88 | -1.26 | 0.63 | | |
| 14 | 1.97 | 0.99 | 0.98 | 0.49 | 9.45 | 4.73 | 2.40 | 1.20 | | |
| 15 | -0.97 | 0.49 | -0.49 | 0.24 | -4.68 | 2.34 | -1.27 | 0.63 | | |
| 16 | 1.94 | 0.97 | 0.99 | 0.49 | 9.36 | 4.68 | 2.70 | 1.35 | | |
| 17 | -0.52 | 0.26 | -0.33 | 0.17 | -3.79 | 1.89 | -1.46 | 0.73 | | |
| 18 | 0.08 | 0.00 | 0.33 | 0.16 | 5.54 | 2.77 | 3.06 | 1.53 | | |
| 19 | -1.00 | 0.50 | -0.37 | 0.18 | -1.64 | 0.82 | -2.00 | 1.00 | | |
| 20 | 3.86 | 1.93 | 1.12 | 0.56 | 1.05 | 0.53 | 4.93 | 2.46 | | |
| 21 | -0.84 | 0.42 | -0.26 | 0.13 | -1.86 | 0.93 | -2.05 | 1.02 | | |
| 22 | -0.34 | 0.00 | -0.06 | 0.00 | 3.50 | 1.75 | 1.71 | 0.85 | | |
| 23 | -0.51 | 0.25 | -0.16 | 0.08 | -3.08 | 1.54 | -1.12 | 0.56 | | |
| 24 | 0.47 | 0.23 | 0.13 | 0.07 | 1.11 | 0.56 | -0.01 | 0.00 | | |
| 25 | -0.32 | 0.16 | -0.09 | 0.05 | -1.07 | 0.54 | -0.15 | 0.08 | | |
| 26 | -0.54 | 0.27 | -0.16 | 0.08 | -2.43 | 1.22 | -0.68 | 0.34 | | |
| 27 | 0.52 | 0.26 | 0.15 | 0.08 | 1.94 | 0.97 | 0.38 | 0.19 | | |
| 28 | -0.32 | 0.16 | -0.09 | 0.00 | -1.20 | 0.60 | -0.24 | 0.12 | | |
| Bot.Flgspl | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | | |
| Bot.Flgspl | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | | |
| 29 | 0.04 | 0.01 | 0.01 | 0.00 | 0.03 | 0.01 | 0.15 | 0.04 | | |
| 30 | 1.14 | 0.35 | 0.33 | 0.10 | 0.85 | 0.26 | 3.68 | 1.13 | | |
| 31 | -1.33 | 0.00 | -0.39 | 0.00 | -2.51 | 0.77 | -4.42 | 1.36 | | |
| 32 | -0.27 | 0.08 | -0.09 | 0.03 | -0.31 | 0.10 | 0.49 | 0.15 | | |
| 33 | 0.49 | 0.15 | 0.16 | 0.05 | 1.36 | 0.42 | 0.00 | 0.00 | | |
| 34 | -1.58 | 0.49 | -0.53 | 0.16 | -6.51 | 2.00 | -1.98 | 0.61 | | |
| 35 | 3.58 | 1.10 | 1.24 | 0.38 | 14.95 | 4.60 | 4.16 | 1.28 | | |
| 36 | -1.23 | 0.38 | -0.47 | 0.15 | -6.02 | 1.85 | -1.95 | 0.60 | | |
| 37 | -0.13 | 0.04 | 0.16 | 0.05 | 1.51 | 0.47 | 0.04 | 0.01 | | |
| 38 | 0.29 | 0.09 | -0.12 | 0.00 | -0.86 | 0.26 | 0.35 | 0.11 | | |
| 39 | -3.06 | 0.94 | -0.49 | 0.15 | -1.55 | 0.48 | -3.60 | 1.11 | | |
| Bot.Flgspl | -2.94 | 0.91 | -0.43 | 0.13 | -2.06 | 0.63 | -3.79 | 1.17 | | |
| Bot.Flgspl | -2.94 | 0.72 | -0.43 | 0.11 | -2.06 | 0.51 | -3.79 | 0.94 | | |
| 40 | 8.53 | 2.13 | 1.53 | 0.38 | 1.77 | 0.44 | 8.69 | 2.17 | | |
| Bot.Flgspl | -2.32 | 0.58 | -0.41 | 0.10 | -1.41 | 0.35 | -2.92 | 0.73 | | |
| Bot.Flgspl | -2.32 | 0.73 | -0.41 | 0.13 | -1.41 | 0.44 | -2.92 | 0.90 | | |
| 41 | -2.18 | 0.67 | -0.38 | 0.12 | -0.64 | 0.20 | -2.31 | 0.71 | | |
| 42 | -0.38 | 0.12 | -0.07 | 0.00 | -3.04 | 0.94 | -1.23 | 0.38 | | |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 43 | 0.17 | 0.05 | 0.04 | 0.00 | 4.45 | 1.37 | 1.16 | 0.36 |
| 44 | -1.36 | 0.42 | -0.24 | 0.07 | -6.97 | 2.15 | -2.21 | 0.68 |
| 45 | 2.88 | 0.89 | 0.50 | 0.15 | 11.72 | 3.60 | 3.05 | 0.94 |
| 46 | -1.53 | 0.47 | -0.25 | 0.08 | -6.13 | 1.89 | -1.77 | 0.54 |
| 47 | 0.26 | 0.08 | 0.08 | 0.00 | 0.23 | 0.07 | -0.57 | 0.18 |
| 48 | -0.19 | 0.06 | -0.09 | 0.00 | 0.37 | 0.11 | 1.01 | 0.31 |
| 49 | -1.65 | 0.00 | -0.48 | 0.00 | -2.84 | 0.87 | -5.44 | 1.68 |
| 50 | 1.49 | 0.46 | 0.53 | 0.16 | 1.04 | 0.32 | 4.70 | 1.45 |
| 51 | 0.03 | 0.01 | 0.01 | 0.00 | 0.13 | 0.00 | 0.19 | 0.06 |
| Bot.Flg.Spl | 0.03 | 0.01 | 0.01 | 0.00 | 0.17 | 0.05 | 0.20 | 0.06 |
| Bot.Flg.Spl | 0.03 | 0.01 | 0.01 | 0.00 | 0.17 | 0.08 | 0.20 | 0.10 |
| 52 | -0.35 | 0.18 | -0.13 | 0.06 | -1.83 | 0.92 | -0.83 | 0.42 |
| 53 | 0.79 | 0.40 | 0.30 | 0.15 | 3.06 | 1.53 | 0.63 | 0.31 |
| 54 | -0.78 | 0.39 | -0.30 | 0.15 | -3.28 | 1.64 | -0.88 | 0.44 |
| 55 | 0.30 | 0.15 | 0.10 | 0.05 | 0.36 | 0.18 | -0.21 | 0.11 |
| 56 | -0.35 | 0.18 | -0.13 | 0.06 | -0.97 | 0.49 | -0.11 | 0.05 |
| 57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -2.87 | 0.64 | -0.56 | 0.12 | -2.93 | 0.65 | -5.08 | 1.13 |
| Bot.Flg.Spl | -2.87 | 0.64 | -0.56 | 0.12 | -2.93 | 0.65 | -5.08 | 1.13 |
| 59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.07 | 0.02 | 0.03 | 0.00 | 0.26 | 0.06 | 0.07 | 0.01 |
| Bot.Flg.Spl | 0.07 | 0.03 | 0.03 | 0.02 | 0.26 | 0.12 | 0.07 | 0.03 |
| 61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -0.55 | 0.39 | -0.15 | 0.00 | 0.43 | 0.30 | -0.40 | 0.28 |
| Bot.Flg.Spl | -0.55 | 0.43 | -0.15 | 0.00 | 0.43 | 0.33 | -0.40 | 0.31 |
| 62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 76 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 89 | -0.62 | 0.39 | -0.22 | 0.14 | -1.60 | 1.02 | -1.34 | 0.85 |
| 90 | 4.04 | 1.57 | 1.25 | 0.48 | 0.99 | 0.38 | 4.81 | 1.86 |
| 91 | -0.60 | 0.38 | -0.23 | 0.14 | -1.43 | 0.90 | -1.24 | 0.78 |
| 92 | -0.57 | 0.36 | -0.14 | 0.00 | 0.92 | 0.58 | -0.24 | 0.15 |
| 93 | -0.27 | 0.17 | -0.09 | 0.05 | -0.22 | 0.14 | 0.23 | 0.14 |
| 94 | -0.42 | 0.27 | -0.20 | 0.13 | -2.48 | 1.57 | -0.92 | 0.58 |
| 95 | 1.91 | 1.21 | 0.78 | 0.50 | 6.97 | 4.41 | 1.61 | 1.02 |
| 96 | -0.48 | 0.30 | -0.22 | 0.14 | -2.41 | 1.52 | -0.90 | 0.57 |
| 97 | -0.21 | 0.14 | -0.07 | 0.05 | -0.23 | 0.15 | 0.23 | 0.15 |
| 98 | -0.46 | 0.00 | -0.12 | 0.00 | 0.83 | 0.53 | -0.25 | 0.16 |
| 99 | -0.63 | 0.40 | -0.23 | 0.15 | -1.39 | 0.88 | -1.23 | 0.78 |
| 100 | 3.57 | 1.38 | 1.13 | 0.44 | 1.06 | 0.41 | 4.62 | 1.79 |
| 101 | -0.27 | 0.17 | -0.11 | 0.07 | -1.43 | 0.90 | -0.93 | 0.59 |
| 102 | -1.15 | 0.73 | -0.38 | 0.24 | -1.26 | 0.80 | -1.89 | 1.20 |
| 103 | -0.18 | 0.00 | 0.00 | 0.00 | 3.00 | 1.90 | 1.10 | 0.69 |
| 104 | -0.14 | 0.09 | -0.03 | 0.02 | 0.09 | 0.05 | 0.17 | 0.11 |
| 105 | -0.39 | 0.25 | -0.17 | 0.11 | -2.99 | 1.89 | -1.36 | 0.86 |
| 106 | 0.20 | 0.13 | 0.06 | 0.04 | 0.39 | 0.25 | 0.05 | 0.03 |
| 107 | 0.47 | 0.30 | 0.18 | 0.11 | 3.45 | 2.18 | 0.84 | 0.53 |
| 108 | -0.87 | 0.55 | -0.31 | 0.20 | -1.41 | 0.89 | -2.42 | 1.53 |
| 109 | -0.88 | 0.55 | -0.32 | 0.00 | -1.87 | 1.18 | -2.37 | 1.50 |
| 110 | 0.46 | 0.29 | 0.17 | 0.11 | 0.24 | 0.15 | 1.38 | 0.87 |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| Bot.Flг.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.03 | 0.02 |
| Bot.Flг.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.03 | 0.03 |
| 111 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.05 | 0.04 |
| 112 | -0.33 | 0.25 | -0.12 | 0.09 | -1.16 | 0.89 | -0.31 | 0.24 |
| 113 | -0.03 | 0.02 | -0.01 | 0.01 | -0.17 | 0.13 | -0.11 | 0.08 |
| 114 | 1.28 | 0.98 | 0.45 | 0.35 | 4.12 | 3.16 | 0.77 | 0.59 |
| 115 | -0.37 | 0.29 | -0.15 | 0.12 | -1.87 | 1.44 | -0.69 | 0.53 |
| 116 | -0.45 | 0.35 | -0.16 | 0.13 | -1.58 | 1.21 | -0.36 | 0.28 |
| 117 | 0.50 | 0.38 | 0.24 | 0.18 | 4.04 | 3.10 | 1.91 | 1.46 |
| 118 | -1.00 | 0.77 | -0.30 | 0.00 | -0.60 | 0.46 | -1.30 | 1.00 |
| 119 | -0.56 | 0.21 | -0.19 | 0.07 | -1.21 | 0.46 | -1.02 | 0.39 |
| 120 | 2.97 | 1.13 | 0.87 | 0.33 | 0.69 | 0.26 | 3.49 | 1.32 |
| 121 | -0.33 | 0.26 | -0.13 | 0.10 | -0.98 | 0.75 | -0.76 | 0.58 |
| 122 | -0.41 | 0.31 | -0.09 | 0.00 | 0.65 | 0.50 | -0.17 | 0.13 |
| 123 | -0.18 | 0.14 | -0.05 | 0.04 | -0.20 | 0.15 | 0.17 | 0.13 |
| 124 | -0.23 | 0.18 | -0.13 | 0.10 | -1.75 | 1.35 | -0.57 | 0.44 |
| 125 | 1.14 | 0.88 | 0.50 | 0.38 | 5.04 | 3.87 | 0.92 | 0.71 |
| 126 | -0.23 | 0.18 | -0.13 | 0.10 | -1.77 | 1.36 | -0.62 | 0.48 |
| 127 | -0.18 | 0.14 | -0.06 | 0.04 | -0.17 | 0.13 | 0.22 | 0.17 |
| 128 | -0.49 | 0.37 | -0.12 | 0.00 | 0.66 | 0.50 | -0.22 | 0.17 |
| 129 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 131 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 132 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 133 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 134 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 135 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 137 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 138 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 139 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 141 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 142 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 143 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 144 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 145 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 146 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 147 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 148 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 149 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Dabrowski sign convention: +fw/fb ratio used for allowable stress.
 (See 2003 Guide spec. commentary C5.1)

First of two splice entries is to left of splice,
 second is to right of splice.

BRIDGE 69801 J, K, L, M, & N
Girder 10 : Rating Output : Lateral Bending in Flanges

Factored Lateral Bending in Bottom Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 10.38 | 14.12 | 3.92 | 0.278 | 0.555 | 0.218 | 0.218 |
| 20.79 | 15.99 | 4.49 | 0.281 | 0.562 | 0.249 | 0.249 |
| 31.20 | 7.93 | 2.64 | 0.333 | 0.666 | compact | |
| 41.59 | 20.59 | 4.69 | 0.228 | 0.456 | compact | |
| 52.51 | 12.59 | 2.90 | 0.231 | 0.461 | 0.161 | 0.161 |
| 63.44 | 20.02 | 6.16 | 0.308 | 0.615 | 0.342 | 0.342 |
| 74.34 | 19.99 | 6.16 | 0.308 | 0.617 | 0.342 | 0.342 |
| 85.28 | 12.78 | 2.95 | 0.231 | 0.462 | 0.164 | 0.164 |
| 96.20 | 20.69 | 4.93 | 0.238 | 0.477 | compact | |
| 107.08 | 13.53 | 3.10 | 0.229 | 0.458 | 0.172 | 0.172 |
| 118.00 | 18.25 | 5.60 | 0.307 | 0.614 | 0.311 | 0.311 |
| 128.88 | 14.68 | 4.04 | 0.275 | 0.551 | 0.225 | 0.225 |
| 138.73 | 0.02 | 0.00 | 0.141 | 0.281 | compact | |
| 140.84 | 4.11 | 0.09 | 0.021 | 0.042 | compact | |
| 145.49 | 14.15 | 1.58 | 0.112 | 0.224 | compact | |
| 156.37 | 13.70 | 3.78 | 0.276 | 0.552 | compact | |
| 167.21 | 21.57 | 5.87 | 0.272 | 0.545 | compact | |
| 178.08 | 22.33 | 6.08 | 0.272 | 0.545 | compact | |
| 188.92 | 15.87 | 4.40 | 0.277 | 0.554 | compact | |
| 199.79 | 10.98 | 2.61 | 0.237 | 0.475 | compact | |
| 210.64 | 19.83 | 4.69 | 0.236 | 0.473 | compact | |
| 221.01 | 12.02 | 2.86 | 0.238 | 0.476 | compact | |
| 232.34 | 15.12 | 4.60 | 0.304 | 0.609 | compact | |
| 243.66 | 20.88 | 6.25 | 0.299 | 0.598 | compact | |
| 255.01 | 20.31 | 6.07 | 0.299 | 0.598 | compact | |
| 266.33 | 12.40 | 3.82 | 0.308 | 0.617 | compact | |
| 277.67 | 16.64 | 2.08 | 0.125 | 0.250 | compact | |
| 282.70 | 4.60 | 0.11 | 0.024 | 0.047 | compact | |
| 284.79 | 1.37 | 0.19 | 0.139 | 0.277 | compact | |
| 294.25 | 17.57 | 4.50 | 0.256 | 0.513 | 0.250 | 0.250 |
| 304.66 | 23.51 | 6.67 | 0.283 | 0.567 | 0.370 | 0.370 |
| 315.09 | 18.82 | 5.46 | 0.290 | 0.580 | 0.303 | 0.303 |
| 325.49 | 20.91 | 0.00 | 0.000 | 0.000 | compact | |
| 335.92 | 28.95 | 0.00 | 0.000 | 0.000 | compact | |
| 353.65 | 19.59 | 0.00 | 0.000 | 0.000 | compact | |
| 371.43 | 35.36 | 0.00 | 0.000 | 0.000 | compact | |
| 389.16 | 18.76 | 0.00 | 0.000 | 0.000 | compact | |
| 406.91 | 28.88 | 0.00 | 0.000 | 0.000 | compact | |
| 425.59 | 17.96 | 0.00 | 0.000 | 0.000 | compact | |
| 444.26 | 24.32 | 0.00 | 0.000 | 0.000 | compact | |
| 462.91 | 29.11 | 0.00 | 0.000 | 0.000 | compact | |
| 467.83 | 8.35 | 0.00 | 0.000 | 0.000 | compact | |
| 469.93 | 0.98 | 0.00 | 0.000 | 0.000 | compact | |
| 487.58 | 29.26 | 0.00 | 0.000 | 0.000 | compact | |
| 506.23 | 19.94 | 0.00 | 0.000 | 0.000 | compact | |
| 524.90 | 31.30 | 3.91 | 0.125 | 0.250 | compact | |
| 542.50 | 18.37 | 3.43 | 0.187 | 0.374 | compact | |
| 560.12 | 34.29 | 6.12 | 0.178 | 0.357 | compact | |
| 577.72 | 18.83 | 3.47 | 0.184 | 0.368 | compact | |
| 595.35 | 29.11 | 3.61 | 0.124 | 0.248 | compact | |
| 613.88 | 18.82 | 3.91 | 0.208 | 0.415 | compact | |
| 632.40 | 25.23 | 5.07 | 0.201 | 0.402 | compact | |
| 650.92 | 23.66 | 1.26 | 0.053 | 0.107 | compact | |
| 654.79 | 9.01 | 0.03 | 0.003 | 0.007 | compact | |
| 656.89 | 0.65 | 0.05 | 0.083 | 0.165 | compact | |
| 672.75 | 30.82 | 5.21 | 0.169 | 0.338 | compact | |

| | | | | | |
|--------|-------|------|-------|-------|---------|
| 689.61 | 21.19 | 3.96 | 0.187 | 0.374 | compact |
| 706.49 | 27.77 | 2.78 | 0.100 | 0.200 | compact |
| 721.87 | 17.60 | 2.81 | 0.160 | 0.319 | compact |
| 737.26 | 33.92 | 5.16 | 0.152 | 0.304 | compact |
| 752.66 | 17.47 | 2.80 | 0.160 | 0.320 | compact |
| 768.07 | 28.81 | 0.00 | 0.000 | 0.000 | compact |
| 783.54 | 18.70 | 0.00 | 0.000 | 0.000 | compact |
| 799.05 | 35.28 | 0.00 | 0.000 | 0.000 | compact |
| 814.57 | 17.78 | 0.00 | 0.000 | 0.000 | compact |
| 830.05 | 29.87 | 0.00 | 0.000 | 0.000 | compact |
| 846.96 | 22.83 | 0.00 | 0.000 | 0.000 | compact |
| 863.94 | 33.18 | 0.00 | 0.000 | 0.000 | compact |
| 880.91 | 0.00 | 0.00 | 0.000 | 0.000 | compact |

Factored Lateral Bending in Top Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 31.20 | 1.42 | 4.23 | 2.984 | 5.967 | compact | |
| 41.59 | 26.70 | 7.51 | 0.281 | 0.563 | compact | |
| 52.51 | 16.32 | 4.65 | 0.285 | 0.569 | 0.258 | |
| 85.28 | 16.56 | 4.72 | 0.285 | 0.570 | 0.262 | |
| 96.20 | 26.81 | 7.89 | 0.294 | 0.588 | compact | |
| 107.08 | 17.54 | 4.96 | 0.283 | 0.566 | compact | |
| 138.73 | 0.03 | 0.00 | 0.173 | 0.347 | compact | |
| 140.84 | 5.58 | 0.14 | 0.025 | 0.051 | compact | |
| 145.49 | 19.24 | 2.57 | 0.134 | 0.268 | compact | |
| 199.79 | 11.75 | 4.23 | 0.360 | 0.721 | compact | |
| 210.64 | 19.83 | 4.69 | 0.236 | 0.473 | compact | |
| 221.01 | 12.93 | 4.65 | 0.360 | 0.719 | compact | |
| 277.67 | 22.62 | 3.38 | 0.150 | 0.299 | compact | |
| 282.70 | 6.26 | 0.18 | 0.028 | 0.057 | compact | |
| 284.79 | 1.78 | 0.30 | 0.171 | 0.342 | compact | |
| 325.49 | 27.10 | 0.00 | 0.000 | 0.000 | compact | |
| 335.92 | 28.95 | 0.00 | 0.000 | 0.000 | compact | |
| 406.91 | 28.88 | 0.00 | 0.000 | 0.000 | compact | |
| 462.91 | 29.11 | 0.00 | 0.000 | 0.000 | compact | |
| 467.83 | 8.35 | 0.00 | 0.000 | 0.000 | compact | |
| 469.93 | 0.98 | 0.00 | 0.000 | 0.000 | compact | |
| 524.90 | 31.30 | 3.91 | 0.125 | 0.250 | compact | |
| 595.35 | 29.11 | 3.61 | 0.124 | 0.248 | compact | |
| 650.92 | 23.66 | 1.26 | 0.053 | 0.107 | compact | |
| 654.79 | 9.01 | 0.03 | 0.003 | 0.007 | compact | |
| 656.89 | 0.65 | 0.05 | 0.083 | 0.165 | compact | |
| 706.49 | 27.77 | 2.78 | 0.100 | 0.200 | compact | |
| 768.07 | 28.81 | 0.00 | 0.000 | 0.000 | compact | |
| 830.05 | 29.87 | 0.00 | 0.000 | 0.000 | compact | |

BRIDGE 69801 J, K, L, M, & N

Girder 7 : Rating Output : Bottom Flange Factored Bending Stress - Group I Loa

Girder 7 Grp I Factored Bending Stresses - ksi

| Tenth
Point | Loc | ----- Bottom Flange ----- | | | | | | | | |
|----------------|--------|---|--------------|-------------|-------------|-------------|------|-------|-------|-------|
| | | Noncomp
Dead | Comp
Dead | Max
LM+I | Min
LL+I | LL+I
Rng | Wind | Tot | Allow | Ratio |
| 0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 31.2 | 0.001 |
| 1 | 4.08 | 1.6 | 0.6 | 6.1 | -1.0 | 7.1 | 0.0 | 8.4 | 33.0 | 0.253 |
| 2 | 8.15 | 2.9 | 1.0 | 10.7 | -2.0 | 12.7 | 0.0 | 14.6 | 31.3 | 0.468 |
| 3 | 12.23 | 3.8 | 1.3 | 11.8 | -2.8 | 14.6 | 0.0 | 16.9 | 33.4 | 0.504 |
| 4 | 16.31 | 4.0 | 1.3 | 12.8 | -2.6 | 15.3 | 0.0 | 18.1 | 32.7 | 0.552 |
| 5 | 20.39 | 3.8 | 1.3 | 12.7 | -2.3 | 15.1 | 0.0 | 17.7 | 31.7 | 0.559 |
| 6 | 24.46 | 3.1 | 1.0 | 9.7 | -1.9 | 11.6 | 0.0 | 13.8 | 34.2 | 0.405 |
| 7 | 28.54 | 2.0 | 0.7 | 7.1 | -1.1 | 8.1 | 0.0 | 9.7 | 33.5 | 0.289 |
| 8 | 32.62 | 0.4 | 0.1 | 2.4 | -0.6 | 3.1 | 0.0 | 3.0 | 33.7 | 0.090 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.2 | 0.000 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.9 | 0.000 |
| 9 | 36.69 | -1.2 | -0.5 | 1.4 | -5.0 | 6.4 | 0.0 | -6.7 | 35.2 | 0.190 |
| 10 | 40.77 | -3.0 | -1.2 | 2.5 | -11.7 | 14.1 | 0.0 | -15.9 | 33.7 | 0.470 |
| 11 | 47.74 | 0.8 | 0.3 | 10.1 | -9.0 | 19.1 | 0.0 | 11.2 | 34.8 | 0.320 |
| 12 | 54.70 | 3.4 | 1.1 | 14.9 | -8.0 | 22.9 | 0.0 | 19.5 | 35.9 | 0.543 |
| 13 | 61.66 | 5.0 | 1.7 | 19.7 | -7.1 | 26.8 | 0.0 | 26.4 | 35.7 | 0.741 |
| 14 | 68.63 | 5.6 | 1.9 | 21.1 | -6.5 | 27.6 | 0.0 | 28.6 | 34.4 | 0.830 |
| 15 | 75.59 | 5.0 | 1.9 | 20.4 | -6.2 | 26.6 | 0.0 | 27.2 | 32.6 | 0.837 |
| 16 | 82.56 | 3.2 | 1.5 | 19.3 | -7.0 | 26.2 | 0.0 | 23.9 | 34.6 | 0.692 |
| 17 | 89.52 | 0.1 | 0.7 | 14.4 | -8.2 | 22.7 | 0.0 | 15.2 | 35.8 | 0.424 |
| 18 | 96.49 | -4.6 | -0.5 | 15.2 | -12.1 | 27.2 | 0.0 | -17.2 | 33.4 | 0.515 |
| 19 | 103.45 | -8.7 | -1.7 | 4.8 | -13.7 | 18.5 | 0.0 | -24.1 | 33.7 | 0.714 |
| Bot. Flg. Spl. | | -10.0 | -2.0 | 4.4 | -15.4 | 19.8 | 0.0 | -27.4 | 33.7 | 0.811 |
| Bot. Flg. Spl. | | -6.4 | -1.3 | 2.8 | -9.8 | 12.6 | 0.0 | -17.5 | 34.2 | 0.512 |
| 20 | 110.41 | -8.4 | -1.9 | 2.1 | -12.6 | 14.7 | 0.0 | -22.8 | 34.1 | 0.671 |
| Bot. Flg. Spl. | | -5.1 | -1.1 | 5.4 | -10.2 | 15.6 | 0.0 | -16.4 | 34.1 | 0.483 |
| Bot. Flg. Spl. | | -5.4 | -1.2 | 5.7 | -10.8 | 16.6 | 0.0 | -17.4 | 33.6 | 0.519 |
| 21 | 117.26 | -4.1 | -0.9 | 7.0 | -9.9 | 16.9 | 0.0 | -14.9 | 33.6 | 0.444 |
| 22 | 124.11 | -0.2 | -0.1 | 10.4 | -8.2 | 18.6 | 0.0 | 10.1 | 33.9 | 0.299 |
| 23 | 130.96 | 2.6 | 0.5 | 14.2 | -6.8 | 21.0 | 0.0 | 17.2 | 36.0 | 0.479 |
| 24 | 137.80 | 4.5 | 0.8 | 16.5 | -6.1 | 22.5 | 0.0 | 21.7 | 35.6 | 0.611 |
| 25 | 144.65 | 5.5 | 0.9 | 18.4 | -5.8 | 24.2 | 0.0 | 24.9 | 35.0 | 0.710 |
| 26 | 151.50 | 5.5 | 0.9 | 18.9 | -5.5 | 24.4 | 0.0 | 25.3 | 35.5 | 0.712 |
| 27 | 158.34 | 4.7 | 0.7 | 17.2 | -6.1 | 23.2 | 0.0 | 22.5 | 35.8 | 0.628 |
| 28 | 165.19 | 3.0 | 0.3 | 14.8 | -6.7 | 21.5 | 0.0 | 18.0 | 35.9 | 0.501 |
| 29 | 172.04 | 0.5 | -0.3 | 8.8 | -6.9 | 15.8 | 0.0 | 9.0 | 35.7 | 0.252 |
| 30 | 178.88 | -2.8 | -1.2 | 1.9 | -7.8 | 9.7 | 0.0 | -11.8 | 33.9 | 0.348 |
| Bot. Flg. Spl. | | 0.3 | 0.2 | 3.0 | -1.8 | 4.8 | 0.0 | 3.5 | 36.0 | 0.096 |
| Bot. Flg. Spl. | | 0.6 | 0.3 | 5.8 | -3.4 | 9.2 | 0.0 | 6.6 | 36.0 | 0.185 |
| 31 | 185.99 | 1.7 | 0.8 | 6.1 | -1.3 | 7.5 | 0.0 | 8.5 | 36.0 | 0.237 |
| 32 | 193.09 | 6.4 | 2.1 | 13.9 | -3.6 | 17.5 | 0.0 | 22.3 | 36.0 | 0.621 |
| 33 | 200.19 | 9.0 | 3.0 | 20.4 | -6.0 | 26.4 | 0.0 | 32.4 | 36.0 | 0.901 |
| 34 | 207.30 | 9.7 | 3.3 | 21.8 | -7.8 | 29.6 | 0.0 | 34.8 | 36.0 | 0.966 |
| 35 | 214.40 | 9.0 | 3.1 | 23.2 | -9.4 | 32.6 | 0.0 | 35.2 | 36.0 | 0.979 |
| 36 | 221.50 | 6.8 | 2.4 | 19.9 | -10.8 | 30.8 | 0.0 | 29.1 | 36.0 | 0.809 |
| 37 | 228.61 | 3.3 | 1.3 | 17.1 | -12.1 | 29.2 | 0.0 | 21.7 | 36.0 | 0.603 |
| 38 | 235.71 | -1.5 | -0.2 | 10.9 | -13.2 | 24.1 | 0.0 | -14.9 | 32.4 | 0.459 |
| 39 | 242.81 | -7.5 | -2.8 | 8.0 | -16.7 | 24.6 | 0.0 | -27.0 | 32.4 | 0.833 |
| Bot. Flg. Spl. | | -7.6 | -2.8 | 8.0 | -16.7 | 24.7 | 0.0 | -27.2 | 32.4 | 0.840 |
| Bot. Flg. Spl. | | -5.5 | -2.0 | 5.7 | -12.0 | 17.7 | 0.0 | -19.5 | 32.4 | 0.602 |
| 40 | 249.92 | -10.9 | -4.2 | 5.1 | -16.3 | 21.4 | 0.0 | -31.4 | 32.4 | 0.970 |
| Bot. Flg. Spl. | | 0.1 | 0.0 | -0.1 | 0.1 | 0.1 | 0.0 | 0.2 | 36.0 | 0.005 |
| Bot. Flg. Spl. | | 0.1 | 0.0 | -0.1 | 0.2 | 0.2 | 0.0 | 0.3 | 36.0 | 0.008 |
| 41 | 258.02 | -8.9 | -3.1 | 7.7 | -14.6 | 22.3 | 0.0 | -26.6 | 32.4 | 0.821 |
| 42 | 266.12 | -1.4 | 0.0 | 14.3 | -11.9 | 26.2 | 0.0 | -13.2 | 32.4 | 0.409 |
| 43 | 274.22 | 3.7 | 1.7 | 21.5 | -10.7 | 32.2 | 0.0 | 26.8 | 36.0 | 0.744 |
| 44 | 282.32 | 6.3 | 2.6 | 25.9 | -9.9 | 35.8 | 0.0 | 34.8 | 36.0 | 0.968 |
| 45 | 290.42 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 46 | 298.52 | 4.5 | 2.3 | 26.7 | -12.3 | 39.0 | 0.0 | 33.5 | 36.0 | 0.930 |
| 47 | 306.63 | 0.0 | 1.0 | 22.8 | -14.4 | 37.1 | 0.0 | 23.7 | 36.0 | 0.659 |
| Bot. Flg. Spl. | | -5.5 | -0.7 | 25.3 | -18.6 | 43.9 | 0.0 | -24.8 | 32.4 | 0.765 |
| Bot. Flg. Spl. | | -3.9 | -0.5 | 17.7 | -13.0 | 30.8 | 0.0 | -17.4 | 32.4 | 0.537 |

| | | | | | | | | | | |
|--------------|--------|---|------|------|-------|------|-----|-------|------|-------|
| 48 | 314.73 | -5.0 | -0.9 | 16.2 | -13.4 | 29.6 | 0.0 | -19.3 | 32.4 | 0.595 |
| 49 | 322.83 | -11.5 | -3.5 | 6.5 | -14.4 | 20.9 | 0.0 | -29.3 | 32.2 | 0.910 |
| Bot.Flg.Spl. | | -11.6 | -3.5 | 6.5 | -14.5 | 21.0 | 0.0 | -29.6 | 32.2 | 0.918 |
| Bot.Flg.Spl. | | -7.3 | -2.2 | 4.1 | -9.1 | 13.1 | 0.0 | -18.5 | 32.2 | 0.574 |
| 50 | 330.93 | -12.4 | -4.2 | 3.0 | -14.7 | 17.7 | 0.0 | -31.4 | 32.2 | 0.973 |
| Bot.Flg.Spl. | | -5.9 | -1.6 | 5.7 | -9.1 | 14.8 | 0.0 | -16.7 | 32.3 | 0.515 |
| Bot.Flg.Spl. | | -11.8 | -3.3 | 11.4 | -18.2 | 29.6 | 0.0 | -33.3 | 32.3 | 1.029 |
| 51 | 340.51 | -11.0 | -2.9 | 11.8 | -17.4 | 29.2 | 0.0 | -31.4 | 32.3 | 0.970 |
| Bot.Flg.Spl. | | -0.2 | 1.3 | 27.5 | -16.6 | 44.2 | 0.0 | 28.5 | 36.0 | 0.793 |
| Bot.Flg.Spl. | | -0.2 | 0.9 | 20.2 | -12.2 | 32.4 | 0.0 | 21.0 | 36.0 | 0.582 |
| 52 | 350.09 | 0.0 | 0.7 | 14.5 | -10.7 | 25.1 | 0.0 | 15.2 | 36.0 | 0.422 |
| 53 | 359.67 | 5.7 | 2.5 | 21.1 | -9.6 | 30.6 | 0.0 | 29.2 | 36.0 | 0.811 |
| 54 | 369.26 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 55 | 378.84 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 56 | 388.42 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 57 | 398.00 | 5.6 | 2.5 | 19.7 | -8.3 | 28.0 | 0.0 | 27.8 | 34.9 | 0.797 |
| 58 | 407.58 | -0.2 | 0.8 | 14.0 | -9.1 | 23.1 | 0.0 | 14.6 | 34.9 | 0.418 |
| Bot.Flg.Spl. | | -0.3 | 0.7 | 13.9 | -9.1 | 22.9 | 0.0 | -8.7 | 34.9 | 0.249 |
| Bot.Flg.Spl. | | -0.4 | 1.0 | 19.0 | -12.5 | 31.4 | 0.0 | 19.5 | 35.8 | 0.544 |
| 59 | 417.17 | -11.2 | -3.0 | 8.9 | -14.3 | 23.3 | 0.0 | -28.5 | 32.5 | 0.875 |
| Bot.Flg.Spl. | | -12.0 | -3.3 | 8.8 | -15.3 | 24.1 | 0.0 | -30.6 | 32.5 | 0.942 |
| Bot.Flg.Spl. | | -5.7 | -1.6 | 4.2 | -7.2 | 11.4 | 0.0 | -14.4 | 32.5 | 0.444 |
| 60 | 426.75 | -11.9 | -4.0 | 3.2 | -13.9 | 17.1 | 0.0 | -29.9 | 32.2 | 0.927 |
| Bot.Flg.Spl. | | -7.5 | -2.3 | 4.2 | -10.2 | 14.5 | 0.0 | -20.1 | 32.2 | 0.623 |
| Bot.Flg.Spl. | | -10.6 | -3.3 | 6.0 | -14.5 | 20.5 | 0.0 | -28.4 | 32.2 | 0.882 |
| 61 | 434.21 | -10.2 | -3.2 | 6.1 | -14.2 | 20.3 | 0.0 | -27.5 | 32.2 | 0.854 |
| 62 | 441.67 | -4.8 | -1.1 | 14.8 | -13.0 | 27.9 | 0.0 | -18.9 | 32.2 | 0.587 |
| Bot.Flg.Spl. | | -1.8 | 0.0 | 14.2 | -11.1 | 25.3 | 0.0 | -12.9 | 31.7 | 0.407 |
| Bot.Flg.Spl. | | -2.6 | 0.0 | 18.1 | -14.6 | 32.7 | 0.0 | -17.2 | 26.8 | 0.641 |
| 63 | 449.13 | -0.7 | 0.5 | 19.8 | -14.0 | 33.8 | 0.0 | 19.6 | 34.9 | 0.562 |
| 64 | 456.59 | 3.5 | 1.7 | 23.2 | -12.1 | 35.3 | 0.0 | 28.4 | 34.3 | 0.826 |
| 65 | 464.05 | 6.0 | 2.2 | 23.2 | -9.9 | 33.1 | 0.0 | 31.4 | 34.3 | 0.917 |
| 66 | 471.51 | 6.6 | 2.3 | 20.9 | -7.5 | 28.3 | 0.0 | 29.8 | 34.7 | 0.859 |
| 67 | 478.97 | 5.6 | 1.9 | 15.7 | -4.9 | 20.6 | 0.0 | 23.1 | 35.6 | 0.650 |
| 68 | 486.43 | 2.9 | 0.9 | 8.8 | -2.2 | 11.0 | 0.0 | 12.7 | 35.7 | 0.354 |
| Bot.Flg.Spl. | | -1.0 | -0.5 | 2.1 | -4.8 | 6.9 | 0.0 | -6.3 | 35.8 | 0.177 |
| Bot.Flg.Spl. | | -0.7 | -0.3 | 1.4 | -3.2 | 4.6 | 0.0 | -4.2 | 35.8 | 0.117 |
| 69 | 493.89 | -0.9 | -0.4 | 0.9 | -3.3 | 4.2 | 0.0 | -4.6 | 35.8 | 0.128 |
| 70 | 501.35 | -4.8 | -2.2 | 4.2 | -16.0 | 20.2 | 0.0 | -23.0 | 31.4 | 0.731 |
| 71 | 509.61 | 0.4 | -0.8 | 10.2 | -12.9 | 23.1 | 0.0 | -13.2 | 31.4 | 0.421 |
| 72 | 517.87 | 4.3 | 0.1 | 16.8 | -11.7 | 28.5 | 0.0 | 21.1 | 35.1 | 0.602 |
| 73 | 526.14 | 6.7 | 0.6 | 20.8 | -10.0 | 30.9 | 0.0 | 28.1 | 35.5 | 0.792 |
| 74 | 534.40 | 7.6 | 0.9 | 22.7 | -8.6 | 31.3 | 0.0 | 31.3 | 34.7 | 0.900 |
| 75 | 542.67 | 7.1 | 1.0 | 22.2 | -7.7 | 29.9 | 0.0 | 30.3 | 35.4 | 0.855 |
| 76 | 550.93 | 5.1 | 0.8 | 20.3 | -8.2 | 28.5 | 0.0 | 26.2 | 34.9 | 0.749 |
| 77 | 559.19 | 1.7 | 0.3 | 16.0 | -9.4 | 25.5 | 0.0 | 18.0 | 35.6 | 0.506 |
| Bot.Flg.Spl. | | 0.0 | 0.1 | 14.1 | -10.0 | 24.1 | 0.0 | 14.2 | 35.7 | 0.398 |
| Bot.Flg.Spl. | | 0.0 | 0.1 | 13.9 | -9.6 | 23.5 | 0.0 | 14.0 | 35.7 | 0.393 |
| 78 | 567.46 | -3.1 | -0.4 | 13.0 | -11.4 | 24.4 | 0.0 | -14.8 | 32.3 | 0.459 |
| Bot.Flg.Spl. | | -7.8 | -1.2 | 7.2 | -12.4 | 19.6 | 0.0 | -21.4 | 32.3 | 0.661 |
| Bot.Flg.Spl. | | -5.4 | -0.8 | 5.1 | -8.7 | 13.7 | 0.0 | -14.9 | 32.3 | 0.462 |
| 79 | 575.72 | -6.3 | -1.0 | 4.0 | -8.9 | 12.9 | 0.0 | -16.1 | 32.3 | 0.500 |
| 80 | 583.99 | -11.3 | -1.9 | 3.4 | -14.1 | 17.4 | 0.0 | -27.3 | 32.3 | 0.846 |
| 81 | 592.28 | -6.5 | -0.8 | 3.5 | -8.6 | 12.1 | 0.0 | -16.0 | 32.3 | 0.496 |
| Bot.Flg.Spl. | | -5.7 | -0.7 | 4.8 | -8.6 | 13.4 | 0.0 | -14.9 | 32.3 | 0.462 |
| Bot.Flg.Spl. | | -7.1 | -0.8 | 6.0 | -10.7 | 16.7 | 0.0 | -18.7 | 32.3 | 0.578 |
| 82 | 600.58 | -3.2 | 0.1 | 12.4 | -10.4 | 22.8 | 0.0 | -13.5 | 32.3 | 0.418 |
| Bot.Flg.Spl. | | -1.5 | 0.4 | 15.1 | -10.1 | 25.3 | 0.0 | -11.3 | 32.3 | 0.349 |
| Bot.Flg.Spl. | | -1.7 | 0.4 | 16.3 | -10.9 | 27.2 | 0.0 | -12.1 | 31.4 | 0.387 |
| 83 | 608.87 | 0.8 | 0.8 | 15.5 | -9.5 | 25.0 | 0.0 | 17.1 | 35.4 | 0.483 |
| 84 | 617.17 | 3.9 | 1.3 | 19.6 | -8.9 | 28.5 | 0.0 | 24.7 | 34.3 | 0.720 |
| 85 | 625.47 | 5.5 | 1.5 | 21.3 | -8.4 | 29.6 | 0.0 | 28.3 | 35.1 | 0.807 |
| 86 | 633.76 | 5.9 | 1.5 | 21.8 | -8.9 | 30.7 | 0.0 | 29.2 | 34.0 | 0.859 |
| 87 | 642.06 | 5.0 | 1.2 | 19.7 | -9.8 | 29.5 | 0.0 | 25.8 | 35.2 | 0.734 |
| 88 | 650.36 | 2.7 | 0.6 | 15.7 | -10.8 | 26.5 | 0.0 | 19.1 | 34.7 | 0.550 |
| 89 | 658.65 | -0.7 | -0.2 | 9.4 | -11.1 | 20.5 | 0.0 | -12.1 | 31.4 | 0.384 |
| 90 | 666.95 | -5.2 | -1.5 | 4.6 | -13.8 | 18.4 | 0.0 | -20.5 | 31.4 | 0.653 |
| 91 | 674.45 | -0.7 | -0.2 | 0.3 | -1.9 | 2.2 | 0.0 | -2.9 | 34.5 | 0.083 |
| Bot.Flg.Spl. | | -0.5 | -0.2 | 0.8 | -1.8 | 2.6 | 0.0 | -2.5 | 34.4 | 0.073 |
| Bot.Flg.Spl. | | -0.6 | -0.2 | 0.9 | -2.2 | 3.1 | 0.0 | -3.0 | 34.4 | 0.088 |
| 92 | 681.95 | 3.8 | 0.9 | 8.1 | -1.2 | 9.3 | 0.0 | 12.9 | 35.7 | 0.360 |
| 93 | 689.45 | 7.3 | 1.7 | 15.0 | -2.7 | 17.6 | 0.0 | 24.0 | 35.4 | 0.678 |
| 94 | 696.95 | 9.1 | 2.2 | 18.8 | -4.0 | 22.9 | 0.0 | 30.1 | 35.5 | 0.849 |
| 95 | 704.45 | 9.3 | 2.3 | 20.0 | -5.4 | 25.3 | 0.0 | 31.6 | 35.9 | 0.880 |
| 96 | 711.95 | 7.9 | 2.0 | 19.6 | -6.6 | 26.2 | 0.0 | 29.5 | 35.8 | 0.824 |
| 97 | 719.45 | 4.9 | 1.4 | 16.0 | -7.8 | 23.8 | 0.0 | 22.3 | 35.8 | 0.623 |

| | | | | | | | | | | |
|--------------|--------|------|------|------|-------|------|-----|-------|------|-------|
| 98 | 726.95 | 0.3 | 0.4 | 11.7 | -8.9 | 20.6 | 0.0 | 12.4 | 35.9 | 0.346 |
| 99 | 734.45 | -5.8 | -1.2 | 5.3 | -10.8 | 16.2 | 0.0 | -17.9 | 33.6 | 0.532 |
| 100 | 741.95 | -8.7 | -2.2 | 2.3 | -11.1 | 13.4 | 0.0 | -21.9 | 32.4 | 0.677 |
| 101 | 748.54 | -5.1 | -1.1 | 2.6 | -7.6 | 10.2 | 0.0 | -13.8 | 32.4 | 0.426 |
| Bot.Flg.Spl. | | -3.6 | -0.5 | 11.9 | -10.5 | 22.4 | 0.0 | -14.6 | 32.4 | 0.452 |
| Bot.Flg.Spl. | | -4.7 | -0.7 | 15.7 | -13.9 | 29.6 | 0.0 | -19.3 | 32.3 | 0.598 |
| 102 | 755.13 | -4.6 | -0.7 | 16.0 | -13.8 | 29.9 | 0.0 | -19.1 | 32.3 | 0.591 |
| 103 | 761.71 | -0.3 | 0.5 | 15.8 | -10.7 | 26.5 | 0.0 | 15.9 | 35.8 | 0.445 |
| 104 | 768.30 | 2.4 | 1.1 | 18.9 | -9.0 | 27.9 | 0.0 | 22.3 | 35.4 | 0.632 |
| 105 | 774.89 | 3.5 | 1.4 | 20.6 | -7.3 | 27.9 | 0.0 | 25.5 | 33.8 | 0.755 |
| 106 | 781.48 | 3.2 | 1.2 | 18.8 | -7.4 | 26.2 | 0.0 | 23.3 | 35.3 | 0.660 |
| 107 | 788.06 | 1.4 | 0.7 | 17.1 | -8.9 | 26.0 | 0.0 | 19.3 | 35.9 | 0.537 |
| 108 | 794.65 | -1.8 | -0.2 | 14.1 | -11.2 | 25.3 | 0.0 | -13.2 | 32.3 | 0.408 |
| Bot.Flg.Spl. | | -1.9 | -0.2 | 13.9 | -11.2 | 25.1 | 0.0 | -13.4 | 32.3 | 0.414 |
| Bot.Flg.Spl. | | -1.9 | -0.2 | 13.5 | -11.0 | 24.5 | 0.0 | -13.1 | 31.4 | 0.416 |
| 109 | 801.24 | -6.3 | -1.9 | 5.9 | -11.7 | 17.6 | 0.0 | -19.9 | 31.4 | 0.633 |
| Bot.Flg.Spl. | | -6.9 | -2.1 | 5.8 | -12.4 | 18.2 | 0.0 | -21.3 | 31.4 | 0.679 |
| Bot.Flg.Spl. | | -4.7 | -1.4 | 4.0 | -8.5 | 12.5 | 0.0 | -14.7 | 32.3 | 0.454 |
| 110 | 807.83 | -8.5 | -2.9 | 3.4 | -13.3 | 16.7 | 0.0 | -24.7 | 32.3 | 0.767 |
| 111 | 814.46 | -3.9 | -1.1 | 4.7 | -9.4 | 14.1 | 0.0 | -14.3 | 32.3 | 0.443 |
| Bot.Flg.Spl. | | -3.1 | -0.8 | 6.2 | -9.2 | 15.5 | 0.0 | -13.1 | 32.3 | 0.405 |
| Bot.Flg.Spl. | | -4.5 | -1.1 | 9.1 | -13.4 | 22.5 | 0.0 | -19.0 | 31.4 | 0.606 |
| 112 | 821.08 | -0.2 | 0.4 | 12.7 | -10.9 | 23.7 | 0.0 | 12.9 | 35.9 | 0.359 |
| 113 | 827.71 | 3.7 | 1.5 | 17.8 | -9.8 | 27.6 | 0.0 | 23.0 | 35.8 | 0.644 |
| 114 | 834.34 | 6.1 | 2.2 | 20.7 | -8.4 | 29.0 | 0.0 | 29.0 | 34.7 | 0.835 |
| 115 | 840.97 | 7.1 | 2.5 | 21.6 | -6.9 | 28.5 | 0.0 | 31.2 | 32.1 | 0.972 |
| 116 | 847.59 | 6.4 | 2.3 | 20.2 | -7.4 | 27.6 | 0.0 | 28.9 | 34.8 | 0.832 |
| 117 | 854.22 | 4.3 | 1.6 | 17.0 | -8.6 | 25.6 | 0.0 | 22.9 | 35.8 | 0.640 |
| 118 | 860.85 | 0.6 | 0.5 | 10.2 | -9.4 | 19.6 | 0.0 | 11.3 | 35.9 | 0.316 |
| 119 | 867.48 | -4.5 | -1.4 | 6.4 | -11.8 | 18.1 | 0.0 | -17.6 | 31.4 | 0.561 |
| Bot.Flg.Spl. | | -5.1 | -1.6 | 6.3 | -12.5 | 18.7 | 0.0 | -19.2 | 31.4 | 0.611 |
| Bot.Flg.Spl. | | -3.5 | -1.1 | 4.3 | -8.6 | 12.9 | 0.0 | -13.2 | 32.3 | 0.409 |
| 120 | 874.10 | -7.6 | -2.7 | 3.8 | -13.0 | 16.8 | 0.0 | -23.4 | 31.7 | 0.738 |
| 121 | 879.43 | -4.6 | -1.5 | 3.7 | -9.8 | 13.4 | 0.0 | -15.9 | 31.7 | 0.500 |
| Bot.Flg.Spl. | | -3.3 | -1.0 | 6.0 | -9.3 | 15.4 | 0.0 | -13.7 | 31.7 | 0.432 |
| Bot.Flg.Spl. | | -5.4 | -1.7 | 9.8 | -15.1 | 24.9 | 0.0 | -22.2 | 30.7 | 0.724 |
| 122 | 884.75 | -3.4 | -0.9 | 13.5 | -14.5 | 28.0 | 0.0 | -18.8 | 30.7 | 0.613 |
| 123 | 890.07 | -0.5 | 0.2 | 15.4 | -11.6 | 27.0 | 0.0 | 15.1 | 30.7 | 0.491 |
| 124 | 895.39 | 1.5 | 0.7 | 18.4 | -10.3 | 28.7 | 0.0 | 20.5 | 30.0 | 0.684 |
| 125 | 900.71 | 2.3 | 0.9 | 19.3 | -8.9 | 28.3 | 0.0 | 22.5 | 31.6 | 0.713 |
| 126 | 906.03 | 2.1 | 0.8 | 20.3 | -10.7 | 31.1 | 0.0 | 23.2 | 30.2 | 0.769 |
| 127 | 911.35 | 0.9 | 0.4 | 18.3 | -12.9 | 31.2 | 0.0 | 19.6 | 31.5 | 0.623 |
| 128 | 916.67 | -1.5 | -0.4 | 14.5 | -14.7 | 29.2 | 0.0 | -16.5 | 30.7 | 0.538 |
| 129 | 922.00 | -4.8 | -1.8 | 14.9 | -19.3 | 34.2 | 0.0 | -25.9 | 30.7 | 0.842 |
| 130 | 927.32 | -9.2 | -3.4 | 2.6 | -21.5 | 24.1 | 0.0 | -34.2 | 30.7 | 1.112 |
| Bot.Flg.Spl. | | -1.2 | -0.4 | 0.1 | -2.3 | 2.4 | 0.0 | -3.9 | 35.9 | 0.108 |
| Bot.Flg.Spl. | | -0.6 | -0.2 | 0.1 | -1.2 | 1.3 | 0.0 | -2.1 | 35.9 | 0.059 |
| 132 | 939.59 | 3.0 | 0.9 | 4.9 | -0.5 | 5.5 | 0.0 | 8.8 | 35.9 | 0.246 |
| 133 | 945.73 | 5.8 | 1.8 | 9.0 | -0.7 | 9.7 | 0.0 | 16.5 | 35.8 | 0.461 |
| 134 | 951.86 | 7.7 | 2.4 | 11.4 | -0.8 | 12.2 | 0.0 | 21.5 | 35.7 | 0.601 |
| 135 | 958.00 | 8.7 | 2.7 | 12.7 | -0.8 | 13.4 | 0.0 | 24.0 | 35.8 | 0.670 |
| 136 | 964.14 | 8.8 | 2.7 | 12.7 | -0.7 | 13.4 | 0.0 | 24.2 | 35.8 | 0.675 |
| 137 | 970.27 | 7.9 | 2.4 | 11.8 | -0.6 | 12.4 | 0.0 | 22.2 | 35.8 | 0.619 |
| 138 | 976.41 | 6.2 | 1.9 | 9.5 | -0.5 | 10.0 | 0.0 | 17.6 | 35.6 | 0.494 |
| 139 | 982.55 | -3.5 | 1.1 | 5.8 | -0.2 | 6.0 | 0.0 | 10.3 | 35.8 | 0.288 |
| 140 | 988.68 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.0 | 0.000 |

Governing expression for allowable compression stress

Tenth Pt Expression

9 compact
 10 compact
 18 compact
 19 (5-4)
 20 compact
 21 compact
 22 compact
 30 compact
 38 (5-8)
 39 (5-8)
 40 (5-8)
 41 (5-8)
 42 (5-8)
 48 (5-8)
 49 (5-8)

50 (5-8)
 51 (5-8)
 59 (5-4)
 60 compact
 61 compact
 62 compact
 69 compact
 70 compact
 71 compact
 78 compact
 79 compact
 80 compact
 81 (5-4)
 82 (5-4)
 89 compact
 90 compact
 91 (5-8)
 99 compact
 100 compact
 101 compact
 102 compact
 108 (5-4)
 109 (5-4)
 110 compact
 111 (5-4)
 119 (5-4)
 120 compact
 121 compact
 122 compact
 123 compact
 128 compact
 129 compact
 130 compact
 131 compact

Perf. ratio for compact section is (factored mom/mom strength)
 if this is less than (total stress/allowable stress).

