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28-OCT-09                                 GEORGIA DEPARTMENT OF TRANSPORTATION                                PROB. NO. 0001
14:43:11                     PRECONSTUCTION DIVISION - OFFICE OF BRIDGE & STRUCTURAL DESIGN
                  THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
                                                 REVISED:  JUNE 30, 2008
                          32' CURB-CURB; 5 BEAMS; 140' SPAN; 30' TALL; BRIDGE 19A ; PIER 2

                                                            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   8   0-00-00 3500. 1400.  8. 60000. 24000. 3409. 29000. 0.0030 170.  11   5  16   16   11    2  2.00  4.00 3.00 2.00

COLUMN 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  2.50  3.750   2  2.00 0.70 0.90 1.00 1.00 0.75 18.85  0.120    0.000  3.00  9.00  1.250 1.000 3.000 235.000    -9.999

                                                          CAP DATA

CN  C     L       A      DE      BC      BE      DH      LH      XB1     XB2     XB3     XB4     XB5     XB6     XB7     XB8

11  L  17.625   4.000   4.000   6.000   6.000   4.000  13.625  13.500   6.750   2.750

12  2 SAME AS CANTILEVER  1

                                                         COLUMN DATA

CN 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

21 1 C T   30.000  0.000  8.000  6.000  8.000  6.000  6.000  0.000   8  6 11  8  6 11 22 16 11 22 16 11  0.000  0.000  0.000

                                                FOOTING DATA

CN S/P   B       D       T      DEL.B   DEL.D   DEL.T  R.B/D  R.D/B   S.HT.  NP  SYM.   BP      DP      SET.

31  P  10.000  10.000   3.000   0.500   0.500   0.250  1.000  1.000   2.500   4   3    0.000   0.000   0.000
                                                     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

   1367.     2733.   1    50   0    44   6    41  12    33  16    17  19    7.375   7.375    4.071  11.726

                                                              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

  1   50   0   44   6   41  12   33  16   17  19   1   100   0   88  12   82  24   66  32   34  38   140.2   280.3  15.583  15.583

                          MISCELLANEOUS FORCES
CENTRI.  TRACTION FORCE AND ARMS   EXPANSION   SHRINKAGE     STREAM FLOW
  FT        FL      APT     APL    COEFFICIENT COEFFICIENT    PT      PL

 0.000    9.870  15.583  15.583    0.00018000  0.00044000   0.000   0.000
                               DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES

I.D.  NL    P1       P2       P3       P4       P5       P6       P7       P8       P9       P10      P11      P12

D.L.   0  265.764  293.437    0.000  293.437    0.000  293.437  265.764

LL 1   1   81.493   56.026    0.000    0.000    0.000    0.000    0.000

LL 2   2   81.493   96.773    0.000   76.400    0.000   20.373    0.000

LL 3   1    0.000    0.000    0.000    0.000    0.000   56.026   81.493

LL 4   2    0.000   20.373    0.000   76.400    0.000   96.773   81.493

LL 5   1    0.000   30.560    0.000   76.400    0.000   30.560    0.000

LL 6   2   66.213  101.866    0.000   76.400    0.000   30.560    0.000

LL 7   2   12.733   76.400    0.000   96.773    0.000   76.400   12.733

LL 8   2   81.493   56.026    0.000    0.000    0.000   56.026   81.493
                                         COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

                                                TRANSVERSE                                    *            LONGITUDINAL

       LOAD         COL      PC         MT         V          MB         RF         ML         MR         MT          V         MB         MF

UNIT F.AT CL.CAP     1     0.000     -6.000     1.000     30.000      0.000      0.000      0.000      6.000      1.000     30.000     30.000

DEAD LOAD TOTAL      1  1616.589      0.000     0.000      0.000   1789.389   6365.952  -6365.952      0.000      0.000      0.000      0.000
                        1789.389

TRAC. FORCE 1 LN     1     0.000      0.000     0.000      0.000      0.000      0.000      0.000   -213.024     -9.870   -449.904   -449.904

WIND ON SUBSTR.      1     0.000    -24.426     4.071    122.130      0.000      0.000      0.000    -70.356    -11.726   -351.780   -351.780

GROUP 2 WIND 1 1     1     0.000   -938.607    72.421   2676.711      0.000      0.000      0.000    -70.356    -11.726   -351.780   -351.780

GROUP 2 WIND 1 2     1     0.000   -938.607    72.421   2676.711      0.000      0.000      0.000     70.356     11.726    351.780    351.780

GROUP 2 WIND 2 1     1     0.000   -828.906    64.219   2370.162      0.000      0.000      0.000   -289.679    -28.124   -964.655   -964.655

GROUP 2 WIND 2 2     1     0.000   -828.906    64.219   2370.162      0.000      0.000      0.000    289.679     28.124    964.655    964.655

GROUP 2 WIND 3 1     1     0.000   -774.055    60.118   2216.887      0.000      0.000      0.000   -509.003    -44.522  -1577.531  -1577.531

