APALACHICOLA COASTAL RESILIENCE

Drainage Basin Analysis

DECEMBER 2019

DRAFT

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Introduction

The City of Apalachicola is located at the terminus of the Apalachicola River and adjacent to the Apalachicola Bay (Location Map- Attachment A). The City is located in of the most ecologically diverse and undeveloped basins in the United States. The City depends on the River and Bay for economic as well as environmental reasons, therefore its protection is a major priority. The City over the past few years has been working to improve the water quality of the City and has in recent years installed some nutrient boxes to help with the reduction of nutrients into the Apalachicola Bay. The City is looking at different ways to improve the water quality in the City. The majority of the City and its infrastructure was built before environmental laws were put into place. In fact, the City did not begin to address drainage issues at all until the 1980's. This report will serve to analyze runoff within special basins in the city and driveway culverts. The City consists of both open drainage systems and closed systems. These systems collect the stormwater around town and convey the water to the Apalachicola River and Bay.

The City have committed to a long-term goal as it relates to the conservation of the ecological system surrounding the City. This includes the Apalachicola River. Water quality through physical improvements and resource restoration in the resulting areas as evidenced through quantitative water quality monitoring. The storm-hardening components will make Apalachicola more resilient to storm surge and sea level rise. Educational materials and signage will educate visitors to the environmental importance of stormwater management and resilience. The City have stormwater regulations put in place for any new developments in town, and not just for the older part of Apalachicola.

In partnership with the Florida Department of Environmental Protection (FDEP) Florida Resilient Coastlines Program (FRCP) the City was awarded funds for the purpose of conducting a drainage basin analysis on two of the City's largest basins. The City directed the study towards a 145 acre and a 131-acre basin, reference Basins 3 & 23 in Attachment E. This basin is one of the many basins within the City that needs to be reviewed to address the problem areas within the drainage basin. The City has had some ongoing concerns with these drainage basins and would like to help alleviate any issues or concerns that have been noted by residents in the area. Some of these issues are mostly due to isolated flooding or ponding within the drainage basin.

This report will layout a block by block analysis within each basin to determine the flow path of the stormwater runoff to determine the needed culvert size and conveyance description. This analysis will be used by the City of Apalachicola to develop recommendations for nuisance flooding that occurs from improper culvert sizing, and in some instances no culverts which can cause a back-water issue in some of the drainage areas. It will also be a guide to help

Figure 1: Avenue G Conveyance System (Basin 23)

residents develop their property and not adversely affect the drainage basins. Most times residents are not aware that their small home can have upstream or downstream impacts to a project.

Existing Conditions

Figure 2 - Large conveyance ditch near Basin 3 outfall

The original basins as show in Attachment B – 2015 Basin Map on the Northwestern portion of Apalachicola, discharge directly to the Apalachicola Bay with no treatment via driveway ditches, conveyance swales, inlets, and concrete piping. It is noted that there are some low areas within the basins that contribute to some low nuisance basins that contribute to some low nuisance flooding within the basin. Both basins are in FEMA flood zones which can be see in Attachment C - FEMA Flood Map. The flood elevations in some of these areas are 9 feet and 10 feet using NAVD88.

The discharge point within Basin 3 is an unmaintained ditch just south of 12th street and south of 20th street and flows downhill into a small wetland system just north of 11th street, east of 2nd Ave, and west of the marina. This area acts as a sort of treatment facility, before discharging into Scipio Creek. Wetlands have been known as natural areas that serve as stormwater treatment. So, some of the stormwater in this basin is treated by a natural system that uptake nutrients with the natural vegetation within the wetland system. Basin 23 contains majority A and A/D soils according to NRCS Web Soil Survey in Attachment D. “A” soil are typically well drained soils, but because of the location of the City, there is tendency to have a high-water table because of the coastal influence of the river. The basin contains isolated flooding areas as well as ditch systems with no discharge points as illustrated in Attachment E – Topographic Map. Most of this basin contains residential properties and city streets, whose runoff is either captured by a series of inlets or ditches, seen in Attachment F Conveyance Map. Many of these are in need of maintenance and repair.

Basin 23 discharges via a well maintained drainage ditch along Juniper Street into the mouth of Scipio Creek. Basin 23 also contains majority A and A/D soils according to Attachment D. This basin has a special concern of large isolated flooding areas. Locations include Blocks 23-75, 23-82, 23-80, and 23-63 (Reference Attachment E: Topographic Map). This basin is also, a mix of residential properties discharging towards the river into more commercial areas also via inlets or ditches as seen in Attachment F – Conveyance Map.

Some of the issues that the City is seeing is because historically, there were main drainage pathways that over the course to the City development over 50 years ago, certain conveyance systems (ditches), were eliminated or relocated for development. Then to add to this, the City residents in some areas have filled up ditches and swales to beautify their property not knowing they are outside their property line, and in the City maintained right of way. You can see evidence of this with remnants of headwalls for culverts under streets are still remnant.

Figure 3 - Small Outfall from small wetland area into Scipio Creek Marina

Figure 4 - Residential encroachment into drainage lines and ROW

Figure 6 - Existing inlet with sediment and vegetation present

Figure 5 - Existing Inlet covered due to lack of maintenance

Methodology

To begin the basin analysis, a field survey by staff was conducted to verify locations and sizes of all ditches, inlets, and pipe sizes within the basin. Measurements of each ditch were taken on site using a level, yardstick, and tape measure (measurements were taken to be conservative and above existing water levels). On-site observations were made on site of drainage patterns which was then used to determine sub-basin boundaries. The sub-basins were then drawn around each flood area, inlet, or isolated ditch. Curve numbers and runoff coefficients were calculated by estimating areas of pervious and impervious area within each sub-basin. The curve numbers and runoff coefficients were chosen according to Attachment M – References. It should be noted that impervious areas were estimated from aerial photography with a conservative approach.

Each ditch or culvert was then modeled using Hydraflow Express, which outputs the existing maximum flow capacity of each pipe or ditch. These results may be seen in Attachment I; it should be noted that a slope of 0.5% was assumed to be conservative within each pipe or ditch that was modeled.

The aforementioned maximum flow capacities were compared to the calculated maximum flow rates within each sub-basin which can be seen in Attachment H – Sub-Basin Summary. These maximum flow rates were calculated using the Rational Method:

$$Q = C\ (Runoff\ Coefficent)\ \times i\ (rainfall\ intensity) \times A\ (Contributing\ Area)$$

The rainfall intensity was chosen by calculating the time of concentration within each basin utilizing the lag method:

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

- L = Length of longest flow path (ft)
- CN = Weighted Curve Number
- S = Slope (%)

This method was chosen for it generality and accuracy. It should be noted the slope was calculated from available LIDAR data. The analysis utilized a 25 Year design storm and FDOT rainfall curves to determine rainfall intensities corresponding to calculated times of concentration (See Attachment M – References).

Each maximum flow rate was then compared to each sub-basins conveyance component to determine if the components were accurately sized. In addition to analyzing existing ditches, culverts, and storm pipes, this analysis also estimated flow rates on all street frontages for the purpose of providing recommended culvert sizes for future maintenance or development within the study areas (See Attachment J – Block Analysis Summary).

Discussion and Recommendations:

During the field survey, the predetermined basin lines were adjusted due to observed flow patterns, which may be seen in comparing Attachment B – 2015 Basin Map to the updated Attachment E – Topographic Map. Basin 3 & 23 were calculated to have new areas of 119.5 acres and 129.6 acres respectively. It should be noted that due to lack of data (inverts, topography) basin lines are drawn according to best data available.

Attachment J – Block Analysis Summary lays out descriptions for each "Blocks'" conveyance system, as well as the calculated flow capacity of any conveyance component, the estimated maximum flow rates at each street frontage, and recommended pipe sizes within each frontage or other existing component. Estimated maximum flow rates were found by applying each ditch's or inlet flow rate to its corresponding component and subsequently adding these flow rates downstream. These flow directions were determined utilizing field observations and LIDAR data, therefore leaving a margin of error. These estimated flow rates, however, do not take into account possible infiltration that may occur in any of the City's existing ditches or swales. Nevertheless, it was determined that a few of the existing storm pipes may be currently undersized, which may explain some of the nuisance flooding during heavy rains. While this may contribute, field observations lead to a conclusion that isolated flood areas, outfall inverts below mean high water line of the adjacent bay, and a high water table are the most likely causes for nuisance flooding.

Conclusions

Many existing conveyance components lie in disrepair or complete disuse. Development within the City has seen historic pipe sizing become undersized and in need of replacement. Establishment of driveway ditches and swales will remain an important step towards additional the additional collection and treatment of stormwater runoff within the study areas.

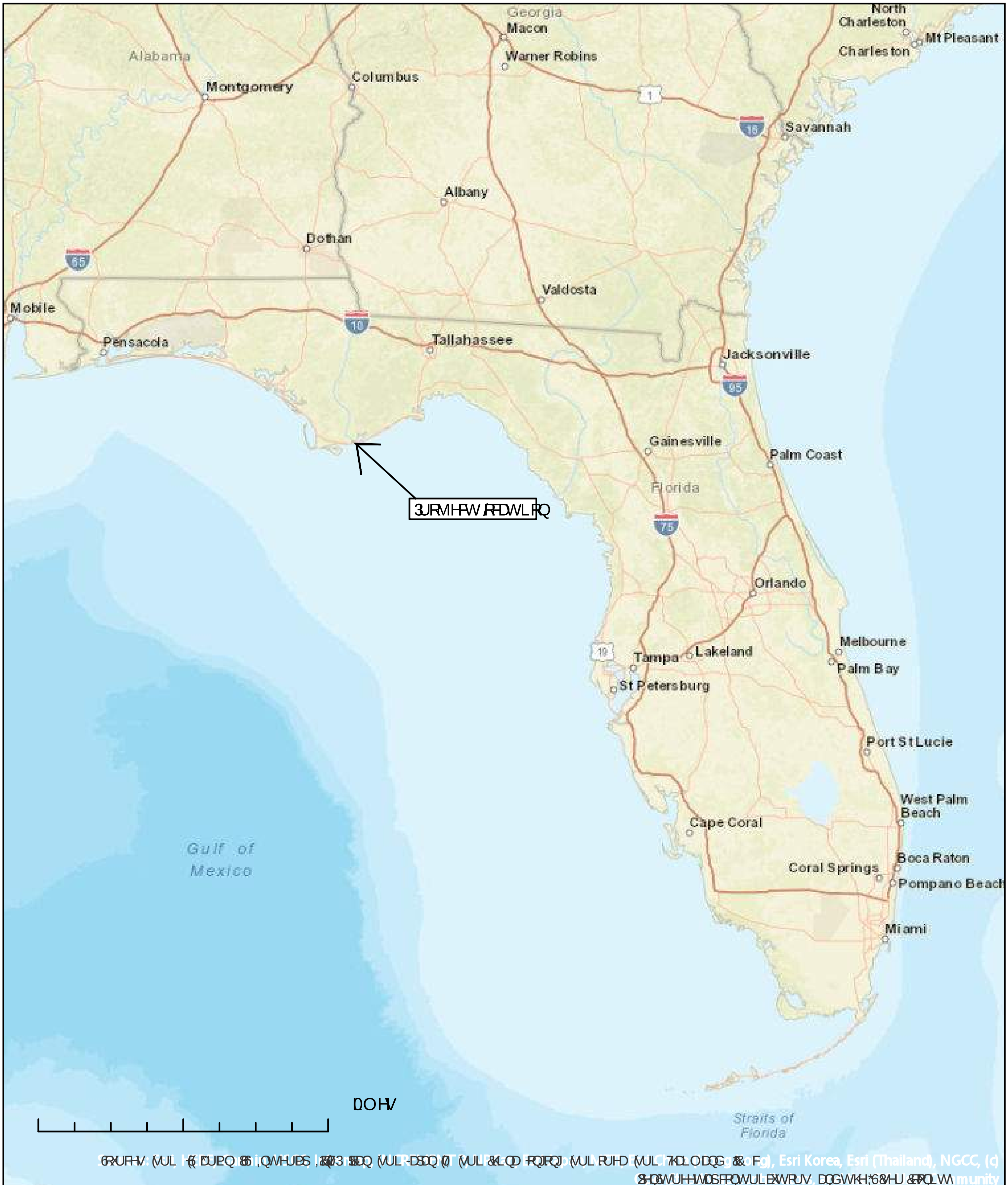
The City of Apalachicola is taking steps towards the improvement of their stormwater management system. This will take time and money to accomplish, but the first step with this endeavor is to optimize their conveyance system. This is accomplished by having a plan for any residents who are developing their properties. Basin's 3 & 23 within the city maintain issues of nuisance localized flooding, dilapidated infrastructure, and absence of treatment. We recommend that the following steps be taken in order to begin improvement of these basins as well as the City's conveyance system as a whole (also see Attachment J):

- Overall improvement and maintenance of the culvert systems in the City that the residents maintain.
- Flush any debris from system.
- Have the City stormwater system TV'd to determine the condition of under ground conveyance system. Some could be damaged; blocking and preventing flow. This was encountered in recent projects elsewhere in the city.
- Regrade the swale system in the City. This will require public meeting prior, so that the residents understand what the purpose of the swale improvement is to convey stormwater. This will help educate the public and hopefully prevent the residents from filling in roadside swales.
- Install backflow preventors on all outfall pipes to prevent high tide backing up into the conveyance system.
- Upgrade capacity of conveyance systems
- Install more nutrient boxes where possible to improve water quality of the stormwater discharging in the bay waters.

- Restore historic ditch systems and establish new ones for the purpose of additional capacity and treatment.
- Regulate filling of lots within flooded areas.
- Purchase parcels within nuisance flooding areas for potential SWMF's.
- Replace any undersized pipes (See Attachment J).
- Establish connectivity to isolated ditch systems.
- #5 Replace culvert crossing with appropriate sized pipes. (Reference Attachment K)
- #6, and #7 are identified in as areas in need of inlet connections to nearby conveyance system. (Reference Attachment K)
- #9 upgrades to prevent lot flooding (Reference Attachment K).
- #110 within the project basin area. (Reference Attachment K).
- Educate the public on the dangers of sea level rise as it pertains to Apalachicola.

Attachment A

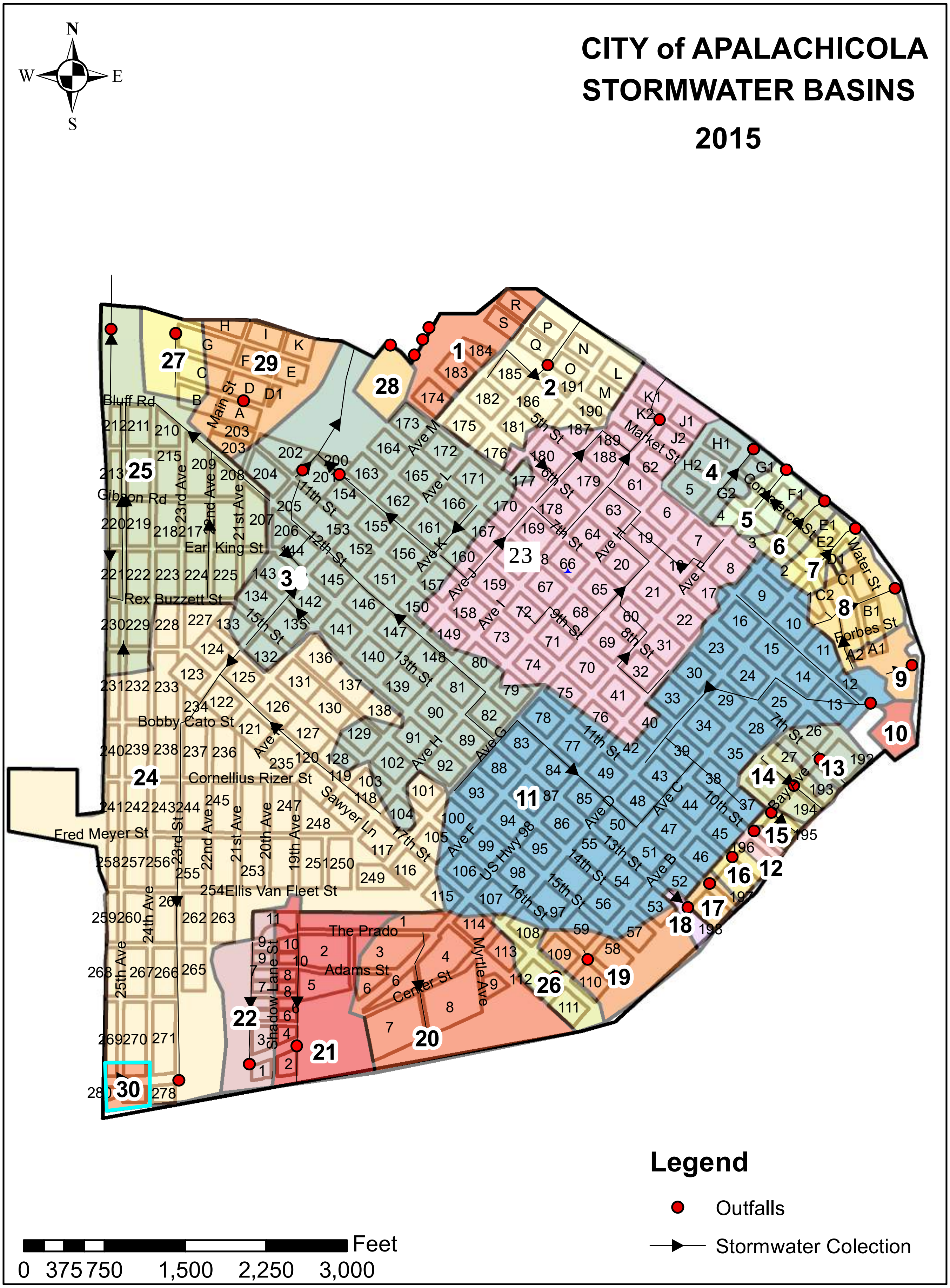
Location Map



	/RFDWLRQ 0DS	'DWH 'HFHPEHU	3URMHFW 1R
$SDODFKLFROD &RDVWDO 5HVLOLHQFH 3URMHFW $SDODFKLFROD)ORULGD	1 &RQURH 6WUHHW 6XLWH 7DOODKDVVHH)/	&UHDWHG 7%	)LJXUH 1R
		&KHFNHG $$	

Attachment B

2015 Basin Map


CITY of APALACHICOLA
STORMWATER BASINS
2015
N
S
E
W
Legend
Outfalls
Stormwater Colection
Feet
0 375 750 1,500 2,250 3,000
Bluff Rd
Gibson Rd
Earl King St
Rex Buzzett St
Bobby Cato St
Cornellius Rizer St
Fred Meyer St
Ellis Van Fleet St
Sawyer Ln
The Prado
Adams St
Center St
Myrtle Ave
Shadow Lane St
US Hwy 98
Market St
Commerce St
Water St
Forbes St
Bay Ave
Main St

Attachment C

FEMA Flood Map

29°45'6.68"N
85°0'0.51"W

USGS The National Map: Orthoimagery. Data refreshed April, 2019.
84°58'7.02"W
29°43'0.86"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can beordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **12/6/2019 3:58:34 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 Feet

Meters 0 50 100 200 300 400

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

FRANKLIN_CO_FL, FLORIDA
AND INCORPORATED AREAS

PANEL 526 OF 650

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF APALACHICOLA FLORIDA	120089	0526
NP FLORIDA	120THR	0526
FRANKLIN COUNTY UNINCORPORATED AREAS FLORIDA	120088	0526

MAP NUMBER
12037C0526F
EFFECTIVE DATE
02/05/2014

Attachment D

NRCS Soil Report

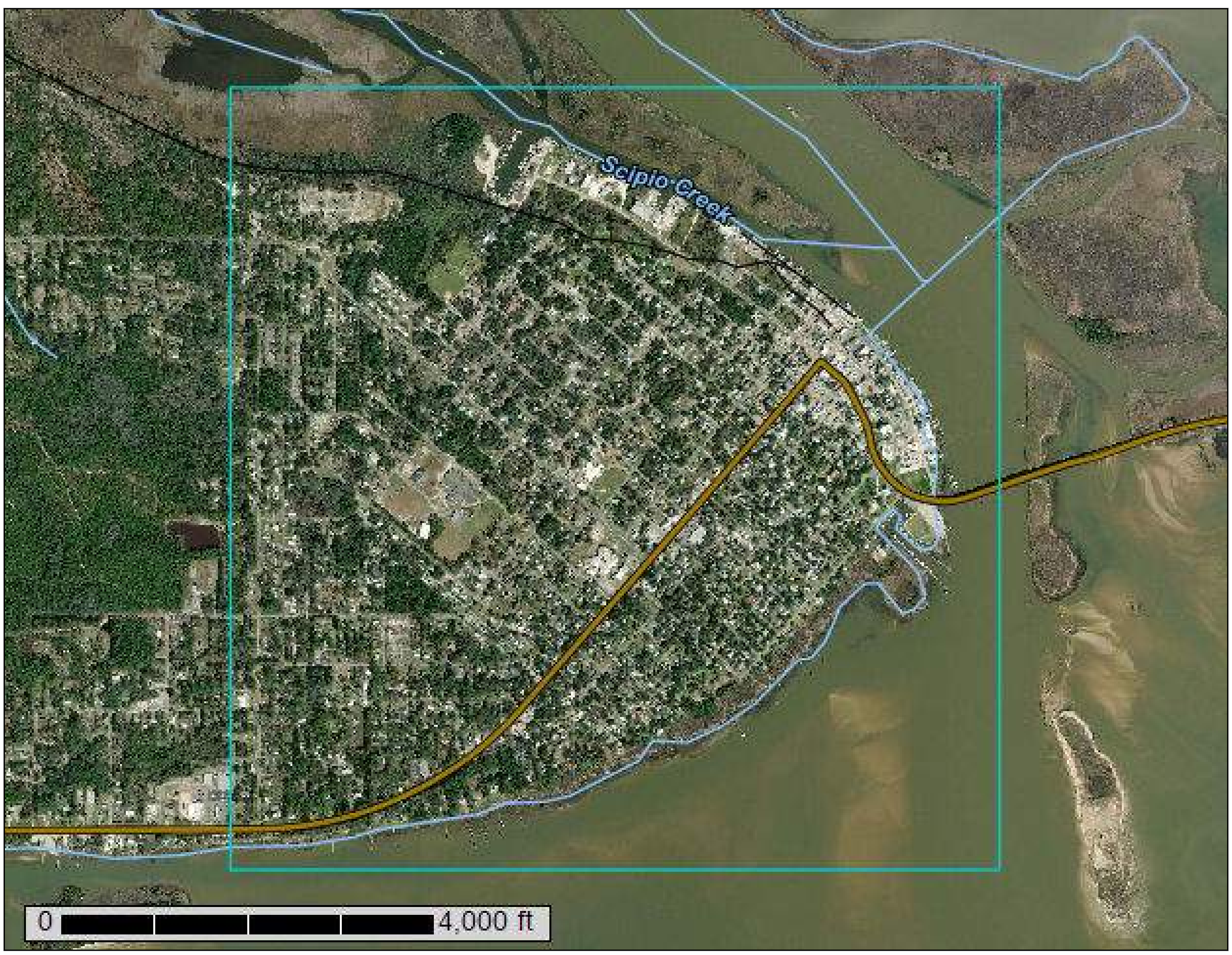
United States Department of Agriculture

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

Franklin County, Florida



December 6, 2019

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

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: 1:19,600 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 250, 500, 1000, 1500

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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.