Grp I Bottom Flange Factored Lateral Bending Stress

| Tenth
Pt | Noncomp | | Dead | | Comp Dead | | Max LL+I | | Min LL+I | |
|-------------|---------|------|---------|------|-----------|------|----------|------|----------|-----|
| | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw | Lat Mom | fw |
| | k-ft | ksi | k-ft | ksi | k-ft | ksi | k-ft | ksi | k-ft | ksi |
| 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | | |
| 1 | -0.65 | 0.33 | -0.25 | 0.13 | -2.59 | 1.30 | -0.49 | 0.25 | | |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | -0.02 | 0.01 | -0.01 | 0.00 | | |
| 3 | 1.64 | 0.82 | 0.63 | 0.31 | 6.48 | 3.24 | 1.25 | 0.62 | | |
| 4 | -1.14 | 0.57 | -0.44 | 0.22 | -4.56 | 2.28 | -0.78 | 0.39 | | |
| 5 | -0.36 | 0.18 | -0.14 | 0.07 | -1.40 | 0.70 | -0.29 | 0.14 | | |
| 6 | 0.99 | 0.49 | 0.38 | 0.19 | 3.99 | 2.00 | 0.61 | 0.31 | | |
| 7 | -0.41 | 0.21 | -0.16 | 0.08 | -1.62 | 0.81 | -0.31 | 0.16 | | |
| 8 | -0.16 | 0.00 | -0.06 | 0.00 | -0.65 | 0.33 | -0.10 | 0.05 | | |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | | |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | | |
| 9 | 0.07 | 0.03 | 0.03 | 0.00 | 0.05 | 0.02 | 0.26 | 0.10 | | |
| 10 | 1.26 | 0.50 | 0.48 | 0.19 | 0.95 | 0.38 | 4.53 | 1.81 | | |
| 11 | -1.51 | 0.60 | -0.58 | 0.00 | -3.23 | 1.29 | -5.34 | 2.14 | | |
| 12 | -0.27 | 0.11 | -0.11 | 0.04 | -0.45 | 0.18 | 0.64 | 0.26 | | |
| 13 | 0.48 | 0.19 | 0.19 | 0.08 | 1.64 | 0.66 | -0.14 | 0.06 | | |
| 14 | -1.79 | 0.71 | -0.75 | 0.30 | -8.97 | 3.59 | -2.34 | 0.93 | | |
| 15 | 3.85 | 1.54 | 1.68 | 0.67 | 19.86 | 7.94 | 4.94 | 1.98 | | |
| 16 | -1.25 | 0.50 | -0.63 | 0.25 | -8.51 | 3.40 | -2.57 | 1.03 | | |
| 17 | -0.66 | 0.00 | 0.09 | 0.04 | 2.27 | 0.91 | -0.12 | 0.05 | | |
| 18 | 0.97 | 0.39 | -0.01 | 0.00 | -0.92 | 0.37 | 0.98 | 0.39 | | |
| 19 | -1.50 | 0.60 | -0.28 | 0.11 | -0.89 | 0.36 | -2.24 | 0.89 | | |
| Bot.Flg.Spl | -1.36 | 0.54 | -0.24 | 0.09 | -1.17 | 0.47 | -2.16 | 0.86 | | |
| Bot.Flg.Spl | -1.36 | 0.38 | -0.24 | 0.07 | -1.17 | 0.33 | -2.16 | 0.61 | | |
| 20 | 4.46 | 1.27 | 0.91 | 0.26 | 1.04 | 0.30 | 6.15 | 1.76 | | |
| Bot.Flg.Spl | -1.12 | 0.32 | -0.23 | 0.07 | -1.91 | 0.55 | -2.58 | 0.74 | | |
| Bot.Flg.Spl | -1.12 | 0.30 | -0.23 | 0.06 | -1.91 | 0.51 | -2.58 | 0.69 | | |
| 21 | -1.45 | 0.39 | -0.29 | 0.08 | -1.62 | 0.43 | -2.80 | 0.75 | | |
| 22 | 0.01 | 0.00 | 0.01 | 0.00 | 0.97 | 0.26 | 1.21 | 0.32 | | |
| 23 | 0.07 | 0.02 | 0.01 | 0.00 | -0.04 | 0.01 | -0.42 | 0.11 | | |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 24 | -0.87 | 0.23 | -0.17 | 0.04 | -3.75 | 1.00 | -1.09 | 0.29 |
| 25 | 2.11 | 0.56 | 0.40 | 0.11 | 8.35 | 2.23 | 2.18 | 0.58 |
| 26 | -1.13 | 0.30 | -0.20 | 0.05 | -4.65 | 1.24 | -1.26 | 0.34 |
| 27 | 0.48 | 0.13 | 0.10 | 0.03 | 1.57 | 0.42 | 0.24 | 0.07 |
| 28 | -0.26 | 0.07 | -0.07 | 0.00 | -0.58 | 0.15 | 0.06 | 0.01 |
| 29 | -0.75 | 0.00 | -0.24 | 0.00 | -1.49 | 0.40 | -2.01 | 0.54 |
| 30 | 0.67 | 0.18 | 0.26 | 0.07 | 0.41 | 0.11 | 1.69 | 0.45 |
| Bot.Flg.Spl | 0.11 | 0.03 | 0.05 | 0.00 | 0.40 | 0.11 | 0.12 | 0.03 |
| Bot.Flg.Spl | 0.11 | 0.06 | 0.05 | 0.03 | 0.40 | 0.23 | 0.12 | 0.07 |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 |
| 40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -2.48 | 0.66 | -0.39 | 0.10 | -2.68 | 0.71 | -4.23 | 1.13 |
| Bot.Flg.Spl | -2.48 | 0.48 | -0.39 | 0.08 | -2.68 | 0.53 | -4.23 | 0.84 |
| 41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -2.61 | 0.52 | -0.55 | 0.11 | -3.71 | 0.74 | -5.46 | 1.09 |
| Bot.Flg.Spl | -2.61 | 0.71 | -0.55 | 0.15 | -3.71 | 1.00 | -5.46 | 1.47 |
| 48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.16 | 0.04 | 0.07 | 0.00 | 0.62 | 0.17 | 0.18 | 0.05 |
| Bot.Flg.Spl | 0.16 | 0.09 | 0.07 | 0.04 | 0.62 | 0.36 | 0.18 | 0.11 |
| 50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -0.49 | 0.13 | -0.15 | 0.04 | -0.65 | 0.17 | -0.92 | 0.23 |
| Bot.Flg.Spl | -0.49 | 0.11 | -0.15 | 0.03 | -0.65 | 0.15 | -0.92 | 0.21 |
| 51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -0.11 | 0.00 | -0.14 | 0.06 | -0.30 | 0.12 | 0.21 | 0.08 |
| Bot.Flg.Spl | -0.11 | 0.08 | -0.14 | 0.09 | -0.30 | 0.20 | 0.21 | 0.14 |
| 52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 55 | 2.40 | 0.96 | 1.10 | 0.44 | 7.62 | 3.05 | 1.82 | 0.73 |
| 56 | -0.92 | 0.37 | -0.44 | 0.17 | -3.18 | 1.27 | -0.84 | 0.34 |
| 57 | 0.24 | 0.10 | 0.18 | 0.07 | 0.87 | 0.35 | 0.04 | 0.02 |
| 58 | -0.14 | 0.00 | -0.15 | 0.06 | -0.45 | 0.18 | 0.14 | 0.05 |
| Bot.Flg.Spl | -0.11 | 0.04 | -0.14 | 0.06 | -0.29 | 0.12 | 0.22 | 0.09 |
| Bot.Flg.Spl | -0.11 | 0.07 | -0.14 | 0.09 | -0.29 | 0.19 | 0.22 | 0.15 |
| 59 | -1.23 | 0.82 | -0.35 | 0.23 | -0.84 | 0.56 | -1.59 | 1.06 |
| Bot.Flg.Spl | -1.24 | 0.82 | -0.35 | 0.23 | -0.96 | 0.64 | -1.66 | 1.10 |
| Bot.Flg.Spl | -1.24 | 0.32 | -0.35 | 0.09 | -0.96 | 0.25 | -1.66 | 0.44 |
| 60 | 4.45 | 1.19 | 1.41 | 0.38 | 1.12 | 0.30 | 4.88 | 1.30 |
| Bot.Flg.Spl | -1.28 | 0.34 | -0.37 | 0.10 | -1.38 | 0.37 | -1.99 | 0.53 |
| Bot.Flg.Spl | -1.28 | 0.52 | -0.37 | 0.15 | -1.38 | 0.56 | -1.99 | 0.80 |
| 61 | -1.41 | 0.56 | -0.40 | 0.16 | -1.40 | 0.56 | -2.11 | 0.84 |
| 62 | 0.06 | 0.03 | -0.05 | 0.02 | 2.13 | 0.85 | 1.23 | 0.49 |
| Bot.Flg.Spl | 0.06 | 0.02 | -0.04 | 0.00 | -0.21 | 0.08 | 0.29 | 0.12 |
| Bot.Flg.Spl | 0.06 | 0.04 | -0.04 | 0.00 | -0.21 | 0.12 | 0.29 | 0.17 |
| 63 | -0.34 | 0.19 | -0.14 | 0.00 | -1.99 | 1.14 | -0.92 | 0.53 |
| 64 | -0.01 | 0.01 | 0.06 | 0.03 | 0.45 | 0.26 | -0.15 | 0.08 |
| 65 | -0.17 | 0.10 | -0.06 | 0.03 | -0.35 | 0.20 | -0.01 | 0.00 |
| 66 | -0.36 | 0.21 | -0.17 | 0.10 | -2.03 | 1.16 | -0.73 | 0.42 |
| 67 | 0.45 | 0.26 | 0.19 | 0.11 | 1.60 | 0.91 | 0.32 | 0.18 |
| 68 | -0.23 | 0.13 | -0.10 | 0.06 | -1.20 | 0.68 | -0.55 | 0.32 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.11 | 0.06 | 0.12 | 0.07 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.11 | 0.04 | 0.12 | 0.04 |
| 69 | 0.01 | 0.00 | 0.01 | 0.00 | 0.08 | 0.03 | 0.10 | 0.03 |
| 70 | 0.68 | 0.23 | 0.28 | 0.09 | 0.56 | 0.19 | 2.11 | 0.70 |
| 71 | -1.06 | 0.00 | -0.31 | 0.10 | -2.19 | 0.73 | -3.18 | 1.06 |
| 72 | 1.27 | 0.42 | 0.03 | 0.00 | 6.28 | 2.09 | 3.60 | 1.20 |
| 73 | -0.88 | 0.29 | -0.08 | 0.03 | -3.67 | 1.22 | -1.55 | 0.52 |
| 74 | 2.28 | 0.76 | 0.32 | 0.11 | 8.47 | 2.82 | 2.65 | 0.88 |
| 75 | -0.95 | 0.32 | -0.15 | 0.05 | -4.02 | 1.34 | -1.30 | 0.43 |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 76 | 1.53 | 0.51 | 0.27 | 0.09 | 7.57 | 2.52 | 2.54 | 0.85 |
| 77 | -0.63 | 0.21 | -0.09 | 0.00 | -2.86 | 0.95 | -1.49 | 0.50 |
| Bot.Flq.Spl | -0.47 | 0.00 | -0.08 | 0.00 | -2.24 | 0.75 | -0.91 | 0.30 |
| Bot.Flq.Spl | -0.47 | 0.00 | -0.08 | 0.00 | -2.24 | 0.75 | -0.91 | 0.30 |
| 78 | 0.98 | 0.33 | 0.11 | 0.00 | 3.85 | 1.28 | 3.39 | 1.13 |
| Bot.Flq.Spl | -1.57 | 0.52 | -0.24 | 0.08 | -1.01 | 0.34 | -2.18 | 0.73 |
| Bot.Flq.Spl | -1.57 | 0.34 | -0.24 | 0.05 | -1.01 | 0.22 | -2.18 | 0.48 |
| 79 | -1.52 | 0.34 | -0.23 | 0.05 | -1.30 | 0.29 | -2.33 | 0.52 |
| 80 | 5.12 | 1.14 | 0.81 | 0.18 | 1.43 | 0.32 | 6.02 | 1.34 |
| 81 | -1.58 | 0.35 | -0.21 | 0.05 | -1.39 | 0.31 | -2.38 | 0.53 |
| Bot.Flq.Spl | -2.75 | 0.61 | -0.39 | 0.09 | -1.84 | 0.41 | -3.83 | 0.85 |
| Bot.Flq.Spl | -2.75 | 0.79 | -0.39 | 0.11 | -1.84 | 0.53 | -3.83 | 1.10 |
| 82 | 1.98 | 0.57 | 0.03 | 0.00 | 7.14 | 2.04 | 6.03 | 1.72 |
| Bot.Flq.Spl | -0.03 | 0.01 | -0.16 | 0.05 | -1.30 | 0.37 | 0.17 | 0.05 |
| Bot.Flq.Spl | -0.03 | 0.01 | -0.16 | 0.05 | -1.30 | 0.37 | 0.17 | 0.05 |
| 83 | -1.09 | 0.31 | -0.22 | 0.06 | -5.43 | 1.55 | -2.92 | 0.83 |
| 84 | 2.24 | 0.64 | 0.85 | 0.24 | 14.11 | 4.03 | 5.34 | 1.53 |
| 85 | -1.45 | 0.41 | -0.47 | 0.13 | -7.59 | 2.17 | -2.71 | 0.78 |
| 86 | 3.50 | 1.00 | 0.99 | 0.28 | 15.84 | 4.52 | 5.36 | 1.53 |
| 87 | -1.29 | 0.37 | -0.36 | 0.10 | -6.90 | 1.97 | -3.01 | 0.86 |
| 88 | 1.62 | 0.46 | 0.42 | 0.12 | 11.51 | 3.29 | 6.56 | 1.88 |
| 89 | -2.06 | 0.59 | -0.54 | 0.00 | -4.23 | 1.21 | -5.74 | 1.64 |
| 90 | 1.66 | 0.47 | 0.44 | 0.13 | 1.36 | 0.39 | 4.11 | 1.18 |
| 91 | 0.03 | 0.01 | 0.01 | 0.00 | 0.07 | 0.00 | 0.13 | 0.04 |
| Bot.Flq.Spl | 0.02 | 0.01 | 0.01 | 0.00 | 0.12 | 0.03 | 0.15 | 0.04 |
| Bot.Flq.Spl | 0.02 | 0.01 | 0.01 | 0.00 | 0.12 | 0.05 | 0.15 | 0.06 |
| 92 | -0.46 | 0.18 | -0.13 | 0.05 | -1.55 | 0.60 | -0.56 | 0.22 |
| 93 | 1.08 | 0.42 | 0.29 | 0.11 | 2.80 | 1.09 | 0.35 | 0.14 |
| 94 | -1.02 | 0.40 | -0.28 | 0.11 | -2.71 | 1.06 | -0.43 | 0.17 |
| 95 | 0.28 | 0.11 | 0.07 | 0.03 | 0.43 | 0.17 | -0.08 | 0.03 |
| 96 | -0.40 | 0.16 | -0.11 | 0.04 | -0.89 | 0.35 | -0.07 | 0.03 |
| 97 | -0.19 | 0.08 | -0.04 | 0.02 | -1.48 | 0.58 | -0.91 | 0.35 |
| 98 | -0.10 | 0.00 | -0.06 | 0.00 | 1.18 | 0.46 | 1.21 | 0.47 |
| 99 | -0.81 | 0.32 | -0.18 | 0.07 | -1.08 | 0.42 | -1.52 | 0.59 |
| 100 | 5.63 | 1.22 | 1.30 | 0.28 | 1.35 | 0.29 | 6.64 | 1.44 |
| 101 | -2.14 | 0.46 | -0.44 | 0.09 | -2.30 | 0.50 | -3.46 | 0.75 |
| Bot.Flq.Spl | -1.37 | 0.54 | -0.36 | 0.14 | 0.97 | 0.38 | -0.93 | 0.36 |
| Bot.Flq.Spl | -1.37 | 0.74 | -0.36 | 0.19 | 0.97 | 0.52 | -0.93 | 0.50 |
| 102 | -1.29 | 0.69 | -0.34 | 0.18 | 1.18 | 0.63 | -0.73 | 0.39 |
| 103 | -0.05 | 0.00 | -0.11 | 0.00 | -0.43 | 0.23 | 0.47 | 0.25 |
| 104 | -0.48 | 0.26 | -0.11 | 0.06 | -3.57 | 1.90 | -1.74 | 0.92 |
| 105 | 1.35 | 0.72 | 0.61 | 0.33 | 10.24 | 5.45 | 2.88 | 1.53 |
| 106 | -0.25 | 0.13 | -0.14 | 0.08 | -3.64 | 1.93 | -1.52 | 0.81 |
| 107 | -0.23 | 0.12 | -0.08 | 0.04 | -0.22 | 0.12 | 0.38 | 0.20 |
| 108 | -0.92 | 0.49 | -0.26 | 0.00 | 1.11 | 0.59 | -0.53 | 0.28 |
| Bot.Flq.Spl | -0.96 | 0.51 | -0.28 | 0.15 | 0.89 | 0.47 | -0.70 | 0.37 |
| Bot.Flq.Spl | -0.96 | 0.43 | -0.28 | 0.12 | 0.89 | 0.40 | -0.70 | 0.31 |
| 109 | -0.84 | 0.37 | -0.29 | 0.13 | -2.20 | 0.98 | -2.21 | 0.98 |
| Bot.Flq.Spl | -0.61 | 0.27 | -0.22 | 0.10 | -2.08 | 0.93 | -1.87 | 0.83 |
| Bot.Flq.Spl | -0.61 | 0.18 | -0.22 | 0.07 | -2.08 | 0.64 | -1.87 | 0.57 |
| 110 | 4.88 | 1.50 | 1.54 | 0.47 | 1.80 | 0.55 | 7.05 | 2.17 |
| 111 | -1.01 | 0.31 | -0.38 | 0.12 | -2.42 | 0.74 | -2.37 | 0.73 |
| Bot.Flq.Spl | -1.35 | 0.42 | -0.49 | 0.15 | -2.43 | 0.75 | -2.82 | 0.87 |
| Bot.Flq.Spl | -1.35 | 0.61 | -0.49 | 0.22 | -2.43 | 1.09 | -2.82 | 1.26 |
| 112 | -0.76 | 0.00 | -0.18 | 0.00 | 1.43 | 0.63 | -0.33 | 0.15 |
| 113 | -0.63 | 0.28 | -0.20 | 0.09 | -0.50 | 0.22 | 0.74 | 0.33 |
| 114 | -1.13 | 0.50 | -0.55 | 0.25 | -6.76 | 3.01 | -2.84 | 1.26 |
| 115 | 4.84 | 2.15 | 2.04 | 0.91 | 18.77 | 8.34 | 4.91 | 2.18 |
| 116 | -1.27 | 0.57 | -0.58 | 0.26 | -6.38 | 2.84 | -2.58 | 1.15 |
| 117 | -0.52 | 0.23 | -0.18 | 0.08 | -0.81 | 0.36 | 0.53 | 0.24 |
| 118 | -0.91 | 0.00 | -0.22 | 0.00 | 2.07 | 0.92 | -0.56 | 0.25 |
| 119 | -1.41 | 0.63 | -0.54 | 0.24 | -3.64 | 1.62 | -3.23 | 1.43 |
| Bot.Flq.Spl | -1.00 | 0.44 | -0.41 | 0.18 | -3.40 | 1.51 | -2.57 | 1.14 |
| Bot.Flq.Spl | -1.00 | 0.30 | -0.41 | 0.13 | -3.40 | 1.04 | -2.57 | 0.79 |
| 120 | 7.99 | 2.46 | 2.63 | 0.81 | 3.65 | 1.12 | 12.58 | 3.87 |
| 121 | -0.53 | 0.16 | -0.24 | 0.07 | -3.91 | 1.20 | -2.83 | 0.87 |
| Bot.Flq.Spl | -2.19 | 0.68 | -0.79 | 0.24 | -4.98 | 1.53 | -5.62 | 1.73 |
| Bot.Flq.Spl | -2.19 | 1.12 | -0.79 | 0.40 | -4.98 | 2.51 | -5.62 | 2.83 |
| 122 | -2.62 | 1.31 | -0.89 | 0.45 | -3.69 | 1.85 | -5.43 | 2.72 |
| 123 | -0.86 | 0.00 | -0.13 | 0.00 | 8.02 | 4.01 | 3.26 | 1.63 |
| 124 | -0.15 | 0.07 | -0.02 | 0.01 | 0.14 | 0.07 | 0.18 | 0.09 |
| 125 | -0.25 | 0.13 | -0.19 | 0.09 | -8.15 | 4.07 | -4.37 | 2.18 |
| 126 | 0.19 | 0.09 | 0.05 | 0.03 | 1.13 | 0.56 | 0.50 | 0.25 |
| 127 | -0.51 | 0.25 | -0.09 | 0.00 | 9.49 | 4.74 | 2.91 | 1.46 |
| 128 | -3.43 | 1.72 | -1.20 | 0.00 | -3.77 | 1.88 | -8.53 | 4.27 |
| 129 | -2.97 | 1.49 | -1.05 | 0.53 | -5.00 | 2.50 | -8.11 | 4.06 |

| | | | | | | | | |
|--------------|-------|------|-------|------|-------|------|-------|------|
| 130 | 2.67 | 1.34 | 0.91 | 0.46 | 0.69 | 0.34 | 5.71 | 2.85 |
| Bot.Flgl.Spl | 0.02 | 0.01 | 0.01 | 0.00 | 0.07 | 0.00 | 0.10 | 0.05 |
| Bot.Flgl.Spl | 0.02 | 0.01 | 0.01 | 0.00 | 0.07 | 0.00 | 0.10 | 0.02 |
| 131 | 0.02 | 0.01 | 0.01 | 0.00 | 0.07 | 0.00 | 0.10 | 0.02 |
| 132 | -0.41 | 0.10 | -0.14 | 0.04 | -0.98 | 0.24 | -0.29 | 0.07 |
| 133 | 0.65 | 0.16 | 0.22 | 0.06 | 1.26 | 0.31 | 0.10 | 0.03 |
| 134 | -1.02 | 0.25 | -0.35 | 0.09 | -1.85 | 0.46 | -0.12 | 0.03 |
| 135 | 0.64 | 0.16 | 0.22 | 0.05 | 1.11 | 0.28 | 0.06 | 0.02 |
| 136 | -0.82 | 0.20 | -0.28 | 0.07 | -1.42 | 0.36 | -0.08 | 0.02 |
| 137 | -0.72 | 0.18 | -0.25 | 0.06 | -1.33 | 0.33 | -0.05 | 0.01 |
| 138 | 1.43 | 0.36 | 0.49 | 0.12 | 2.63 | 0.66 | 0.10 | 0.00 |
| 139 | -0.59 | 0.15 | -0.20 | 0.05 | -1.08 | 0.27 | -0.04 | 0.00 |
| 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Dabrowski sign convention: +fw/fb ratio used for allowable stress.
 (See 2003 Guide spec. commentary C5.1)

First of two splice entries is to left of splice,
 second is to right of splice.

BRIDGE 69801 J, K, L, M, & N
Girder 7 : Rating Output : Lateral Bending in Flanges

Factored Lateral Bending in Bottom Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 11.54 | 16.48 | 6.57 | 0.399 | 0.798 | 0.365 | 0.365 |
| 23.08 | 15.15 | 5.56 | 0.367 | 0.734 | 0.309 | 0.309 |
| 33.64 | 0.11 | 0.02 | 0.218 | 0.436 | compact | |
| 35.71 | 0.20 | 0.01 | 0.033 | 0.066 | compact | |
| 40.77 | 15.86 | 2.51 | 0.158 | 0.316 | compact | |
| 52.43 | 16.76 | 6.64 | 0.396 | 0.793 | compact | |
| 64.07 | 27.20 | 10.66 | 0.392 | 0.784 | compact | |
| 75.69 | 27.20 | 10.66 | 0.392 | 0.784 | compact | |
| 87.26 | 18.04 | 7.20 | 0.399 | 0.798 | compact | |
| 98.78 | 19.48 | 5.97 | 0.307 | 0.613 | compact | |
| 110.41 | 22.84 | 3.29 | 0.144 | 0.288 | compact | |
| 122.39 | 7.62 | 1.29 | 0.169 | 0.337 | compact | |
| 133.68 | 19.04 | 2.69 | 0.141 | 0.282 | compact | |
| 145.00 | 24.89 | 3.51 | 0.141 | 0.282 | compact | |
| 156.31 | 23.29 | 3.30 | 0.142 | 0.283 | compact | |
| 167.60 | 14.85 | 2.14 | 0.144 | 0.288 | compact | |
| 178.88 | 11.80 | 0.70 | 0.059 | 0.119 | compact | |
| 183.82 | 1.52 | 0.03 | 0.023 | 0.046 | compact | |
| 185.88 | 8.00 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 201.17 | 32.76 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 217.42 | 32.59 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 233.67 | 11.61 | 0.00 | 0.000 | 0.000 | compact | |
| 249.92 | 31.43 | 0.00 | 0.000 | 0.000 | compact | |
| 266.14 | 15.70 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 282.33 | 34.85 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 298.51 | 33.47 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 314.73 | 22.06 | 0.00 | 0.000 | 0.000 | compact | |
| 330.93 | 31.37 | 0.00 | 0.000 | 0.000 | compact | |
| 346.90 | 12.89 | 0.00 | 0.000 | 0.000 | compact | |
| 362.88 | 31.75 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 378.86 | 38.98 | 4.44 | 0.114 | 0.228 | 0.247 | 0.247 |
| 394.83 | 30.69 | 3.53 | 0.115 | 0.230 | 0.196 | 0.196 |
| 410.79 | 10.65 | 1.96 | 0.184 | 0.369 | compact | |
| 426.75 | 29.89 | 2.87 | 0.096 | 0.192 | compact | |
| 443.41 | 15.40 | 1.81 | 0.118 | 0.235 | compact | |
| 460.05 | 29.79 | 4.31 | 0.145 | 0.289 | 0.239 | 0.239 |
| 476.71 | 25.13 | 3.22 | 0.128 | 0.256 | 0.179 | 0.179 |
| 491.73 | 2.04 | 0.14 | 0.070 | 0.141 | compact | |
| 495.06 | 7.47 | 0.06 | 0.008 | 0.016 | compact | |
| 501.35 | 22.97 | 1.03 | 0.045 | 0.089 | compact | |
| 517.90 | 21.14 | 2.53 | 0.119 | 0.239 | compact | |
| 534.41 | 31.26 | 3.69 | 0.118 | 0.236 | compact | |
| 550.95 | 26.18 | 3.12 | 0.119 | 0.239 | compact | |
| 567.48 | 16.40 | 1.49 | 0.091 | 0.182 | compact | |
| 583.99 | 27.31 | 2.66 | 0.097 | 0.194 | compact | |
| 600.52 | 15.64 | 2.34 | 0.150 | 0.299 | compact | |
| 617.12 | 24.73 | 4.98 | 0.201 | 0.403 | compact | |
| 633.73 | 29.23 | 5.85 | 0.200 | 0.400 | compact | |
| 650.35 | 19.07 | 3.86 | 0.203 | 0.405 | compact | |
| 666.95 | 20.49 | 1.78 | 0.087 | 0.173 | compact | |
| 673.87 | 4.23 | 0.05 | 0.013 | 0.025 | compact | |
| 675.95 | 1.03 | 0.10 | 0.095 | 0.190 | compact | |
| 688.39 | 22.44 | 3.25 | 0.145 | 0.289 | compact | |
| 701.76 | 31.06 | 4.84 | 0.156 | 0.312 | compact | |
| 715.17 | 26.42 | 4.17 | 0.158 | 0.316 | compact | |
| 728.56 | 8.41 | 1.83 | 0.217 | 0.434 | compact | |

| | | | | | | |
|--------|-------|-------|-------|-------|---------|-------|
| 741.95 | 21.93 | 2.95 | 0.135 | 0.269 | compact | |
| 758.40 | 17.36 | 4.13 | 0.238 | 0.476 | compact | |
| 774.84 | 25.53 | 6.60 | 0.258 | 0.517 | compact | |
| 791.28 | 13.66 | 3.78 | 0.276 | 0.553 | compact | |
| 807.83 | 24.74 | 4.17 | 0.168 | 0.337 | compact | |
| 824.39 | 17.95 | 3.99 | 0.222 | 0.445 | compact | |
| 840.96 | 31.21 | 11.43 | 0.366 | 0.733 | compact | |
| 857.54 | 17.11 | 6.40 | 0.374 | 0.748 | compact | |
| 874.10 | 23.40 | 7.17 | 0.307 | 0.613 | compact | |
| 891.84 | 16.88 | 7.73 | 0.458 | 0.916 | 0.430 | 0.430 |
| 909.58 | 20.82 | 9.41 | 0.452 | 0.904 | 0.523 | 0.523 |
| 927.32 | 34.15 | 4.65 | 0.136 | 0.272 | compact | |
| 932.38 | 8.24 | 0.12 | 0.015 | 0.030 | compact | |
| 934.45 | 0.38 | 0.04 | 0.107 | 0.214 | compact | |
| 944.48 | 14.96 | 1.86 | 0.124 | 0.249 | compact | |
| 955.52 | 22.97 | 3.14 | 0.137 | 0.273 | compact | |
| 966.59 | 0.01 | 0.00 | 0.137 | 0.273 | compact | |
| 977.64 | 16.13 | 2.21 | 0.137 | 0.274 | compact | |
| 988.68 | 0.00 | 0.00 | 0.000 | 0.000 | compact | |

Factored Lateral Bending in Top Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 33.64 | 0.02 | 0.04 | 2.366 | 4.731 | 0.002 | |
| 35.71 | 0.27 | 0.01 | 0.041 | 0.082 | compact | |
| 40.77 | 21.43 | 4.18 | 0.195 | 0.390 | compact | |
| 98.78 | 26.32 | 9.95 | 0.378 | 0.756 | compact | |
| 110.41 | 22.84 | 3.29 | 0.144 | 0.288 | compact | |
| 122.39 | 7.57 | 1.93 | 0.255 | 0.509 | compact | |
| 178.88 | 15.21 | 1.05 | 0.069 | 0.138 | compact | |
| 183.82 | 1.96 | 0.05 | 0.027 | 0.053 | 0.003 | |
| 185.88 | 9.47 | 0.00 | 0.000 | 0.000 | 0.000 | |
| 249.92 | 31.43 | 0.00 | 0.000 | 0.000 | compact | |
| 314.73 | 22.06 | 0.00 | 0.000 | 0.000 | compact | |
| 330.93 | 31.37 | 0.00 | 0.000 | 0.000 | compact | |
| 346.90 | 9.64 | 0.00 | 0.000 | 0.000 | 0.000 | |
| 410.79 | 8.10 | 1.96 | 0.243 | 0.485 | 0.109 | |
| 426.75 | 29.89 | 2.87 | 0.096 | 0.192 | compact | |
| 443.41 | 15.40 | 1.81 | 0.118 | 0.235 | compact | |
| 491.73 | 2.38 | 0.20 | 0.085 | 0.169 | compact | |
| 495.06 | 10.02 | 0.10 | 0.010 | 0.020 | compact | |
| 501.35 | 30.82 | 1.76 | 0.057 | 0.114 | compact | |
| 567.48 | 16.40 | 1.49 | 0.091 | 0.182 | compact | |
| 583.99 | 27.31 | 2.66 | 0.097 | 0.194 | compact | |
| 600.52 | 15.64 | 2.34 | 0.150 | 0.299 | compact | |
| 666.95 | 26.22 | 3.11 | 0.119 | 0.237 | compact | |
| 673.87 | 5.42 | 0.09 | 0.017 | 0.035 | compact | |
| 728.56 | 2.00 | 1.83 | 0.913 | 1.826 | compact | |
| 741.95 | 21.93 | 2.95 | 0.135 | 0.269 | compact | |
| 807.83 | 24.74 | 4.17 | 0.168 | 0.337 | compact | |
| 874.10 | 23.40 | 7.17 | 0.307 | 0.613 | compact | |
| 927.32 | 43.50 | 7.44 | 0.171 | 0.342 | compact | |
| 932.38 | 7.90 | 0.20 | 0.025 | 0.049 | compact | |



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/22/09 BY CJM SHEET NO. 1 OF 5

Check of controlling Areas on Girders

Bridge 69801 I

Both moment and shear critical Rating Factors are at Pier 1-3A (Non composite @ Pier 1-3A).

Girder I

Shear controls - $R_F = 0.62$ IN1 ; 1.03 OP

Plate Girder Dimensions

web = $34" \times 3/8"$

Top Flange = $12" \times 5/8"$

Bottom Flange = $12" \times 1"$

} MDX Dimensions match

$$\text{MDX Shear capacity} = 198.5 \text{ K} = C \cdot 0.58 \cdot F_y \cdot D_w \cdot t_w \quad (\text{Eq 6-4})$$

$$\frac{D}{t_w} = \frac{34"}{3/8"} = 90.67$$

$$1.10 \frac{\sqrt{E K_w}}{F_y} = 69.81 \quad (K_w = 5.0)$$

$$1.38 \frac{\sqrt{E K_w}}{F_y} = 87.58 \quad (K_w = 5.0)$$

$$\text{use Eq 6-7} \Rightarrow D/t_w > 1.38 \frac{\sqrt{E K_w}}{F_y}$$

$$C = \frac{1.52 E K_w}{\left(\frac{D}{t_w}\right)^2 F_y} = \frac{1.52 (29,000 \text{ ksi}) (5)}{\left(\frac{34}{3/8}\right)^2 \cdot 36 \text{ ksi}} = 0.745$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/22/09 BY CJM SHEET NO. 2 OF 5

Check of Controlling Areas on Girders - cont

Bridge 69301 J - cont

$$\text{Capacity} = 0.745 (0.58) (36 \text{ ksi}) (34") (\frac{3}{8} ") = 198.3 \text{ K (MDX } 198.5) \text{ OK}$$

Loads

$$\text{DL (non comp)} = 72.19 \text{ K}$$

$$\text{DL (comp)} = 27.28 \text{ K}$$

$$\text{LL} = 51.56 \text{ K}$$

$$\text{RF}_{\text{inv}} = \frac{198.5 \text{ K} - 1.3 (72.19 + 27.28)}{2.17 (51.56)} = 0.62 \text{ (MDX} = 0.62) \text{ OK}$$

$$\text{RF}_{\text{op}} = 0.62 \cdot 5/3 = 1.03 \text{ (MDX} = 1.03) \text{ OK}$$

Moment on Girder 7

$$\text{MDX} \Rightarrow \text{Cap} = 1076.3 \text{ K-ft} = 12915.6 \text{ K-in ; RF} = 0.73 \text{ inv ; } 1.21 \text{ op}$$

$$\text{Fcr} = 30 \text{ Ksi}$$

$$\text{I} = 7152 \text{ in}^4$$

$$\bar{y}_{\text{Top}} = 19.94 \text{ in}$$

$$\bar{y}_{\text{Bot}} = 15.65 \text{ in}$$

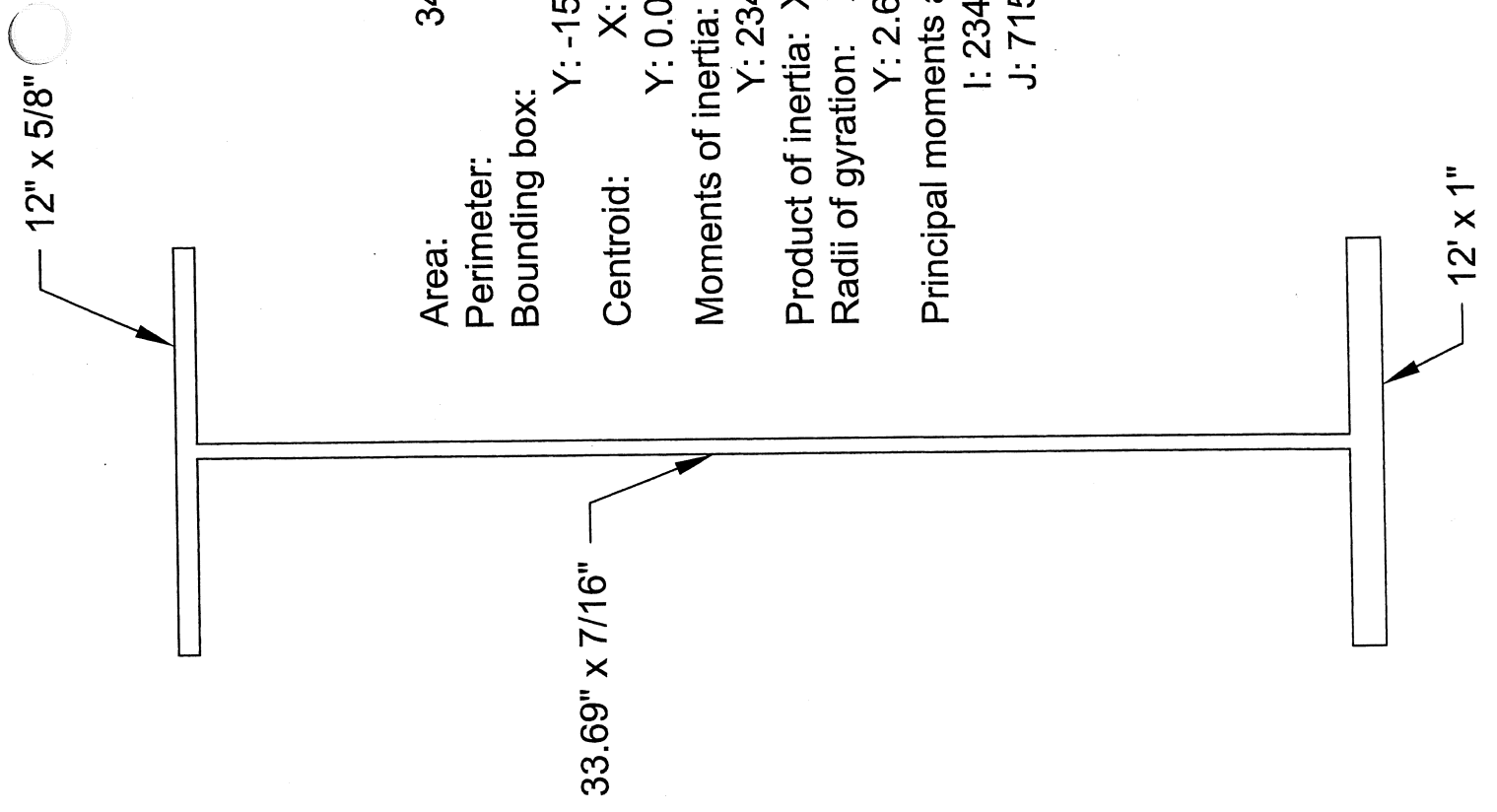
$$\text{S}_{\text{XT}} = 7152 \text{ in}^4 / 19.94 \text{ in} = 358.7 \text{ in}^3$$

$$\text{S}_{\text{XL}} = 7152 \text{ in}^4 / 15.65 \text{ in} = 457 \text{ in}^3$$

$$\text{Fy} = 36 \text{ Ksi}$$

$$\text{Fcr} = 30.0 \text{ Ksi (MDX) ; } 29.7 \text{ (Swiss method)}$$

$$\begin{aligned} \text{Cap} &= 358.7 \text{ in}^3 \cdot 36 \text{ Ksi} \cdot \frac{1}{12} = 1076.1 \text{ K-ft} \quad * \text{ Controls} \\ &= 457 \text{ in}^3 \cdot 30 \text{ Ksi} \cdot \frac{1}{12} = 1142.5 \text{ K-ft} \end{aligned}$$



Area: 34.3575
Perimeter: 118.2950
Bounding box: X: -6.0000 -- 6.0000
Y: -15.6496 -- 19.9354
Centroid: X: 0.0000
Y: 0.0000
Moments of inertia: X: 7151.8996
Y: 234.2370
Product of inertia: XY: 0.0000
Radii of gyration: X: 14.4278
Y: 2.6111
Principal moments and X-Y directions about centroid:
I: 234.2370 along [0.0000 -1.0000]
J: 7151.8996 along [1.0000 0.0000]



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 1/22/09 BY CTM SHEET NO. 3 OF 5

Bridge 69801 J cont...