GROUP 2 WIND 3 2     1     0.000   -774.055    60.118   2216.887      0.000      0.000      0.000    509.003     44.522   1577.531   1577.531

GROUP 2 WIND 4 1     1     0.000   -627.786    49.182   1808.154      0.000      0.000      0.000   -655.218    -55.454  -1986.114  -1986.114

GROUP 2 WIND 4 2     1     0.000   -627.786    49.182   1808.154      0.000      0.000      0.000    655.218     55.454   1986.114   1986.114
GROUP 2 WIND 5 1   1     0.000  -335.248    27.310   990.688     0.000     0.000     0.000  -764.880   -63.653 -2292.552 -2292.552

GROUP 2 WIND 5 2   1     0.000  -335.248    27.310   990.688     0.000     0.000     0.000   764.880    63.653  2292.552  2292.552

GROUP 3 WIND 1 1   1     0.000  -584.176    35.746  1442.087     0.000     0.000     0.000   -21.107    -3.518  -105.534  -105.534

GROUP 3 WIND 1 2   1     0.000  -584.176    35.746  1442.087     0.000     0.000     0.000    21.107     3.518   105.534   105.534

GROUP 3 WIND 2 1   1     0.000  -514.954    31.603  1273.433     0.000     0.000     0.000  -159.500   -11.801  -442.720  -442.720

GROUP 3 WIND 2 2   1     0.000  -514.954    31.603  1273.433     0.000     0.000     0.000   159.500    11.801   442.720   442.720

GROUP 3 WIND 3 1   1     0.000  -480.343    29.532  1189.106     0.000     0.000     0.000  -297.894   -20.084  -779.905  -779.905

GROUP 3 WIND 3 2   1     0.000  -480.343    29.532  1189.106     0.000     0.000     0.000   297.894    20.084   779.905   779.905

GROUP 3 WIND 4 1   1     0.000  -388.047    24.008   964.235     0.000     0.000     0.000  -390.156   -25.606 -1004.695 -1004.695

GROUP 3 WIND 4 2   1     0.000  -388.047    24.008   964.235     0.000     0.000     0.000   390.156    25.606  1004.695  1004.695

GROUP 3 WIND 5 1   1     0.000  -203.456    12.960   514.491     0.000     0.000     0.000  -459.353   -29.747 -1173.288 -1173.288

GROUP 3 WIND 5 2   1     0.000  -203.456    12.960   514.491     0.000     0.000     0.000   459.353    29.747  1173.288  1173.288

LIVE LOAD LL 1     1   137.519 -1478.331     0.000  1478.331   137.519  1478.331     0.000     0.000     0.000     0.000     0.000

LIVE LOAD LL 2     1   275.039 -1615.855     0.000  1615.855   275.039  1753.373  -137.518     0.000     0.000     0.000     0.000
                                       COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)

                                                   TRANSVERSE                            *            LONGITUDINAL

       LOAD         COL      PC         MT         V         MB         RF         ML         MR         MT         V         MB         MF

LIVE LOAD LL 3     1   137.519  1478.331     0.000 -1478.331   137.519     0.000 -1478.331     0.000     0.000     0.000     0.000

LIVE LOAD LL 4     1   275.039  1615.855     0.000 -1615.855   275.039   137.518 -1753.373     0.000     0.000     0.000     0.000

LIVE LOAD LL 5     1   137.520     0.000     0.000     0.000   137.520   206.280  -206.280     0.000     0.000     0.000     0.000

LIVE LOAD LL 6     1   275.039 -1375.191     0.000  1375.191   275.039  1581.471  -206.280     0.000     0.000     0.000     0.000

LIVE LOAD LL 7     1   275.039     0.000     0.000     0.000   275.039   687.596  -687.596     0.000     0.000     0.000     0.000

LIVE LOAD LL 8     1   275.038     0.000     0.000     0.000   275.038  1478.331 -1478.331     0.000     0.000     0.000     0.000
                                                     CAP ANALYSIS AND DESIGN DATA

                                                       CAP MOMENTS AND SHEARS

                              MOMENTS(KIP-FEET)                            **                 SHEARS(KIPS)

POINT   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

P 1      -43.835   -43.835   -43.835   -43.835   -43.835   -43.835   -43.835    -22.227 -367.721  -22.227 -367.721  -22.227 -544.642

P 2    -2682.449 -2682.449 -3876.668 -2682.449 -2682.449 -2682.449 -3397.550   -416.699 -798.168 -416.699 -798.168 -593.621-1185.183

P 3    -4910.422 -4910.422 -7168.933 -4910.422 -4910.422 -4910.422 -6262.823   -822.609 -822.609 -822.609 -822.609-1209.624-1209.624

C 1L   -8275.737 -8275.737-12082.310 -8275.737 -8275.737 -8275.737-10555.122   -860.049          -860.049         -1247.064

C 1R   -8275.737 -8275.737-12082.310 -8275.737 -8275.737 -8275.737-10555.122             860.049          1247.064          860.049

