Drainage Report

Barrington Park
Phase X

Prepared For:

City of Jonesboro
ARKANSAS

April 25, 2022

Submitted By:

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April 25, 2022

Mr. Craig Light, PE
City Engineer
City of Jonesboro
300 South Church Street
Jonesboro, Arkansas 72401

RE: Drainage Analysis – Barrington Park Phase X

Dear Mr. Light:

The purpose of this report is to provide an analysis of the existing drainage conditions and anticipated post-development drainage conditions for the Service Road project. Described below is a summary of the drainage analysis:

Project Name: Barrington Park Phase X

1. **Project Location:** North and South along the undeveloped Annadale Drive connection.
2. **Proposed Site Development:** The proposed project improvements are within a 7.1 ac. tract. There is an offsite detention pond southwest of the project location with ample storage for the proposed development. This 1.5 Ac. detention pond was designated and described in Barrington Park Subdivision Phase III Plat.
3. **Method of Run-Off Calculation and Storm Routing:** Storm and Sanitary Analysis was used to calculate the stormwater runoff for the 2 -100-year rainfall events over a 24-hour storm period for drainage areas collected by the proposed curb inlets. Run-off calculations were performed only for the anticipated post-development conditions due to drainage pipes being in place. Run-off calculations were performed using the Natural Resources Conservation Service's TR-55 Hydrograph method.
4. **Existing Site:** The property within Barrington Park Phase X is primarily covered with grass and light brush. Drainage flows to the south, as there is a natural sag that runs through the center of the proposed development into an offsite detention pond.
5. **Drainage Calculations:** The following items were considered in the drainage calculations and analysis:

- **Conditions Analyzed:** Post-Developed conditions were considered. The Post-Developed conditions were modeled as "1/2 acre lots, 25% impervious." CN (80).

- **Runoff Curve Numbers:** All runoff curve numbers were determined based on Table 2.2a and 2.2c of the TR-55 Urban Hydrology for Small Watersheds Handbook. All run-off curve numbers are attached in the Appendix.
- **Time of Concentration Calculations:** All time of concentration calculations were calculated using TR-55 and are attached in the Appendix.

Table 1.
Pre-Development and Post-Development Curve Numbers for the Drainage Areas

Area Description	Post Area (Acre)	Curve Number
Barrington Park Phase X	7.1	80

Table 2.
Inlet Loading

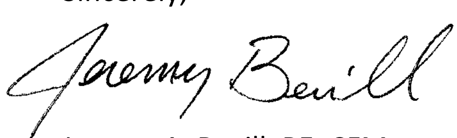
Inlet	100 yr Peak Flow (CFS)	Gutter Spread (ft)	Max Gutter Water Depth During 100yr Storm (ft)
A-1	4.12	10.01	0.45
A-2	13.15	21.69	0.68
A-3	4.56	8.45	0.25
A-4	2.58	6.44	0.21
A-5	0.65	2.16	0.04
A-6	0.31	1.69	0.10

3. **Conclusions and Recommendations:** The proposed development of Barrington Park Phase X will create increases in runoff during the 2-100 year storm events. The stormwater increases are conveyed to the existing detention pond that was previously approved and constructed.

In my opinion and based on the data presented in this report, the improvements depicted on the Subdivision Plan and Design Drawings; the stormwater discharges from this project will not endanger life or property adjacent to or downstream from the proposed site.

Please call me at 870-932-2019 if you have any questions or need additional information.

Sincerely,



Jeremy A. Bevill, PE, CFM
Civil Engineer

Appendix

USDA Soil Classification Report

Grading and Drainage Plan

Inlet Drainage Areas

Proposed Development ASCII Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Craighead County, Arkansas

Barrington Park Phase 10

April 18, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:1,760 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 25, 50, 100, 150

Feet: 0, 50, 100, 200, 300

N

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Craighead County, Arkansas
Survey Area Data: Version 21, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2019—Sep 19, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6	Brandon-Saffell association, moderately steep	2.0	27.5%
11	Collins silt loam, 0 to 1 percent slopes, occasionally flooded, brief duration	2.9	38.9%
31	Loring silt loam, 8 to 12 percent slopes, west	2.5	33.6%
Totals for Area of Interest		**7.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Craighead County, Arkansas

6—Brandon-Saffell association, moderately steep

Map Unit Setting

National map unit symbol: ly1f
Elevation: 150 to 490 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 50 to 70 degrees F
Frost-free period: 225 to 265 days
Farmland classification: Not prime farmland

Map Unit Composition

Brandon and similar soils: 50 percent
Saffell and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brandon

Setting

Landform: Loess hills
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over gravelly marine deposits

Typical profile

A - 0 to 5 inches: silt loam
Bt - 5 to 39 inches: silty clay loam
2C - 39 to 72 inches: very gravelly sandy clay loam

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Saffell

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Loamy and gravelly marine deposits

Typical profile
A - 0 to 3 inches: gravelly fine sandy loam
Bt1 - 3 to 15 inches: very gravelly silt loam
Bt2 - 15 to 58 inches: very gravelly sandy clay loam
C - 58 to 72 inches: gravelly sandy loam