Girder 7 -

Web = $34 \times 7/16$

Top Flange = $12 \times 5/8$

Bottom Flange = 12×1

} MPX input matches

Loads

D.L. comp = -266.92 K-ft

D.L. non comp = -101.31 K-ft

LL = -378.75 K-ft

$$R.F.(inv) = \frac{1076.1 \text{ K-ft} - 1.3(266.92 + 101.31)}{2.17(378.75)} = 0.173$$

max = 0.173 (OK)

$$R.F.(op) = \frac{1076.1 - 1.3(266.92 + 101.31)}{1.3(378.75)} = 1.21$$

max = 1.21 (OK)



4/5

Project: Bridge 69801 Rating
Project Number: 090147
Description: Beam Capacity Verification of MDX Software Output
Design CSM Check _____
11/22/09

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY
STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

| | |
|---------------------|---|
| $G_w := 1$ | Girder Number (From LHB Model) |
| $P_i := 130$ | Point Number Along Girder (From LHB Model) |
| $N_{loc} := 927.32$ | Location Along Girder (From LHB Model) (Feet) |

Enter Girder Geometric Data

| | |
|------------------|---|
| $L_w := 17.73$ | Length Between Braces (Feet) |
| $R_w := 488.465$ | Beam Radius (Feet) |
| $b_{fc} := 12$ | Compression Flange Width (Inches) |
| $t_{fc} := 1$ | Compression Flange Thickness (Inches) |
| $b_{ft} := 12$ | Tension Flange Width (Inches) |
| $t_{ft} := .625$ | Tension Flange Thickness (Inches) |
| $f_l := 0$ | Total Factored Lateral Flange Bending Stress at Point (psi) |
| $f_b := 34160$ | Factored Average Flange Stress at Point (psi) |
| $F_y := 36000$ | Yield Strength (psi) |
| $E := 29000000$ | Elastic Modulus (psi) |

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$\text{FLANGE} := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_{fc}}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

$$\text{FLANGE} = \text{"Compact"}$$

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.221$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

$$F_{bs} = 30728$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.945$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.023$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

$$F_{cr1c} = 29703$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

$$F_{cr2c} = 36000$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 29703$$

BRIDGE 69801 J, K, L, M, & N
 Girder 7 : Rating Output : Bottom Flange Factored Bending Stress - Group I Loa

Girder 7 Grp I Factored Bending Stresses - ksi

| Tenth
Point | Loc | ----- Bottom Flange ----- | | | | | | | | Ratio |
|----------------|--------|---|--------------|-------------|-------------|-------------|------|-------|-------|-------|
| | | Noncomp
Dead | Comp
Dead | Max
LM+I | Min
LL+I | LL+I
Rng | Wind | Tot | Allow | |
| 0 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 31.2 | 0.001 |
| 1 | 4.08 | 1.7 | 0.6 | 6.2 | -1.0 | 7.1 | 0.0 | 8.4 | 32.9 | 0.255 |
| 2 | 8.15 | 3.0 | 1.0 | 10.4 | -1.9 | 12.3 | 0.0 | 14.3 | 31.3 | 0.459 |
| 3 | 12.23 | 3.8 | 1.2 | 11.4 | -2.7 | 14.0 | 0.0 | 16.4 | 33.4 | 0.491 |
| 4 | 16.31 | 4.0 | 1.3 | 12.4 | -2.5 | 14.9 | 0.0 | 17.7 | 32.7 | 0.543 |
| 5 | 20.39 | 3.8 | 1.2 | 12.4 | -2.3 | 14.7 | 0.0 | 17.4 | 31.7 | 0.550 |
| 6 | 24.46 | 3.1 | 1.0 | 9.6 | -1.9 | 11.4 | 0.0 | 13.7 | 34.2 | 0.401 |
| 7 | 28.54 | 2.0 | 0.7 | 7.0 | -1.0 | 8.0 | 0.0 | 9.6 | 33.5 | 0.288 |
| 8 | 32.62 | 0.5 | 0.2 | 2.4 | -0.6 | 3.0 | 0.0 | 3.0 | 33.7 | 0.090 |
| Bot.Flgspl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.2 | 0.000 |
| Bot.Flgspl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.9 | 0.000 |
| 9 | 36.69 | -1.2 | -0.5 | 1.4 | -5.0 | 6.4 | 0.0 | -6.7 | 35.2 | 0.190 |
| 10 | 40.77 | -3.0 | -1.2 | 2.5 | -11.7 | 14.1 | 0.0 | -15.9 | 33.7 | 0.471 |
| 11 | 47.74 | 0.8 | 0.3 | 10.1 | -8.9 | 19.0 | 0.0 | 11.2 | 34.8 | 0.322 |
| 12 | 54.70 | 3.5 | 1.2 | 15.0 | -7.9 | 22.9 | 0.0 | 19.7 | 35.9 | 0.548 |
| 13 | 61.66 | 5.1 | 1.7 | 19.9 | -7.1 | 26.9 | 0.0 | 26.7 | 35.7 | 0.749 |
| 14 | 68.63 | 5.7 | 2.0 | 21.5 | -6.4 | 27.9 | 0.0 | 29.2 | 34.4 | 0.847 |
| 15 | 75.59 | 5.1 | 1.9 | 20.8 | -6.1 | 26.9 | 0.0 | 27.8 | 32.5 | 0.854 |
| 16 | 82.56 | 3.3 | 1.5 | 19.8 | -6.7 | 26.5 | 0.0 | 24.6 | 34.6 | 0.713 |
| 17 | 89.52 | 0.1 | 0.8 | 15.2 | -7.9 | 23.1 | 0.0 | 16.1 | 35.8 | 0.450 |
| 18 | 96.49 | -4.7 | -0.4 | 16.1 | -11.5 | 27.6 | 0.0 | -16.5 | 33.2 | 0.497 |
| 19 | 103.45 | -8.8 | -1.7 | 4.9 | -14.3 | 19.2 | 0.0 | -24.8 | 33.7 | 0.734 |
| Bot.Flgspl. | | -10.1 | -2.1 | 4.6 | -16.7 | 21.3 | 0.0 | -28.9 | 33.7 | 0.856 |
| Bot.Flgspl. | | -6.5 | -1.3 | 3.0 | -10.6 | 13.6 | 0.0 | -18.4 | 34.2 | 0.540 |
| 20 | 110.41 | -8.5 | -2.0 | 2.5 | -14.6 | 17.0 | 0.0 | -25.1 | 34.1 | 0.738 |
| Bot.Flgspl. | | -5.2 | -1.2 | 5.5 | -11.3 | 16.7 | 0.0 | -17.7 | 34.1 | 0.521 |
| Bot.Flgspl. | | -5.5 | -1.3 | 5.8 | -12.0 | 17.7 | 0.0 | -18.8 | 33.6 | 0.559 |
| 21 | 117.26 | -4.3 | -1.0 | 7.0 | -10.7 | 17.6 | 0.0 | -15.9 | 33.6 | 0.473 |
| 22 | 124.11 | -0.4 | 0.0 | 10.9 | -8.2 | 19.0 | 0.0 | 10.5 | 33.9 | 0.309 |
| 23 | 130.96 | 2.5 | 0.5 | 14.5 | -6.4 | 20.9 | 0.0 | 17.5 | 36.0 | 0.487 |
| 24 | 137.80 | 4.5 | 0.8 | 17.0 | -5.6 | 22.5 | 0.0 | 22.3 | 35.6 | 0.627 |
| 25 | 144.65 | 5.6 | 1.0 | 18.5 | -5.3 | 23.8 | 0.0 | 25.1 | 35.0 | 0.718 |
| 26 | 151.50 | 5.6 | 0.9 | 18.9 | -5.2 | 24.1 | 0.0 | 25.5 | 35.4 | 0.718 |
| 27 | 158.34 | 4.8 | 0.7 | 17.1 | -5.9 | 23.0 | 0.0 | 22.7 | 35.8 | 0.633 |
| 28 | 165.19 | 3.1 | 0.3 | 14.8 | -6.6 | 21.4 | 0.0 | 18.1 | 35.9 | 0.505 |
| 29 | 172.04 | 0.6 | -0.3 | 8.8 | -6.9 | 15.7 | 0.0 | 9.1 | 35.9 | 0.254 |
| 30 | 178.88 | -2.8 | -1.2 | 1.9 | -7.8 | 9.7 | 0.0 | -11.8 | 33.9 | 0.347 |
| Bot.Flgspl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.8 | 0.000 |
| Bot.Flgspl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.8 | 0.000 |
| 31 | 185.99 | 1.6 | 0.8 | 6.1 | -1.3 | 7.5 | 0.0 | 8.5 | 36.0 | 0.237 |
| 32 | 193.09 | 6.3 | 2.1 | 13.9 | -3.6 | 17.5 | 0.0 | 22.3 | 36.0 | 0.620 |
| 33 | 200.19 | 8.9 | 3.0 | 20.4 | -6.0 | 26.4 | 0.0 | 32.4 | 36.0 | 0.899 |
| 34 | 207.30 | 9.6 | 3.3 | 21.9 | -7.8 | 29.6 | 0.0 | 34.8 | 36.0 | 0.965 |
| 35 | 214.40 | 8.9 | 3.1 | 23.3 | -9.4 | 32.7 | 0.0 | 35.2 | 36.0 | 0.979 |
| 36 | 221.50 | 6.7 | 2.4 | 20.0 | -10.8 | 30.8 | 0.0 | 29.1 | 36.0 | 0.809 |
| 37 | 228.61 | 3.3 | 1.3 | 17.2 | -12.0 | 29.2 | 0.0 | 21.8 | 36.0 | 0.605 |
| 38 | 235.71 | -1.5 | -0.2 | 11.0 | -13.1 | 24.1 | 0.0 | -14.8 | 32.4 | 0.457 |
| 39 | 242.81 | -7.5 | -2.8 | 8.0 | -16.7 | 24.7 | 0.0 | -26.9 | 32.4 | 0.831 |
| Bot.Flgspl. | | -7.6 | -2.8 | 8.0 | -16.8 | 24.8 | 0.0 | -27.2 | 32.4 | 0.838 |
| Bot.Flgspl. | | -5.4 | -2.0 | 5.7 | -12.0 | 17.7 | 0.0 | -19.4 | 32.4 | 0.600 |
| 40 | 249.92 | -10.8 | -4.2 | 5.1 | -16.3 | 21.4 | 0.0 | -31.3 | 32.4 | 0.967 |
| Bot.Flgspl. | | -5.9 | -2.1 | 4.6 | -9.6 | 14.2 | 0.0 | -17.7 | 32.4 | 0.545 |
| Bot.Flgspl. | | -10.1 | -3.6 | 7.8 | -16.5 | 24.3 | 0.0 | -30.2 | 32.4 | 0.932 |
| 41 | 258.02 | -8.8 | -3.0 | 7.7 | -14.6 | 22.3 | 0.0 | -26.5 | 32.4 | 0.818 |
| 42 | 266.12 | -1.4 | 0.0 | 14.3 | -11.9 | 26.2 | 0.0 | -13.2 | 32.4 | 0.407 |
| 43 | 274.22 | 3.6 | 1.7 | 21.5 | -10.7 | 32.2 | 0.0 | 26.8 | 36.0 | 0.744 |
| 44 | 282.32 | 6.3 | 2.6 | 25.9 | -9.8 | 35.8 | 0.0 | 34.8 | 36.0 | 0.967 |
| 45 | 290.42 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 46 | 298.52 | 4.5 | 2.3 | 26.7 | -12.2 | 39.0 | 0.0 | 33.5 | 36.0 | 0.929 |
| 47 | 306.63 | 0.0 | 1.0 | 22.8 | -14.2 | 37.0 | 0.0 | 23.8 | 36.0 | 0.660 |
| Bot.Flgspl. | | -5.5 | -0.7 | 25.3 | -18.5 | 43.8 | 0.0 | -24.6 | 32.4 | 0.760 |
| Bot.Flgspl. | | -3.8 | -0.5 | 17.7 | -13.0 | 30.7 | 0.0 | -17.3 | 32.4 | 0.533 |

| | | | | | | | | | | |
|--------------|--------|---|------|------|-------|------|-----|-------|------|-------|
| 48 | 314.73 | -4.9 | -0.9 | 16.2 | -13.3 | 29.5 | 0.0 | -19.2 | 32.4 | 0.591 |
| 49 | 322.83 | -11.4 | -3.4 | 6.6 | -14.3 | 20.8 | 0.0 | -29.1 | 32.2 | 0.903 |
| Bot.Flg.Spl. | | -11.5 | -3.5 | 6.5 | -14.4 | 20.9 | 0.0 | -29.4 | 32.2 | 0.911 |
| Bot.Flg.Spl. | | -7.2 | -2.2 | 4.1 | -9.0 | 13.1 | 0.0 | -18.4 | 32.2 | 0.570 |
| 50 | 330.93 | -12.4 | -4.2 | 3.0 | -14.7 | 17.7 | 0.0 | -31.2 | 32.2 | 0.968 |
| Bot.Flg.Spl. | | -5.9 | -1.6 | 5.7 | -9.1 | 14.8 | 0.0 | -16.6 | 32.3 | 0.514 |
| Bot.Flg.Spl. | | -11.8 | -3.3 | 11.4 | -18.2 | 29.6 | 0.0 | -33.2 | 32.3 | 1.026 |
| 51 | 340.51 | -10.9 | -2.9 | 11.8 | -17.4 | 29.2 | 0.0 | -31.3 | 32.3 | 0.967 |
| Bot.Flg.Spl. | | -0.2 | 1.3 | 27.3 | -16.7 | 44.0 | 0.0 | 28.3 | 36.0 | 0.787 |
| Bot.Flg.Spl. | | -0.2 | 0.9 | 20.0 | -12.3 | 32.3 | 0.0 | 20.8 | 36.0 | 0.578 |
| 52 | 350.09 | 0.0 | 0.8 | 14.4 | -10.6 | 25.0 | 0.0 | 15.1 | 36.0 | 0.419 |
| 53 | 359.67 | 5.6 | 2.5 | 20.9 | -9.5 | 30.4 | 0.0 | 29.0 | 36.0 | 0.806 |
| 54 | 369.26 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 55 | 378.84 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 56 | 388.42 | Factored stresses in inelastic range for noncompact sect. | | | | | | | | |
| 57 | 398.00 | 5.6 | 2.5 | 19.7 | -8.3 | 28.1 | 0.0 | 27.8 | 34.9 | 0.798 |
| 58 | 407.58 | -0.2 | 0.8 | 14.1 | -9.1 | 23.1 | 0.0 | 14.7 | 34.9 | 0.420 |
| Bot.Flg.Spl. | | -0.3 | 0.7 | 13.9 | -9.1 | 23.0 | 0.0 | -8.7 | 34.9 | 0.248 |
| Bot.Flg.Spl. | | -0.4 | 1.0 | 19.1 | -12.4 | 31.5 | 0.0 | 19.6 | 35.8 | 0.547 |
| 59 | 417.17 | -11.1 | -3.0 | 9.0 | -14.3 | 23.4 | 0.0 | -28.4 | 32.5 | 0.873 |
| Bot.Flg.Spl. | | -12.0 | -3.3 | 8.9 | -15.3 | 24.2 | 0.0 | -30.6 | 32.5 | 0.939 |
| Bot.Flg.Spl. | | -5.6 | -1.6 | 4.2 | -7.2 | 11.4 | 0.0 | -14.4 | 32.5 | 0.443 |
| 60 | 426.75 | -11.9 | -4.0 | 3.2 | -13.9 | 17.1 | 0.0 | -29.8 | 32.2 | 0.925 |
| Bot.Flg.Spl. | | -7.4 | -2.3 | 4.3 | -10.2 | 14.5 | 0.0 | -20.0 | 32.2 | 0.621 |
| Bot.Flg.Spl. | | -10.5 | -3.3 | 6.1 | -14.5 | 20.6 | 0.0 | -28.3 | 32.2 | 0.879 |
| 61 | 434.21 | -10.1 | -3.1 | 6.2 | -14.2 | 20.3 | 0.0 | -27.4 | 32.2 | 0.852 |
| 62 | 441.67 | -4.7 | -1.1 | 14.9 | -13.0 | 27.9 | 0.0 | -18.8 | 32.2 | 0.585 |
| Bot.Flg.Spl. | | -1.8 | 0.0 | 14.2 | -11.0 | 25.2 | 0.0 | -12.9 | 31.7 | 0.406 |
| Bot.Flg.Spl. | | -2.6 | 0.0 | 18.1 | -14.6 | 32.7 | 0.0 | -17.1 | 26.8 | 0.640 |
| 63 | 449.13 | -0.7 | 0.5 | 19.7 | -14.0 | 33.7 | 0.0 | 19.6 | 34.9 | 0.562 |
| 64 | 456.59 | 3.5 | 1.7 | 23.2 | -12.1 | 35.3 | 0.0 | 28.4 | 34.3 | 0.826 |
| 65 | 464.05 | 5.9 | 2.3 | 23.2 | -9.9 | 33.1 | 0.0 | 31.4 | 34.3 | 0.916 |
| 66 | 471.51 | 6.6 | 2.3 | 20.9 | -7.5 | 28.3 | 0.0 | 29.8 | 34.7 | 0.859 |
| 67 | 478.97 | 5.5 | 1.9 | 15.7 | -4.9 | 20.6 | 0.0 | 23.1 | 35.5 | 0.651 |
| 68 | 486.43 | 2.9 | 0.9 | 8.9 | -2.2 | 11.1 | 0.0 | 12.7 | 35.8 | 0.355 |
| Bot.Flg.Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.9 | 0.000 |
| Bot.Flg.Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.8 | 0.000 |
| 69 | 493.89 | -0.9 | -0.4 | 0.9 | -3.3 | 4.2 | 0.0 | -4.6 | 35.8 | 0.128 |
| 70 | 501.35 | -4.8 | -2.1 | 4.2 | -16.0 | 20.2 | 0.0 | -22.9 | 31.4 | 0.730 |
| 71 | 509.61 | 0.4 | -0.8 | 10.3 | -12.9 | 23.2 | 0.0 | -13.2 | 31.4 | 0.421 |
| 72 | 517.87 | 4.2 | 0.1 | 16.9 | -11.8 | 28.7 | 0.0 | 21.3 | 35.1 | 0.605 |
| 73 | 526.14 | 6.6 | 0.6 | 21.1 | -10.0 | 31.1 | 0.0 | 28.3 | 35.5 | 0.799 |
| 74 | 534.40 | 7.6 | 0.9 | 23.1 | -8.6 | 31.7 | 0.0 | 31.6 | 34.7 | 0.911 |
| 75 | 542.67 | 7.1 | 1.0 | 22.7 | -8.0 | 30.6 | 0.0 | 30.7 | 35.4 | 0.867 |
| 76 | 550.93 | 5.1 | 0.8 | 20.8 | -8.7 | 29.5 | 0.0 | 26.7 | 34.9 | 0.764 |
| 77 | 559.19 | 1.7 | 0.4 | 16.5 | -9.9 | 26.4 | 0.0 | 18.5 | 35.6 | 0.519 |
| Bot.Flg.Spl. | | 0.0 | 0.1 | 14.5 | -10.4 | 24.9 | 0.0 | 14.6 | 35.7 | 0.410 |
| Bot.Flg.Spl. | | 0.0 | 0.1 | 14.3 | -10.0 | 24.4 | 0.0 | 14.4 | 35.7 | 0.405 |
| 78 | 567.46 | -3.0 | -0.4 | 13.4 | -11.9 | 25.3 | 0.0 | -15.3 | 32.3 | 0.473 |
| Bot.Flg.Spl. | | -7.7 | -1.2 | 7.3 | -12.6 | 19.9 | 0.0 | -21.5 | 32.3 | 0.664 |
| Bot.Flg.Spl. | | -5.4 | -0.8 | 5.1 | -8.8 | 13.9 | 0.0 | -15.0 | 32.3 | 0.465 |
| 79 | 575.72 | -6.2 | -1.0 | 4.0 | -8.9 | 12.9 | 0.0 | -16.2 | 32.3 | 0.500 |
| 80 | 583.99 | -11.2 | -1.9 | 3.3 | -14.1 | 17.5 | 0.0 | -27.3 | 32.3 | 0.844 |
| 81 | 592.28 | -6.5 | -0.8 | 3.6 | -8.9 | 12.5 | 0.0 | -16.2 | 32.3 | 0.501 |
| Bot.Flg.Spl. | | -5.7 | -0.6 | 5.0 | -8.8 | 13.8 | 0.0 | -15.1 | 32.3 | 0.468 |
| Bot.Flg.Spl. | | -7.1 | -0.8 | 6.2 | -11.0 | 17.3 | 0.0 | -18.9 | 32.3 | 0.586 |
| 82 | 600.58 | -3.1 | 0.1 | 12.9 | -10.8 | 23.7 | 0.0 | -13.9 | 32.3 | 0.430 |
| Bot.Flg.Spl. | | -1.5 | 0.4 | 15.6 | -10.6 | 26.2 | 0.0 | -11.7 | 32.3 | 0.362 |
| Bot.Flg.Spl. | | -1.7 | 0.4 | 16.8 | -11.4 | 28.2 | 0.0 | -12.6 | 31.4 | 0.401 |
| 83 | 608.87 | 0.8 | 0.8 | 15.9 | -10.0 | 25.8 | 0.0 | 17.5 | 35.4 | 0.494 |
| 84 | 617.17 | 3.8 | 1.3 | 20.1 | -9.4 | 29.5 | 0.0 | 25.2 | 34.3 | 0.734 |
| 85 | 625.47 | 5.5 | 1.5 | 21.7 | -8.7 | 30.4 | 0.0 | 28.7 | 35.1 | 0.817 |
| 86 | 633.76 | 5.9 | 1.5 | 22.1 | -9.1 | 31.3 | 0.0 | 29.5 | 34.0 | 0.866 |
| 87 | 642.06 | 4.9 | 1.1 | 20.0 | -10.0 | 30.1 | 0.0 | 26.1 | 35.2 | 0.742 |
| 88 | 650.36 | 2.7 | 0.6 | 16.0 | -11.1 | 27.1 | 0.0 | 19.3 | 34.7 | 0.556 |
| 89 | 658.65 | -0.8 | -0.3 | 9.6 | -11.5 | 21.1 | 0.0 | -12.6 | 31.4 | 0.401 |
| 90 | 666.95 | -5.1 | -1.5 | 2.3 | -12.5 | 14.8 | 0.0 | -19.1 | 33.6 | 0.569 |
| 91 | 674.45 | -0.9 | -0.3 | 0.4 | -2.4 | 2.8 | 0.0 | -3.6 | 34.6 | 0.104 |
| Bot.Flg.Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.8 | 0.000 |
| Bot.Flg.Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.8 | 0.000 |
| 92 | 681.95 | 3.8 | 0.9 | 8.0 | -1.2 | 9.2 | 0.0 | 12.7 | 35.8 | 0.356 |
| 93 | 689.45 | 7.2 | 1.7 | 15.0 | -2.7 | 17.7 | 0.0 | 24.0 | 35.4 | 0.676 |
| 94 | 696.95 | 9.0 | 2.2 | 18.8 | -4.1 | 22.9 | 0.0 | 30.1 | 35.5 | 0.848 |
| 95 | 704.45 | 9.2 | 2.3 | 20.1 | -5.4 | 25.5 | 0.0 | 31.6 | 35.9 | 0.881 |
| 96 | 711.95 | 7.9 | 2.0 | 19.7 | -6.7 | 26.3 | 0.0 | 29.5 | 35.8 | 0.825 |
| 97 | 719.45 | 4.9 | 1.4 | 16.5 | -7.8 | 24.3 | 0.0 | 22.7 | 35.8 | 0.635 |

| | | | | | | | | | | |
|--------------|--------|------|------|------|-------|------|-----|-------|------|-------|
| 98 | 726.95 | 0.3 | 0.4 | 11.7 | -8.9 | 20.6 | 0.0 | 12.5 | 35.9 | 0.347 |
| 99 | 734.45 | -5.7 | -1.2 | 5.5 | -10.7 | 16.3 | 0.0 | -17.7 | 33.6 | 0.525 |
| 100 | 741.95 | -8.6 | -2.1 | 2.4 | -11.1 | 13.5 | 0.0 | -21.8 | 32.4 | 0.673 |
| 101 | 748.54 | -5.0 | -1.1 | 2.7 | -7.6 | 10.3 | 0.0 | -13.8 | 32.4 | 0.425 |
| Bot.Flg.Spl. | | -3.6 | -0.5 | 12.1 | -10.6 | 22.7 | 0.0 | -14.7 | 32.4 | 0.455 |
| Bot.Flg.Spl. | | -4.7 | -0.7 | 16.0 | -14.1 | 30.0 | 0.0 | -19.5 | 31.4 | 0.620 |
| 102 | 755.13 | -4.6 | -0.7 | 16.2 | -14.0 | 30.3 | 0.0 | -19.3 | 31.4 | 0.613 |
| 103 | 761.71 | -0.3 | 0.5 | 15.9 | -10.9 | 26.8 | 0.0 | 16.1 | 35.8 | 0.450 |
| 104 | 768.30 | 2.3 | 1.0 | 19.2 | -9.2 | 28.4 | 0.0 | 22.6 | 35.4 | 0.640 |
| 105 | 774.89 | 3.5 | 1.3 | 20.6 | -7.8 | 28.4 | 0.0 | 25.4 | 33.8 | 0.752 |
| 106 | 781.48 | 3.2 | 1.2 | 19.0 | -8.6 | 27.6 | 0.0 | 23.3 | 35.3 | 0.661 |
| 107 | 788.06 | 1.4 | 0.6 | 16.3 | -10.3 | 26.7 | 0.0 | 18.3 | 35.9 | 0.511 |
| 108 | 794.65 | -1.8 | -0.3 | 10.0 | -11.5 | 21.5 | 0.0 | -13.7 | 31.4 | 0.435 |
| Bot.Flg.Spl. | | -1.9 | -0.4 | 9.8 | -11.6 | 21.4 | 0.0 | -13.9 | 31.4 | 0.441 |
| Bot.Flg.Spl. | | -1.9 | -0.4 | 9.8 | -11.2 | 21.0 | 0.0 | -13.4 | 31.4 | 0.427 |
| 109 | 801.24 | -6.3 | -2.1 | 6.3 | -13.7 | 20.0 | 0.0 | -22.1 | 31.4 | 0.704 |
| Bot.Flg.Spl. | | -6.8 | -2.3 | 6.2 | -14.4 | 20.6 | 0.0 | -23.5 | 31.4 | 0.748 |
| Bot.Flg.Spl. | | -4.7 | -1.6 | 4.3 | -9.9 | 14.1 | 0.0 | -16.1 | 32.3 | 0.500 |
| 110 | 807.83 | -8.5 | -3.0 | 3.6 | -14.4 | 18.0 | 0.0 | -25.9 | 32.3 | 0.802 |
| 111 | 814.46 | -3.8 | -1.2 | 4.6 | -9.4 | 14.0 | 0.0 | -14.4 | 32.3 | 0.447 |
| Bot.Flg.Spl. | | -3.1 | -0.9 | 6.0 | -9.2 | 15.2 | 0.0 | -13.2 | 32.3 | 0.408 |
| Bot.Flg.Spl. | | -4.5 | -1.3 | 8.7 | -13.4 | 22.2 | 0.0 | -19.2 | 31.4 | 0.610 |
| 112 | 821.08 | -0.2 | 0.3 | 11.8 | -10.9 | 22.7 | 0.0 | 11.9 | 35.9 | 0.331 |
| 113 | 827.71 | 3.7 | 1.5 | 16.9 | -9.8 | 26.7 | 0.0 | 22.1 | 35.8 | 0.617 |
| 114 | 834.34 | 6.1 | 2.2 | 20.0 | -8.3 | 28.3 | 0.0 | 28.3 | 34.8 | 0.813 |
| 115 | 840.97 | 7.1 | 2.5 | 21.1 | -6.9 | 28.0 | 0.0 | 30.7 | 32.2 | 0.953 |
| 116 | 847.59 | 6.3 | 2.3 | 19.9 | -7.3 | 27.2 | 0.0 | 28.6 | 34.8 | 0.822 |
| 117 | 854.22 | 4.2 | 1.6 | 16.9 | -8.5 | 25.4 | 0.0 | 22.7 | 35.8 | 0.636 |
| 118 | 860.85 | 0.6 | 0.5 | 10.2 | -9.4 | 19.7 | 0.0 | 11.4 | 35.9 | 0.317 |
| 119 | 867.48 | -4.4 | -1.4 | 6.5 | -11.8 | 18.3 | 0.0 | -17.6 | 31.4 | 0.561 |
| Bot.Flg.Spl. | | -5.1 | -1.6 | 6.4 | -12.5 | 18.9 | 0.0 | -19.2 | 31.4 | 0.610 |
| Bot.Flg.Spl. | | -3.5 | -1.1 | 4.4 | -8.6 | 13.0 | 0.0 | -13.2 | 32.3 | 0.408 |
| 120 | 874.10 | -7.6 | -2.7 | 3.8 | -12.9 | 16.7 | 0.0 | -23.2 | 31.7 | 0.732 |
| 121 | 879.43 | -4.5 | -1.5 | 3.7 | -9.5 | 13.2 | 0.0 | -15.6 | 31.7 | 0.491 |
| Bot.Flg.Spl. | | -3.3 | -1.0 | 6.0 | -9.1 | 15.1 | 0.0 | -13.4 | 31.7 | 0.424 |
| Bot.Flg.Spl. | | -5.4 | -1.6 | 9.8 | -14.8 | 24.6 | 0.0 | -21.8 | 30.7 | 0.709 |
| 122 | 884.75 | -3.4 | -0.9 | 13.5 | -14.1 | 27.6 | 0.0 | -18.4 | 30.7 | 0.600 |
| 123 | 890.07 | -0.5 | 0.2 | 15.4 | -11.3 | 26.7 | 0.0 | 15.1 | 30.7 | 0.490 |
| 124 | 895.39 | 1.5 | 0.7 | 18.3 | -10.1 | 28.4 | 0.0 | 20.5 | 30.0 | 0.683 |
| 125 | 900.71 | 2.3 | 0.9 | 19.3 | -8.7 | 28.1 | 0.0 | 22.5 | 31.6 | 0.714 |
| 126 | 906.03 | 2.1 | 0.8 | 20.3 | -10.7 | 31.1 | 0.0 | 23.3 | 30.2 | 0.770 |
| 127 | 911.35 | 0.9 | 0.4 | 18.3 | -12.9 | 31.2 | 0.0 | 19.6 | 32.2 | 0.609 |
| 128 | 916.67 | -1.5 | -0.3 | 14.6 | -14.7 | 29.4 | 0.0 | -16.5 | 30.7 | 0.538 |
| 129 | 922.00 | -4.8 | -1.8 | 15.0 | -19.3 | 34.3 | 0.0 | -25.9 | 30.7 | 0.842 |
| 130 | 927.32 | -9.1 | -3.5 | 2.6 | -21.6 | 24.2 | 0.0 | -34.2 | 30.0 | 1.140 |
| Bot.Flg.Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.5 | 0.000 |
| Bot.Flg.Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.9 | 0.000 |
| 132 | 939.59 | 3.0 | 0.9 | 4.9 | -0.6 | 5.5 | 0.0 | 8.8 | 35.9 | 0.244 |
| 133 | 945.73 | 5.7 | 1.8 | 9.1 | -0.8 | 9.8 | 0.0 | 16.6 | 35.8 | 0.463 |
| 134 | 951.86 | 7.6 | 2.4 | 11.5 | -0.8 | 12.3 | 0.0 | 21.5 | 35.7 | 0.602 |
| 135 | 958.00 | 8.6 | 2.7 | 12.8 | -0.9 | 13.6 | 0.0 | 24.1 | 35.9 | 0.669 |
| 136 | 964.14 | 8.7 | 2.7 | 12.8 | -0.8 | 13.7 | 0.0 | 24.3 | 36.0 | 0.674 |
| 137 | 970.27 | 7.9 | 2.4 | 11.9 | -0.7 | 12.7 | 0.0 | 22.2 | 35.7 | 0.623 |
| 138 | 976.41 | 6.1 | 1.9 | 9.7 | -0.6 | 10.3 | 0.0 | 17.7 | 35.7 | 0.496 |
| 139 | 982.55 | 3.5 | 1.1 | 5.6 | -0.3 | 5.9 | 0.0 | 10.1 | 35.8 | 0.282 |
| 140 | 988.68 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.0 | 0.000 |

Governing expression for allowable compression stress

Tenth Pt Expression

- 9 compact
- 10 compact
- 18 compact
- 19 (5-4)
- 20 compact
- 21 compact
- 22 compact
- 30 compact
- 38 (5-8)
- 39 (5-8)
- 40 (5-8)
- 41 (5-8)
- 42 (5-8)
- 48 (5-8)
- 49 (5-8)

50 (5-8)
 51 (5-8)
 59 (5-4)
 60 compact
 61 compact
 62 compact
 69 compact
 70 compact
 71 compact
 78 compact
 79 compact
 80 compact
 81 (5-4)
 82 (5-4)
 89 compact
 90 (5-8)
 91 (5-8)
 99 compact
 100 compact
 101 compact
 102 compact
 108 (5-4)
 109 (5-4)
 110 compact
 111 (5-4)
 119 (5-4)
 120 compact
 121 compact
 122 compact
 123 compact
 128 compact
 129 compact
 130 compact
 131 compact

Perf. ratio for compact section is (factored mom/mom strength)
 if this is less than (total stress/allowable stress).

Grp I Bottom Flange Factored Lateral Bending Stress

| Tenth
Pt | Noncomp | | Dead | | Comp Dead | | Max LL+I | | Min LL+I | |
|-------------|-----------------|-----------|-----------------|-----------|-----------------|-----------|-----------------|-----------|-----------------|-----------|
| | Lat Mom
k-ft | fw
ksi | Lat Mom
k-ft | fw
ksi | Lat Mom
k-ft | fw
ksi | Lat Mom
k-ft | fw
ksi | Lat Mom
k-ft | fw
ksi |
| 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | | |
| 1 | -0.66 | 0.33 | -0.24 | 0.12 | -2.51 | 1.26 | -0.47 | 0.24 | | |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | -0.02 | 0.01 | -0.01 | 0.00 | | |
| 3 | 1.65 | 0.82 | 0.61 | 0.30 | 6.27 | 3.13 | 1.19 | 0.59 | | |
| 4 | -1.15 | 0.57 | -0.43 | 0.21 | -4.46 | 2.23 | -0.75 | 0.37 | | |
| 5 | -0.36 | 0.18 | -0.13 | 0.07 | -1.35 | 0.67 | -0.27 | 0.14 | | |
| 6 | 1.00 | 0.50 | 0.38 | 0.19 | 3.93 | 1.97 | 0.59 | 0.30 | | |
| 7 | -0.42 | 0.21 | -0.16 | 0.08 | -1.59 | 0.80 | -0.30 | 0.15 | | |
| 8 | -0.16 | 0.00 | -0.06 | 0.00 | -0.64 | 0.32 | -0.10 | 0.05 | | |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | | |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | | |
| 9 | 0.07 | 0.03 | 0.03 | 0.00 | 0.05 | 0.02 | 0.25 | 0.10 | | |
| 10 | 1.28 | 0.51 | 0.47 | 0.19 | 0.96 | 0.38 | 4.51 | 1.80 | | |
| 11 | -1.54 | 0.62 | -0.57 | 0.00 | -3.26 | 1.30 | -5.31 | 2.12 | | |
| 12 | -0.27 | 0.11 | -0.11 | 0.05 | -0.48 | 0.19 | 0.63 | 0.25 | | |
| 13 | 0.49 | 0.19 | 0.20 | 0.08 | 1.68 | 0.67 | -0.14 | 0.06 | | |
| 14 | -1.83 | 0.73 | -0.76 | 0.31 | -9.14 | 3.66 | -2.31 | 0.93 | | |
| 15 | 3.95 | 1.58 | 1.71 | 0.68 | 20.29 | 8.12 | 4.89 | 1.96 | | |
| 16 | -1.29 | 0.51 | -0.65 | 0.26 | -8.77 | 3.51 | -2.52 | 1.01 | | |
| 17 | -0.65 | 0.00 | 0.12 | 0.05 | 2.37 | 0.95 | -0.13 | 0.05 | | |
| 18 | 0.97 | 0.39 | -0.03 | 0.00 | -0.95 | 0.38 | 0.97 | 0.39 | | |
| 19 | -1.52 | 0.61 | -0.30 | 0.12 | -0.97 | 0.39 | -2.46 | 0.99 | | |
| Bot.Flg.Spl | -1.37 | 0.55 | -0.25 | 0.10 | -1.26 | 0.50 | -2.30 | 0.92 | | |
| Bot.Flg.Spl | -1.37 | 0.38 | -0.25 | 0.07 | -1.26 | 0.36 | -2.30 | 0.65 | | |
| 20 | 4.52 | 1.29 | 0.99 | 0.28 | 1.20 | 0.34 | 7.10 | 2.03 | | |
| Bot.Flg.Spl | -1.15 | 0.33 | -0.25 | 0.07 | -1.98 | 0.56 | -2.81 | 0.80 | | |
| Bot.Flg.Spl | -1.15 | 0.31 | -0.25 | 0.07 | -1.98 | 0.53 | -2.81 | 0.75 | | |
| 21 | -1.48 | 0.40 | -0.32 | 0.08 | -1.69 | 0.45 | -3.10 | 0.83 | | |
| 22 | 0.04 | 0.00 | 0.00 | 0.00 | 0.98 | 0.26 | 1.28 | 0.34 | | |
| 23 | 0.06 | 0.01 | 0.02 | 0.00 | -0.03 | 0.01 | -0.45 | 0.12 | | |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 24 | -0.88 | 0.24 | -0.18 | 0.05 | -3.80 | 1.01 | -1.01 | 0.27 |
| 25 | 2.15 | 0.57 | 0.42 | 0.11 | 8.42 | 2.25 | 1.99 | 0.53 |
| 26 | -1.16 | 0.31 | -0.21 | 0.06 | -4.68 | 1.25 | -1.18 | 0.31 |
| 27 | 0.49 | 0.13 | 0.10 | 0.03 | 1.58 | 0.42 | 0.22 | 0.06 |
| 28 | -0.26 | 0.07 | -0.07 | 0.00 | -0.58 | 0.15 | 0.07 | 0.02 |
| 29 | -0.17 | 0.00 | -0.01 | 0.00 | -1.14 | 0.30 | -0.50 | 0.13 |
| 30 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 |
| 40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -2.53 | 0.67 | -0.38 | 0.10 | -2.93 | 0.78 | -4.34 | 1.16 |
| Bot.Flg.Spl | -2.53 | 0.49 | -0.38 | 0.08 | -2.93 | 0.58 | -4.34 | 0.86 |
| 41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -2.65 | 0.53 | -0.60 | 0.12 | -3.74 | 0.75 | -5.95 | 1.19 |
| Bot.Flg.Spl | -2.65 | 0.73 | -0.60 | 0.16 | -3.74 | 1.00 | -5.95 | 1.60 |
| 48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -0.49 | 0.13 | -0.15 | 0.04 | -0.65 | 0.17 | -0.92 | 0.23 |
| Bot.Flg.Spl | -0.49 | 0.11 | -0.15 | 0.03 | -0.65 | 0.14 | -0.92 | 0.21 |
| 51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flg.Spl | -0.12 | 0.00 | -0.14 | 0.06 | -0.30 | 0.12 | 0.21 | 0.08 |
| Bot.Flg.Spl | -0.12 | 0.08 | -0.14 | 0.09 | -0.30 | 0.20 | 0.21 | 0.14 |
| 52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 55 | 2.38 | 0.95 | 1.10 | 0.44 | 7.62 | 3.05 | 1.83 | 0.73 |
| 56 | -0.92 | 0.37 | -0.44 | 0.18 | -3.18 | 1.27 | -0.84 | 0.34 |
| 57 | 0.24 | 0.10 | 0.18 | 0.07 | 0.87 | 0.35 | 0.04 | 0.02 |
| 58 | -0.14 | 0.00 | -0.15 | 0.06 | -0.44 | 0.18 | 0.14 | 0.05 |
| Bot.Flg.Spl | -0.11 | 0.04 | -0.14 | 0.06 | -0.28 | 0.11 | 0.22 | 0.09 |
| Bot.Flg.Spl | -0.11 | 0.07 | -0.14 | 0.09 | -0.28 | 0.19 | 0.22 | 0.15 |
| 59 | -1.22 | 0.81 | -0.35 | 0.23 | -0.84 | 0.56 | -1.59 | 1.06 |
| Bot.Flg.Spl | -1.23 | 0.82 | -0.34 | 0.23 | -0.97 | 0.65 | -1.66 | 1.10 |
| Bot.Flg.Spl | -1.23 | 0.32 | -0.34 | 0.09 | -0.97 | 0.26 | -1.66 | 0.44 |
| 60 | 4.42 | 1.18 | 1.41 | 0.38 | 1.13 | 0.30 | 4.88 | 1.30 |
| Bot.Flg.Spl | -1.27 | 0.34 | -0.37 | 0.10 | -1.38 | 0.37 | -1.98 | 0.53 |
| Bot.Flg.Spl | -1.27 | 0.52 | -0.37 | 0.15 | -1.38 | 0.56 | -1.98 | 0.80 |
| 61 | -1.40 | 0.56 | -0.40 | 0.16 | -1.41 | 0.56 | -2.11 | 0.84 |
| 62 | 0.06 | 0.03 | -0.06 | 0.02 | 2.13 | 0.85 | 1.23 | 0.49 |
| Bot.Flg.Spl | 0.06 | 0.02 | -0.05 | 0.00 | -0.21 | 0.08 | 0.29 | 0.12 |
| Bot.Flg.Spl | 0.06 | 0.04 | -0.05 | 0.00 | -0.21 | 0.12 | 0.29 | 0.17 |
| 63 | -0.34 | 0.19 | -0.14 | 0.00 | -1.99 | 1.14 | -0.92 | 0.53 |
| 64 | -0.01 | 0.01 | 0.06 | 0.03 | 0.45 | 0.26 | -0.15 | 0.08 |
| 65 | -0.17 | 0.10 | -0.06 | 0.03 | -0.35 | 0.20 | -0.01 | 0.00 |
| 66 | -0.36 | 0.20 | -0.17 | 0.10 | -2.03 | 1.16 | -0.73 | 0.42 |
| 67 | 0.45 | 0.26 | 0.19 | 0.11 | 1.77 | 1.01 | 0.47 | 0.27 |
| 68 | -0.22 | 0.12 | -0.09 | 0.05 | -0.84 | 0.48 | -0.23 | 0.13 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 |
| Bot.Flg.Spl | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 |
| 69 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.04 | 0.01 |
| 70 | 0.68 | 0.23 | 0.28 | 0.09 | 0.56 | 0.19 | 2.11 | 0.70 |
| 71 | -1.05 | 0.00 | -0.31 | 0.10 | -2.20 | 0.73 | -3.19 | 1.06 |
| 72 | 1.27 | 0.42 | 0.03 | 0.00 | 6.33 | 2.11 | 3.63 | 1.21 |
| 73 | -0.88 | 0.29 | -0.09 | 0.03 | -3.72 | 1.24 | -1.56 | 0.52 |
| 74 | 2.26 | 0.75 | 0.32 | 0.11 | 8.63 | 2.88 | 2.65 | 0.88 |
| 75 | -0.95 | 0.32 | -0.15 | 0.05 | -4.11 | 1.37 | -1.34 | 0.45 |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 76 | 1.52 | 0.51 | 0.27 | 0.09 | 7.76 | 2.59 | 2.69 | 0.90 |
| 77 | -0.63 | 0.21 | -0.09 | 0.00 | -2.94 | 0.98 | -1.56 | 0.52 |
| Bot.Flg.Spl | -0.47 | 0.00 | -0.08 | 0.00 | -2.30 | 0.77 | -0.95 | 0.32 |
| Bot.Flg.Spl | -0.47 | 0.00 | -0.08 | 0.00 | -2.30 | 0.77 | -0.95 | 0.32 |
| 78 | 0.97 | 0.32 | 0.11 | 0.00 | 3.99 | 1.33 | 3.53 | 1.18 |
| Bot.Flg.Spl | -1.56 | 0.52 | -0.24 | 0.08 | -1.03 | 0.34 | -2.21 | 0.74 |
| Bot.Flg.Spl | -1.56 | 0.34 | -0.24 | 0.05 | -1.03 | 0.23 | -2.21 | 0.49 |
| 79 | -1.50 | 0.33 | -0.23 | 0.05 | -1.34 | 0.30 | -2.37 | 0.53 |
| 80 | 5.09 | 1.13 | 0.81 | 0.18 | 1.43 | 0.32 | 6.03 | 1.34 |
| 81 | -1.56 | 0.35 | -0.21 | 0.05 | -1.43 | 0.32 | -2.42 | 0.54 |
| Bot.Flg.Spl | -2.73 | 0.61 | -0.39 | 0.09 | -1.88 | 0.42 | -3.88 | 0.86 |
| Bot.Flg.Spl | -2.73 | 0.79 | -0.39 | 0.11 | -1.88 | 0.54 | -3.88 | 1.11 |
| 82 | 1.96 | 0.56 | 0.03 | 0.00 | 7.41 | 2.12 | 6.27 | 1.79 |
| Bot.Flg.Spl | -0.03 | 0.01 | -0.16 | 0.05 | -1.31 | 0.38 | 0.16 | 0.05 |
| Bot.Flg.Spl | -0.03 | 0.01 | -0.16 | 0.05 | -1.31 | 0.38 | 0.16 | 0.05 |
| 83 | -1.08 | 0.31 | -0.22 | 0.06 | -5.59 | 1.60 | -3.05 | 0.87 |
| 84 | 2.22 | 0.63 | 0.85 | 0.24 | 14.45 | 4.13 | 5.63 | 1.61 |
| 85 | -1.44 | 0.41 | -0.46 | 0.13 | -7.73 | 2.21 | -2.83 | 0.81 |
| 86 | 3.46* | 0.99 | 0.98 | 0.28 | 16.06 | 4.59 | 5.51 | 1.57 |
| 87 | -1.28 | 0.36 | -0.35 | 0.10 | -7.01 | 2.00 | -3.09 | 0.88 |
| 88 | 1.59 | 0.45 | 0.39 | 0.11 | 11.71 | 3.35 | 6.74 | 1.93 |
| 89 | -2.03 | 0.58 | -0.53 | 0.00 | -3.62 | 1.03 | -5.39 | 1.54 |
| 90 | 1.64 | 0.47 | 0.44 | 0.12 | 0.69 | 0.20 | 3.72 | 1.06 |
| 91 | 0.03 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.08 | 0.02 |
| Bot.Flg.Spl | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 |
| Bot.Flg.Spl | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 |
| 92 | -0.43 | 0.17 | -0.12 | 0.05 | -1.15 | 0.45 | -0.16 | 0.06 |
| 93 | 1.06 | 0.41 | 0.29 | 0.11 | 2.80 | 1.09 | 0.35 | 0.14 |
| 94 | -1.01 | 0.39 | -0.28 | 0.11 | -2.72 | 1.06 | -0.44 | 0.17 |
| 95 | 0.27 | 0.11 | 0.07 | 0.03 | 0.42 | 0.16 | -0.08 | 0.03 |
| 96 | -0.40 | 0.16 | -0.11 | 0.04 | -0.89 | 0.35 | -0.07 | 0.03 |
| 97 | -0.19 | 0.07 | -0.04 | 0.02 | -1.49 | 0.58 | -0.91 | 0.35 |
| 98 | -0.10 | 0.00 | -0.06 | 0.00 | 1.18 | 0.46 | 1.21 | 0.47 |
| 99 | -0.80 | 0.31 | -0.18 | 0.07 | -1.09 | 0.43 | -1.52 | 0.59 |
| 100 | 5.58 | 1.21 | 1.28 | 0.28 | 1.43 | 0.31 | 6.63 | 1.44 |
| 101 | -2.12 | 0.46 | -0.43 | 0.09 | -2.34 | 0.51 | -3.48 | 0.75 |
| Bot.Flg.Spl | -1.36 | 0.53 | -0.35 | 0.14 | 0.96 | 0.37 | -0.92 | 0.36 |
| Bot.Flg.Spl | -1.36 | 0.74 | -0.35 | 0.19 | 0.96 | 0.51 | -0.92 | 0.49 |
| 102 | -1.28 | 0.69 | -0.34 | 0.18 | 1.18 | 0.63 | -0.71 | 0.38 |
| 103 | -0.04 | 0.00 | -0.11 | 0.00 | -0.41 | 0.22 | 0.45 | 0.24 |
| 104 | -0.48 | 0.26 | -0.10 | 0.05 | -3.59 | 1.92 | -1.78 | 0.95 |
| 105 | 1.34 | 0.71 | 0.58 | 0.31 | 10.22 | 5.46 | 3.06 | 1.64 |
| 106 | -0.25 | 0.13 | -0.12 | 0.07 | -3.58 | 1.92 | -1.71 | 0.92 |
| 107 | -0.23 | 0.12 | -0.09 | 0.05 | -0.26 | 0.14 | 0.49 | 0.26 |
| 108 | -0.91 | 0.49 | -0.28 | 0.00 | 1.04 | 0.56 | -0.51 | 0.27 |
| Bot.Flg.Spl | -0.95 | 0.51 | -0.30 | 0.16 | 0.83 | 0.44 | -0.70 | 0.38 |
| Bot.Flg.Spl | -0.95 | 0.42 | -0.30 | 0.13 | 0.83 | 0.37 | -0.70 | 0.31 |
| 109 | -0.83 | 0.37 | -0.29 | 0.13 | -2.17 | 0.96 | -2.48 | 1.10 |
| Bot.Flg.Spl | -0.60 | 0.27 | -0.21 | 0.09 | -2.05 | 0.91 | -2.10 | 0.93 |
| Bot.Flg.Spl | -0.60 | 0.18 | -0.21 | 0.07 | -2.05 | 0.63 | -2.10 | 0.64 |
| 110 | 4.85 | 1.49 | 1.60 | 0.49 | 1.93 | 0.59 | 7.62 | 2.35 |
| 111 | -1.00 | 0.31 | -0.38 | 0.12 | -2.31 | 0.71 | -2.46 | 0.76 |
| Bot.Flg.Spl | -1.35 | 0.41 | -0.50 | 0.15 | -2.35 | 0.72 | -2.95 | 0.91 |
| Bot.Flg.Spl | -1.35 | 0.61 | -0.50 | 0.22 | -2.35 | 1.05 | -2.95 | 1.32 |
| 112 | -0.76 | 0.00 | -0.20 | 0.00 | 1.30 | 0.58 | -0.44 | 0.19 |
| 113 | -0.63 | 0.28 | -0.21 | 0.09 | -0.60 | 0.27 | 0.74 | 0.33 |
| 114 | -1.13 | 0.50 | -0.53 | 0.24 | -6.48 | 2.88 | -2.83 | 1.26 |
| 115 | 4.82 | 2.14 | 2.02 | 0.90 | 18.34 | 8.15 | 4.89 | 2.17 |
| 116 | -1.27 | 0.56 | -0.58 | 0.26 | -6.30 | 2.80 | -2.57 | 1.14 |
| 117 | -0.52 | 0.23 | -0.18 | 0.08 | -0.74 | 0.33 | 0.53 | 0.24 |
| 118 | -0.91 | 0.00 | -0.22 | 0.00 | 2.06 | 0.92 | -0.55 | 0.24 |
| 119 | -1.40 | 0.62 | -0.54 | 0.24 | -3.63 | 1.62 | -3.21 | 1.42 |
| Bot.Flg.Spl | -0.99 | 0.44 | -0.41 | 0.18 | -3.40 | 1.51 | -2.56 | 1.14 |
| Bot.Flg.Spl | -0.99 | 0.30 | -0.41 | 0.13 | -3.40 | 1.04 | -2.56 | 0.78 |
| 120 | 7.94 | 2.44 | 2.60 | 0.80 | 3.66 | 1.13 | 12.46 | 3.83 |
| 121 | -0.53 | 0.16 | -0.24 | 0.07 | -3.89 | 1.20 | -2.78 | 0.86 |
| Bot.Flg.Spl | -2.18 | 0.67 | -0.79 | 0.24 | -4.97 | 1.53 | -5.54 | 1.71 |
| Bot.Flg.Spl | -2.18 | 1.12 | -0.79 | 0.40 | -4.97 | 2.50 | -5.54 | 2.79 |
| 122 | -2.60 | 1.30 | -0.89 | 0.44 | -3.69 | 1.84 | -5.36 | 2.68 |
| 123 | -0.85 | 0.00 | -0.11 | 0.00 | 7.99 | 4.00 | 3.16 | 1.58 |
| 124 | -0.15 | 0.07 | -0.02 | 0.01 | 0.13 | 0.06 | 0.14 | 0.07 |
| 125 | -0.25 | 0.12 | -0.20 | 0.10 | -8.14 | 4.07 | -4.32 | 2.16 |
| 126 | 0.18 | 0.09 | 0.05 | 0.02 | 1.14 | 0.57 | 0.53 | 0.27 |
| 127 | 0.50 | 0.25 | 0.27 | 0.00 | 9.75 | 4.88 | 5.08 | 2.54 |
| 128 | -0.15 | 0.08 | -0.08 | 0.00 | -2.93 | 1.46 | -1.53 | 0.77 |
| 129 | -0.22 | 0.11 | -0.12 | 0.06 | -4.29 | 2.15 | -2.24 | 1.12 |

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bot.Flг.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.07 | 0.00 |
| Bot.Flг.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.07 | 0.00 |
| 131 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.07 | 0.02 |
| 132 | -0.41 | 0.10 | -0.14 | 0.04 | -0.98 | 0.24 | -0.30 | 0.07 |
| 133 | 0.65 | 0.16 | 0.22 | 0.06 | 1.26 | 0.32 | 0.11 | 0.03 |
| 134 | -1.01 | 0.25 | -0.35 | 0.09 | -1.87 | 0.47 | -0.13 | 0.03 |
| 135 | -0.20 | 0.05 | -0.07 | 0.02 | -0.35 | 0.09 | -0.01 | 0.00 |
| 136 | -0.13 | 0.03 | -0.05 | 0.01 | -0.24 | 0.06 | -0.02 | 0.01 |
| 137 | -1.02 | 0.25 | -0.35 | 0.09 | -1.88 | 0.47 | -0.09 | 0.02 |
| 138 | 0.97 | 0.24 | 0.33 | 0.08 | 1.87 | 0.47 | 0.09 | 0.02 |
| 139 | -0.58 | 0.15 | -0.20 | 0.05 | -1.10 | 0.27 | -0.05 | 0.00 |
| 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Dabrowski sign convention: +fw/fb ratio used for allowable stress.
 (See 2003 Guide spec. commentary C5.1)

First of two splice entries is to left of splice,
 second is to right of splice.