P 5    -4910.422 -4910.422 -7168.933 -4910.422 -4910.422 -4910.422 -6262.823    822.609  822.609 1209.624 1209.624  822.609  822.609

P 6    -2682.449 -2682.449 -3876.668 -2682.449 -2682.449 -2682.449 -3397.551    798.168  416.700 1185.183  593.621  798.168  416.700

P 7      -43.835   -43.834   -43.835   -43.835   -43.835   -43.835   -43.835    367.721   22.227  544.642   22.227  367.721   22.227
                                                             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

P 1    -33.719   -33.719   3.12  2 # 11    3.12  2 # 11    0.00 0.000 #5@ 0.00  24.00 0.060 #5@10.33  62.53         0.08  0.000  0.124

P 2 -2063.423 -2613.500  10.82  7 # 11    3.12  2 # 11   24.00 0.060 #5@10.33  24.00 0.138 #5@ 4.49  86.32         0.18  0.556  1.311

P 3 -3777.248 -4817.557  17.64 12 # 11    3.12  2 # 11   24.00 0.114 #5@ 5.44  24.00 0.114 #5@ 5.44  96.00         0.29  0.544  1.067

C 1 -6365.952 -8119.325  30.31 20 # 11    3.12  2 # 11   24.00 0.123 #5@ 5.05  24.00 0.123 #5@ 5.05  96.00         0.50  0.573  0.980

P 5 -3777.248 -4817.557  17.64 12 # 11    3.12  2 # 11   24.00 0.114 #5@ 5.44  24.00 0.114 #5@ 5.44  96.00         0.29  0.544  1.067

P 6 -2063.423 -2613.500  10.82  7 # 11    3.12  2 # 11   24.00 0.138 #5@ 4.49  24.00 0.060 #5@10.33  86.32         0.18  0.556  1.311

P 7    -33.719   -33.719   3.12  2 # 11    3.12  2 # 11   24.00 0.060 #5@10.33   0.00 0.000 #5@ 0.00  62.53         0.08  0.000  0.124

NOTE: *** FS/FZ RATIO EXCEEDS 1.0! ***
                                        COLUMN ANALYSIS AND DESIGN OUTPUT

                                            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

 1  T    1 LL 2 0.0                  2698.7 -3508.0     0.0  2698.7  3686.2  1760.4  9963.3 13626.5  6507.6  3.695  72.00  96.00

 1  B    3 LL 2 4.1                  2683.8  3354.1-2475.9  2683.8  3509.3  2671.9  8957.4 11717.2  8921.3  3.339  72.00  96.00


                                          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

 1  T   15 # 11   15 # 11    8 # 11    8 # 11  71.76  1.038  1.00  0.000    2811.    58150.  1.051     1.087     1.000  2  0.70

 1  B   15 # 11   15 # 11    8 # 11    8 # 11  71.76  1.038  1.00  0.000    2571.    58150.  1.046     1.079     1.000  2  0.70
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                                                       FOOTING 1 DESIGN LOADS
F G LLID   WC  ES  C  S       P        MT      VT       ML      VL      P4      P3      P2      P1      MTF     VBF     VPF     LOAD
1 3 LL 2  4.1             2020.806 2323.810  24.008-1904.504 -45.346 182.018  68.861 178.581 291.738 101.254  -0.243  41.010  MAX.P1
1 3 LL 2  1.1             2627.048 3642.161  46.470-1306.945 -30.235 186.389 108.917 282.390 359.863 138.483  -0.315  53.313  MAX.MT
1 3 LL 2  3.1             2627.048 3313.286  38.391-2183.627 -51.771 220.664  90.968 248.115 377.812 134.855  -0.315  53.313  MAX.VT
1 3 LL 2  3.1             2627.048 3313.286  38.391-2183.627 -51.771 220.664  90.968 248.115 377.812 134.855  -0.315  53.313  MAX.VP
1 3 LL 2  5.1             2627.048 2436.287  16.848-2695.026 -64.333 257.664  97.503 211.116 371.276 166.822  35.688  53.313  MAX.ML
1 3 LL 2  5.1             2627.048 2436.287  16.848-2695.026 -64.333 257.664  97.503 211.116 371.276 166.822  35.688  53.313  MAX.VL
1 3 LL 2  4.1             2020.806 2323.810  24.008-1904.504 -45.346 182.018  68.861 178.581 291.738 101.254  -0.243  41.010  MAX.P3
                                   FOOTING 1 ANALYSIS/DESIGN RESULTS
     FOOTING SIZE             *   BAR REINFORCEMENT STEEL     *         SECTION CAPACITIES         *
   B       D       T    P1/PA   AS   NO.SIZE  SPAC. PLACEMENT    MT.     VB      VP      DS      FC
13.500  13.500   3.750  0.993  1.12  20 # 8 @ 8.000  TOP TRAN 144.246  34.242  68.483  28.372  0.000
                               1.31  18 # 9 @ 9.000  BOT.LONG 169.893  35.526  71.051  29.436  0.000
NUMBER OF PILES = 12  BP = 1.833  DP = 5.500
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