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: Franklin County, Florida
Survey Area Data: Version 16, Sep 16, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 30, 2017

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
4	Dirego and Bayvi soils, tidal	45.6	2.8%
5	Aquents, nearly level	101.4	6.3%
7	Bohicket and Tisonia soils, tidal	109.8	6.9%
11	Dorovan-Pamlico complex, depressional	6.5	0.4%
15	Ortega fine sand, 0 to 5 percent slopes	5.4	0.3%
20	Lynn Haven sand	1.8	0.1%
22	Leon sand, 0 to 2 percent slopes	256.2	16.0%
23	Maurepas muck, frequently flooded	12.9	0.8%
24	Mandarin fine sand, 0 to 2 percent slopes	326.1	20.4%
25	Chowan, Brickyard, and Kenner soils, frequently flooded	13.1	0.8%
29	Resota fine sand, 0 to 5 percent slopes	62.2	3.9%
30	Rutlege loamy fine sand, depressional	0.2	0.0%
31	Rutlege fine sand, 0 to 2 percent slopes	60.8	3.8%
33	Scranton fine sand, 0 to 2 percent slopes	105.5	6.6%
36	Pickney-Pamlico complex, depressional	47.3	2.9%
99	Water	198.8	12.4%
100	Waters of the Gulf of Mexico	248.9	15.5%
Totals for Area of Interest		**1,602.3**	**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.

Franklin County, Florida

4—Dirego and Bayvi soils, tidal

Map Unit Setting

National map unit symbol: 1ll15
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Dirego and similar soils: 50 percent
Bayvi and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dirego

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 35 inches: muck
Cg - 35 to 72 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 55.0
Available water storage in profile: Very high (about 14.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A/D
Forage suitability group: Forage suitability group not assigned (G152AA999FL)
Hydric soil rating: Yes

Description of Bayvi

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf

Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A1 - 0 to 8 inches: mucky sand
A2 - 8 to 26 inches: sand
Cg3 - 26 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 70.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A/D
Forage suitability group: Forage suitability group not assigned (G152AA999FL)
Hydric soil rating: Yes

Minor Components

Maurepas

Percent of map unit: 10 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

5—Aquents, nearly level

Map Unit Setting

National map unit symbol: 1ll1h
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Aquents and similar soils: 50 percent
Aquents and similar soils: 50 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Aquents

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Medium
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Aquents

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None

7—Bohicket and Tisonia soils, tidal

Map Unit Setting

National map unit symbol: 1ll1k
Elevation: 0 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Bohicket and similar soils: 45 percent
Tisonia and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bohicket

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy and clayey marine deposits

Typical profile

A - 0 to 23 inches: silty clay
Cg - 23 to 80 inches: silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 40.0
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Forage suitability group: Forage suitability group not assigned (G152AA999FL)
Hydric soil rating: Yes

Description of Tisonia

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material over clayey alluvium

Typical profile

Oe - 0 to 4 inches: mucky peat
Oa - 4 to 26 inches: muck
Cg - 26 to 66 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 35.0
Available water storage in profile: Very high (about 13.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Forage suitability group: Forage suitability group not assigned (G152AA999FL)
Hydric soil rating: Yes

Minor Components

Dirego

Percent of map unit: 5 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Maurepas

Percent of map unit: 5 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Chowan

Percent of map unit: 3 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Brickyard

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

11—Dorovan-Pamlico complex, depressional

Map Unit Setting

National map unit symbol: 1ll05
Elevation: 0 to 450 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Dorovan, depressional, and similar soils: 55 percent
Pamlico, depressional, and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dorovan, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material

Typical profile

Oa1 - 0 to 5 inches: muck
Oa2 - 5 to 80 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
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 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 13.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D

Forage suitability group: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Description of Pamlico, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 38 inches: muck
Cg - 38 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 13.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Minor Components

Rutlege

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Pickney

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scranton

Percent of map unit: 3 percent
Landform: Sloughs on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Lynn haven

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

15—Ortega fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tsyb
Elevation: 30 to 490 feet
Mean annual precipitation: 51 to 62 inches
Mean annual air temperature: 64 to 73 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Ortega and similar soils: 78 percent
Minor components: 22 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ortega

Setting

Landform: Knolls on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
C - 5 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R152AY002FL)
Hydric soil rating: No

Minor Components

Leon
Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: North Florida Flatwoods (R152AY004FL)
Hydric soil rating: No

Hurricane
Percent of map unit: 4 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Longleaf Pine-Turkey Oak Hills (R152AY002FL)
Hydric soil rating: No

Kershaw
Percent of map unit: 4 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Longleaf Pine-Turkey Oak Hills (R152AY002FL)
Hydric soil rating: No

Albany
Percent of map unit: 4 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Longleaf Pine-Turkey Oak Hills (R153AY002FL)
Hydric soil rating: No

Ridgewood

Percent of map unit: 3 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Longleaf Pine-Turkey Oak Hills (R152AY002FL)
Hydric soil rating: No

Lynn haven, depressional

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Ecological site: Wetland Hardwood Hammock (R152AY012FL)
Hydric soil rating: Yes

20—Lynn Haven sand

Map Unit Setting

National map unit symbol: 1ll0h
Elevation: 0 to 300 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Lynn haven, hydric, and similar soils: 59 percent
Lynn haven, non-hydric, and similar soils: 30 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lynn Haven, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 22 inches: sand
E - 22 to 28 inches: sand
Bh - 28 to 50 inches: sand
E' - 50 to 64 inches: sand
B'h - 64 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: Yes

Description of Lynn Haven, Non-hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 22 inches: sand
E - 22 to 28 inches: sand
Bh - 28 to 50 inches: sand
E' - 50 to 64 inches: sand
B'h - 64 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: No

Minor Components

Leon
Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rutlege
Percent of map unit: 5 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

22—Leon sand, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2rz0s
Elevation: 0 to 300 feet
Mean annual precipitation: 60 to 69 inches
Mean annual air temperature: 63 to 72 degrees F
Frost-free period: 252 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition
Leon and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leon

Setting
Landform: Flatwoods, marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile
A - 0 to 5 inches: sand

E - 5 to 18 inches: sand
Bh - 18 to 26 inches: sand
E' - 26 to 65 inches: sand
B'h - 65 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 2 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: sandy soils on flats of mesic or hydric lowlands (G133AA141FL)
Other vegetative classification: North Florida Flatwoods (R152AY004FL)
Hydric soil rating: No

Minor Components

Leon, hydric

Percent of map unit: 5 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: Yes

Pottsburg

Percent of map unit: 4 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Hurricane

Percent of map unit: 4 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Mandarin

Percent of map unit: 3 percent

Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Pickney

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: North Florida Flatwoods (R152AY004FL)
Hydric soil rating: Yes

Rutlege

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: North Florida Flatwoods (R152AY004FL)
Hydric soil rating: Yes

23—Maurepas muck, frequently flooded

Map Unit Setting

National map unit symbol: 1ll0l
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Maurepas and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maurepas

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Woody organic material

Typical profile

Oa - 0 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 20.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Minor Components

Pamlico

Percent of map unit: 5 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Dirego

Percent of map unit: 3 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Dorovan

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

24—Mandarin fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ttkv
Elevation: 0 to 100 feet
Mean annual precipitation: 59 to 67 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 223 to 253 days
Farmland classification: Not prime farmland

Map Unit Composition

Mandarin and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mandarin

Setting

Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 24 inches: fine sand
Bh - 24 to 32 inches: fine sand
C - 32 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G152AA131FL)
Hydric soil rating: No

Minor Components

Ortega

Percent of map unit: 5 percent
Landform: Ridges, knolls, marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Chaires

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

25—Chowan, Brickyard, and Kenner soils, frequently flooded

Map Unit Setting

National map unit symbol: 1ll0n
Elevation: 0 to 350 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Chowan and similar soils: 55 percent
Brickyard and similar soils: 25 percent
Kenner and similar soils: 15 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chowan

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy marine deposits over organic material

Typical profile

A - 0 to 5 inches: silty clay loam

Cg - 5 to 37 inches: silty clay loam
Oa - 37 to 80 inches: muck

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 11.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Forage suitability group: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Description of Brickyard

Setting
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium

Typical profile
A - 0 to 4 inches: silty clay
B/Cg - 4 to 28 inches: silty clay
Cg - 28 to 80 inches: silty clay

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Forage suitability group: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Description of Kenner

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified herbaceous organic material and clayey alluvium

Typical profile

Oa - 0 to 12 inches: muck
Cg - 12 to 23 inches: silty clay loam
O'a - 23 to 70 inches: muck
C'g - 70 to 80 inches: mucky silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very high (about 12.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: D
Forage suitability group: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Minor Components

Maurepas

Percent of map unit: 3 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Meggett

Percent of map unit: 2 percent

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

29—Resota fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2ttl8
Elevation: 10 to 40 feet
Mean annual precipitation: 61 to 69 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 252 to 282 days
Farmland classification: Not prime farmland

Map Unit Composition

Resota and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Resota

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 19 inches: fine sand
Bw - 19 to 42 inches: fine sand
C - 42 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 to 50.00 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Hydric soil rating: No

Minor Components

Ortega

Percent of map unit: 4 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Mandarin

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Kureb

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, dunes on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

30—Rutlege loamy fine sand, depressional

Map Unit Setting

National map unit symbol: 1ll0v
Elevation: 0 to 450 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Rutlege, depressional, and similar soils: 89 percent

Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rutlege, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits and/or fluviomarine deposits

Typical profile

A - 0 to 11 inches: loamy fine sand
Cg - 11 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Minor Components

Pickney

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scranton

Percent of map unit: 3 percent
Landform: Sloughs on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Lynn haven

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

31—Rutlege fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ttkl
Elevation: 0 to 450 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Rutlege and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rutlege

Setting

Landform: Flats, marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy marine deposits and/or fluviomarine deposits

Typical profile

A - 0 to 13 inches: fine sand
Cg - 13 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: Yes

Minor Components

Lynn haven

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Pickney

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scranton

Percent of map unit: 2 percent
Landform: Sloughs on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Pamlico

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

33—Scranton fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ttkj
Elevation: 0 to 450 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days

Farmland classification: Not prime farmland

Map Unit Composition

Scranton and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scranton

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
Cg - 9 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: No

Minor Components

Scranton, slough

Percent of map unit: 10 percent
Landform: Sloughs on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Leon

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf

Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rutlege

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: North Florida Flatwoods (R133AY004FL)
Hydric soil rating: Yes

36—Pickney-Pamlico complex, depressional

Map Unit Setting

National map unit symbol: 1ll11
Elevation: 0 to 450 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 290 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Pickney, depressional, and similar soils: 45 percent
Pamlico, depressional, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pickney, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits and/or fluviomarine deposits

Typical profile

A - 0 to 41 inches: sand
Cg - 41 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Description of Pamlico, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 27 inches: muck
Cg - 27 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Minor Components

Scranton

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex

Across-slope shape: Linear
Hydric soil rating: No

Scranton, slough
Percent of map unit: 3 percent
Landform: Sloughs on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Rutlege
Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Maurepas
Percent of map unit: 2 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Dorovan
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lynn haven
Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

99—Water

Map Unit Composition

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

100—Waters of the Gulf of Mexico

Map Unit Composition

Gulf of mexico: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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 Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Map—Saturated Hydraulic Conductivity (Ksat)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 10.0645
- > 10.0645 and <= 66.5790
- > 66.5790 and <= 80.8755
- > 80.8755 and <= 92.0000
- > 92.0000 and <= 246.9950
- Not rated or not available

Soil Rating Lines

- <= 10.0645
- > 10.0645 and <= 66.5790
- > 66.5790 and <= 80.8755
- > 80.8755 and <= 92.0000
- > 92.0000 and <= 246.9950
- Not rated or not available

Soil Rating Points

- <= 10.0645
- > 10.0645 and <= 66.5790
- > 66.5790 and <= 80.8755
- > 80.8755 and <= 92.0000
- > 92.0000 and <= 246.9950
- Not rated or not available

Water Features

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.

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: Franklin County, Florida
Survey Area Data: Version 16, Sep 16, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 30, 2017

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 LEGEND	MAP INFORMATION
Streams and Canals	

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
4	Dirego and Bayvi soils, tidal	92.0000	45.6	2.8%
5	Aquents, nearly level		101.4	6.3%
7	Bohicket and Tisonia soils, tidal	0.4733	109.8	6.9%
11	Dorovan-Pamlico complex, depressional	9.0000	6.5	0.4%
15	Ortega fine sand, 0 to 5 percent slopes	92.0000	5.4	0.3%
20	Lynn Haven sand	66.5790	1.8	0.1%
22	Leon sand, 0 to 2 percent slopes	75.0000	256.2	16.0%
23	Maurepas muck, frequently flooded	92.0000	12.9	0.8%
24	Mandarin fine sand, 0 to 2 percent slopes	80.8755	326.1	20.4%
25	Chowan, Brickyard, and Kenner soils, frequently flooded	10.0645	13.1	0.8%
29	Resota fine sand, 0 to 5 percent slopes	246.9950	62.2	3.9%
30	Rutlege loamy fine sand, depressional	92.0000	0.2	0.0%
31	Rutlege fine sand, 0 to 2 percent slopes	92.0000	60.8	3.8%
33	Scranton fine sand, 0 to 2 percent slopes	92.0000	105.5	6.6%
36	Pickney-Pamlico complex, depressional	92.0000	47.3	2.9%
99	Water		198.8	12.4%
100	Waters of the Gulf of Mexico		248.9	15.5%
Totals for Area of Interest			**1,602.3**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 60

Units of Measure: Inches

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.


85° 0' 26" W
84° 58' 33" W
29° 44' 32" N
29° 42' 22" N
692700
693200
693700
694200
694700
695200
695700
3291900
3291400
3290900
3290400
3289900
3289400
3288900
3288400
3287900
Scipio Creek
Apalachicola River
99
7
5
25
15
24
36
29
23
31
22
20
11
33
30
4
100
98
Map Scale: 1:19,600 if printed on A portrait (8.5" x 11") sheet.
Meters
0 250 500 1000 1500
Feet
0 500 1000 2000 3000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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.

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: Franklin County, Florida
Survey Area Data: Version 16, Sep 16, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 30, 2017

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
4	Dirego and Bayvi soils, tidal	A/D	45.6	2.8%
5	Aquents, nearly level		101.4	6.3%
7	Bohicket and Tisonia soils, tidal	D	109.8	6.9%
11	Dorovan-Pamlico complex, depressional	B/D	6.5	0.4%
15	Ortega fine sand, 0 to 5 percent slopes	A	5.4	0.3%
20	Lynn Haven sand	A/D	1.8	0.1%
22	Leon sand, 0 to 2 percent slopes	A/D	256.2	16.0%
23	Maurepas muck, frequently flooded	A/D	12.9	0.8%
24	Mandarin fine sand, 0 to 2 percent slopes	A	326.1	20.4%
25	Chowan, Brickyard, and Kenner soils, frequently flooded	C/D	13.1	0.8%
29	Resota fine sand, 0 to 5 percent slopes	A	62.2	3.9%
30	Rutlege loamy fine sand, depressional	A/D	0.2	0.0%
31	Rutlege fine sand, 0 to 2 percent slopes	A/D	60.8	3.8%
33	Scranton fine sand, 0 to 2 percent slopes	A/D	105.5	6.6%
36	Pickney-Pamlico complex, depressional	A/D	47.3	2.9%
99	Water		198.8	12.4%
100	Waters of the Gulf of Mexico		248.9	15.5%
Totals for Area of Interest			**1,602.3**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

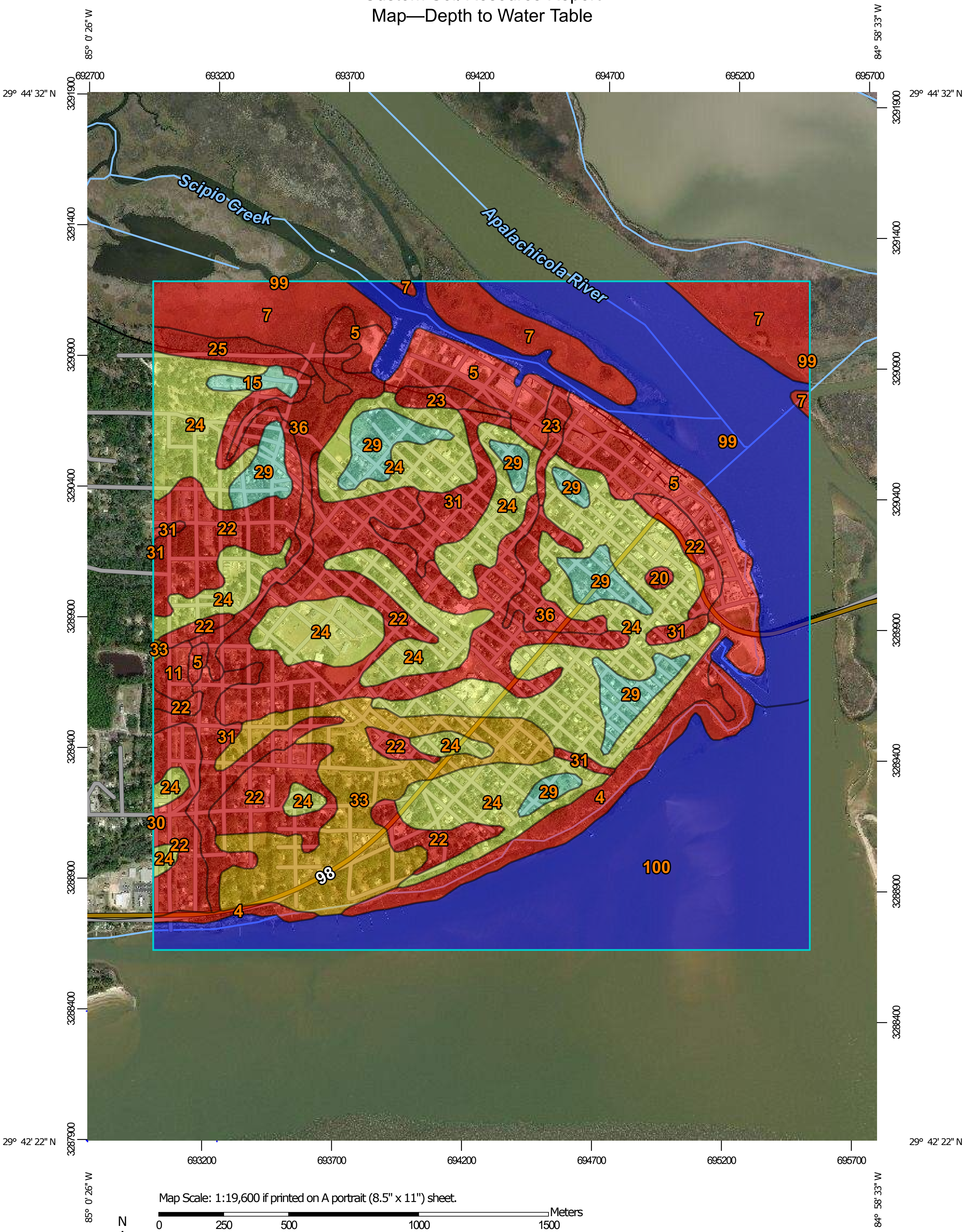
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Map—Depth to Water Table



Map Scale: 1:19,600 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 250, 500, 1000, 1500

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- 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.