BRIDGE 69801 J, K, L, M, & N
Girder 7 : Rating Output : Lateral Bending in Flanges

Factored Lateral Bending in Bottom Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 11.54 | 16.05 | 6.41 | 0.399 | 0.799 | 0.356 | 0.356 |
| 23.08 | 14.96 | 5.50 | 0.368 | 0.736 | 0.306 | 0.306 |
| 33.64 | 0.11 | 0.02 | 0.219 | 0.438 | compact | |
| 35.71 | 0.20 | 0.01 | 0.033 | 0.066 | compact | |
| 40.77 | 15.88 | 2.50 | 0.158 | 0.315 | compact | |
| 52.43 | 16.91 | 6.72 | 0.397 | 0.794 | compact | |
| 64.07 | 27.59 | 10.84 | 0.393 | 0.786 | compact | |
| 75.69 | 27.71 | 10.90 | 0.393 | 0.787 | compact | |
| 87.26 | 18.86 | 7.56 | 0.401 | 0.802 | compact | |
| 98.78 | 19.23 | 5.89 | 0.306 | 0.612 | compact | |
| 110.41 | 25.13 | 3.60 | 0.143 | 0.287 | compact | |
| 122.39 | 7.85 | 1.33 | 0.169 | 0.338 | compact | |
| 133.68 | 19.44 | 2.75 | 0.142 | 0.283 | compact | |
| 145.00 | 25.14 | 3.55 | 0.141 | 0.283 | compact | |
| 156.31 | 23.47 | 3.33 | 0.142 | 0.284 | compact | |
| 167.60 | 14.97 | 2.15 | 0.144 | 0.288 | compact | |
| 178.88 | 11.77 | 0.01 | 0.001 | 0.002 | compact | |
| 183.82 | 0.01 | 0.00 | 0.023 | 0.046 | 0.000 | 0.000 |
| 185.88 | 0.05 | 0.00 | 0.000 | 0.000 | compact | |
| 201.17 | 32.71 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 217.42 | 32.59 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 233.67 | 11.68 | 0.00 | 0.000 | 0.000 | compact | |
| 249.92 | 31.34 | 0.00 | 0.000 | 0.000 | compact | |
| 266.14 | 15.70 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 282.33 | 34.81 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 298.51 | 33.45 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 314.73 | 22.05 | 0.00 | 0.000 | 0.000 | compact | |
| 330.93 | 31.22 | 0.00 | 0.000 | 0.000 | compact | |
| 346.90 | 12.90 | 0.00 | 0.000 | 0.000 | compact | |
| 362.88 | 31.54 | 0.00 | 0.000 | 0.000 | 0.000 | 0.000 |
| 378.86 | 38.90 | 4.43 | 0.114 | 0.228 | 0.246 | 0.246 |
| 394.83 | 30.68 | 3.53 | 0.115 | 0.230 | 0.196 | 0.196 |
| 410.79 | 10.54 | 1.96 | 0.186 | 0.372 | compact | |
| 426.75 | 29.80 | 2.86 | 0.096 | 0.192 | compact | |
| 443.41 | 15.34 | 1.80 | 0.118 | 0.235 | compact | |
| 460.05 | 29.78 | 4.31 | 0.145 | 0.289 | 0.239 | 0.239 |
| 476.71 | 25.13 | 3.22 | 0.128 | 0.256 | 0.179 | 0.179 |
| 491.73 | 0.01 | 0.00 | 0.072 | 0.144 | compact | |
| 495.06 | 7.45 | 0.06 | 0.008 | 0.016 | compact | |
| 501.35 | 22.92 | 1.02 | 0.045 | 0.089 | compact | |
| 517.90 | 21.27 | 2.54 | 0.120 | 0.239 | compact | |
| 534.41 | 31.63 | 3.74 | 0.118 | 0.236 | compact | |
| 550.95 | 26.68 | 3.19 | 0.119 | 0.239 | compact | |
| 567.48 | 16.84 | 1.54 | 0.091 | 0.182 | compact | |
| 583.99 | 27.26 | 2.65 | 0.097 | 0.194 | compact | |
| 600.52 | 16.08 | 2.41 | 0.150 | 0.299 | compact | |
| 617.12 | 25.17 | 5.07 | 0.202 | 0.403 | compact | |
| 633.73 | 29.47 | 5.90 | 0.200 | 0.400 | compact | |
| 650.35 | 19.27 | 3.91 | 0.203 | 0.406 | compact | |
| 666.95 | 19.09 | 1.66 | 0.087 | 0.174 | compact | |
| 673.87 | 5.04 | 0.06 | 0.012 | 0.024 | compact | |
| 675.95 | 0.01 | 0.00 | 0.096 | 0.192 | compact | |
| 688.39 | 22.37 | 3.23 | 0.144 | 0.289 | compact | |
| 701.76 | 31.07 | 4.84 | 0.156 | 0.311 | compact | |
| 715.17 | 26.62 | 4.20 | 0.158 | 0.315 | compact | |
| 728.56 | 8.51 | 1.83 | 0.215 | 0.430 | compact | |

| | | | | | |
|--------|-------|-------|-------|-------|-------------|
| 741.95 | 21.80 | 2.93 | 0.134 | 0.268 | compact |
| 758.40 | 17.65 | 4.19 | 0.237 | 0.475 | compact |
| 774.84 | 25.43 | 6.59 | 0.259 | 0.519 | compact |
| 791.28 | 12.55 | 3.66 | 0.292 | 0.584 | compact |
| 807.83 | 25.89 | 4.35 | 0.168 | 0.336 | compact |
| 824.39 | 16.97 | 3.77 | 0.222 | 0.444 | compact |
| 840.96 | 30.66 | 11.22 | 0.366 | 0.732 | compact |
| 857.54 | 17.07 | 6.38 | 0.374 | 0.747 | compact |
| 874.10 | 23.21 | 7.12 | 0.307 | 0.613 | compact |
| 891.84 | 16.85 | 7.72 | 0.458 | 0.916 | 0.429 0.429 |
| 909.58 | 20.84 | 9.42 | 0.452 | 0.904 | 0.524 0.524 |
| 927.32 | 34.16 | 0.00 | 0.000 | 0.000 | compact |
| 932.38 | 0.00 | 0.00 | 0.013 | 0.027 | compact |
| 934.45 | 0.44 | 0.04 | 0.096 | 0.192 | compact |
| 944.48 | 14.98 | 1.86 | 0.124 | 0.249 | compact |
| 955.52 | 23.02 | 3.15 | 0.137 | 0.273 | compact |
| 966.59 | 23.45 | 3.21 | 0.137 | 0.274 | compact |
| 977.64 | 16.19 | 2.22 | 0.137 | 0.274 | compact |
| 988.68 | 0.00 | 0.00 | 0.000 | 0.000 | compact |

Factored Lateral Bending in Top Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 33.64 | 0.02 | 0.04 | 2.538 | 5.075 | 0.002 | |
| 35.71 | 0.27 | 0.01 | 0.041 | 0.082 | compact | |
| 40.77 | 21.45 | 4.17 | 0.195 | 0.389 | compact | |
| 98.78 | 25.98 | 9.81 | 0.378 | 0.755 | compact | |
| 110.41 | 25.13 | 3.60 | 0.143 | 0.287 | compact | |
| 122.39 | 7.76 | 1.99 | 0.256 | 0.512 | compact | |
| 178.88 | 15.17 | 0.01 | 0.001 | 0.002 | compact | |
| 183.82 | 0.02 | 0.00 | 0.027 | 0.054 | 0.000 | |
| 185.88 | 0.05 | 0.00 | 0.000 | 0.000 | 0.000 | |
| 249.92 | 31.34 | 0.00 | 0.000 | 0.000 | compact | |
| 314.73 | 22.05 | 0.00 | 0.000 | 0.000 | compact | |
| 330.93 | 31.22 | 0.00 | 0.000 | 0.000 | compact | |
| 346.90 | 9.56 | 0.00 | 0.000 | 0.000 | 0.000 | |
| 410.79 | 7.94 | 1.96 | 0.247 | 0.493 | 0.109 | |
| 426.75 | 29.80 | 2.86 | 0.096 | 0.192 | compact | |
| 443.41 | 15.34 | 1.80 | 0.118 | 0.235 | compact | |
| 491.73 | 0.01 | 0.00 | 0.086 | 0.172 | compact | |
| 495.06 | 10.00 | 0.10 | 0.010 | 0.020 | compact | |
| 501.35 | 30.75 | 1.76 | 0.057 | 0.114 | compact | |
| 567.48 | 16.84 | 1.54 | 0.091 | 0.182 | compact | |
| 583.99 | 27.26 | 2.65 | 0.097 | 0.194 | compact | |
| 600.52 | 16.08 | 2.41 | 0.150 | 0.299 | compact | |
| 666.95 | 24.43 | 2.90 | 0.119 | 0.237 | compact | |
| 673.87 | 6.53 | 0.11 | 0.016 | 0.033 | compact | |
| 675.95 | 0.01 | 0.00 | 0.123 | 0.246 | compact | |
| 741.95 | 21.80 | 2.93 | 0.134 | 0.268 | compact | |
| 807.83 | 25.89 | 4.35 | 0.168 | 0.336 | compact | |
| 874.10 | 23.21 | 7.12 | 0.307 | 0.613 | compact | |
| 927.32 | 43.52 | 0.01 | 0.000 | 0.000 | compact | |
| 932.38 | 0.01 | 0.00 | 0.017 | 0.034 | compact | |
| 934.45 | 0.56 | 0.06 | 0.109 | 0.218 | compact | |
| 988.68 | 0.00 | 0.00 | 0.000 | 0.000 | compact | |



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PROJECT Special Structures Rating

PROJECT # 090147

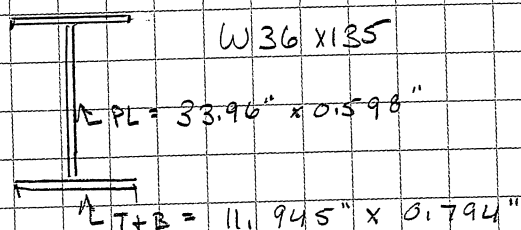
DATE 2/11/10

BY CJM

SHEET NO. 1 OF 4

Check of controlling location - Bridge 69801 m

Location: Girder 8 - span 7.0 (at Pier 2-3D)



Shear capacity

$$D/t_w = 33.96" / 0.598" = 56.79 < 1.10 \sqrt{\frac{E K_w}{F_y}} = 63.46 \quad (K_w = 5) \quad (\text{assume unstiff})$$

$$C = 1.0$$

$$V_u = C V_p = 1.0 (0.58) (36 \text{ ksi}) (33.96") (0.598") = 424.0 \text{ K}$$

$$\text{MDX shear cap} = 424.0 \text{ K} \quad \underline{\underline{\text{OK}}}$$

$$\text{MDX loads} - \text{HS20} = \text{DL non comp} = -37.64 \text{ K}$$

$$\text{DL comp} = -15.15 \text{ K}$$

$$\text{LL + Imp} = -52.28 \text{ K}$$

$$\text{MDX R.F.} = \begin{matrix} 3.13 \text{ inv} \\ 5.23 \text{ op} \end{matrix}$$

$$\text{R.F. inv} = \frac{424.0 \text{ K} - 1.3 (37.64 \text{ K} + 15.15 \text{ K})}{2.17 (52.28 \text{ K})} = 3.13 \quad \text{OK}$$

$$\text{R.F. (op)} = \frac{424 \text{ K} - 1.3 (37.64 \text{ K} + 15.15 \text{ K})}{1.3 (52.28 \text{ K})} = 5.23 \quad \text{OK}$$



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PROJECT Special Structures Rating
PROJECT # 090147 DATE 2/11/10 BY CJM SHEET NO. 2 OF 4

Moment Capacity - Girder 8 - Span point 7.0

$$M_{DX} \text{ Cap} = 1599.9$$

$$M_{DX} R_{IF} = 1.00 \text{ (inv)} ; 1.68 \text{ (OP)}$$

$$I_{xx} = 11254.00 \text{ in}^4$$

$$Y_{TOP} = 18.27 \text{ in}$$

$$Y_{BOT} = 18.27 \text{ in}$$

$$S_{XT} = 11254 / 18.27 = 616.0 \text{ in}^3$$

$$S_{XL} = 616.0 \text{ in}^3$$

$$F_y = 36 \text{ ksi}$$

$$F_{cr} = 31.2 \text{ ksi (MDX)} ; 31.18 \text{ ksi (JWS MathCAD) - OK}$$

$$\text{Cap} = (616.0 \text{ in}^3)(36 \text{ ksi})(1^{+1/12} \text{ in}) = 1848 \text{ K-FT}$$

$$= (616.0 \text{ in}^3)(31.2 \text{ ksi})(1^{+1/12} \text{ in}) = 1631.6 \text{ K-FT}$$

$$M_{DX} = 1599.9 \text{ K-FT} \quad \text{OK (use for R}_{IF}\text{)}$$

MDX Loads @ 7.0

$$DL_{noncomp} = -431.96 \text{ K-FT}$$

$$DL_{comp} = -155.55 \text{ K-FT}$$

$$LL + IMP = -383.75 \text{ K-FT}$$

$$R_{IF \text{ inv}} = \frac{1599.9 \text{ K-FT} - 1.3(-431.96 + -155.55)}{2.17(-383.75)} = 1.00 \quad M_{DX} = 1.0 \quad \underline{\underline{OK}}$$

$$R_{IF \text{ OP}} = \frac{1599.9 \text{ K-FT} - 1.3(-431.96 + -155.55)}{1.3(-383.75)} = 1.68 \quad M_{DX} = 1.68 \quad \underline{\underline{OK}}$$



Project: Bridge 69801 Rating
 Project Number: 090147
 Description: Beam Capacity Verification of MDX Software Output
 Design CJM Check _____
 z/n/p

BRIDGE 69801

CHECK OF BEAM ALLOWABLE STRESS (STRENGTH) AT TENTH POINTS CONSIDERING CURVATURE

PER AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF HORIZONTALLY
STEEL GIRDER HIGHWAY BRIDGES - 2003

Girder and Design Point Under Consideration

| | |
|---------------------|---|
| $G_w := 8$ | Girder Number (From LHB Model) |
| $P_1 := 60$ | Point Number Along Girder (From LHB Model) |
| $N_{loc} := 380.49$ | Location Along Girder (From LHB Model) (Feet) |

Enter Girder Geometric Data

| | |
|-------------------|---|
| $L_w := 18.755$ | Length Between Braces (Feet) |
| $R_w := 1439.39$ | Beam Radius (Feet) |
| $b_{fc} := 11.94$ | Compression Flange Width (Inches) |
| $t_{fc} := .794$ | Compression Flange Thickness (Inches) |
| $b_{ft} := 11.94$ | Tension Flange Width (Inches) |
| $t_{ft} := .794$ | Tension Flange Thickness (Inches) |
| $f_l := 3930$ | Total Factored Lateral Flange Bending Stress at Point (psi) |
| $f_b := 31120$ | Factored Average Flange Stress at Point (psi) |
| $F_y := 36000$ | Yield Strength (psi) |
| $E := 29000000$ | Elastic Modulus (psi) |

Compact Flanges - Art. 5.2.1

$$b_f := \begin{cases} b_{fc} & \text{if } b_{fc} = b_{ft} \wedge t_{fc} = t_{ft} \\ 0.9 \cdot b_{fc} & \text{otherwise} \end{cases}$$

Check for flange symmetry

$$FLANGE := \begin{cases} \text{"Compact"} & \text{if } (F_y \leq 50000) \wedge \left[\left(\frac{b_{fc}}{t_{fc}} \right) \leq 18 \right] \\ \text{"Not Compact"} & \text{otherwise} \end{cases}$$

Check for Flange Compactness

$$FLANGE = \text{"Compact"}$$

$$\lambda := \frac{1}{\pi} \cdot \left[\frac{(12 \cdot l)}{b_f} \right] \cdot \sqrt{\frac{F_y}{E}}$$

$$\lambda = 0.211$$

$$F_{bs} := F_y \cdot (1 - 3 \cdot \lambda^2)$$

(Equation 5-5)

$$F_{bs} = 31174$$

$$\rho_{bc} := \frac{1}{1 + \frac{(12 \cdot l)}{b_f} \cdot \left[1 + \frac{(2 \cdot l)}{b_f} \right] \cdot \left[\left(\frac{1}{R} \right) - 0.01 \right]^2}$$

$$\rho_{bc} = 0.999$$

$$\rho_{wc} := 0.95 + 18 \cdot \left[0.1 - \left(\frac{1}{R} \right) \right]^2 + \left[\left(\frac{f_l}{f_b} \right) \cdot \frac{\left[0.3 - 1.2 \cdot \left(\frac{1}{R} \right) \cdot \left(\frac{1}{b_f} \right) \right]}{\rho_{bc} \cdot \left(\frac{F_{bs}}{F_y} \right)} \right]$$

$$\rho_{wc} = 1.126$$

$$F_{cr1c} := \begin{cases} F_{bs} \cdot \rho_{bc} \cdot \rho_{wc} & \text{if } \rho_{bc} \cdot \rho_{wc} \leq 1 \\ F_{bs} & \text{otherwise} \end{cases}$$

(Equation 5-4)

$$F_{cr1c} = 31174$$

$$F_{cr2c} := F_y - \left| \frac{f_l}{3} \right|$$

(Equation 5-6)

$$F_{cr2c} = 34690$$

$$F_{crc} := \begin{cases} F_{cr1c} & \text{if } F_{cr1c} \leq F_{cr2c} \\ F_{cr2c} & \text{otherwise} \end{cases}$$

$$F_{crc} = 31174$$

Girder 8 Grp I Factored Bending Stresses - ksi

Girder 8 Grp I Factored Bending Stresses - ksi

| Tenth Point | Loc | Bottom Flange | | | | | | Tot | Allow | Ratio |
|----------------|--------|---------------|-----------|----------|----------|----------|------|-------|-------|-------|
| | | Noncomp Dead | Comp Dead | Max LM+I | Min LL+I | LL+I Rng | Wind | | | |
| 0 | 0.00 | 0.0 | 0.0 | 0.0 | -0.1 | 0.1 | 0.0 | -0.1 | 22.8 | 0.005 |
| 1 | 5.66 | 2.0 | 0.5 | 9.3 | -2.3 | 11.7 | 0.0 | 11.8 | 34.1 | 0.344 |
| 2 | 11.32 | 3.2 | 0.7 | 14.5 | -4.6 | 19.2 | 0.0 | 18.4 | 34.1 | 0.540 |
| 3 | 16.98 | 4.5 | 1.0 | 18.2 | -5.0 | 23.2 | 0.0 | 23.7 | 34.3 | 0.691 |
| 4 | 22.64 | 5.1 | 1.0 | 19.8 | -5.3 | 25.1 | 0.0 | 26.0 | 33.4 | 0.779 |
| 5 | 28.30 | 5.6 | 1.1 | 20.5 | -5.1 | 25.6 | 0.0 | 27.2 | 34.4 | 0.790 |
| 6 | 33.96 | 5.2 | 0.9 | 20.0 | -5.5 | 25.5 | 0.0 | 26.1 | 33.3 | 0.784 |
| 7 | 39.62 | 4.4 | 0.6 | 18.6 | -6.5 | 25.1 | 0.0 | 23.6 | 34.3 | 0.686 |
| 8 | 45.28 | 2.6 | 0.2 | 15.3 | -7.5 | 22.8 | 0.0 | 18.0 | 34.1 | 0.529 |
| 9 | 50.95 | -0.3 | -0.6 | 9.4 | -8.7 | 18.2 | 0.0 | -9.6 | 33.8 | 0.284 |
| 10 | 56.61 | -4.2 | -1.9 | 3.1 | -12.2 | 15.4 | 0.0 | -18.3 | 33.0 | 0.554 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.3 | 0.000 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 35.9 | 0.000 |
| 11 | 62.96 | 0.8 | 0.3 | 2.3 | -0.6 | 2.9 | 0.0 | 3.4 | 35.9 | 0.095 |
| 12 | 69.31 | 3.7 | 1.3 | 8.5 | -2.2 | 10.8 | 0.0 | 13.5 | 35.5 | 0.381 |
| 13 | 75.66 | 5.5 | 2.0 | 13.0 | -3.8 | 16.8 | 0.0 | 20.5 | 35.7 | 0.575 |
| 14 | 82.01 | 6.1 | 2.3 | 15.9 | -5.2 | 21.1 | 0.0 | 24.3 | 35.4 | 0.687 |
| 15 | 88.36 | 5.7 | 2.3 | 16.3 | -6.5 | 22.8 | 0.0 | 24.3 | 35.9 | 0.676 |
| 16 | 94.71 | 4.2 | 1.8 | 15.6 | -7.8 | 23.4 | 0.0 | 21.6 | 35.9 | 0.600 |
| 17 | 101.07 | 1.6 | 1.0 | 12.6 | -8.8 | 21.4 | 0.0 | 15.2 | 35.5 | 0.429 |
| 18 | 107.42 | -1.9 | -0.3 | 11.9 | -10.7 | 22.6 | 0.0 | -12.9 | 34.1 | 0.379 |
| 19 | 113.77 | -6.4 | -2.1 | 4.4 | -11.4 | 15.8 | 0.0 | -19.9 | 34.1 | 0.585 |
| Bot. Flg. Spl. | | -6.7 | -2.2 | 4.4 | -11.6 | 16.0 | 0.0 | -20.5 | 34.1 | 0.602 |
| Bot. Flg. Spl. | | -5.2 | -1.7 | 3.4 | -9.0 | 12.4 | 0.0 | -15.9 | 34.1 | 0.467 |
| 20 | 120.12 | -9.2 | -3.4 | 2.8 | -11.7 | 14.5 | 0.0 | -24.3 | 31.5 | 0.771 |
| Bot. Flg. Spl. | | -4.8 | -1.6 | 3.0 | -7.2 | 10.3 | 0.0 | -13.6 | 31.5 | 0.431 |
| Bot. Flg. Spl. | | -6.2 | -2.1 | 3.9 | -9.3 | 13.2 | 0.0 | -17.5 | 31.5 | 0.556 |
| 21 | 127.22 | -6.1 | -2.0 | 3.9 | -9.2 | 13.1 | 0.0 | -17.3 | 31.5 | 0.548 |
| Bot. Flg. Spl. | | -1.7 | -0.2 | 12.6 | -8.3 | 20.9 | 0.0 | -10.1 | 31.5 | 0.322 |
| Bot. Flg. Spl. | | -2.5 | -0.3 | 19.1 | -12.6 | 31.7 | 0.0 | -15.3 | 31.5 | 0.487 |
| 22 | 134.32 | -2.3 | -0.1 | 13.4 | -10.9 | 24.2 | 0.0 | -13.3 | 31.5 | 0.423 |
| 23 | 141.42 | 3.0 | 1.4 | 19.1 | -9.7 | 28.7 | 0.0 | 23.5 | 36.0 | 0.652 |
| 24 | 148.52 | 6.1 | 2.4 | 22.6 | -8.2 | 30.8 | 0.0 | 31.1 | 36.0 | 0.864 |
| 25 | 155.62 | 7.4 | 2.8 | 24.0 | -7.2 | 31.1 | 0.0 | 34.1 | 36.0 | 0.948 |
| 26 | 162.72 | 6.7 | 2.6 | 22.9 | -8.6 | 31.5 | 0.0 | 32.1 | 36.0 | 0.893 |
| 27 | 169.82 | 4.2 | 1.8 | 19.6 | -10.1 | 29.7 | 0.0 | 25.6 | 36.0 | 0.710 |
| 28 | 176.92 | -0.3 | 0.4 | 12.0 | -11.1 | 23.1 | 0.0 | 12.1 | 36.0 | 0.335 |
| 29 | 184.02 | -6.7 | -2.1 | 7.1 | -14.0 | 21.1 | 0.0 | -22.8 | 31.5 | 0.726 |
| 30 | 191.12 | -10.0 | -3.6 | 3.3 | -15.1 | 18.4 | 0.0 | -28.6 | 31.0 | 0.923 |
| 31 | 196.72 | -5.8 | -1.9 | 3.9 | -11.4 | 15.3 | 0.0 | -19. | | |

| | | | | | | | | | | |
|----------------|--------|-------|------|------|-------|------|-----|-------|------|-------|
| 56 | 351.95 | 7.5 | 2.8 | 23.5 | -8.6 | 32.1 | 0.0 | 33.8 | 35.3 | 0.958 |
| 57 | 359.09 | 4.7 | 1.9 | 19.9 | -10.1 | 30.0 | 0.0 | 26.6 | 35.9 | 0.741 |
| 58 | 366.22 | 0.0 | 0.4 | 12.1 | -11.2 | 23.3 | 0.0 | 12.5 | 35.9 | 0.349 |
| 59 | 373.35 | -6.8 | -2.2 | 7.1 | -14.2 | 21.3 | 0.0 | -23.1 | 31.6 | 0.730 |
| 60 | 380.49 | -10.9 | -3.9 | 3.8 | -16.2 | 20.0 | 0.0 | -31.1 | 31.2 | 0.998 |
| 61 | 386.12 | -6.4 | -2.1 | 4.2 | -12.2 | 16.5 | 0.0 | -20.8 | 31.2 | 0.666 |
| 62 | 391.74 | -3.8 | -1.0 | 15.8 | -15.8 | 31.6 | 0.0 | -20.6 | 31.2 | 0.662 |
| 63 | 397.37 | 0.2 | 0.5 | 16.8 | -12.7 | 29.5 | 0.0 | 17.5 | 35.5 | 0.494 |
| 64 | 403.00 | 3.2 | 1.2 | 19.9 | -11.3 | 31.1 | 0.0 | 24.2 | 36.0 | 0.673 |
| 65 | 408.63 | 4.8 | 1.6 | 21.1 | -9.7 | 30.7 | 0.0 | 27.5 | 35.2 | 0.782 |
| 66 | 414.25 | 5.2 | 1.7 | 21.9 | -9.2 | 31.1 | 0.0 | 28.9 | 35.8 | 0.806 |
| 67 | 419.88 | 4.4 | 1.4 | 19.7 | -10.7 | 30.4 | 0.0 | 25.6 | 35.2 | 0.727 |
| 68 | 425.51 | 2.4 | 0.8 | 15.7 | -12.0 | 27.8 | 0.0 | 18.9 | 35.0 | 0.539 |
| 69 | 431.14 | -0.8 | -0.3 | 15.8 | -15.5 | 31.3 | 0.0 | -16.7 | 31.2 | 0.536 |
| 70 | 436.77 | -5.3 | -2.1 | 3.1 | -17.0 | 20.2 | 0.0 | -24.4 | 32.6 | 0.749 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.9 | 0.000 |
| Bot. Flg. Spl. | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.9 | 0.000 |
| 71 | 442.39 | -0.4 | -0.1 | 0.2 | -1.1 | 1.3 | 0.0 | -1.6 | 34.4 | 0.045 |
| 72 | 448.02 | 3.9 | 1.1 | 9.6 | -1.8 | 11.4 | 0.0 | 14.6 | 35.6 | 0.410 |
| 73 | 453.64 | 6.6 | 2.0 | 16.3 | -3.7 | 20.0 | 0.0 | 24.9 | 36.0 | 0.691 |
| 74 | 459.27 | 7.9 | 2.3 | 19.0 | -5.7 | 24.7 | 0.0 | 29.2 | 34.6 | 0.844 |
| 75 | 464.90 | 7.7 | 2.3 | 19.4 | -7.4 | 26.8 | 0.0 | 29.3 | 35.4 | 0.828 |
| 76 | 470.52 | 5.9 | 1.9 | 18.9 | -9.0 | 27.9 | 0.0 | 26.7 | 35.5 | 0.752 |
| 77 | 476.15 | 2.8 | 1.0 | 16.2 | -10.8 | 26.9 | 0.0 | 20.0 | 34.8 | 0.574 |
| Bot. Flg. Spl. | | -0.4 | 0.3 | 17.8 | -13.9 | 31.8 | 0.0 | -14.0 | 30.9 | 0.455 |
| Bot. Flg. Spl. | | -0.4 | 0.3 | 19.1 | -14.9 | 34.0 | 0.0 | -15.1 | 30.9 | 0.488 |
| 78 | 481.77 | -2.0 | -0.3 | 15.7 | -15.5 | 31.2 | 0.0 | -17.8 | 30.9 | 0.577 |
| 79 | 487.40 | -5.3 | -1.7 | 4.8 | -10.8 | 15.6 | 0.0 | -17.8 | 30.9 | 0.575 |
| 80 | 493.03 | -10.4 | -3.5 | 3.3 | -14.0 | 17.3 | 0.0 | -27.8 | 30.9 | 0.902 |
| 81 | 499.25 | -8.3 | -2.3 | 5.7 | -13.7 | 19.5 | 0.0 | -24.3 | 31.7 | 0.765 |
| 82 | 505.48 | -1.6 | 0.2 | 12.8 | -10.3 | 23.0 | 0.0 | -11.6 | 31.7 | 0.366 |
| 83 | 511.71 | 3.5 | 1.5 | 18.6 | -9.1 | 27.7 | 0.0 | 23.6 | 35.9 | 0.659 |
| 84 | 517.94 | 6.5 | 2.3 | 22.3 | -7.8 | 30.0 | 0.0 | 31.0 | 35.5 | 0.875 |
| 85 | 524.16 | 7.5 | 2.6 | 24.0 | -6.7 | 30.7 | 0.0 | 34.0 | 34.3 | 0.993 |
| 86 | 530.39 | 6.5 | 2.3 | 22.7 | -8.4 | 31.1 | 0.0 | 31.5 | 35.4 | 0.888 |
| 87 | 536.62 | 3.6 | 1.5 | 20.5 | -10.1 | 30.6 | 0.0 | 25.6 | 35.9 | 0.713 |
| 88 | 542.85 | -1.2 | 0.2 | 17.9 | -13.7 | 31.6 | 0.0 | 16.9 | 31.7 | 0.532 |
| Bot. Flg. Spl. | | -1.7 | 0.0 | 17.2 | -13.8 | 31.0 | 0.0 | -15.5 | 31.7 | 0.488 |
| Bot. Flg. Spl. | | -1.8 | 0.0 | 18.6 | -15.0 | 33.5 | 0.0 | -16.7 | 31.7 | 0.528 |
| 89 | 549.08 | -8.7 | -2.6 | 7.9 | -16.3 | 24.2 | 0.0 | -27.6 | 31.5 | 0.876 |
| 90 | 555.30 | -10.3 | -3.5 | 2.6 | -14.0 | 16.6 | 0.0 | -27.8 | 31.5 | 0.883 |
| 91 | 561.50 | -9.2 | -2.7 | 7.5 | -17.5 | 25.0 | 0.0 | -29.3 | 31.5 | 0.931 |
| 92 | 567.70 | -2.2 | 0.1 | 14.5 | -12.9 | 27.5 | 0.0 | -15.0 | 31.5 | 0.476 |
| 93 | 573.90 | 3.2 | 1.5 | 20.5 | -11.3 | 31.8 | 0.0 | 25.1 | 36.0 | 0.698 |
| 94 | 580.11 | 6.2 | 2.3 | 24.1 | -9.5 | 33.6 | 0.0 | 32.6 | 36.0 | 0.905 |
| 95 | 586.31 | 7.2 | 2.6 | 25.4 | -7.7 | 33.1 | 0.0 | 35.2 | 36.0 | 0.977 |
| 96 | 592.51 | 6.1 | 2.4 | 23.8 | -7.7 | 31.5 | 0.0 | 32.3 | 36.0 | 0.897 |
| 97 | 598.71 | 3.0 | 1.6 | 21.3 | -9.1 | 30.4 | 0.0 | 25.9 | 36.0 | 0.718 |
| 98 | 604.91 | -2.2 | 0.3 | 18.3 | -12.4 | 30.7 | 0.0 | 16.4 | 31.5 | 0.521 |
| 99 | 611.11 | -9.4 | -2.5 | 6.2 | -13.5 | 19.8 | 0.0 | -25.4 | 31.5 | 0.805 |
| 100 | 617.31 | -11.9 | -3.8 | 3.5 | -14.5 | 17.9 | 0.0 | -30.2 | 30.5 | 0.992 |
| 101 | 622.49 | -6.7 | -1.9 | 4.2 | -11.5 | 15.7 | 0.0 | -20.1 | 30.5 | 0.659 |
| 102 | 627.67 | -3.7 | -0.4 | 18.8 | -16.3 | 35.0 | 0.0 | -20.4 | 30.5 | 0.669 |
| 103 | 632.85 | 1.7 | 1.1 | 18.6 | -12.0 | 30.6 | 0.0 | 21.4 | 36.0 | 0.594 |
| 104 | 638.03 | 5.8 | 2.0 | 22.0 | -10.4 | 32.4 | 0.0 | 29.9 | 36.0 | 0.830 |
| 105 | 643.22 | 8.4 | 2.7 | 23.3 | -8.7 | 32.1 | 0.0 | 34.4 | 36.0 | 0.956 |
| 106 | 648.40 | 9.5 | 2.9 | 23.3 | -7.1 | 30.4 | 0.0 | 35.8 | 36.0 | 0.993 |
| 107 | 653.58 | 9.3 | 2.8 | 21.6 | -5.4 | 27.0 | 0.0 | 33.7 | 36.0 | 0.935 |
| 108 | 658.76 | 7.6 | 2.2 | 17.4 | -3.6 | 21.0 | 0.0 | 27.2 | 36.0 | 0.756 |
| 109 | 663.94 | 4.5 | 1.3 | 10.4 | -1.8 | 12.2 | 0.0 | 16.3 | 36.0 | 0.452 |
| 110 | 669.13 | 0.0 | 0.0 | 0.1 | -0.1 | 0.2 | 0.0 | -0.1 | 36.0 | 0.003 |

Governing expression for allowable compression stress

Tenth Pt Expression

- 9 compact
- 10 compact
- 18 (5-8)
- 19 (5-8)
- 20 (5-8)
- 21 (5-8)
- 22 (5-8)
- 29 (5-8)
- 30 (5-8)
- 31 (5-8)
- 32 (5-8)
- 39 (5-8)

Perf. ratio for compact section is (factored mom/mom strength)
if this is less than (total stress/allowable stress).

[illegible]

| | | | | | | | | |
|-------------|-------|------|-------|------|-------|------|-------|------|
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 49 | -0.57 | 0.37 | -0.22 | 0.14 | -1.66 | 1.06 | -1.39 | 0.89 |
| 50 | 4.15 | 1.48 | 1.34 | 0.48 | 1.13 | 0.40 | 5.10 | 1.81 |
| 51 | -0.64 | 0.41 | -0.25 | 0.16 | -1.54 | 0.98 | -1.36 | 0.86 |
| 52 | -0.62 | 0.39 | -0.16 | 0.00 | 0.96 | 0.61 | -0.29 | 0.18 |
| 53 | -0.28 | 0.18 | -0.09 | 0.06 | -0.25 | 0.16 | 0.24 | 0.15 |
| 54 | -0.41 | 0.26 | -0.22 | 0.14 | -2.67 | 1.70 | -0.97 | 0.62 |
| 55 | 1.93 | 1.23 | 0.84 | 0.54 | 7.55 | 4.80 | 1.72 | 1.09 |
| 56 | -0.47 | 0.30 | -0.23 | 0.15 | -2.59 | 1.64 | -0.98 | 0.62 |
| 57 | -0.23 | 0.15 | -0.08 | 0.05 | -0.29 | 0.18 | 0.26 | 0.16 |
| 58 | -0.50 | 0.00 | -0.13 | 0.00 | 0.90 | 0.57 | -0.27 | 0.17 |
| 59 | -0.63 | 0.40 | -0.25 | 0.16 | -1.49 | 0.94 | -1.36 | 0.86 |
| 60 | 3.76 | 1.47 | 1.23 | 0.48 | 1.18 | 0.46 | 5.09 | 1.98 |
| 61 | -0.27 | 0.10 | -0.12 | 0.05 | -1.54 | 0.60 | -1.06 | 0.41 |
| 62 | -1.20 | 0.76 | -0.41 | 0.26 | -1.37 | 0.87 | -2.11 | 1.34 |
| 63 | -0.24 | 0.00 | -0.01 | 0.00 | 3.23 | 2.05 | 1.26 | 0.80 |
| 64 | -0.15 | 0.10 | -0.04 | 0.02 | 0.08 | 0.05 | 0.22 | 0.14 |
| 65 | -0.37 | 0.24 | -0.17 | 0.11 | -3.23 | 2.05 | -1.50 | 0.95 |
| 66 | 0.21 | 0.13 | 0.06 | 0.04 | 0.44 | 0.28 | 0.02 | 0.01 |
| 67 | 0.45 | 0.29 | 0.18 | 0.12 | 3.74 | 2.37 | 0.90 | 0.58 |
| 68 | -0.90 | 0.57 | -0.33 | 0.21 | -1.54 | 0.98 | -2.53 | 1.61 |
| 69 | -0.90 | 0.57 | -0.34 | 0.00 | -2.03 | 1.29 | -2.48 | 1.58 |
| 70 | 0.49 | 0.31 | 0.18 | 0.11 | 0.27 | 0.17 | 1.44 | 0.92 |
| Bot.Flг.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 | 0.00 |
| Bot.Flг.Spl | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 | 0.00 |
| 71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.05 | 0.03 |
| 72 | -0.36 | 0.23 | -0.13 | 0.08 | -1.26 | 0.82 | -0.36 | 0.24 |
| 73 | -0.03 | 0.02 | -0.01 | 0.01 | -0.18 | 0.12 | -0.11 | 0.07 |
| 74 | 1.39 | 0.90 | 0.49 | 0.32 | 4.47 | 2.89 | 0.99 | 0.64 |
| 75 | -0.41 | 0.26 | -0.16 | 0.10 | -2.05 | 1.33 | -0.83 | 0.54 |
| 76 | -0.49 | 0.32 | -0.18 | 0.11 | -1.74 | 1.13 | -0.47 | 0.30 |
| 77 | 0.55 | 0 | | | | | | |

| | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|
| 102 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 103 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 105 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 106 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 107 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 108 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 109 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 110 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Dabrowski sign convention: +fw/fb ratio used for allowable stress.
(See 2003 Guide spec. commentary C5.1)

First of two splice entries is to left of splice,
second is to right of splice.

