

1. Agenda.

Documents:

[BOMC-9-21-16-WS-AGENDA.PDF](#)

2. Agenda Item No. 3

Documents:

[HYDRO-COAE DRAINAGE\\_2016-08-29.PDF](#)

3. Agenda Item No. 5

Documents:

[TREE ORD PACKET.PDF](#)

4. Agenda Item No. 8

Documents:

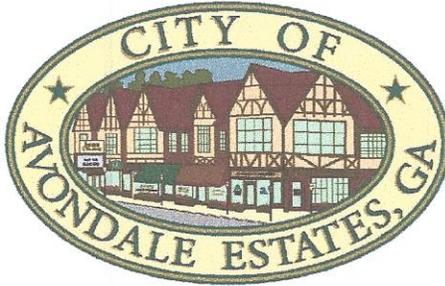
[LOCAL MAINTENANCE2017.DOCX](#)



**BOARD OF MAYOR AND COMMISSIONERS  
WORK SESSION  
September 21, 2016  
5:30 p.m.**

**AGENDA**

- Item No. 1 Meeting Called to Order
- Item No. 2 Adoption of Agenda
- Item No. 3 Drainage and Hydrologic Analysis of Clarendon Avenue/Berkeley Road Area  
Mark Cooke – Skyline Engineering and Construction
- Item No. 4 Planning and Zoning Board Openings
- Item No. 5 Lake Avondale and Willis Park Rules
- Item No. 6 Residential Tree Ordinance
- Item No. 7 US 278 Road Diet Update
- Item No. 8 Annexation Update
- Item No. 9 Fiscal Year 2017 Local Maintenance Improvement Grant (LMIG) Agreement
- Item No. 10 Service Delivery Strategy Resolution
- Item No. 11 Amendment to Avondale Estates Code of Ordinance Division 3.PERMITS Sec.  
5-76 Expiration
- Item No. 12 Public Comment
- Item No. 13 Adjournment



**DRAINAGE & HYDROLOGIC ANALYSIS  
CLARENDON AVE./BERKELY RD. AREA**

**CITY OF AVONDALE ESTATES, GEORGIA**

PREPARED FOR:

**CITY OF AVONDALE ESATES**  
Department of Public Works  
21 North Avondale Plaza  
Avondale Estates, GA 30002

PREPARED BY:



A handwritten signature in blue ink, appearing to read "Mark D. Cooke", is written over a horizontal line.

**Mark D. Cooke, P.E.**  
Civil Engineer

A horizontal line is drawn above the name "Stacey R. Jones, P.E.", which is written in a bold, black, sans-serif font. Below the name, the title "Sr. Civil Engineer" is written in a smaller, black, sans-serif font.

August 18, 2016

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## EXHIBITS

<b>A</b>	<b>City of Avondale Estates Map – Initial Project Area</b>	<b>16</b>
<b>B</b>	<b>Existing Drainage Basin Map</b>	<b>17</b>
<b>C</b>	<b>Preliminary Drainage Plan</b>	<b>18</b>

## **I. Introduction**

This report summarizes the preliminary hydrologic analysis performed for the Clarendon Ave./Berkeley Rd. area within the City of Avondale Estates, Georgia (GA). The area consists of an established residential single family neighborhood with lot sizes averaging approximately 12,000 square feet (sf). Known existing flooding issues have been documented both within the City's right-of-way and private properties.

## **II. Site Location**

The original study area was defined as noted in the attached Exhibit "A". However, after further analysis the study area increased to include the limits of total stormwater contributing area as shown in Exhibit "B".

## **III. Project Due Diligence**

The following evaluation of the existing drainage conveyance and stormwater patterns of the project area is based on review of City of Avondale Estates mapping (Exhibit "A") and DeKalb County Topographic information (Exhibit "B"). Mapping from the City of Avondale Estates provided limited information and locations of storm sewers, catch basins, inlets and ditches located within the subject area. Site visits of the subject area were performed to record photographs, study the drainage area and patterns, interview available residents and verify both DeKalb County and the City's mapping information.

## **IV. Existing Conditions**

The study area discharges from the City via two drainage basins referred to as Drainage Basins 1 and 2 on attached Exhibit "B".

### Drainage Basin 1

Drainage Basin 1 discharges into Shoal Creek East Fork Middle Branch via an existing 36" corrugated metal pipe (CMP) pipe located in Avondale Park west of the intersection of Clarendon Place and Dartmouth Avenue. Stormwater runoff is collected upstream via six curb inlets located at the intersection of Clarendon Place and Dartmouth Avenue. This location has been depicted as Study Point (SP) 1 on attached Exhibit "B". The total drainage basin area at this location is approximately 71 acres and the peak rate of flow for the 25-year storm event has been calculated to be approximately 240 cubic feet per second (cfs).

In comparison, it is important to note that the capacity of the existing 36" CMP has been calculated to be approximately 62.57 cfs. Thus, stormwater discharge to the existing stormwater conveyance system greatly exceeds its capacity and therefore the system creates a "ponding" area at the intersection of Clarendon Place and Dartmouth Avenue where stormwater backs up from the existing 36" pipe and the six existing curb inlets.

Within Drainage Basin 1 is sub-basin 1A as shown in Exhibit "B". Property owners in this area have experienced severe flooding issues along the existing ditch at the rear of the shared lot lines which discharges south into Kingstone Road. The drainage area of sub-basin 1A is approximately 8.7 acres.

#### Drainage Basin 2

Drainage Basin 2 of the project study area discharges via an existing 18" CMP pipe located north of the Avondale Swim and Tennis Club and also discharges into Shoal Creek East Fork Middle Branch. Stormwater Runoff from Drainage Basin 2 discharges into the existing 18" CMP pipe via two curb inlets/catch basins located at the low point along Dartmouth Avenue. The total drainage basin area at this location is approximately 32 acres and the peak rate of flow for the 25-year storm event has been calculated to be approximately 180 cfs.

In comparison, it is important to note that the capacity of the existing 18" CMP has been calculated to be approximately 5.69 cfs. Stormwater discharge to the existing stormwater conveyance system greatly exceeds its capacity and therefore the system creates a "ponding" area at the low point of Dartmouth Avenue where stormwater backs up from the existing 18" pipe and the two existing curb inlets.

#### **V. Recommendations**

In both Drainage Basin 1 and 2 the existing capacity of their respective receiving conveyance pipes and inlets are currently undersized. It is our opinion that a proposed pipe network as depicted on Exhibit "C" would help mitigate flooding issues within the study area. By adding additional curb inlets and the subsurface storm sewer system, stormwater runoff can be collected and conveyed underground prior to accumulating at the surface and creating the current flooding issues as experienced by multiple city residents. Additionally, the existing storm sewer systems for each basin can be modified to meet the volumes for the 25-year storm event and incorporated into the proposed system. All proposed improvements for Basin 1 and Basin 2 will be shown as "Proposed Storm Sewers - Phase 1" and "Proposed Storm Sewers - Phase 2" respectively.

*Please note it is also important to analyze the downstream receiving channel, Shoal Creek East Fork Middle Branch, to ensure it has the capacity to handle the increase in stormwater runoff velocity and volume as a result of the proposed recommendations. This tasks may result in preparing the downstream streambank as recommended in the Georgia Stormwater Manual.*

## **VI. Methodology**

SCS Hydrologic Methodology was applied in the following analysis using the Type II rainfall distribution for the 24 hour storm in Atlanta, Georgia. Time of concentration values for existing conditions were calculated using the SCS TR-55 methodology and curve number calculations are based on Type “C” soils and Table 2.1.5-1 of the Georgia Stormwater Management Manual. Analysis for all storm events was performed using Hydraflow Hydrographs 2004, hydrology & hydraulics software program, version 6.0 by Intellisolve.

See Appendix B-1 for Methodology Support Information.

## VII. Preliminary Cost Estimate

The cost estimate is conceptual in nature and should not be used for construction purposes. All final costs should be based on construction plans and specifications that are sealed by a licensed professional engineer in the State of Georgia.

Skyline's approach to this estimate consisted of a table-top review and approximating units of the proposed pipe network depicted on Exhibit "C". A conceptual table was created depicting the major elements of a typical infrastructure improvement project, Refer to Table I. Major work divisions are roadway, concrete, reinforced concrete pipe (RCP), grassing and appurtenances. Line items were evaluated for approximate quantities (Qty.), unit of measurement (Units), unit price, and amount in U.S. dollars (\$). Typical elements are as follows:

- Traffic control
- Erosion and sedimentation control
- Asphalt
- Signage
- Striping
- Driveways
- Curbs
- Gutters
- Base pavement
- RCP (18" – 72" o.d.)
- Catch basins
- Drop inlets
- Head wall
- Grassing (permanent)

Initial quantities of RCP, drop inlets, catch basins, headwalls, and junction boxes were compiled from the Skyline Inlet Basin Map. Costs were compiled from various sources such as Old Castle Concrete, ISCO Industrial, Georgia Department of Transportation (GDOT), Emory Village Construction Costs, and RS Means Building Construction Data.