Properties and qualities
Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Loring
Percent of map unit: 10 percent
Hydric soil rating: No

Memphis
Percent of map unit: 10 percent
Hydric soil rating: No

11—Collins silt loam, 0 to 1 percent slopes, occasionally flooded, brief duration

Map Unit Setting
National map unit symbol: 2t23j
Elevation: 200 to 410 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 46 to 68 degrees F
Frost-free period: 193 to 270 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Collins and similar soils: 94 percent

Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Collins

Setting

Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-silty alluvium derived from sedimentary rock

Typical profile

Ap - 0 to 7 inches: silt loam
C - 7 to 30 inches: silt loam
Cg - 30 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F131AY005MO - Loamy Braided Terrace Forest
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Aquents

Percent of map unit: 6 percent
Landform: Flood-plain steps
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

31—Loring silt loam, 8 to 12 percent slopes, west

Map Unit Setting

National map unit symbol: 2wn6f
Elevation: 210 to 490 feet
Mean annual precipitation: 41 to 56 inches
Mean annual air temperature: 48 to 70 degrees F
Frost-free period: 215 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Loring and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loring

Setting

Landform: Terraces, loess hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 24 inches: silt loam
Btx - 24 to 72 inches: silt loam
BC - 72 to 76 inches: silt loam

Properties and qualities

Slope: 8 to 12 percent
Depth to restrictive feature: 16 to 41 inches to fragipan
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Ecological site: F134XY207AL - Western Fragipan Uplands - PROVISIONAL
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group

Map Scale: 1:1,760 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 25, 50, 100, 150

Feet: 0, 50, 100, 200, 300

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Craighead County, Arkansas
Survey Area Data: Version 21, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2019—Sep 19, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6	Brandon-Saffell association, moderately steep	B	2.0	27.5%
11	Collins silt loam, 0 to 1 percent slopes, occasionally flooded, brief duration	C	2.9	38.9%
31	Loring silt loam, 8 to 12 percent slopes, west	C/D	2.5	33.6%
Totals for Area of Interest			**7.4**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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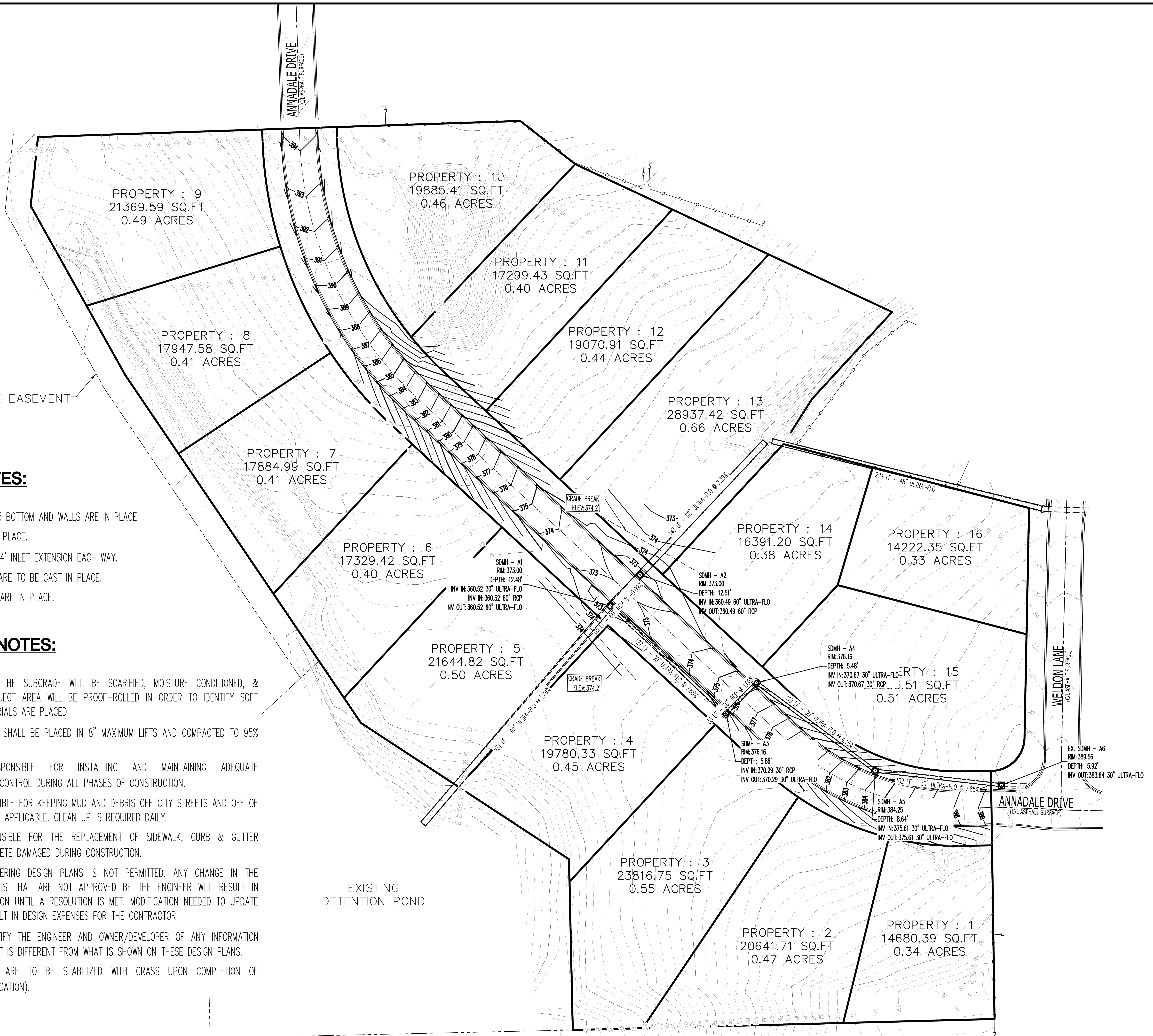


