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1                         THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
0PROBLEM NO. 0001 INPUT DATA           I75/I575 NW CORRIDOR - BRIDGE NO.5 LT WIDENING - BENT 3 HAMMER HEAD
0                                                           DESIGN DATA
  DESIGN NO. NO. NO. SKEW ANG  F'C    FC    N   FY     FS     EC    ES    CONC.   Z   *  *  * CAP REINFORCING STEEL  *  *  *  CAP
 OPTIONS CAN COL LLC  D  M  S  PSI    PSI       PSI    PSI    KSI   KSI   STRAIN FACT MAIN STR MAX  MAX  MIN  MIN  TOP   MIN DEPTH BOT
                                                                                  SIZE SIZ TOP  BOT SIZE  NO.  CL.  S.SP INCR. CL.
 D D D L  2   1   7   0-00-00 3500. 1400.  9. 60000. 24000. 3409. 29000. 0.0030 170.  11   5   9    9   11    2  2.00  4.00 3.00 2.00
0COLUMN REINFORCING STEEL   R   KL   OC   OF   CM  BD1  BD2 IMPACT SOIL WT ALL.S.P.  MIN   MAX  EDGE  PILE  REBAR ALL.PILE ALL.PILE I
 MIN.P MAX.P CL.SP. CLEAR MODE COEF                          %     KCF      KSF    PL SP PL SP DIST  DEPTH CLEAR CAPACITY  UPLIFT  P
  1.00  8.00  2.25  2.500   1  2.00 0.00 0.90 1.00 1.00 0.00 24.20  0.120    0.000  2.50  5.00  1.250 1.000 3.000 192.000    0.000
0                                                         CAP DATA
0CN  C     L       A       DE       BC       BE       DH       LH      XB1      XB2      XB3      XB4      XB5      XB6      XB7      XB8
011  C   7.375   0.000   3.000    3.000    0.000    0.000    0.000    5.354    3.854
012  2 SAME AS CANTILEVER  1
0                                                       COLUMN DATA
0CN P I T S   HT      A       DT       BT       DB       BB      DL      FLEX  ND NB SZ ND NB SZ ND NB SZ ND NB SZ  SLOPE     EP      AP
021 1 C T   25.000  0.000  3.000   3.000   0.000   0.000  0.000  0.000    2  4 11  0  0  0 99 99 11  0  0  0  0.000  0.000  0.000
0                                                    FOOTING DATA
0CN S/P    B        D        T       DEL.B   DEL.D   DEL.T  R.B/D  R.D/B   S.HT.  NP  SYM.   BP       DP       SET.
031  P   5.000   5.000   3.250    0.250   0.250   0.250  1.000  1.000   3.000   0   3    0.000   0.000   0.000
1                                                  GROUP II WIND
 SUPERSTRUCTURE AREA*STD.        WIND ON SUPERSTRUCTURE INTENSITIES        * WIND FORCE ARM  * WIND ON PIER
   TRANS.      LONG.  WIND FT1 FL1   FT2 FL2   FT3 FL3   FT4 FL4   FT5 FL5     APT      APL       PT      PL
0     46.         23.   1    50   0    44   6    41  12    33  16    17  19    5.167    1.833    1.596   3.006
0                                                         GROUP III WIND
 STD. *   WIND ON SUPERSTRUCTURE INTENSITIES     *  STD. *      WIND ON LIVE LOAD INTENSITIES       *  LENGTHS OF LL * WIND ON LL ARMS
 WIND FT1 FL1   FT2 FL2   FT3 FL3   FT4 FL4   FT5 FL5  WIND FT1 FL1   FT2 FL2   FT3 FL3   FT4 FL4   FT5 FL5   TRANS.  LONGI.   APT      APL
0  1   50   0    44   6    41  12    33  16    17  19   1   100   0    88  12    82  24    66  32    34  38    82.0     82.0  11.833  11.833
0                              MISCELLANEOUS FORCES
 CENTRI.  TRACTION FORCE AND ARMS   EXPANSION   SHRINKAGE     STREAM FLOW
   FT        FL      APT     APL    COEFFICIENT COEFFICIENT    PT      PL
0 0.000    3.524   0.000   1.833    0.00018000  0.00044000   0.000   0.000
0                                  DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES
0I.D.  NL     P1        P2       P3        P4       P5       P6       P7       P8       P9       P10      P11      P12
0D.L.   0   93.607    0.000   98.217    0.000   98.217