Approximate construction costs are as follows:

Phase 1 - \$ 863,822.97

Phase 2 - \$ 225,361.24

**\$ 1,089,184.21 Grand Total**

Refer to Table I for the approximate breakdown of probable cost elements, quantities, units, unit price, and line item amounts.

**Table 1**

<b>Phase 1</b>				
<b>Avondale, Georgia</b>				
<b>Description</b>	<b>Qty.</b>	<b>Units</b>	<b>Unit Price (\$)</b>	<b>Amount (\$)</b>
<b>Roadway:</b>				
Traffic Control	0.67	LS	26000	17420
Temporary Grassing	5	AC	1000	5000
Mulch	4	TN	600	2400
Construct and Remove Inlet Sediment Trap	33	EA	200	6600
Maintenance of Temporary silt Fence	8911	LF	2	17822
Maintenance of Inlet Sediment Trap	33	EA	2	66
Temporary Silt Fence	8911	LF	2.25	20049.75
Grading Complete (Demolition incl)	2779	CY	7	19454.12
Graded Aggregate Base	1191	CY	40	47623.6
Aggregate Surface Course	6.7	TN	40	268
Recycled Asphalt Conc. Patching, Incl. Bitumen . Matl & Lime	6.7	TN	200	1340
Recycled Asph. Conc. 12.5 MM Superpave, GP 2 Only, Incl. Bitumen & H Lime	6.7	TN	200	1340
Bitumen Tack Coat	134	GL	7	938
Mill Asph Conc. Pavement, 2" Depth	676.7	SY	3	2030
<b>Concrete:</b>				
Driveway Concrete, 6 IN Tk	167.5	SY	40	6700
Class B Concrete, Base or Pavement Widening	194	CY	200	38806
<b>Reinforced Concrete Pipe:</b>				
Storm Drain Pipe, 18 IN, H 1-10	2319	LF	40	92760
Storm Drain Pipe, 24 IN, H 1-10	1677	LF	50	83850
Storm Drain Pipe, 36 IN, H 1-10	1729	LF	70	121030
Storm Drain Pipe, 48 IN, H 1-10	368	LF	100	36800
Storm Drain Pipe, 54 IN, H 1-10	472	LF	125	59000
Storm Drain Pipe, 72 IN, H 1-10	480	LF	200	96000
Storm Drain Pipe, 60 IN, H 1-10	532	LF	130	69160
Catch Basin, GP 1	32	EA	2800	89600
Drop Inlet, GP 1	4	EA	2500	10000

DRAINAGE ANALYSIS  
CLARENDON AVE./BERKELEY RD. AREA

Pipe Lube	15	EA	100	1500
Junction Box	1	EA	3500	3500
Headwall	1	EA	3500	3500
<b>Grassing and Appurtenances:</b>				
Permanent Grassing	5	AC	1000	5000
Agricultural Lime	5	TN	2	10
Liquid Lime	75	GL	2	150
Fertilizer, Mixed Grade	2.5	TN	2	5
Fertilizer, Nitrogen Content	450	LB	2	900
Striping	900	LF	2	1800
Signage	40	SF	35	1400
				<b>\$ 863,822.97</b>

<b>Phase 2</b>				
<b>Description</b>	<b>Qty.</b>	<b>Units</b>	<b>Unit Price (\$)</b>	<b>Amount (\$)</b>
<b>Roadway:</b>				
Traffic Control	0.33	LS	26000	8580
Temporary Grassing	2	AC	1000	2000
Mulch	2	TN	600	1200
Construct and Remove Inlet Sediment Trap	7	EA	200	1400
Maintenance of Temporary silt Fence	4389	LF	2	8778
Maintenance of Inlet Sediment Trap	7	EA	5	35
Temporary Silt Fence	4389	LF	2.25	9875.25
Grading Complete (Demolition incl)	1369	CY	7	9581.88
Graded Aggregate Base	586.4	CY	40	23456.4
Aggregate Surface Course	3.3	TN	40	132
Recycled Asphalt Conc. Patching, Incl. Bitumen . Matl & Lime	3.3	TN	200	660
Recycled Asph. Conc. 12.5 MM Superpave, GP 2 Only, Incl. Bitumen & H Lime	3.3	TN	200	660
Bitumen Tack Coat	66	GL	7	462
Mill Asph Conc. Pavement, 2" Depth	333.3	SY	3	1000
<b>Concrete:</b>				
Driveway Concrete, 6 IN Tk	82.5	SY	40	3300
Class B Concrete, Base or Pavement Widening	74.07	CY	200	14815

DRAINAGE ANALYSIS  
CLARENDON AVE./BERKELEY RD. AREA

<b>Reinforced Concrete Pipe:</b>				
Storm Drain Pipe, 18 IN, H 1-10	297	LF	40	11880
Storm Drain Pipe, 24 IN, H 1-10	819	LF	50	40950
Storm Drain Pipe, 36 IN, H 1-10	357	LF	70	24990
Storm Drain Pipe, 54 IN, H 1-10	286	LF	125	35750
Catch Basin, GP 1	6	EA	2800	16800
Pipe Lube	15	EA	100	1500
Headwall	1	EA	3500	3500
<b>Grassing and Appurtenances:</b>				
Permanent Grassing	2	AC	1000	2000
Agricultural Lime	2	TN	2	4
Liquid Lime	25	GL	2	50
Fertilizer, Mixed Grade	1	TN	2	2
Fertilizer, Nitrogen Content	50	LB	2	100
Striping	600	LF	2	1200
Signage	20	SF	35	700

**\$ 225,361.24**

<b>Grand Total (Phase 1 and 2)</b>				<b>\$ 1,089,184.21</b>
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**VIII. Hydraulic and Hydrologic Support Information**

The following pages are technical support for the analysis provided herein.