DRAINAGE NOTES:

1. SDMH A1, A2, A3, A4, A5 BOTTOM AND WALLS ARE IN PLACE.
2. SDMH A6 COMPLETELY IN PLACE.
3. SDMH A1 & A2 REQUIRE 4' INLET EXTENSION EACH WAY.
4. ALL STORM DRAIN TOPS ARE TO BE CAST IN PLACE.
5. ALL STORM DRAIN PIPES ARE IN PLACE.

ENGINEERING NOTES:

1. AFTER SITE STRIPPING, THE SUBGRADE WILL BE SCARIFIED, MOISTURE CONDITIONED, & RECOMPACTED. THE PROJECT AREA WILL BE PROOF-ROLLED IN ORDER TO IDENTIFY SOFT SOILS BEFORE FILL MATERIALS ARE PLACED
2. ALL SOIL FILL (PI 5-20) SHALL BE PLACED IN 8" MAXIMUM LIFTS AND COMPACTED TO 95% STANDARD PROCTOR.
3. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ADEQUATE EROSION/SEDIMENTATION CONTROL DURING ALL PHASES OF CONSTRUCTION.
4. CONTRACTOR IS RESPONSIBLE FOR KEEPING MUD AND DEBRIS OFF CITY STREETS AND OFF OF PAVED DRIVEWAYS WHERE APPLICABLE. CLEAN UP IS REQUIRED DAILY.
5. CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT OF SIDEWALK, CURB & GUTTER AND/OR ASPHALT/CONCRETE DAMAGED DURING CONSTRUCTION.
6. DEVIATION FROM ENGINEERING DESIGN PLANS IS NOT PERMITTED. ANY CHANGE IN THE CONSTRUCTION DOCUMENTS THAT ARE NOT APPROVED BE THE ENGINEER WILL RESULT IN CONSTRUCTION TERMINATION UNTIL A RESOLUTION IS MET. MODIFICATION NEEDED TO UPDATE DESIGN PLANS WILL RESULT IN DESIGN EXPENSES FOR THE CONTRACTOR.
7. CONTRACTOR SHALL NOTIFY THE ENGINEER AND OWNER/DEVELOPER OF ANY INFORMATION FOUND IN THE FIELD THAT IS DIFFERENT FROM WHAT IS SHOWN ON THESE DESIGN PLANS.
8. ALL DISTURBED AREAS ARE TO BE STABILIZED WITH GRASS UPON COMPLETION OF EARTHWORK (SEE SPECIFICATION).

BASIS OF BEARING: ARKANSAS STATE PLANE GRID NORTH ZONE (0301)

LEGEND:

PR-TP	PROPOSED TOP OF PAVEMENT
PR-TW	PROPOSED TOP OF WALK
PR-TC	PROPOSED TOP OF CURB
TAPER	TAPER CURB HEAD TO FLUSH OVER 6' SPAN

811
Know what's **below.**
Call before you dig.

GRAPHIC SCALE 1"=40'

FISHER ARNOLD
ENGINEERS | ARCHITECTS | CONSULTANTS | PLANNERS
404 CREATH AVE. | JONESBORO, AR 72401
870.932.2019 | Fax: 870.932.1076 | www.fisherarnold.com

GRADING AND DRAINAGE

BARRINGTON PARK PHASE X
JONESBORO, CRAIGHEAD COUNTY, ARKANSAS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 13420 JEREMY A. BEVILL
seal