BRIDGE 69801 J, K, L, M, & N
Girder 8 : Rating Output : Lateral Bending in Flanges

Factored Lateral Bending in Bottom Flange
From Curvature

| Brace Location
(ft) | Primary
Bending
Stress
(ksi) | Lateral
Bending
Stress
(ksi) | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|------------------------|---------------------------------------|---------------------------------------|-----------------------------|---------------|---------------------------|---------------|
| 0.00 | 0.00 | 0.00 | 0.000 | 0.000 | compact | |
| 11.32 | 18.44 | 5.75 | 0.312 | 0.623 | 0.319 | 0.319 |
| 22.64 | 25.98 | 8.08 | 0.311 | 0.622 | 0.449 | 0.449 |
| 33.95 | 26.13 | 8.17 | 0.313 | 0.626 | 0.454 | 0.454 |
| 45.28 | 18.05 | 5.76 | 0.319 | 0.639 | 0.320 | 0.320 |
| 56.61 | 18.30 | 0.07 | 0.004 | 0.007 | 0.004 | 0.004 |
| 61.58 | 0.04 | 0.00 | 0.055 | 0.110 | compact | |
| 63.66 | 4.89 | 0.35 | 0.071 | 0.142 | compact | |
| 74.11 | 18.79 | 5.07 | 0.270 | 0.539 | compact | |
| 85.62 | 24.28 | 7.24 | 0.298 | 0.597 | compact | |
| 97.11 | 19.19 | 5.82 | 0.303 | 0.607 | compact | |
| 108.62 | 14.25 | 0.00 | 0.000 | 0.000 | compact | |
| 120.12 | 24.29 | 0.00 | 0.000 | 0.000 | compact | |
| 137.87 | 17.19 | 0.00 | 0.000 | 0.000 | compact | |
| 155.62 | 34.12 | 0.00 | 0.000 | 0.000 | compact | |
| 173.37 | 18.82 | 0.00 | 0.000 | 0.000 | compact | |
| 191.12 | 28.59 | 0.00 | 0.000 | 0.000 | compact | |
| 209.80 | 19.65 | 0.00 | 0.000 | 0.000 | compact | |
| 228.47 | 26.67 | 0.00 | 0.000 | 0.000 | compact | |
| 247.12 | 21.44 | 0.00 | 0.000 | 0.000 | compact | |
| 252.04 | 0.01 | 0.00 | 0.000 | 0.000 | compact | |
| 254.14 | 7.25 | 0.00 | 0.000 | 0.000 | compact | |
| 271.79 | 32.00 | 0.00 | 0.000 | 0.000 | compact | |
| 290.47 | 20.67 | 0.00 | 0.000 | 0.000 | compact | |
| 309.14 | 30.53 | 3.77 | 0.123 | 0.247 | compact | |
| 326.98 | 19.12 | 3.63 | 0.190 | 0.379 | compact | |
| 344.83 | 36.18 | 6.56 | 0.181 | 0.362 | compact | |
| 362.65 | 19.56 | 3.66 | 0.187 | 0.374 | compact | |
| 380.49 | 31.12 | 3.93 | 0.126 | 0.253 | compact | |
| 399.25 | 19.75 | 4.16 | 0.211 | 0.421 | compact | |
| 418.01 | 26.68 | 5.44 | 0.204 | 0.408 | compact | |
| 436.77 | 24.41 | 1.34 | 0.055 | 0.110 | compact | |
| 440.71 | 0.00 | 0.00 | 0.003 | 0.007 | compact | |
| 442.78 | 0.53 | 0.04 | 0.082 | 0.164 | compact | |
| 458.87 | 28.89 | 4.77 | 0.165 | 0.330 | compact | |
| 475.96 | 20.20 | 3.67 | 0.182 | 0.363 | compact | |
| 493.03 | 27.84 | 2.80 | 0.101 | 0.201 | compact | |
| 508.61 | 17.57 | 2.76 | 0.157 | 0.314 | compact | |
| 524.17 | 34.02 | 5.09 | 0.150 | 0.299 | compact | |
| 539.75 | 18.07 | 2.83 | 0.157 | 0.313 | compact | |
| 555.30 | 27.81 | 0.00 | 0.000 | 0.000 | compact | |
| 570.81 | 18.79 | 0.00 | 0.000 | 0.000 | compact | |
| 586.30 | 35.16 | 0.00 | 0.000 | 0.000 | compact | |
| 601.81 | 17.85 | 0.00 | 0.000 | 0.000 | compact | |
| 617.31 | 30.22 | 0.00 | 0.000 | 0.000 | compact | |
| 634.57 | 24.19 | 0.00 | 0.000 | 0.000 | compact | |
| 651.86 | 34.36 | 0.00 | 0.000 | 0.000 | compact | |
| 669.13 | 0.00 | 0.00 | 0.000 | 0.000 | compact | |

Factored Lateral Bending in Top Flange
From Curvature

| Brace Location | Primary
Bending
Stress | Lateral
Bending
Stress | Lateral

Primary | Perf
Ratio | Lateral

.5 Fy | Perf
Ratio |
|----------------|------------------------------|------------------------------|-----------------------------|---------------|---------------------------|---------------|
|----------------|------------------------------|------------------------------|-----------------------------|---------------|---------------------------|---------------|

| (ft) | (ksi) | (ksi) | | | |
|--------|-------|-------|-------|-------|---------|
| 56.61 | 23.72 | 0.11 | 0.004 | 0.009 | compact |
| 61.58 | 0.05 | 0.00 | 0.068 | 0.136 | compact |
| 63.66 | 6.22 | 0.52 | 0.084 | 0.168 | compact |
| 108.62 | 18.13 | 0.00 | 0.000 | 0.000 | compact |
| 120.12 | 24.29 | 0.00 | 0.000 | 0.000 | compact |
| 191.12 | 28.59 | 0.00 | 0.000 | 0.000 | compact |
| 247.12 | 21.44 | 0.00 | 0.000 | 0.000 | compact |
| 252.04 | 0.01 | 0.00 | 0.000 | 0.000 | compact |
| 254.14 | 7.25 | 0.00 | 0.000 | 0.000 | compact |
| 309.14 | 30.53 | 3.77 | 0.123 | 0.247 | compact |
| 380.49 | 31.12 | 3.93 | 0.126 | 0.253 | compact |
| 436.77 | 24.41 | 1.34 | 0.055 | 0.110 | compact |
| 440.71 | 0.00 | 0.00 | 0.003 | 0.007 | compact |
| 442.78 | 0.53 | 0.04 | 0.082 | 0.164 | compact |
| 493.03 | 27.84 | 2.80 | 0.101 | 0.201 | compact |
| 555.30 | 27.81 | 0.00 | 0.000 | 0.000 | compact |
| 617.31 | 30.22 | 0.00 | 0.000 | 0.000 | compact |



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/3/10 BY CSM SHEET NO. _____ OF _____

- Permit Loading only Loads Girder in question + Does not Load Adjacent Girders. Due to Nature of Bridge System + having influence surface draped over Entire System, Adjacent Girders will have an influence on Girder in Question. The following calculations are the percent increase to Distribution Factor for Permit Loading

Christopher Miller

From: MDX Software Support [support@mdxsoftware.com]
Sent: Monday, February 22, 2010 8:28 AM
To: Christopher Miller
Cc: Jon Siiter; mdxsoftware@gmail.com
Subject: Re: (Case 55452) Permit Loads

Your mail has been scanned by InterScan VirusWall.
*****_*****

You are correct in the description of your first two paragraphs. There is no way to place a permit truck on only a few girders near the girder of concern if wheel distribution is used for loading. One reason is that some geometries that can be constructed in the general geometry model do not necessarily have neighboring girders numbered sequentially.

If you want to reflect the contribution of neighboring girders if only one girder actually is being loaded we suggest perhaps increasing the distribution of the permit truck to compensate. Since live loading is largely probabilistic it would seem this could be adequate. If you examine the influence surface for any particular effect you could use the relative size of neighboring coefficients as a guide for the amount of increase. Note that the far girders may not contribute that much to the girder of concern because of the drape of the influence surface.

The problem seems to be that it is difficult to relate distribution factors to actual lane loading. If you can do the latter it would seem to be a better model of the loading.

(Note: recommend calling us if you send a Gmail since we do not closely monitor that avenue. The closely monitored address is support@mdxsoftware.com. The Gmail address is available for those cases where attachments for some reason have a problem being sent to our primary address.)

rd

<http://www.mdxsoftware.com/faq.htm>
<http://www.mdxsoftware.com/fixlog.htm>
<http://www.mdxsoftware.com/new.htm>

Download info for your office can be
obtained at: Help\Update Information

MDX Software Support
support@mdxsoftware.com

-----Original Message-----

From: "Christopher Miller" <Christopher.Miller@lhbcorp.com>

Reply-To: "Christopher Miller" <Christopher.Miller@lhbcorp.com>

Date: Wed, 17 Feb 2010 13:57:17 -0600

To: "MDX Software Support" <support@mdxsoftware.com>

Cc: "Jon Siiter" <Jon.Siiter@lhbcorp.com>, "mdxsoftware@gmail.com" <mdxsoftware@gmail.com>

Subject: RE: (Case 55452) Permit Loads

>*****

>Your mail has been scanned by InterScan VirusWall.

>*****_*****

>

>

>I'm still trying to figure out what exactly is going on with the permit trucks.

>

>

>To clarify, for HS20, it places the wheels along ALL the girders in the place of greatest effect. It then applies the distribution factor and impact to those loads based on the influence surface. So it takes into account the loads from the adjacent girders when finding the loads for the girder and location of concern.

>

>

>When permit truck loads are calculated, it places the truck along ONLY the girder of concern and applies the distribution factor and impact. It does not take into account the influence from adjacent girders for the girder of concern even though those girders will see a load and have influence on the girder of concern.

>

>Is there a way when running the permit trucks to get influence from the adjacent girders without enacting the condition PERMIT TRUCK IN ALL LANES? When enacting this condition, it seems to be over conservative, where the default seems to be missing some of the load. If we were to use the default when obtaining permit loads, would we have to adjust the distribution factor as stated in FAQ #20, paragraph 4 to account for additional load from adjacent girders? It seems that when running permit trucks on default, MDX is finding the loads along the line of that of HS20 when enacting the condition LOCAL WHEEL DISTRIBUTION ONLY, and the default for HS20 finds loads along the lines of the permit trucks when enacting the condition PERMIT TRUCKS IN ALL LANES.

>

>Thanks,

>

>Chris

>

>

>

MDX Software - FAQ #20

Why do I get significantly different results using the same wheel distribution on girders of a system that I use on a single girder of that system modeled as a line girder project?

The difference is due primarily to differences in ordinates of influence lines, developed for the single girder, from ordinates of influence surfaces developed for the system. A unit load is used in both cases, but the entire system across the grid resists the unit load placed at a particular location on the system, whereas only the single girder, modeled as a line girder project, resists the unit load placed at a comparable location. Because multiple girders in the system are involved in the resistance, influence ordinates over a girder in the system will be less than those for that girder modeled as a line girder project.

In that respect it might then seem reasonable to apply a larger distribution to the system for equivalent effects. This might be the case if only the girder for which effects are being determined were the only girder loaded with the distribution given for that girder. However, the influence surface for a particular effect drapes over the entire grid, and there exists a counter argument that wheel distribution given for all girders in the grid should be applied to the influence surface ordinates at those other girders when determining a particular effect on the girder for which live effects are being developed. This is the approach MDX employs by default.

Thus it would then seem that equivalent effects between a system model and a line girder model would be obtained only by using a lower distribution value for the system. But comparing system analysis modeling to line girder modeling has a bit of the flavor of an apples and oranges comparison. Skew, curvature, and short girder inserts are only a few of the factors that make it difficult to determine an equivalent wheel distribution for a system which would produce results comparable to that of a line girder model. Determining the equivalent wheel distribution to be applied to the separate girders of a system is a task we have to leave to the user exercising sound engineering judgement.

As an alternative for consideration, we have enabled a condition, LOCAL WHEEL DISTRIBUTION ONLY, which causes only the girder for which live effects are being determined to be loaded with the wheel distribution supplied for that girder. While it is felt some rigor is sacrificed if this approach is used, it does reduce considerably the compute time for a large system. In this case it would make sense to use a larger distribution than that used for a line girder project because of the differences in influence ordinates.

Whatever choice is made, the user can check results for a particular effect on a particular girder by applying wheel distribution, for all girders loaded, to the influence surface values at those loaded girders.



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/3/10

BY CJM

SHEET NO. 1 OF 1

Location: Girder 7 - Span point 3.0

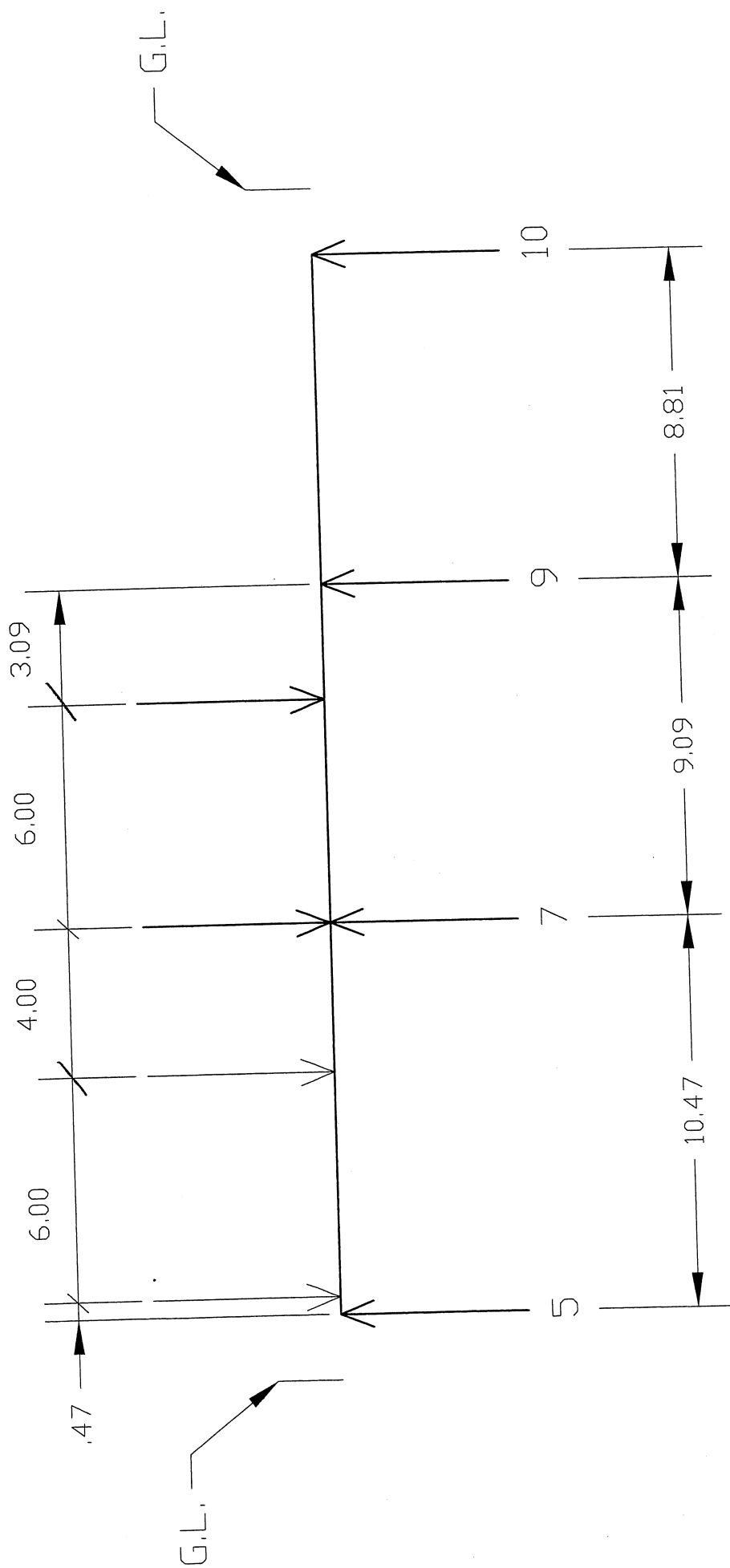
- use Framing plan Geometry from Girder 5 - span point 5.0
(See calcs)
- Distribution factor - 1 lane permit, 1 lane HS20
(See attached sheets for calcs)

From Influence surface

Single girder Loaded = -198.1 k-ft

1 lane Permit = 241.5 k-ft $\Delta = 21.9\%$

1 lane Permit + 1 lane HS20 = 366.8 k-ft $\Delta = 85.2\%$



Case 3

Permit

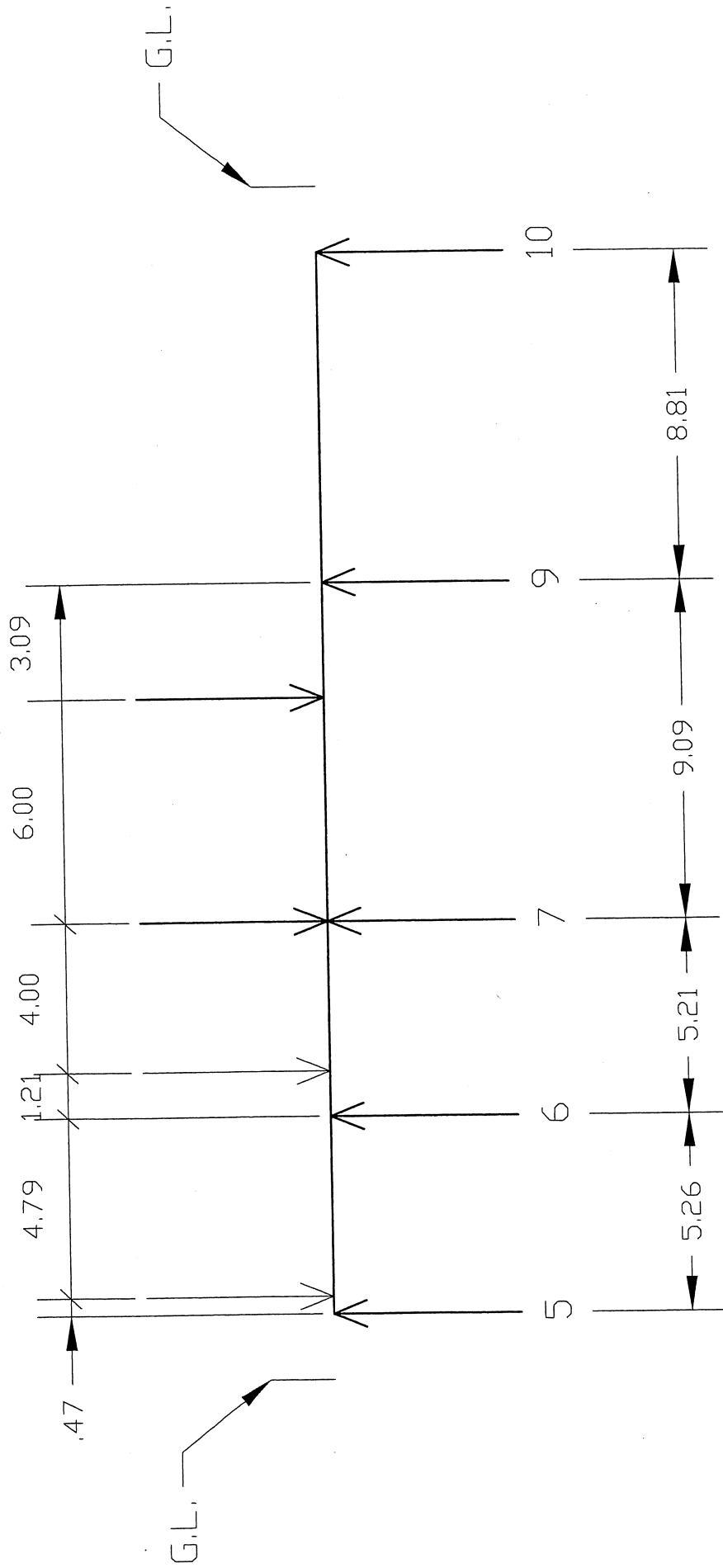
$$G_7 = 1^k + 1^k (3.09 / 9.09) =$$

$$G_9 = 1^k (6.00 / 9.09) =$$

H520

$$G_5 = 1^k (10.0 / 10.47) + 1^k (4.0 / 10.47) = 1.337 \text{ wheels}$$

$$G_7 = 1^k (6.47 / 10.47) + 1^k (0.47 / 10.47) = 0.663 \text{ wheels}$$



Case 2 - permit truck only

$$\text{Girder 7} = 1^k + 1^k (3.09' / 9.09') = 1.340 \text{ wheels}$$

$$\text{Girder 9} = 1^k (6.00 / 9.09) = 0.660 \text{ wheels}$$

Mom at 20

Girder 10

0.00000 0.00031 0.00053 0.00089 0.00103 0.00121
0.00125 0.00124 0.00099 0.00075 0.00000 10
-0.00142 -0.00321 -0.00475 -0.00650 -0.00748
-0.00819 -0.00780 -0.00700 -0.00447 0.00000 20
0.00634 0.01280 0.02198 0.02769 0.03506
0.03895 0.03973 0.03782 0.02691 0.00000 30
-0.02213 -0.04046 -0.04263 -0.02743 -0.00889
0.02575 0.04470 0.04757 0.02161 0.00000 40
0.02430 0.06589 0.07694 0.08281 0.07154
0.06013 0.04339 0.02812 0.01267 0.00000 50
-0.01234 -0.00939 -0.00416 -0.00180 -0.00023
0.00011 -0.00025 -0.00040 -0.00028 0.00000 60
0.00012 0.00002 -0.00019 -0.00033 -0.00040
-0.00039 -0.00031 -0.00019 -0.00012 0.00000 70
0.00010 0.00014 0.00020 0.00024 0.00024
0.00023 0.00019 0.00013 0.00010 0.00000 80
-0.00011 -0.00010 -0.00009 -0.00008 -0.00006
-0.00004 -0.00003 -0.00001 -0.00001 0.00000 90
0.00001 0.00001 0.00002 0.00002 0.00002
0.00001 0.00001 0.00001 0.00000 0.00000 100
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 110
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 120
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 130
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 140
0.00000 0.00000 0.00000 0.00000 0.00000 150

Girder 9

0.00000

0.00116 0.00197 0.00337 0.00388 0.00454
0.00480 0.00476 0.00385 0.00298 0.00000 10
-0.00540 -0.01175 -0.01725 -0.02297 -0.02652
-0.02847 -0.02757 -0.02401 -0.01517 0.00000 20
0.02558 0.04959 0.09385 0.12416 0.18481
0.21243 0.27514 0.30667 0.26225 0.00000 30
-0.30095 -0.65990 -0.93637 -1.13861 -1.25322
-1.21398 -0.98964 -0.76341 -0.24563 0.00000 40
-0.11346 -0.42552 -0.55463 -0.68895 -0.71979
-0.66887 -0.53220 -0.42212 -0.18414 0.00000 50
0.16642 0.13494 0.11569 0.09646 0.07763
0.05879 0.03796 0.02647 0.01029 0.00000 60
-0.00883 -0.01123 -0.01439 -0.01452 -0.01340
-0.01132 -0.00862 -0.00492 -0.00284 0.00000 70
0.00172 0.00229 0.00270 0.00302 0.00289
0.00257 0.00193 0.00131 0.00090 0.00000 80
-0.00089 -0.00080 -0.00072 -0.00056 -0.00044
-0.00033 -0.00022 -0.00011 -0.00007 0.00000 90
0.00005 0.00006 0.00008 0.00008 0.00007
0.00006 0.00005 0.00003 0.00002 0.00000 100
-0.00001 -0.00001 -0.00001 -0.00002 -0.00002
-0.00001 -0.00001 -0.00001 0.00000 0.00000 110
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 120
0.00000 0.00000 0.00000 0.00000 0.00000 130
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 140
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 150

Girder 8

-1.39064 -1.48353 -1.55387 -1.51250 -1.41795 -1.25755
-1.05588 -0.82139 -0.56096 -0.26301 0.00000 10
0.25913 0.21975 0.18485 0.16418 0.12507
0.10518 0.06625 0.04663 0.01895 0.00000 20
-0.01604 -0.02062 -0.02686 -0.02738 -0.02543
-0.02166 -0.01665 -0.00959 -0.00564 0.00000 30
0.00333 0.00439 0.00523 0.00585 0.00559
0.00498 0.00376 0.00258 0.00179 0.00000 40
-0.00140 -0.00112 -0.00102 -0.00081 -0.00065
-0.00050 -0.00035 -0.00018 -0.00012 0.00000 50
0.00008 0.00011 0.00014 0.00014 0.00013

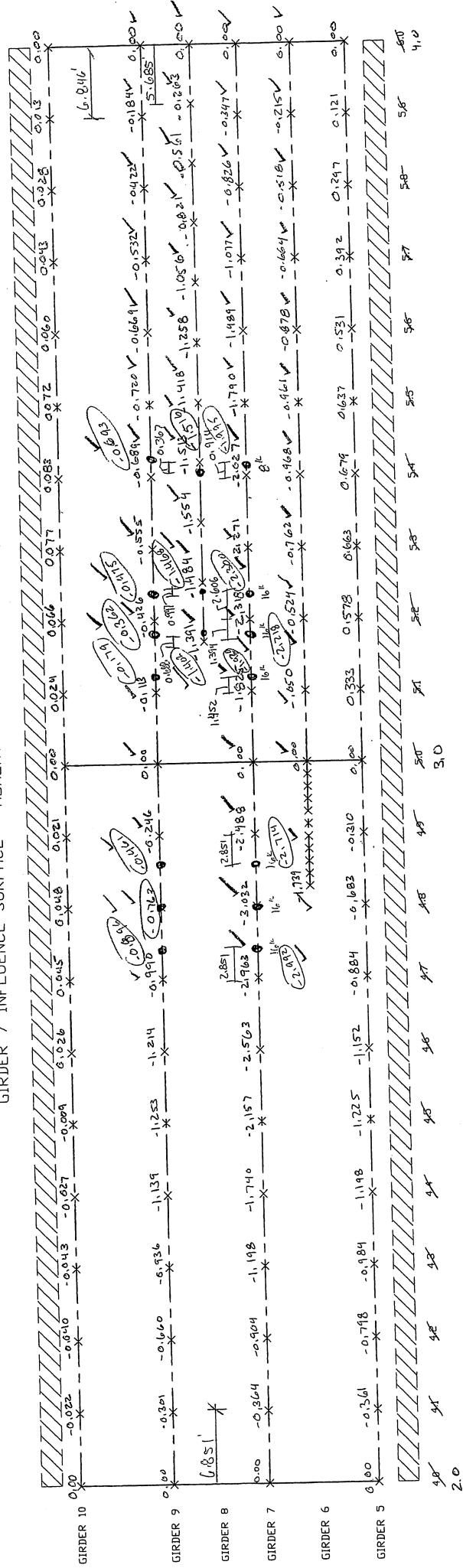
| | | | | | | |
|----------|----------|----------|----------|----------|----------|------------|
| | | 0.00011 | 0.00009 | 0.00005 | 0.00003 | 0.00000 |
| | | -0.00002 | -0.00002 | -0.00003 | -0.00003 | -0.00003 |
| | | -0.00003 | -0.00002 | -0.00001 | -0.00001 | 0.0000070 |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000090 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000010 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000110 |
| Girder 7 | 0.07529 | 0.11850 | 0.14472 | 0.20387 | 0.24428 | 0.27090 |
| | | 0.33429 | 0.36705 | 0.40388 | 0.26329 | 0.0000010 |
| | | -0.36420 | -0.90430 | -1.19815 | -1.73982 | -2.15730 |
| | | -2.56270 | -2.96297 | -3.03165 | -2.48840 | 0.0000020 |
| | | -1.82505 | -2.31764 | -2.27130 | -2.02677 | -1.79014 |
| | | -1.48853 | -1.07717 | -0.82632 | -0.34729 | 0.0000030 |
| | | 0.27867 | 0.25409 | 0.22531 | 0.18573 | 0.16258 |
| | | 0.11395 | 0.09288 | 0.04844 | 0.02513 | 0.0000040 |
| | | -0.01951 | -0.03018 | -0.03490 | -0.03564 | -0.03325 |
| | | -0.02849 | -0.02173 | -0.01446 | -0.00711 | 0.0000050 |
| | | 0.00499 | 0.00779 | 0.00847 | 0.00871 | 0.00806 |
| | | 0.00685 | 0.00498 | 0.00371 | 0.00145 | 0.0000060 |
| | | -0.00087 | -0.00117 | -0.00145 | -0.00145 | -0.00134 |
| | | -0.00111 | -0.00074 | -0.00048 | -0.00013 | 0.0000070 |
| | | 0.00009 | 0.00015 | 0.00018 | 0.00019 | 0.00018 |
| | | 0.00015 | 0.00012 | 0.00008 | 0.00004 | 0.0000080 |
| | | -0.00003 | -0.00004 | -0.00005 | -0.00005 | -0.00005 |
| | | -0.00004 | -0.00003 | -0.00002 | -0.00001 | 0.0000090 |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| | | 0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000130 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000140 |
| Girder 6 | -1.73923 | -1.38546 | -1.12714 | -0.94184 | -0.80736 | -0.70123 |
| | | -0.60132 | -0.49269 | -0.36394 | -0.20357 | 0.0000010 |
| | | -0.05041 | -0.52438 | -0.76216 | -0.96804 | -0.96099 |
| | | -0.87818 | -0.66413 | -0.51764 | -0.21480 | 0.0000020 |
| | | 0.23252 | 0.19364 | 0.15517 | 0.11412 | 0.09546 |
| | | 0.06049 | 0.04813 | 0.02349 | 0.01201 | 0.0000030 |
| | | -0.00883 | -0.01397 | -0.01616 | -0.01656 | -0.01548 |
| | | -0.01330 | -0.01013 | -0.00678 | -0.00338 | 0.0000040 |
| | | 0.00233 | 0.00368 | 0.00401 | 0.00414 | 0.00384 |
| | | 0.00327 | 0.00238 | 0.00178 | 0.00068 | 0.0000050 |
| | | -0.00041 | -0.00055 | -0.00068 | -0.00068 | -0.00063 |
| | | -0.00052 | -0.00034 | -0.00022 | -0.00006 | 0.0000060 |
| | | 0.00004 | 0.00007 | 0.00008 | 0.00009 | 0.00008 |
| | | 0.00007 | 0.00005 | 0.00004 | 0.00002 | 0.0000070 |
| | | -0.00001 | -0.00002 | -0.00002 | -0.00002 | -0.00002 |
| | | -0.00002 | -0.00002 | -0.00001 | -0.00001 | 0.0 |

[illegible]

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

✓ RAM 4/30/10

GIRDER 7 INFLUENCE SURFACE - MOMENT - POINT 20 - SPAN POINT 3.0



$WDX Load = -229.16 \text{ k-ft}$
 $DF = 1.310 \text{ (5/5.5)}$
 $LL + IMP = 125$
 $Girder 7 = 1.310 + 125 \cdot \frac{1}{2} [(8k, -1.995) + 16 (-2.942 + -3.052 + -2.714 + -1.930 + -2.218 + -2.300)] = 212.00 \text{ k-ft} \quad D = 8\% \quad 0k$
 $W/Statics D.F.$

$Girder 7 = 125 \cdot \frac{1}{2} [1wheel (8k, -1.995) + 16 (-2.300 + -2.218)] + 134wheels \cdot 16k (-1.93 + -2.714 + -3.032 + -2.942) = -198.1 \text{ k-ft}$
 $Girder 8 = 125 \cdot \frac{1}{2} [1wheel (8k, -1.995) + 16 (-2.942 + -3.052 + -2.714 + -1.930)] = -241.4 \text{ k-ft}$
 $Girder 9 = 125 \cdot \frac{1}{2} [1wheel (8k, -1.995) + 16 (-2.942 + -3.052 + -2.714 + -1.930)] + 0.66wheels \cdot 16k (-0.179 + -0.461 + -0.765 + -0.896) = -19.0 \text{ k-ft}$

$Total Permit = 241.5 \text{ k-ft}$
 $D = \frac{-241.5}{-198.1} = 21.9\% \quad \checkmark$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/2/10 BY CJM SHEET NO. OF

Permit Truck D.F. Adjustment

Location - Girder 5 - span point S.O

- Location is in an area of curvature interchange. Influence Surface will be draped over squared span. Span lengths will be averaged by all Girders that Run Entire length of span + Girder spacing will be taken at Pier 2-3E

Span length : Pier 3-3E to Pier 2-3E

Girder 5 = 71.84'

Girder 6 = N/A - Girder does not span entire length

Girder 7 = 69.65'

Girder 9 = 67.40'

Girder 10 = 65.14'

Average = 68.51'

Span from Pier 2-3E to Pier 1-3E was calculated for location - Girder 5 - span point S.S - use 68.46'

Girder Spacing

G₅ - G₆ = 5.26'

G₆ - G₇ = 5.21'

G₇ - G₉ = 9.09

G₉ - G₁₀ = 8.81

Girder 8 - Partially in Span from Pier 2-3E - 1-3E - use similar ratio of spacing from start of Girder 8 between 7 + 9 for @ Pier

$$9.09 / 9.44 = 0.963 \rightarrow \text{A Beginning}$$
$$7-8 = 4.67 \cdot 0.963 = 4.50 \quad \text{sum} = 9.09014$$
$$8-9 = 4.78 \cdot 0.963 = 4.59$$



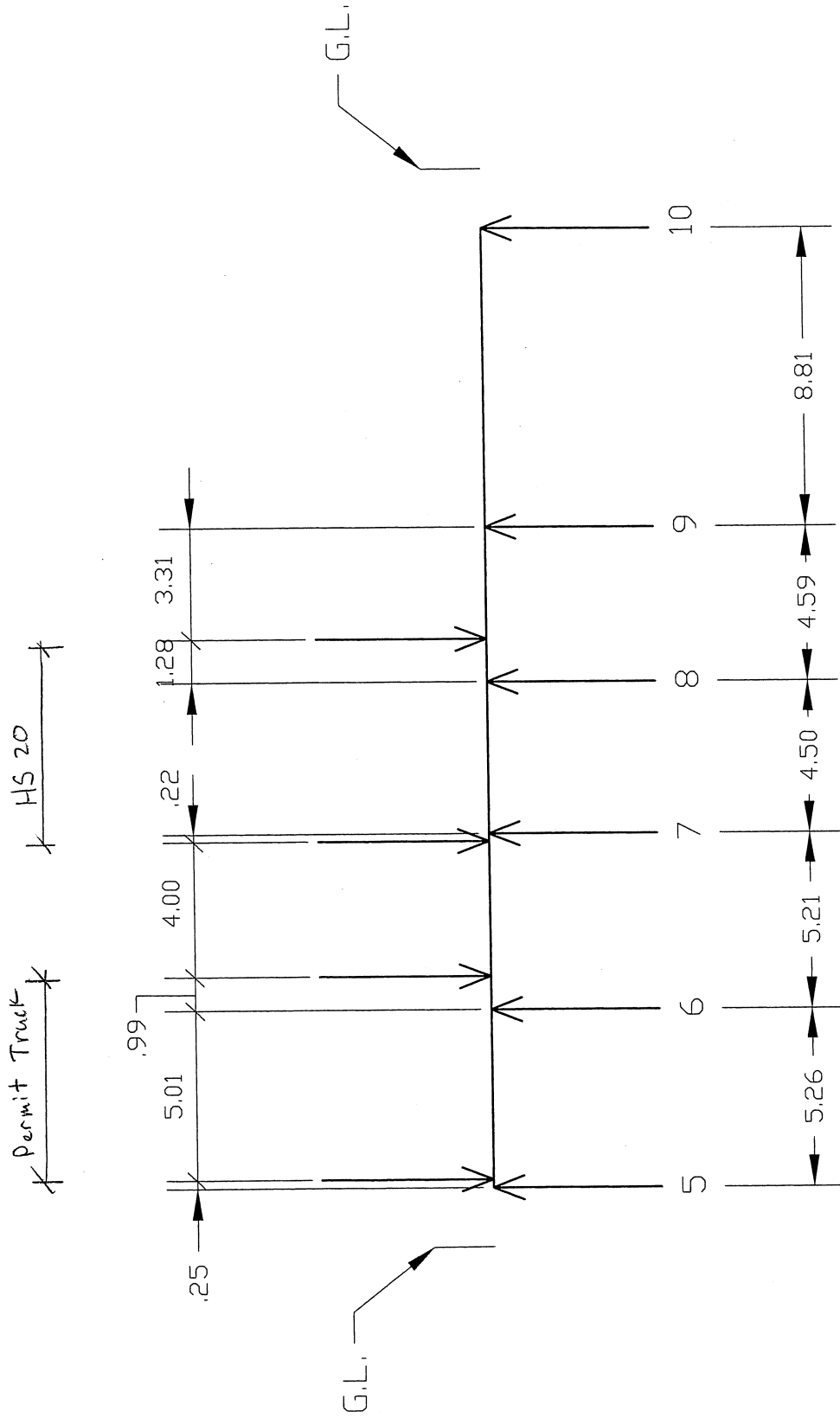
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PROJECT _____
PROJECT # _____ DATE _____ BY _____ SHEET NO. _____ OF _____

From Influence Surface

- Single Girder loaded = -274.6 k-ft
- 1 lane Permit Truck = -313.73 k-ft $\Delta = 14.2\%$
- 1 lane Permit + 1 lane HS20 = -399.2 k-ft $\Delta = 45.4\%$



Case 1

Permit Truck Distribution Factor

$$G_5 = 1^k (5.01' / 5.22') = 0.952 \text{ wheels}$$

$$G_6 = 1^k (4.22' / 5.21') + 1^k (0.25' / 5.22') = 0.858 \text{ wheels}$$

$$G_7 = 1^k (0.99' / 5.21') = 0.190 \text{ wheels}$$

HS20 Distribution Factor

$$G_5 = 1^k (0.22' / 5.21') = 0.042 \text{ wheels}$$

$$G_6 = 1^k (4.99' / 5.21') = 0.958 \text{ wheels}$$

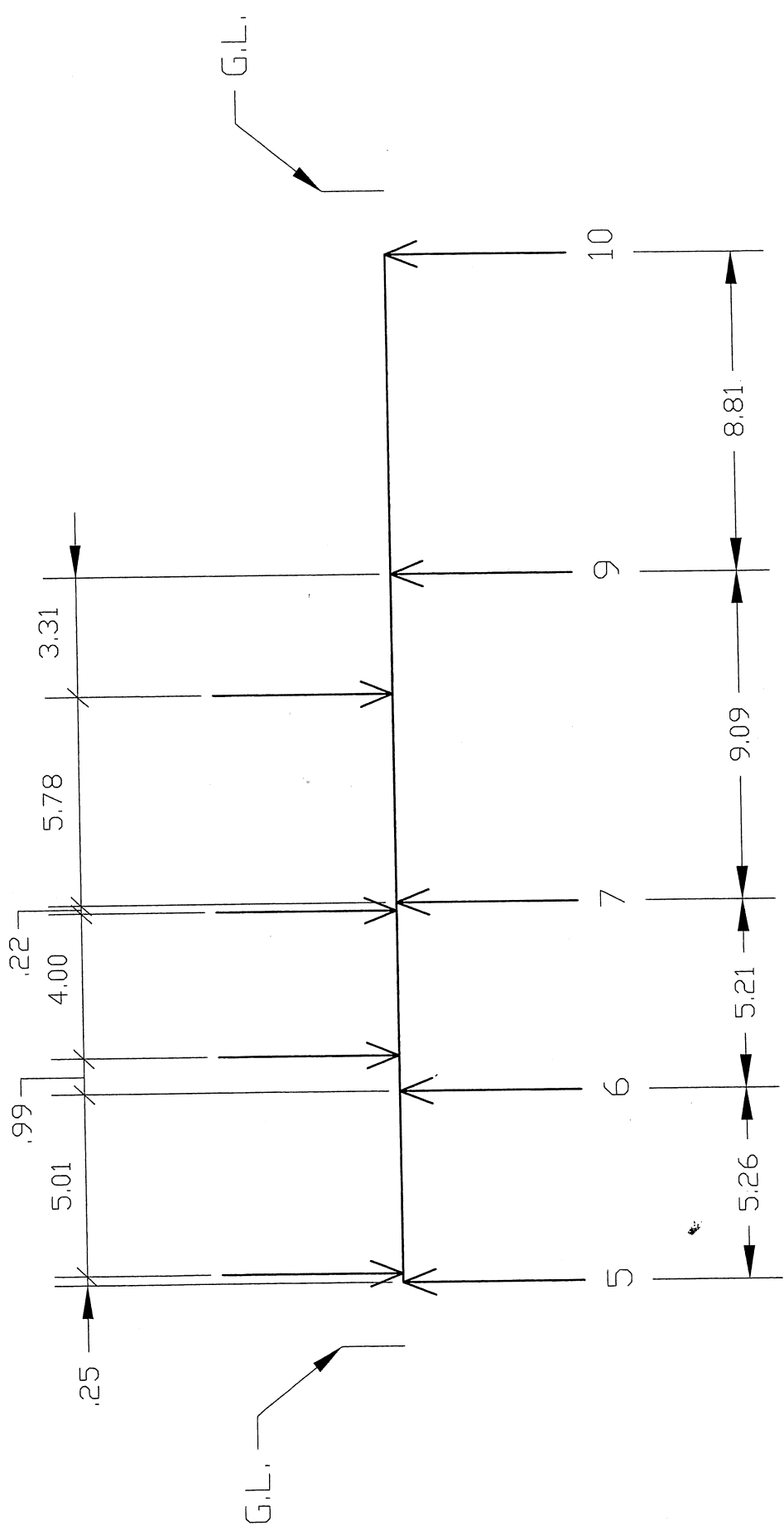
$$G_7 = 1^k (3.31' / 4.59') = 0.721 \text{ wheels}$$

$$G_8 = 1^k (1.28' / 4.59') = 0.279 \text{ wheels}$$

$$\Sigma F_y = 2 \text{ wheels } \text{ok}$$

$$\Sigma F_y = 2 \text{ wheels } \text{ok}$$

Permit Truck HS20 Truck



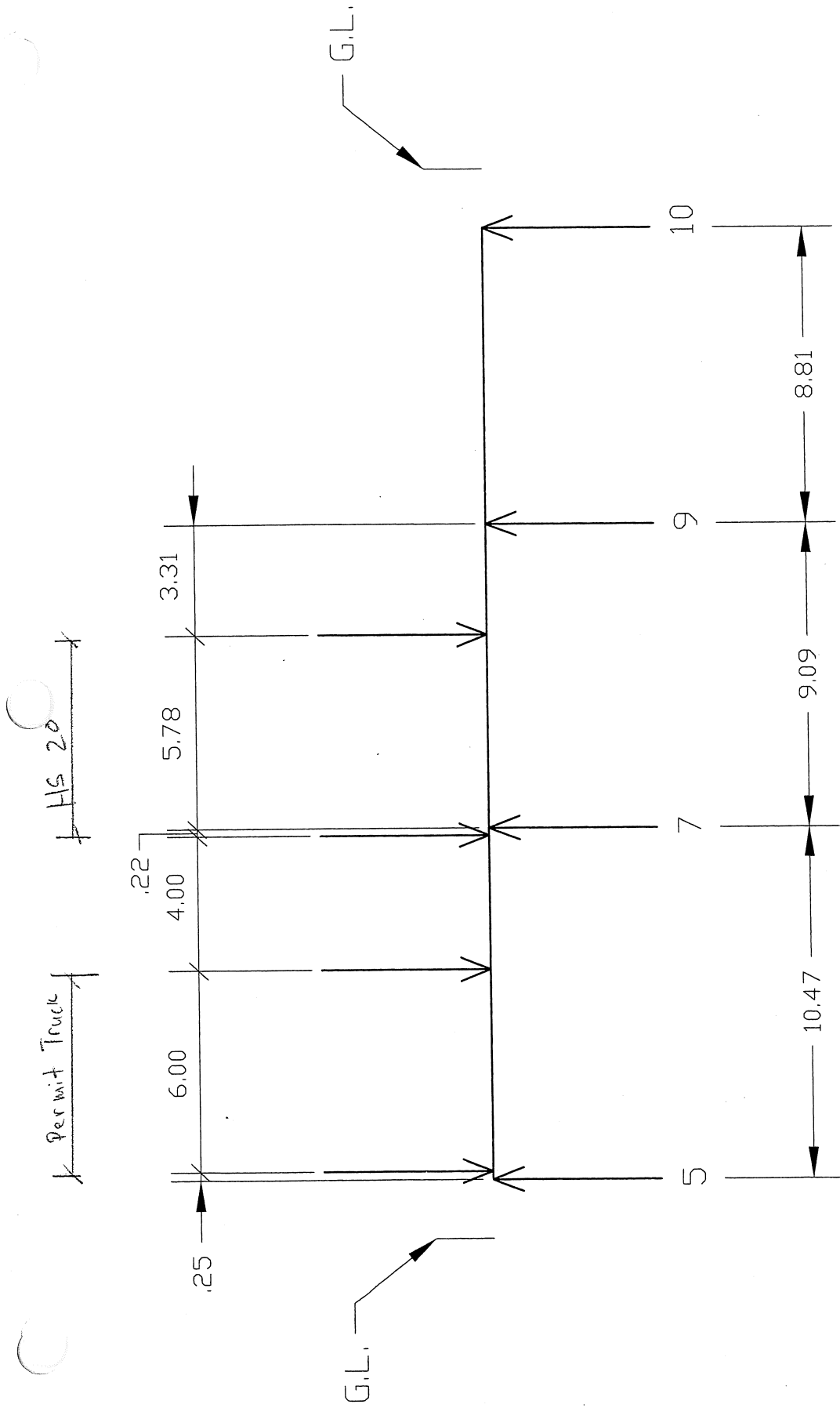
Case 2

Permit Distribution Factor
 $G_5 = 1^k (8.01' / 5.26') = 0.952 \text{ wheels}$
 $G_6 = 1^k (0.25' / 5.26') + 1^k (4.22' / 5.21') = 0.858 \text{ wheels}$
 $G_7 = 1^k (0.99' / 5.21') = 0.190 \text{ wheels}$

$\sum F_y = 2 \text{ wheels OK}$

HS 20 Distribution Factor
 $G_6 = 1^k (0.22' / 5.21') = 0.042 \text{ wheels}$
 $G_7 = 1^k (4.99' / 5.21') + 1^k (3.31' / 9.09') = 1.322 \text{ wheels}$
 $G_8 = 1^k (5.78' / 9.09') = 0.1636 \text{ wheels}$

$\sum F_y = 2 \text{ wheels OK}$



Case 3

Permit Truck D.F

$$G_5 = 1^k (10.22' / 10.47') + 1^k (4.22' / 10.47') = 1.379 \text{ wheels}$$

$$G_7 = 1^k (0.25' / 10.47') + 1^k (6.25' / 10.47') = 0.621 \text{ wheels}$$

HS 20 P.F

$$G_5 = 1^k (0.22' / 10.47') = 0.021 \text{ wheels}$$

$$G_7 = 1^k (10.25' / 10.47') + 1^k (3.31' / 9.09') = 1.343 \text{ wheels}$$

$$G_9 = 1^k (5.78' / 9.09') = 0.636 \text{ wheels}$$

$$\sum F_y = 2 \text{ wheels}$$

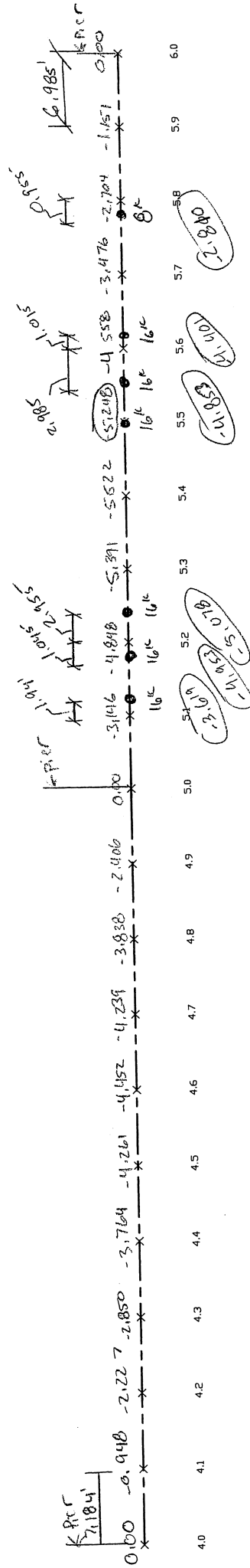
$$\sum F_y = 2 \text{ wheels}$$

Girder S moment @ Span P+ S.O

$$MD \times Load = -308.57 \text{ K-ft}$$

$$D.F. = 0.1946$$

$$LL + Imp = 1.25$$



$$G-S = 0.996 \cdot 1.25 \cdot \frac{1 \text{ wheel}}{2 \text{ axel}} \left[(8^k \cdot -2.810) + 16^k (-3.614 + -4.953 + -5.078 + -5.248 + -4.853 + -4.401) \right] = 290.8 \text{ K-ft} \quad \Delta = 6\% \quad OK$$

Mom at 40

Girder 10

0.00000 -0.00047 -0.00079 -0.00139 -0.00165 -0.00195
-0.00224 -0.00229 -0.00200 -0.00162 0.00000¹⁰
0.00317 0.00652 0.00964 0.01244 0.01488
0.01613 0.01684 0.01562 0.01100 0.00000²⁰
-0.01596 -0.02908 -0.04742 -0.05766 -0.07337
-0.08393 -0.09379 -0.09892 -0.07858 0.00000³⁰
0.07522 0.15043 0.19480 0.21652 0.21509
0.19167 0.14357 0.10813 0.04321 0.00000⁴⁰
-0.03233 -0.05185 -0.05568 -0.05697 -0.05015
-0.04321 -0.03285 -0.02232 -0.01027 0.00000⁵⁰
0.01061 0.00922 0.00594 0.00412 0.00270
0.00198 0.00142 0.00112 0.00052 0.00000⁶⁰
-0.00041 -0.00044 -0.00048 -0.00041 -0.00032
-0.00025 -0.00018 -0.00010 -0.00005 0.00000⁷⁰
0.00002 0.00002 0.00001 -0.00001 -0.00001
-0.00002 -0.00002 -0.00002 -0.00001 0.00000⁸⁰
0.00002 0.00002 0.00002 0.00002 0.00001
0.00001 0.00001 0.00000 0.00000 0.00000⁹⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹⁰⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹¹⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹²⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹³⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹⁴⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹⁵⁰