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: Franklin County, Florida
Survey Area Data: Version 16, Sep 16, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 30, 2017

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—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
4	Dirego and Bayvi soils, tidal	8	45.6	2.8%
5	Aquents, nearly level	8	101.4	6.3%
7	Bohicket and Tisonia soils, tidal	8	109.8	6.9%
11	Dorovan-Pamlico complex, depressional	0	6.5	0.4%
15	Ortega fine sand, 0 to 5 percent slopes	145	5.4	0.3%
20	Lynn Haven sand	8	1.8	0.1%
22	Leon sand, 0 to 2 percent slopes	15	256.2	16.0%
23	Maurepas muck, frequently flooded	8	12.9	0.8%
24	Mandarin fine sand, 0 to 2 percent slopes	77	326.1	20.4%
25	Chowan, Brickyard, and Kenner soils, frequently flooded	0	13.1	0.8%
29	Resota fine sand, 0 to 5 percent slopes	130	62.2	3.9%
30	Rutlege loamy fine sand, depressional	0	0.2	0.0%
31	Rutlege fine sand, 0 to 2 percent slopes	0	60.8	3.8%
33	Scranton fine sand, 0 to 2 percent slopes	31	105.5	6.6%
36	Pickney-Pamlico complex, depressional	0	47.3	2.9%
99	Water	>200	198.8	12.4%
100	Waters of the Gulf of Mexico	>200	248.9	15.5%
Totals for Area of Interest			**1,602.3**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

References

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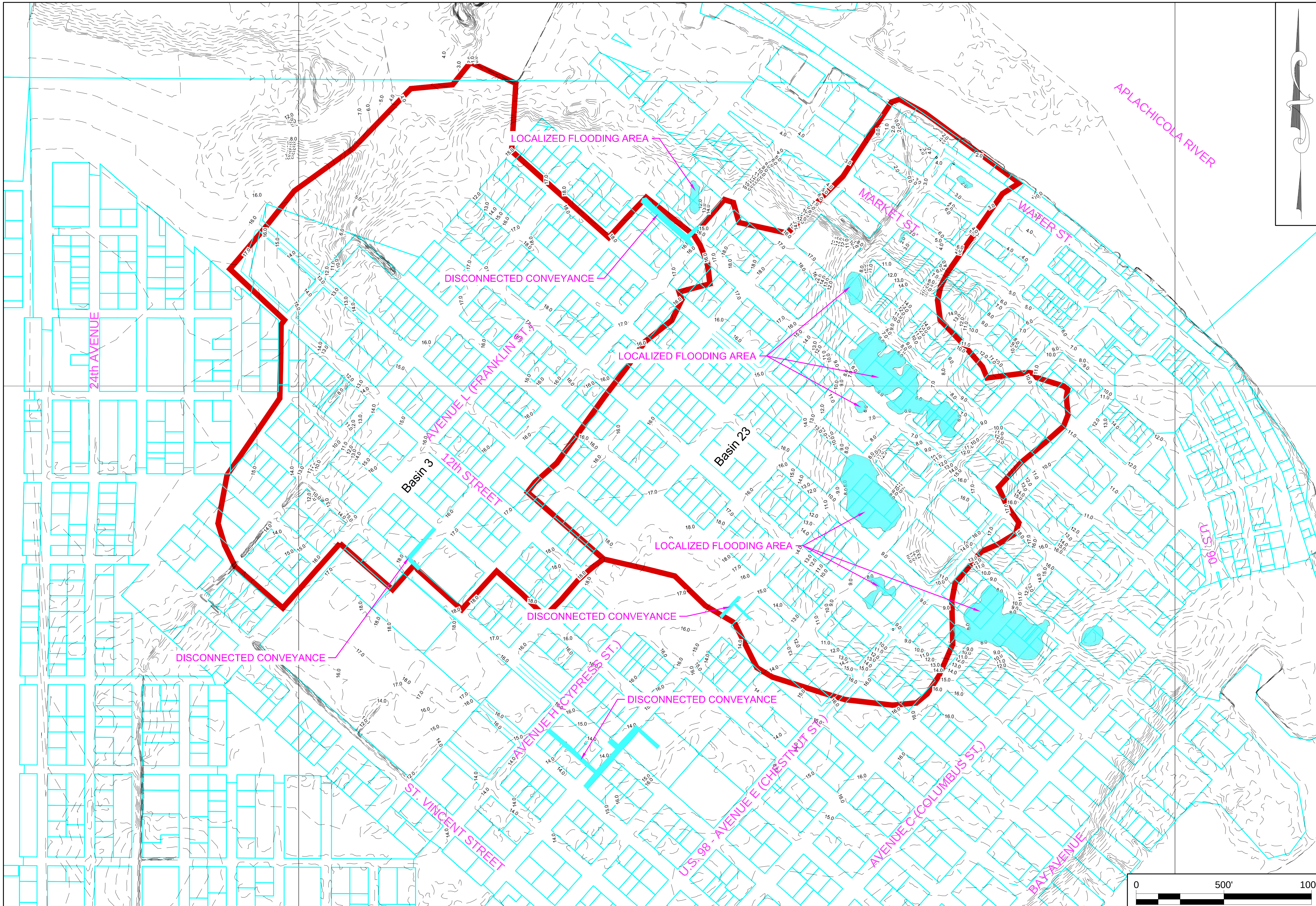
Attachment E

Topographic Map (Lidar)



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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Date:	01-15-20
Designed:	TAB
Drawn:	TAB
Checked:	AOA
Project No.:	50118984
Sheet No.:	T1

Seal:

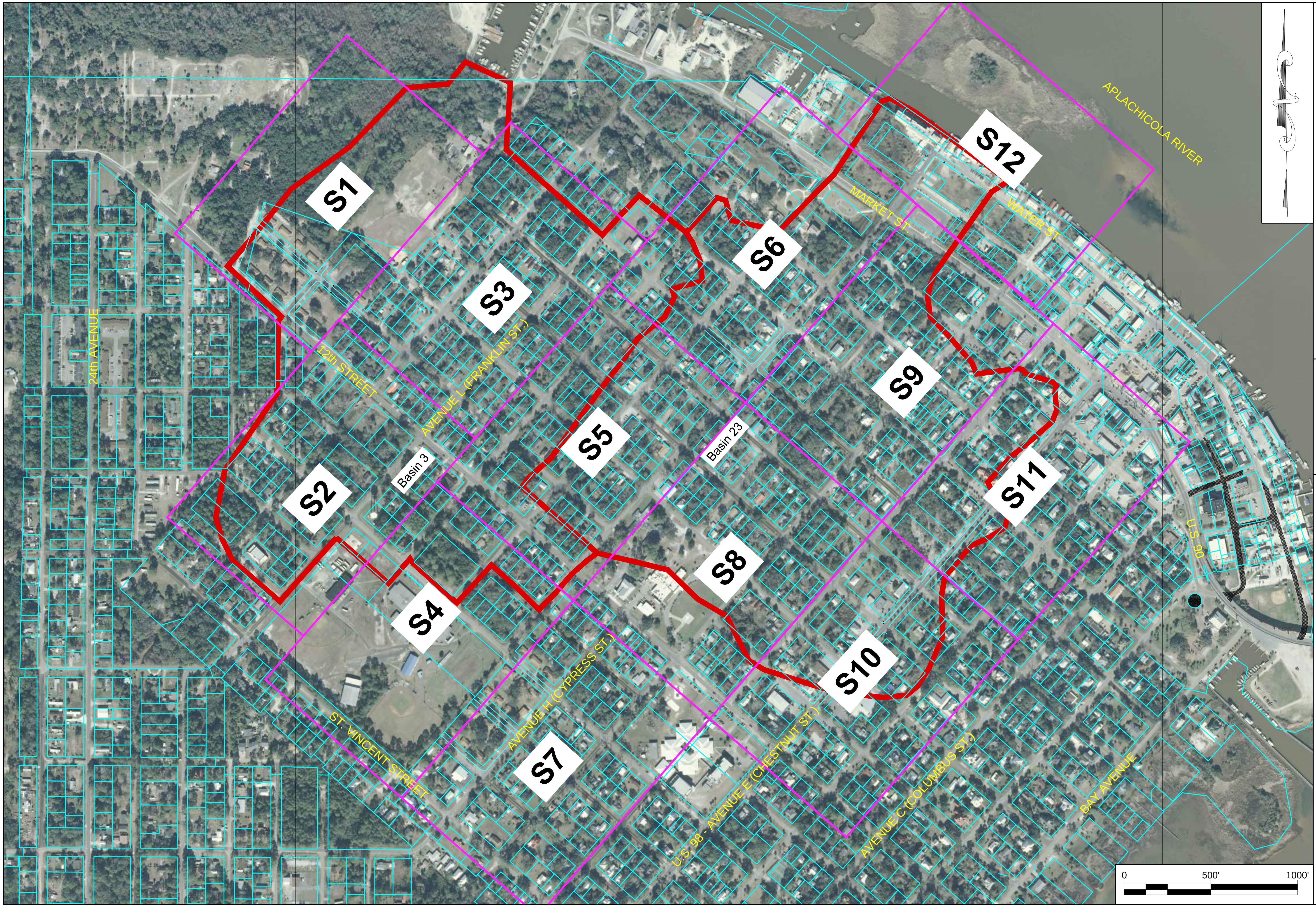
COA# 8794

TOPOGRAPHY KEY MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Attachment F

Conveyance Map



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Date:	01-15-20
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Drawn:	TAB
Checked:	AOA
Project No.:	50118984
Sheet No.:	M1

Seal:

CONVEYANCE KEY MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Seal:

COA# 8794

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Date:	01-15-20
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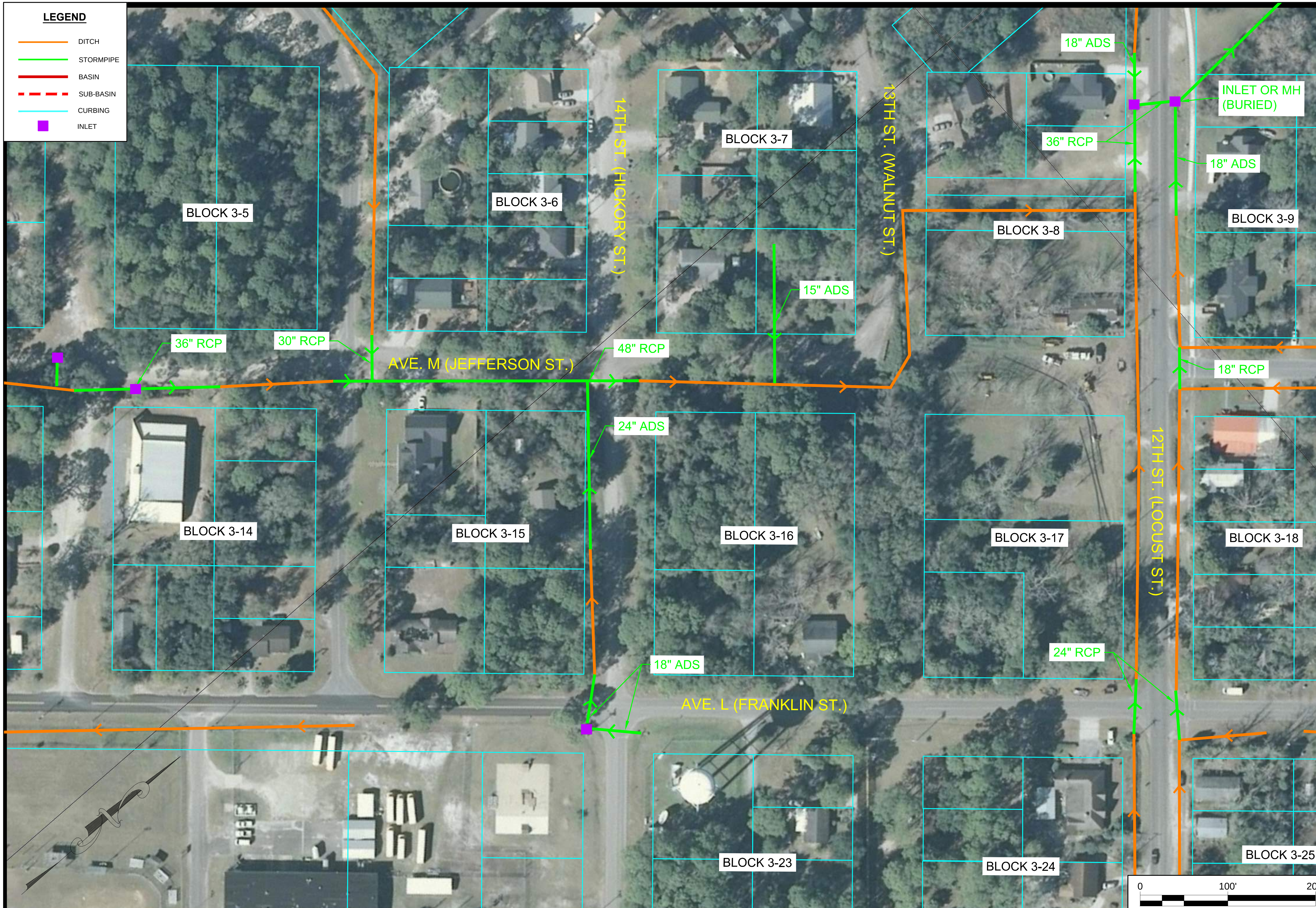
Project No.:	50118984
Sheet No.:	S1



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#65524

Date:	01-15-20
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Drawn:	TAB
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Project No.:	50118984
Sheet No.:	S2

Seal:

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

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Date:	01-15-20
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Checked:	AOA
Project No.:	50118984
Sheet No.:	S3

Seal:

COA# 8794

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS

CITY OF APALACHICOLA

APALACHICOLA

FRANKLIN COUNTY, FLORIDA

Seal:

COA# 8794

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#65524

Date:	01-15-20
Designed:	TAB
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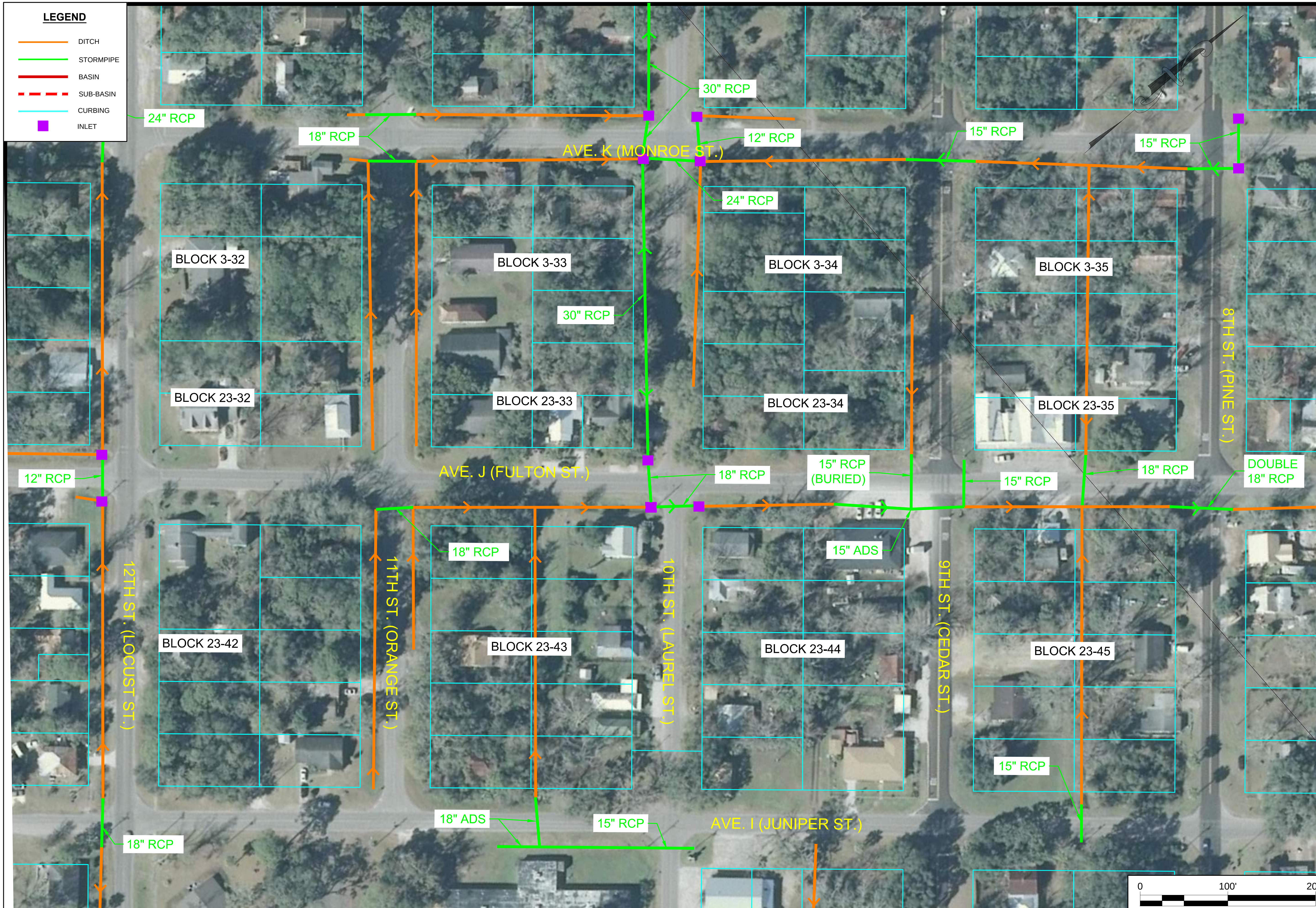
Project No.: 50118984

Sheet No.: S4



CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Seal:

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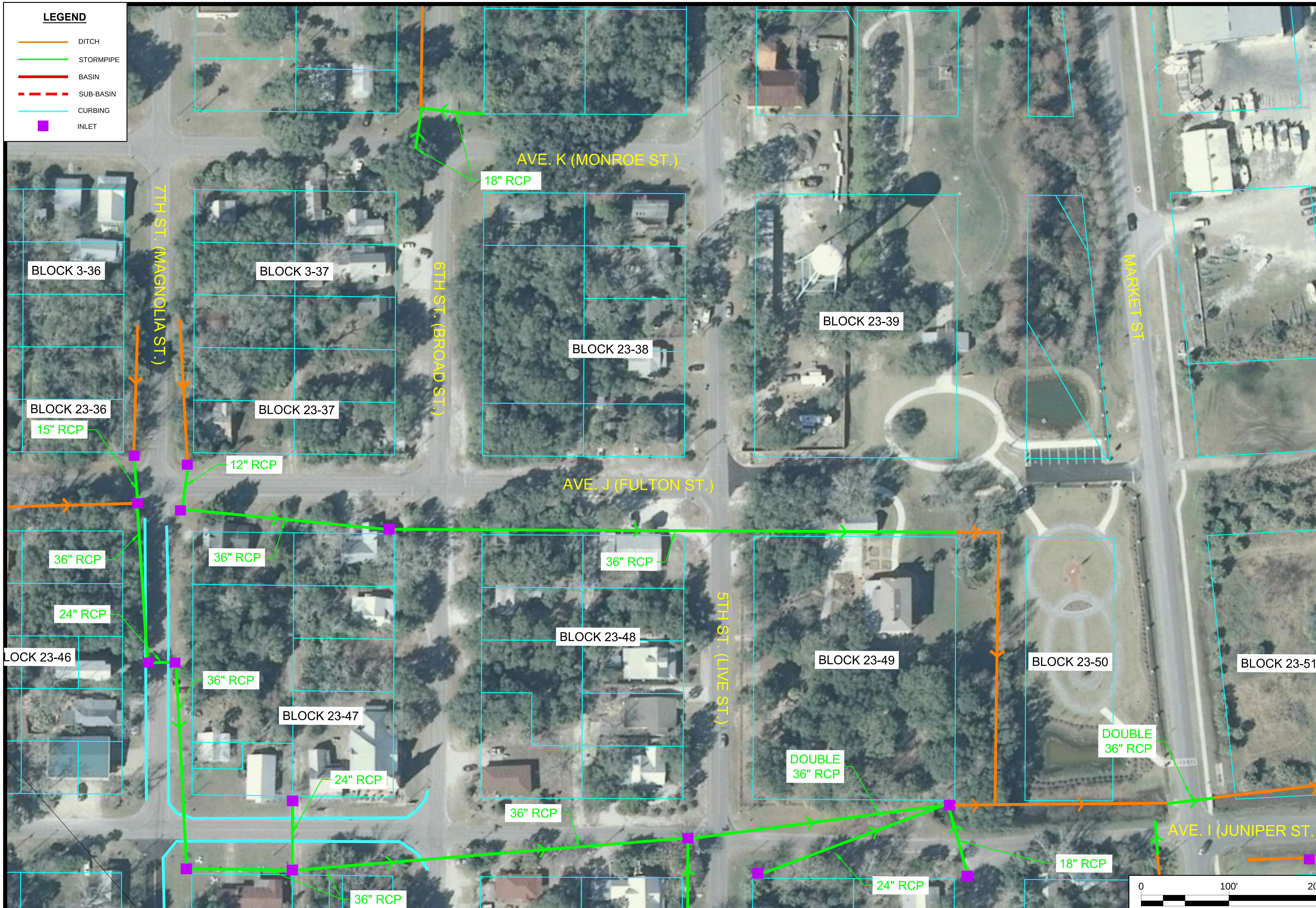
#65524

Date: 01-15-20
Designed: TAB
Drawn: TAB
Checked: AOA

Project No.: 50118984
Sheet No.: S5



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Project No.: 50118984
Sheet No.: S6
Date: 01-15-20
Designed: TAB
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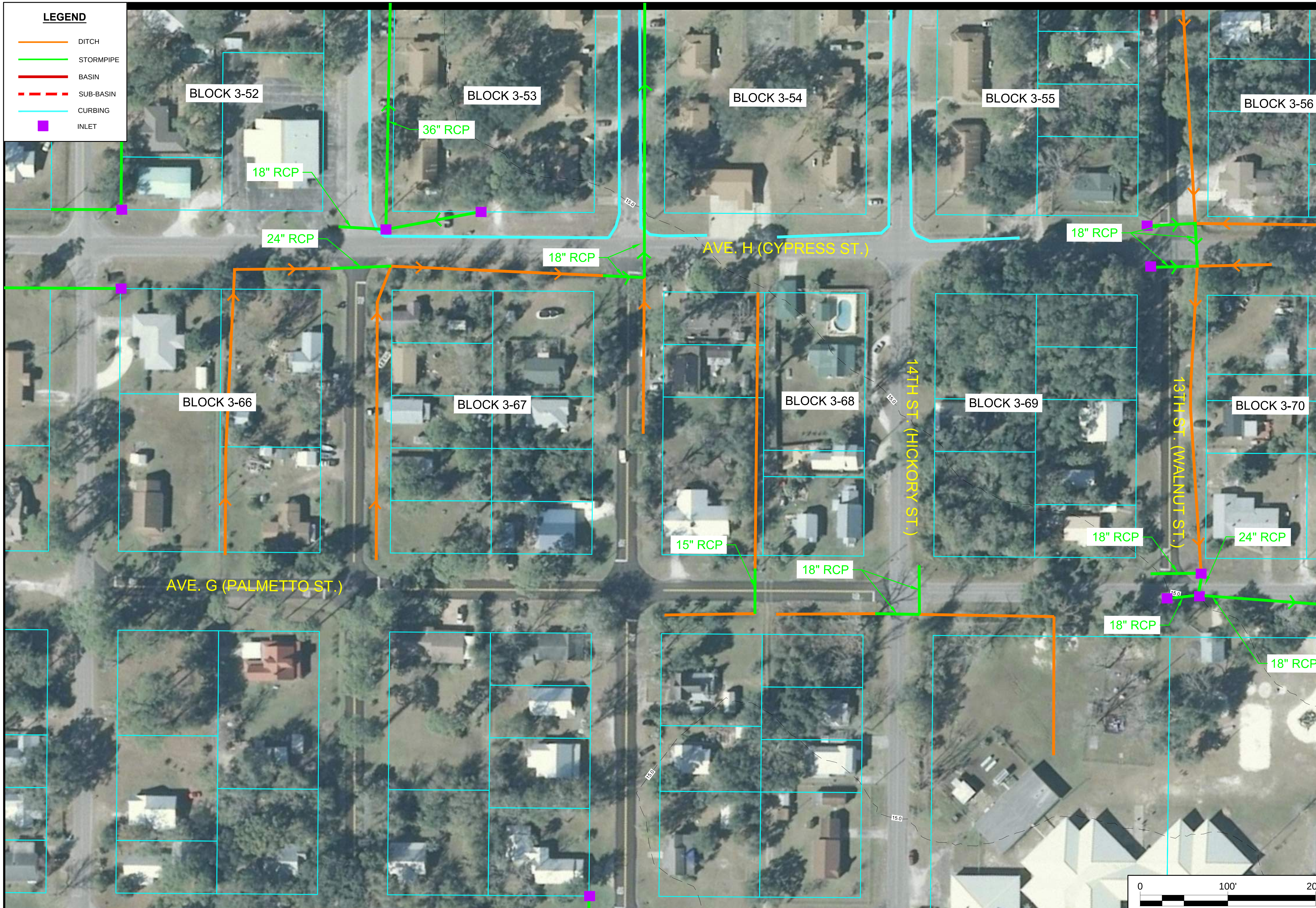
Checked: AOA