0LL 1   1   38.481    0.000   42.839    0.000   16.114
0LL 2   2   38.481    0.000   42.839    0.000   61.139
0LL 4   2    0.000    0.000   38.290    0.000   43.272
0LL 5   1   27.298    0.000   42.839    0.000   27.298
0LL 6   2   27.298    0.000   42.839    0.000   61.436
0LL 7   2   48.718    0.000   47.389    0.000    1.328
0LL 8   2   38.481    0.000   42.839    0.000   16.114
1                                       COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)
0                                                TRANSVERSE                           *                 LONGITUDINAL
0       LOAD          COL      PC         MT         V         MB         RF         ML         MR         MT         V         MB         MF
0UNIT F.AT CL.CAP     1      0.000      0.000     1.000     25.000      0.000      0.000      0.000      0.000     1.000     25.000     25.000
0DEAD LOAD TOTAL      1    309.954     24.682     0.000    -24.682    343.704    537.886   -562.568      0.000     0.000      0.000      0.000
                           343.704
0TRAC. FORCE 1 LN     1      0.000      0.000     0.000      0.000      0.000      0.000      0.000     -6.459    -3.524    -94.559    -94.559
0WIND ON SUBSTR.      1      0.000      0.000     1.596     39.900      0.000      0.000      0.000      0.000    -3.006    -75.150    -75.150
0GROUP 2 WIND 1 1     1      0.000    -11.884     3.896    109.284      0.000      0.000      0.000      0.000    -3.006    -75.150    -75.150
0GROUP 2 WIND 1 2     1      0.000    -11.884     3.896    109.284      0.000      0.000      0.000      0.000     3.006     75.150     75.150
0GROUP 2 WIND 2 1     1      0.000    -10.458     3.620    100.958      0.000      0.000      0.000     -0.253    -3.144    -78.853    -78.853
0GROUP 2 WIND 2 2     1      0.000    -10.458     3.620    100.958      0.000      0.000      0.000      0.253     3.144     78.853     78.853
0GROUP 2 WIND 3 1     1      0.000     -9.745     3.482     96.795      0.000      0.000      0.000     -0.506    -3.282    -82.556    -82.556
0GROUP 2 WIND 3 2     1      0.000     -9.745     3.482     96.795      0.000      0.000      0.000      0.506     3.282     82.556     82.556
0GROUP 2 WIND 4 1     1      0.000     -7.844     3.114     85.694      0.000      0.000      0.000     -0.675    -3.374    -85.025    -85.025
0GROUP 2 WIND 4 2     1      0.000     -7.844     3.114     85.694      0.000      0.000      0.000      0.675     3.374     85.025     85.025
0GROUP 2 WIND 5 1     1      0.000     -4.041     2.378     63.491      0.000      0.000      0.000     -0.801    -3.443    -86.876    -86.876
0GROUP 2 WIND 5 2     1      0.000     -4.041     2.378     63.491      0.000      0.000      0.000      0.801     3.443     86.876     86.876
0GROUP 3 WIND 1 1     1      0.000   -100.596     9.369    334.816      0.000      0.000      0.000      0.000    -0.902    -22.545    -22.545
0GROUP 3 WIND 1 2     1      0.000   -100.596     9.369    334.816      0.000      0.000      0.000      0.000     0.902     22.545     22.545
0GROUP 3 WIND 2 1     1      0.000    -88.524     8.302    296.074      0.000      0.000      0.000    -11.720    -1.927    -59.900    -59.900
0GROUP 3 WIND 2 2     1      0.000    -88.524     8.302    296.074      0.000      0.000      0.000     11.720     1.927     59.900     59.900
0GROUP 3 WIND 3 1     1      0.000    -82.489     7.769    276.704      0.000      0.000      0.000    -23.439    -2.953    -97.254    -97.254