Girder 9

0.00000 0.00173 0.00294 0.00498 0.00572 0.00666
0.00690 0.00680 0.00538 0.00409 0.00000¹⁰
-0.00721 -0.01561 -0.02247 -0.02959 -0.03306
-0.03469 -0.03195 -0.02669 -0.01557 0.00000²⁰
0.02247 0.03984 0.06413 0.07676 0.08887
0.08868 0.07606 0.06315 0.03516 0.00000³⁰
-0.02124 -0.02995 -0.02078 0.00225 0.02370
0.04864 0.05406 0.04700 0.01103 0.00000⁴⁰
0.04986 0.15319 0.20582 0.27192 0.29738
0.28784 0.23873 0.19288 0.08635 0.00000⁵⁰
-0.07886 -0.06433 -0.05549 -0.04646 -0.03753
-0.02850 -0.01844 -0.01287 -0.00501 0.00000⁶⁰
0.00429 0.00546 0.00698 0.00705 0.00650
0.00549 0.00418 0.00238 0.00138 0.00000⁷⁰
-0.00083 -0.00111 -0.00131 -0.00146 -0.00140
-0.00124 -0.00094 -0.00064 -0.00043 0.00000⁸⁰
0.00043 0.00039 0.00035 0.00027 0.00021
0.00016 0.00011 0.00005 0.00003 0.00000⁹⁰
-0.00002 -0.00003 -0.00004 -0.00004 -0.00004
-0.00003 -0.00002 -0.00001 -0.00001 0.00000¹⁰⁰
0.00000 0.00001 0.00001 0.00001 0.00001
0.00001 0.00001 0.00000 0.00000 0.00000¹¹⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹²⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹³⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹⁴⁰
0.00000 0.00000 0.00000 0.00000 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000¹⁵⁰

Girder 8

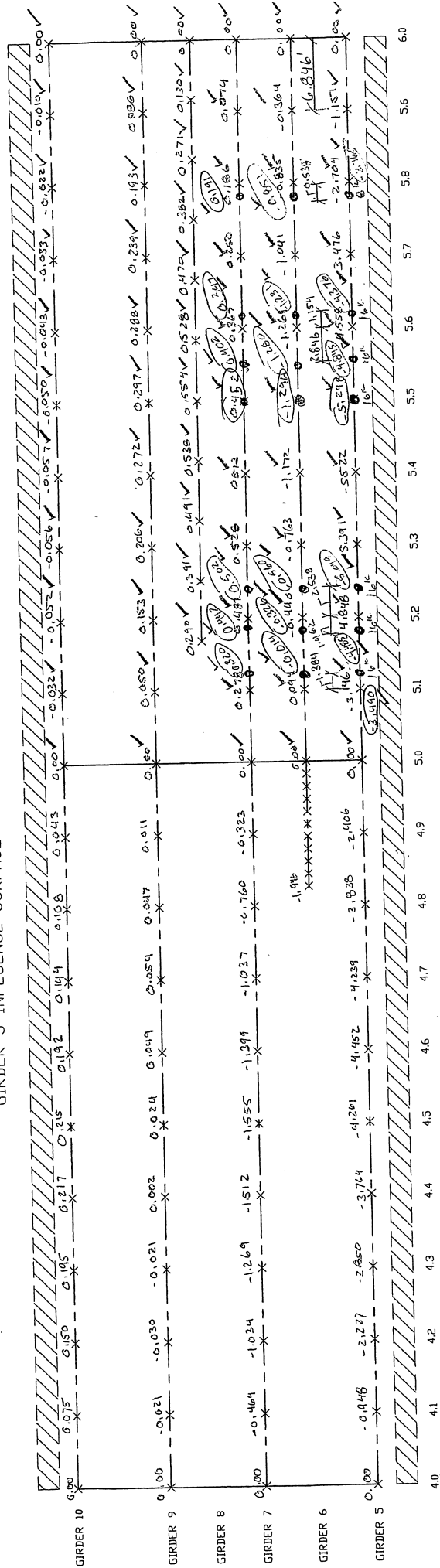
0.28984 0.39114 0.49060 0.53797 0.55423 0.52845
0.47021 0.38247 0.27051 0.12996 0.00000¹⁰
-0.12972 0.11006 0.09265 0.08231 0.06274
-0.05277 -0.03325 -0.02341 -0.00952 0.00000²⁰
0.00805 0.01035 0.01348 0.01374 0.01277
0.01087 0.00836 0.00482 0.00283 0.00000³⁰
-0.00167 -0.00220 -0.00262 -0.00293 -0.00281
-0.00250 -0.00189 -0.00129 -0.00090 0.00000⁴⁰
0.00070 0.00056 0.00051 0.00041 0.00033
0.00025 0.00018 0.00009 0.00006 0.00000⁵⁰
-0.00004 -0.00005 -0.00007 -0.00007 -0.00007

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|-----|
| | | -0.00006 | -0.00004 | -0.00002 | -0.00001 | 0.00000 | 60 |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00002 | 0.00001 | |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00000 | 0.00000 | 70 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 80 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 90 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| Girder 7 | 0.12938 | 0.19477 | 0.23459 | 0.32236 | 0.37615 | 0.41183 | |
| | | 0.48825 | 0.52039 | 0.55665 | 0.5943 | 0.00000 | 60 |
| | | -0.46410 | -1.03435 | -1.26947 | -1.51235 | -1.55471 | |
| | | -1.39912 | -1.03665 | -0.75979 | -0.32333 | 0.00000 | 20 |
| | | 0.27757 | 0.48702 | 0.52843 | 0.51335 | 0.45176 | |
| | | 0.36740 | 0.25042 | 0.18603 | 0.07410 | 0.00000 | 30 |
| | | -0.05548 | -0.04833 | -0.04176 | -0.03460 | -0.03105 | |
| | | -0.02330 | -0.01976 | -0.01118 | -0.00601 | 0.00000 | 40 |
| | | 0.00427 | 0.00611 | 0.00667 | 0.00653 | 0.00600 | |
| | | 0.00521 | 0.00418 | 0.00306 | 0.00150 | 0.00000 | 50 |
| | | -0.00098 | -0.00139 | -0.00143 | -0.00139 | -0.00127 | |
| | | -0.00111 | -0.00086 | -0.00067 | -0.00028 | 0.00000 | 60 |
| | | 0.00016 | 0.00021 | 0.00025 | 0.00025 | 0.00022 | |
| | | 0.00017 | 0.00011 | 0.00007 | 0.00002 | 0.00000 | 70 |
| | | 0.00000 | 0.00000 | 0.00001 | 0.00002 | 0.00003 | |
| | | 0.00003 | 0.00002 | 0.00002 | 0.00001 | 0.00000 | 80 |
| | | -0.00001 | -0.00002 | -0.00002 | -0.00002 | -0.00002 | |
| | | -0.00002 | -0.00002 | -0.00001 | -0.00001 | 0.00000 | 90 |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| Girder 6 | -1.94555 | -1.55988 | -1.28117 | -1.08315 | -0.93958 | -0.82428 | |
| | | 0.71179 | -0.58632 | -0.43486 | -0.24394 | 0.00000 | 0 |
| | | 0.09404 | -0.44020 | -0.76267 | -1.17202 | -1.29586 | |
| | | -1.26880 | -1.04050 | -0.83534 | -0.36387 | 0.00000 | 20 |
| | | 0.42563 | 0.37284 | 0.31669 | 0.24951 | 0.21446 | |
| | | 0.14379 | 0.11626 | 0.05852 | 0.03044 | 0.00000 | 30 |
| | | -0.02273 | -0.03614 | -0.04185 | -0.04290 | -0.04012 | |
| | | -0.03440 | -0.02612 | -0.01729 | -0.00864 | 0.00000 | 40 |
| | | 0.00598 | 0.00945 | 0.01029 | 0.01060 | 0.00976 | |
| | | 0.00825 | 0.00593 | 0.00442 | 0.00170 | 0.00000 | 50 |
| | | -0.00104 | -0.00137 | -0.00169 | -0.00169 | -0.00156 | |
| | | -0.00130 | -0.00086 | -0.00057 | -0.00016 | 0.00000 | 60 |
| | | 0.00009 | 0.00016 | 0.00018 | 0.00017 | 0.00016 | |
| | | 0.00013 | 0.00010 | 0.00006 | 0.00003 | 0.00000 | 70 |
| | | -0.00002 | -0.00003 | -0.00004 | -0.00004 | -0.00004 | |
| | | -0.00003 | -0.00003 | -0.00002 | -0.00001 | 0.00000 | 80 |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 90 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| Girder 5 | 0.00000 | 0.00480 | 0.00802 | 0.01364 | 0.01566 | 0.01817 | |
| | | 0.01886 | 0.01841 | 0.01439 | 0.01105 | 0.00000 | 10 |
| | | -0.01957 | -0.04063 | -0.06012 | -0.08097 | -0.09458 | |
| | | -0.10362 | -0.10208 | -0.09220 | -0.06440 | 0.00000 | 20 |
| | | 0.09393 | 0.17548 | 0.31662 | 0.40998 | 0.59469 | |
| | | 0.67649 | 0.86200 | 0.94717 | 0.79614 | 0.00000 | 30 |
| | | -0.94816 | -2.22687 | -2.84978 | -3.76370 | -4.26141 | |

[illegible]

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

GIRDER 5 INFLUENCE SURFACE - MOMENT - POINT 40 - SPAN POINT 5.0



Use Case 1 + 2 - Permit Truck - Standard A

$$\begin{aligned}
 \text{Girder 5} &= 0.952 \cdot 1.25 \cdot \frac{1 \text{ wheel}}{2 \text{ axles}} \left[(8^k \cdot -2.765) + 16^k (-3.490 + 4.458 + -5.049 + -5.218 + 4.845 + -4.576) \right] = -2741.6 \text{ K-ft} \\
 \text{Girder 6} &= 0.946/0.952 \cdot 2741.6 = 287.3 \text{ K-ft} \quad \text{WISX} = 308 \text{ K-ft} \quad D = 7\% \quad \text{Due To minor change in wheel placement + Adjusted span length} \\
 \text{Girder 7} &= 0.858 \cdot 1.25 \cdot \frac{1 \text{ wheel}}{2 \text{ axles}} \left[(8^k \cdot -0.851) + 16^k (-0.614 + -0.326 + -0.360 + -1.296 + -1.251) \right] = -44.03 \text{ K-ft} \\
 \text{Girder 8} &= 0.190 \cdot 1.25 \cdot \frac{1 \text{ wheel}}{2 \text{ axles}} \left[(8^k \cdot 0.191) + 16^k (0.320 + 0.442 + 0.502 + 0.452 + 0.602 + 0.347) \right] = 419 \text{ K-ft}
 \end{aligned}$$

$$\text{Total Permit} = -213.73 \text{ K-ft}$$

$$\Delta \text{ increase} = \frac{-213.73}{-2741.6} = 14.12\% \quad \text{Single lane permit}$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/4/10 BY CJM SHEET NO. _____ OF _____

Location: Girder 7 - SPAN point 2.5 (tent point 15)

- Use Framing Plan Geometry from Girder 5 - span pt. 4.5

- See attached sheets for Distribution Factors

From influence surface:

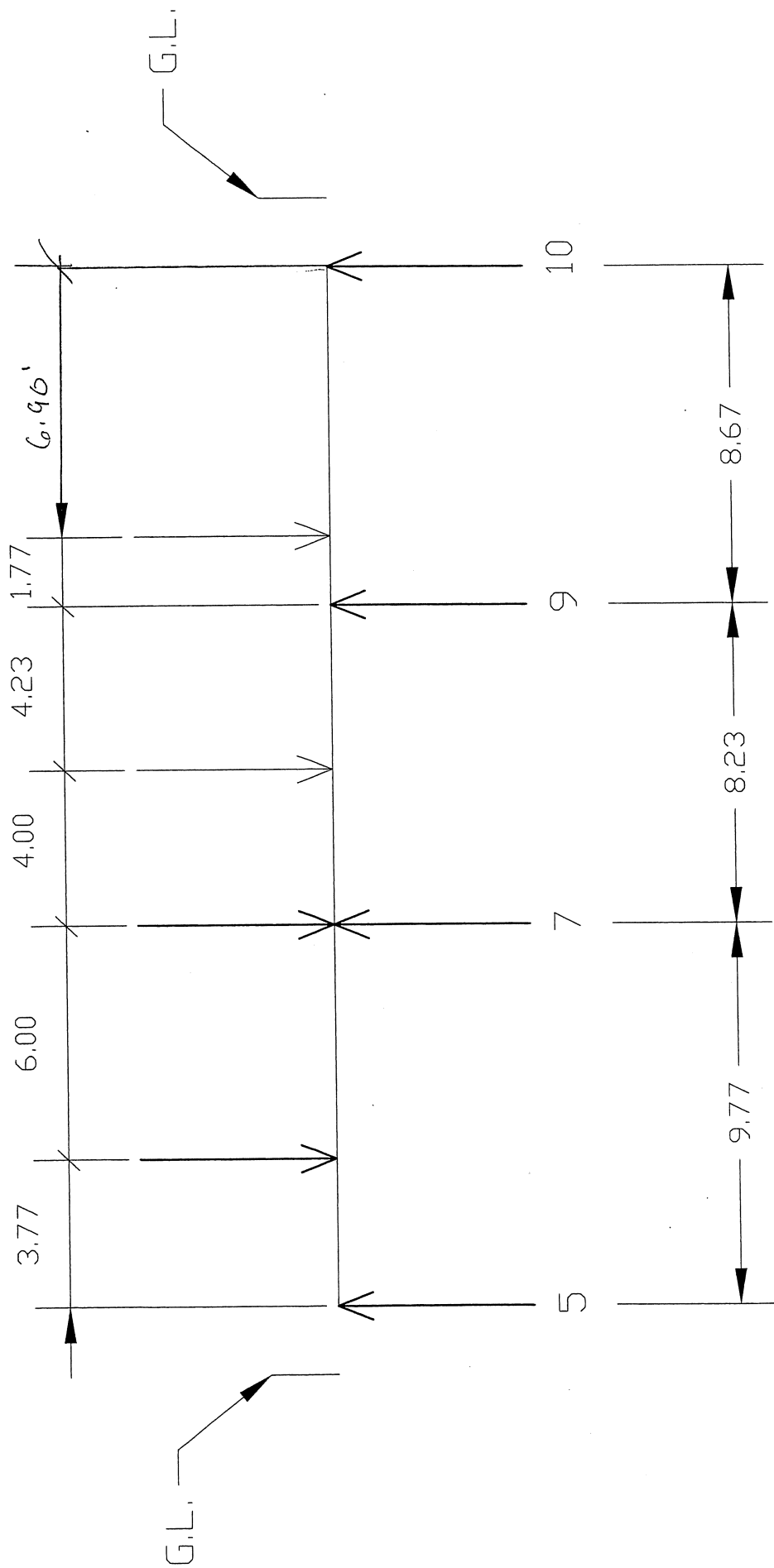
Single Girder Loaded = 291.8 K-ft

1 lane permit truck = 357.9 K-ft

$\Delta = 22.6\%$

1 lane permit + 2 lane HS20 = 607.9 K-ft

$\Delta = 108.3\%$



Case 2
Permit Truck Distribution Factor

$$G_5 = 1^k (6/9.77) = 0.614 \text{ wheels}$$

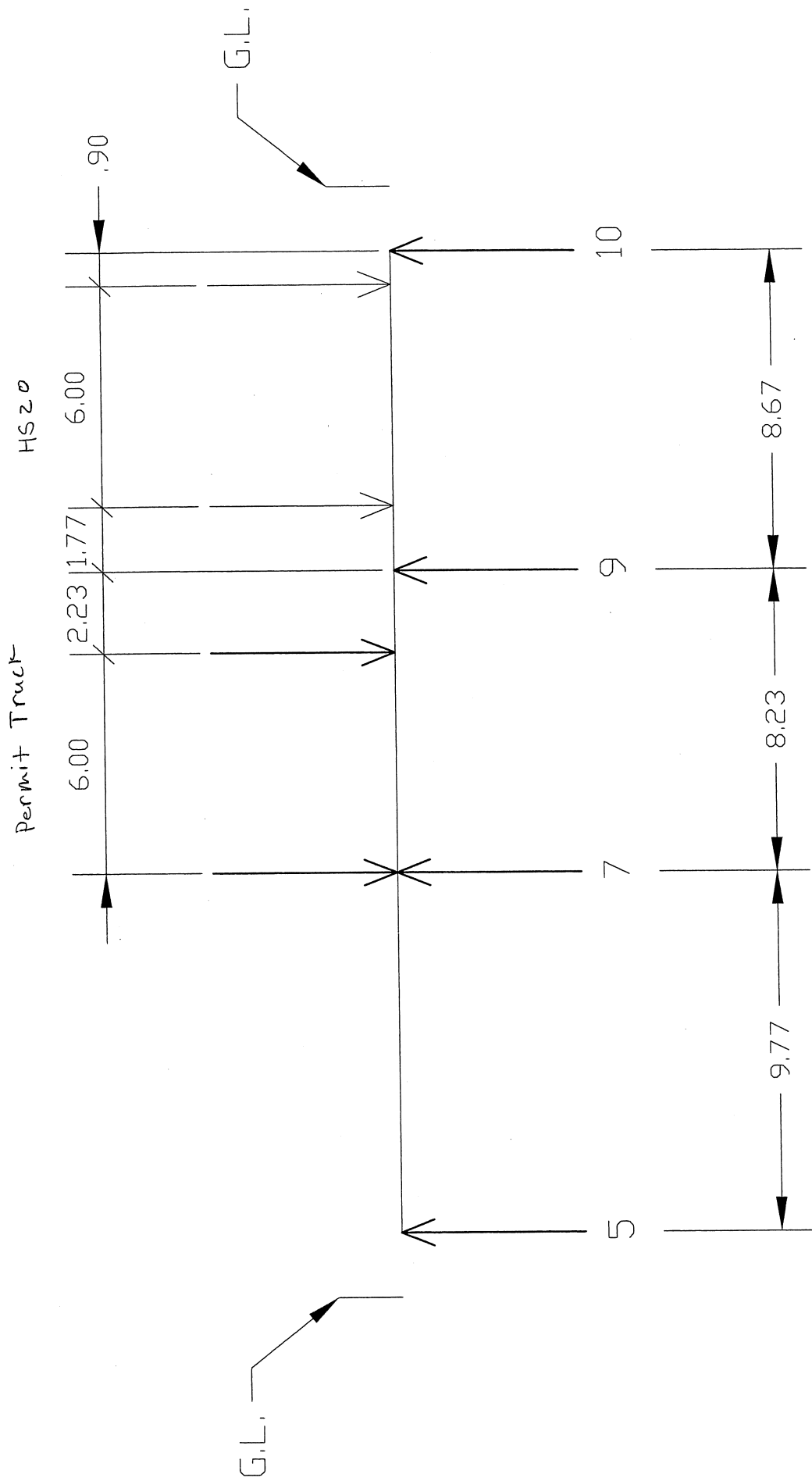
$$G_7 = 1^k + 1^k (3.77/9.77) = 1.386 \text{ wheels}$$

HS20

$$G_7 = 1^k (4.23/8.23) = 0.514 \text{ wheels}$$

$$G_9 = 1^k (4.0/8.23) + 1^k (6.90/8.67) = 1.282 \text{ wheels}$$

$$G_{10} = 1^k (1.77/8.67) = 0.204 \text{ wheels}$$



Case 1

Permit Truck

$$G_7 = 1^k + 1^k (21.23' / 8.23') = 1.271 \text{ wheels}$$

$$G_9 = 1^k (6.00 / 8.23) = 0.729 \text{ wheels}$$

HS20

$$G_9 = 1^k (6.90 / 8.67) + 1^k (0.90 / 8.67) = 0.900 \text{ wheels}$$

$$G_{10} = 1^k (1.77 / 8.67) + 1^k (7.77 / 8.67) = 1.100 \text{ wheels}$$

Mom at 15

| | | | | | | | |
|-----------|----------|----------|----------|----------|----------|----------|-----|
| Girder 10 | 0.00000 | -0.00090 | -0.00153 | -0.00262 | -0.00302 | -0.00356 | |
| | | -0.00377 | -0.00376 | -0.00306 | -0.00237 | 0.00000 | 16 |
| | | 0.00452 | 0.01003 | 0.01488 | 0.02013 | 0.02349 | |
| | | 0.02581 | 0.02535 | 0.02314 | 0.01536 | 0.00000 | 20 |
| | | -0.02255 | -0.04493 | -0.07856 | -0.09978 | -0.13057 | |
| | | -0.15089 | -0.16567 | -0.16880 | -0.12995 | 0.00000 | 30 |
| | | 0.11731 | 0.23165 | 0.28993 | 0.30494 | 0.30975 | |
| | | 0.28041 | 0.23832 | 0.19540 | 0.08929 | 0.00000 | 40 |
| | | -0.08670 | -0.16864 | -0.19936 | -0.22462 | -0.22451 | |
| | | -0.20163 | -0.16541 | -0.11711 | -0.05365 | 0.00000 | 50 |
| | | 0.05788 | 0.05868 | 0.04990 | 0.04134 | 0.03301 | |
| | | 0.02498 | 0.01617 | 0.01146 | 0.00468 | 0.00000 | 60 |
| | | -0.00431 | -0.00546 | -0.00697 | -0.00701 | -0.00646 | |
| | | -0.00546 | -0.00416 | -0.00237 | -0.00137 | 0.00000 | 70 |
| | | 0.00083 | 0.00111 | 0.00131 | 0.00147 | 0.00141 | |
| | | 0.00125 | 0.00095 | 0.00065 | 0.00045 | 0.00000 | 80 |
| | | -0.00045 | -0.00042 | -0.00038 | -0.00030 | -0.00024 | |
| | | -0.00018 | -0.00013 | -0.00006 | -0.00004 | 0.00000 | 90 |
| | | 0.00003 | 0.00004 | 0.00005 | 0.00005 | 0.00004 | |
| | | 0.00004 | 0.00003 | 0.00002 | 0.00001 | 0.00000 | 100 |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 | |
| | | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 150 |
| Girder 9 | 0.00000 | -0.00213 | -0.00361 | -0.00618 | -0.00714 | -0.00835 | |
| | | -0.00885 | -0.00880 | -0.00716 | -0.00555 | 0.00000 | 10 |
| | | 0.01012 | 0.02198 | 0.03237 | 0.04310 | 0.04995 | |
| | | 0.05372 | 0.05233 | 0.04571 | 0.02909 | 0.00000 | 20 |
| | | -0.04959 | -0.09675 | -0.18554 | -0.24784 | -0.37935 | |
| | | -0.44250 | -0.59585 | -0.67819 | -0.59438 | 0.00000 | 30 |
| | | 0.72022 | 1.60667 | 2.29782 | 2.76466 | 2.93585 | |
| | | 2.62916 | 1.94420 | 1.42855 | 0.52221 | 0.00000 | 40 |
| | | -0.30034 | -0.44363 | -0.46741 | -0.46086 | -0.42381 | |
| | | -0.36564 | -0.26995 | -0.20864 | -0.08816 | 0.00000 | 50 |
| | | 0.07899 | 0.06306 | 0.05320 | 0.04409 | 0.03521 | |
| | | 0.02665 | 0.01729 | 0.01213 | 0.00478 | 0.00000 | 60 |
| | | -0.00417 | -0.00534 | -0.00688 | -0.00698 | -0.00647 | |
| | | -0.00549 | -0.00419 | -0.00240 | -0.00139 | 0.00000 | 70 |
| | | 0.00085 | 0.00112 | 0.00133 | 0.00149 | 0.00143 | |
| | | 0.00127 | 0.00096 | 0.00065 | 0.00045 | 0.00000 | 80 |
| | | -0.00045 | -0.00041 | -0.00037 | -0.00029 | -0.00023 | |
| | | -0.00017 | -0.00012 | -0.00006 | -0.00004 | 0.00000 | 90 |
| | | 0.00003 | 0.00003 | 0.00004 | 0.00004 | 0.00004 | |
| | | 0.00003 | 0.00003 | 0.00001 | 0.00001 | 0.00000 | 100 |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 | |
| | | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 150 |
| Girder 8 | -0.35391 | -0.38869 | -0.41544 | -0.42057 | -0.40441 | -0.36996 | |
| | | -0.31610 | -0.25066 | -0.17267 | -0.08189 | 0.00000 | |
| | | 0.08058 | 0.06667 | 0.05429 | 0.04744 | 0.03506 | |
| | | 0.02909 | 0.01786 | 0.01245 | 0.00499 | 0.00000 | |
| | | -0.00422 | -0.00544 | -0.00709 | -0.00724 | -0.00673 | |
| | | -0.00572 | -0.00438 | -0.00251 | -0.00148 | 0.00000 | |
| | | 0.00088 | 0.00116 | 0.00139 | 0.00155 | 0.00149 | |
| | | 0.00133 | 0.00100 | 0.00069 | 0.00048 | 0.00000 | |
| | | -0.00037 | -0.00030 | -0.00027 | -0.00021 | -0.00017 | |
| | | -0.00013 | -0.00009 | -0.00005 | -0.00003 | 0.00000 | |
| | | 0.00002 | 0.00003 | 0.00004 | 0.00004 | 0.00003 | |

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|
| | | 0.00003 | 0.00002 | 0.00001 | 0.00001 | 0.00001 | 0.00000 |
| | | 0.00000 | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 |
| | | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| Girder 7 | -0.13045 | -0.20533 | -0.25011 | -0.34788 | -0.41319 | -0.45359 | |
| | | -0.54525 | -0.59050 | -0.63884 | -0.41002 | 0.00000 | 0 |
| | | 0.51322 | 1.55072 | 2.33580 | 4.52810 | 7.12427 | |
| | | 4.36898 | 1.88385 | 1.04393 | 0.26734 | 0.00000 | 20 |
| | | -0.17615 | -0.32460 | -0.37263 | -0.40737 | -0.39711 | |
| | | -0.35884 | -0.27735 | -0.21828 | -0.09486 | 0.00000 | 36 |
| | | 0.07616 | 0.06857 | 0.05998 | 0.04858 | 0.04212 | |
| | | 0.02890 | 0.02334 | 0.01194 | 0.00613 | 0.00000 | 40 |
| | | -0.00481 | -0.00753 | -0.00877 | -0.00900 | -0.00840 | |
| | | -0.00719 | -0.00545 | -0.00358 | -0.00176 | 0.00000 | 50 |
| | | 0.00125 | 0.00197 | 0.00216 | 0.00223 | 0.00207 | |
| | | 0.00175 | 0.00126 | 0.00094 | 0.00036 | 0.00000 | 60 |
| | | -0.00022 | -0.00030 | -0.00037 | -0.00037 | -0.00034 | |
| | | -0.00029 | -0.00019 | -0.00012 | -0.00003 | 0.00000 | 70 |
| | | 0.00003 | 0.00004 | 0.00005 | 0.00006 | 0.00005 | |
| | | 0.00005 | 0.00004 | 0.00002 | 0.00001 | 0.00000 | 80 |
| | | -0.00001 | -0.00001 | -0.00002 | -0.00002 | -0.00002 | |
| | | -0.00002 | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 90 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| Girder 6 | 0.76110 | 0.62390 | 0.52876 | 0.46380 | 0.41716 | 0.37700 | |
| | | 0.33213 | 0.27769 | 0.20825 | 0.11774 | 0.00000 | 10 |
| | | -0.25899 | -0.42023 | -0.47314 | -0.50705 | -0.49183 | |
| | | -0.44063 | -0.33794 | -0.26558 | -0.11240 | 0.00000 | 20 |
| | | 0.12841 | 0.11072 | 0.09241 | 0.07137 | 0.06088 | |
| | | 0.04020 | 0.03237 | 0.01617 | 0.00837 | 0.00000 | 30 |
| | | -0.00623 | -0.00989 | -0.01145 | -0.01174 | -0.01098 | |
| | | -0.00943 | -0.00717 | -0.00477 | -0.00238 | 0.00000 | 40 |
| | | 0.00165 | 0.00260 | 0.00283 | 0.00292 | 0.00270 | |
| | | 0.00229 | 0.00165 | 0.00123 | 0.00047 | 0.00000 | 50 |
| | | -0.00029 | -0.00038 | -0.00047 | -0.00047 | -0.00044 | |
| | | -0.00036 | -0.00024 | -0.00016 | -0.00004 | 0.000 | |

[illegible]

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

✓✓ 4/30/10



G7 - Case 2 D.F. = 1386 / 1475 = 310.5 K-F = 291.8 K-F

$$G_5 = 0.614 \cdot 1.25 \cdot \frac{10 \times 1}{Z_{\text{schwell}}} \cdot \left[(8^{\frac{1}{2}} \cdot 1.227) + 16^k \cdot (0.1782 + 1.256 + 1.567 + 2.298 + 2.205) \right] = 66.1 \text{ k-ft}$$

Total permit truck = 357.9 k-ft

$$\frac{G_5}{G_7} = \frac{66.1}{291.8} = 22.6\% \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/3/10

BY CSM

SHEET NO. 1 OF

Location : Girder 5 : span point 4.5 (Pier 3-3E to 2-3C)

- location is in area of curvature + interchange. Influence Surface will be draped over squared span. Span length will be average of all full spanning girders + girder spacing will be average of both ends of span

Span length

Girder 5 = 71.84'

Girder 6 = N/A - Does not span entire length

Girder 7 = 69.65'

Girder 9 = 67.40'

Girder 10 = 65.14'

Average = 68.51'

Girder Spacing

| Bay | Pier 3-3C | Pier 2-3E | Average |
|--------|-----------|-----------|---------|
| G5-G6 | 4.53' * | 5.26' | 4.90' |
| G6-G7 | 4.53' * | 5.21' | 4.87' |
| G7-G9 | 7.42' | 9.09' | 8.23' |
| G9-G10 | 8.53' | 8.81' | 8.67' |

* Distance Taken at Beginning of Girder 6



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PROJECT Special structures Rating

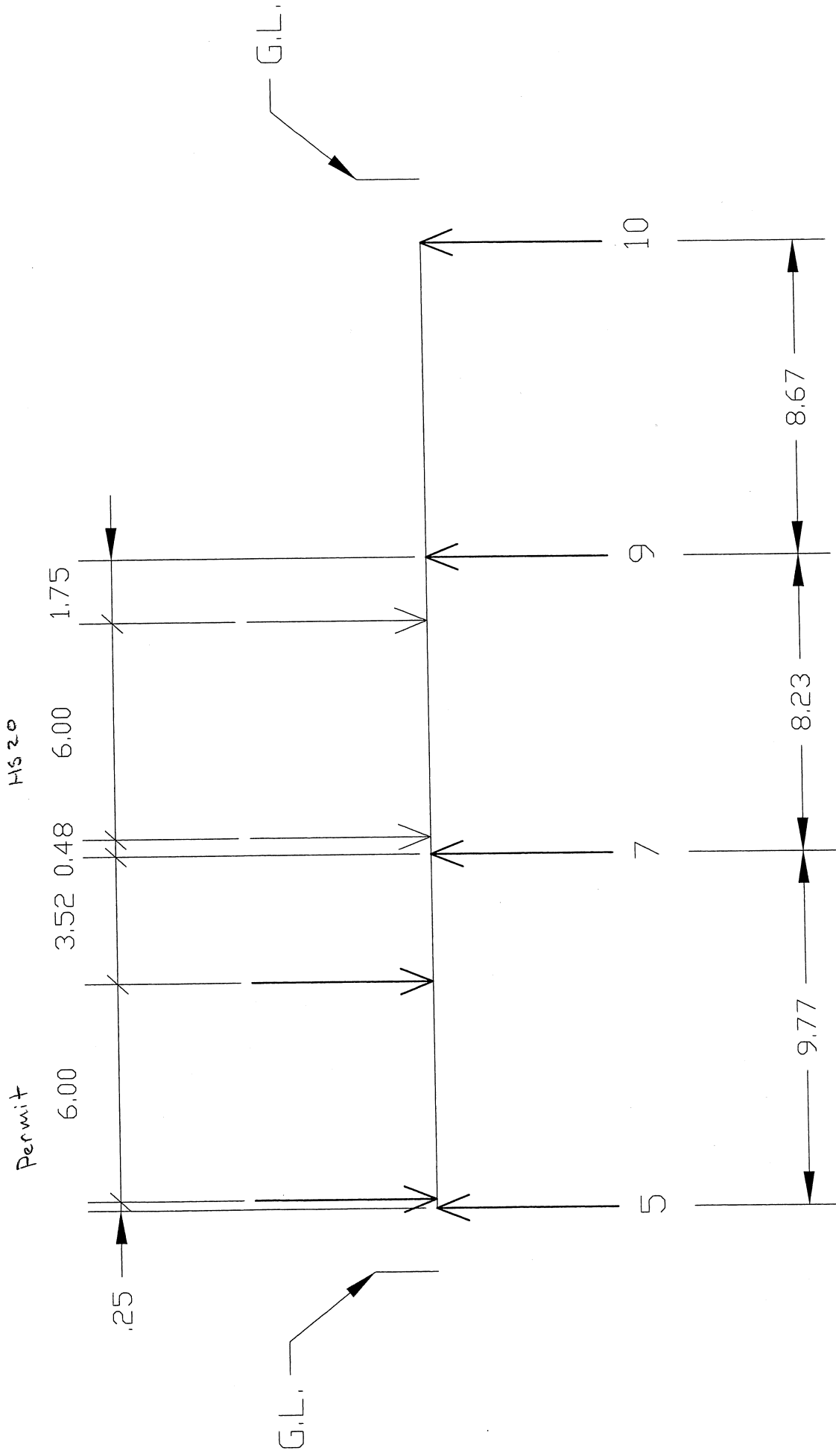
PROJECT # 090147 DATE 3/3/10 BY CSM SHEET NO. _____ OF _____

From Influence Surface

Single girder loaded (statics) = 660.3 K-ft

Single lane Permit = 808.7 K-ft $\Delta = 22.5\%$

1 lane Permit + 1 lane HS20 = 1122.6 K-ft $\Delta = 70\%$



Permit P.I.F
 Girder 5 = $1^k (9.52' / 9.77') + 1^k (3.32' / 9.77') = 1.335$ wheels
 Girder 7 = $1^k (0.25' / 9.77') + 1^k (6.25' / 9.77') = 0.665$ wheels
 HS20 P.I.F
 Girder 7 = $1^k (7.75' / 8.23') + 1^k (1.75' / 8.23') = 1.154$ wheels
 Girder 9 = $1^k (0.48' / 8.23') + 1^k (6.48' / 8.23') = 0.846$ wheels

Mom at 35

Girder 10

| | | | | | |
|---------|----------|----------|----------|----------|-------------|
| 0.00000 | 0.00048 | 0.00080 | 0.00146 | 0.00175 | 0.00208 |
| | 0.00251 | 0.00260 | 0.00236 | 0.00195 | 0.00000 10 |
| | -0.00388 | -0.00773 | -0.01148 | -0.01457 | -0.01779 |
| | -0.01934 | -0.02102 | -0.01987 | -0.01455 | 0.00000 20 |
| | 0.02183 | 0.03957 | 0.06627 | 0.08172 | 0.10823 |
| | 0.12924 | 0.15410 | 0.17007 | 0.14136 | 0.00000 30 |
| | -0.13910 | -0.27955 | -0.36473 | -0.41258 | -0.41524 |
| | -0.38690 | -0.30456 | -0.23925 | -0.10282 | 0.00000 40 |
| | 0.07195 | 0.11156 | 0.11932 | 0.12189 | 0.11040 |
| | 0.09595 | 0.07512 | 0.05203 | 0.02387 | 0.00000 50 |
| | -0.02527 | -0.02426 | -0.01894 | -0.01500 | -0.01147 |
| | -0.00865 | -0.00574 | -0.00418 | -0.00177 | 0.00000 60 |
| | 0.00156 | 0.00191 | 0.00235 | 0.00229 | 0.00206 |
| | 0.00172 | 0.00130 | 0.00074 | 0.00042 | 0.00000 70 |
| | -0.00024 | -0.00032 | -0.00036 | -0.00039 | -0.00037 |
| | -0.00032 | -0.00024 | -0.00016 | -0.00011 | 0.00000 80 |
| | 0.00010 | 0.00009 | 0.00008 | 0.00007 | 0.00005 |
| | 0.00004 | 0.00003 | 0.00001 | 0.00001 | 0.00000 90 |
| | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 |
| | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 100 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 110 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 120 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 130 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 140 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 150 |
| | -0.00375 | -0.00637 | -0.01081 | -0.01243 | -0.01450 |
| | -0.01511 | -0.01491 | -0.01188 | -0.00908 | 0.00000 10 |
| | 0.01617 | 0.03511 | 0.05093 | 0.06740 | 0.07622 |
| | 0.08077 | 0.07588 | 0.06454 | 0.03894 | 0.00000 20 |
| | -0.06049 | -0.11201 | -0.19567 | -0.24663 | -0.32579 |
| | -0.35173 | -0.38628 | -0.39066 | -0.29723 | 0.00000 30 |
| | 0.27945 | 0.54529 | 0.68375 | 0.73256 | 0.73071 |
| | 0.65692 | 0.52847 | 0.41857 | 0.17997 | 0.00000 40 |
| | -0.13301 | -0.22829 | -0.25344 | -0.26655 | -0.25762 |
| | -0.22692 | -0.17284 | -0.13480 | -0.05741 | 0.00000 50 |
| | 0.05180 | 0.04301 | 0.03774 | 0.03192 | 0.02604 |
| | 0.01988 | 0.01290 | 0.00900 | 0.00350 | 0.00000 60 |
| | -0.00298 | -0.00378 | -0.00483 | -0.00486 | -0.00447 |
| | -0.00377 | -0.00287 | -0.00163 | -0.00094 | 0.00000 70 |
| | 0.00057 | 0.00076 | 0.00089 | 0.00100 | 0.00095 |
| | 0.00085 | 0.00064 | 0.00043 | 0.00029 | 0.00000 80 |
| | -0.00029 | -0.00026 | -0.00023 | -0.00018 | -0.00014 |
| | -0.00010 | -0.00007 | -0.00003 | -0.00002 | 0.00000 90 |
| | 0.00002 | 0.00002 | 0.00003 | 0.00003 | 0.00002 |
| | 0.00002 | 0.00001 | 0.00001 | 0.00000 | 0.00000 100 |
| | 0.00000 | 0.00000 | 0.00000 | -0.00001 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 110 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 120 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 130 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 140 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 150 |
| | -0.54299 | -0.57684 | -0.57075 | -0.54564 | -0.48996 |
| | -0.41697 | -0.32570 | -0.22366 | -0.10468 | 0.00000 |
| | 0.10295 | 0.08777 | 0.07432 | 0.06619 | 0.05070 |
| | 0.04274 | 0.02703 | 0.01906 | 0.00776 | 0.00000 |
| | -0.00657 | -0.00844 | -0.01099 | -0.01120 | -0.01040 |
| | -0.00887 | -0.00682 | -0.00393 | -0.00231 | 0.00000 |
| | 0.00136 | 0.00180 | 0.00214 | 0.00239 | 0.00228 |
| | 0.00203 | 0.00153 | 0.00105 | 0.00073 | 0.00000 |
| | -0.00057 | -0.00046 | -0.00042 | -0.00033 | -0.00027 |
| | -0.00021 | -0.00015 | -0.00007 | -0.00005 | 0.00000 |
| | 0.00003 | 0.00004 | 0.00006 | 0.00006 | 0.00005 |

Girder 9

0.00000

Girder 8

-0.50362

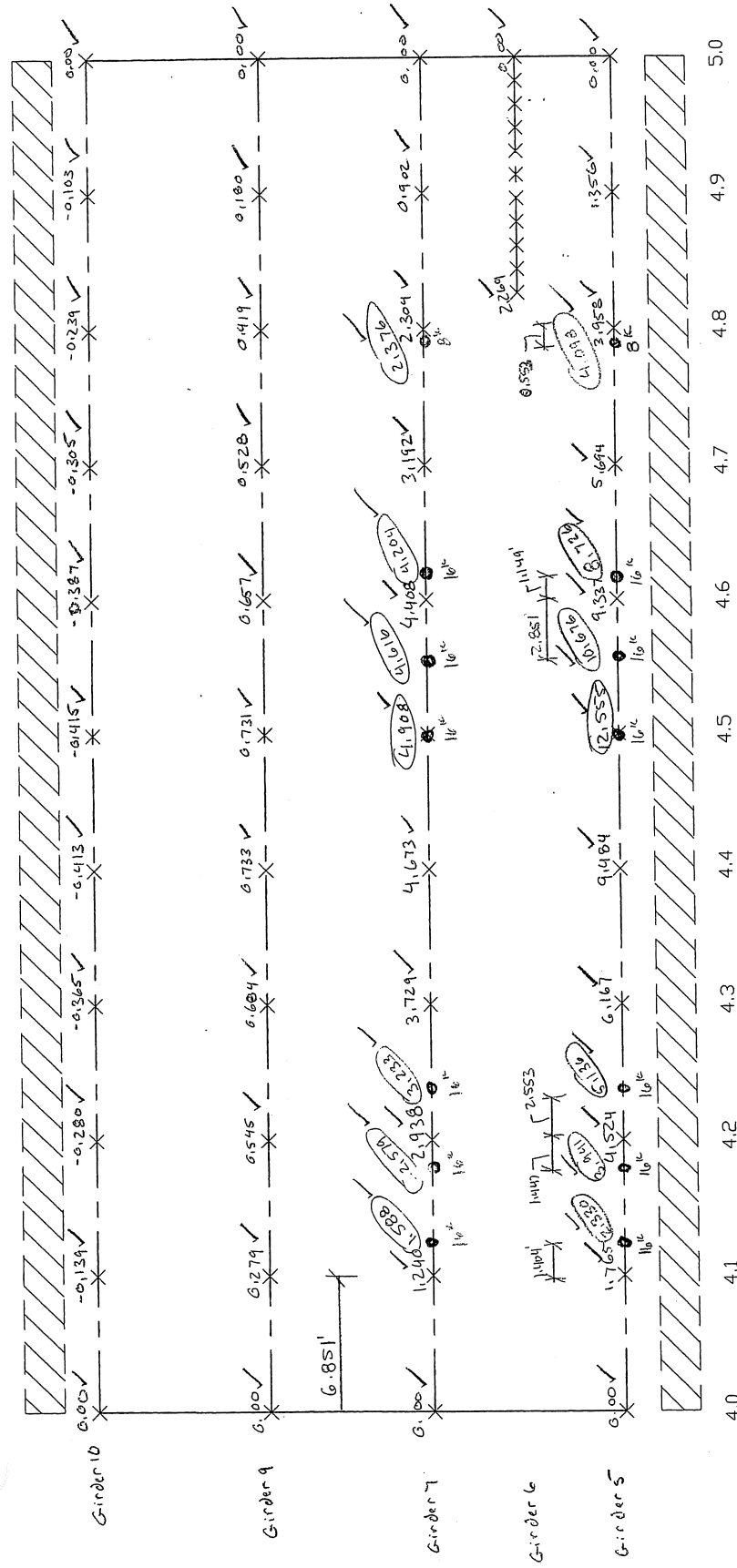
| | | | | | | |
|----------|----------|----------|----------|----------|----------|------------------------|
| | | 0.00005 | 0.00003 | 0.00002 | 0.00001 | 0.00000 |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 |
| | | -0.00001 | -0.00001 | -0.00001 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| Girder 7 | -0.27168 | -0.41658 | -0.50528 | -0.70576 | -0.83635 | -0.92507 |
| | | -1.12975 | -1.22822 | -1.34138 | -0.87599 | 0.00000 ¹⁰ |
| | | 1.24036 | 2.93758 | 3.72850 | 4.67312 | 4.90846 |
| | | 4.40808 | 3.19169 | 2.30395 | 0.90203 | 0.00000 ²⁰ |
| | | -0.52948 | -0.86186 | -0.94663 | -0.98271 | -0.93641 |
| | | -0.82765 | -0.62988 | -0.49230 | -0.21201 | 0.00000 ³⁰ |
| | | 0.17143 | 0.15646 | 0.13850 | 0.11343 | 0.09869 |
| | | 0.06813 | 0.05508 | 0.02822 | 0.01451 | 0.00000 ⁴⁰ |
| | | -0.01145 | -0.01796 | -0.02097 | -0.02156 | -0.02015 |
| | | -0.01723 | -0.01304 | -0.00854 | -0.00420 | 0.00000 ⁵⁰ |
| | | 0.00299 | 0.00473 | 0.00518 | 0.00537 | 0.00497 |
| | | 0.00422 | 0.00304 | 0.00225 | 0.00087 | 0.00000 ⁶⁰ |
| | | -0.00053 | -0.00071 | -0.00089 | -0.00089 | -0.00083 |
| | | -0.00069 | -0.00046 | -0.00030 | -0.00008 | 0.00000 ⁷⁰ |
| | | 0.00006 | 0.00011 | 0.00013 | 0.00014 | 0.00014 |
| | | 0.00012 | 0.00009 | 0.00006 | 0.00003 | 0.00000 ⁸⁰ |
| | | -0.00002 | -0.00004 | -0.00004 | -0.00005 | -0.00005 |
| | | -0.00004 | -0.00003 | -0.00002 | -0.00001 | 0.00000 ⁹⁰ |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| | | 0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁰⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹¹⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹²⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹³⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁴⁰ |
| Girder 6 | 2.26898 | 1.86148 | 1.57937 | 1.38707 | 1.24905 | 1.12986 |
| | | 0.99599 | 0.83309 | 0.62497 | 0.35341 | 0.00000 ¹⁰ |
| | | -0.79461 | -1.28708 | -1.43997 | -1.52174 | -1.46284 |
| | | -1.29675 | -0.98503 | -0.77037 | -0.32337 | 0.00000 ²⁰ |
| | | 0.36648 | 0.31488 | 0.26176 | 0.20125 | 0.17136 |
| | | 0.11274 | 0.09068 | 0.04520 | 0.02338 | 0.00000 ³⁰ |
| | | -0.01737 | -0.02758 | -0.03193 | -0.03273 | -0.03061 |
| | | -0.02626 | -0.01997 | -0.01327 | -0.00662 | 0.00000 ⁴⁰ |
| | | 0.00458 | 0.00724 | 0.00788 | 0.00812 | 0.00750 |
| | | 0.00636 | 0.00458 | 0.00343 | 0.00132 | 0.00000 ⁵⁰ |
| | | -0.00080 | -0.00106 | -0.00131 | -0.00131 | -0.00121 |
| | | -0.00100 | -0.00067 | -0.00044 | -0.00012 | 0.00000 ⁶⁰ |
| | | 0.00007 | 0.00013 | 0.00015 | 0.00015 | 0.00014 |
| | | 0.00011 | 0.00009 | 0.00006 | 0. | |

[illegible]

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

✓ RAM 4/30/10

GIRDER 5 INFLUENCE SURFACE - MOM - POINT 35 - SPAN POINT 4.5



WDK Load = 502.68 K-ft
 DIF = 1.058
 LL + imp = 1.25

$$\text{Girder 5} = 1.058 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} \left[8 \cdot 4.098 + 16 (2.330 + 3.941 + 5.136 + 12.555 + 10.676 + 8.726) \right] = 480.5 \text{ K-ft}$$

$$\text{Statics DIF} = 1.335 / 1.058 \cdot 480.5 = 660.3 \text{ K-ft}$$

$$\text{Girder 7} = 0.1665 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} \left[8 \cdot 2.976 + 16 (1.588 + 2.579 + 3.233 + 4.908 + 4.616 + 4.204) \right] = 148.4 \text{ K-ft}$$

Permit truck = 808.7 K-ft ✓

Due to Shortened Span length



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/1/10 BY CJM SHEET NO. 1 OF 1

Location: Girder 5-span Point + S.S. (Pier 2-3E to 1-3E)

- Location is in an area of curvature & interchange. Influence surfaced will be draped over squared Span. Span length will be averaged over girders that span Entire length & Girder spacing will be averaged from Each support

Span length:

Girder 5 = 69.85'

Girder 6 = 69.13'

Girder 7 = 68.48'

Girder 8 = N/A - Does not span Entire length.

