

BT2RTPIER.OUT
 1 THE ANALYSIS AND DESIGN OF PIERS FOR BRIDGES - V 4.2.07 - AASHTO SPECS 1984 INTERIM
 0 PROBLEM NO. 0001 INPUT DATA I75/I575 NW CORRIDOR - BRIDGE NO.1 RT WIDENING - BT 2RT HAMMER HEAD 05-OCT-09

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 PSI KSI KSI STRAIN FACT MAIN STR MAX MIN TOP MIN TOP MIN DEPTH BOT
 D D D L 2 1 1 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
 0 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 2.25 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

CAP DATA
 0 OCN C L A DE BC BE DH LH XB1 XB2 XB3 XB4 XB5 XB6 XB7 XB8
 011 C 2.000 0.000 3.500 3.000 0.000 0.000 0.000 1.000
 012 C 2.000 0.000 3.500 3.000 0.000 0.000 0.000 1.000

COLUMN DATA
 0 OCN 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 23.750 0.000 3.000 3.000 0.000 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

FOOTING DATA
 0 OCN 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

GROUP II WIND
 1 SUPERSTRUCTURE AREA*STD. WIND ON SUPERSTRUCTURE INTENSITIES * WIND FORCE ARM * WIND ON PIER
 0 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 1.783

GROUP III WIND
 0 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 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

MISCELLANEOUS FORCES
 0 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

DEAD LOAD SUPERSTRUCTURE AND LIVE LOAD CASES
 0 OI.D. NL P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12
 OD.L. 0 0.000 69.000 0.000
 OLL 1 1 0.000 41.998 0.000

COLUMN MOMENTS(KIP-FEET), SHEARS(KIPS), REACTIONS(KIPS)
 0 TRANSVERSE * LONGITUDINAL
 0 UNIT F.AT CL.CAP COL PC MT V MB RF ML MR MT V MB MF
 ODEAD LOAD TOTAL 1 75.300 0.000 0.000 1.000 23.750 0.000 0.000 3.150 -3.150 0.000 1.000 23.750 23.750
 107.363

OTRAC. FORCE 1 LN 1 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 -6.107 -2.932 -75.742 -75.742
 OWIND ON SUBSTR. 1 0.000 0.000 1.643 39.021 0.000 0.000 0.000 0.000 -1.783 -42.346 -42.346
 OGROUP 2 WIND 1 1 0.000 -9.032 3.343 88.428 0.000 0.000 0.000 0.000 -1.783 -42.346 -42.346
 OGROUP 2 WIND 2 1 0.000 -9.032 3.343 88.428 0.000 0.000 0.000 0.000 1.783 42.346 42.346
 OGROUP 2 WIND 2 1 0.000 -7.948 3.139 82.499 0.000 0.000 0.000 0.000 -0.212 -1.885 -44.981 -44.981
 OGROUP 2 WIND 2 2 1 0.000 -7.948 3.139 82.499 0.000 0.000 0.000 0.000 0.212 1.885 44.981 44.981
 OGROUP 2 WIND 3 1 1 0.000 -7.406 3.037 79.535 0.000 0.000 0.000 0.000 -0.425 -1.987 -47.616 -47.616
 OGROUP 2 WIND 3 2 1 0.000 -7.406 3.037 79.535 0.000 0.000 0.000 0.000 0.425 1.987 47.616 47.616
 OGROUP 2 WIND 4 1 1 0.000 -5.961 2.765 71.630 0.000 0.000 0.000 0.000 -0.567 -2.055 -49.373 -49.373
 OGROUP 2 WIND 4 2 1 0.000 -5.961 2.765 71.630 0.000 0.000 0.000 0.000 0.567 2.055 49.373 49.373
 OGROUP 2 WIND 5 1 1 0.000 -3.071 2.221 55.820 0.000 0.000 0.000 0.000 -0.673 -2.106 -50.690 -50.690
 OGROUP 2 WIND 5 2 1 0.000 -3.071 2.221 55.820 0.000 0.000 0.000 0.000 0.673 2.106 50.690 50.690
 OGROUP 3 WIND 1 1 1 0.000 -78.116 7.353 252.747 0.000 0.000 0.000 0.000 -0.535 -12.704 -12.704
 OGROUP 3 WIND 1 2 1 0.000 -78.116 7.353 252.747 0.000 0.000 0.000 0.000 0.535 12.704 12.704
 OGROUP 3 WIND 2 1 1 0.000 -68.742 6.530 223.822 0.000 0.000 0.000 0.000 -9.112 -1.328 -40.641 -40.641
 OGROUP 3 WIND 2 2 1 0.000 -68.742 6.530 223.822 0.000 0.000 0.000 0.000 9.112 1.328 40.641 40.641
 OGROUP 3 WIND 3 1 1 0.000 -64.055 6.118 209.360 0.000 0.000 0.000 0.000 -18.225 -2.120 -68.577 -68.577
 OGROUP 3 WIND 3 2 1 0.000 -64.055 6.118 209.360 0.000 0.000 0.000 0.000 18.225 2.120 68.577 68.577
 OGROUP 3 WIND 4 1 1 0.000 -51.556 5.020 170.793 0.000 0.000 0.000 0.000 -24.300 -2.648 -87.202 -87.202
 OGROUP 3 WIND 4 2 1 0.000 -51.556 5.020 170.793 0.000 0.000 0.000 0.000 24.300 2.648 87.202 87.202
 OGROUP 3 WIND 5 1 1 0.000 -26.559 2.825 93.660 0.000 0.000 0.000 0.000 -28.856 -3.045 -101.170 -101.170
 OGROUP 3 WIND 5 2 1 0.000 -26.559 2.825 93.660 0.000 0.000 0.000 0.000 28.856 3.045 101.170 101.170
 OLIVE LOAD LL 1 1 41.998 0.000 0.000 41.998 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000