0GROUP 3 WIND 3 2     1      0.000    -82.489     7.769    276.704      0.000      0.000      0.000     23.439     2.953     97.254     97.254
0GROUP 3 WIND 4 1     1      0.000    -66.393     6.346    225.048      0.000      0.000      0.000    -31.252    -3.636   -122.157   -122.157
0GROUP 3 WIND 4 2     1      0.000    -66.393     6.346    225.048      0.000      0.000      0.000     31.252     3.636    122.157    122.157
0GROUP 3 WIND 5 1     1      0.000    -34.203     3.501    121.738      0.000      0.000      0.000    -37.112    -4.149   -140.834   -140.834
0GROUP 3 WIND 5 2     1      0.000    -34.203     3.501    121.738      0.000      0.000      0.000     37.112     4.149    140.834    140.834
0LIVE LOAD LL 1       1     97.434   -119.753     0.000    119.753     97.434    206.027    -86.274      0.000     0.000      0.000      0.000
0LIVE LOAD LL 2       1    142.459    121.311     0.000   -121.311    142.459    206.027   -327.338      0.000     0.000      0.000      0.000
1                                       COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)
0                                                TRANSVERSE                           *                 LONGITUDINAL
0       LOAD          COL      PC         MT         V         MB         RF         ML         MR         MT         V         MB         MF
0LIVE LOAD LL 4       1     81.562    231.678     0.000   -231.678     81.562      0.000   -231.678      0.000     0.000      0.000      0.000
0LIVE LOAD LL 5       1     97.435      0.000     0.000      0.000     97.435    146.154   -146.154      0.000     0.000      0.000      0.000
0LIVE LOAD LL 6       1    131.573    182.775     0.000   -182.775    131.573    146.154   -328.928      0.000     0.000      0.000      0.000
0LIVE LOAD LL 7       1     97.435   -253.726     0.000    253.726     97.435    260.836     -7.110      0.000     0.000      0.000      0.000
0LIVE LOAD LL 8       1     97.434   -119.753     0.000    119.753     97.434    206.027    -86.274      0.000     0.000      0.000      0.000
1                                                    CAP ANALYSIS AND DESIGN DATA
0                                                      CAP MOMENTS AND SHEARS
0                               MOMENTS(KIP-FEET)                                   **                   SHEARS(KIPS)
0POINT    D.L.TOT.  G1 MAX.+  G1 MAX.-  G2 MAX.+  G2 MAX.-  G3 MAX.+  G3 MAX.-    DL T.LT  DL T.RT  G1 + LT  G1 + RT  G1 - LT  G1 - RT
0P 1        -3.584    -3.584    -3.584    -3.584    -3.584    -3.584    -3.584     -3.547 -125.236   -3.547 -125.236   -3.547 -231.003
0P 2      -499.277  -499.277  -906.902  -499.277  -499.277  -499.277  -743.364   -132.000 -132.000 -132.000 -132.000 -237.766 -237.766
0C 1L     -699.251  -699.251 -1265.526  -699.251  -699.251  -699.251 -1038.338   -134.632          -134.632          -240.399
0C 1R     -731.338  -731.338 -1445.441  -731.338  -731.338  -731.338 -1158.945             140.625           274.003           140.625
0P 4      -522.374  -522.374 -1036.411  -522.374  -522.374  -522.374  -830.181    137.993  137.993  271.370  271.370  137.993  137.993
0P 5        -3.584    -3.584    -3.584    -3.584    -3.584    -3.584    -3.584    131.229    3.547  264.607    3.547  131.229    3.547
0                                                         CAP DESIGN DATA
 PT.    M+ UNF.   M- UNF.  TOP REINFORCE.  BOT.REINFORCE.     LEFT STIRRUPS        RIGHT STIRRUPS      D      FC     PS    FS/FF  FS/FZ
          K-FT.     K-FT.    AS  NO.SIZE     AS  NO.SIZE   M.SP. AV/IN BAR&SPAC  M.SP. AV/IN BAR&SPAC   IN.    PSI     %    RATIO  RATIO