# Channel Report

## 18 in. CMP Capacity

### Circular

Diameter (ft) = 1.50

Invert Elev (ft) = 100.00

Slope (%) = 1.00

N-Value = 0.024

### Calculations

Compute by: Q vs Depth

No. Increments = 10

### Highlighted

Depth (ft) = 1.50

Q (cfs) = 5.688

Area (sqft) = 1.77

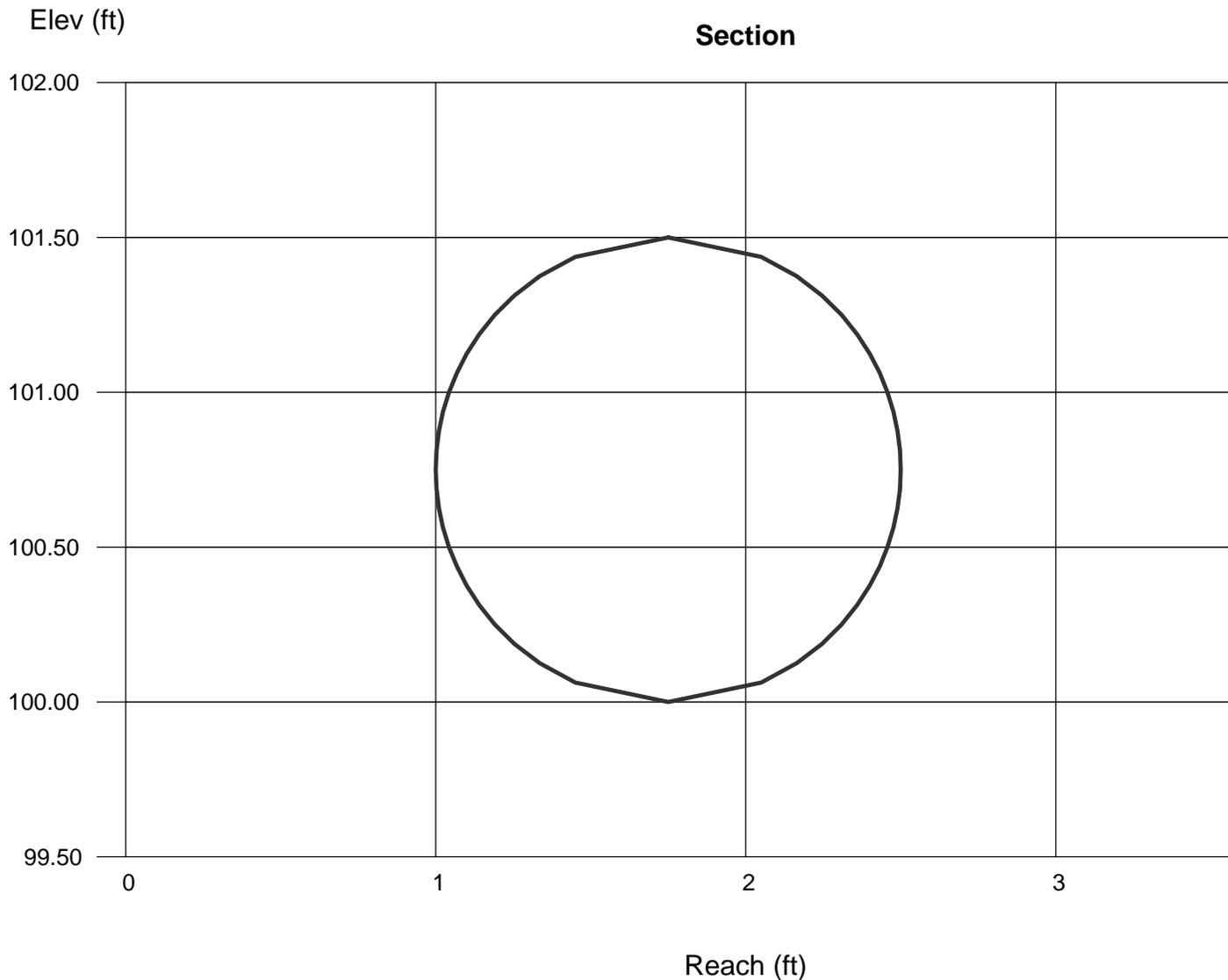
Velocity (ft/s) = 3.22

Wetted Perim (ft) = 4.71

Crit Depth,  $Y_c$  (ft) = 0.95

Top Width (ft) = 0.00

EGL (ft) = 1.66



# Channel Report

## 36 in. CMP Capacity

### Circular

Diameter (ft) = 3.00

Invert Elev (ft) = 100.00

Slope (%) = 3.00

N-Value = 0.024

### Calculations

Compute by: Q vs Depth

No. Increments = 10

### Highlighted

Depth (ft) = 3.00

Q (cfs) = 62.57

Area (sqft) = 7.07

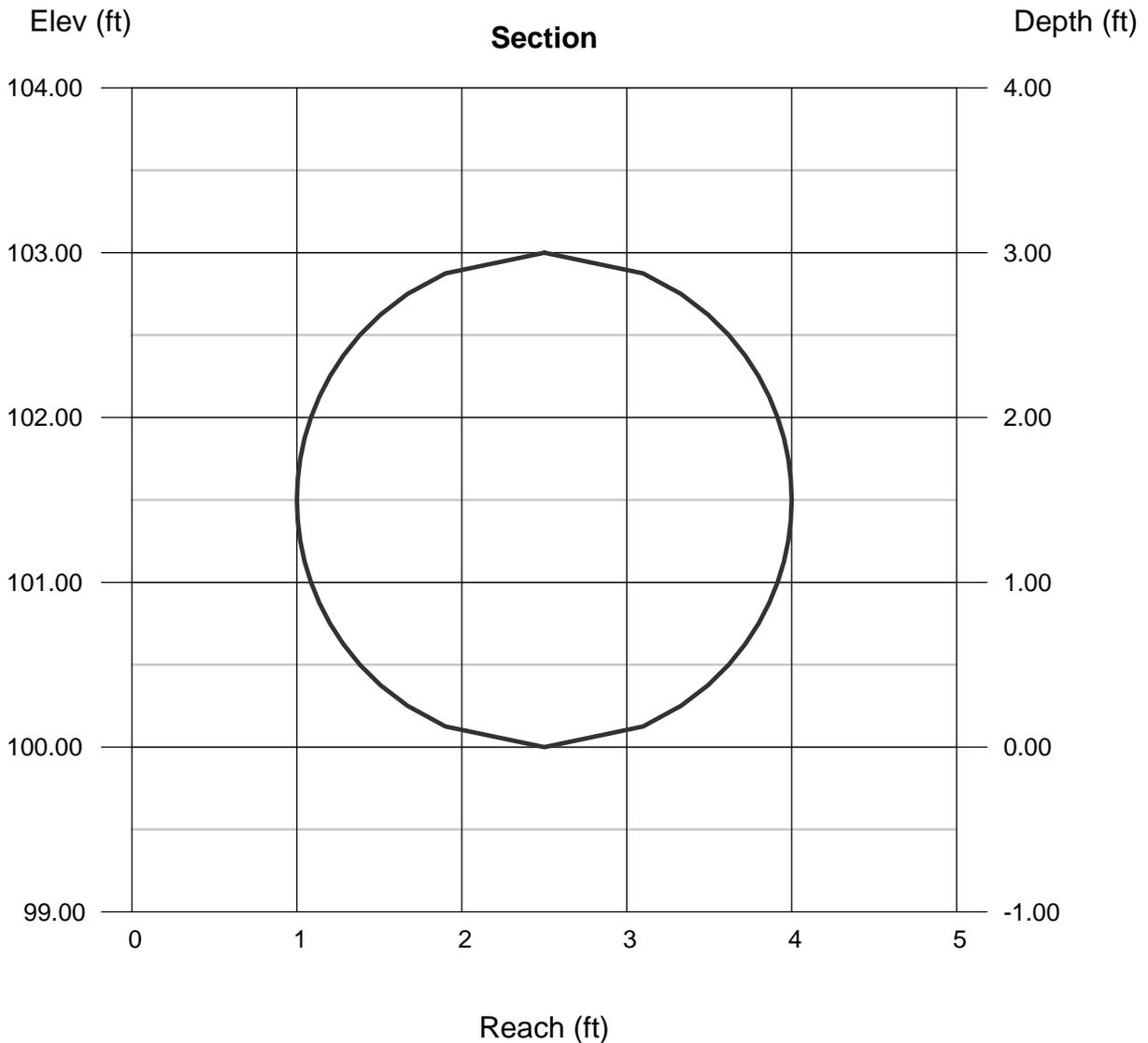
Velocity (ft/s) = 8.85

Wetted Perim (ft) = 9.42

Crit Depth, Yc (ft) = 2.62

Top Width (ft) = 0.00

EGL (ft) = 4.22



# Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	240.04	2	736	1,169,810	-----	-----	-----	Study Pt. 1
2	SCS Runoff	180.11	2	722	514,057	-----	-----	-----	Study Pt. 2
08-17-16.gpw					Return Period: 25 Year			Wednesday, Aug 17, 2016	

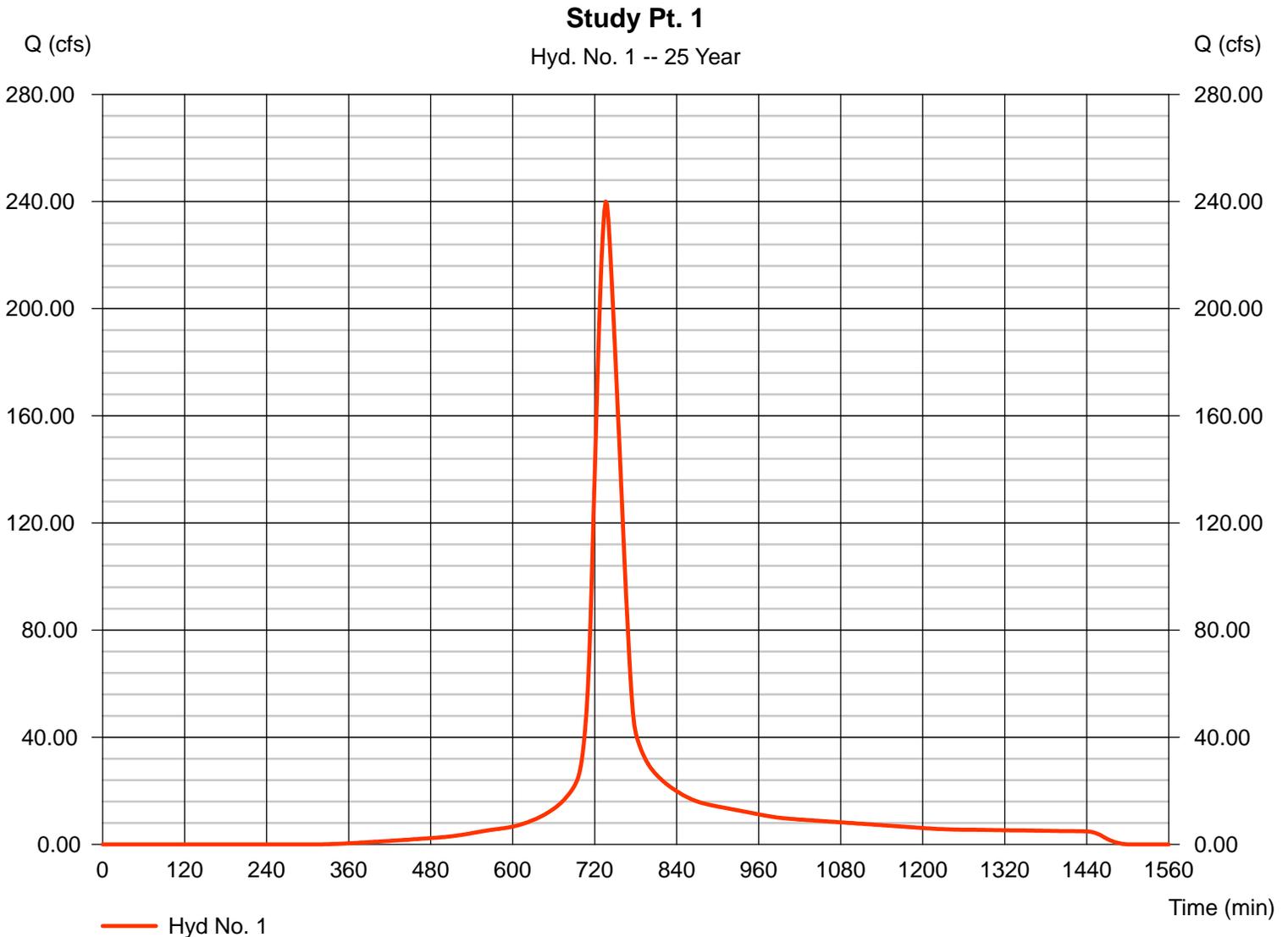
# Hydrograph Report

## Hyd. No. 1

Study Pt. 1

Hydrograph type = SCS Runoff  
Storm frequency = 25 yrs  
Time interval = 2 min  
Drainage area = 71.000 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 6.48 in  
Storm duration = 24 hrs