JEREMY BEVILL – CIVIL ENGINEER
ARKANSAS – PE # 13420

CERTIFICATE OF AUTHORIZATION FISHER & ARNOLD INC. No. 248 ARKANSAS
coa

FISHER & ARNOLD, INC.
Arkansas – 248

CLIENT:
KENSINGTON

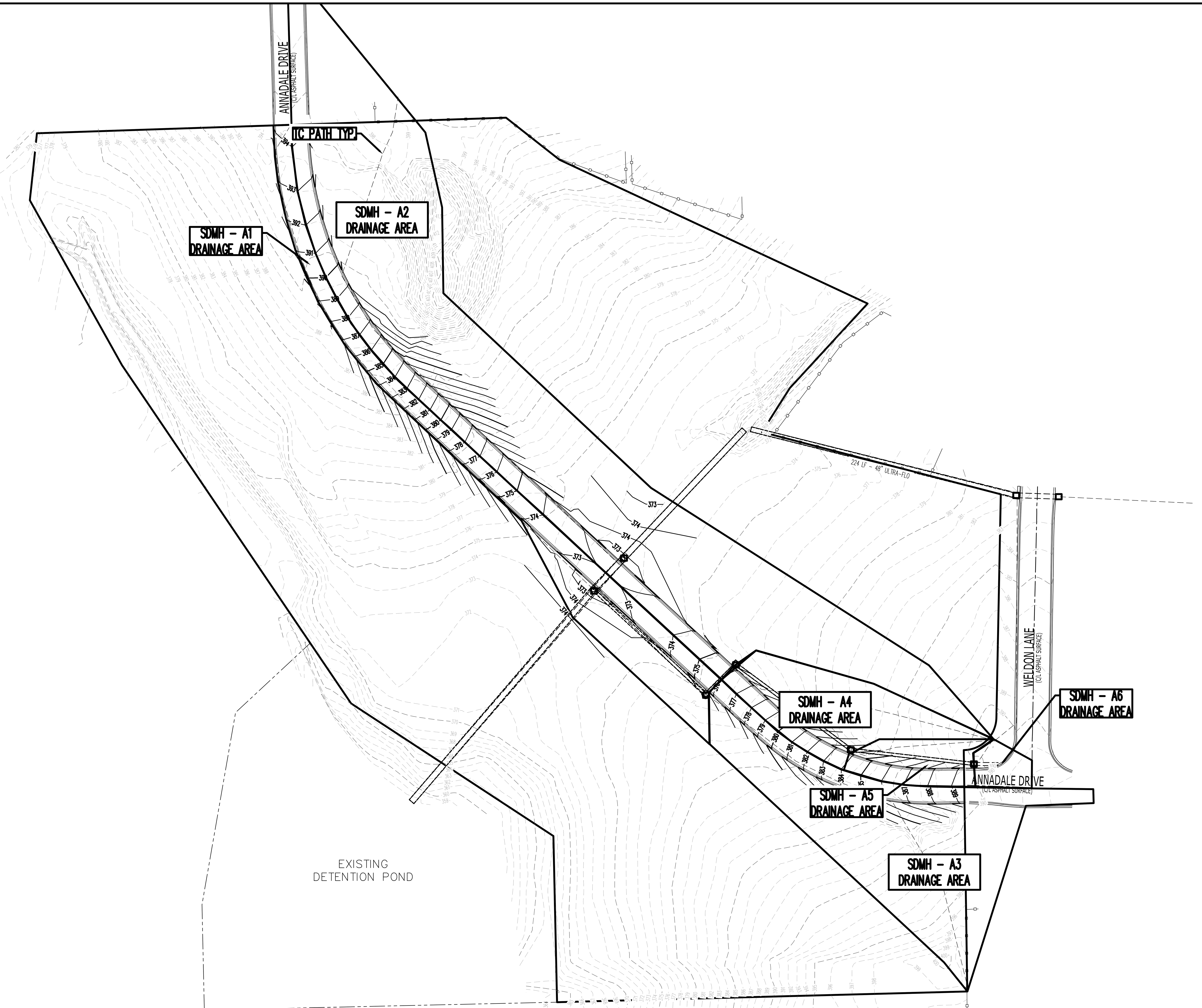
REVISIONS

DATE	BY	DESCRIPTION

PROJECT NO.
KENSINDEV.0001JB

DRAWN BY	CHECKED BY
JS	JB
DATE 4-25-22	SCALE 1"=40'

SHEET
C 4.0



LEGEND:

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Know what's **below.**
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INLET DRAINAGE AREAS

BARRINGTON PARK PHASE X
JONESBORO, CRAIGHEAD COUNTY, ARKANSAS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 13420
JEREMY A. BEVILL
seal

JEREMY BEVILL - CIVIL ENGINEER
ARKANSAS - PE # 13420

CERTIFICATE OF AUTHORIZATION
FISHER & ARNOLD INC.
No. 248
ARKANSAS
coa

FISHER & ARNOLD, INC.
Arkansas - 248

CLIENT:
KENSINGTON

REVISIONS

DATE	BY	DESCRIPTION

PROJECT NO. KENSINDEV Drain Areas
DRAWN BY JS
CHECKED BY JB
DATE 4-25-22
SCALE 1"=40'
SHEET C 4.0

Autodesk® Storm and Sanitary Analysis 2016 - Version 13.3.412 (Build 0)

****

Project Description

****

File Name .... Existing Boxes.SPF

****

Analysis Options

****

Flow Units .... cfs
Subbasin Hydrograph Method. SCS TR-55
Time of Concentration...... SCS TR-55
Link Routing Method .... Hydrodynamic
Storage Node Exfiltration.. None
Starting Date APR-18-2022 00:00:00
Ending Date APR-19-2022 00:00:00
Report Time Step 00:05:00