Seal:

CONVEYANCE MAP
APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



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Date:	01-15-20
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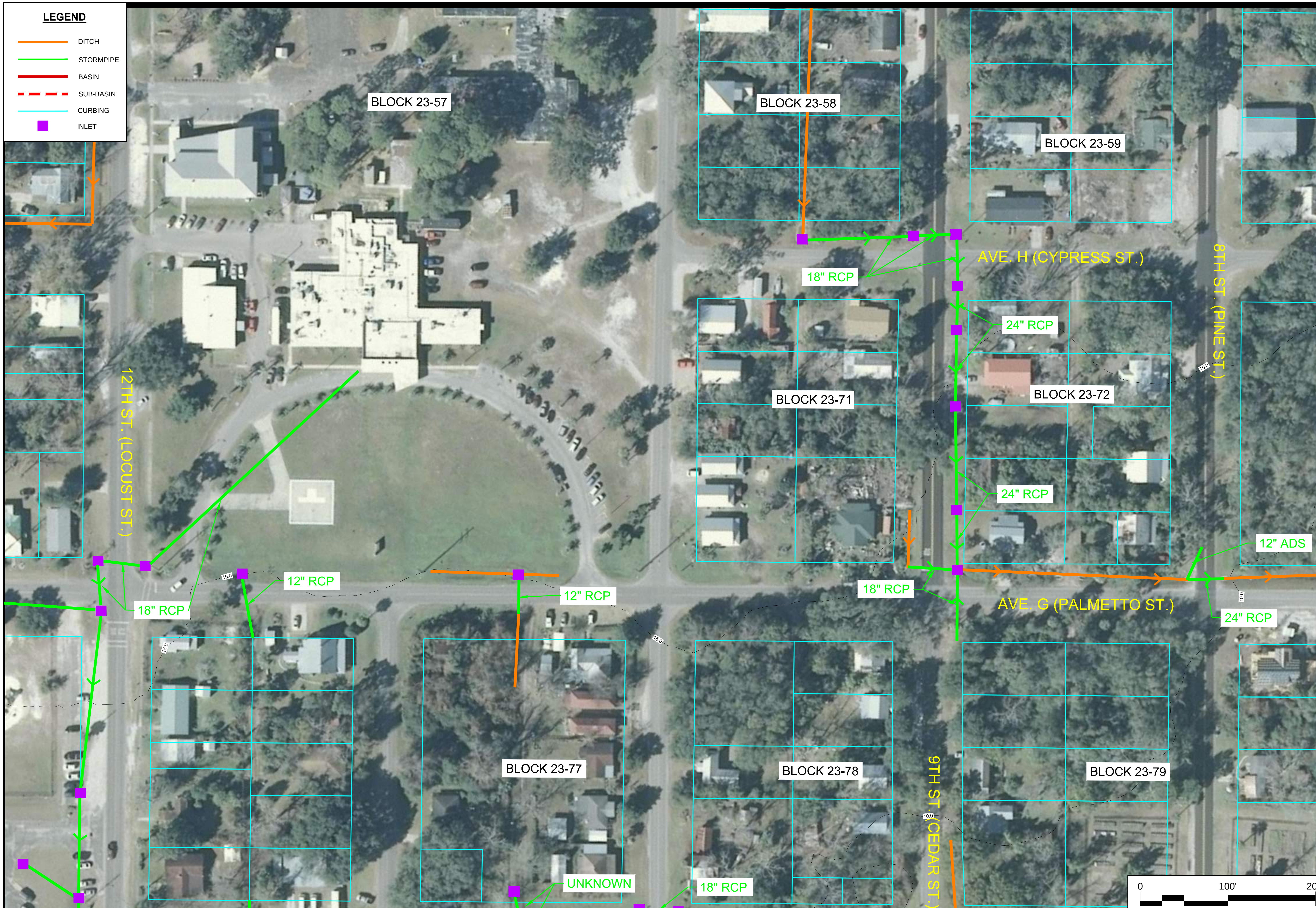
Project No.:	50118984
Sheet No.:	S7

Seal:

COA# 8794

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



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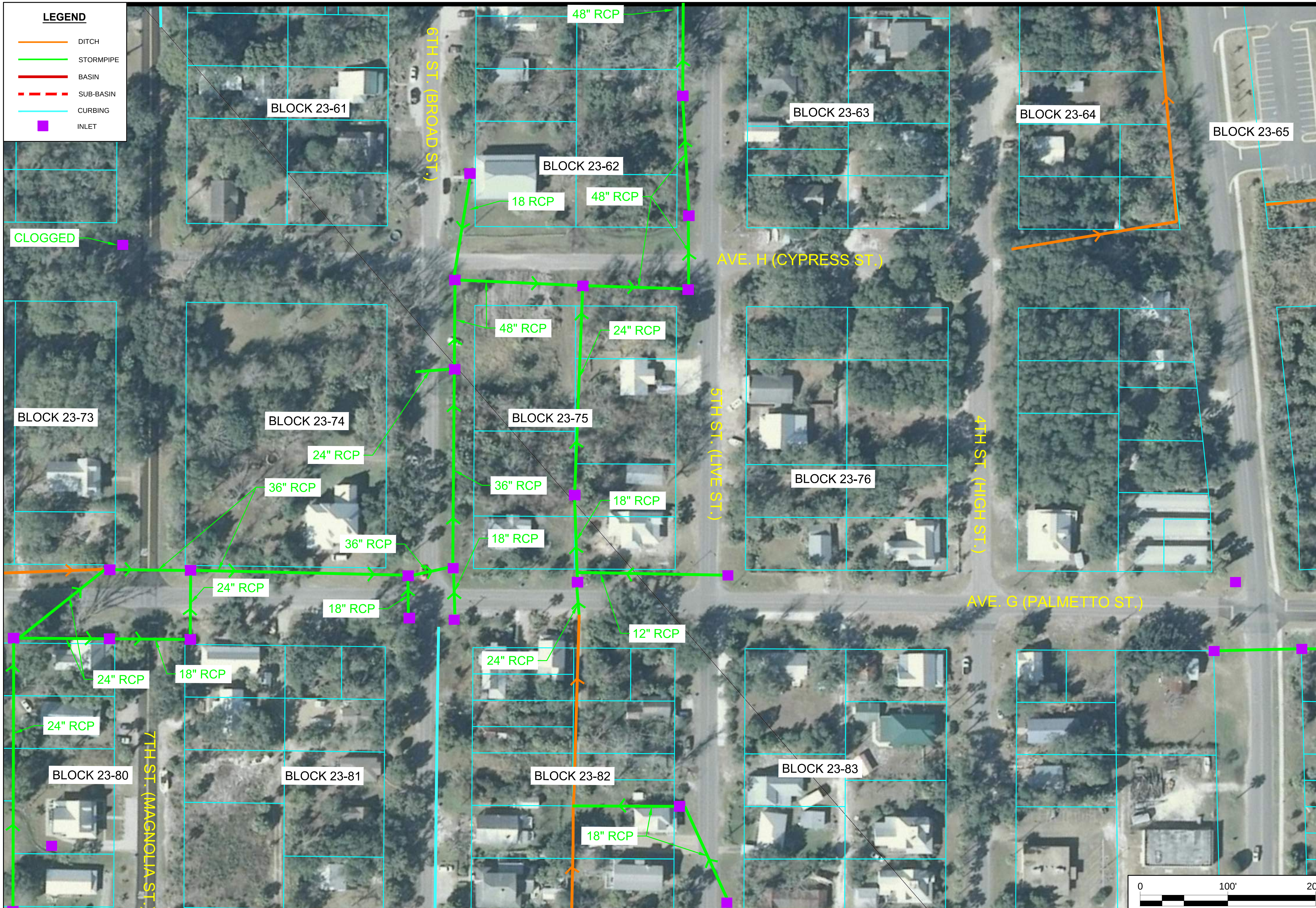
Project No.: 50118984
Sheet No.: S8

Date: 01-15-20
Designed: TAB
Drawn: TAB
Checked: AOA

Seal:

COA# 8794

CONVEYANCE MAP
APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS

CITY OF APALACHICOLA

APALACHICOLA

FRANKLIN COUNTY, FLORIDA

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Seal:

Date: 01-15-20
Designed: TAB
Drawn: TAB
Checked: AOA

Project No.: 50118984

Sheet No.: S9

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AYODEJI O. AJOSE-ADEGUN, P.E.
#65524

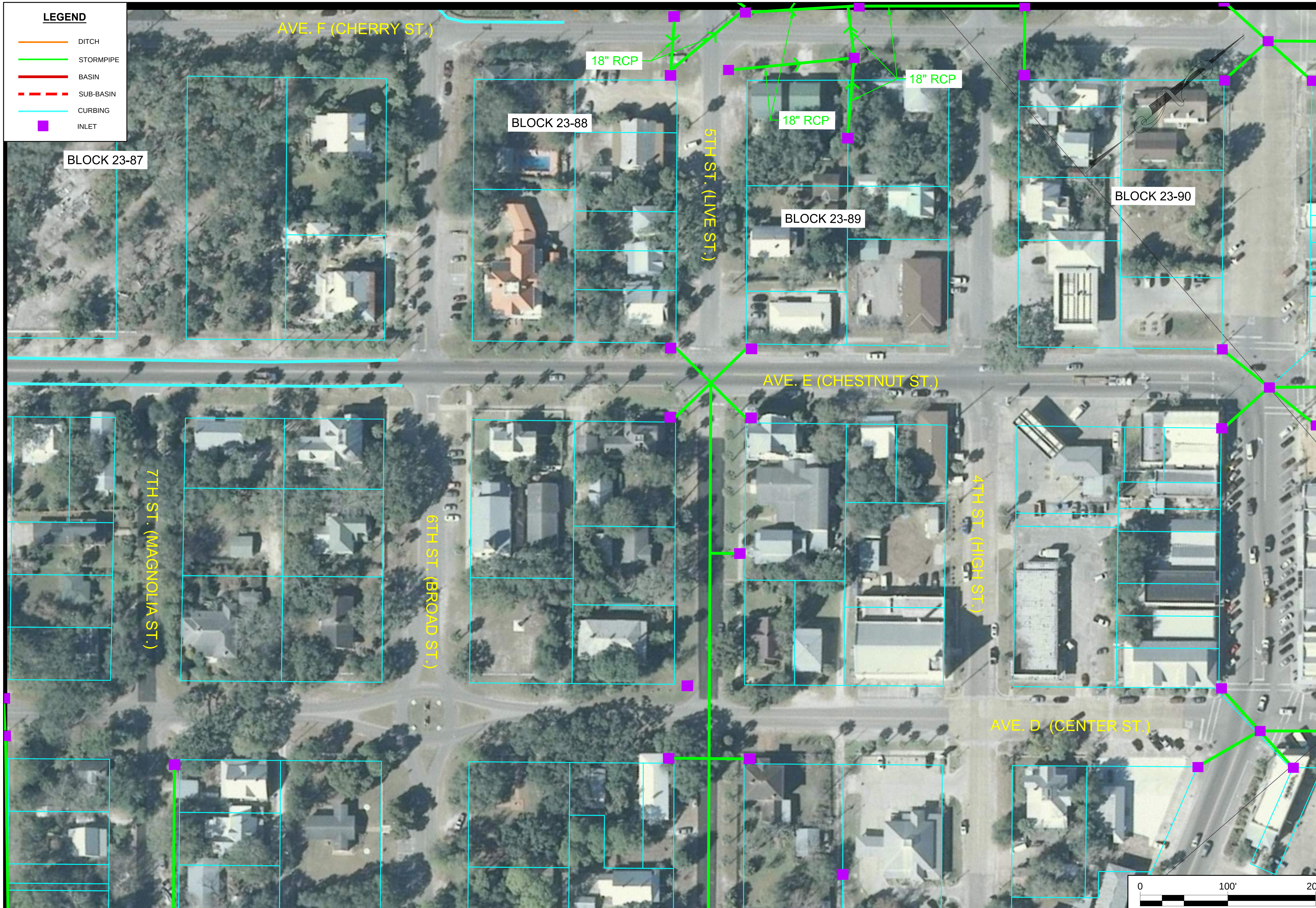
Project No.:	50118984
Sheet No.:	S10
Date:	01-15-20
Designed:	TAB
Drawn:	TAB
Checked:	AOA

Seal:

COA# 8794

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



Project No.: 50118984
Sheet No.: S11

Date: 01-15-20
Designed: TAB
Drawn: TAB
Checked: AOA

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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Seal:

COA# 8794

CONVEYANCE MAP
APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Date:	01-15-20
Designed:	TAB
Drawn:	TAB
Checked:	AOA
Project No.:	50118984
Sheet No.:	S12

Seal:

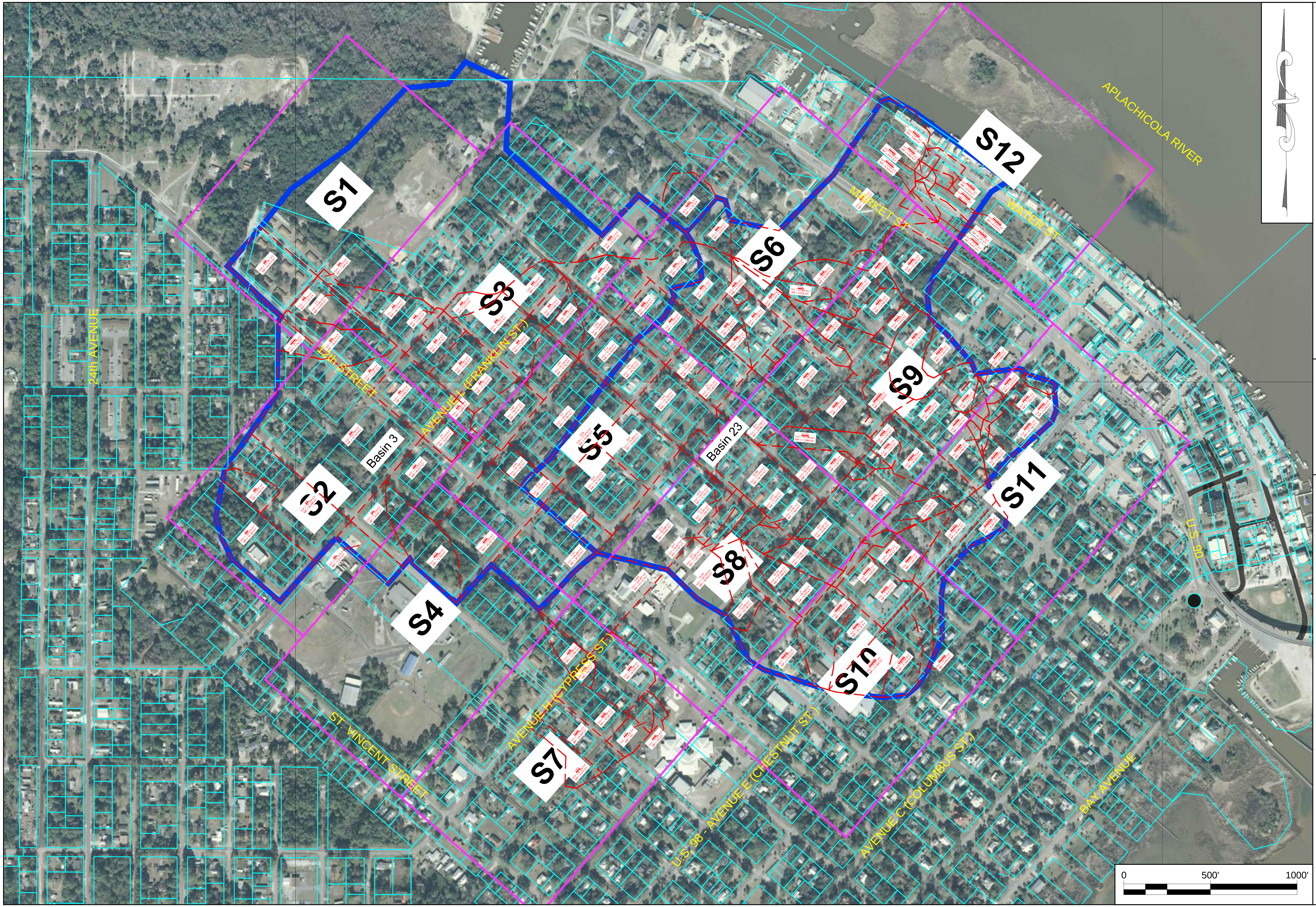
COA# 8794

CONVEYANCE MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Attachment G

Sub-Basin Map



SUB-BASIN KEY MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS

CITY OF APALACHICOLA

APALACHICOLA

FRANKLIN COUNTY, FLORIDA

Seal:

COA# 8794

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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Date:	01-15-20
Designed:	TAB
Drawn:	TAB
Checked:	AOA
Project No.:	50118984
Sheet No.:	M1

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Seal:

COA# 8794

Dewberry

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Tallahassee, FL 32301
850.523.0062

AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Date:	01-15-20
Designed:	TAB
Drawn:	TAB
Checked:	AOA
Project No.:	50118984
Sheet No.:	S1

Dewberry

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Tallahassee, FL 32301
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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Project No.: 50118984
Sheet No.: S2

Date: 01-15-20
Designed: TAB
Drawn: TAB
Checked: AOA

Seal:

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

LEGEND
DITCH
STORMPIPE
BASIN
SUB-BASIN
CURBING
INLET
3-P
TOT = 112,019 S.F.
IMP = 26,155 S.F.
3-Q
TOT = 5,691 S.F.
IMP = 2,047 S.F.
BLOCK 3-9
BLOCK 3-10
BLOCK 3-11
BLOCK 3-12
BLOCK 3-13
10TH ST. (LAUREL ST.)
9TH ST. (CEDAR ST.)
8TH ST. (PINE ST.)
AVE. M (JEFFERSON ST.)
3-S
TOT = 31,580 S.F.
IMP = 3,273 S.F.
3-R
TOT = 57,112 S.F.
IMP = 13,947 S.F.
11TH ST. (ORANGE ST.)
BLOCK 3-19
BLOCK 3-20
BLOCK 3-21
BLOCK 3-22
7TH ST. (MAGNOLIA ST.)
3-T
TOT = 69.262 S.F.
IMP = 10,480 S.F.
3-U
TOT = 70,951 S.F.
IMP = 16,815 S.F.
3-V
TOT = 63,828 S.F.
IMP = 7,849 S.F.
AVE. L (FRANKLIN ST.)
3-W
TOT = 28,047 S.F.
IMP = 4,869 S.F.
3-X
TOT = 55,491 S.F.
IMP = 17,214 S.F.
3-Y
TOT = 54,148 S.F.
IMP = 21,475 S.F.
3-Z
TOT = 27,103 S.F.
IMP = 11,089 S.F.
3-CC
TOT = 120,012 S.F.
IMP = 25,537 S.F.
3-AA
TOT = 51,107 S.F.
IMP = 9,175 S.F.
3-BB
TOT = 111,795 S.F.
IMP = 26,160 S.F.
BLOCK 3-26
BLOCK 3-27
BLOCK 3-28
BLOCK 3-29
0
100'
200'
Dewberry
Dewberry Engineers, Inc.
101 N. Monroe St., Suite 710
Tallahassee, FL 32301
850.523.0062
AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524
Date: 01-15-20
Designed: TAB
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Project No.: 50118984
Sheet No.: S3
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SUB-BASIN MAP
APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Project No.: 50118984

Sheet No.: S4

Date: 01-15-20

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AYODEJI O. AJOSE-ADEOGUN, P.E.
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Seal:

COA# 8794

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

COA# 8794

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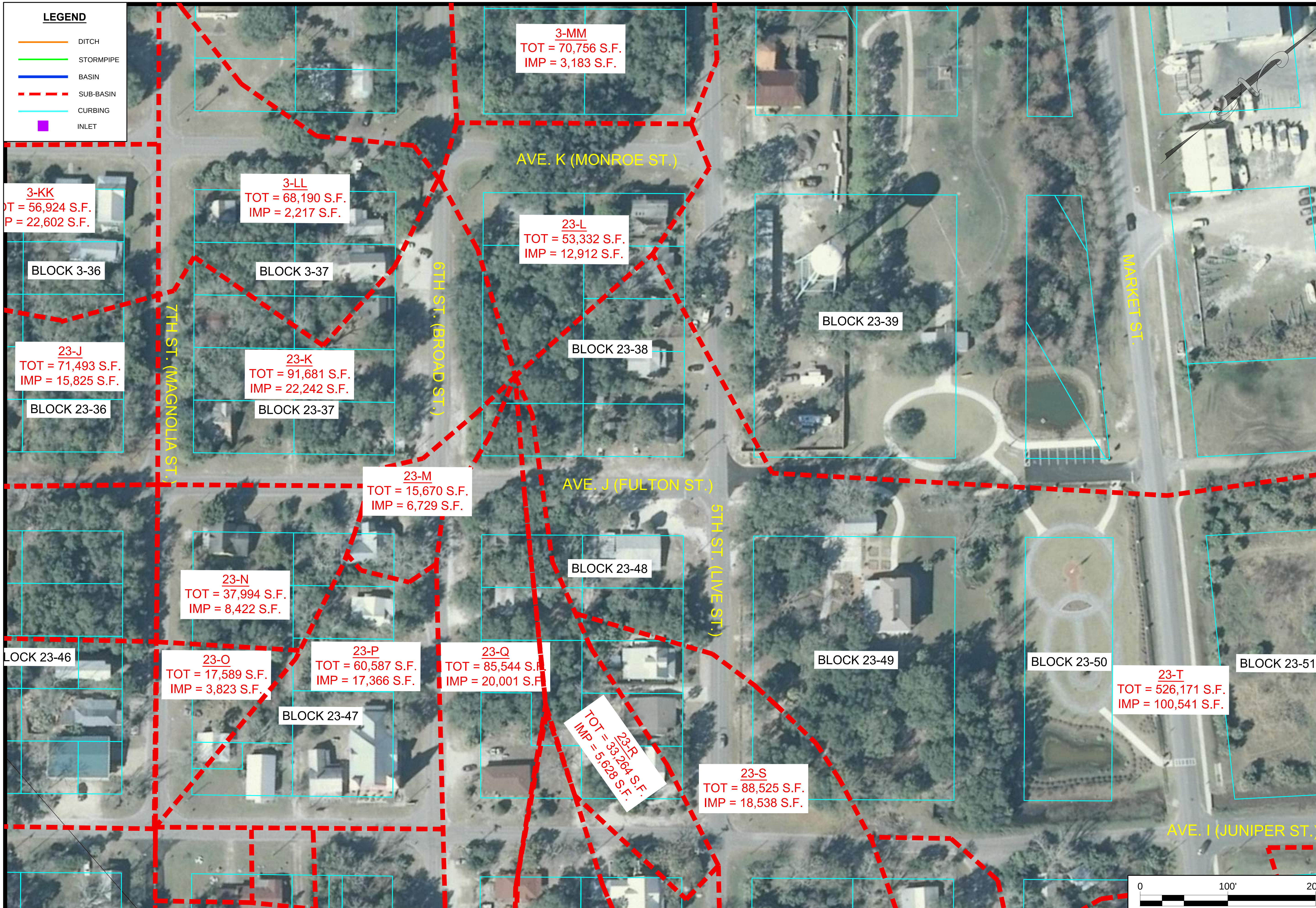
Sheet No.:	S5