Peak discharge = 240.04 cfs  
Time to peak = 736 min  
Hyd. volume = 1,169,810 cuft  
Curve number = 83  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 37.80 min  
Distribution = Type II  
Shape factor = 484



# TR55 Tc Worksheet

## Hyd. No. 1

Study Pt. 1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
<b>Sheet Flow</b>				
Manning's n-value	= 0.150	0.011	0.011	
Flow length (ft)	= 100.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 4.08	0.00	0.00	
Land slope (%)	= 1.00	0.00	0.00	
<b>Travel Time (min)</b>	<b>= 11.45</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 11.45</b>
<b>Shallow Concentrated Flow</b>				
Flow length (ft)	= 255.00	3745.00	0.00	
Watercourse slope (%)	= 4.00	1.50	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	= 3.23	2.49	0.00	
<b>Travel Time (min)</b>	<b>= 1.32</b>	<b>+ 25.07</b>	<b>+ 0.00</b>	<b>= 26.39</b>
<b>Channel Flow</b>				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	= 0.00	0.00	0.00	
Flow length (ft)	= 0.0	0.0	0.0	
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+ 0.00</b>	<b>+ 0.00</b>	<b>= 0.00</b>
<b>Total Travel Time, Tc .....</b>				<b>37.80 min</b>

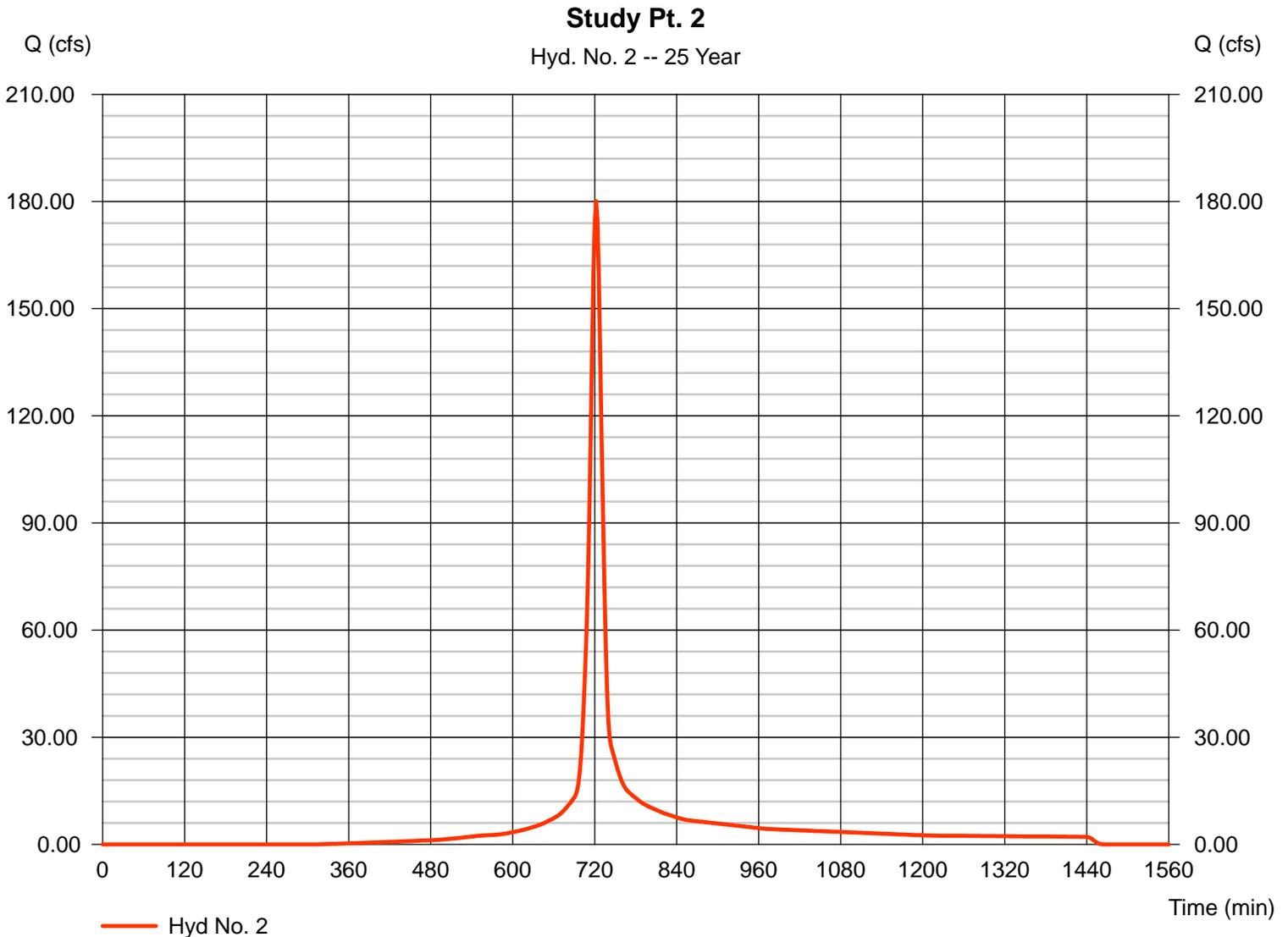
# Hydrograph Report

## Hyd. No. 2

Study Pt. 2

Hydrograph type = SCS Runoff  
Storm frequency = 25 yrs  
Time interval = 2 min  
Drainage area = 32.000 ac  
Basin Slope = 0.0 %  
Tc method = TR55  
Total precip. = 6.48 in  
Storm duration = 24 hrs

Peak discharge = 180.11 cfs  
Time to peak = 722 min  
Hyd. volume = 514,057 cuft  
Curve number = 83  
Hydraulic length = 0 ft  
Time of conc. (Tc) = 15.60 min  
Distribution = Type II  
Shape factor = 484