Girder 9 = 67.81'

Girder 10 = 67.04'

Average = 68.46'

Girder Spacing:

| Bay | Pier 2-3E | Pier 1-3E | Average |
|---------------------------------|-----------|-----------|---------|
| G ₅ -G ₆ | 5.26' | 7.49' | 6.38' |
| G ₆ -G ₇ | 5.21' | 7.49' | 6.35' |
| G ₇ -G ₈ | 4.67' * | 8.65' | 6.66' |
| G ₈ -G ₉ | 4.78' * | 6.18' | 5.48' |
| G ₉ -G ₁₀ | 8.81' | 9.11' | 8.96' |

* Distance Taken at Beginning of Girder 8

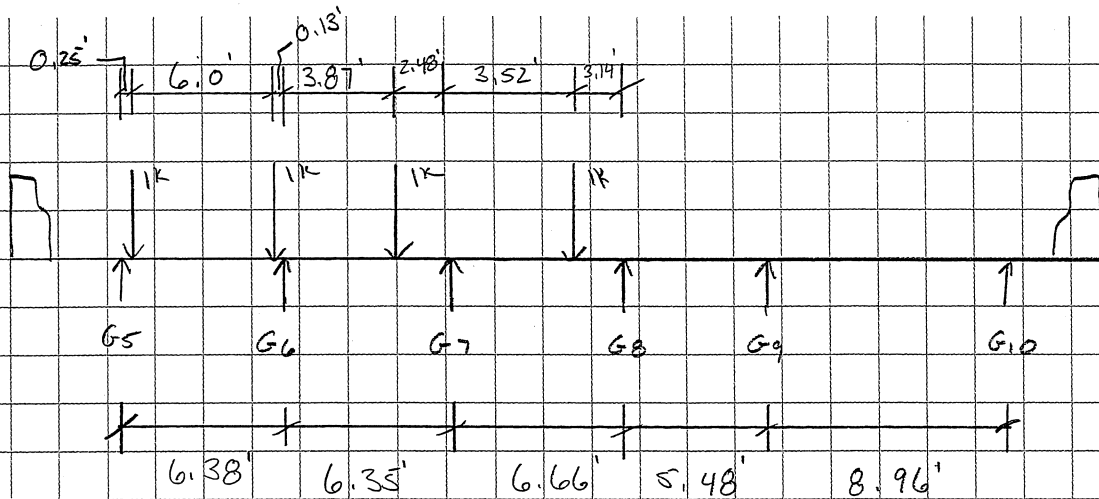


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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/1/10 BY CJM SHEET NO. 2 OF



Distribution Factors - wheel Loads - Two Lanes Permit Truck

$$G_5 = 1^K (6.13' / 6.38') + 1^K (0.13' / 6.38') = 0.981 \text{ wheels}$$

$$G_6 = 1^K (0.25' / 6.38') + 1^K (6.25' / 6.38') + 1^K (2.48' / 6.35') = 1.409 \text{ wheels}$$

$$G_7 = 1^K (3.87' / 6.35') + 1^K (3.14' / 6.66') = 1.081 \text{ wheels}$$

$$G_8 = 1^K (3.52' / 6.66') = 0.529 \text{ wheels}$$

$\Sigma F_v = 4 \text{ wheels } \underline{OK}$

When Girder 8 not present

$$G_7 = 1^K (3.87' / 6.35') + 1^K (8.62' / 12.14') = 1.319 \text{ wheels}$$

$$G_9 = 1^K (3.52' / 12.14') = 0.290 \text{ wheels}$$

$\Sigma F_v = 4 \text{ wheels } \underline{OK}$

- Above Distribution Factors are approximate based on a rectangle span
actual D.F based on geometry will Differ. Only approx to get percent increase.

- Actual P.F @ S15 = 1.033

- MDX Load = 504.34 K-ft



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PROJECT Special Structures Rating

PROJECT # 040147 DATE 3/2/10 BY CJM SHEET NO. 3 OF

Distribution Factor - wheel loads - 1 lane permit truck + 1 lane HS20

Permit truck (Two left wheel lines)

$$G_5 = 1^k (6.13' / 6.38') + 1^k (0.13' / 6.38') = 0.981 \text{ wheels}$$

$$G_6 = 1^k (0.25' / 6.38') + 1^k (6.25' / 6.38') = 1.019 \text{ wheels}$$

$$\Sigma F_y = 2 \text{ wheels } \underline{OK}$$

HS20 Truck

$$G_6 = 1^k (2.48' / 6.35') = 0.391 \text{ wheels}$$

$$G_7 = 1^k (3.87' / 6.35') + 1^k (3.14' / 6.66') = 1.081 \text{ wheels}$$

$$G_8 = 1^k (3.52' / 6.35') = 0.528 \text{ wheels}$$

$$\Sigma F_y = 2 \text{ wheels } OK$$

From influence surface

$$G_5 = 443.4 \text{ K-ft}$$

$$G_6 = 205.1 \text{ K-ft} + 65.5 \text{ K-ft} = 270.6 \text{ K-ft}$$

$$G_7 = 43.7 \text{ K-ft}$$

$$G_8 = 1.0 \text{ K-ft}$$

$$\text{Total} = 758.7 \text{ K-ft}$$

$$\Delta = \frac{758.7 \text{ K-ft}}{443.4 \text{ K-ft}} = 71\%$$

Mom at 45

Girder 10

| | | | | | |
|---------|----------|----------|----------|----------|-------------|
| 0.00000 | -0.00022 | -0.00036 | -0.00065 | -0.00077 | -0.00091 |
| | -0.00106 | -0.00109 | -0.00096 | -0.00078 | 0.00000 10 |
| | 0.00154 | 0.00313 | 0.00464 | 0.00596 | 0.00717 |
| | 0.00779 | 0.00822 | 0.00768 | 0.00547 | 0.00000 20 |
| | -0.00804 | -0.01466 | -0.02425 | -0.02974 | -0.03866 |
| | -0.04530 | -0.05259 | -0.05698 | -0.04663 | 0.00000 30 |
| | 0.04701 | 0.09731 | 0.13163 | 0.15531 | 0.16490 |
| | 0.16199 | 0.13820 | 0.11570 | 0.05919 | 0.00000 40 |
| | 0.06528 | -0.13100 | -0.15648 | -0.18007 | -0.18212 |
| | 0.16684 | -0.13879 | -0.09972 | -0.04636 | 0.00000 50 |
| | 0.05066 | 0.05144 | 0.04378 | 0.03638 | 0.02912 |
| | 0.02215 | 0.01446 | 0.01029 | 0.00423 | 0.00000 60 |
| | -0.00387 | -0.00489 | -0.00620 | -0.00622 | -0.00571 |
| | -0.00481 | -0.00366 | -0.00209 | -0.00121 | 0.00000 70 |
| | 0.00073 | 0.00096 | 0.00114 | 0.00127 | 0.00121 |
| | 0.00108 | 0.00081 | 0.00056 | 0.00038 | 0.00000 80 |
| | -0.00039 | -0.00036 | -0.00032 | -0.00026 | -0.00020 |
| | -0.00016 | -0.00011 | -0.00005 | -0.00004 | 0.00000 90 |
| | 0.00002 | 0.00003 | 0.00004 | 0.00004 | 0.00004 |
| | 0.00003 | 0.00002 | 0.00001 | 0.00001 | 0.00000 100 |
| | 0.00000 | -0.00001 | -0.00001 | -0.00001 | -0.00001 |
| | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 110 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 120 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 130 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 140 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 150 |
| | 0.00101 | 0.00171 | 0.00291 | 0.00334 | 0.00389 |
| | 0.00404 | 0.00398 | 0.00316 | 0.00241 | 0.00000 10 |
| | -0.00426 | -0.00925 | -0.01336 | -0.01763 | -0.01980 |
| | -0.02087 | -0.01939 | -0.01633 | -0.00967 | 0.00000 20 |
| | 0.01448 | 0.02625 | 0.04415 | 0.05446 | 0.06852 |
| | 0.07211 | 0.07419 | 0.07195 | 0.05215 | 0.00000 30 |
| | -0.05048 | -0.10194 | -0.13251 | -0.14535 | -0.14547 |
| | -0.12096 | -0.08114 | -0.05125 | -0.00395 | 0.00000 40 |
| | -0.03126 | -0.09068 | -0.12477 | -0.17223 | -0.18980 |
| | -0.18997 | -0.15995 | -0.13070 | -0.05969 | 0.00000 50 |
| | 0.05405 | 0.04097 | 0.03263 | 0.02589 | 0.01984 |
| | 0.01455 | 0.00917 | 0.00637 | 0.00247 | 0.00000 60 |
| | -0.00217 | -0.00279 | -0.00362 | -0.00369 | -0.00343 |
| | -0.00292 | -0.00224 | -0.00129 | -0.00075 | 0.00000 70 |
| | 0.00046 | 0.00061 | 0.00072 | 0.00081 | 0.00077 |
| | 0.00069 | 0.00052 | 0.00036 | 0.00024 | 0.00000 80 |
| | -0.00025 | -0.00022 | -0.00020 | -0.00016 | -0.00013 |
| | -0.00010 | -0.00007 | -0.00003 | -0.00002 | 0.00000 90 |
| | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.00002 |
| | 0.00002 | 0.00001 | 0.00001 | 0.00000 | 0.00000 100 |
| | 0.00000 | 0.00000 | 0.00000 | -0.00001 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 110 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 120 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 130 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 140 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 150 |
| | 0.26943 | 0.21442 | 0.16006 | 0.10503 | 0.06345 |
| | 0.00976 | -0.03054 | -0.03230 | -0.02069 | 0.00000 10 |
| | 0.02371 | 0.01895 | 0.01472 | 0.01264 | 0.00895 |
| | 0.00728 | 0.00432 | 0.00297 | 0.00117 | 0.00000 20 |
| | -0.00099 | -0.00129 | -0.00168 | -0.00172 | -0.00160 |
| | -0.00135 | -0.00102 | -0.00058 | -0.00034 | 0.00000 30 |
| | 0.00021 | 0.00027 | 0.00033 | 0.00037 | 0.00036 |
| | 0.00032 | 0.00024 | 0.00017 | 0.00012 | 0.00000 40 |
| | -0.00009 | -0.00007 | -0.00007 | -0.00005 | -0.00004 |
| | -0.00003 | -0.00002 | -0.00001 | -0.00001 | 0.00000 50 |
| | 0.00000 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |

Girder 8

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|-----|
| | | 0.00001 | 0.00001 | 0.00000 | 0.00000 | 0.00000 | 60 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 70 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 80 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 90 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| Girder 7 | 0.07462 | 0.11318 | 0.13666 | 0.18862 | 0.22106 | 0.24257 | |
| | | 0.28959 | 0.31026 | 0.33358 | 0.21580 | 0.00000 | 10 |
| | | -0.28278 | -0.64502 | -0.80551 | -1.00806 | -1.09203 | |
| | | -1.07418 | -0.93743 | -0.78793 | -0.41598 | 0.00000 | 20 |
| | | 0.37475 | 0.73738 | 0.87451 | 0.99885 | 1.01153 | |
| | | 0.95783 | 0.79786 | 0.65208 | 0.30074 | 0.00000 | 30 |
| | | -0.26420 | -0.25954 | -0.24376 | -0.21037 | -0.18590 | |
| | | -0.13166 | -0.10696 | -0.05521 | -0.02858 | 0.00000 | 40 |
| | | 0.02302 | 0.03659 | 0.04310 | 0.04457 | 0.04176 | |
| | | 0.03567 | 0.02685 | 0.01733 | 0.00853 | 0.00000 | 50 |
| | | -0.00613 | -0.00983 | -0.01084 | -0.01130 | -0.01048 | |
| | | -0.00886 | -0.00633 | -0.00466 | -0.00179 | 0.00000 | 60 |
| | | 0.00109 | 0.00147 | 0.00185 | 0.00186 | 0.00174 | |
| | | 0.00145 | 0.00097 | 0.00064 | 0.00017 | 0.00000 | 70 |
| | | -0.00014 | -0.00025 | -0.00031 | -0.00034 | -0.00033 | |
| | | -0.00029 | -0.00023 | -0.00016 | -0.00008 | 0.00000 | 80 |
| | | 0.00006 | 0.00010 | 0.00012 | 0.00012 | 0.00012 | |
| | | 0.00011 | 0.00009 | 0.00006 | 0.00003 | 0.00000 | 90 |
| | | -0.00003 | -0.00003 | -0.00003 | -0.00002 | -0.00002 | |
| | | -0.00001 | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| Girder 6 | -1.15600 | -0.97903 | -0.86640 | -0.79642 | -0.74742 | -0.69777 | |
| | | -0.62761 | -0.53261 | -0.40377 | -0.22998 | 0.00000 | 10 |
| | | 0.91776 | 2.25860 | 3.01874 | 4.02856 | 4.34006 | |
| | | 4.17202 | 3.32355 | 2.62900 | 1.11385 | 0.00000 | 20 |
| | | -1.24279 | -1.06029 | -0.87437 | -0.66599 | -0.56503 | |
| | | -0.36893 | -0.29609 | -0.14693 | -0.07584 | 0.00000 | 30 |
| | | 0.05624 | 0.08921 | 0.10320 | 0.10572 | 0.09882 | |
| | | 0.08476 | 0.06441 | 0.04274 | 0.02133 | 0.00000 | 40 |
| | | -0.01476 | -0.02332 | -0.02539 | -0.02616 | -0.02414 | |
| | | -0.02044 | -0.01473 | -0.01100 | -0.00423 | 0.00000 | 50 |
| | | 0.00257 | 0.00341 | 0.00420 | 0.00420 | 0.00388 | |
| | | 0.00323 | 0.00214 | 0.00141 | 0.00038 | 0.00000 | 60 |
| | | -0.00024 | -0.00040 | -0.00046 | -0.00046 | -0.00042 | |
| | | -0.00036 | -0.00027 | -0.00018 | -0.00009 | 0.00000 | 70 |
| | | 0.00006 | 0.00009 | 0.00011 | 0.00011 | 0.00011 | |
| | | 0.00009 | 0.00007 | 0.00005 | 0.00002 | 0.00000 | 80 |
| | | -0.00002 | -0.00003 | -0.00002 | -0.00002 | -0.00001 | |
| | | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 90 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| Girder 5 | 0.00000 | 0.00272 | 0.00453 | 0.00771 | 0.00885 | 0.01027 | |
| | | 0.01066 | 0.01040 | 0.00813 | 0.00624 | 0.00000 | 10 |
| | | -0.01104 | -0.02290 | -0.03387 | -0.04557 | -0.05319 | |
| | | -0.05821 | -0.05728 | -0.05165 | -0.03603 | 0.00000 | 20 |
| | | 0.05236 | 0.09764 | 0.17588 | 0.22747 | 0.32938 | |
| | | 0.37436 | 0.47620 | 0.52301 | 0.43910 | 0.00000 | 30 |
| | | -0.51965 | -1.20836 | -1.53665 | -2.00116 | -2.22986 | |

| | | | | | | | |
|----------|---------|----------|----------|----------|----------|----------|-----|
| | | -2.28792 | -2.10208 | -1.84981 | -1.06300 | 0.00000 | 40 |
| | | 1.54184 | 3.74496 | 5.59286 | 8.58838 | 12.89200 | |
| | | 9.54803 | 6.42635 | 4.72008 | 1.85837 | 0.00000 | 50 |
| | | -1.43281 | -1.28055 | -1.11668 | -0.90550 | -0.78782 | |
| | | -0.54358 | -0.44161 | -0.22755 | -0.11769 | 0.00000 | 60 |
| | | 0.09120 | 0.14140 | 0.16374 | 0.16729 | 0.15601 | |
| | | 0.13348 | 0.10155 | 0.06711 | 0.03304 | 0.00000 | 70 |
| | | -0.02330 | -0.03652 | -0.03980 | -0.04092 | -0.03771 | |
| | | -0.03188 | -0.02300 | -0.01714 | -0.00659 | 0.00000 | 80 |
| | | 0.00396 | 0.00528 | 0.00653 | 0.00656 | 0.00610 | |
| | | 0.00512 | 0.00350 | 0.00234 | 0.00047 | 0.00000 | 90 |
| | | -0.00021 | -0.00035 | -0.00040 | -0.00040 | -0.00036 | |
| | | -0.00030 | -0.00023 | -0.00015 | -0.00007 | 0.00000 | 100 |
| | | 0.00002 | 0.00003 | 0.00004 | 0.00004 | 0.00005 | |
| Girder 4 | 0.00000 | 0.00005 | 0.00006 | 0.00006 | 0.00007 | 0.00008 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00001 | 0.00001 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | -0.00001 | -0.00001 | -0.00001 | |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | 0.00000 | |
| | | 0.00001 | 0.00003 | 0.00004 | 0.00006 | 0.00007 | |
| | | 0.00009 | 0.00011 | 0.00013 | 0.00009 | 0.00000 | |
| | | -0.00009 | -0.00018 | -0.00022 | -0.00025 | -0.00024 | |
| | | -0.00021 | -0.00017 | -0.00012 | -0.00006 | 0.00000 | |
| | | 0.00004 | 0.00007 | 0.00008 | 0.00009 | 0.00008 | |
| Girder 3 | 0.00002 | 0.00007 | 0.00006 | 0.00004 | 0.00002 | 0.00000 | |
| | | 0.00002 | 0.00002 | 0.00001 | 0.00001 | 0.00001 | |
| | | 0.00001 | 0.00001 | 0.00000 | 0.00000 | 0.00000 | |
| | | -0.00002 | -0.00004 | -0.00005 | -0.00006 | -0.00007 | |
| | | -0.00006 | -0.00005 | -0.00004 | -0.00002 | 0.00000 | |
| | | 0.00002 | 0.00003 | 0.00004 | 0.00004 | 0.00004 | |
| | | 0.00004 | 0.00003 | 0.00002 | 0.00001 | 0.00000 | |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 | |
| | | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| Girder 2 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| Girder 1 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | | |

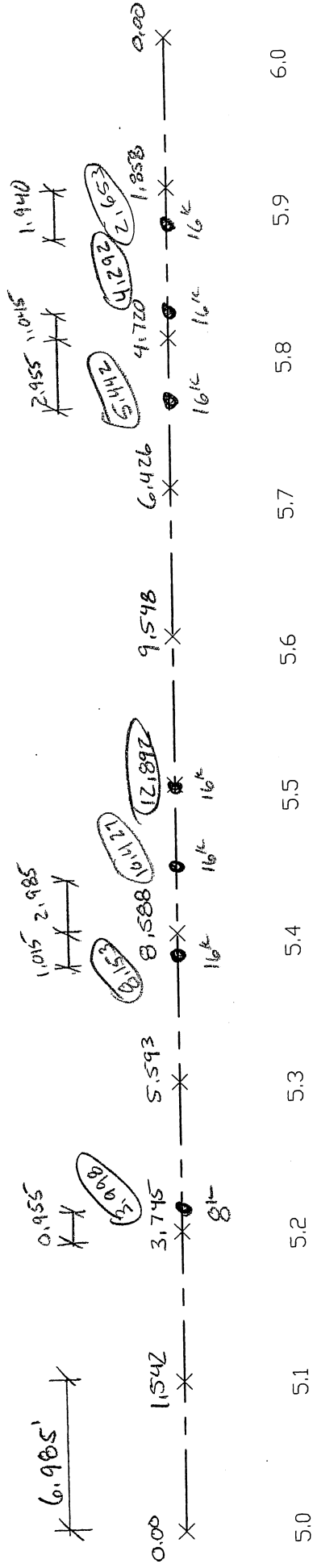
| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

Girder S - moment @ point 45

$$D_s = 1.033 \cdot 1.077$$

MDX Load = ~~804.13~~ K-ft 492.16 K-ft

LL + Imp = 112.5



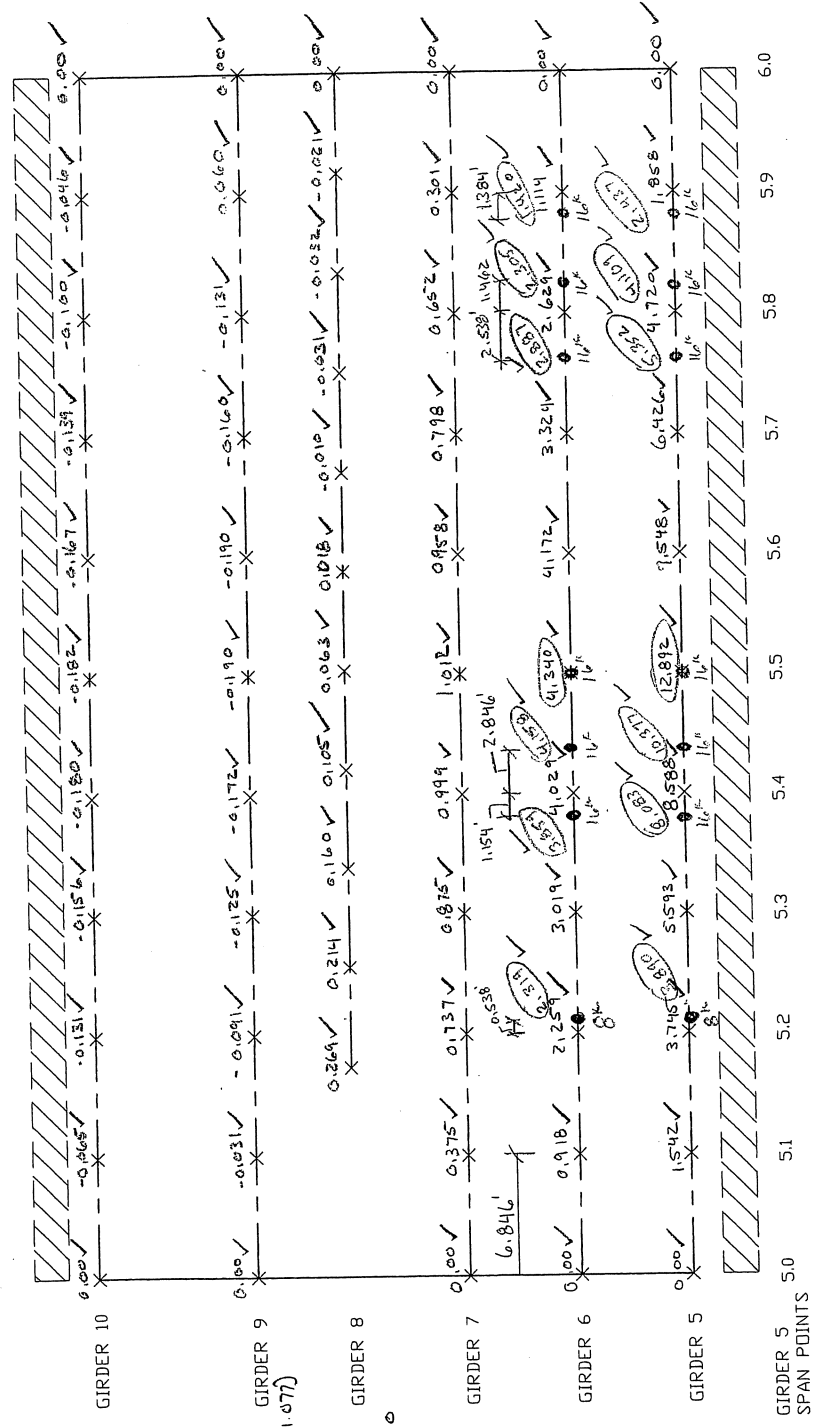
$$Girder S = 1.033 \cdot 1.077 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} \left[(8^k \cdot 3,998) + 16^k (8,153 + 10,427 + 12,892 + 15,442 + 17,895) \right] = 493.9$$

Due to Rounding

$$D = \frac{493.9}{492.6} = 0.26\%$$

✓ RAM 4/30/10

GIRDER 5 INFLUENCE SURFACE - POINT 45 - SPAN POINT 5.5





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PROJECT Special Structures Rating

PROJECT # 090147

DATE 3/2/10

BY CJM

SHEET NO. 1

OF 1

Location: Girder 7 - span point 3.5

- use same Framing Geometry from Girder 5 - span point 5.5
(See calcs)

Distribution Factors - 1 lane Permit truck, 1 lane HS20
(See attached Sheets for calcs)

Use Case 2 or 3 (Permit left lane on G₇ + Right Adjacent to G₈)
Try HS20 on each side of Permit Truck

Case 2:

MDX Load = 294.84 K-ft - w/ 1.228 D.F. - only Girder 7

1 lane Permit Truck = 427.1 K-ft $\Delta = +45\%$

1 lane Permit + 1 lane HS20 = 581.5 K-ft $\Delta = +97.2\%$

c

Case 3:

MDX Load = 294.84 K-ft - w/ 1.228 D.F. only Girder 7

1 lane Permit Truck = 427.1 K-ft $\Delta = +45\%$

1 lane Permit + 1 lane HS20 = 633.7 K-ft $\Delta = +115.0\%$

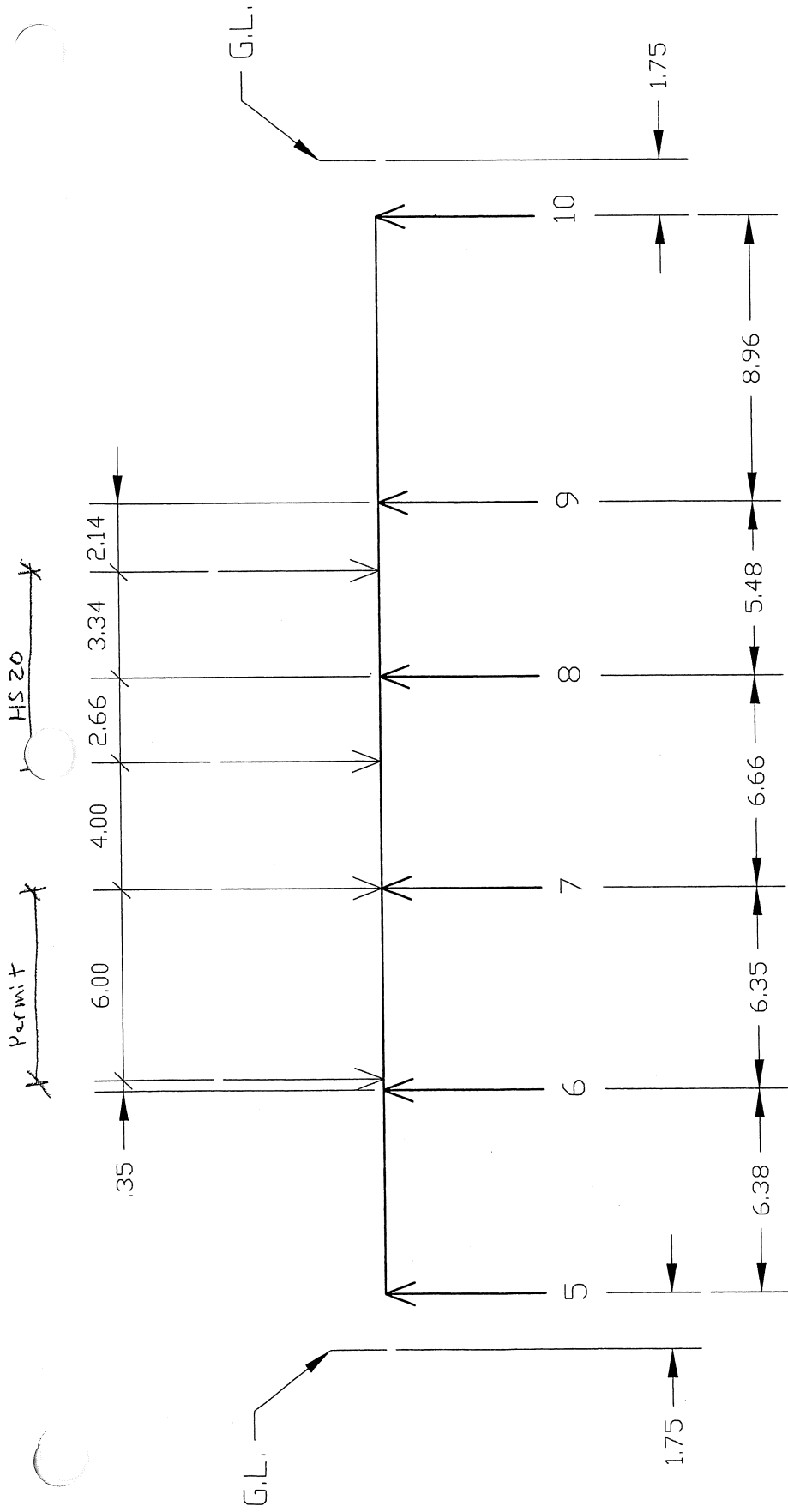
Single lane loaded = 258.7 K-ft

Case 2: Permit only = 427.1 K-ft $\Delta = 65.1\%$

Permit + HS20 = 581.5 K-ft $\Delta = 124.8\%$

Case 2: Permit only = 427.1 K-ft $\Delta = 65.1\%$

Permit + HS20 = 633.7 K-ft $\Delta = 145\%$



Case I

Permit P.F

$$G_6 = 1^K (6.0' / 6.35') = 0.945 \text{ wheels}$$

$$G_7 = 1^K + 1^K (0.35' / 6.35') = 1.055 \text{ wheels}$$

HS20 P.F

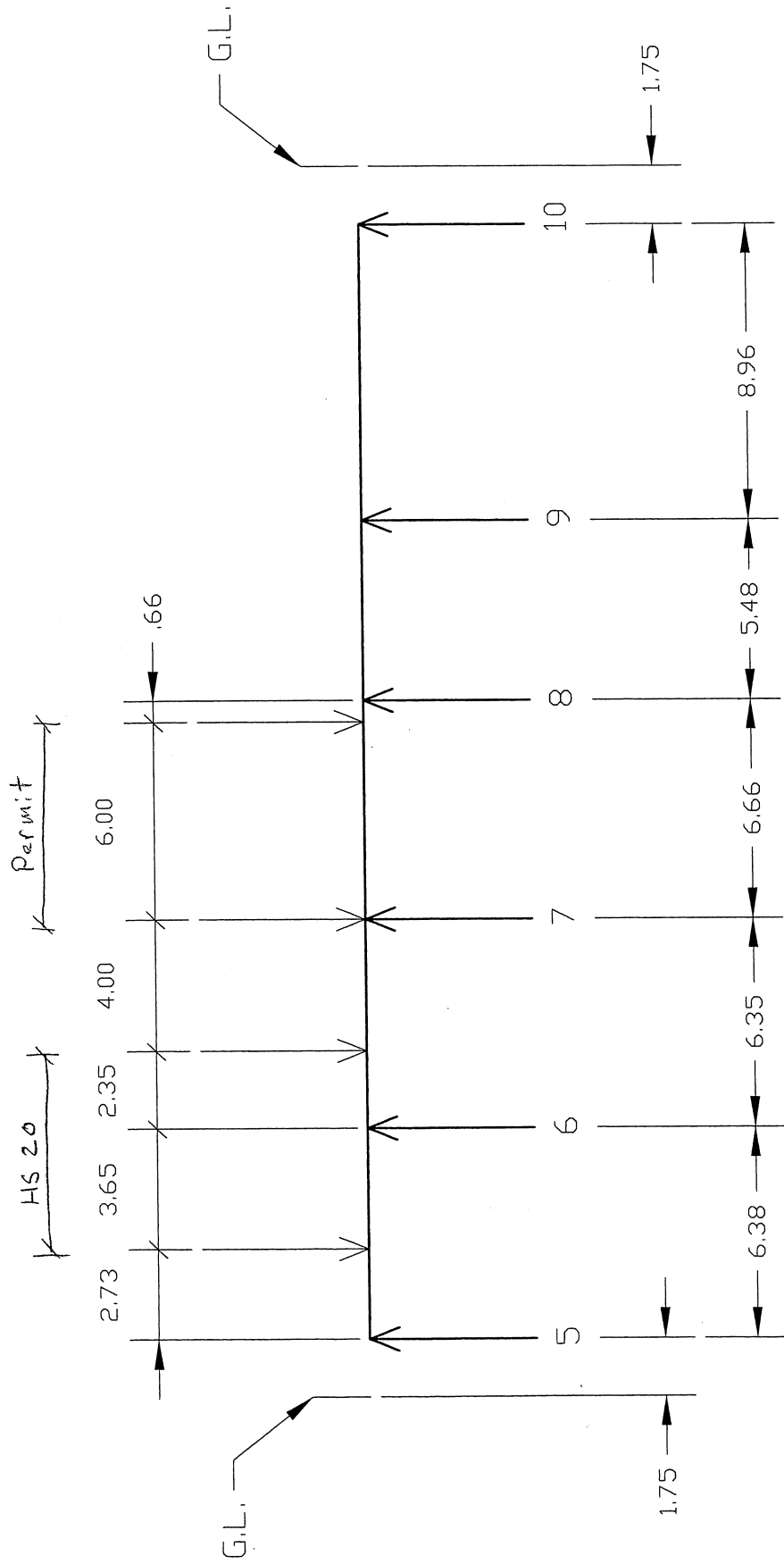
$$G_7 = 1^K (2.66' / 6.66') = 0.399 \text{ wheels}$$

$$G_8 = 1^K (4.00' / 6.66') + 1^K (2.14' / 5.48') = 0.991 \text{ wheels}$$

$$G_9 = 1^K (3.34' / 5.48') = 0.609 \text{ wheels}$$

$$\Sigma F_y = 2 \text{ wheels} - \underline{OK}$$

$$\Sigma F_y = 1.999 \approx 2 \text{ wheels} - \underline{OK}$$



Case 3

Permit D, F

$$G_7 = 1'' + 1'' (0.66' / 6.66') = 1.099 \text{ wheels}$$

$$G_8 = 1'' (6.00' / 6.66') = 0.901 \text{ wheels}$$

$$\sum F_y = 2.0 \text{ wheels} - 0.11$$

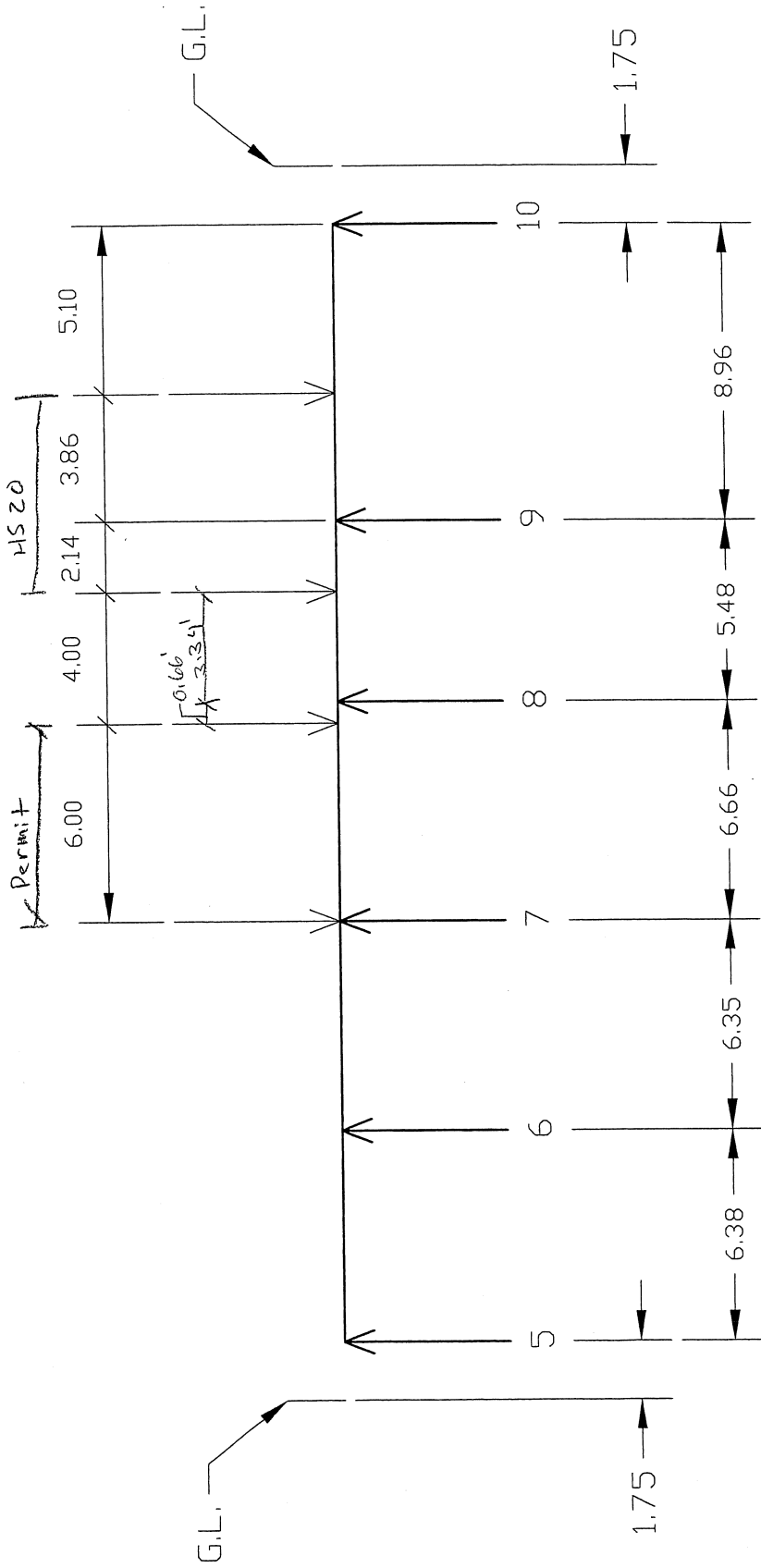
HS 20 D, F

$$G_5 = 1'' (3.65' / 6.38') = 0.572 \text{ wheels}$$

$$G_6 = 1'' (2.73' / 6.38') + 1'' (4.00' / 6.35') = 1.058 \text{ wheels}$$

$$G_7 = 1'' (2.35' / 6.35') = 0.370 \text{ wheels}$$

$$\sum F_y = 2 \text{ wheels} - 0.11$$



Case 2

Permit D.F.

$$G_7 = 1^k + 1^k (0.66' / 6.66') = 1.099 \text{ wheels}$$

$$G_8 = 1^k (6.00' / 6.66') = 0.901 \text{ wheels}$$

HS20 D.F.

$$G_8 = 1^k (2.14' / 5.48') = 0.391 \text{ wheels}$$

$$G_9 = 1^k (3.34' / 5.48') + 1^k (5.10' / 8.96') = 1.179 \text{ wheels}$$

$$G_{10} = 1^k (3.86' / 8.96') = 0.431 \text{ wheels}$$

$$\Sigma F_y = 2 \text{ wheels} - 0.1^k$$

$$\Sigma F_y = 2.001 \approx 2 \text{ wheels} - 0.1^k$$

Mom at 25

| | | | | | | |
|-----------|---------|----------|----------|----------|----------|------------------------|
| Girder 10 | 0.00000 | 0.00017 | 0.00029 | 0.00049 | 0.00057 | 0.00067 |
| | | 0.00070 | 0.00070 | 0.00056 | 0.00043 | 0.00000 ¹⁰ |
| | | -0.00082 | -0.00185 | -0.00275 | -0.00375 | -0.00438 |
| | | -0.00484 | -0.00474 | -0.00434 | -0.00288 | 0.00000 ²⁰ |
| | | 0.00431 | 0.00878 | 0.01592 | 0.02064 | 0.02810 |
| | | 0.03387 | 0.03988 | 0.04277 | 0.03503 | 0.00000 ³⁰ |
| | | -0.03663 | -0.07831 | -0.10737 | -0.12439 | -0.13241 |
| | | -0.12095 | -0.09544 | -0.07301 | -0.02624 | 0.00000 ⁴⁰ |
| | | 0.01056 | -0.00346 | -0.01897 | -0.05004 | -0.05803 |
| | | -0.07238 | -0.06574 | -0.05149 | -0.02704 | 0.00000 ⁵⁰ |
| | | 0.02778 | 0.01811 | 0.00311 | -0.00277 | -0.00612 |
| | | -0.00521 | -0.00270 | -0.00123 | -0.00015 | 0.00000 ⁶⁰ |
| | | 0.00057 | 0.00114 | 0.00199 | 0.00244 | 0.00256 |
| | | 0.00231 | 0.00182 | 0.00107 | 0.00065 | 0.00000 ⁷⁰ |
| | | -0.00049 | -0.00068 | -0.00088 | -0.00104 | -0.00105 |
| | | -0.00098 | -0.00077 | -0.00055 | -0.00039 | 0.00000 ⁸⁰ |
| | | 0.00044 | 0.00041 | 0.00037 | 0.00030 | 0.00024 |
| | | 0.00018 | 0.00012 | 0.00006 | 0.00004 | 0.00000 ⁹⁰ |
| | | -0.00003 | -0.00004 | -0.00006 | -0.00006 | -0.00006 |
| | | -0.00005 | -0.00004 | -0.00002 | -0.00001 | 0.00000 ¹⁰⁰ |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00000 | 0.00000 ¹¹⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹²⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹³⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁴⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁵⁰ |
| Girder 9 | 0.00000 | 0.00052 | 0.00089 | 0.00152 | 0.00175 | 0.00205 |
| | | 0.00216 | 0.00215 | 0.00174 | 0.00134 | 0.00000 ¹⁰ |
| | | -0.00244 | -0.00528 | -0.00775 | -0.01029 | -0.01185 |
| | | -0.01268 | -0.01223 | -0.01060 | -0.00666 | 0.00000 ²⁰ |
| | | 0.01103 | 0.02117 | 0.03956 | 0.05195 | 0.07628 |
| | | 0.08714 | 0.11130 | 0.12326 | 0.10459 | 0.00000 ³⁰ |
| | | -0.11873 | -0.26269 | -0.37964 | -0.47790 | -0.55341 |
| | | -0.58744 | -0.56541 | -0.51496 | -0.31947 | 0.00000 ⁴⁰ |
| | | 0.45294 | 1.09654 | 1.42076 | 1.80809 | 1.94942 |
| | | 1.89587 | 1.59576 | 1.29971 | 0.58892 | 0.00000 ⁵⁰ |
| | | -0.54173 | -0.43819 | -0.37475 | -0.31194 | -0.25065 |
| | | -0.18961 | -0.12230 | -0.08527 | -0.03312 | 0.00000 ⁶⁰ |
| | | 0.02845 | 0.03618 | 0.04634 | 0.04679 | 0.04318 |
| | | 0.03649 | 0.02779 | 0.01585 | 0.00917 | 0.00000 ⁷⁰ |
| | | -0.00555 | -0.00738 | -0.00872 | -0.00974 | -0.00931 |
| | | -0.00828 | -0.00623 | -0.00423 | -0.00290 | 0.00000 ⁸⁰ |
| | | 0.00286 | 0.00259 | 0.00232 | 0.00180 | 0.00141 |
| | | 0.00105 | 0.00072 | 0.00035 | 0.00023 | 0.00000 ⁹⁰ |
| | | -0.00016 | -0.00020 | -0.00026 | -0.00026 | -0.00024 |
| | | -0.00020 | -0.00015 | -0.00009 | -0.00005 | 0.00000 ¹⁰⁰ |
| | | 0.00003 | 0.00004 | 0.00005 | 0.00005 | 0.00005 |
| | | 0.00005 | 0.00003 | 0.00002 | 0.00002 | 0.00000 ¹¹⁰ |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | -0.00001 |
| | | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹²⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹³⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁴⁰ |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁵⁰ |
| Girder 8 | 1.03859 | 2.07714 | 3.19557 | 3.94274 | 4.35938 | 4.14153 |
| | | 3.56348 | 2.76848 | 1.86030 | 0.86020 | 0.00000 ¹⁰ |
| | | -0.82417 | -0.69876 | -0.58742 | -0.52162 | -0.39716 |
| | | -0.33396 | -0.21029 | -0.14799 | -0.06015 | 0.00000 ²⁰ |
| | | 0.05092 | 0.06544 | 0.08524 | 0.08689 | 0.08072 |
| | | 0.06875 | 0.05284 | 0.03044 | 0.01789 | 0.00000 ³⁰ |
| | | -0.01056 | -0.01393 | -0.01659 | -0.01855 | -0.01774 |
| | | -0.01580 | -0.01193 | -0.00819 | -0.00567 | 0.00000 ⁴⁰ |
| | | 0.00444 | 0.00354 | 0.00323 | 0.00258 | 0.00208 |
| | | 0.00159 | 0.00112 | 0.00057 | 0.00038 | 0.00000 ⁵⁰ |
| | | -0.00027 | -0.00034 | -0.00044 | -0.00045 | -0.00042 |

Girder 7 0.03286

| | | | | | |
|----------|----------|----------|----------|----------|-----|
| -0.00035 | -0.00027 | -0.00016 | -0.00009 | 0.00000 | 60 |
| 0.00005 | 0.00007 | 0.00009 | 0.00010 | 0.00009 | |
| 0.00008 | 0.00006 | 0.00004 | 0.00003 | 0.00000 | 70 |
| -0.00002 | -0.00002 | -0.00002 | -0.00002 | -0.00001 | |
| -0.00001 | -0.00001 | 0.00000 | 0.00000 | 0.00000 | 80 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 90 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| 0.05114 | 0.06224 | 0.08721 | 0.10412 | 0.11527 | |
| 0.14155 | 0.15492 | 0.16995 | 0.11067 | 0.00000 | 10 |
| -0.15081 | -0.35608 | -0.45576 | -0.60643 | -0.68862 | |
| -0.73274 | -0.70938 | -0.63994 | -0.38394 | 0.00000 | 20 |
| 0.45513 | 1.63867 | 2.58022 | 4.40188 | 7.90531 | |
| 5.07318 | 2.82429 | 1.91742 | 0.67025 | 0.00000 | 30 |
| -0.53443 | -0.49827 | -0.45035 | -0.37799 | -0.33279 | |
| -0.23561 | -0.19250 | -0.10080 | -0.05244 | 0.00000 | 40 |
| 0.04093 | 0.06354 | 0.07366 | 0.07536 | 0.07034 | |
| 0.06026 | 0.04589 | 0.03042 | 0.01496 | 0.00000 | 50 |
| -0.01053 | -0.01649 | -0.01797 | -0.01850 | -0.01712 | |
| -0.01455 | -0.01056 | -0.00785 | -0.00306 | 0.00000 | 60 |
| 0.00185 | 0.00248 | 0.00308 | 0.00309 | 0.00285 | |
| 0.00236 | 0.00158 | 0.00103 | 0.00027 | 0.00000 | 70 |
| -0.00020 | -0.00034 | -0.00040 | -0.00042 | -0.00039 | |
| -0.00034 | -0.00026 | -0.00018 | -0.00009 | 0.00000 | 80 |
| 0.00006 | 0.00010 | 0.00011 | 0.00012 | 0.00011 | |
| 0.00010 | 0.00008 | 0.00006 | 0.00003 | 0.00000 | 90 |
| -0.00003 | -0.00003 | -0.00002 | -0.00002 | -0.00002 | |
| -0.00001 | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 100 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| -0.41987 | -0.38272 | -0.36243 | -0.34877 | -0.33155 | |
| -0.30154 | -0.25789 | -0.19659 | -0.11239 | 0.00000 | 10 |
| 0.54780 | 1.44019 | 1.97918 | 2.70425 | 2.88194 | |
| 2.77662 | 2.14610 | 1.67027 | 0.68444 | 0.00000 | 20 |
| -0.72770 | -0.60699 | -0.48740 | -0.35940 | -0.30097 | |
| -0.19117 | -0.15221 | -0.07437 | -0.03806 | 0.00000 | 30 |
| 0.02801 | 0.04430 | 0.05122 | 0.05245 | 0.04902 | |
| 0.04207 | 0.03202 | 0.02135 | 0.01064 | 0.00000 | 40 |
| -0.00735 | -0.01161 | -0.01264 | -0.01304 | -0.01208 | |
| -0.01026 | -0.00743 | -0.00556 | -0.00214 | 0.00000 | 50 |
| 0.00130 | 0.00172 | 0.00212 | 0.00212 | 0.00196 | |
| 0.00162 | 0.00108 | 0.00070 | 0.00019 | 0.00000 | 60 |
| -0.00012 | -0.00021 | -0.00025 | -0.00026 | -0.00024 | |
| -0.00021 | -0.00016 | -0.00010 | -0.00005 | 0.00000 | 70 |
| 0.00003 | 0.00006 | 0.00007 | 0.00007 | 0.00006 | |
| 0.00006 | 0.00005 | 0.00003 | 0.00002 | 0.00000 | 80 |
| -0.00002 | -0.00002 | -0.00001 | -0.00001 | -0.00001 | |
| -0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 90 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 100 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 110 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 120 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 130 |
| 0.00101 | 0.00169 | 0.00286 | 0.00328 | 0.00380 | |
| 0.00394 | 0.00384 | 0.00299 | 0.00229 | 0.00000 | 10 |
| -0.00402 | -0.00828 | -0.01222 | -0.01632 | -0.01897 | |
| -0.02058 | -0.02011 | -0.01793 | -0.01240 | 0.00000 | 20 |
| 0.01767 | 0.03275 | 0.05892 | 0.07602 | 0.10991 | |
| 0.12477 | 0.15846 | 0.17424 | 0.14593 | 0.00000 | 30 |
| -0.16775 | -0.37834 | -0.47290 | -0.59479 | -0.63661 | |