****

Element Count

****

Number of rain gages 1
Number of subbasins 6
Number of nodes 7
Number of links 10

****

Subbasin Summary

****

Subbasin ID	Total Area acres	Peak Rate Factor
Sub-01	1.47	484.00
Sub-02	0.20	484.00
Sub-04	0.57	484.00
Sub-05	0.30	484.00
Sub-06	0.04	484.00
Sub-09	0.09	484.00

****

Node Summary

****

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft²	External Inflow
Out-01	OUTFALL	356.93	361.93	0.00	

****

Inlet Summary

****

Inlet ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation ft	Inlet Rim Elevation ft	Ponded Area ft²	Initial Water Elevation ft	Grate Clogging Factor %
Jun-01	FHWA HEC-22 GENERIC	N/A	On Sag	1	360.52	372.21	6950.00	360.52	0.00
Jun-02	FHWA HEC-22 GENERIC	N/A	On Sag	1	360.49	372.17	6950.00	360.49	0.00
Jun-03	FHWA HEC-22 GENERIC	N/A	On Grade	1	370.29	375.44	-	370.29	0.00
Jun-04	FHWA HEC-22 GENERIC	N/A	On Grade	1	370.67	375.32	-	370.67	0.00
Jun-05	FHWA HEC-22 GENERIC	N/A	On Grade	1	375.61	380.95	-	375.61	0.00
Jun-06	FHWA HEC-22 GENERIC	N/A	On Grade	1	383.64	389.56	-	383.64	0.00

****

Roadway and Gutter Summary

****

Inlet ID	Roadway Longitudinal Slope ft/ft	Roadway Cross Slope ft/ft	Roadway Manning's Roughness	Gutter Cross Slope ft/ft	Gutter Width ft	Gutter Depression in
Jun-01	-	0.0200	0.0160	0.0620	2.00	2.00
Jun-02	-	0.0200	0.0160	0.0620	2.00	2.00
Jun-03	0.0560	0.0200	0.0160	0.0620	2.00	2.00
Jun-04	0.0560	0.0200	0.0160	0.0620	2.00	2.00
Jun-05	0.0625	0.0200	0.0160	0.0620	2.00	2.00
Jun-06	0.0500	0.0200	0.0160	0.0620	2.00	2.00

****

Link Summary

****

Link ID	From Node	To Node	Element Type	Length ft	Slope %	Manning's Roughness
Link-02	Jun-06	Jun-05	CONDUIT	103.0	7.7969	0.0150
Link-03	Jun-05	Jun-04	CONDUIT	118.4	4.1712	0.0150
Link-04	Jun-04	Jun-03	CONDUIT	35.6	1.0674	0.0150
Link-05	Jun-03	Jun-01	CONDUIT	128.8	5.6444	0.0150
Link-06	Jun-01	Jun-02	CONDUIT	37.3	0.0804	0.0150
Link-08	Jun-01	Out-01	CONDUIT	230.0	1.5609	0.0150
Link-09	Jun-06	Jun-05	CHANNEL	104.0	8.2804	0.0130
Link-10	Jun-05	Jun-04	CHANNEL	118.8	4.7403	0.0130
Link-11	Jun-04	Jun-02	CHANNEL	129.2	2.4383	0.0130
Link-12	Jun-03	Jun-01	CHANNEL	126.8	2.5467	0.0130

****
Cross Section Summary
****

Link ID	Shape	Depth/ Diameter ft	Width ft	No. of Barrels	Cross Sectional Area ft²	Full Flow Hydraulic Radius ft	Design Flow Capacity cfs
Link-02	CIRCULAR	2.50	2.50	1	4.91	0.63	99.26
Link-03	CIRCULAR	2.50	2.50	1	4.91	0.63	72.60
Link-04	CIRCULAR	2.50	2.50	1	4.91	0.63	36.73
Link-05	CIRCULAR	2.50	2.50	1	4.91	0.63	84.46
Link-06	CIRCULAR	5.00	5.00	1	19.63	1.25	64.01
Link-08	CIRCULAR	5.00	5.00	1	19.63	1.25	282.00
Link-09	IRREGULAR	0.33	1.75	1	0.43	0.20	4.85
Link-10	IRREGULAR	0.33	1.75	1	0.43	0.20	3.67
Link-11	IRREGULAR	0.33	1.75	1	0.43	0.20	2.63
Link-12	IRREGULAR	0.33	1.75	1	0.43	0.20	2.69