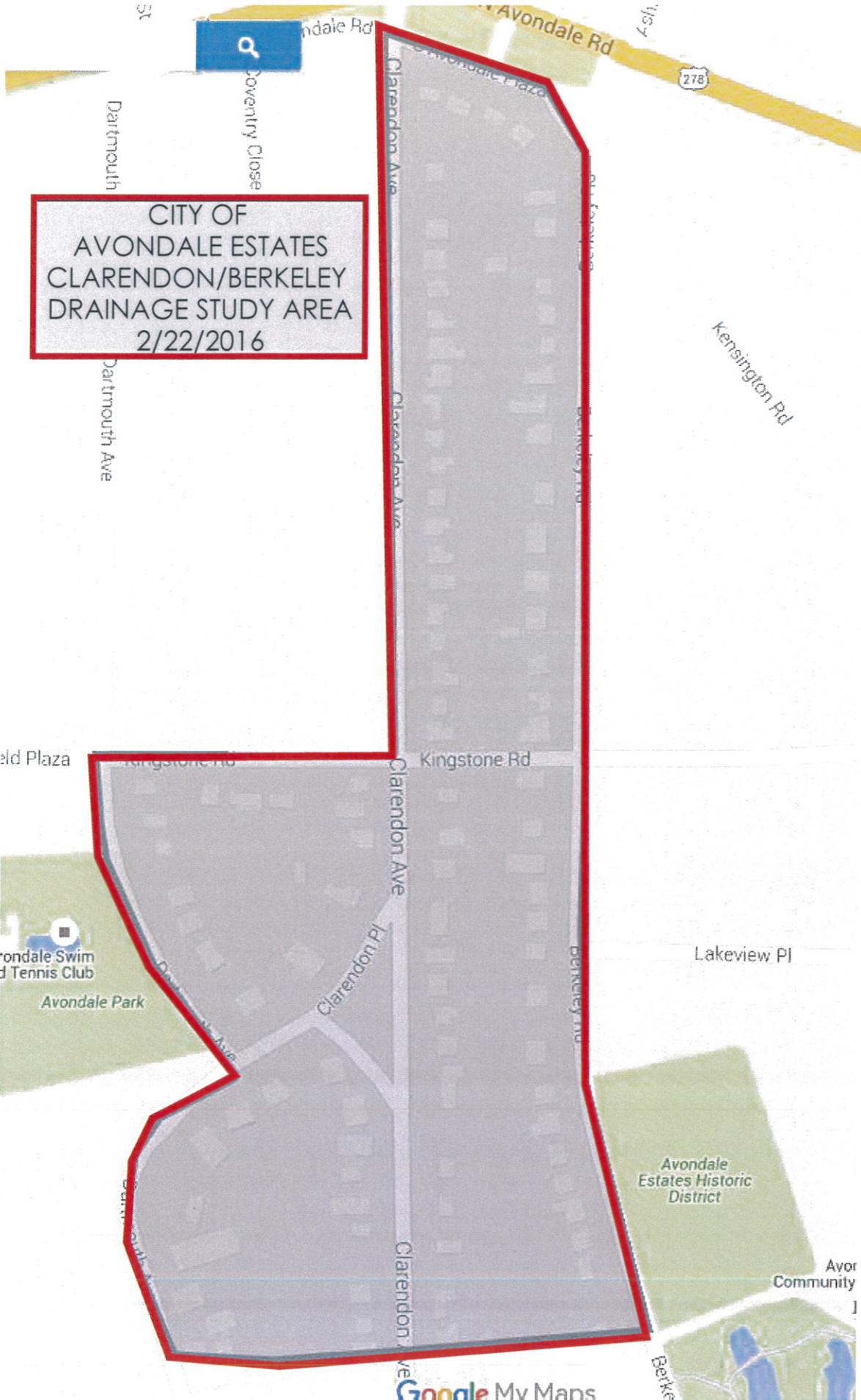


# TR55 Tc Worksheet

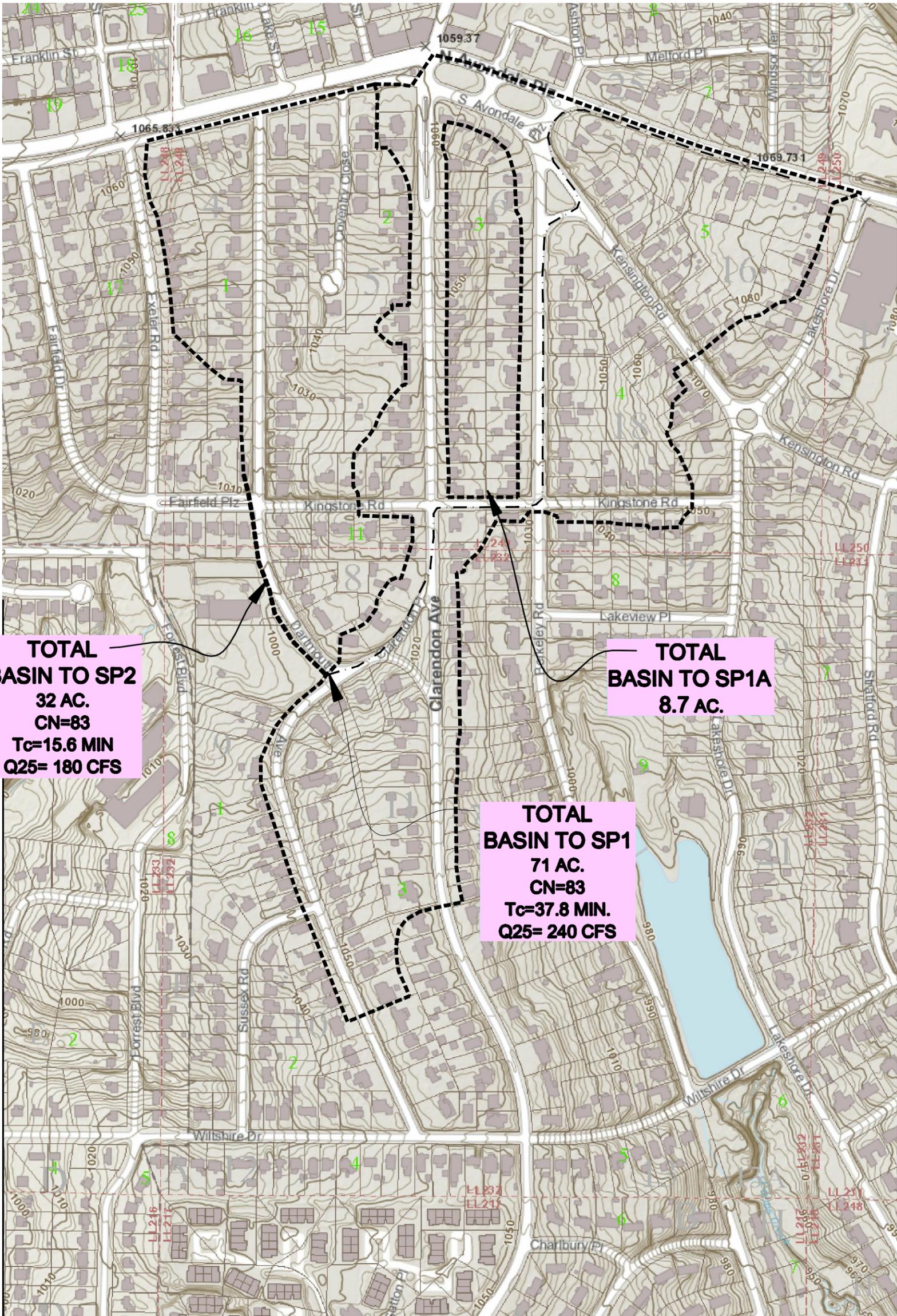
## Hyd. No. 2

Study Pt. 2

<u>Description</u>	<u>A</u>		<u>B</u>		<u>C</u>		<u>Totals</u>	
<b>Sheet Flow</b>								
Manning's n-value	= 0.150		0.011		0.011			
Flow length (ft)	= 100.0		0.0		0.0			
Two-year 24-hr precip. (in)	= 4.08		0.00		0.00			
Land slope (%)	= 4.00		0.00		0.00			
<b>Travel Time (min)</b>	<b>= 6.58</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>6.58</b>	
<b>Shallow Concentrated Flow</b>								
Flow length (ft)	= 600.00		1140.00		0.00			
Watercourse slope (%)	= 3.00		3.00		0.00			
Surface description	= Unpaved		Paved		Paved			
Average velocity (ft/s)	= 2.79		3.52		0.00			
<b>Travel Time (min)</b>	<b>= 3.58</b>	<b>+</b>	<b>5.40</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>8.97</b>	
<b>Channel Flow</b>								
X sectional flow area (sqft)	= 0.00		0.00		0.00			
Wetted perimeter (ft)	= 0.00		0.00		0.00			
Channel slope (%)	= 0.00		0.00		0.00			
Manning's n-value	= 0.015		0.015		0.015			
Velocity (ft/s)	= 0.00		0.00		0.00			
Flow length (ft)	= 0.0		0.0		0.0			
<b>Travel Time (min)</b>	<b>= 0.00</b>	<b>+</b>	<b>0.00</b>	<b>+</b>	<b>0.00</b>	<b>=</b>	<b>0.00</b>	
<b>Total Travel Time, Tc .....</b>							<b>=</b>	<b>15.60 min</b>



CITY OF  
AVONDALE ESTATES  
CLARENDON/BERKELEY  
DRAINAGE STUDY AREA  
2/22/2016



**TOTAL  
BASIN TO SP2  
32 AC.  
CN=83  
T<sub>c</sub>=15.6 MIN  
Q<sub>25</sub>= 180 CFS**

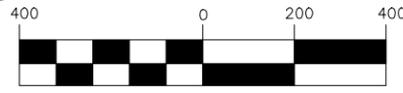
**TOTAL  
BASIN TO SP1A  
8.7 AC.**

**TOTAL  
BASIN TO SP1  
71 AC.  
CN=83  
T<sub>c</sub>=37.8 MIN.  
Q<sub>25</sub>= 240 CFS**

**AVONDALE ESTATES  
EXHIBIT "B"  
EXISTING DRAINAGE  
BASIN MAP**



GRAPHIC SCALE



( IN FEET )  
1 inch = 400 ft.





## **Draft Tree Ordinance**

### **General:**

The Board of Mayor and Commissioners (BOMC) charged the Ad Hoc Committee for Greenspace with the development of a residential tree ordinance. A draft ordinance was presented to the BOMC at the August 17, 2016 Work Session. The BOMC requested that staff format the ordinance within the current Code of Ordinances.

### **Ordinance:**

Staff incorporated the proposed residential tree ordinance in Article X Tree Protection and Preservation. Division 1 includes the purpose and intent and definitions for the whole article. Division 2 addresses non-residential, which has not been altered. Division 3 is the new residential tree ordinance. Items highlighted in green have been incorporated from the Ad Hoc Committee and items highlighted in blue are staff additions and changes to the Ad Hoc Committee's proposed text.

Amended to be included in the Code of Ordinances.

## **ARTICLE X. –Tree Protection and Preservation**

### **Division 1-Generally**

Sec 5-406. -Purpose and intent of article.

