

HYDROLOGICAL DESIGN
At
PINE GROVE DEVELOPMENT

For
PINE GROVE, LLC

Land Lots 703, 704, 737, 738, 775 & 776
4TH District, 3rd Section
City of Cartersville, Bartow County, Georgia
October 10, 2002

Prepared for
PINE GROVE, LLC
PO BOX 1733
CARTERSVILLE, GEORGIA 30121

Prepared By

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A unitpeak hydrograph is then generated using the pre- basin data. Hydrographs are generated for the 2, 5, 10, 25, 50, & 100 year storm events. (basin area- 231.1 acres) (weighted curve number (Cn)- 70) (length of travel- 4350 feet) (lag time- 2.01 hours) The computed peak flows are summarized in chapter 2.

A fictional hydrology design is then performed to establish the storage needed for storm water detention. (the storage provided in the post-developed lakes & depressed areas must be equal to or greater than storage provided in the pre-developed depressed areas plus the storage required for detention) First, a hydrograph is generated for the pre-developed site. (S.C.S. Method) This study assumes the 52.1 acre on-site tract as pristine cover (Cn-66) and a time of concentration of 0.47 hours. Then, a hydrograph is generated for the post-developed site. The weighted Cn was generated from measured impervious, landscaped and natural areas. (Cn-79) Lakes are counted as impervious surface. The time of concentration is 0.40 hours. This post-developed hydrograph is then routed into a fictional storage basin with an orifice and rectangular weir designed to control outflow at or below pre-developed runoff rates for all 6 storm events. The storage volume required for these events is to be added to the pre-developed storage volume to establish the total storage required in the combined lakes and depressed areas.

A unitpeak hydrograph is then generated for the post-developed 231.1 acre drainage basin. The basin weighted Cn is computed using additional impervious and landscaped surfaces and the lag time is adjusted for piped conveyance. (change is minor due to basin size and length of flow) Area delineations and calculations are shown on hydrology exhibits located in chapter 5. (24x36 inserts) This new hydrograph is then routed into the 2 lakes and depressed areas. (storage computations beginning at 681.0, or the proposed normal pool elevation) The elevation of the existing (2) 30 inch r.c.p. outlet pipes and ditch across Douthit Ferry Road are elevated too high to set the pond outlet structure at 681.0. The existing pipes will be abandoned, and replaced with a new 43 inch wide by 48inch high box culvert, that will act as a control outlet for the lakes. The new culvert will be placed at an elevation of 682.8 and will be installed at a 0% slope. Pumps will maintain 681.0 level.

A system of inlet headwalls and pipes will convey runoff from Wellington Subdivision to the east and from the storage depression to the north through the proposed subdivision and draining thence into the proposed lakes. These head walls will be placed at an elevation of 684.5 m.s.l. so that existing depressed areas will continue to store runoff as in historical rain events, but will enter piped conveyance system at a level to maintain post-developed elevations at or below pre-developed elevations. (685.18 m.s.l.)

Page from Hydrology Study

LAKES- (2.34 NORTH) (4.86 SOUTH) 7.20 ACRES
 NOTE: LAKE AREA SHOWN IS AT 681 CONTOUR (NORMAL POOL)
 TOTAL IMPERVIOUS SURFACE- 21.7 ACRES

LANDSCAPED AREAS

ESTIMATED LANDSCAPE AREA IS 19.1 ACRES

NATURAL AREAS

NATURAL COVER IS 11.3 ACRES (BUFFERS, ETC.)

$$\frac{(21.7 \times 98) + (19.1 \times 70) + (11.3 \times 66)}{52.10}$$

WEIGHTED Cn = 79



GRAPHIC SCALE



(IN FEET)
1 inch = 200 ft.