****
Transect Summary
****

Transect Type B Gutter

Area:					
	0.0131	0.0265	0.0401	0.0541	0.0683
	0.0828	0.0976	0.1127	0.1280	0.1437
	0.1596	0.1758	0.1922	0.2090	0.2261
	0.2434	0.2610	0.2789	0.2970	0.3155
	0.3342	0.3532	0.3725	0.3921	0.4120
	0.4321	0.4525	0.4732	0.4942	0.5155
	0.5370	0.5589	0.5810	0.6034	0.6261
	0.6490	0.6722	0.6958	0.7196	0.7437
	0.7680	0.7927	0.8176	0.8428	0.8683
	0.8941	0.9201	0.9465	0.9731	1.0000
Hrad:					
	0.0325	0.0637	0.0938	0.1229	0.1510
	0.1783	0.2048	0.2305	0.2555	0.2799
	0.3037	0.3270	0.3497	0.3720	0.3938
	0.4152	0.4362	0.4568	0.4770	0.4969
	0.5165	0.5358	0.5549	0.5736	0.5921
	0.6104	0.6284	0.6463	0.6639	0.6813
	0.6986	0.7156	0.7325	0.7493	0.7659
	0.7823	0.7986	0.8148	0.8308	0.8467
	0.8625	0.8782	0.8937	0.9092	0.9246
	0.9398	0.9550	0.9701	0.9851	1.0000
Width:					
	0.4896	0.5000	0.5104	0.5208	0.5312
	0.5416	0.5521	0.5625	0.5729	0.5833
	0.5937	0.6041	0.6146	0.6250	0.6354
	0.6458	0.6562	0.6667	0.6771	0.6875
	0.6979	0.7083	0.7187	0.7292	0.7396
	0.7500	0.7604	0.7708	0.7812	0.7917
	0.8021	0.8125	0.8229	0.8333	0.8437
	0.8542	0.8646	0.8750	0.8854	0.8958
	0.9062	0.9167	0.9271	0.9375	0.9479
	0.9583	0.9687	0.9792	0.9896	1.0000

****
Runoff Quantity Continuity
****

	Volume acre-ft	Depth inches
Total Precipitation	1.728	7.795
Surface Runoff	0.039	0.177
Continuity Error (%)	-0.004	

****
Flow Routing Continuity
****

	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	1.167	0.380
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.009	0.003
Continuity Error (%)	-0.000	

****
Composite Curve Number Computations Report
****

Subbasin Sub-01

Soil/Surface Description	Area (acres)	Soil Group	CN
1/2 acre lots, 25% impervious	1.47	C	80.00
Composite Area & Weighted CN	1.47		80.00

Subbasin Sub-02

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.20	-	80.00
Composite Area & Weighted CN	0.20		80.00

Subbasin Sub-04

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.57	-	80.00
Composite Area & Weighted CN	0.57		80.00

Subbasin Sub-05

Soil/Surface Description	Area (acres)	Soil Group	CN

-	0.30	-	80.00
Composite Area & Weighted CN	0.30		80.00

Subbasin Sub-06

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.04	-	80.00
Composite Area & Weighted CN	0.04		80.00

Subbasin Sub-09

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.09	-	80.00
Composite Area & Weighted CN	0.09		80.00

```
***************************************************
SCS TR-55 Time of Concentration Computations Report
***************************************************

Sheet Flow Equation
-------------------

        Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

        Where:

        Tc = Time of Concentration (hrs)
        n  = Manning's Roughness
        Lf = Flow Length (ft)
        P  = 2 yr, 24 hr Rainfall (inches)
        Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation
----------------------------------

        V  = 16.1345 * (Sf^0.5) (unpaved surface)
        V  = 20.3282 * (Sf^0.5) (paved surface)
        V  = 15.0 * (Sf^0.5) (grassed waterway surface)
        V  = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
        V  = 9.0 * (Sf^0.5) (cultivated straight rows surface)
        V  = 7.0 * (Sf^0.5) (short grass pasture surface)
        V  = 5.0 * (Sf^0.5) (woodland surface)
        V  = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
        Tc = (Lf / V) / (3600 sec/hr)

        Where:

        Tc = Time of Concentration (hrs)
        Lf = Flow Length (ft)
        V  = Velocity (ft/sec)
        Sf = Slope (ft/ft)

Channel Flow Equation
---------------------

        V  = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
        R  = Aq / Wp
        Tc = (Lf / V) / (3600 sec/hr)

        Where:

        Tc = Time of Concentration (hrs)
        Lf = Flow Length (ft)
        R  = Hydraulic Radius (ft)
        Aq = Flow Area (ft²)
        Wp = Wetted Perimeter (ft)
        V  = Velocity (ft/sec)
        Sf = Slope (ft/ft)
        n  = Manning's Roughness
```

Subbasin Sub-01

Sheet Flow Computations

	Subarea A	Subarea B	Subarea C
Manning's Roughness:	0.30	0.00	0.00
Flow Length (ft):	100.00	0.00	0.00
Slope (%):	6.25	0.00	0.00
2 yr, 24 hr Rainfall (in):	3.88	3.88	3.88
Velocity (ft/sec):	0.17	0.00	0.00
Computed Flow Time (minutes):	9.82	0.00	0.00