- (a) Trees are declared to be beneficial public resources, deterring soil erosion, increasing air purification, aiding in noise, glare and heat abatement, enhancing property values, *beautifying residential and commercial property, providing shelter for birds and wildlife* and contributing to the general health, safety and well-being of the citizens. *The existing tree canopy is also a hallmark of the residential areas of Avondale Estates, contributing to the City's sense of place and identity and therefore is a valuable community resource.* To that end, it shall be unlawful to cut down, damage, poison or in any manner destroy or cause to be destroyed any trees covered by this article, except in accordance with the provisions of this article.
- (b) *Therefore, the City wishes to maintain a healthy tree canopy. To that end, the City encourages the planting and maintenance of canopy trees on both public and private property.*
- (c) *The provisions of this article shall prevent the reduction of a healthy tree canopy, educate citizens and property owners on the value and methods of tree protection, lessen the impact of tree removal, and provide recourse to the City and its citizens for the unwanted removal of healthy specimen trees.*
- (d) *Removal, damage or destruction of protected trees, unless authorized in a City of Avondale Tree Removal Permit duly issued in accordance with the provisions of this article, is prohibited.*
- (e) *The provisions of this article shall apply to any person removing trees on any lot or tract of land, whether for him/herself or on behalf of another person, including all tree removal companies, utility companies or persons in the business of tree removal or construction.*

Sec. 5-407. Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

*Arborist Report means*

*Buildable area means that portion of a lot which is not located within any minimum required yard, landscaped area or buffer; that portion of a lot wherein a building may be located according to current zoning requirements.*

*Boundary Tree:* A tree growing on a property boundary line between two lots resulting in joint ownership by the adjacent property owners when the trunk exists on each property, or a tree that has 20 percent or more of its critical root zone extending across a property boundary and into an adjacent property regardless of its location on the property line.

*Conifer tree* means any tree with needle leaves and a woody cone fruit including, but not limited to pine, juniper and cedar species.

*Construction Zone:* The area within the limit of disturbance and within five (5) feet of a proposed building, structure or pavement on an approved Site Plan.

*Critical root zone* means the minimum area beneath a tree which must be left undisturbed in order to preserve a sufficient root mass to give a tree a reasonable chance of survival. The critical root zone (CRZ) will typically be represented by a circle centering on the tree's trunk with a radius equal in feet to one (1) times the number of inches of the trunk diameter. Example: The CRZ radius of a tree which has a diameter of twenty (20) inches is twenty (20) feet.

*CRZ Disturbance:* any activity that disturbs the existing grade or surface of the ground within the CRZ, or is likely to cause damage to roots, including but not limited to trenching, excavation, filling, paving, construction of structures, compaction of the ground, driving vehicles or equipment, storage of construction materials, etc.

*Density factor* means a unit of measure used to prescribe the calculated tree coverage on a site. See section 5-410.

*Development activity* means any alteration of the natural environment which requires the approval of a development or site plan and issuance of a development permit. Development activity shall also include the thinning or removal of trees from undeveloped land in conjunction with a forest management program, and the removal of trees incidental to the development of land or to the marketing of land for development.

*Diameter breast height (DBH)* means the diameter in inches of a tree measured at between four (4) and four and one-half (4½) feet above the existing grade.

*Drip line* means an imaginary, perpendicular line that extends downward from the outermost tips of the tree branches to the ground. The circular area of land surrounding the tree from the trunk to the outermost branches.

*Enforcement officer* means the city manager or the manager's duly authorized representative.

*Hardwood tree* for the purposes of this article, means any tree that is not coniferous (cone bearing) shall be classified as a hardwood.

*Limit of Disturbance*: any activity that disturbs the existing grade or surface of the ground as indicated on a grading or erosion control plan.

*Non-exempt Tree*: A tree that does not meet any of the requirements for exemption as listed in Section 11.d, above; i.e., a protected tree.

*Person* means any individual, partnership, corporation, association or other legal entity, including the plural as well as singular, and including utility companies and all tree removal companies and persons removing trees on behalf of others.

*Prescription* means any type of site or tree instruction developed by an arborist certified by the International Society of Arboriculture or State Registered Forester that is aimed at preserving tree(s).

*Project* means any work on a subject site that requires a building, demolition or land disturbance permit.

*Special hardship*. A special hardship will be deemed to exist when, in the opinion of the enforcement officer, the planting of the trees required by this article will create unusual problems, including, but not limited to, the following:

- (1) There is inadequate space on the site to permit the normal, anticipated growth and spread of the trees proposed for the site;
- (2) The topography of the site makes planting of the trees particularly difficult or survival of the trees unlikely;
- (3) The placement of the trees would create unsafe conditions for vehicular traffic.

**Current**

*Specimen tree* means any tree with a trunk diameter of ten (10) inches or greater or circumference of thirty-two (32) inches or greater as measured at the diameter breast height.

**Proposed**

*Specimen Tree:* A canopy hardwood tree, other than genus pinus, thirty (30) inches or more, a genus pinus, thirty-six (36) inches or more, measured at breast height diameter measured at breast height (DBH). In order to be classed a Specimen, the tree must also be in Fair or better condition as determined by a certified Arborist.

*Tree* means any self-supporting, woody, perennial plant usually having a single trunk diameter of two (2) inches or more and which in the city would normally grow to an overall height of a minimum of fifteen (15) feet at maturity.

*Tree density* means a figure arrived at by measuring the diameter of trees at the diameter breast height. See section 5-410. [This unit of measure only applies to trees not located in the residential zones \(R-12/R-24\).](#)

*Tree planting list* means the recommended species of trees as adopted by the board of mayor and commissioners.

*Tree Canopy:* The area of ground directly beneath the crown spread of a tree; for the purposes of this ordinance the canopy shall be measured the same as the critical root zone (CRZ).

*Tree Impact:* Any tree disturbance that proposes or has the potential to affect 20% or more of a tree's critical root zone. This applies to trees on the property subject to the permit, boundary trees on adjoining lots or verge trees in the public right-of-way.

*Tree protection zone* means all lands that fall outside the buildable area of a parcel, including driveways and parking areas, all areas of a parcel required to remain in open space, and/or all areas required as yard areas, buffers or landscaped areas according to the provisions of the zoning ordinance of the city, or by conditions of zoning and variance approval, and/or these administrative guidelines.

*Verge Tree*: A publicly-owned tree growing within the right-of-way, and between the sidewalk and curb.

(Ord. No. 861, § 1(5-181), 1-17-94)

Cross reference— Definitions and rules of construction generally, § 1-2.

## **Division 2: Tree Protection and Preservation on Non-Single Family Lots**

Sec. 408. Purpose and Intent.

The provisions of this article shall apply to any person removing trees on any lot or tract of land which is zoned in any category other than residential, whether for himself or on behalf of another person, including all tree removal companies, utility companies or persons in the business of tree removal or construction.

Sec. 5-409. - Application—Required; procedure.

(a) Prior to the commencement of any development activity upon any lot or tract of land which is zoned in any category other than residential, the owner or agent responsible for such property shall submit an application for a development permit. No person shall remove, cause to be removed, poison, damage, trim or transplant any tree without first having completed such application, including all information required by this article, and receiving a permit for the development activity proposed.

(b) Each application submitted shall include the following:

(1) *Identification*. The name, address and telephone number of the owner or tenant of the property shall be shown as well as the lot number and street address of the tract of land included in the application.

(2) *Site plan*. A map or plat drawn to scale prepared and sealed by a registered surveyor or certified engineer, and in the case of proposed construction, the intended location of any structures and any related site development which would require the removal of any trees from the site.

(3) *Tree survey*. A map or plat drawn to scale such as the site plan showing the location of every existing tree on the property which is two (2) inches or greater at diameter breast height. The survey shall show the desired location of any structure proposed for the site

and any trees which will have to be removed to allow construction and/or related site development. In the event of a development activity which does not involve construction, every existing tree on the property which is two (2) inches or greater at diameter breast height shall be shown, and the proposal shall identify all trees for which removal is planned. In all cases, the tree survey shall identify the species of the tree and the diameter of the trunk of the tree at diameter breast height. Example: Ten-inch red maple, eight-inch pin oak, six-inch white pine.

(4) *Density calculation sheet.* A sheet provided by the city upon which the person shall show the density factor prior to any development activity, the density of trees which will remain if the development activity is permitted, and the density of trees which will need to be added to meet the requirements of this article.

(Ord. No. 861, § 1(5-182), 1-17-94)

Sec. 5-410. - Same—Density calculations.

Each application for a permit to remove, trim or transplant trees as required under this article shall be accompanied by a calculation which will determine the number and size of the trees required to comply. The applicant shall determine the size of the tract and the size of the area to be developed. The difference shall be the tree protection zone. The applicant shall also determine the number and size of trees necessary to meet the requirements of the article, the number and size of the trees to be left on the tract, and the number and size of the new trees which will be required to comply. Example: On a ten thousand-square-foot lot, a person wants to construct a three thousand-square-foot building, resulting in a tree protection zone of seven thousand (7,000) square feet. At a rate of four (4) inches of diameter per one thousand (1,000) square feet, the person would need twenty-eight (28) inches of tree measured at diameter breast height. In this example, the lot already has three (3) trees which will remain after the development activity, and these measure nine (9) inches, five (5) inches and four (4) inches in diameter for a total of eighteen (18) inches; therefore, additional trees with diameters totaling ten (10) inches are required. This could be accomplished by planting two (2) trees with diameters of three (3) inches and two (2) trees with diameters of two (2) inches.