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Seal:

COA# 8794

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#65524

Date:	01-15-20
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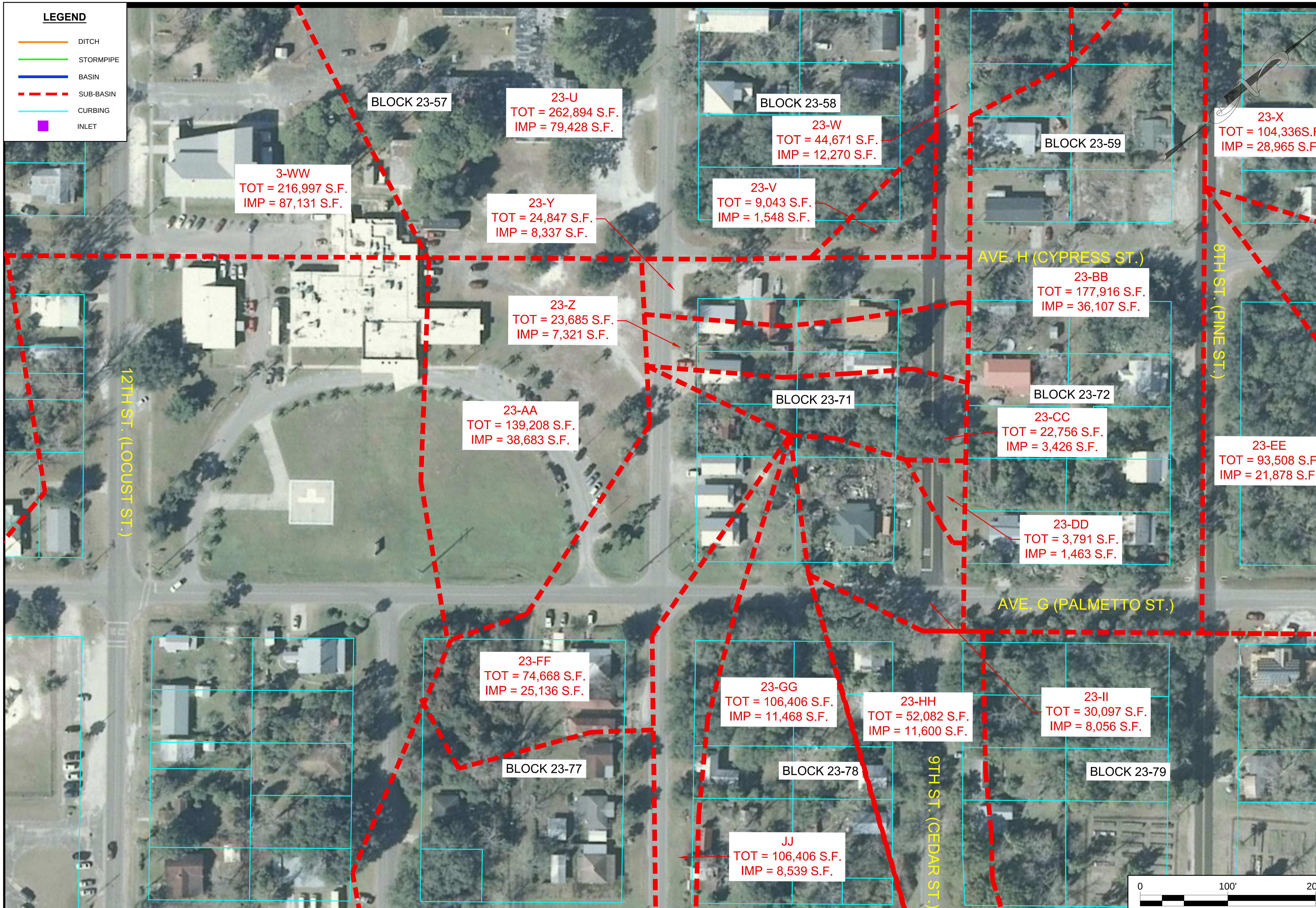
Project No.:	50118984
Sheet No.:	S7

Seal:

COA# 8794

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



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#65524

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SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

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#65524

Project No.: 50118984

Sheet No.: S9

Date: 01-15-20

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Seal:

COA# 8794

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Project No.: 50118984
Sheet No.: S10

Date: 01-15-20
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#65524

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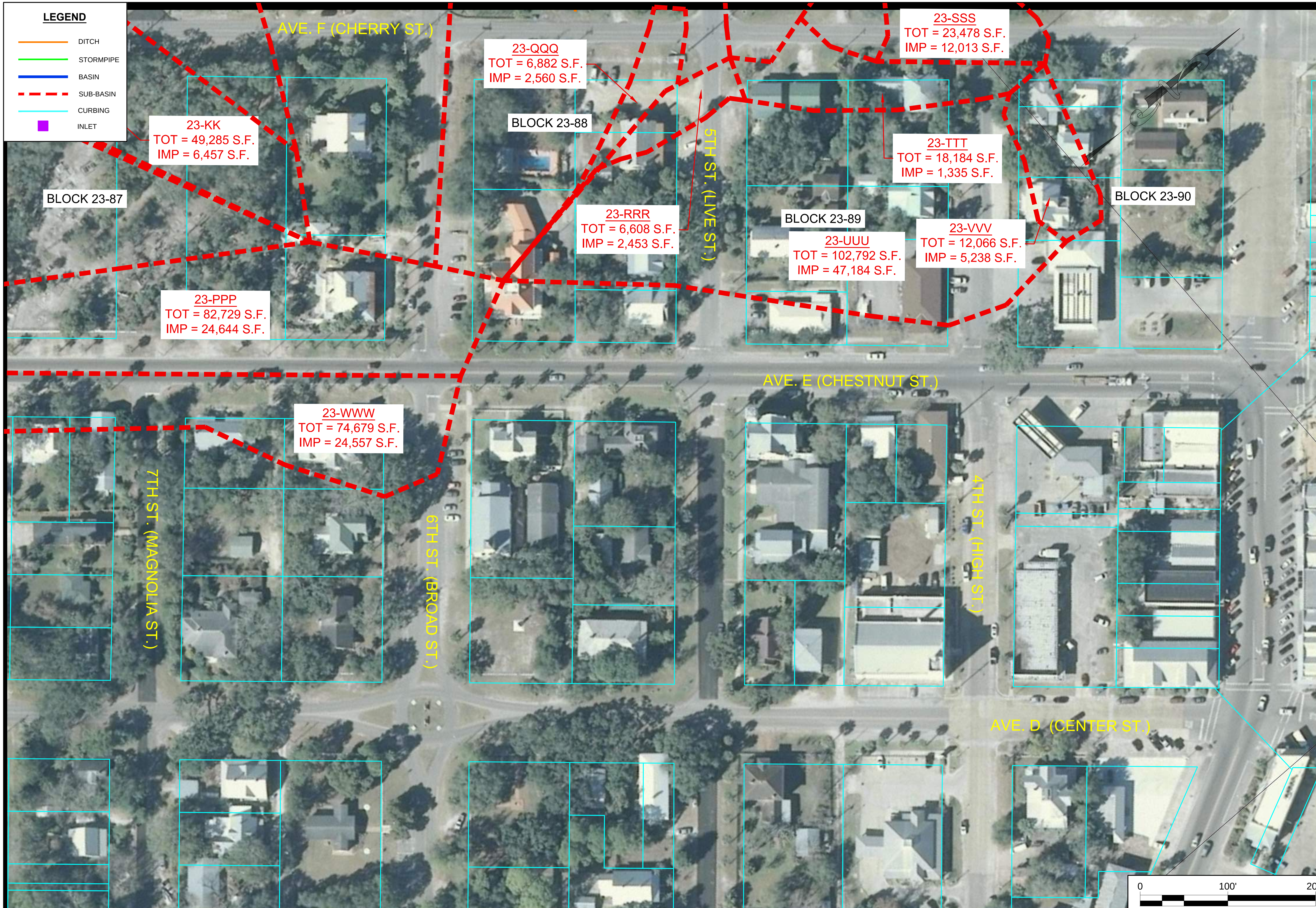
COA# 8794

SUB-BASIN MAP
APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA



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Date:	01-15-20
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Project No.:	50118984
Sheet No.:	S11

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COA# 8794

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Project No.: 50118984
Sheet No.: S12

Date: 01-15-20
Designed: TAB
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Checked: AOA

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AYODEJI O. AJOSE-ADEOGUN, P.E.
#65524

Seal:

COA# 8794

SUB-BASIN MAP

APALACHICOLA COASTAL RESILIENCE BASIN ANALYSIS
CITY OF APALACHICOLA
APALACHICOLA
FRANKLIN COUNTY, FLORIDA

Attachment H

Sub-Basin Summary

Dewberry

Basin Name:	3-A			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	137,651 sf	3.16 acres		
Impervios Area:	44,913 sf	1.03 acres	98	0.95
Pervious Area:	92,738 sf	2.13 acres	49	0.3
		Weighted Total:	**65**	**0.51**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
65	17	13.5	696	0.503	0.85	**51.19**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.51	3.6	3.16	**5.825517 cfs**

Dewberry

Basin Name:		3-B		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	75,325 sf	1.73 acres		
Impervios Area:	11,161 sf	0.26 acres	98	0.95
Pervious Area:	64,164 sf	1.47 acres	49	0.3
		Weighted Total:	**56**	**0.40**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	15	11.5	251	1.394	0.28	**16.98**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.40	6.8	1.73	**4.660115 cfs**

Dewberry®

Basin Name:	3-C			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	5,310 sf	0.12 acres		
Impervios Area:	1,609 sf	0.04 acres	98	0.95
Pervious Area:	3,701 sf	0.08 acres	49	0.3
		Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	15	12	350	0.857	0.39	**23.30**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.50	6	0.12	**0.363478 cfs**

Dewberry®

Basin Name:	3-D			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	182,415 sf	4.19 acres		
Impervios Area:	19,160 sf	0.44 acres	98	0.95
Pervious Area:	163,255 sf	3.75 acres	49	0.3
		Weighted Total:	**54**	**0.37**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	17	14	360	0.833	0.52	**30.91**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.37	5.2	4.19	**8.019472 cfs**

Dewberry

Basin Name:	3-E			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	43,647 sf	1.00 acres		
Impervios Area:	6,438 sf	0.15 acres	98	0.95
Pervious Area:	37,209 sf	0.85 acres	49	0.3
		Weighted Total:	**56**	**0.40**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	15	14.5	111	0.450	0.26	**15.57**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.40	6.9	1.00	**2.737 cfs**

Dewberry

Basin Name:	3-F			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	187,568 sf	4.31 acres		
Impervios Area:	49,296 sf	1.13 acres	98	0.95
Pervious Area:	138,272 sf	3.17 acres	49	0.3
		Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	16	14	470	0.426	0.73	**44.04**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	4.4	4.31	**8.920485 cfs**

Dewberry

Basin Name:		3-G		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	522,194 sf	11.99 acres		
Impervios Area:	107,912 sf	2.48 acres	98	0.95
Pervious Area:	414,282 sf	9.51 acres	49	0.3
		Weighted Total:	**59**	**0.43**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	16	10	566	1.060	0.58	**34.72**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	5	11.99	**26.03317 cfs**

Dewberry®

Basin Name:	**3-H**			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	94,679 sf	2.17 acres		
Impervios Area:	28,932 sf	0.66 acres	98	0.95
Pervious Area:	65,747 sf	1.51 acres	49	0.3
		Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	15	12	280	1.071	0.29	**17.38**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.50	6.8	2.17	**7.369711 cfs**

Basin Name:			3-H(1)			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	38,799 sf		0.89 acres			
Impervios Area:	7,702 sf		0.18 acres		98	0.95
Pervious Area:	31,097 sf		0.71 acres		49	0.3
				Weighted Total:	**59**	**0.43**
Time of Concentration (Lag Equation)						

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	15	12	223	1.345	0.25	**14.78**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	7	0.89	**2.674977 cfs**

Basin Name:	3-I			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	37,666 sf	0.86 acres		
Impervios Area:	13,273 sf	0.30 acres	98	0.95
Pervious Area:	24,393 sf	0.56 acres	49	0.3
		Weighted Total:	**66**	**0.53**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
66	15	13	130	1.538	0.12	**7.40**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.53	8	0.86	**3.659734 cfs**

Basin Name:		**3-J**			
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	119,639 sf		2.75 acres		
Impervios Area:	29,094 sf		0.67 acres	98	0.95
Pervious Area:	90,545 sf		2.08 acres	49	0.3
			Weighted Total:	**61**	**0.46**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	15	14	240	0.417	0.44	**26.64**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.46	5.7	2.75	**7.171165 cfs**

Dewberry

Basin Name:	3-K			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	50,733 sf	1.16 acres		
Impervios Area:	5,270 sf	0.12 acres	98	0.95
Pervious Area:	45,463 sf	1.04 acres	49	0.3
		Weighted Total:	**54**	**0.37**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	18	16	380	0.526	0.68	**40.68**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.37	4.6	1.16	**1.968982 cfs**

Dewberry®

Basin Name:	3-L				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	61,359 sf		1.41 acres		
Impervios Area:	16,233 sf		0.37 acres	98	0.95
Pervious Area:	45,126 sf		1.04 acres	49	0.3
			Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	18	16	334	0.599	0.47	**28.18**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	5.4	1.41	**3.589977 cfs**

Dewberry®

Basin Name:		3-M		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	173,363 sf	3.98 acres		
Impervios Area:	46,027 sf	1.06 acres	98	0.95
Pervious Area:	127,336 sf	2.92 acres	49	0.3
		Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	16	15.5	576	0.087	1.91	**114.34**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	2.4	3.98	**4.513854 cfs**

Dewberry®

Basin Name:	3-N			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	31,012 sf	0.71 acres		
Impervios Area:	9,215 sf	0.21 acres	98	0.95
Pervious Area:	21,797 sf	0.50 acres	49	0.3
		Weighted Total:	**64**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	16	15.5	246	0.203	0.61	**36.36**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.49	4.9	0.71	**1.720326 cfs**

Dewberry

Basin Name:		3-O		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	6,043 sf	0.14 acres		
Impervios Area:	6,043 sf	0.14 acres	98	0.95
Pervious Area:	- sf	0.00 acres	49	0.3
		Weighted Total:	**98**	**0.95**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
98	15	13	325	0.615	0.13	**7.83**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.95	8.5	0.14	**1.12023 cfs**

Dewberry®

Basin Name:	3-P			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	112,019 sf	2.57 acres		
Impervios Area:	26,155 sf	0.60 acres	98	0.95
Pervious Area:	85,864 sf	1.97 acres	49	0.3
		Weighted Total:	**60**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	16	13	505	0.594	0.68	**40.94**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.45	4.6	2.57	**5.344115 cfs**

Basin Name:		3-Q		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	5,691 sf	0.13 acres		
Impervios Area:	2,047 sf	0.05 acres	98	0.95
Pervious Area:	3,644 sf	0.08 acres	49	0.3
		Weighted Total:	**67**	**0.53**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	16	15.5	120	0.417	0.22	**13.21**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.53	7.6	0.13	**0.53002 cfs**

Dewberry

Basin Name:	3-R			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	57,112 sf	1.31 acres		
Impervios Area:	13,947 sf	0.32 acres	98	0.95
Pervious Area:	43,165 sf	0.99 acres	49	0.3
		Weighted Total:	**61**	**0.46**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	16	15.5	185	0.270	0.45	**26.82**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.46	5.7	1.31	**3.428263 cfs**

Dewberry

Basin Name:			**3-S**			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	31,580 sf		0.72 acres			
Impervios Area:	3,273 sf		0.08 acres		98	0.95
Pervious Area:	28,307 sf		0.65 acres		49	0.3
				Weighted Total:	**54**	**0.37**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	18	17	242	0.413	0.53	**32.00**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.37	5.2	0.72	**1.38493 cfs**

Dewberry®

Basin Name:	3-T			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	69,262 sf	1.59 acres		
Impervios Area:	10,480 sf	0.24 acres	98	0.95
Pervious Area:	58,782 sf	1.35 acres	49	0.3
		Weighted Total:	**56**	**0.40**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	16.5	16	385	0.130	1.30	**78.04**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.40	3	1.59	**1.900179 cfs**

Dewberry®

Basin Name:	3-U			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	70,951 sf	1.63 acres		
Impervios Area:	16,815 sf	0.39 acres	98	0.95
Pervious Area:	54,136 sf	1.24 acres	49	0.3
		Weighted Total:	**61**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	18	16	230	0.870	0.30	**17.96**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.45	6.6	1.63	**4.881068 cfs**

Dewberry

Basin Name:		3-V		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	63,828 sf	1.47 acres		
Impervios Area:	7,849 sf	0.18 acres	98	0.95
Pervious Area:	55,979 sf	1.29 acres	49	0.3
		Weighted Total:	**55**	**0.38**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
55	18	17.5	267	0.187	0.84	**50.22**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.38	4.1	1.47	**2.282507 cfs**

Dewberry

Basin Name:	3-W				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	28,047 sf		0.64 acres		
Impervios Area:	4,869 sf		0.11 acres	98	0.95
Pervious Area:	23,178 sf		0.53 acres	49	0.3
			Weighted Total:	**58**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	16.5	16	118	0.424	0.27	**16.32**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.41	6.9	0.64	**1.834131 cfs**

Dewberry

Basin Name:	3-X			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	55,491 sf	1.27 acres		
Impervios Area:	17,214 sf	0.40 acres	98	0.95
Pervious Area:	38,277 sf	0.88 acres	49	0.3
		Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	16	15.5	125	0.400	0.25	**14.83**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.50	7	1.27	**4.473251 cfs**

Dewberry®

Basin Name:	3-Y				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	54,148 sf		1.24 acres		
Impervios Area:	21,475 sf		0.49 acres	98	0.95
Pervious Area:	32,673 sf		0.75 acres	49	0.3
			Weighted Total:	**68**	**0.56**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
68	17	15.5	210	0.714	0.25	**15.04**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.56	7	1.24	**4.853582 cfs**

Dewberry

Basin Name:	3-Z				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	27,103 sf	0.62 acres			
Impervios Area:	11,089 sf	0.25 acres		98	0.95
Pervious Area:	16,014 sf	0.37 acres		49	0.3
			Weighted Total:	**69**	**0.57**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
69	18	17.5	243	0.206	0.52	**30.99**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.57	5.3	0.62	**1.866285 cfs**

Dewberry®

Basin Name:	3-AA			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	51,107 sf	1.17 acres		
Impervios Area:	9,175 sf	0.21 acres	98	0.95
Pervious Area:	41,932 sf	0.96 acres	49	0.3
		Weighted Total:	**58**	**0.42**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	18	16.5	500	0.300	1.02	**61.12**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.42	3.7	1.17	**1.808876** cfs

Basin Name:			**3-BB**			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	111,795 sf		2.57 acres			
Impervios Area:	26,160 sf		0.60 acres		98	0.95
Pervious Area:	85,635 sf		1.97 acres		49	0.3
			Weighted Total:		**60**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	18	17	430	0.233	0.96	**57.51**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.45	3.7	2.57	**4.293096 cfs**

Dewberry®

Basin Name:		**3-CC**			
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	129,282 sf	2.97 acres			
Impervios Area:	12,782 sf	0.29 acres		98	0.95
Pervious Area:	116,500 sf	2.67 acres		49	0.3
		Weighted Total:		**54**	**0.36**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	18	17	361	0.277	0.90	**54.15**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.36	3.9	2.97	**4.216306 cfs**

Dewberry®

Basin Name:		3-DD				
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	223,424 sf		5.13 acres			
Impervios Area:	48,351 sf		1.11 acres		98	0.95
Pervious Area:	175,073 sf		4.02 acres		49	0.3
				Weighted Total:	**60**	**0.44**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	18	17	332	0.301	0.70	**41.99**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.44	4.5	5.13	**10.17101 cfs**

Dewberry®

Basin Name:	3-EE			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	89,813 sf	2.06 acres		
Impervios Area:	23,101 sf	0.53 acres	98	0.95
Pervious Area:	66,712 sf	1.53 acres	49	0.3
		Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	16	15.5	205	0.244	0.50	**30.16**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.47	5.3	2.06	**5.105271 cfs**

Dewberry®

Basin Name:	3-FF			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	62,362 sf	1.43 acres		
Impervios Area:	10,754 sf	0.25 acres	98	0.95
Pervious Area:	51,608 sf	1.18 acres	49	0.3
		Weighted Total:	**57**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	16	15.5	258	0.194	0.75	**45.18**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.41	4.4	1.43	**2.595828 cfs**

Dewberry®

Basin Name:		3-GG		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	48,965 sf	1.12 acres		
Impervios Area:	6,805 sf	0.16 acres	98	0.95
Pervious Area:	42,160 sf	0.97 acres	49	0.3
		Weighted Total:	**56**	**0.39**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	18	17	292	0.342	0.65	**39.11**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.39	4.7	1.12	**2.062211 cfs**

Dewberry

Basin Name:	3-HH					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	27,728 sf		0.64 acres			
Impervios Area:	4,160 sf		0.10 acres		98	0.95
Pervious Area:	23,568 sf		0.54 acres		49	0.3
				Weighted Total:	**56**	**0.40**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	17	16.5	118	0.424	0.28	**16.80**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.40	6.8	0.64	**1.720669 cfs**

Dewberry®

Basin Name:	3-II					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	125,249 sf		2.88 acres			
Impervios Area:	20,781 sf		0.48 acres		98	0.95
Pervious Area:	104,468 sf		2.40 acres		49	0.3
			Weighted Total:		**57**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	16	15.5	458	0.109	1.60	**96.05**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.41	2.9	2.88	**3.400799** cfs