Shallow Concentrated Flow Computations

	Subarea A	Subarea B	Subarea C
Flow Length (ft):	56.64	334.70	0.00
Slope (%):	6.25	6.70	0.00
Surface Type:	Unpaved	Paved	Unpaved
Velocity (ft/sec):	4.03	5.26	0.00
Computed Flow Time (minutes):	0.23	1.06	0.00
Total TOC (minutes):	5.56		

Subbasin Sub-02

Sheet Flow Computations

	Subarea A	Subarea B	Subarea C
Manning's Roughness:	0.30	0.00	0.00
Flow Length (ft):	100.00	0.00	0.00
Slope (%):	2.50	0.00	0.00
2 yr, 24 hr Rainfall (in):	3.88	3.88	3.88
Velocity (ft/sec):	0.12	0.00	0.00
Computed Flow Time (minutes):	14.17	0.00	0.00

Shallow Concentrated Flow Computations

	Subarea A	Subarea B	Subarea C
Flow Length (ft):	386.25	0.00	0.00
Slope (%):	6.70	0.00	0.00
Surface Type:	Paved	Unpaved	Unpaved
Velocity (ft/sec):	5.26	0.00	0.00
Computed Flow Time (minutes):	1.22	0.00	0.00
Total TOC (minutes):	15.39		

Subbasin Sub-04

Sheet Flow Computations

	Subarea A	Subarea B	Subarea C
Manning's Roughness:	0.30	0.00	0.00
Flow Length (ft):	100.00	0.00	0.00
Slope (%):	10.00	0.00	0.00
2 yr, 24 hr Rainfall (in):	3.88	3.88	3.88
Velocity (ft/sec):	0.20	0.00	0.00
Computed Flow Time (minutes):	8.14	0.00	0.00

Shallow Concentrated Flow Computations

	Subarea A	Subarea B	Subarea C
Flow Length (ft):	152.43	100.00	0.00
Slope (%):	7.10	7.10	0.00
Surface Type:	Paved	Unpaved	Unpaved
Velocity (ft/sec):	5.42	4.30	0.00
Computed Flow Time (minutes):	0.47	0.39	0.00
Total TOC (minutes):	4.50		

Subbasin Sub-05

Sheet Flow Computations

	Subarea A	Subarea B	Subarea C
Manning's Roughness:	0.30	0.00	0.00
Flow Length (ft):	100.00	0.00	0.00
Slope (%):	5.00	0.00	0.00
2 yr, 24 hr Rainfall (in):	3.88	3.88	3.88
Velocity (ft/sec):	0.16	0.00	0.00
Computed Flow Time (minutes):	10.74	0.00	0.00

Shallow Concentrated Flow Computations

	Subarea A	Subarea B	Subarea C
Flow Length (ft):	93.47	31.05	0.00
Slope (%):	5.00	5.00	0.00
Surface Type:	Unpaved	Paved	Unpaved
Velocity (ft/sec):	3.61	4.55	0.00
Computed Flow Time (minutes):	0.43	0.11	0.00
Total TOC (minutes):	5.64		

Subbasin Sub-06

Sheet Flow Computations

	Subarea A	Subarea B	Subarea C
Manning's Roughness:	0.30	0.00	0.00
Flow Length (ft):	24.15	0.00	0.00
Slope (%):	3.30	0.00	0.00
2 yr, 24 hr Rainfall (in):	3.88	3.88	3.88
Velocity (ft/sec):	0.10	0.00	0.00
Computed Flow Time (minutes):	4.07	0.00	0.00
Total TOC (minutes):	4.07		

Subbasin Sub-09

Sheet Flow Computations

	Subarea A	Subarea B	Subarea C
Manning's Roughness:	0.30	0.00	0.00
Flow Length (ft):	100.00	0.00	0.00
Slope (%):	10.00	0.00	0.00
2 yr, 24 hr Rainfall (in):	3.88	3.88	3.88
Velocity (ft/sec):	0.20	0.00	0.00
Computed Flow Time (minutes):	8.14	0.00	0.00

Shallow Concentrated Flow Computations

	Subarea A	Subarea B	Subarea C
Flow Length (ft):	17.85	0.00	0.00
Slope (%):	5.60	0.00	0.00
Surface Type:	Paved	Unpaved	Unpaved
Velocity (ft/sec):	4.81	0.00	0.00
Computed Flow Time (minutes):	0.06	0.00	0.00
Total TOC (minutes):	8.20		

Subbasin Runoff Summary

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days hh:mm:ss
Sub-01	7.70	5.34	11.85	80.000	0 00:06:00
Sub-02	7.70	5.34	1.28	80.000	0 00:15:23
Sub-04	7.70	5.34	4.60	80.000	0 00:06:00
Sub-05	7.70	5.34	2.43	80.000	0 00:06:00
Sub-06	7.70	5.32	0.31	80.000	0 00:06:00
Sub-09	7.70	5.34	0.63	80.000	0 00:08:11

****
Node Depth Summary
****

Node ID	Average Depth Attained ft	Maximum Depth Attained ft	Maximum HGL Attained ft	Time of Max Occurrence days hh:mm	Total Flooded Volume acre-in	Total Time Flooded minutes	Retention Time hh:mm:ss
Out-01	0.13	0.82	357.75	0 12:05	0	0	0:00:00

