

100-YR DESIGN CITY OF ROCKWALL DETENTION BASIN DESIGN MODIFIED RATIONAL METHOD. GIVEN: Total Area = 58.6200 AC, Bypass Area = 0 AC, Area Routed to Pond = 58.6200 AC, Prop C = 0.62, Flow Thru Area = 0.0000 AC, Qmax = 170.29, Flow Thru Qmax = 0.00 cfs, Qavg = 0.00 cfs, Flow Thru Qavg = 0 AC, Qc = 137.90 cfs, Flow Thru Qc = 0.00 cfs, Exlet C = 0.35, Flow Thru Qc = 0.00 cfs, Exlet Tc = 20 min, TOTAL Qc = 137.90 cfs. RESULT: Maximum Required Storage = 368,057 cf.

AREAS DRAINING TO POND. Table with columns: DA #, AREA, FUTURE USE, C, CA. Rows include DA 5 (18.39 COMMERCIAL), DA A1 (2.29 COMMERCIAL), DA E (19.44 SINGLE-FAMILY), DA G (4.29 SCHOOL), DA H (8.15 PARK), DA I (6.06 PARK), and TOTAL (58.62 WEIGHTED C VALUE, 0.62, 36.31).

STAGE-STORAGE TABLE. Table with columns: ELEVATION, VOLUME (CF). Rows show stages from 526.00 to 530.50 and corresponding volumes from 0 to 313,425 CF.

Storm event calculations for 100-year design. Columns: Storm Duration, Inflow, Outflow, Storage. Rows for 5, 10, 15, 20, 30, 40, 50, 60, 70, 80, 90 min storms.

CONTROLS

DRAINAGE CALCULATIONS: (100-YR) Q10 = KCA, K \* C < 1.0, K = 1.00, Tc = 20 MIN. (PRE-DEVELOPED), I100 = 8.30 (IN/HR) PRE-DEVELOPED, C = 0.35 PRE-DEVELOPED, Tc = 10 MIN. (DEVELOPED), I100 = 9.80 (IN/HR) DEVELOPED, C = 0.62 DEVELOPED (WEIGHTED VALUE), A = DRAINAGE BASIN (OFF-SITE) = 0.00 ACRES, Q PASS THROUGH (Tc=20 MIN; C=0.35) = 0.00 CFS, A = DRAINAGE BASIN (SITE) = 58.62 ACRES, Q DEVELOPED = 356.18 CFS, Q PRE-DEVELOPED = 170.29 CFS, A (BYPASS) = 3.82 ACRES (DRAINAGE AREA F), Q DEVELOPED (BYPASS) = 10.0 CFS (C=0.35, I=8.30), BYPASS AREA IS ON-SITE AREA THAT DOES NOT ROUTE THROUGH POND, Q ALLOWED TO RELEASE AT DETENTION POND = Qr, Qr = Q PRE-DEV - Q DEV (BYPASS) + Q PASS THROUGH, Qr = 170.29 - 11.1 + 0.00 = 159.19 CFS, \*DOWNSTREAM CULVERT WILL ONLY ACCEPT 149.0 CFS, Qr = 149.0 - DRAINAGE AREA F (11.1 CFS) = 137.90 CFS, VOLUME REQUIRED = 308,037 CF.

OUTLET CONTROL (ORIFICE) 100-YR Q = CA \* sqrt(2gh), Q = Qr = Q ALLOWED (CFS) = 137.90 CFS, C = 0.66, A = ORIFICE AREA (SF), g = GRAVITATIONAL CONSTANT = 32.2 FT/S^2, H = HYDRAULIC HEAD (FT), H = 530.50 - 525.00 = 5.50, A = 11.1019 SF, USE 36" X 35" RECTANGULAR OPENING, 40" X 2 1/2" RECTANGULAR OPENING, & 40" X 3.5" RECTANGULAR OPENING AT OUTLET STRUCTURE, REFER TO 03/CS.08, A = 11.1111 SF, WITHIN 1% TOLERANCE.

50-YR DESIGN CITY OF ROCKWALL DETENTION BASIN DESIGN MODIFIED RATIONAL METHOD. GIVEN: Total Area = 58.6200 AC, Bypass Area = 0 AC, Area Routed to Pond = 58.6200 AC, Prop C = 0.62, Flow Thru Area = 0.0000 AC, Qmax = 136.41, Flow Thru Qmax = 0.00 cfs, Qavg = 0.00 cfs, Flow Thru Qavg = 0 AC, Qc = 109.80 cfs, Flow Thru Qc = 0.00 cfs, Exlet C = 0.35, Flow Thru Qc = 0.00 cfs, Exlet Tc = 20 min, TOTAL Qc = 109.80 cfs. RESULT: Maximum Required Storage = 244,885 cf.