Dewberry

Basin Name:	3-JJ				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	51,050 sf	1.17 acres			
Impervios Area:	15,322 sf	0.35 acres		98	0.95
Pervious Area:	35,728 sf	0.82 acres		49	0.3
			Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	16	15.5	130	0.385	0.26	**15.81**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.50	7	1.17	**4.061527 cfs**

Dewberry®

Basin Name:		3-KK		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	56,924 sf	1.31 acres		
Impervios Area:	22,602 sf	0.52 acres	98	0.95
Pervious Area:	34,322 sf	0.79 acres	49	0.3
		Weighted Total:	**68**	**0.56**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
68	17.5	17	235	0.213	0.50	**30.14**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.56	5.3	1.31	**3.865313 cfs**

Basin Name:	3-LL			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	68,190 sf	1.57 acres		
Impervios Area:	2,217 sf	0.05 acres	98	0.95
Pervious Area:	65,973 sf	1.51 acres	49	0.3
		Weighted Total:	**51**	**0.32**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
51	18	16	215	0.930	0.35	**21.19**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.32	6.2	1.57	**3.116802 cfs**

Dewberry

Basin Name:	3-MM			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	70,756 sf	1.62 acres		
Impervios Area:	3,183 sf	0.07 acres	98	0.95
Pervious Area:	67,573 sf	1.55 acres	49	0.3
		Weighted Total:	**51**	**0.33**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
51	15	12	158	1.899	0.19	**11.42**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.33	7.7	1.62	**4.117936 cfs**

Dewberry

Basin Name:	3-NN			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	34,589 sf	0.79 acres		
Impervios Area:	3,183 sf	0.07 acres	98	0.95
Pervious Area:	31,406 sf	0.72 acres	49	0.3
		Weighted Total:	**54**	**0.36**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	16	15.5	222	0.225	0.68	**41.05**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.36	4.6	0.79	**1.314279 cfs**

Basin Name:	3-OO			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	14,450 sf	0.33 acres		
Impervios Area:	782 sf	0.02 acres	98	0.95
Pervious Area:	13,668 sf	0.31 acres	49	0.3
		Weighted Total:	**52**	**0.34**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
52	16	15.5	140	0.357	0.39	**23.62**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.34	5.9	0.33	**0.656003 cfs**

Dewberry®

Basin Name:	3-PP				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	48,395 sf		1.11 acres		
Impervios Area:	9,415 sf		0.22 acres	98	0.95
Pervious Area:	38,980 sf		0.89 acres	49	0.3
			Weighted Total:	**59**	**0.43**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	14.5	14	165	0.303	0.41	**24.59**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	5.9	1.11	**2.795355 cfs**

Dewberry®

Basin Name:	3-QQ			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	78,150 sf	1.79 acres		
Impervios Area:	24,859 sf	0.57 acres	98	0.95
Pervious Area:	53,291 sf	1.22 acres	49	0.3
		Weighted Total:	**65**	**0.51**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
65	16	14	342	0.585	0.45	**27.17**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.51	5.5	1.79	**5.000423 cfs**

Dewberry

Basin Name:	3-RR				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	99,904 sf	2.29 acres			
Impervios Area:	16,341 sf	0.38 acres		98	0.95
Pervious Area:	83,563 sf	1.92 acres		49	0.3
			Weighted Total:	**57**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	16	14	332	0.602	0.53	**31.70**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.41	5.2	2.29	**4.845795 cfs**

Dewberry

Basin Name:	3-SS			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	113,385 sf	2.60 acres		
Impervios Area:	22,935 sf	0.53 acres	98	0.95
Pervious Area:	90,450 sf	2.08 acres	49	0.3
		Weighted Total:	**59**	**0.43**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	18	16.5	167	0.898	0.24	**14.28**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	6.8	2.60	**7.637238 cfs**

Dewberry

Basin Name:	3-TT				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	17,228	sf	0.40 acres		
Impervios Area:	-	sf	0.00 acres	98	0.95
Pervious Area:	17,228	sf	0.40 acres	49	0.3
			Weighted Total:	**49**	**0.30**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
49	14.5	14	92	0.543	0.24	**14.64**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.30	8.5	0.40	**1.008526 cfs**

Dewberry

Basin Name:	3-UU			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	13,368 sf	0.31 acres		
Impervios Area:	745 sf	0.02 acres	98	0.95
Pervious Area:	12,623 sf	0.29 acres	49	0.3
		Weighted Total:	**52**	**0.34**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
52	15	14	170	0.588	0.36	**21.46**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.34	6.2	0.31	**0.639734 cfs**

Dewberry®

Basin Name:	3-VV			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	45,233 sf	1.04 acres		
Impervios Area:	7,038 sf	0.16 acres	98	0.95
Pervious Area:	38,195 sf	0.88 acres	49	0.3
		Weighted Total:	**57**	**0.40**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	15.5	15	170	0.294	0.45	**26.82**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.40	5.3	1.04	**2.207676 cfs**

Dewberry®

Basin Name:	**3-WW**			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	216,997 sf	4.98 acres		
Impervios Area:	87,131 sf	2.00 acres	98	0.95
Pervious Area:	129,866 sf	2.98 acres	49	0.3
		Weighted Total:	**69**	**0.56**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
69	18	17	422	0.237	0.76	**45.36**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.56	4.4	4.98	**12.29639 cfs**

Dewberry

Basin Name:	**3-XX**			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	195,869 sf	4.50 acres		
Impervios Area:	26,725 sf	0.61 acres	98	0.95
Pervious Area:	169,144 sf	3.88 acres	49	0.3
		Weighted Total:	**56**	**0.39**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	18	17.5	230	0.217	0.68	**40.68**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.39	4.6	4.50	**8.039646 cfs**

Basin Name:	**23-GGGG**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	60,023 sf		1.38 acres			
Impervios Area:	27,795 sf		0.64 acres		98	0.95
Pervious Area:	32,228 sf		0.74 acres		49	0.3
				Weighted Total:	**72**	**0.60**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
72	8	7	166	0.602	0.21	**12.43**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.60	7.6	1.38	**6.293842 cfs**

Dewberry

Basin Name:	23-A			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	24,546 sf	0.56 acres		
Impervios Area:	3,254 sf	0.07 acres	98	0.95
Pervious Area:	21,292 sf	0.49 acres	49	0.3
		Weighted Total:	**55**	**0.39**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
55	17	16.5	119	0.420	0.29	**17.36**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.39	6.8	0.56	**1.479718 cfs**

Dewberry®

Basin Name:		23-B		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	117,674 sf	2.70 acres		
Impervios Area:	35,063 sf	0.80 acres	98	0.95
Pervious Area:	82,611 sf	1.90 acres	49	0.3
		Weighted Total:	**64**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	16	15.5	175	0.286	0.39	**23.33**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.49	6.1	2.70	**8.135175 cfs**

Dewberry

Basin Name:	23-C			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	74,322 sf	1.71 acres		
Impervios Area:	26,157 sf	0.60 acres	98	0.95
Pervious Area:	48,165 sf	1.11 acres	49	0.3
		Weighted Total:	**66**	**0.53**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
66	16	15.5	208	0.240	0.45	**27.27**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.53	5.5	1.71	**4.961951 cfs**

Dewberry

Basin Name:		23-D		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	52,458 sf	1.20 acres		
Impervios Area:	8,876 sf	0.20 acres	98	0.95
Pervious Area:	43,582 sf	1.00 acres	49	0.3
		<u>Weighted Total:</u>	**<u>57</u>**	**<u>0.41</u>**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	16	15.5	237	0.211	0.68	**<u>40.62</u>**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.41	4.6	1.20	**<u>2.27115</u>** **<u>cfs</u>**

Dewberry

Basin Name:		23-E		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	141,233 sf	3.24 acres		
Impervios Area:	36,706 sf	0.84 acres	98	0.95
Pervious Area:	104,527 sf	2.40 acres	49	0.3
		Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	17	16	224	0.446	0.40	**23.85**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	6	3.24	**9.122424 cfs**

Dewberry®

Basin Name:	23-F			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	116,859 sf	2.68 acres		
Impervios Area:	29,855 sf	0.69 acres	98	0.95
Pervious Area:	87,004 sf	2.00 acres	49	0.3
		Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	16	15.5	320	0.156	0.90	**53.92**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	3.9	2.68	**4.876204 cfs**

Dewberry®

Basin Name:		**23-G**		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	131,755 sf	3.02 acres		
Impervios Area:	30,423 sf	0.70 acres	98	0.95
Pervious Area:	101,332 sf	2.33 acres	49	0.3
		Weighted Total:	**60**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	16	15.5	272	0.184	0.75	**45.01**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.45	4.4	3.02	**5.990045 cfs**

Dewberry

Basin Name:	23-H				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	50,804 sf	1.17 acres			
Impervios Area:	9,804 sf	0.23 acres		98	0.95
Pervious Area:	41,000 sf	0.94 acres		49	0.3
			Weighted Total:	**58**	**0.43**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	16	15.5	165	0.303	0.41	**24.64**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	5.8	1.17	**2.877871 cfs**

Dewberry

Basin Name:	23-I				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	66,742 sf	1.53 acres			
Impervios Area:	23,942 sf	0.55 acres		98	0.95
Pervious Area:	42,800 sf	0.98 acres		49	0.3
			Weighted Total:	**67**	**0.53**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	16	15.5	302	0.166	0.73	**43.89**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.53	4.4	1.53	**3.594434 cfs**

Dewberry®

Basin Name:		23-J				
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:		71,493 sf		1.64 acres		
Impervios Area:		15,825 sf		0.36 acres	98	0.95
Pervious Area:		55,668 sf		1.28 acres	49	0.3
				Weighted Total:	**60**	**0.44**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	16	15.5	234	0.214	0.62	**37.46**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.44	4.8	1.64	**3.496876 cfs**

Dewberry®

Basin Name:			**23-K**			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	91,681 sf		2.10 acres			
Impervios Area:	22,242 sf		0.51 acres		98	0.95
Pervious Area:	69,439 sf		1.59 acres		49	0.3
			Weighted Total:		**61**	**0.46**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	18	16	362	0.552	0.54	**32.16**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.46	5.2	2.10	**5.00919 cfs**

Basin Name:	23-L					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	53,332 sf		1.22 acres			
Impervios Area:	12,912 sf		0.30 acres		98	0.95
Pervious Area:	40,420 sf		0.93 acres		49	0.3
				Weighted Total:	**61**	**0.46**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	18	15	260	1.154	0.28	**17.09**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.46	6.7	1.22	**3.751815 cfs**

Dewberry®

Basin Name:	23-M			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	15,670 sf	0.36 acres		
Impervios Area:	6,729 sf	0.15 acres	98	0.95
Pervious Area:	8,941 sf	0.21 acres	49	0.3
		Weighted Total:	**70**	**0.58**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
70	18	17	189	0.529	0.26	**15.39**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.58	7	0.36	**1.458309 cfs**

Dewberry®

Basin Name:					**23-N**	
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	15,670 sf		0.36 acres			
Impervios Area:	6,729 sf		0.15 acres		98	0.95
Pervious Area:	8,941 sf		0.21 acres		49	0.3
			Weighted Total:		**70**	**0.58**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
70	17	16	201	0.498	0.28	**16.67**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.58	6.8	0.36	**1.416643 cfs**

Dewberry

Basin Name:		23-O		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	15,670 sf	0.36 acres		
Impervios Area:	6,729 sf	0.15 acres	98	0.95
Pervious Area:	8,941 sf	0.21 acres	49	0.3
		<u>Weighted Total:</u>	**<u>70</u>**	**<u>0.58</u>**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
70	16	15.5	130	0.385	0.22	**<u>13.38</u>**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.58	7.4	0.36	**<u>1.541641</u>** **<u>cfs</u>**

Dewberry

Basin Name:		23-P			
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	60,587 sf	1.39 acres			
Impervios Area:	17,366 sf	0.40 acres		98	0.95
Pervious Area:	43,221 sf	0.99 acres		49	0.3
			Weighted Total:	**63**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	17	16	257	0.389	0.46	**27.58**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.49	5.5	1.39	**3.720202 cfs**

Dewberry®

Basin Name:	23-Q			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	85,544 sf	1.96 acres		
Impervios Area:	20,001 sf	0.46 acres	98	0.95
Pervious Area:	65,543 sf	1.50 acres	49	0.3
		Weighted Total:	**60**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	18	8	750	1.333	0.62	**37.49**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.45	4.8	1.96	**4.260479 cfs**

Dewberry®

Basin Name:			23-R			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	33,264 sf		0.76 acres			
Impervios Area:	5,628 sf		0.13 acres		98	0.95
Pervious Area:	27,636 sf		0.63 acres		49	0.3
				Weighted Total:	**57**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	18	11	522	1.341	0.51	**30.30**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.41	5.3	0.76	**1.65928 cfs**

Dewberry®

Basin Name:	23-S			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	88,525 sf	2.03 acres		
Impervios Area:	18,538 sf	0.43 acres	98	0.95
Pervious Area:	69,987 sf	1.61 acres	49	0.3
		Weighted Total:	**59**	**0.44**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	18	6	311	3.859	0.19	**11.23**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.44	7.8	2.03	**6.913135 cfs**

Dewberry

Basin Name:	23-T			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	526,171 sf	12.08 acres		
Impervios Area:	100,541 sf	2.31 acres	98	0.95
Pervious Area:	425,630 sf	9.77 acres	49	0.3
		Weighted Total:	**58**	**0.42**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	18	4	476	2.941	0.31	**18.50**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.42	6.6	12.08	**33.81863 cfs**

Dewberry®

Basin Name:		23-U		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	262,894 sf	6.04 acres		
Impervios Area:	79,428 sf	1.82 acres	98	0.95
Pervious Area:	183,466 sf	4.21 acres	49	0.3
		Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	18	17.5	623	0.080	2.02	**120.92**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.50	2.4	6.04	**7.189884 cfs**

Dewberry

Basin Name:			23-V			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	9,043 sf		0.21 acres			
Impervios Area:	1,548 sf		0.04 acres		98	0.95
Pervious Area:	7,495 sf		0.17 acres		49	0.3
			Weighted Total:		**57**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	18	17.5	97	0.515	0.21	**12.69**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.41	7.4	0.21	**0.631803 cfs**

Dewberry®

Basin Name:	23-W				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	44,671 sf	1.03 acres			
Impervios Area:	12,270 sf	0.28 acres		98	0.95
Pervious Area:	32,401 sf	0.74 acres		49	0.3
			Weighted Total:	**62**	**0.48**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	16.5	16	379	0.132	1.09	**65.60**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.48	3.4	1.03	**1.668529 cfs**

Dewberry®

Basin Name:		23-X		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	104,336 sf	2.40 acres		
Impervios Area:	28,965 sf	0.66 acres	98	0.95
Pervious Area:	75,371 sf	1.73 acres	49	0.3
		Weighted Total:	**63**	**0.48**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	16.5	14	316	0.791	0.38	**23.08**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.48	6	2.40	**6.90469 cfs**

Dewberry

Basin Name:	23-Y			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	24,847 sf	0.57 acres		
Impervios Area:	7,321 sf	0.17 acres	98	0.95
Pervious Area:	17,526 sf	0.40 acres	49	0.3
		Weighted Total:	**63**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	18	15.5	322	0.776	0.39	**23.15**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.49	6	0.57	**1.682197 cfs**

Dewberry

Basin Name:		23-Z		
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	23,685 sf	0.54 acres		
Impervios Area:	7,321 sf	0.17 acres	98	0.95
Pervious Area:	16,364 sf	0.38 acres	49	0.3
		Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	18	15.5	336	0.744	0.40	**24.02**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.50	5.9	0.54	**1.606944 cfs**

Dewberry®

Basin Name:	23-AA			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	139,208 sf	3.20 acres		
Impervios Area:	38,683 sf	0.89 acres	98	0.95
Pervious Area:	100,525 sf	2.31 acres	49	0.3
		Weighted Total:	**63**	**0.48**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	18	15	249	1.205	0.26	**15.45**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.48	6.9	3.20	**10.59811 cfs**

Dewberry®

Basin Name:			**23-BB**			
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	177,916 sf		4.08 acres			
Impervios Area:	36,107 sf		0.83 acres		98	0.95
Pervious Area:	141,809 sf		3.26 acres		49	0.3
			Weighted Total:		**59**	**0.43**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	16	12	604	0.662	0.77	**46.48**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	6.9	4.08	**12.17231 cfs**

Dewberry

Basin Name:	23-CC			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	22,756 sf	0.52 acres		
Impervios Area:	3,426 sf	0.08 acres	98	0.95
Pervious Area:	19,330 sf	0.44 acres	49	0.3
		Weighted Total:	**56**	**0.40**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	18	14.5	275	1.273	0.32	**19.06**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.40	6.5	0.52	**1.350988 cfs**

Dewberry®

Basin Name:	23-DD			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	3,791 sf	0.09 acres		
Impervios Area:	1,463 sf	0.03 acres	98	0.95
Pervious Area:	2,328 sf	0.05 acres	49	0.3
		Weighted Total:	**68**	**0.55**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
68	15	14	70	1.429	0.07	**4.48**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.55	8.5	0.09	**0.407487 cfs**

Dewberry

Basin Name:	**23-EE**				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	93,508 sf	2.15 acres			
Impervios Area:	21,878 sf	0.50 acres		98	0.95
Pervious Area:	71,630 sf	1.64 acres		49	0.3
			Weighted Total:	**60**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	16	8	393	2.036	0.30	**18.09**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.45	6.7	2.15	**6.502061 cfs**

Dewberry®

Basin Name:	23-FF			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	74,668 sf	1.71 acres		
Impervios Area:	25,136 sf	0.58 acres	98	0.95
Pervious Area:	49,532 sf	1.14 acres	49	0.3
		Weighted Total:	**65**	**0.52**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
65	18	14	354	1.130	0.33	**19.62**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.52	6.4	1.71	**5.691651 cfs**

Dewberry®

Basin Name:	23-GG			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	106,406 sf	2.44 acres		
Impervios Area:	11,468 sf	0.26 acres	98	0.95
Pervious Area:	94,938 sf	2.18 acres	49	0.3
		Weighted Total:	**54**	**0.37**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	17	10	464	1.509	0.47	**28.05**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.37	5.4	2.44	**4.881322 cfs**

Dewberry

Basin Name:	23-HH			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	52,082 sf	1.20 acres		
Impervios Area:	11,600 sf	0.27 acres	98	0.95
Pervious Area:	40,482 sf	0.93 acres	49	0.3
		Weighted Total:	**60**	**0.44**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	15	10	316	1.582	0.29	**17.47**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.44	6.7	1.20	**3.562966 cfs**

Dewberry

Basin Name:	23-II			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	52,082 sf	1.20 acres		
Impervios Area:	11,600 sf	0.27 acres	98	0.95
Pervious Area:	40,482 sf	0.93 acres	49	0.3
		Weighted Total:	**60**	**0.44**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	17	15	143	1.399	0.16	**9.86**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.44	8.2	1.20	**4.360646 cfs**

Dewberry®

Basin Name:	23-JJ				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	106,406 sf	2.44 acres			
Impervios Area:	8,539 sf	0.20 acres		98	0.95
Pervious Area:	97,867 sf	2.25 acres		49	0.3
			Weighted Total:	**53**	**0.35**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
53	18	12	518	1.158	0.60	**36.17**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.35	4.9	2.44	**4.215187 cfs**

Basin Name:	23-KK			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	49,285 sf	1.13 acres		
Impervios Area:	6,547 sf	0.15 acres	98	0.95
Pervious Area:	42,738 sf	0.98 acres	49	0.3
		Weighted Total:	**56**	**0.39**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	16	10	261	2.299	0.23	**13.90**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.39	7.3	1.13	**3.190993 cfs**

Dewberry

Basin Name:	23-LL			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	136,850 sf	3.14 acres		
Impervios Area:	48,390 sf	1.11 acres	98	0.95
Pervious Area:	88,460 sf	2.03 acres	49	0.3
		Weighted Total:	**66**	**0.53**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
66	15	6	382	2.356	0.24	**14.13**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.53	7.2	3.14	**11.98488 cfs**

Dewberry

Basin Name:	23-MM				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	94,342 sf	2.17 acres			
Impervios Area:	12,936 sf	0.30 acres		98	0.95
Pervious Area:	81,406 sf	1.87 acres		49	0.3
			Weighted Total:	**56**	**0.39**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
56	17	6	479	2.296	0.37	**22.49**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.39	6.1	2.17	**5.140888 cfs**

Dewberry

Basin Name:	23-NN			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	21,427 sf	0.49 acres		
Impervios Area:	8,079 sf	0.19 acres	98	0.95
Pervious Area:	13,348 sf	0.31 acres	49	0.3
		Weighted Total:	**67**	**0.55**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	15	8	222	3.153	0.13	**7.68**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.55	8.5	0.49	**2.279048 cfs**

Dewberry®

Basin Name:	23-OO				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	29,549 sf	0.68 acres			
Impervios Area:	10,600 sf	0.24 acres		98	0.95
Pervious Area:	18,949 sf	0.44 acres		49	0.3
			Weighted Total:	**67**	**0.53**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	14	9	244	2.049	0.18	**10.52**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.53	8	0.68	**2.893425 cfs**

Basin Name:	23-PP			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	52,254 sf	1.20 acres		
Impervios Area:	13,549 sf	0.31 acres	98	0.95
Pervious Area:	38,705 sf	0.89 acres	49	0.3
		<u>Weighted Total:</u>	**<u>62</u>**	**<u>0.47</u>**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	14	7	252	2.778	0.18	**<u>10.51</u>**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	8	1.20	**<u>4.496428 cfs</u>**

Dewberry®

Basin Name:	**23-QQ**			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	137,640 sf	3.16 acres		
Impervios Area:	27,460 sf	0.63 acres	98	0.95
Pervious Area:	110,180 sf	2.53 acres	49	0.3
		Weighted Total:	**59**	**0.43**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
59	12	3	232	3.879	0.15	**8.97**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.43	8.2	3.16	**11.13306 cfs**

Dewberry

Basin Name:	23-RR					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	70,188 sf		1.61 acres			
Impervios Area:	11,988 sf		0.28 acres		98	0.95
Pervious Area:	58,200 sf		1.34 acres		49	0.3
			Weighted Total:		**57**	**0.41**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
57	16	8	451	1.774	0.39	**23.39**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.41	5.9	1.61	**3.907409 cfs**

Dewberry

Basin Name:	**23-SS**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	73,910 sf		1.70 acres			
Impervios Area:	7,855 sf		0.18 acres		98	0.95
Pervious Area:	66,055 sf		1.52 acres		49	0.3
				Weighted Total:	**54**	**0.37**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	13	6	279	2.509	0.24	**14.51**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.37	7.1	1.70	**4.446261 cfs**