Post-developed Hydrology Exhibit
of

PINE GROVE DEVELOPMENT, LLC
 LAND LOTS 703, 704, 737, 738, 775 & 776
 4th DISTRICT, 3rd SECTION
 CITY OF CARTERSVILLE, BARTOW COUNTY, GEORGIA

Drawn By JTH

Checked By DB

Scale 1" = 200'

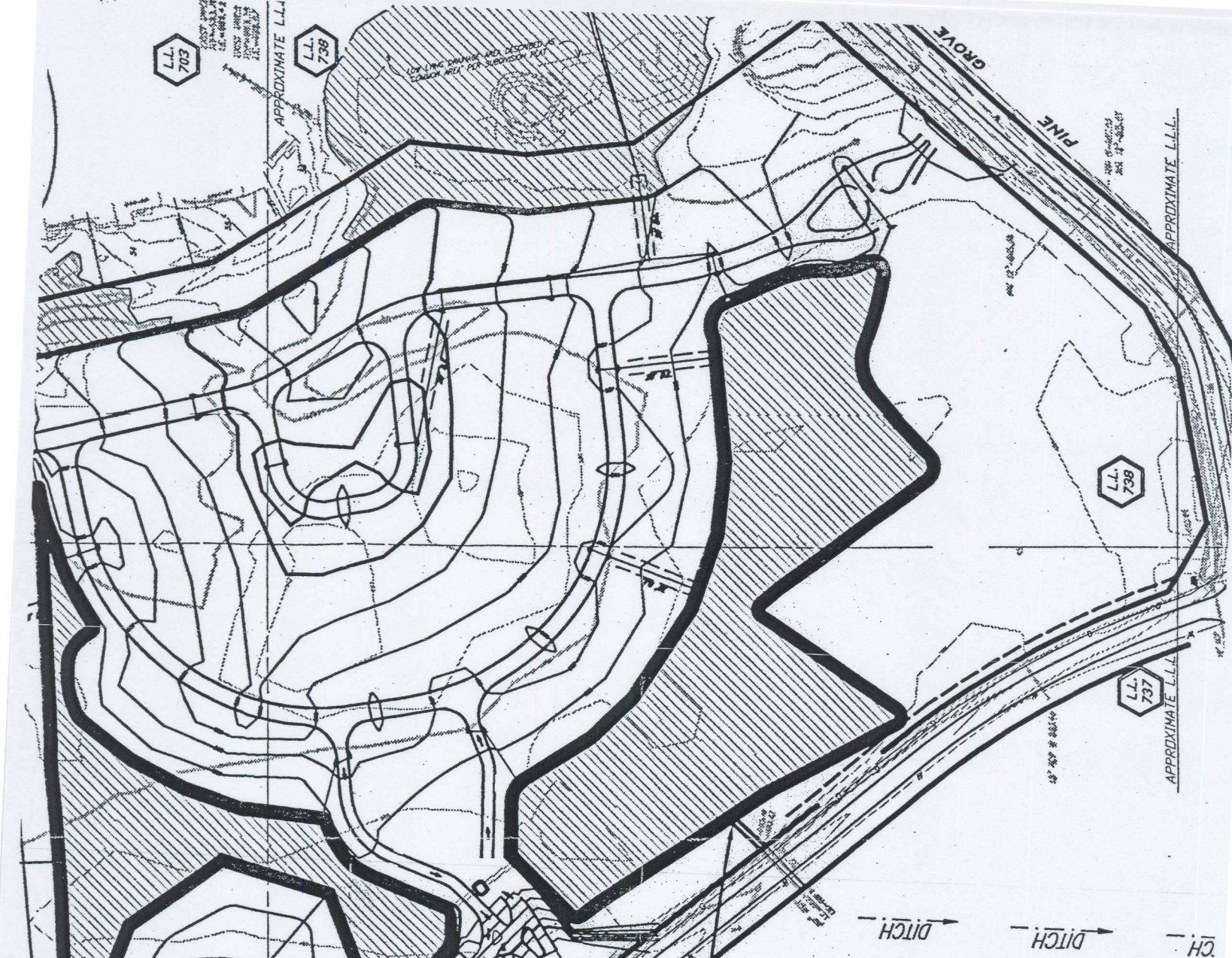
Date 10/07/02

Drawing Number

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ENGINEERING, INC. ONE DUNWOODY PARK, SUITE 205 ATLANTA, GA 30338 770-225-2121



INSTALL NEW 43" WIDE x 48" HIGH BOX
 CULVERT @ 682.80 (125' LONG BOX
 WILL BE LAYED AT 0% SLOPE AND WILL
 ACT AS LAKE OUTLET CONTROL

NORMAL POOL ELEVATION OF THE LAKES ARE TO BE
 MAINTAINED AT AN ELEV. OF 681.0 BY A PUMP PLACED
 AT OUTLET. (INVERT - 682.80)

From: Post-developed
 Hydrology Exhibit