(1) Calculation of required tree density:

Size of Lot: _____	square feet
Size of Structure: _____	square feet
Difference: _____	square feet (Tree Protection Zone)

(Trees required: 4 inches at diameter breast height per 1,000 square feet)

a. (Tree Protection Zone ÷ by 1000 sq. feet) × 4 inches = \_\_\_\_\_ inches  
(Required Density)

(2) Density of existing trees:

a.	Density of existing trees on lot proposed for development:	_____ inches
b.	Density of trees to be removed:	_____ inches
c.	Density remaining after development activity:	_____ inches

Note: These figures come from a separate sheet supplied by applicant on which there appears a list of every tree on the site greater than two (2) inches at diameter breast height. List must show the species and diameter of every tree and a notation of all trees to be left in the Tree Protection Zone, with a total of the diameter of those trees.

(3) Additional density of trees needed:

From (1)a, density of trees required:	_____ inches
From (2)c, density remaining after development activity:	_____ inches

Additional density needed:	_____inches
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(Ord. No. 861, § 1(app. A), 1-17-94)

Sec. 5-411. - Inspection of site; project approval.

(a) The enforcement officer shall review the application which shall, upon filing, be deemed to constitute consent from the applicant to the enforcement officer and such person as the code enforcement may designate for entry upon land for the purposes of inspection. In reviewing the application, the enforcement officer may consult with the environmental committee, landscape architects, foresters, elected officials and others as he may deem necessary and advisable.

(b) Upon completion of the development activity, the enforcement officer shall inspect the property to determine compliance with the permit and tree density requirement. If the enforcement officer finds that the project does not meet the requirements of this article or that it varies from what was proposed in the application, he shall withhold final approval of the project and notify the applicant of the deficiencies which must be corrected. The applicant shall take prompt action to bring the project into compliance.

(c) When the enforcement officer is satisfied that the project is in compliance, he shall grant his final approval in writing. It shall be the responsibility of the applicant to see that all trees included in the calculation to fulfill the tree density requirement of this article, whether new or existing trees, remain alive for a period of two (2) years from the date of the final approval. Trees that die shall be replaced and the tree density requirement shall be maintained throughout the two-year period.

(Ord. No. 861, § 1(5-183), 1-17-94)

Sec. 5-412. - Trees required.

(a) For every tract of land covered by the application described in the preceding section, a determination shall be made of the square footage of the tree protection zone. As a condition of granting a permit, the enforcement officer shall require the applicant to assure that there be a density factor of no less than four (4) inches of tree diameter, measured at diameter breast height, per one thousand (1,000) square feet of area in the tree protection zone. This may be

accomplished by calculating the diameter breast height of trees already existing in the tree protection zone, plus any trees transplanted from the buildable area of the tract or from elsewhere. See section 5-410.

(b) In fulfilling the planting requirements of this article, the following rules shall apply:

(1) As there is a desire to expand the presence of hardwoods, no more than twenty-five (25) percent of trees planted to meet the requirements shall be conifers.

(2) In determining the tree density factor, no tree of less than two (2) inches at diameter breast height shall be counted, and no trees planted to meet the requirements of this article shall be less than two (2) inches diameter at diameter breast height nor less than eight (8) feet high at time of planting.

(3) New trees required shall not be located in one (1) particular area of the property but shall, as much as possible, be planted across the entire tract in a manner acceptable to the enforcement officer.

(4) Where specimen trees exist on the tract, every effort shall be made to avoid their removal.

(5) During any development activity, every effort shall be made to prevent harm or damage to all trees located in the tree protection zone and no encroachment, placement of solvents, material, construction machinery or temporary soil deposits shall be allowed within six (6) feet of the area inside the drip line of any specimen tree within the zone. Fencing, barricades, or other substantial devices shall be used to adequately protect trees during construction and any development activity.

(6) When parking areas are developed on a tract, every effort shall be made to protect existing trees or newly planted trees from damages by motor vehicles. This may be accomplished through the use of curbing or other devices. In addition, efforts shall be made to avoid the placement of impervious material in a tree's critical root zone area.

(7) All replacement trees and existing trees used to meet the density factor shall be maintained properly to ensure their survival, and any such tree which dies within two (2) years of the date the project receives final approval shall be replaced with trees of sufficient diameter to maintain the density factor.

(8) Nothing in this article shall be construed to allow the removal of vegetation in a required buffer, except for authorized buffer improvements.

(c) The requirements set forth in this section may be varied by the enforcement officer upon showing that such requirements will create a special hardship in the use of the site as defined in section 5-407. The enforcement officer shall make diligent effort to review various alternatives which would allow compliance with this article, and may suggest the relocation of new structures planned for the site. Following this effort, if the enforcement officer determines that variations are justified, and the tree density factor cannot be met on a particular site, the officer shall be empowered to reach an agreement wherein the applicant may make a contribution to the city which shall be used for the purchase, placement and care of trees. These trees shall be located on property within the city which is under the control of the city or another governmental entity. The amount of the contribution by the applicant shall be based upon the fair market value of the number, size, and type of trees that cannot be planted on the site to meet the tree density requirement plus labor to secure and plant the trees and to maintain the trees for a period of two (2) years after they are planted. The city shall be responsible for selecting the species and size of the trees and for making arrangements for planting any trees falling under this alternative. Every effort shall be made to assure that the property under development comes as nearly as possible into full compliance with this article. Should it be necessary to grant a variation, in no instance shall more than fifty (50) percent of the required tree density for a particular lot or tract be met through this alternative method. If the variation is granted, the limitation on the percentage of conifers planted shall still apply, and no more than twenty-five (25) percent of whatever trees are planted shall be conifers.

(Ord. No. 861, § 1(5-184), 1-17-94)

Sec. 5-413. - Tree removal, relocation, or trimming.

(a) When a person desires to remove, relocate or trim a tree as defined in this article, an application shall be filed with the enforcement officer. Upon review of the application, the enforcement officer may issue a permit if one (1) or more of the following conditions is found to exist:

- (1) The tree is located in an area where a structure or improvement will be placed in accordance to an approved plan, and the tree cannot be relocated on the site because of age, type or size of tree.
- (2) The tree is diseased.
- (3) The tree is injured.

(4) The tree is in danger of falling on or close to existing or proposed structures.

(5) The tree interferes with existing utility service.

(6) The tree creates unsafe vision clearance for vehicular movement.

(7) The tree conflicts with other ordinances or regulations.

(b) The enforcement officer, in reviewing applications for removal and relocation of trees, may suggest possible alternatives which might prevent the loss of particular trees. When a tree must be removed, the applicant shall determine that tree's diameter at diameter breast height and replace that tree with trees of equal diameter. Such replacement trees shall be located on the same tract from which trees were removed or, if approved by the enforcement officer, they may be located on governmental property within the city.

(c) When a permit for removal is granted, it shall be the responsibility of the applicant to see that all debris from the trees cut or substantially damaged shall be removed from the site in a timely manner, including the removal of any portion of the tree stump above the original natural grade or elevation of the land.

(Ord. No. 861, § 1(5-185), 1-17-94)

Sec. 5-414. - Exceptions.

The following shall be exempt from the provisions of this article:

(1) The routine or seasonal pruning or transplanting of trees.

(2) In the case of emergencies, such as hurricane, windstorm, flood, freeze or other disasters, whether for one (1) lot or the entire city, the enforcement officer shall be authorized to waive these requirements upon finding that such a waiver is necessary so that public or private work to restore order in the city will not be impeded.

(3) The requirements of this article shall not apply to any property which is zoned for residential use.

(4) The removal of trees from horticultural properties such as farms, nurseries or orchards; however, this exception shall not be interpreted to include lumber harvesting incidental to development of the land.

(5) The necessary removal of trees by a utility company within dedicated utility easements; however, for utility work within street rights-of-way or on public property, compliance with this article is required.

(6) The removal of trees on public rights-of-way conducted by, on behalf of, or any activity pursuant to work to be dedicated to, a federal, state, county, municipal or other governmental agency in pursuance of its lawful activities or functions in the construction or improvement of public rights-of-way.

(7) The removal of trees from golf courses, lakes, detention ponds and drainage easements.

(8) The removal of any tree which is or threatens to become a danger to human life or property.

(Ord. No. 861, § 1(5-186), 1-17-94)

Sec. 5-415. - Fees.

The fee schedule to review applications for permits covered in this article shall be as follows:

- 1) Site of 1 acre or less in size .....\$25.00
- 2) Site greater than 1 but less than 5 acres .....\$50.00
- 3) Site greater than 5 acres:  
For first 5 acres ....\$.75.00  
For each additional acre .....\$5.00

(Ord. No. 861, § 1(5-187), 1-17-94)

Sec. 5-416. - Appeals.

