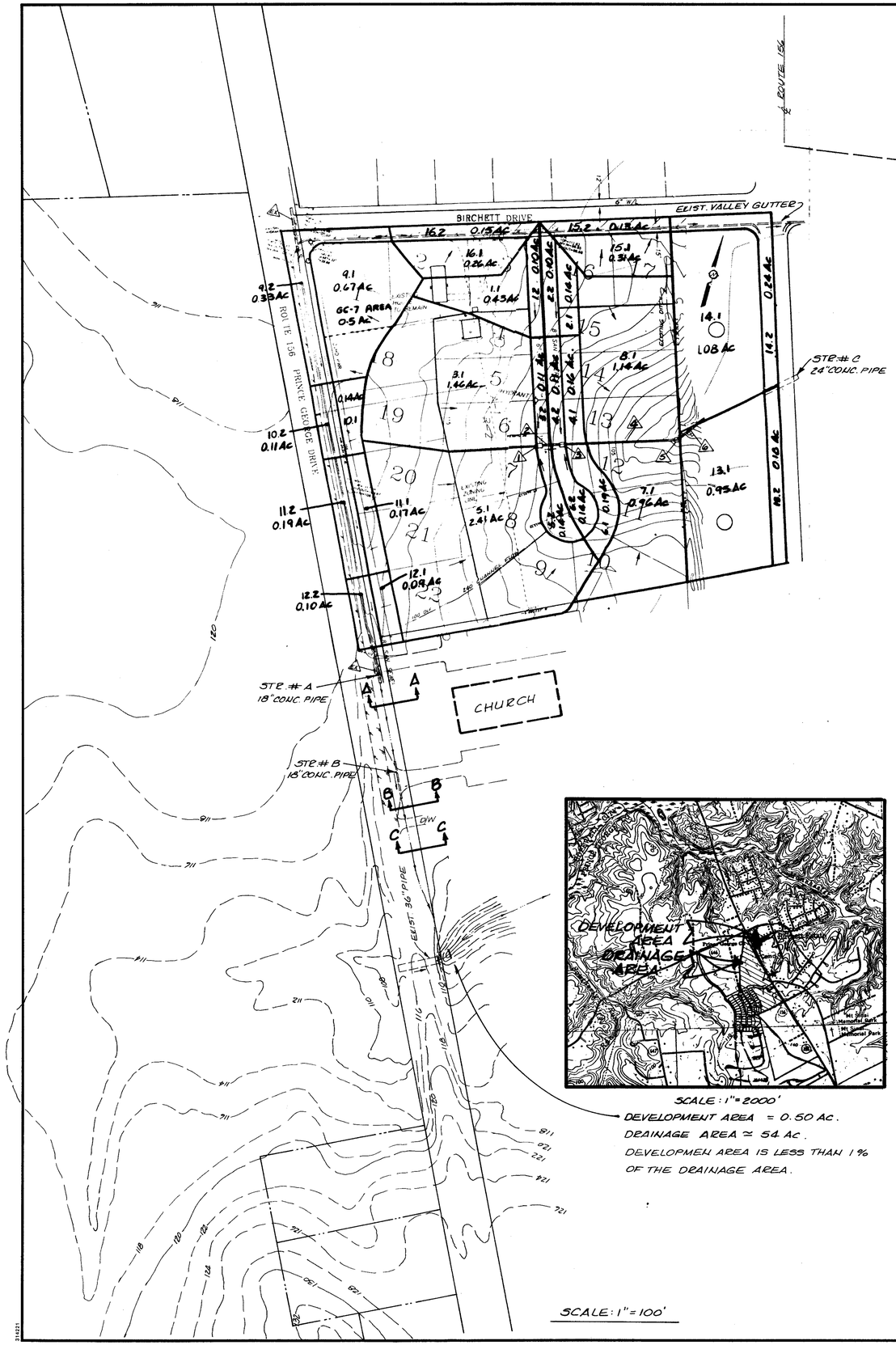
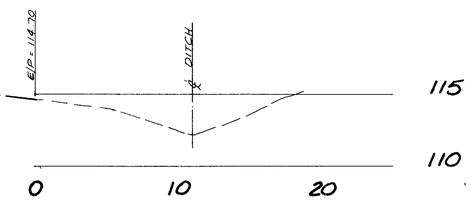




A - A SCALE: 1" = 5'

$A = \frac{10.8 \times 1.8}{2} = 9.70\ SF.$

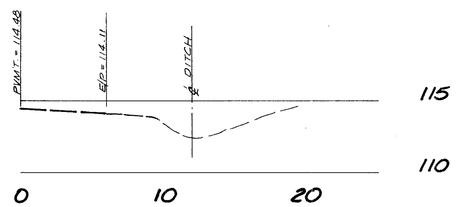
$P = 11.6$

$R = \frac{9.7}{11.6} = 0.836$

$V = \frac{1.486}{0.03} \times (0.836)^{0.667} \times (0.0016)^{0.5}$

$= 1.75\ FT/SEC.$

Q CHANNEL = 16.97 CFS



B - B SCALE: 1" = 5'