CAP ANALYSIS AND DESIGN DATA
 CAP MOMENTS AND SHEARS ** SHEARS(KIPS)
 0 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
 OP 1 -1.024 -1.024 -1.024 -1.024 -1.024 -1.024 -2.047 -2.047 -2.047 -2.047 -2.047 -2.047
 OC 1L -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095
 OC 1R -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095 -4.095
 OP 3 -1.024 -1.024 -1.024 -1.024 -1.024 -1.024 2.047 2.047 2.047 2.047 2.047 2.047

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
 OP 1 -0.788 -0.788 6.24 4 # 11 6.24 4 # 11 0.00 0.000 #5@ 0.00 0.00 0.000 #5@ 0.00 42.00 0.45 0.000 0.001
 OC 1 -3.150 -3.150 6.24 4 # 11 6.24 4 # 11 0.00 0.000 #5@ 0.00 0.00 0.000 #5@ 0.00 42.00 0.45 0.000 0.006
 OP 3 -0.788 -0.788 6.24 4 # 11 6.24 4 # 11 0.00 0.000 #5@ 0.00 0.00 0.000 #5@ 0.00 42.00 0.45 0.000 0.001

COLUMN ANALYSIS AND DESIGN OUTPUT
 CRITICAL COLUMN LOADS
 0 T B GR LLC WC R E C S PF MTF MLF PM MTM MLM PU MTU MLU PU/PM B D
 0 1 T 3 LL 1 1.1 152.5 -101.6 -7.9 152.5 106.9 48.2 1986.0 1392.7 627.4 13.025 36.00 36.00
 0 1 B 3 LL 1 3.1 194.2 272.2 -187.6 194.2 286.6 197.5 954.3 1402.8 967.0 4.900 36.00 36.00

COLUMN DESIGN DATA
 0 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 SUMPV SUMPV DEL.T DEL.L CM R PHIC
 0 1 T 6 # 11 6 # 11 4 # 11 4 # 11 31.20 2.407 1.00 0.000 173. 3453. 1.053 1.053 1.000 1 0.70
 0 1 B 6 # 11 6 # 11 4 # 11 4 # 11 31.20 2.407 1.00 0.000 173. 3453. 1.053 1.053 1.000 1 0.70

FOOTING 1 DESIGN LOADS
 0 OF G LLID WC ES C S P MT VT ML VL P4 P3 P2 P1 MTF VBF VPF LOAD
 01 3 LL 1 3.1 140.562 209.360 6.118 -144.320 -5.052 38.637 2.917 53.860 89.580 12.199 -0.238 1.127 MAX.P1
 01 3 LL 1 1.1 182.731 328.571 9.559 -114.980 -4.507 34.566 5.760 85.680 114.486 17.228 -0.310 1.465 MAX.MT
 01 3 LL 1 1.1 182.731 328.571 9.559 -114.980 -4.507 34.566 5.760 85.680 114.486 17.228 -0.310 1.465 MAX.VT
 01 1 LL 1 0.0 211.648 0.000 0.000 0.000 67.352 67.352 67.352 10.682 -0.310 1.851 MAX.VP
 01 3 LL 1 5.1 182.731 121.758 3.673 -229.986 -7.770 73.628 16.908 46.618 103.338 14.908 -0.310 1.465 MAX.ML
 01 3 LL 1 1.1 182.731 328.571 9.559 -114.980 -4.507 34.566 5.760 85.680 114.486 12.116 -0.310 1.465 MAX.VL
 01 3 LL 1 3.1 140.562 209.360 6.118 -144.320 -5.052 38.637 2.917 53.860 89.580 12.199 -0.238 1.127 MAX.P3

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 7.500 7.500 3.250 0.305 0.19 8 # 4 @11.250 TOP LONG 22.148 28.060 56.120 23.250 0.000

0
NUMBER OF PILES = 4 0.22 9 # 4 @10.000 BOT.TRAN BT2RTPIER.OUT 25.432 28.663 57.327 23.750 0.000
BP = 2.250 DP = 2.250