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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.1 LT WIDENING - BT 2LT HAMMER HEAD                  05-OCT-09
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   2   0-00-00 3500. 1400.  9. 60000. 24000. 3409. 29000. 0.0030 170.  11   5  14   14   11    4  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 26.50  0.120    0.000  3.00  5.00  1.500 1.000 3.000 235.000    0.000
0                                                         CAP DATA
0CN  C     L       A       DE      BC      BE      DH      LH      XB1     XB2     XB3     XB4     XB5     XB6     XB7     XB8
011  C   4.000   0.000   3.500   3.000   0.000   0.000   0.000   2.000   0.500
012  C   4.000   0.000   3.500   3.000   0.000   0.000   0.000   1.500   0.500
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 0 C T   23.750  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      34.        17.   1    50   0    44   6    41  12    33  16    17  19    5.313    2.083    1.643    2.343
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    63.5    63.5  11.875  11.875
0                                 MISCELLANEOUS FORCES
 CENTRI.  TRACTION FORCE AND ARMS   EXPANSION   SHRINKAGE     STREAM FLOW
   FT        FL      APT      APL    COEFFICIENT COEFFICIENT    PT      PL
0 0.000     2.932   0.000   2.083    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   57.000    0.000    0.000    60.000
0LL 1   1   33.698    0.000    0.000    29.424
0LL 2   1    0.000    0.000    0.000    46.881
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      23.750       0.000       0.000       0.000       0.000       1.000      23.750      23.750
0DEAD LOAD TOTAL       1    129.600       6.000       0.000      -6.000     161.663     126.600    -132.600       0.000       0.000       0.000       0.000
                            161.663
0TRAC. FORCE 1 LN      1      0.000       0.000       0.000       0.000       0.000       0.000       0.000      -6.107      -2.932     -75.742     -75.742
0WIND ON SUBSTR.       1      0.000       0.000       1.643      39.021       0.000       0.000       0.000       0.000      -2.343     -55.646     -55.646
0GROUP 2 WIND 1 1      1      0.000      -9.032       3.343      88.428       0.000       0.000       0.000       0.000      -2.343     -55.646     -55.646
0GROUP 2 WIND 1 2      1      0.000      -9.032       3.343      88.428       0.000       0.000       0.000       0.000       2.343      55.646      55.646
0GROUP 2 WIND 2 1      1      0.000      -7.948       3.139      82.499       0.000       0.000       0.000      -0.212      -2.445     -58.281     -58.281
0GROUP 2 WIND 2 2      1      0.000      -7.948       3.139      82.499       0.000       0.000       0.000       0.212       2.445      58.281      58.281
0GROUP 2 WIND 3 1      1      0.000      -7.406       3.037      79.535       0.000       0.000       0.000      -0.425      -2.547     -60.916     -60.916
0GROUP 2 WIND 3 2      1      0.000      -7.406       3.037      79.535       0.000       0.000       0.000       0.425       2.547      60.916      60.916
0GROUP 2 WIND 4 1      1      0.000      -5.961       2.765      71.630       0.000       0.000       0.000      -0.567      -2.615     -62.673     -62.673
0GROUP 2 WIND 4 2      1      0.000      -5.961       2.765      71.630       0.000       0.000       0.000       0.567       2.615      62.673      62.673
0GROUP 2 WIND 5 1      1      0.000      -3.071       2.221      55.820       0.000       0.000       0.000      -0.673      -2.666     -63.990     -63.990
0GROUP 2 WIND 5 2      1      0.000      -3.071       2.221      55.820       0.000       0.000       0.000       0.673       2.666      63.990      63.990
0GROUP 3 WIND 1 1      1      0.000     -78.116       7.353     252.747       0.000       0.000       0.000       0.000      -0.703     -16.694     -16.694
0GROUP 3 WIND 1 2      1      0.000     -78.116       7.353     252.747       0.000       0.000       0.000       0.000       0.703      16.694      16.694
0GROUP 3 WIND 2 1      1      0.000     -68.742       6.530     223.822       0.000       0.000       0.000      -9.112      -1.496     -44.631     -44.631
0GROUP 3 WIND 2 2      1      0.000     -68.742       6.530     223.822       0.000       0.000       0.000       9.112       1.496      44.631      44.631
0GROUP 3 WIND 3 1      1      0.000     -64.055       6.118     209.360       0.000       0.000       0.000     -18.225      -2.288     -72.567     -72.567