Dewberry

Basin Name:	23-TT				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	26,805 sf		0.62 acres		
Impervios Area:	4,830 sf		0.11 acres	98	0.95
Pervious Area:	21,975 sf		0.50 acres	49	0.3
			Weighted Total:	**58**	**0.42**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	14	6	244	3.279	0.17	**10.41**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.42	8	0.62	**2.053444 cfs**

Dewberry®

Basin Name:	23-UU			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	9,503 sf	0.22 acres		
Impervios Area:	4,327 sf	0.10 acres	98	0.95
Pervious Area:	5,176 sf	0.12 acres	49	0.3
		Weighted Total:	**71**	**0.60**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
71	9	8	95	1.053	0.10	**6.08**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.60	8	0.22	**1.040119 cfs**

Dewberry®

Basin Name:	23-VV			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	98,435 sf	2.26 acres		
Impervios Area:	27,943 sf	0.64 acres	98	0.95
Pervious Area:	70,492 sf	1.62 acres	49	0.3
		Weighted Total:	**63**	**0.48**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	14	6	377	2.122	0.27	**16.10**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.48	8	2.26	**8.759128 cfs**

Dewberry®

Basin Name:	**23-WW**			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	45,497 sf	1.04 acres		
Impervios Area:	13,357 sf	0.31 acres	98	0.95
Pervious Area:	32,140 sf	0.74 acres	49	0.3
		Weighted Total:	**63**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	13	8	237	2.110	0.18	**11.00**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.49	7.9	1.04	**4.049956 cfs**

Dewberry

Basin Name:	23-XX				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	10,353 sf		0.24 acres		
Impervios Area:	2,572 sf		0.06 acres	98	0.95
Pervious Area:	7,781 sf		0.18 acres	49	0.3
			Weighted Total:	**61**	**0.46**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	12	10	101	1.980	0.10	**6.07**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.46	8.5	0.24	**0.932288 cfs**

Dewberry®

Basin Name:	23-YY			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	207,785 sf	4.77 acres		
Impervios Area:	36,843 sf	0.85 acres	98	0.95
Pervious Area:	170,942 sf	3.92 acres	49	0.3
		Weighted Total:	**58**	**0.42**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	14	8	433	1.386	0.42	**25.41**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.42	5.8	4.77	**11.48861 cfs**

Dewberry®

Basin Name:	**23-ZZ**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	34,409 sf		0.79 acres			
Impervios Area:	3,702 sf		0.08 acres		98	0.95
Pervious Area:	30,707 sf		0.70 acres		49	0.3
			Weighted Total:		**54**	**0.37**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
54	12	7	230	2.174	0.22	**13.33**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.37	7.5	0.79	**2.191632 cfs**

Dewberry®

Basin Name:	**23-AAA**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	179,814 sf		4.13 acres			
Impervios Area:	59,601 sf		1.37 acres		98	0.95
Pervious Area:	120,213 sf		2.76 acres		49	0.3
				Weighted Total:	**65**	**0.52**
Time of Concentration (Lag Equation)						

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
65	18	9	295	3.051	0.17	**10.39**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.52	8	4.13	**17.02201 cfs**

Dewberry®

Basin Name:	**23-BBB**				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	13,335 sf	0.31 acres			
Impervios Area:	3,684 sf	0.08 acres		98	0.95
Pervious Area:	9,651 sf	0.22 acres		49	0.3
			Weighted Total:	**63**	**0.48**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
63	12	9	145	2.069	0.13	**7.66**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.48	8.5	0.31	**1.247896 cfs**

Dewberry

Basin Name:	23-CCC				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	13,825 sf		0.32 acres		
Impervios Area:	4,721 sf		0.11 acres	98	0.95
Pervious Area:	9,104 sf		0.21 acres	49	0.3
			Weighted Total:	**66**	**0.52**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
66	12	8	178	2.247	0.13	**7.98**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.52	8.5	0.32	**1.40811 cfs**

Dewberry®

Basin Name:	**23-DDD**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	9,562 sf		0.22 acres			
Impervios Area:	2,838 sf		0.07 acres		98	0.95
Pervious Area:	6,724 sf		0.15 acres		49	0.3
				Weighted Total:	**64**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	12	10	106	1.887	0.10	**6.09**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.49	8.5	0.22	**0.919721 cfs**

Dewberry

Basin Name:	23-EEE			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	109,316 sf	2.51 acres		
Impervios Area:	24,508 sf	0.56 acres	98	0.95
Pervious Area:	84,808 sf	1.95 acres	49	0.3
		Weighted Total:	**60**	**0.45**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
60	17	6	530	2.075	0.38	**23.03**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.45	5.8	2.51	**6.487718 cfs**

Dewberry®

Basin Name:	**23-FFF**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	119,380 sf		2.74 acres			
Impervios Area:	37,618 sf		0.86 acres		98	0.95
Pervious Area:	81,762 sf		1.88 acres		49	0.3
				Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	16	13	304	0.987	0.32	**19.11**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.50	6.5	2.74	**8.992816 cfs**

Dewberry

Basin Name:	23-GGG			

Curve Number & Runoff Coefficient

			"CN"	"C"
Contributing Area:	104,273 sf	2.39 acres		
Impervios Area:	31,840 sf	0.73 acres	98	0.95
Pervious Area:	72,433 sf	1.66 acres	49	0.3
		Weighted Total:	**64**	**0.50**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	16	8	395	2.025	0.28	**16.65**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.50	6.8	2.39	**8.114089 cfs**

Dewberry

Basin Name:	**23-HHH**				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	13,166 sf	0.30 acres			
Impervios Area:	7,255 sf	0.17 acres		98	0.95
Pervious Area:	5,911 sf	0.14 acres		49	0.3
			Weighted Total:	**76**	**0.66**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
76	9	8.5	98	0.510	0.13	**7.84**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.66	8.5	0.30	**1.690936 cfs**

Dewberry

Basin Name:	23-III				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	11,078 sf		0.25 acres		
Impervios Area:	2,806 sf		0.06 acres	98	0.95
Pervious Area:	8,272 sf		0.19 acres	49	0.3
			Weighted Total:	**61**	**0.46**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
61	10	9	106	0.943	0.15	**9.09**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.46	8	0.25	**0.945326 cfs**

Basin Name:	23-JJJ			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	61,238 sf	1.41 acres		
Impervios Area:	25,136 sf	0.58 acres	98	0.95
Pervious Area:	36,102 sf	0.83 acres	49	0.3
		Weighted Total:	**69**	**0.57**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
69	16	9.5	369	1.762	0.25	**14.77**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.57	7	1.41	**5.577792 cfs**

Dewberry

Basin Name:	23-KKK			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	101,880 sf	2.34 acres		
Impervios Area:	34,215 sf	0.79 acres	98	0.95
Pervious Area:	67,665 sf	1.55 acres	49	0.3
		Weighted Total:	**65**	**0.52**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
65	9	8	170	0.588	0.25	**15.14**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.52	7	2.34	**8.485451 cfs**

Dewberry®

Basin Name:	23-LLL				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	83,873 sf	1.93 acres			
Impervios Area:	7,341 sf	0.17 acres		98	0.95
Pervious Area:	76,532 sf	1.76 acres		49	0.3
			Weighted Total:	**53**	**0.36**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
53	16	10	411	1.460	0.44	**26.54**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.36	5.7	1.93	**3.916925 cfs**

Dewberry®

Basin Name:	23-MMM			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	73,231 sf	1.68 acres		
Impervios Area:	27,389 sf	0.63 acres	98	0.95
Pervious Area:	45,842 sf	1.05 acres	49	0.3
		Weighted Total:	**67**	**0.54**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	16	10	314	1.911	0.22	**13.07**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.54	7.6	1.68	**6.939126 cfs**

Dewberry®

Basin Name:	23-NNN			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	83,032 sf	1.91 acres		
Impervios Area:	21,506 sf	0.49 acres	98	0.95
Pervious Area:	61,526 sf	1.41 acres	49	0.3
		Weighted Total:	**62**	**0.47**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
62	16	8	395	2.025	0.29	**17.65**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.47	6.7	1.91	**5.981473 cfs**

Dewberry

Basin Name:	**23-000**				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	39,185 sf		0.90 acres		
Impervios Area:	6,979 sf		0.16 acres	98	0.95
Pervious Area:	32,206 sf		0.74 acres	49	0.3
			Weighted Total:	**58**	**0.42**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
58	15	9	448	1.339	0.44	**26.54**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.42	6.7	0.90	**2.505863 cfs**

Basin Name:	23-PPP			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	82,729 sf	1.90 acres		
Impervios Area:	24,644 sf	0.57 acres	98	0.95
Pervious Area:	58,085 sf	1.33 acres	49	0.3
		Weighted Total:	**64**	**0.49**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
64	17	10	598	1.171	0.51	**30.81**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.49	5.3	1.90	**4.968726 cfs**

Dewberry

Basin Name:	23-QQQ			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	6,882 sf	0.16 acres		
Impervios Area:	2,560 sf	0.06 acres	98	0.95
Pervious Area:	4,322 sf	0.10 acres	49	0.3
		Weighted Total:	**67**	**0.54**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	16	9	182	3.846	0.10	**5.97**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.54	8.5	0.16	**0.727573 cfs**

Dewberry®

Basin Name:	23-RRR					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	6,608 sf		0.15 acres			
Impervios Area:	2,453 sf		0.06 acres		98	0.95
Pervious Area:	4,155 sf		0.10 acres		49	0.3
				Weighted Total:	**67**	**0.54**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	15	10	160	3.125	0.10	**5.98**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.54	8.5	0.15	**0.697962 cfs**

Dewberry

Basin Name:	23-SSS			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	23,478 sf	0.54 acres		
Impervios Area:	12,013 sf	0.28 acres	98	0.95
Pervious Area:	11,465 sf	0.26 acres	49	0.3
		Weighted Total:	**74**	**0.63**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
74	12	10	189	1.058	0.16	**9.73**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.63	8	0.54	**2.727612 cfs**

Dewberry®

Basin Name:	**23-TTT**				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	18,184 sf		0.42 acres		
Impervios Area:	1,335 sf		0.03 acres	98	0.95
Pervious Area:	16,849 sf		0.39 acres	49	0.3
			Weighted Total:	**53**	**0.35**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
53	10	9.5	148	0.338	0.41	**24.79**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.35	5.8	0.42	**0.841899 cfs**

Basin Name:	23-UUU			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	102,792 sf	2.36 acres		
Impervios Area:	47,184 sf	1.08 acres	98	0.95
Pervious Area:	55,608 sf	1.28 acres	49	0.3
		Weighted Total:	**71**	**0.60**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
71	18	10	378	2.116	0.21	**12.88**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.60	7.6	2.36	**10.73128 cfs**

Dewberry

Basin Name:	23-VVV					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	12,066 sf		0.28 acres			
Impervios Area:	5,238 sf		0.12 acres		98	0.95
Pervious Area:	6,828 sf		0.16 acres		49	0.3
				Weighted Total:	**70**	**0.58**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
70	12	11	121	0.826	0.14	**8.56**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.58	8.5	0.28	**1.370713 cfs**

Dewberry

Basin Name:	**23-WWW**			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	74,679 sf	1.71 acres		
Impervios Area:	24,557 sf	0.56 acres	98	0.95
Pervious Area:	50,122 sf	1.15 acres	49	0.3
		Weighted Total:	**65**	**0.51**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
65	18	10	516	1.550	0.38	**22.87**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.51	6.1	1.71	**5.372614 cfs**

Dewberry®

Basin Name:	**23-XXX**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	5,971 sf		0.14 acres			
Impervios Area:	3,698 sf		0.08 acres		98	0.95
Pervious Area:	2,273 sf		0.05 acres		49	0.3
				Weighted Total:	**79**	**0.70**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
79	4	3	74	1.351	0.06	**3.48**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.70	8.5	0.14	**0.818584 cfs**

Dewberry®

Basin Name:	23-YYY			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	6,340 sf	0.15 acres		
Impervios Area:	5,564 sf	0.13 acres	98	0.95
Pervious Area:	776 sf	0.02 acres	49	0.3
		<u>Weighted Total:</u>	**<u>92</u>**	**<u>0.87</u>**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
92	4	3	77	1.299	0.04	**<u>2.32</u>**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.87	8.5	0.15	**<u>1.076862</u> <u>cfs</u>**

Dewberry®

Basin Name:	23-ZZZ			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	6,408 sf	0.15 acres		
Impervios Area:	4,812 sf	0.11 acres	98	0.95
Pervious Area:	1,596 sf	0.04 acres	49	0.3
		Weighted Total:	**86**	**0.79**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
86	3.5	3	80	0.625	0.07	**4.40**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.79	8.5	0.15	**0.985461 cfs**

Dewberry

Basin Name:	23-AAAA				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	12,923 sf	0.30 acres			
Impervios Area:	6,352 sf	0.15 acres		98	0.95
Pervious Area:	6,571 sf	0.15 acres		49	0.3
			Weighted Total:	**73**	**0.62**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
73	6	4	215	0.930	0.20	**11.83**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.62	8	0.30	**1.470285 cfs**

Dewberry

Basin Name:	**23-BBBB**					
Curve Number & Runoff Coefficient						
					"CN"	"C"
Contributing Area:	17,917 sf		0.41 acres			
Impervios Area:	9,783 sf		0.22 acres		98	0.95
Pervious Area:	8,134 sf		0.19 acres		49	0.3
				Weighted Total:	**76**	**0.65**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
76	4	3	118	0.847	0.12	**7.11**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.65	8.5	0.41	**2.289702 cfs**

Dewberry

Basin Name:	**23-CCCC**				
Curve Number & Runoff Coefficient					
				"CN"	"C"
Contributing Area:	7,509 sf		0.17 acres		
Impervios Area:	- sf		0.00 acres	98	0.95
Pervious Area:	7,509 sf		0.17 acres	49	0.3
			Weighted Total:	**49**	**0.30**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
49	4	3	90	1.111	0.17	**10.06**

Maximum Flow Rate (Rational Method)

$$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$$

	C	I (in/hr)	A (acres)	
Q =	0.30	8	0.17	**0.413719 cfs**

Basin Name: **23-DDDD**

Curve Number & Runoff Coefficient

			"CN"	"C"
Contributing Area:	19,078 sf	0.44 acres		
Impervios Area:	6,975 sf	0.16 acres	98	0.95
Pervious Area:	12,103 sf	0.28 acres	49	0.3
		Weighted Total:	**67**	**0.54**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	4	3	180	0.556	0.26	**15.70**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.54	8	0.44	**1.883774 cfs**

Dewberry

Basin Name:	23-EEEE			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	47,520 sf	1.09 acres		
Impervios Area:	17,351 sf	0.40 acres	98	0.95
Pervious Area:	30,169 sf	0.69 acres	49	0.3
		Weighted Total:	**67**	**0.54**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
67	6	4	109	1.835	0.10	**5.79**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient) \times i\ (Rainfall\ Intensity) \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.54	8.5	1.09	**4.982559 cfs**

Dewberry

Basin Name:	23-FFFF			
Curve Number & Runoff Coefficient				
			"CN"	"C"
Contributing Area:	12,727 sf	0.29 acres		
Impervios Area:	6,471 sf	0.15 acres	98	0.95
Pervious Area:	6,256 sf	0.14 acres	49	0.3
		Weighted Total:	**74**	**0.63**

Time of Concentration (Lag Equation)

$$t_c = \frac{1.67L^{0.8}\{\frac{1000}{CN} - 9\}^{0.7}}{1900S^{0.5}}$$

CN	High Elev (ft)	Low Elev (ft)	Distance (ft)	Slope (%)	Tc (hr)	Tc (min)
74	6	4	210	0.952	0.19	**11.21**

Maximum Flow Rate (Rational Method)

$Q = C\ (Runoff\ Coefficient)\ \times i\ (Rainfall\ Intensity)\ \times A\ (Drainage\ Area)$

	C	I (in/hr)	A (acres)	
Q =	0.63	7.8	0.29	**1.436849 cfs**

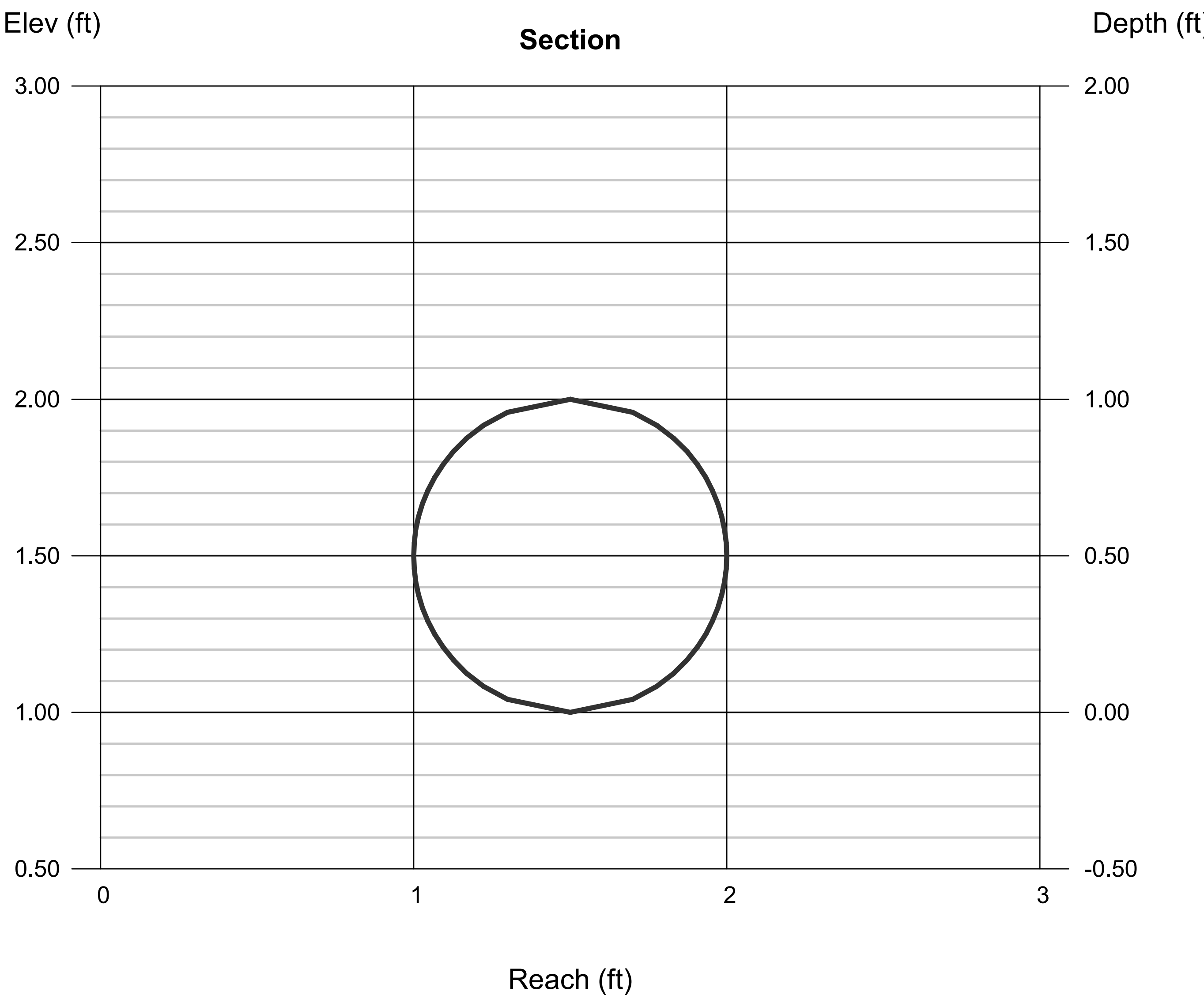
Attachment I

Hydraflow Capacity Report

Channel Report

12 INCH CONCRETE PIPE (FLOWING FULL)

Circular		**Highlighted**	
Diameter (ft)	= 1.00	Depth (ft)	= 1.00
		Q (cfs)	= 2.518
		Area (sqft)	= 0.79
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 3.21
Slope (%)	= 0.50	Wetted Perim (ft)	= 3.14
N-Value	= 0.013	Crit Depth, Yc (ft)	= 0.68
		Top Width (ft)	= 0.00
Calculations		EGL (ft)	= 1.16
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

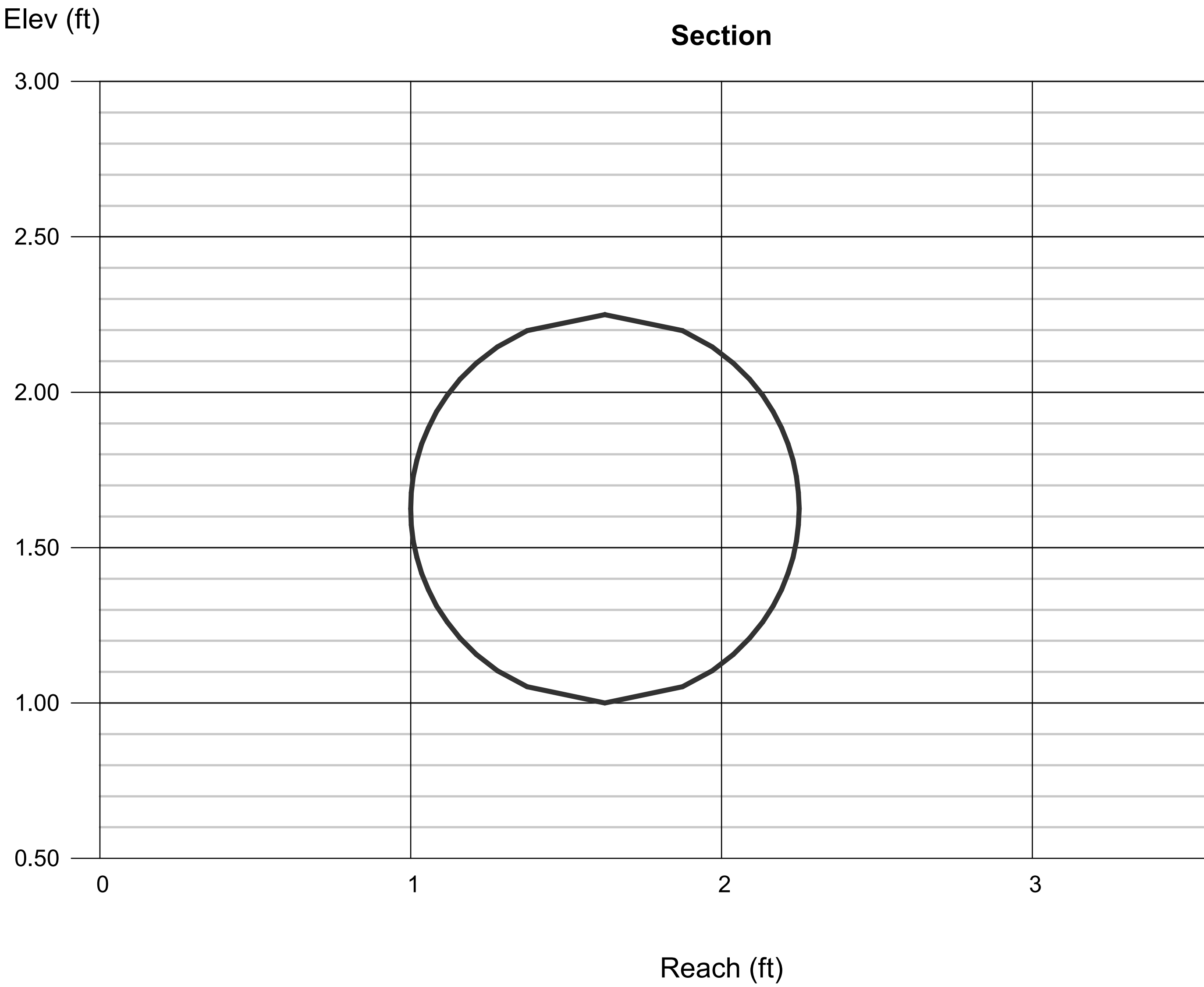
15 INCH CONCRETE PIPE (FLOWING FULL)