****
Node Flow Summary
****

Node ID	Element Type	Maximum Lateral Inflow cfs	Peak Inflow cfs	Time of Peak Inflow Occurrence days hh:mm	Maximum Flooding Overflow cfs	Time of Peak Flooding Occurrence days hh:mm
Out-01	OUTFALL	0.00	16.47	0 12:05	0.00	

****
Inlet Depth Summary
****

Inlet ID	Max Gutter Spread during Peak Flow ft	Max Gutter Water Elev during Peak Flow ft	Max Gutter Water Depth during Peak Flow ft	Time of Maximum Depth Occurrence days hh:mm
Jun-01	10.01	372.66	0.45	0 12:05
Jun-02	21.69	372.85	0.68	0 12:04
Jun-03	8.45	375.69	0.25	0 12:00
Jun-04	6.44	375.53	0.21	0 12:00
Jun-05	2.16	380.99	0.04	0 12:00
Jun-06	1.69	389.66	0.10	0 12:00

****
Inlet Flow Summary
****

Inlet ID	Peak Flow cfs	Peak Lateral Flow cfs	Peak Flow Intercepted by Inlet cfs	Peak Flow Bypassing Inlet cfs	Inlet Efficiency during Peak Flow %	Total Flooding acre-in	Total Time Flooded minutes
Jun-01	4.12	1.23	-	-	-	0.000	0
Jun-02	13.15	11.72	-	-	-	0.000	0
Jun-03	4.56	4.56	1.32	3.23	29.02	0.000	0
Jun-04	2.58	2.40	1.01	1.57	39.25	0.000	0
Jun-05	0.65	0.60	0.16	0.49	24.80	0.000	0
Jun-06	0.31	0.31	0.27	0.03	89.07	0.000	0

****
Outfall Loading Summary
****

Outfall Node ID	Flow Frequency (%)	Average Flow cfs	Peak Inflow cfs
Out-01	77.65	1.18	16.47
System	77.65	1.18	16.47

****
Link Flow Summary
****

Link ID	Element Type	Time of Peak Flow Occurrence days hh:mm	Maximum Velocity Attained ft/sec	Length Factor	Peak Flow during Analysis cfs	Design Flow Capacity cfs	Ratio of Maximum /Design Flow	Ratio of Maximum Flow Depth	Total Time Surcharged minutes	Reported Condition
Link-02	CONDUIT	0 12:00	2.40	1.00	0.24	99.26	0.00	0.05	0	Calculated
Link-03	CONDUIT	0 12:00	2.10	1.00	0.70	72.60	0.01	0.12	0	Calculated
Link-04	CONDUIT	0 12:01	3.78	1.00	1.81	36.73	0.05	0.15	0	Calculated
Link-05	CONDUIT	0 12:01	7.95	1.00	3.11	84.46	0.04	0.13	0	Calculated
Link-06	CONDUIT	0 12:03	3.65	1.00	11.73	64.01	0.18	0.22	0	Calculated
Link-08	CONDUIT	0 12:05	7.43	1.00	16.47	282.00	0.06	0.17	0	Calculated
Link-09	CHANNEL	0 12:00	1.72	1.00	0.06	4.85	0.01	0.13	0	Calculated
Link-10	CHANNEL	0 12:05	1.42	1.00	0.19	3.67	0.05	0.45	0	Calculated
Link-11	CHANNEL	0 12:00	4.10	1.00	1.45	2.63	0.55	0.86	0	Calculated
Link-12	CHANNEL	0 12:00	9.15	1.00	3.24	2.69	1.20	1.00	2	FLOODED

****
Highest Flow Instability Indexes
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All links are stable.

WARNING 138 : Initial water surface elevation defined for Inlet Jun-01 is below catchbasin invert elevation.
              Assumed initial water surface elevation equal to catchbasin inlet invert elevation.
WARNING 138 : Initial water surface elevation defined for Inlet Jun-02 is below catchbasin invert elevation.
              Assumed initial water surface elevation equal to catchbasin inlet invert elevation.
WARNING 138 : Initial water surface elevation defined for Inlet Jun-03 is below catchbasin invert elevation.
              Assumed initial water surface elevation equal to catchbasin inlet invert elevation.
WARNING 138 : Initial water surface elevation defined for Inlet Jun-04 is below catchbasin invert elevation.
              Assumed initial water surface elevation equal to catchbasin inlet invert elevation.
WARNING 138 : Initial water surface elevation defined for Inlet Jun-05 is below catchbasin invert elevation.
              Assumed initial water surface elevation equal to catchbasin inlet invert elevation.
WARNING 138 : Initial water surface elevation defined for Inlet Jun-06 is below catchbasin invert elevation.
              Assumed initial water surface elevation equal to catchbasin inlet invert elevation.

Analysis began on:  Mon Apr 25 16:44:41 2022
Analysis ended on:  Mon Apr 25 16:44:42 2022
Total elapsed time: 00:00:01
```