0GROUP 3 WIND 3 2      1      0.000     -64.055       6.118     209.360       0.000       0.000       0.000      18.225       2.288      72.567      72.567
0GROUP 3 WIND 4 1      1      0.000     -51.556       5.020     170.793       0.000       0.000       0.000     -24.300      -2.816     -91.192     -91.192
0GROUP 3 WIND 4 2      1      0.000     -51.556       5.020     170.793       0.000       0.000       0.000      24.300       2.816      91.192      91.192
0GROUP 3 WIND 5 1      1      0.000     -26.559       2.825      93.660       0.000       0.000       0.000     -28.856      -3.213    -105.160    -105.160
0GROUP 3 WIND 5 2      1      0.000     -26.559       2.825      93.660       0.000       0.000       0.000      28.856       3.213     105.160     105.160
0LIVE LOAD LL 1        1     63.122      -8.548       0.000       8.548      63.122      67.396     -58.848       0.000       0.000       0.000       0.000
0LIVE LOAD LL 2        1     46.881      93.762       0.000     -93.762      46.881       0.000     -93.762       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        -4.095    -4.095    -4.095    -4.095    -4.095    -4.095    -4.095     -4.095  -78.195   -4.095  -78.195   -4.095 -151.353
0P 2       -43.448   -43.448   -80.028   -43.448   -43.448   -43.448   -65.352    -79.219  -79.219  -79.219  -79.219 -152.377 -152.377
0C 1L     -164.580  -164.580  -310.897  -164.580  -164.580  -164.580  -252.195    -82.290           -82.290           -155.448
0C 1R     -172.380  -172.380  -375.937  -172.380  -172.380  -172.380  -294.271              86.190           187.969             86.190
0P 3       -45.398   -45.398   -96.288   -45.398   -45.398   -45.398   -75.871     83.119   83.119  184.897  184.897   83.119   83.119
0P 4        -4.095    -4.095    -4.095    -4.095    -4.095    -4.095    -4.095     82.095    4.095  183.874    4.095   82.095    4.095
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     -3.150     -3.150    6.24  4 # 11     6.24  4 # 11      0.00 0.000 #5@ 0.00  19.33 0.030 #5@19.33  42.00           0.45  0.000   0.006
0P 2    -33.422    -50.271    6.24  4 # 11     6.24  4 # 11     19.33 0.030 #5@19.33  19.33 0.030 #5@19.33  42.00           0.48  0.040   0.093
0C 1   -126.600   -226.362    6.24  4 # 11     6.24  4 # 11     19.33 0.030 #5@19.33  19.33 0.030 #5@19.33  42.00           0.62  0.254   0.419
0P 3    -34.922    -58.362    6.24  4 # 11     6.24  4 # 11     19.33 0.030 #5@19.33  19.33 0.030 #5@19.33  42.00           0.49  0.055   0.108
0P 4     -3.150     -3.150    6.24  4 # 11     6.24  4 # 11     19.33 0.030 #5@19.33   0.00 0.000 #5@ 0.00  42.00           0.45  0.000   0.006
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 2 0.0                  270.3   211.4     0.0   270.3   231.6     88.5  1772.1  1518.8    580.6  6.557  36.00  36.00
0 1  B    3 LL 2 1.1  R               271.1  -458.3   120.2   271.1   495.1    129.6   984.1  1796.6    470.2  3.629  36.00  36.00


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  0.037      291.      3330.  1.096     1.092     1.000  1  0.70
0 1  B    6 # 11    6 # 11    4 # 11    4 # 11  31.20  2.407  1.00  0.025      250.      3368.  1.080     1.078     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 2  3.1R              198.723 -289.480  -6.118  148.310   5.220  43.056   4.168  76.959 115.847  14.708  -0.132   0.510  MAX.P1
01 3 LL 2  1.1R              258.339 -432.728  -9.559  120.167   4.725  39.389   7.501 116.630 148.517  20.370  -0.172   0.663  MAX.MT
01 3 LL 2  1.1R              258.339 -432.728  -9.559  120.167   4.725  39.389   7.501 116.630 148.517  20.370  -0.172   0.663  MAX.VT
01 3 LL 1  1.1               275.030  329.556   9.559 -120.167  -4.725  55.700  23.812 108.664 140.552  18.997  -0.172   0.781  MAX.VP
01 3 LL 1  4.1               275.030  223.016   6.527 -217.014  -7.473  81.838  25.061  82.527 139.303  16.576  -0.172   0.781  MAX.ML
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01 3 LL 2  1.1R             258.339 -432.728  -9.559  120.167   4.725  39.389   7.501 116.630 148.517  13.711  -0.172   0.663  MAX.VL
01 3 LL 2  3.1R             198.723 -289.480  -6.118  148.310   5.220  43.056   4.168  76.959 115.847  14.708  -0.132   0.510  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 7.250   7.250   3.250  0.394  0.21   8 # 4 @10.875  TOP LONG  22.905  28.060  56.120  23.250  0.000
0                                0.26  10 # 4 @ 8.625  BOT.TRAN  29.195  28.663  57.327  23.750  0.000
0NUMBER OF PILES =  4  BP = 2.125  DP = 2.125
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