Storm event calculations for 50-year design. Columns: Storm Duration, Inflow, Outflow, Storage. Rows for 5, 10, 15, 20, 30, 40, 50, 60, 70, 80, 90 min storms.

CONTROLS

DRAINAGE CALCULATIONS: (50-YR) Q50 = KCA, K \* C < 1.0, K = 1.00, Tc = 20 MIN. (PRE-DEVELOPED), I50 = 7.50 (IN/HR) PRE-DEVELOPED, C = 0.35 PRE-DEVELOPED, Tc = 10 MIN. (DEVELOPED), I50 = 9.00 (IN/HR) DEVELOPED, C = 0.62 DEVELOPED (WEIGHTED VALUE), A = DRAINAGE BASIN (OFF-SITE) = 0.00 ACRES, Q PASS THROUGH (Tc=20 MIN; C=0.35) = 0.00 CFS, A = DRAINAGE BASIN (SITE) = 58.62 ACRES, Q DEVELOPED = 327.10 CFS, Q PRE-DEVELOPED = 153.88 CFS, A (BYPASS) = 3.82 ACRES (DRAINAGE AREA F), Q DEVELOPED (BYPASS) = 10.0 CFS (C=0.35, I=7.50), BYPASS AREA IS ON-SITE AREA THAT DOES NOT ROUTE THROUGH POND, Q ALLOWED TO RELEASE AT DETENTION POND = Qr, Qr = Q PRE-DEV - Q DEV (BYPASS) + Q PASS THROUGH, Qr = 153.88 - 10.0 + 0.00 = 143.88 CFS, \*DOWNSTREAM CULVERT WILL ONLY ACCEPT 134.60 CFS, Qr = 134.60 - DRAINAGE AREA F (10.0 CFS) = 124.60 CFS, VOLUME REQUIRED = 274,166 CF.

OUTLET CONTROL (ORIFICE) 50-YR Q = CA \* sqrt(2gh), Q = Qr = Q ALLOWED (CFS) = 124.60 CFS, C = 0.66, A = ORIFICE AREA (SF), g = GRAVITATIONAL CONSTANT = 32.2 FT/S^2, H = HYDRAULIC HEAD (FT), H = 530.50 - 525.00 = 5.15, A = 10.3684 SF, USE 36" X 35" RECTANGULAR OPENING, 40" X 2 1/2" RECTANGULAR OPENING, & 40" X 3.5" RECTANGULAR OPENING AT OUTLET STRUCTURE, REFER TO 03/CS.08, A = 10.3684 SF, WITHIN 1% TOLERANCE.

25-YR DESIGN CITY OF ROCKWALL DETENTION BASIN DESIGN MODIFIED RATIONAL METHOD. GIVEN: Total Area = 58.6200 AC, Bypass Area = 0 AC, Area Routed to Pond = 58.6200 AC, Prop C = 0.62, Flow Thru Area = 0.0000 AC, Qmax = 103.88, Flow Thru Qmax = 0.00 cfs, Qavg = 0.00 cfs, Flow Thru Qavg = 0 AC, Qc = 104.60 cfs, Flow Thru Qc = 0.00 cfs, Exlet C = 0.35, Flow Thru Qc = 0.00 cfs, Exlet Tc = 20 min, TOTAL Qc = 104.60 cfs. RESULT: Maximum Required Storage = 244,885 cf.

Storm event calculations for 25-year design. Columns: Storm Duration, Inflow, Outflow, Storage. Rows for 5, 10, 15, 20, 30, 40, 50, 60, 70, 80, 90 min storms.

10-YR DESIGN CITY OF ROCKWALL DETENTION BASIN DESIGN MODIFIED RATIONAL METHOD. GIVEN: Total Area = 58.6200 AC, Bypass Area = 0 AC, Area Routed to Pond = 58.6200 AC, Prop C = 0.62, Flow Thru Area = 0.0000 AC, Qmax = 121.05, Flow Thru Qmax = 0.00 cfs, Qavg = 0.00 cfs, Flow Thru Qavg = 0 AC, Qc = 98.00 cfs, Flow Thru Qc = 0.00 cfs, Exlet C = 0.35, Flow Thru Qc = 0.00 cfs, Exlet Tc = 20 min, TOTAL Qc = 98.00 cfs. RESULT: Maximum Required Storage = 205,216 cf.