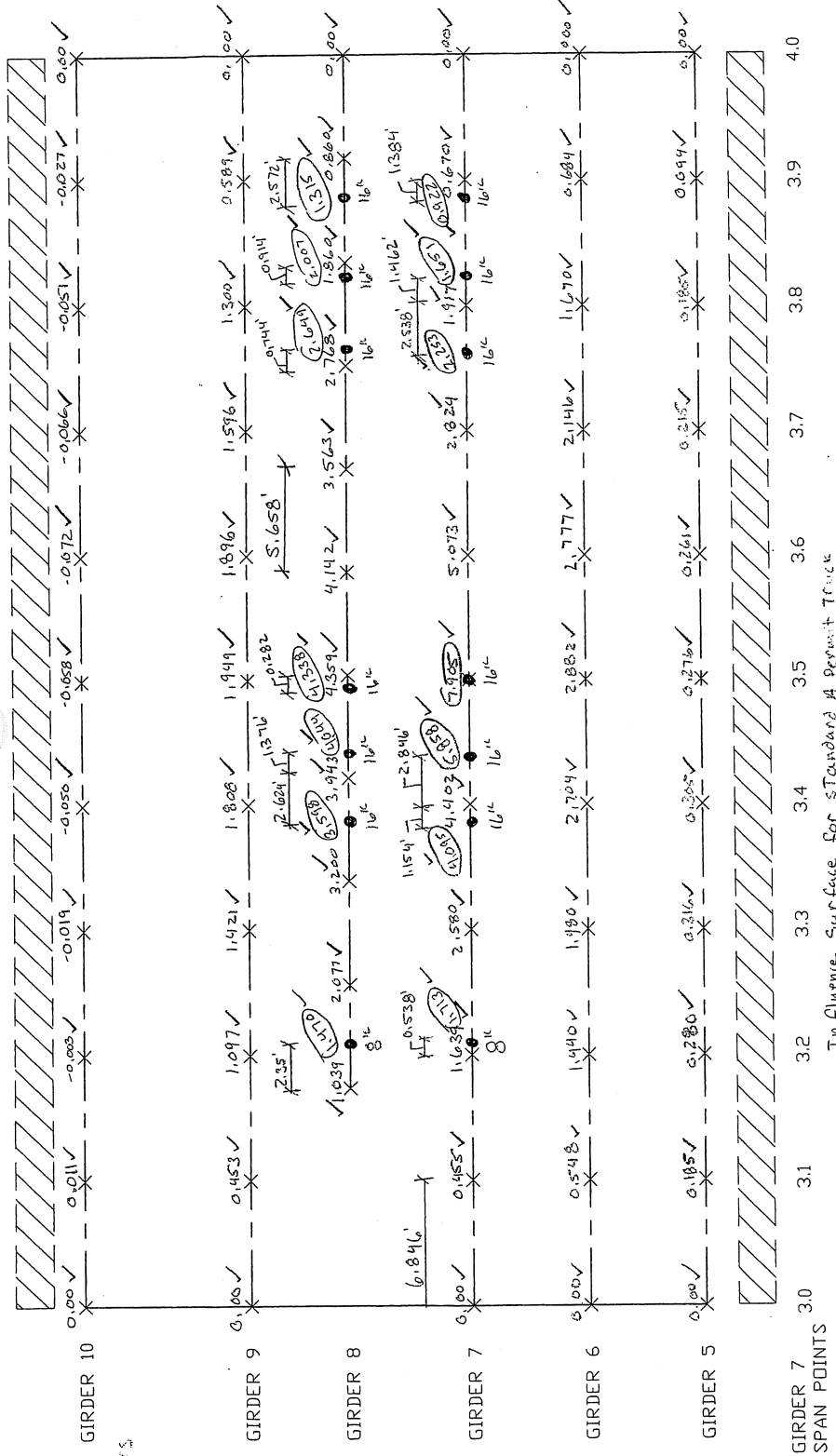
Girder 5 0.00000

[illegible]

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

✓ RAM 4/30/10

GIRDER 7 INFLUENCE SURFACE - POINT 25 - SPAN POINT 3.5



Girder 7 = $1.099 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} [(8^* \cdot 1.713) + 16^* (4.095 + 5.858 + 7.905 + 2.253 + 1.651 + 0.922)] = 258.7 \text{ K-ft}$

D.F. adjusted = $1.228 / 1.099 \cdot 258.7 \text{ K-ft} = 289.1 \text{ K-ft}$ $\Delta = 2\% \text{ OK}$

Girder 8 = $0.901 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} [(8^* \cdot 1.470) + 16^* (3.598 + 4.040 + 4.338 + 2.649 + 2.007 + 1.315)] = 168.4 \text{ K-ft}$

Total Permit Truck = 477.1 K-ft ✓

1 Lane STD A Truck
1 Lane HS20

Distribution Factors

Case 2
Permit

G7 = 1.099 wheels

G8 = 0.901 wheels

HS20

G8 = 0.391 wheels

G9 = 1.179 wheels

G10 = 0.431 wheels

Case 3

Permit

G7 = 1.099 wheels

G8 = 0.901 wheels

HS20

G5 = 0.572 wheels

G6 = 1.058 wheels

G7 = 0.370 wheels

WDX Load
= 244.84 K-ft + 1228
(D.F. = 1.228)
LL + Imp = 125



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PROJECT Special Structure Rating

PROJECT # 090147

DATE 3/1/10

BY CJM

SHEET NO. _____ OF _____

Location: Girder 8 - span point 7.0 (tenth point 60)

- Location in area of curvature + has 3 girders spaced at 9'-0" o.c.
Use middle girder for span length

Span 6 = 70.90'

Span 7 = 55.92'

Moment at location = -320.92 K-ft (MPX-Standard # Truck)

D.F. G_8 = 1.278 wheels

D.F. G_9 = 0.722 wheels = 2 - 1.278

Adjacent Girder Locations

G_9 = span point 11.0 (tenth point 100)

G_{10} = span point 11.0 (tenth point 100)

From influence surface:

Girder 8 = -315.2 K-ft $\Delta = 1.8\%$ - Due to rounding + approx span length

Girder 9 = -33.4 K-ft

% increase to Girder 8 = $-33.4 \text{ K-ft} / -315.2 \text{ K-ft} = 10.6\%$

Mom at 60

Girder 10 0.00000

| | | | | | |
|----------|----------|----------|----------|------------|-----------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000010 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000020 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000036 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000040 |
| -0.00001 | -0.00002 | -0.00003 | -0.00004 | -0.00006 | |
| -0.00007 | -0.00007 | -0.00007 | -0.00004 | 0.0000050 | |
| 0.00008 | 0.00018 | 0.00029 | 0.00039 | 0.00048 | |
| 0.00056 | 0.00059 | 0.00056 | 0.00036 | 0.0000060 | |
| -0.00075 | -0.00130 | -0.00228 | -0.00299 | -0.00356 | |
| -0.00392 | -0.00397 | -0.00316 | -0.00245 | 0.0000070 | |
| 0.00352 | 0.00528 | 0.00855 | 0.01228 | 0.01465 | |
| 0.01614 | 0.01516 | 0.01297 | 0.01022 | 0.0000080 | |
| -0.01577 | -0.04384 | -0.05888 | -0.08507 | -0.10077 | |
| -0.10962 | -0.10968 | -0.08565 | -0.06678 | 0.0000090 | |
| 0.10527 | 0.17341 | 0.28224 | 0.34103 | 0.36157 | |
| 0.34284 | 0.28110 | 0.15819 | 0.07345 | 0.00000100 | |
| 0.03374 | 0.07310 | 0.14761 | 0.21303 | 0.24043 | |
| 0.24346 | 0.20424 | 0.15153 | 0.10660 | 0.00000110 | |

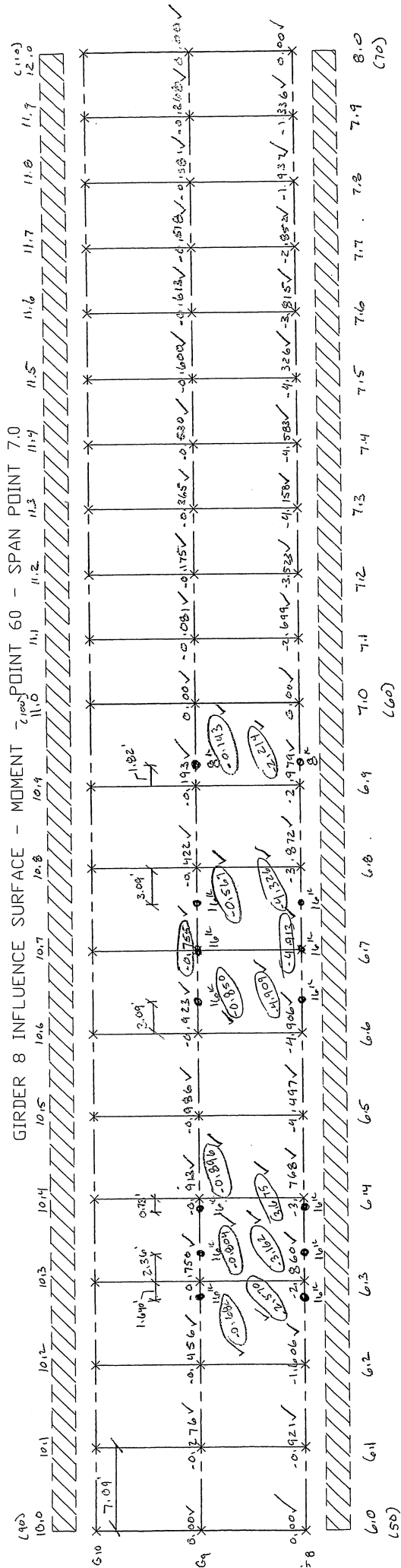
Girder 9 0.00000

| | | | | | |
|------------------|----------|----------|----------|------------|-----------|
| -0.10141 | -0.09799 | -0.09225 | -0.07948 | -0.06858 | |
| -0.05597 | -0.04137 | -0.02291 | -0.01535 | 0.00000120 | |
| 0.01054 | 0.01310 | 0.01662 | 0.01675 | 0.01547 | |
| 0.01298 | 0.01099 | 0.00615 | 0.00377 | 0.00000130 | |
| -0.00235 | -0.00293 | -0.00370 | -0.00372 | -0.00344 | |
| -0.00287 | -0.00243 | -0.00134 | -0.00081 | 0.00000140 | |
| 0.00041 | 0.00052 | 0.00059 | 0.00063 | 0.00057 | |
| 0.00049 | 0.00038 | 0.00026 | 0.00013 | 0.00000150 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000010 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000020 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.0000030 | |
| 0.00000 | -0.00001 | -0.00001 | -0.00002 | -0.00002 | |
| -0.00002 | -0.00002 | -0.00002 | -0.00001 | 0.0000040 | |
| 0.00002 | 0.00005 | 0.00006 | 0.00009 | 0.00011 | |
| 0.00011 | 0.00011 | 0.00009 | 0.00005 | 0.0000050 | |
| -0.00011 | -0.00066 | -0.00119 | -0.00159 | -0.00188 | |
| -0.00201 | -0.00192 | -0.00170 | -0.00107 | 0.0000060 | |
| 0.00193 | 0.00323 | 0.00561 | 0.00731 | 0.00858 | |
| 0.00926 | 0.00912 | 0.00706 | 0.00532 | 0.0000070 | |
| -0.00725 | -0.01082 | -0.01731 | -0.02465 | -0.02921 | |
| -0.03193 | -0.02965 | -0.02497 | -0.01946 | 0.0000080 | |
| 0.02590 | 0.11923 | 0.17027 | 0.25663 | 0.30459 | |
| 0.32808 | 0.32252 | 0.24412 | 0.18615 | 0.0000090 | |
| -0.27563 | -0.45634 | -0.74991 | -0.91313 | -0.98622 | |
| -0.92315 | -0.75490 | -0.42183 | -0.19318 | 0.00000100 | |
| -0.08089 | -0.17465 | -0.36455 | -0.53021 | -0.59965 | |
| -0.61264 | -0.51753 | -0.38136 | -0.26848 | 0.00000110 | |
| 0.25817 | 0.24075 | 0.22163 | 0.18263 | 0.14816 | |
| 0.11392 | 0.07997 | 0.04032 | 0.02735 | 0.00000120 | |
| -0.02034 | -0.02677 | -0.03554 | -0.03678 | -0.03486 | |
| -0.02921 | -0.02469 | -0.01369 | -0.00837 | 0.00000130 | |
| 0.00541 | 0.00700 | 0.00912 | 0.00934 | 0.00874 | |
| 0.00729 | 0.00613 | 0.00337 | 0.00204 | 0.00000140 | |
| -0.00115 | -0.00152 | -0.00182 | -0.00202 | -0.00192 | |
| -0.00169 | -0.00136 | -0.00095 | -0.00049 | 0.00000150 | |
| Girder 8 0.00004 | 0.00007 | 0.00010 | 0.00012 | 0.00014 | 0.00016 |
| | 0.00018 | 0.00018 | 0.00016 | 0.00010 | 0.0000010 |
| | -0.00035 | -0.00151 | -0.00283 | -0.00347 | -0.00431 |
| | -0.00453 | -0.00442 | -0.00393 | -0.00249 | 0.0000020 |
| | 0.00438 | 0.00731 | 0.01281 | 0.01676 | 0.01978 |
| | 0.02140 | 0.02113 | 0.01630 | 0.01230 | 0.0000030 |
| | -0.01569 | -0.02324 | -0.03718 | -0.05232 | -0.06121 |
| | -0.06603 | -0.06046 | -0.05036 | -0.03896 | 0.0000040 |
| | 0.07723 | 0.34641 | 0.48074 | 0.71961 | 0.85658 |
| | 0.93262 | 0.93208 | 0.73836 | 0.58097 | 0.0000050 |
| | -0.92146 | -1.60556 | -2.85967 | -3.76834 | -4.49698 |

[illegible]

[illegible]

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |



Standard A Truck

D, F, G - 1,278

$$P.F = G - g = 2 - 1.278 = 0.722$$
$$mD \times Load = -320,92 \text{ k-ft}$$
$$L + \text{imp} = 1.25$$

$$\begin{aligned} \text{Cylinder} &= 1.278 \cdot 1.25 \cdot \frac{\text{layer}}{\text{2 wheels}} [60^\circ \cdot 2.214] + 16'' [-2.570 + -3.162 + -3.675 + -4.909 + -4.915 + -4.926] \\ &= -315.2 \text{ K-ft} \end{aligned}$$

$$\left(k = 1.8\% - \text{One to rounding} + \right. \\ \left. \text{approx. scaling} + \right. \\ \left. \text{label placement} \right)$$

$$G_9 = 0.722 \cdot 1.25 \cdot \frac{1 \text{ axel}}{2 \text{ wheels}} \cdot \left[(B^k - 0.143) + 16^k \cdot (-0.1682 - 0.8094 + 0.816 + 0.0850 + 0.785 + 0.5671) \right] = -33.4 \text{ kN}$$

$$\frac{G_9}{G_{80}} = \frac{-33.4}{-315.2} = 10.6\%, \checkmark$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/1/10 BY CSM SHEET NO. _____ OF _____

Location: Girder 7 - span point 14.0 (moment)

- Location is in area of curvature and has 3 girders spaced at 9'-0" o.c. Use middle girder for span lengths

Span 13 = 52.22'

Span 14 = 60.25'

Moment at tenth point 130 = -366.50 K-ft (Standard A-truck)

G_7 D.F. = 1.278 wheels

G_6 D.F. = 0.722 wheels (2 - 1.278)

From Influence surface:

$G_7 = -356.1$ K-ft (D = 2.9% - most likely due to rounding & approx span length)

$G_6 = -40.0$ K-ft

% increase to $G_7 = 40 \text{ K-ft} / -356.1 \text{ K-ft} = 11.2\%$

[illegible][illegible]

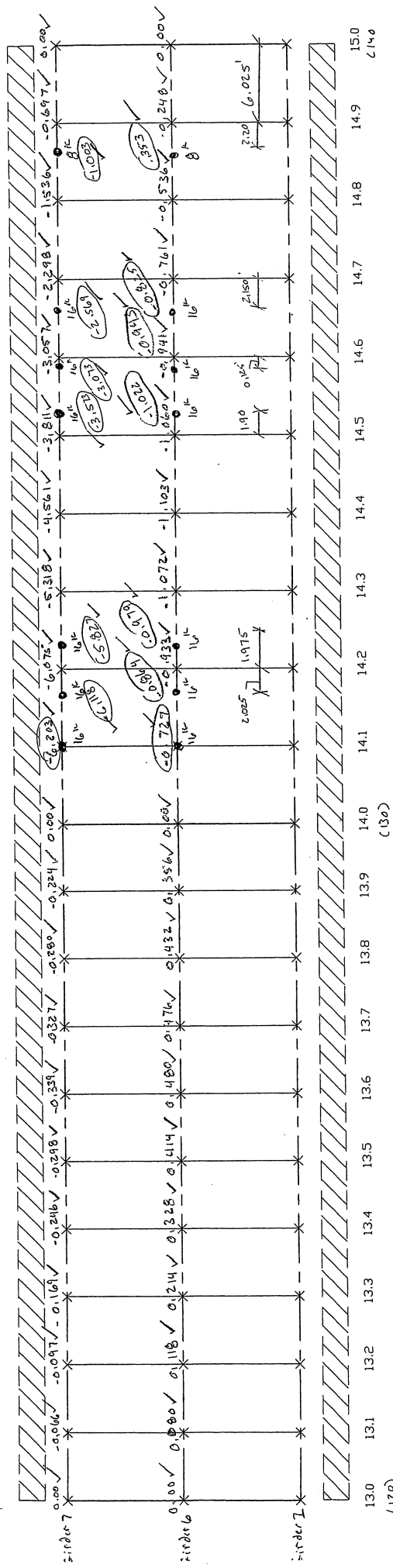
| | | | | |
|----------|----------|----------|----------|------------------------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ¹⁰ |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ²⁰ |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ³⁰ |
| 0.00000 | 0.00000 | -0.00000 | 0.00000 | 0.00000 |
| -0.00000 | -0.00000 | 0.00000 | 0.00000 | 0.00000 ⁴⁰ |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ⁵⁰ |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 ⁶⁰ |
| 0.00000 | 0.00000 | -0.00001 | -0.00001 | -0.00001 |
| -0.00001 | -0.00001 | -0.00002 | -0.00001 | 0.00000 ⁷⁰ |
| 0.00001 | 0.00003 | 0.00004 | 0.00005 | 0.00006 |
| 0.00006 | 0.00006 | 0.00005 | 0.00003 | 0.00000 ⁸⁰ |
| -0.00004 | -0.00009 | -0.00014 | -0.00018 | -0.00021 |
| -0.00022 | -0.00021 | -0.00018 | -0.00011 | 0.00000 ⁹⁰ |
| 0.00014 | 0.00063 | 0.00120 | 0.00168 | 0.00204 |
| 0.00225 | 0.00222 | 0.00202 | 0.00129 | 0.00000 ¹⁰⁰ |
| -0.00208 | -0.00337 | -0.00620 | -0.00742 | -0.00916 |
| -0.01004 | -0.01018 | -0.00819 | -0.00668 | 0.00000 ¹¹⁰ |
| 0.01003 | 0.01787 | 0.03250 | 0.04421 | 0.05534 |
| 0.06191 | 0.06502 | 0.05392 | 0.04469 | 0.00000 ¹²⁰ |
| -0.06553 | -0.09697 | -0.16862 | -0.24600 | -0.29796 |
| -0.33885 | -0.32676 | -0.27990 | -0.22441 | 0.00000 ¹³⁰ |
| -6.20334 | -6.07520 | -5.31830 | -4.56094 | -3.81052 |
| -3.05669 | -2.29794 | -1.53613 | -0.69724 | 0.00000 ¹⁴⁰ |

[illegible]

[illegible]

| | | | | | |
|----------|----------|----------|----------|----------|-----|
| -0.00250 | 0.00095 | 0.00703 | 0.01009 | 0.00000 | 120 |
| -0.02285 | -0.03396 | -0.05961 | -0.09757 | -0.13012 | |
| -0.15478 | -0.15960 | -0.15530 | -0.13193 | 0.00000 | 130 |
| 0.29927 | 0.34317 | 0.35205 | 0.34423 | 0.31774 | |
| 0.27581 | 0.22053 | 0.15364 | 0.08045 | 0.00000 | 140 |

GIRDER 7 INFLUENCE SURFACE - MOMENT - POINT 130 - SPAN POINT 14.0



Standard A Truck
 D.F. $G_7 = 1.278$ wheels
 D.F. $G_6 = 0.722$ wheels (2 - 1.278)
 MDX Load = 366,150 K-ft
 LLTimp = 1.25

$$\text{Girder 7} = 1.278 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} [(0^k \cdot -1.003) + 16^k (-6.203 + -6.118 + -5.827 + -3.573 + 3.073 + -2.569)] = 356.1 \text{ K-ft}$$

$$\text{Girder 6} = 0.722 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} [(0^k \cdot -0.553) + 16^k (-0.727 + -0.864 + -0.974 + -1.022 + -0.943 + -0.825)] = -410.0 \text{ K-ft}$$

$$\frac{G_6}{G_7} = 11.2 \%$$

$\Delta = 2.9\%$ - Due to rounding
 + Approx Span Lengths



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/1/10 BY CJM SHEET NO. _____ OF _____

Location: Girder 5 - span point 8.5 (Tenth point 75)

- Location is in area of curvature has 3 girders evenly spaced. use middle girder span lengths

Span 7 = 81.00'

Span 8 = 95.57'

Span 9 = 74.14'

D.F G-5 = 1.278 wheels

D.F G-6 = 2 - 1.278 = 0.722 wheels

Adjacent Girder Location

Girder 6 = span point 5.5 (Tenth point 45)

Girder 7 = span point 6.5 (Tenth point 55)

Moment @ Location (midspan) = 757.84 K-ft

From influence surface:

Girder 5 = 757.3 K-ft

Girder 6 = 141.8 K-ft

$$\frac{G_6}{G_5} = \frac{141.8}{757.3} = 18.7\%$$

| |
|---|
| Mom at 75 |
| Girder 10 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 |

[illegible]

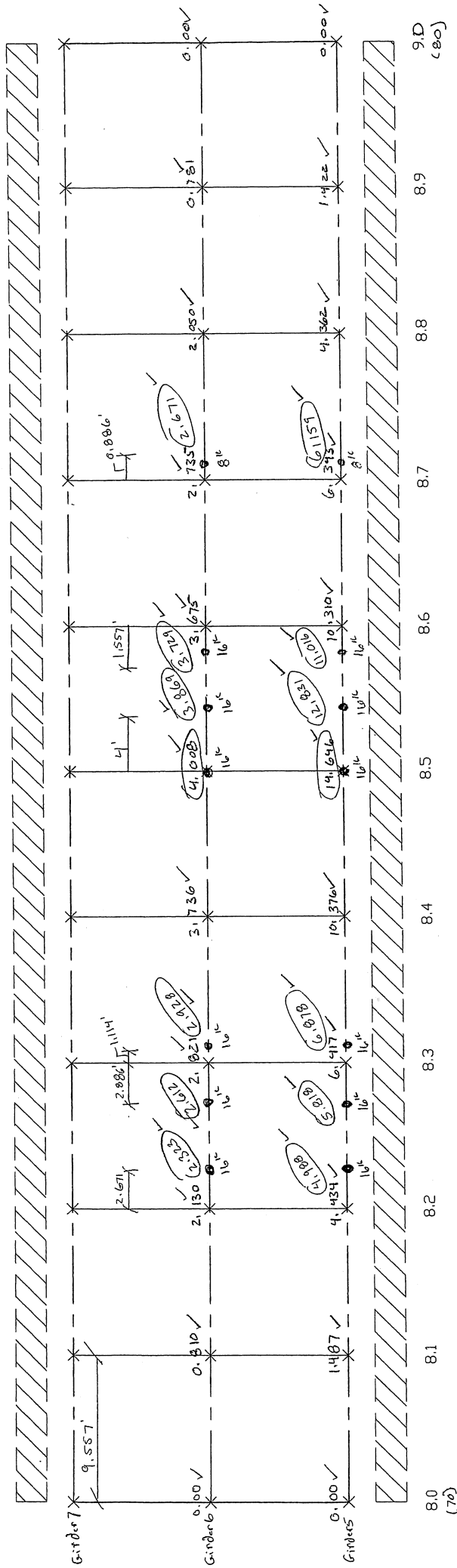
| | | | | | | | |
|--------|---|----------|----------|----------|----------|----------|----------|
| Girder | 8 | -0.00083 | -0.00072 | -0.00058 | -0.00037 | -0.00016 | 0.00009 |
| | | | 0.00029 | 0.00042 | 0.00044 | 0.00027 | 0.00000 |
| | | | -0.00041 | -0.00034 | -0.00028 | -0.00024 | -0.00018 |
| | | | -0.00015 | -0.00009 | -0.00006 | -0.00003 | 0.00000 |
| | | | 0.00002 | 0.00003 | 0.00004 | 0.00004 | 0.00003 |
| | | | 0.00003 | 0.00002 | 0.00001 | 0.00001 | 0.00000 |
| | | | 0.00000 | -0.00001 | -0.00001 | -0.00001 | -0.00001 |
| | | | -0.00001 | -0.00001 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

[illegible]

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|-----|
| | | 0.00738 | 0.00682 | 0.00604 | 0.00353 | 0.00000 | 40 |
| | | -0.00511 | -0.01107 | -0.01499 | -0.02037 | -0.02259 | |
| | | -0.02388 | -0.02217 | -0.01949 | -0.01036 | 0.00000 | 50 |
| | | 0.03989 | 0.12718 | 0.20630 | 0.28472 | 0.31300 | |
| | | 0.33860 | 0.33265 | 0.25666 | 0.18692 | 0.00000 | 60 |
| | | -0.28242 | -0.64586 | -1.00162 | -1.32206 | -1.57187 | |
| | | -1.71329 | -1.68346 | -1.45714 | -0.97718 | 0.00000 | 70 |
| | | 1.48664 | 4.43435 | 6.41746 | 10.37605 | 14.64612 | |
| | | 10.30969 | 6.34294 | 4.36244 | 1.42236 | 0.00000 | 80 |
| | | -0.83650 | -1.12102 | -1.39582 | -1.40460 | -1.31081 | |
| | | -1.10244 | -0.75423 | -0.50404 | -0.10038 | 0.00000 | 90 |
| | | 0.04211 | 0.06864 | 0.07623 | 0.07481 | 0.06716 | |
| | | 0.05551 | 0.04143 | 0.02636 | 0.01173 | 0.00000 | 100 |
| | | -0.00273 | -0.00464 | -0.00596 | -0.00684 | -0.00749 | |
| Girder 4 | 0.00000 | -0.00796 | -0.00854 | -0.00935 | -0.01061 | -0.01245 | 110 |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00001 | 0.00001 | 0.00001 | |
| | | 0.00001 | 0.00001 | 0.00001 | 0.00000 | 0.00000 | |
| | | -0.00001 | -0.00001 | -0.00002 | -0.00003 | -0.00005 | |
| | | -0.00006 | -0.00007 | -0.00008 | -0.00005 | 0.00000 | |
| | | 0.00008 | 0.00015 | 0.00022 | 0.00027 | 0.00030 | |
| | | 0.00032 | 0.00030 | 0.00025 | 0.00015 | 0.00000 | |
| | | -0.00022 | -0.00047 | -0.00072 | -0.00093 | -0.00109 | |
| | | -0.00117 | -0.00115 | -0.00098 | -0.00060 | 0.00000 | |
| | | 0.00052 | 0.00099 | 0.00162 | 0.00202 | 0.00244 | |
| | | 0.00278 | 0.00283 | 0.00263 | 0.00173 | 0.00000 | |
| | | -0.00227 | -0.00588 | -0.00828 | -0.01281 | -0.01694 | |
| | | -0.02119 | -0.02575 | -0.02939 | -0.02040 | 0.00000 | |
| | | 0.02053 | 0.03872 | 0.04842 | 0.05255 | 0.05083 | |
| | | 0.04495 | 0.03457 | 0.02352 | 0.01175 | 0.00000 | |
| | | -0.00813 | -0.01268 | -0.01451 | -0.01482 | -0.01369 | |
| Girder 3 | -0.00525 | -0.01177 | -0.00925 | -0.00636 | -0.00323 | 0.00000 | |
| | | -0.00471 | -0.00417 | -0.00363 | -0.00309 | -0.00256 | |
| | | -0.00203 | -0.00151 | -0.00100 | -0.00050 | 0.00000 | |
| | | 0.00544 | 0.01075 | 0.01431 | 0.01665 | 0.01724 | |
| | | 0.01638 | 0.01357 | 0.00985 | 0.00513 | 0.00000 | |
| | | -0.00418 | -0.00693 | -0.00837 | -0.00902 | -0.00870 | |
| | | -0.00779 | -0.00632 | -0.00447 | -0.00215 | 0.00000 | |
| | | 0.00209 | 0.00243 | 0.00191 | 0.00155 | 0.00117 | |
| | | 0.00098 | 0.00061 | 0.00043 | 0.00015 | 0.00000 | |
| | | -0.00009 | -0.00012 | -0.00013 | -0.00015 | -0.00015 | |
| Girder 2 | 0.00000 | -0.00014 | -0.00013 | -0.00011 | -0.00010 | -0.00007 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | -0.00001 | -0.00001 | -0.00002 | |
| Girder 1 | 0.00000 | -0.00002 | -0.00003 | -0.00003 | -0.00004 | -0.00004 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | -0.00001 | -0.00001 | |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | 0.00000 | |
| | | 0.00001 | 0.00003 | 0.00005 | 0.00007 | 0.00008 | |
| | | 0.00009 | 0.00009 | 0.00008 | 0.00005 | 0.00000 | |
| | | -0.00005 | -0.00010 | -0.00017 | -0.00021 | -0.00025 | |
| | | -0.00028 | -0.00030 | -0.00029 | -0.00020 | 0.00000 | |
| | | 0.00027 | 0.00066 | 0.00092 | 0.00137 | 0.00177 | |
| | | 0.00219 | 0.00264 | 0.00318 | 0.00357 | 0.00000 | |
| | | -0.00315 | -0.00562 | -0.00690 | -0.00729 | -0.00708 | |
| | | -0.00618 | -0.00484 | -0.00322 | -0.00154 | 0.00000 | |
| | | 0.00082 | 0.00101 | 0.00090 | 0.00058 | 0.00032 | |
| | | 0.00004 | -0.00008 | -0.00016 | -0.00010 | 0.00000 | |
| | | 0.00015 | 0.00023 | 0.00029 | 0.00030 | 0.00030 | |
| | | 0.00026 | 0.00019 | 0.00015 | 0.00006 | 0.00000 | |
| | | -0.00005 | -0.00006 | -0.00008 | -0.00009 | -0.00008 | |
| | | -0.00007 | -0.00006 | -0.00004 | -0.00002 | 0.00000 | |
| | | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.00002 | |

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00002 | 0.00001 | 0.00001 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

GIRDER 5 INFLUENCE SURFACE - MOMENT - POINT 75 - SPAN POINT 8.5



Standard A Truck

D.I.F Girder $S = 1,278$ wheels

D.I.F Girder $G = 2 - 1.278 = 0.722$ wheels

$$\text{MDX Load} = 757,84 \text{ K-ft}$$
$$L_L + I_{mp} = 1.25$$

$$\text{Girder } S = 1.278 \cdot 1.25 \cdot \frac{1.5 \text{ xel}}{2 \text{ wheels}} \left[(8^k \cdot 6.159) + 16^k (4.988 + 5.818 + 6.878 + 14.646 + 12.831 + 11.016) \right] = 757.3 \text{ k} \cdot \text{ft}$$

$$\text{G-index}_6 = 0.722 \cdot 125 \cdot \frac{10 \times \text{rel}}{2 \times \text{wheels}} \left[\left(\frac{2}{k} \cdot 2, 671 \right) + 16^k (2, 323 + 2, 612 + 2, 928 + 4, 008 + 3, 869 + 3, 729) \right] = 1411.8 \text{ k-ft}$$

$$\frac{G_6}{G_5} = \frac{141.8}{757.3} = 18.7\% \checkmark$$

$$\Delta = \frac{1}{2} x \cdot t + 0.12$$



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PROJECT Special Structures Rating

PROJECT # 090147 DATE 3/4/16 BY CJM SHEET NO. _____ OF _____

Location: Girder 6 - Span point 5.5 (tenths point 45)

Span Length = 95.57' - large radius - model as straight

D.F. $\Rightarrow G_6 = 1.333$ wheels (Statics)
 $G = 0.667$ wheels

Adjacent Girder Spans

$G_5 = \text{Span 8}$ (tenths point 75)

$G_7 = \text{Span 6}$ (tenths point 55)

From influence surfaces

Single girder Loaded = 431.5 K-ft

1 lane Permit truck = 584.3 K-ft

$\Delta = 35.4\%$

Mom at 45

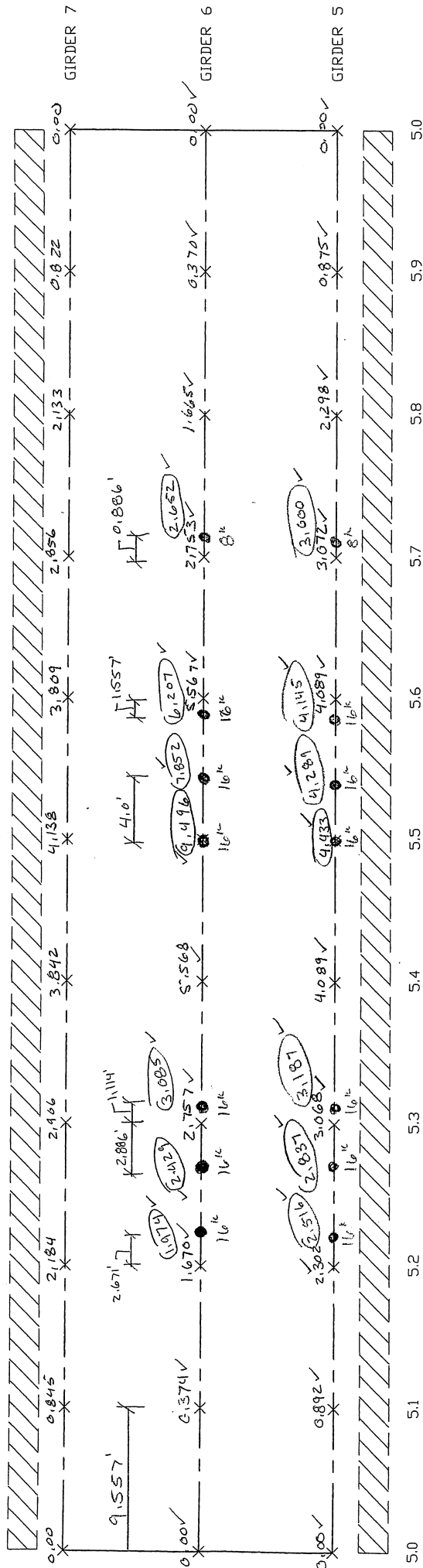
[illegible]

| | | | | | | | | | |
|--------|---|----------|----------|----------|----------|----------|----------|----------|---------|
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| | | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| Girder | 7 | -0.00019 | -0.00029 | -0.00035 | -0.00048 | -0.00056 | -0.00056 | -0.00062 | |
| | | | -0.00074 | -0.00080 | -0.00087 | -0.00056 | -0.00056 | 0.00000 | 10 |
| | | | 0.00074 | 0.00171 | 0.00216 | 0.00275 | 0.00275 | 0.00303 | |
| | | | 0.00307 | 0.00281 | 0.00245 | 0.00142 | 0.00142 | 0.00000 | 20 |
| | | | -0.00158 | -0.00377 | -0.00494 | -0.00668 | -0.00668 | -0.00754 | |
| | | | -0.00800 | -0.00753 | -0.00669 | -0.00364 | -0.00364 | 0.00000 | 30 |
| | | | 0.01875 | 0.05912 | 0.09661 | 0.13395 | 0.13395 | 0.14725 | |
| | | | 0.15859 | 0.15533 | 0.11915 | 0.08611 | 0.08611 | 0.00000 | 40 |
| | | | -0.12907 | -0.29779 | -0.46681 | -0.62516 | -0.62516 | -0.75651 | |
| | | | -0.84346 | -0.85530 | -0.76874 | -0.53648 | -0.53648 | 0.00000 | 50 |
| | | | 0.84531 | 2.18368 | 2.90606 | 3.84200 | 4.13769 | | |
| | | | 3.80856 | 2.85597 | 2.13250 | 0.82218 | 0.00000 | 0.00000 | 60 |
| | | | -0.46786 | -0.61200 | -0.73829 | -0.73067 | -0.73067 | -0.66177 | |
| | | | -0.54162 | -0.35651 | -0.22953 | -0.05659 | -0.05659 | 0.00000 | 70 |
| | | | 0.04287 | 0.07542 | 0.09045 | 0.09493 | 0.09493 | 0.09037 | |
| | | | 0.07880 | 0.06086 | 0.04095 | 0.02026 | 0.02026 | 0.00000 | 80 |
| | | | -0.01435 | -0.02313 | -0.02756 | -0.02931 | -0.02931 | -0.02814 | |
| | | | -0.02507 | -0.02027 | -0.01433 | -0.00707 | -0.00707 | 0.00000 | 90 |
| | | | 0.00711 | 0.00731 | 0.00624 | 0.00520 | 0.00520 | 0.00419 | |
| | | | 0.00320 | 0.00214 | 0.00151 | 0.00056 | 0.00056 | 0.00000 | 100 |
| | | | -0.00040 | -0.00053 | -0.00067 | -0.00069 | -0.00069 | -0.00064 | |
| | | | -0.00054 | -0.00042 | -0.00024 | -0.00014 | -0.00014 | 0.00000 | 110 |
| | | | 0.00010 | 0.00013 | 0.00017 | 0.00017 | 0.00017 | 0.00016 | |
| | | | 0.00014 | 0.00011 | 0.00006 | 0.00004 | 0.00004 | 0.00000 | 120 |
| | | | -0.00002 | -0.00003 | -0.00004 | -0.00004 | -0.00004 | -0.00004 | |
| | | | -0.00004 | -0.00003 | -0.00002 | -0.00001 | -0.00001 | 0.00000 | 130 |
| | | | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | |
| | | | 0.00001 | 0.00001 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 140 |
| Girder | 6 | 0.00293 | 0.00247 | 0.00218 | 0.00199 | 0.00186 | 0.00186 | 0.00173 | |
| | | | 0.00156 | 0.00132 | 0.00100 | 0.00057 | | | |

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|-----|
| | | 0.00528 | 0.00480 | 0.00420 | 0.00239 | 0.00000 | 40 |
| | | -0.00325 | -0.00685 | -0.00915 | -0.01213 | -0.01324 | |
| | | -0.01373 | -0.01241 | -0.01073 | -0.00553 | 0.00000 | 50 |
| | | 0.01976 | 0.06276 | 0.10172 | 0.14015 | 0.15381 | |
| | | 0.16558 | 0.16219 | 0.12431 | 0.08997 | 0.00000 | 60 |
| | | -0.13472 | -0.31055 | -0.48701 | -0.65164 | -0.78822 | |
| | | -0.87806 | -0.88866 | -0.79630 | -0.55888 | 0.00000 | 70 |
| | | 0.89181 | 2.30200 | 3.06797 | 4.08817 | 4.43296 | |
| | | 4.08882 | 3.07217 | 2.29859 | 0.87450 | 0.00000 | 80 |
| | | -0.49661 | -0.64269 | -0.77455 | -0.76721 | -0.69952 | |
| | | -0.58071 | -0.39391 | -0.26255 | -0.05375 | 0.00000 | 90 |
| | | 0.02520 | 0.04303 | 0.04995 | 0.05106 | 0.04754 | |
| | | 0.04065 | 0.03138 | 0.02073 | 0.00967 | 0.00000 | 100 |
| | | -0.00258 | -0.00439 | -0.00565 | -0.00652 | -0.00721 | |
| | | -0.00777 | -0.00847 | -0.00945 | -0.01090 | -0.01298 | 110 |
| Girder 4 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | -0.00001 | -0.00001 | -0.00001 | -0.00002 | |
| | | -0.00003 | -0.00003 | -0.00003 | -0.00002 | 0.00000 | |
| | | 0.00004 | 0.00007 | 0.00010 | 0.00012 | 0.00014 | |
| | | 0.00014 | 0.00013 | 0.00011 | 0.00007 | 0.00000 | |
| | | -0.00010 | -0.00021 | -0.00032 | -0.00041 | -0.00049 | |
| | | -0.00052 | -0.00051 | -0.00043 | -0.00027 | 0.00000 | |
| | | 0.00023 | 0.00044 | 0.00072 | 0.00089 | 0.00108 | |
| | | 0.00123 | 0.00126 | 0.00117 | 0.00077 | 0.00000 | |
| | | -0.00101 | -0.00260 | -0.00367 | -0.00567 | -0.00750 | |
| | | -0.00938 | -0.01139 | -0.01299 | -0.00906 | 0.00000 | |
| | | 0.00970 | 0.01882 | 0.02425 | 0.02712 | 0.02698 | |
| | | 0.02460 | 0.01952 | 0.01376 | 0.00715 | 0.00000 | |
| | | -0.00567 | -0.00945 | -0.01130 | -0.01217 | -0.01165 | |
| | | -0.01043 | -0.00839 | -0.00593 | -0.00303 | 0.00000 | |
| Girder 3 | -0.00180 | -0.00160 | -0.00142 | -0.00123 | -0.00104 | -0.00086 | |
| | | -0.00068 | -0.00050 | -0.00033 | -0.00016 | 0.00000 | |
| | | 0.00167 | 0.00323 | 0.00423 | 0.00494 | 0.00514 | |
| | | 0.00495 | 0.00416 | 0.00311 | 0.00167 | 0.00000 | |
| | | -0.00153 | -0.00270 | -0.00347 | -0.00400 | -0.00406 | |
| | | -0.00383 | -0.00324 | -0.00240 | -0.00119 | 0.00000 | |
| | | 0.00126 | 0.00154 | 0.00138 | 0.00123 | 0.00103 | |
| | | 0.00091 | 0.00064 | 0.00047 | 0.00017 | 0.00000 | |
| | | -0.00011 | -0.00014 | -0.00017 | -0.00019 | -0.00019 | |
| | | -0.00019 | -0.00016 | -0.00014 | -0.00012 | -0.00008 | |
| Girder 2 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | -0.00001 | -0.00001 | |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00002 | -0.00002 | |
| Girder 1 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | -0.00001 | -0.00001 | |
| | | -0.00001 | -0.00001 | -0.00001 | -0.00001 | 0.00000 | |
| | | 0.00001 | 0.00002 | 0.00003 | 0.00004 | 0.00005 | |
| | | 0.00006 | 0.00006 | 0.00005 | 0.00004 | 0.00000 | |
| | | -0.00003 | -0.00006 | -0.00011 | -0.00013 | -0.00016 | |
| | | -0.00018 | -0.00019 | -0.00019 | -0.00013 | 0.00000 | |
| | | 0.00017 | 0.00042 | 0.00059 | 0.00089 | 0.00116 | |
| | | 0.00144 | 0.00174 | 0.00209 | 0.00233 | 0.00000 | |
| | | -0.00223 | -0.00415 | -0.00529 | -0.00584 | -0.00587 | |
| | | -0.00537 | -0.00437 | -0.00308 | -0.00158 | 0.00000 | |
| | | 0.00119 | 0.00193 | 0.00233 | 0.00246 | 0.00240 | |
| | | 0.00213 | 0.00176 | 0.00125 | 0.00063 | 0.00000 | |
| | | -0.00066 | -0.00070 | -0.00059 | -0.00049 | -0.00039 | |
| | | -0.00030 | -0.00021 | -0.00015 | -0.00006 | 0.00000 | |
| | | 0.00004 | 0.00004 | 0.00005 | 0.00005 | 0.00004 | |
| | | 0.00003 | 0.00002 | 0.00001 | 0.00001 | 0.00000 | |
| | | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | |

| | | | | |
|---------|---------|---------|---------|---------|
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |

GIRDER 6 INFLUENCE SURFACE - MOMENT - POINT 45 - SPAN POINT 5.5 ✓



Standard A Truck

MDX Load = 421.49 K-ft
DIF, original = 1.286 wheels
LL imp = 1.25

$$\text{Girder 6} = 1.286 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} [(8' \cdot 2.652) + 16(1.974 + 2.429 + 3.085 + 9.496 + 7.852 + 6.207)] = 416.3 \text{ K-ft} \quad \Delta = 11.2\% \text{ OK}$$

$$\text{Statics DIF} = 1.333 / 1.286 \cdot 416.3 \text{ K-ft} = 431.5 \text{ K-ft}$$

$$\text{Girder 5} = 0.1667 \cdot 1.25 \cdot \frac{1 \text{ axle}}{2 \text{ wheels}} [(8' \cdot 3.000) + 16(2.516 + 2.837 + 3.187 + 4.133 + 4.289 + 4.145)] = 152.8 \text{ K-ft}$$

$$\frac{G-5}{G-6} = \frac{152.8}{431.5} = 35.4\% \checkmark$$