$A = \frac{8.2 \times 1.7}{2} = 7.0\ SF.$

$P = 9.2$

$R = \frac{7.0}{9.2} = 0.76$

$V = \frac{1.486}{0.03} \times (0.76)^{0.667} \times (0.004)^{0.5}$

$= 2.60\ FT/SEC.$

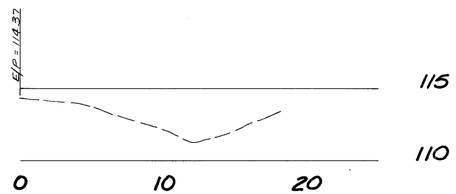
Q CHANNEL = 18.21 CFS

SCALE: 1" = 2000'

DEVELOPMENT AREA = 0.50 AC.

DRAINAGE AREA ≃ 54 AC.

DEVELOPMEN AREA IS LESS THAN 1% OF THE DRAINAGE AREA.



C - C SCALE: 1" = 5'

A = 2.6 SF.

P = 5.4 FT.

$R = \frac{2.6}{5.4} = 0.48$

$V = \frac{1.486}{0.03} \times (0.48)^{0.667} \times (0.01)^{0.5}$

$= 3.02\ FT/SEC.$

Q CHANNEL = 7.85 CFS

BEFORE DEVELOPMENT

EXISTING STRUCTURE # A

150' OLF @ 0.6% TC = 19 MIN.

690' CHANNEL FLOW TC = 5 MIN.

24 MIN.

$I_2 = 3.05$

AREA = 0.73 C = 0.7 = 0.51

AREA = 1.07 C = 0.3 = 0.32

CA = 0.83 Ac.

$Q_2 = 2.53$ CFS

AFTER DEVELOPMENT

Tc = 24 MIN. $I_2 = 3.05$

AREA = 0.73 C = 0.7 = 0.51

AREA = 0.50 C = 0.4 = 0.20

AREA = 0.57 C = 0.3 = 0.17

CA = 0.88 Ac.

$Q_2 = 2.65$ CFS

CAPACITY OF EXIST. STRUCTURE A

L = 70' D = 18" SLOPE = 0.16%

VELOCITY FLOWING FULL = 2.6 FPS

Q = 4.6 FPS

EXIST. STRUCTURE A IS CAPABLE ENOUGH TO CARRY 2.65 CFS DISCHARGE AFTER DEVELOPMENT.

BEFORE DEVELOPMENT

EXISTING STRUCTURE # C

100' OLF @ 2.0% TC = 11.5 MIN.

650' CHANNEL FLOW TC = 4.5 MIN.

16.0 MIN.

$I_2 = 3.75$

AREA = 0.50 C = 0.7 = 0.35

AREA = 10.19 C = 0.3 = 3.06

CA = 3.41 Ac.

$Q_2 = 12.79$

AFTER DEVELOPMENT

Tc = 17 MIN. $I_2 = 3.75$

AREA = 0.50 C = 0.7 = 0.35

AREA = 0.69 C = 0.4 = 0.28

AREA = 9.50 C = 0.3 = 2.85

CA = 3.48 Ac.

$Q_2 = 13.05$ CFS

STRUCTURE # C IS INLET CONTROL $\frac{HW}{D} = 1.02$

ALL WORK SUBJECT TO INSPECTION BY COUNTY ENGINEER

FINAL F.B. 641

711 NORTH COURTHOUSE ROAD
RICHMOND, VIRGINIA 23236
TELEPHONE: (804) 794-3500

8803 STAPLES MILL ROAD
RICHMOND, VIRGINIA 23228
TELEPHONE: (804) 262-7396

4411 CROSSING BOULEVARD
PRINCE GEORGE, VIRGINIA 23875
TELEPHONE: (804) 458-8685

LANDSCAPE ARCHITECTS
PLANNERS * ENGINEERS * ARCHITECTS * SURVEYORS *

COMMONWEALTH OF VIRGINIA
WALKER M. ALTMAN III
LICENSE No. 11030
PROFESSIONAL ENGINEER

REVISION DESCRIPTION	DATE	BY
ENG. REV.	7-12-90	

DATE 5-29-90

DRAWN BY G.F.C.

DESIGNED BY J.B.P.

CHECKED BY W.M.A.

SCALE AS NOTED

BIRCHETT ESTATES-SECTION 5

DRAINAGE STUDY MAP

SHEET NO. 3 OF 4

JOB NO. 8912 - 02