Storm event calculations for 10-year design. Columns: Storm Duration, Inflow, Outflow, Storage. Rows for 5, 10, 15, 20, 30, 40, 50, 60, 70, 80, 90 min storms.

CONTROLS

DRAINAGE CALCULATIONS: (10-YR) Q10 = KCA, K \* C < 1.0, K = 1.00, Tc = 20 MIN. (PRE-DEVELOPED), I10 = 6.60 (IN/HR) PRE-DEVELOPED, C = 0.35 PRE-DEVELOPED, Tc = 10 MIN. (DEVELOPED), I10 = 7.10 (IN/HR) DEVELOPED, C = 0.62 DEVELOPED (WEIGHTED VALUE), A = DRAINAGE BASIN (OFF-SITE) = 0.00 ACRES, Q PASS THROUGH (Tc=20 MIN; C=0.35) = 0.00 CFS, A = DRAINAGE BASIN (SITE) = 58.62 ACRES, Q DEVELOPED = 301.66 CFS, Q PRE-DEVELOPED = 121.05 CFS, A (BYPASS) = 3.82 ACRES (DRAINAGE AREA F), Q DEVELOPED (BYPASS) = 7.9 CFS (C=0.35, I=6.6), BYPASS AREA IS ON-SITE AREA THAT DOES NOT ROUTE THROUGH POND, Q ALLOWED TO RELEASE AT DETENTION POND = Qr, Qr = Q PRE-DEV - Q DEV (BYPASS) + Q PASS THROUGH, Qr = 121.05 - 7.9 + 0.00 = 113.15 CFS, \*DOWNSTREAM CULVERT WILL ONLY ACCEPT 105.90 CFS, Qr = 105.90 - DRAINAGE AREA F (7.9 CFS) = 98.00 CFS, VOLUME REQUIRED = 205,216 CF.

OUTLET CONTROL (ORIFICE) 10-YR Q = CA \* sqrt(2gh), Q = Qr = Q ALLOWED (CFS) = 98.00 CFS, C = 0.66, A = ORIFICE AREA (SF), g = GRAVITATIONAL CONSTANT = 32.2 FT/S^2, H = HYDRAULIC HEAD (FT), H = 529.45 - 525.00 = 4.45, A = 8.7712 SF, USE 36" X 35" RECTANGULAR OPENING AT OUTLET STRUCTURE, REFER TO 03/CS.08, A = 8.7500 SF, WITHIN 1% TOLERANCE.

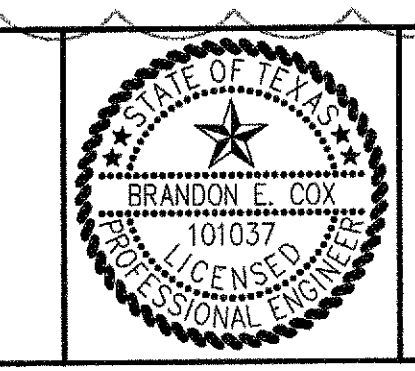
RECORD DRAWINGS. IT WAS THE INTENT THAT THE IMPROVEMENTS SHOWN BE CONSTRUCTED ACCORDING TO THESE PLANS AS APPROVED BY THE CITY. THE LINES AND GRADES WERE SET ON THE GROUND FOR CONSTRUCTION ACCORDING TO SAID PLANS. THE CITY INSPECTED THE CONSTRUCTION. THE ENGINEER DID NOT VERIFY LINES OR GRADES AFTER CONSTRUCTION. WE ARE NOT AWARE OF ANY CHANGES OR REVISIONS TO THESE PLANS DURING CONSTRUCTION OTHER THAN THOSE SHOWN. RANDALL P. POGUE, P.E. DATE: APRIL 15, 2010. TX LIC. NO. 84780.

FOR DETAIL OF ORIFICE, REFER TO SHEET CS.08

REVISIONS table with columns: NO., DATE, REVISION / DESCRIPTION, DRAWN, DATE, SCALE, NOTES. Includes revisions for RECORD DRAWINGS, ADDED RIGHT TURN LANE ON S.H. 205, SANITARY SEWER & ADA ROUTE REVISIONS, and TxDOT COMMENTS.

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DETENTION CALCULATIONS. STONE CREEK RETAIL BLOCK A, LOTS 1-6, STONE CREEK RETAIL ADDITION W.T. DEWESE SURVEY, ABSTRACT NO. 71 CITY OF ROCKWALL, TEXAS. SHEET NO. C2.03

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