Any person adversely affected by a decision of the enforcement officer in the enforcement or interpretation of this article may appeal such decision to the board of appeals. Such appeal shall be taken by filing written notice thereof with the enforcement officer within ten (10) days after the decision of the enforcement officer. Each such appeal shall be accompanied by payment of the fee established for appeals to said board under section 15 of the city's zoning ordinance.

(Ord. No. 861, § 1(5-188), 1-17-94)

Sec. 5-417. - Display of permit.

(a) Any permit issued herein shall be valid for a period of two (2) years from the date of issuance. Failure to commence the work within six (6) months from the date of issuance of the

permit shall make the permit void and require that a new application with necessary fees be filed with the city.

(b)The applicant shall prominently display on the site the permit issued. Such permit shall be displayed continuously while trees are being removed or replaced or work is done as authorized by the permit.

(Ord. No. 861, § 1(5-189), 1-17-94)

Sec. 5-418. - Penalty.

Any person violating or failing to comply with any of the provisions of this article shall be guilty of a misdemeanor and, upon conviction thereof, shall be subject to the penalties as provided in section 1-8. In addition thereto, such person may be enjoined from continuing the violation. Each tree cut, damaged or poisoned shall constitute a separate offense.

(Ord. No. 861, § 1(5-190), 1-17-94)

## New

### **Division 3. TREE PROTECTION AND PRESERVATION ON SINGLE-FAMILY ZONED LOTS (R-12/R-24)**

Sec. 5-419. - Purpose and intent.

The provisions of this division shall apply to any person removing trees on any lot or tract of land which is zoned single-family (R-12/R-24), whether for himself or on behalf of another person, including all tree removal companies, utility companies or persons in the business of tree removal or construction.

Sec. 5-420-Exemptions: The following trees are exempt from Division 3 of this ordinance and may be without a Tree Removal permit:

- (a) Trees (other than genus pinus-**pine tree**) having a trunk diameter (DBH) of **eight (8) inches or less** in the case of a multi-trunk tree measuring the largest trunk diameter (DBH).
- (b) Pine Trees (genus pinus) having a trunk diameter (DBH) of **twelve (12) inches or less**;
- (c) Dead trees.
- (d) Diseased, severely damaged or otherwise declining trees with a certified arborist report.

- (e) Trees considered non-native invasive species as defined by the [State of Georgia Exotic Pest Plan Council](#).
- (f) Trees, not otherwise exempt, that constitute an immediate hazard or create an emergency situation, being an imminent threat to the safety of persons or property; the City of Avondale Estates shall be notified of the removal of such trees at the time of removal or, if that is not possible, as soon as practicable afterward.

Sec. 5-421. – Application-Required; procedure.

(a) Tree Removal Notification:

Property owners in single family residential zoning districts are allowed to remove up to three (3) healthy, protected non-exempt trees during any calendar year. A Tree Removal Notification shall be filed with the City prior to removal. This will allow the City to track ~~the reasons for the tree removal~~, the number, type, and size of trees removed. No other permit requirements apply and no recompense or replanting is required. See attached form. If identified as happening after the fact, there will be a ~~\$400~~ \$1,000 penalty per tree.

(b) Tree Removal/Land Disturbance Permit:

If a property owner intends to remove more than three (3) non-exempt trees during any calendar year, or proposes activities requiring a Demolition Permit, Building Permit or Land Disturbance Permit, the subject property is subject to a Tree Removal Permit and must comply with the residential tree replacement/conservation plan requirements of this Ordinance. ~~A Tree Removal Permit shall be required to remove, or cause CRZ disturbance to, any standing protected non-exempt tree within the city except as noted in Section 1-4.~~ The permit shall be required before any tree removal, land disturbance or site development activities causing tree impact to a protected tree can occur.

A tree replacement/conservation plan shall be submitted with all tree removal/land disturbance permit applications, and shall be prepared by a certified arborist, registered landscape architect, or registered forester. <http://avondaleestates.org/DocumentCenter/Home/View/43>

The tree replacement /conservation plan will indicate the following:

- 1) Location, species and DBH of all existing trees over eight (8) inches, over twelve (12) inches for genus pinus including on-site trees, boundary trees, and verge trees.
- 2) Limit of disturbance.
- 3) Existing and proposed structures.
- 4) Existing and proposed grades.
- 5) Location of new construction, impervious paved surfaces, erosion control measures, and utilities.
- 6) All trees proposed to be removed.
- 7) Percentage area of Critical Root Zone disturbance for all trees to remain, as applicable.
- 8) Tree replacement locations and plant schedule as required.
- 9) Tree Protection details and specifications, for the protection of trees to remain, per City Standards.
- 10) 40 percent minimum total canopy coverage per lot calculation.

(c) Tree Protection.

The tree replacement/~~conservation~~ plan will indicate the protection of any non-exempt trees outside the construction zone. The ~~tree protection~~ tree replacement/~~conservation~~ plan will indicate any areas of disturbance for construction activities, and provide for tree protection fencing at the edge of the CRZ of remaining nonexempt trees. No trenching for utilities or drainage, trenching of silt fence, parking, material storage or other construction activities are allowed within the CRZ of protected trees as indicated on plans.

The plan will indicate a minimum 40 percent total canopy coverage of the lot, including existing trees that are retained, boundary trees, ~~verge trees~~ and newly planted trees. The size of newly planted trees shall be calculated at maturity as defined in the canopy chart, see table 1.

The following activities would not constitute disturbance to the CRZ:

- 1) Removal and replacement of driveway or sidewalk pavement within the same footprint, with no excavation or earthwork.
- 2) Construction of structures over existing foundations.
- 3) Installation of chain-link, wood or PVC property fencing.
- 4) Use of staked hay bales or compost filter sock (wattles or coir rolls) for erosion control during construction.
- 5) Jack-and-bore utility construction.

Sec. 5-422-. Specimen Recompense.

In addition to the above requirements, projects which require a ~~building, demolition or~~ land disturbance permit that removes, or causes disturbance to specimen trees outside of the construction zone shall be required to provide a recompense payment to the City's Tree Fund. For each specimen tree removed, or subject to disturbance of the CRZ of 20% or greater, the recompense payment shall be as follows:

- (a) Specimen trees (other than pine): \$100, plus \$60 per caliper inch.
- (b) Specimen pines: \$100, plus \$30 per caliper inch.

Sec. 5-423. Verge Tree Impacts.

For projects requiring the disturbance of more than 20% of the CRZ of verge trees, the applicant must provide the following:

- (a) Notice to the City indicating the need for the disturbance based on permitted construction. Only if the impacted tree cannot be treated by a certified arborist's prescription will the City allow removal of impacted verge trees by the applicant.
- (b) For any proposed prescription, the length shall be for one year. A copy of the prescription and shall be submitted to the City with construction plans. Failure to comply with the prescription will be subject to Section 1-8 General penalty; continuing violations; abatements of nuisances.
- (c) ~~A bond or escrow account will be required based on any prescription. The bond can be 125% of the cost of removal and replacement of trees listed in the boundary tree agreement, and will be held for three years by the City.~~

Sec. 5-424. - Appeals.

Any person adversely affected by a decision of the enforcement officer in the enforcement or interpretation of this article may appeal such decision to the board of appeals. Such appeal shall be taken by filing written notice thereof with the enforcement officer within ten (10) days after the decision of the enforcement officer. Each such appeal shall be accompanied by payment of the fee established for appeals to said board under section 15 of the city's zoning ordinance.

# Table 1

Canopy Trees at 1,900 SF Credit (+/-50' diameter)

Carya aquatica  
Carya cordiformis  
Carya glabra  
Carya ovata  
Carya tomentosa  
Fagus grandiflora  
Liriodendron tulipifera  
Nyssa sylvatica  
Quercus alba  
Quercus coccinea  
Quercus hemispherica  
Quercus lyrata  
Quercus michauxii  
Quercus muehlenbergii  
Quercus nuttalli  
Quercus pagoda  
Quercus phellos  
Quercus prinus  
Quercus rubra  
Quercus shumardii  
Quercus x comptoniae  
Tilia americana  
Tilia heterophylla  
Ulmus americana

Canopy Trees at 1,200 SF Credit (+/-40' diameter)

Acer barbatum  
Acer rubrum  
Acer saccharum  
Aesculus flava  
Betula nigra  
Ginkgo biloba  
Magnolia acuminata Magnolia  
grandiflora Metasequoia  
glyptostroboides Taxodium  
ascendens Taxodium disticum  
Ulmus alata

Notes:

- Trees to be counted for replacement shall be 3 inch caliper, minimum.
- Potential canopy size assumes an open area, not constricted by impervious surfaces or heavy canopy coverage.
- Potential canopy size assumes a typical coverage for that species at maturity.
- List of Canopy trees are from the City's approved trees for streets and parks, which are acceptable for residential use.
- Other trees may be selected by the applicant and are subject to approval by the City tree official.

### **2017 Local Maintenance & Improvement Grant (LMIG) Program**

The Department of Transportation is accepting applications for the FY 2017 LMIG Program. The City's award amount for the 2017 Program is \$31,482.62. There is a required 30% match \$9,444.78. The Mayor must sign the agreement for approval before application can be submitted to the Georgia Department of Transportation.