0P 1     -2.757    -2.757   3.12  2 # 11    3.12  2 # 11    0.00 0.000 #5@ 0.00  16.33 0.068 #5@ 9.16  36.00          0.27  0.000  0.015
0P 2   -384.059  -571.819   6.54  5 # 11    3.12  2 # 11   16.33 0.072 #5@ 8.65  16.33 0.072 #5@ 8.65  36.00          0.64  0.581  0.947
0C 1   -537.886  -891.496  10.69  7 # 11    3.12  2 # 11   16.33 0.073 #5@ 8.46  16.33 0.093 #5@ 6.63  36.00          1.07  0.798  0.956
0P 4   -401.826  -638.601   7.54  5 # 11    3.12  2 # 11   16.33 0.092 #5@ 6.75  16.33 0.092 #5@ 6.75  36.00          0.77  0.747  1.057
0P 5     -2.757    -2.757   3.12  2 # 11    3.12  2 # 11   16.33 0.088 #5@ 7.06   0.00 0.000 #5@ 0.00  36.00          0.27  0.000  0.015
0NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***
1                                                 COLUMN ANALYSIS AND DESIGN OUTPUT
0                                                      CRITICAL COLUMN LOADS
     T                          E  C  S
 CN  B   GR  LLC  WC  R   S  F  F     PF     MTF     MLF      PM      MTM     MLM      PU      MTU      MLU   PU/PM    B       D
0 1  T    1 LL 7 0.0                 614.5  -518.8    0.0   614.5    647.7   230.1  1530.0  1612.7   573.1  2.490  36.00  36.00
0 1  B    3 LL 4 3.1  R              552.8  -693.0  372.3   552.8    840.9   446.4  1012.2  1533.4   814.0  1.825  36.00  36.00
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0                                          COLUMN DESIGN DATA
     T  B FACE 1  B FACE 2  D FACE 3  D FACE 4
 CN  B   NO.SIZE   NO.SIZE   NO.SIZE   NO.SIZE   AS     PS    BD12   BD     SUMPU     SUMPC   DEL.T     DEL.L      CM    R  PHIC
0 1  T    6 # 11    6 # 11    4 # 11    4 # 11  31.20  2.407  1.00  0.000     636.     3197.  1.248     1.248     1.000  1  0.70
0 1  B    6 # 11    6 # 11    4 # 11    4 # 11  31.20  2.407  1.00  0.060     531.     3018.  1.213     1.199     1.000  1  0.70
1
0                                                   FOOTING 1 DESIGN LOADS
0F G LLID   WC  ES  C  S       P        MT       VT       ML      VL      P4      P3      P2      P1      MTF     VBF     VPF     LOAD
01 3 LL 6  3.1R            449.640 -448.547  -7.769  286.373  10.001 101.187  21.468 139.917 219.636  26.360   0.000  -0.370  MAX.P1
01 3 LL 6  1.1R            584.532 -658.657 -12.179  275.163  10.335 108.031  30.843 205.403 282.591  35.851   0.000  -0.481  MAX.MT
01 3 LL 4  1.1R            532.185 -709.844 -12.179  275.163  10.335  88.546  11.358 198.715 275.903  34.822   0.000  -0.522  MAX.VT
01 3 LL 2  1.1R            595.926 -594.323 -12.179  275.163  10.335 118.922  41.734 200.210 277.398  35.052   0.000  -0.472  MAX.VP
01 3 LL 6  4.1R            584.532 -515.959  -8.250  404.659  13.889 145.096  32.646 168.339 280.788  31.073   0.000  -0.481  MAX.ML
01 3 LL 4  1.1R            532.185 -709.844 -12.179  275.163  10.335  88.546  11.358 198.715 275.903  26.347   0.000  -0.522  MAX.VL
01 3 LL 4  3.1R            409.373 -487.922  -7.769  286.373  10.001  86.198   6.479 134.772 214.491  25.569   0.000  -0.401  MAX.P3
0                                     FOOTING 1 ANALYSIS/DESIGN RESULTS
0     FOOTING SIZE             *   BAR REINFORCEMENT STEEL     *          SECTION CAPACITIES          *
0   B       D       T    P1/PA   AS    NO.SIZE  SPAC. PLACEMENT    MT.      VB      VP      DS      FC
0 6.500   6.500   3.250  0.915  0.40  14 # 4 @ 5.500  TOP LONG  44.368  28.060  56.120  23.250  0.000
0                                0.45  15 # 4 @ 5.125  BOT.TRAN  48.521  28.663  57.327  23.750  0.000
0NUMBER OF PILES =  4  BP = 2.000  DP = 2.000
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