Circular
Diameter (ft) = 1.25

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.25
Q (cfs) = 4.566
Area (sqft) = 1.23
Velocity (ft/s) = 3.72
Wetted Perim (ft) = 3.93
Crit Depth, Yc (ft) = 0.87
Top Width (ft) = 0.00
EGL (ft) = 1.47



Channel Report

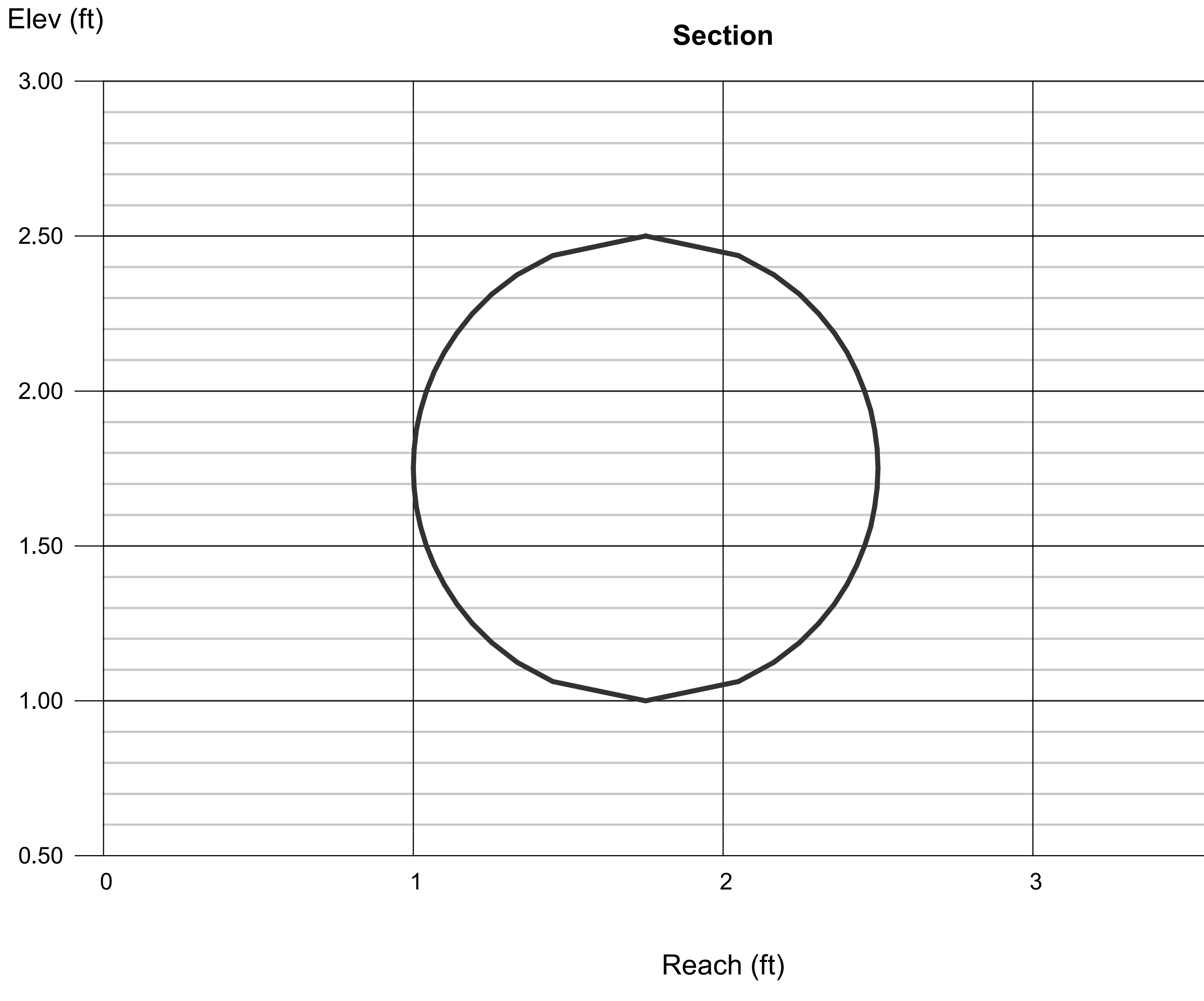
18 INCH CONCRETE PIPE (FLOWING FULL)

Circular
Diameter (ft) = 1.50

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.50
Q (cfs) = 7.425
Area (sqft) = 1.77
Velocity (ft/s) = 4.20
Wetted Perim (ft) = 4.71
Crit Depth, Yc (ft) = 1.06
Top Width (ft) = 0.00
EGL (ft) = 1.77



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

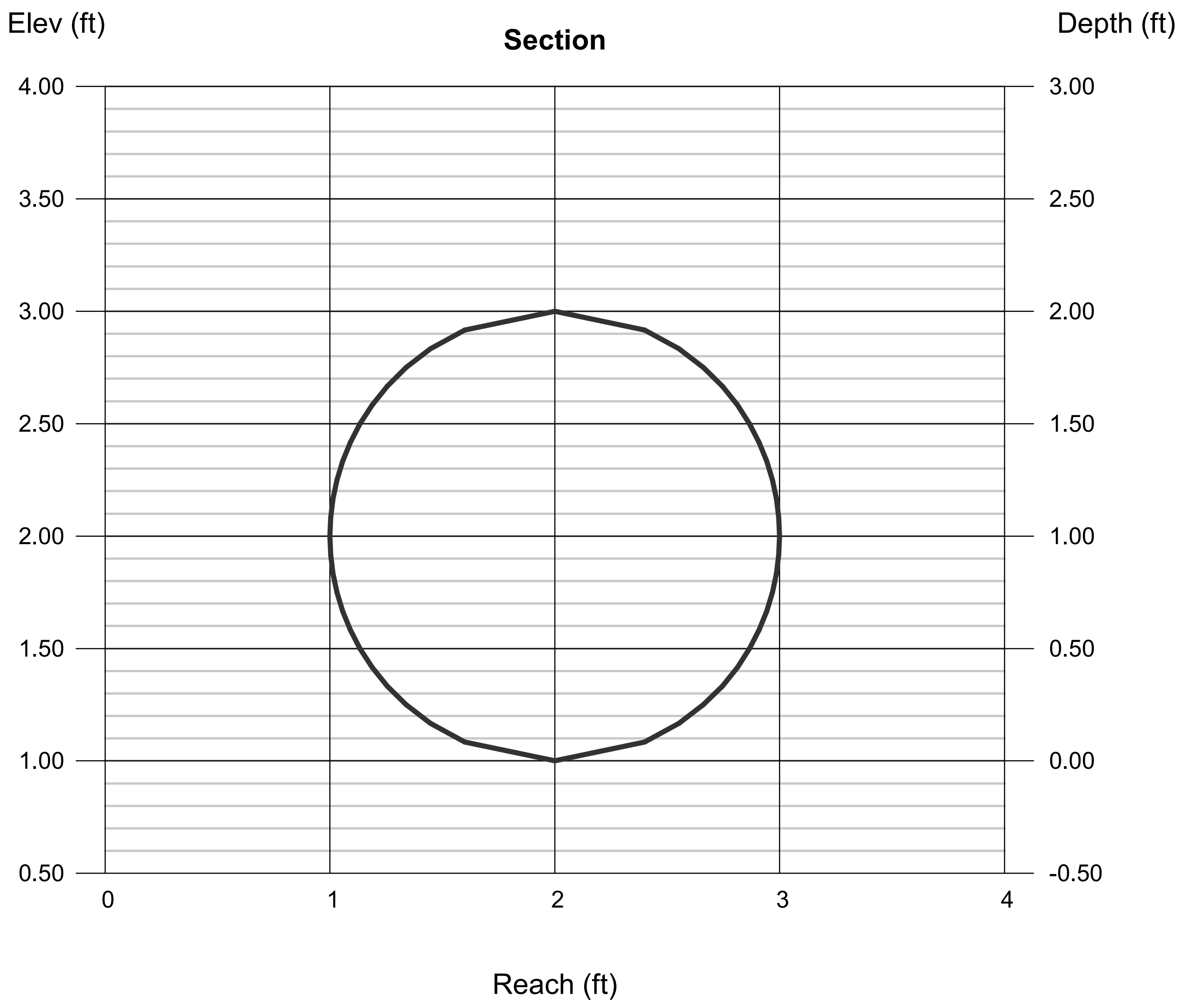
24 INCH CONCRETE PIPE (FLOWING FULL)

Circular
Diameter (ft) = 2.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 2.00
Q (cfs) = 15.99
Area (sqft) = 3.14
Velocity (ft/s) = 5.09
Wetted Perim (ft) = 6.28
Crit Depth, Yc (ft) = 1.44
Top Width (ft) = 0.00
EGL (ft) = 2.40



Channel Report

30 INCH CONCRETE PIPE (FLOWING FULL)

Circular

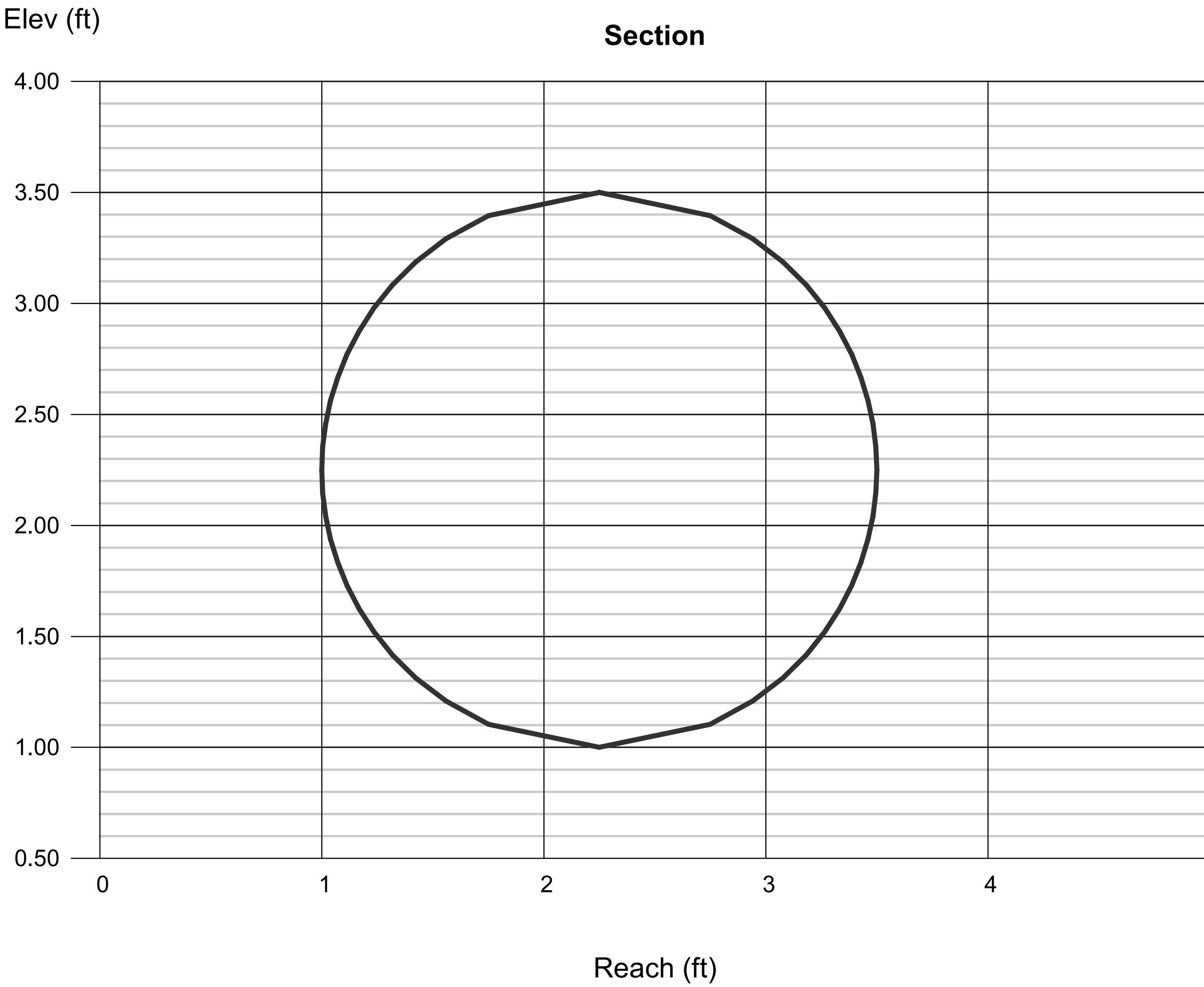
Diameter (ft)	= 2.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 2.50
Q (cfs)	= 29.00
Area (sqft)	= 4.91
Velocity (ft/s)	= 5.91
Wetted Perim (ft)	= 7.85
Crit Depth, Yc (ft)	= 1.84
Top Width (ft)	= 0.00
EGL (ft)	= 3.04



Channel Report

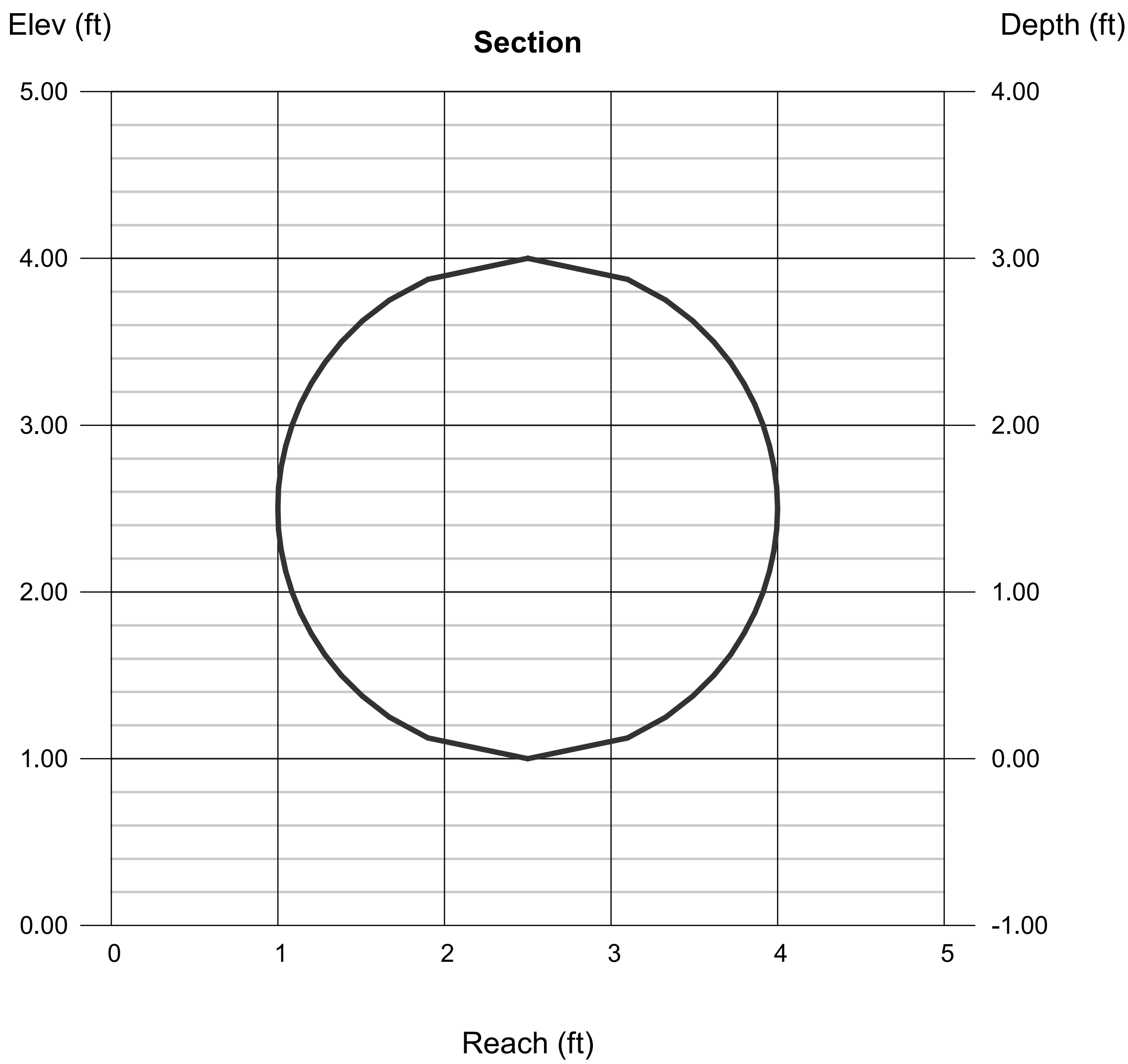
36 INCH CONCRETE PIPE (FLOWING FULL)

Circular
Diameter (ft) = 3.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 3.00
Q (cfs) = 47.16
Area (sqft) = 7.07
Velocity (ft/s) = 6.67
Wetted Perim (ft) = 9.42
Crit Depth, Yc (ft) = 2.24
Top Width (ft) = 0.00
EGL (ft) = 3.69

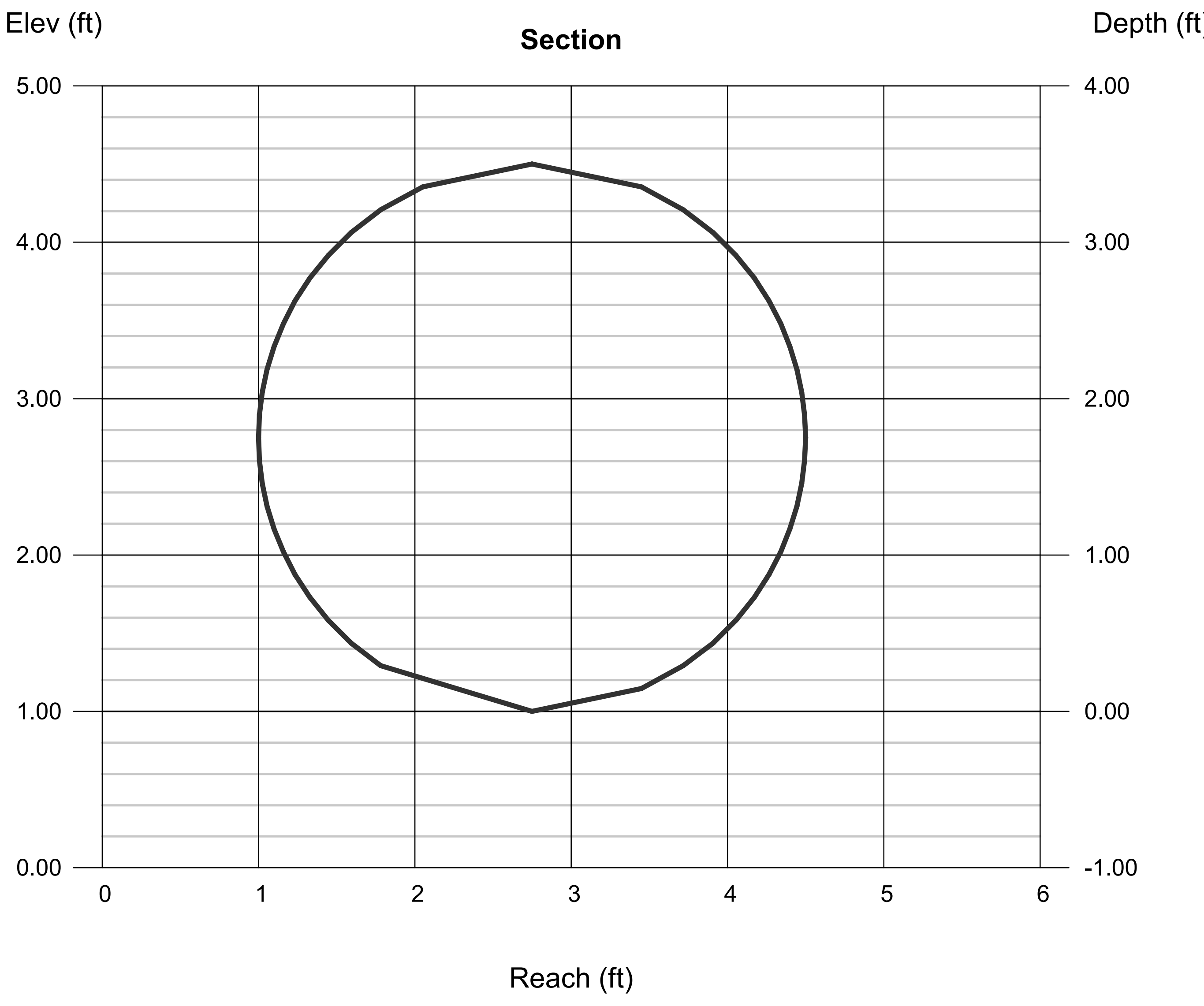


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

42 INCH CONCRETE PIPE (FLOWING FULL)

Circular		**Highlighted**	
Diameter (ft)	= 3.50	Depth (ft)	= 3.50
		Q (cfs)	= 71.14
		Area (sqft)	= 9.62
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 7.39
Slope (%)	= 0.50	Wetted Perim (ft)	= 11.00
N-Value	= 0.013	Crit Depth, Yc (ft)	= 2.65
		Top Width (ft)	= 0.00
Calculations		EGL (ft)	= 4.35
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

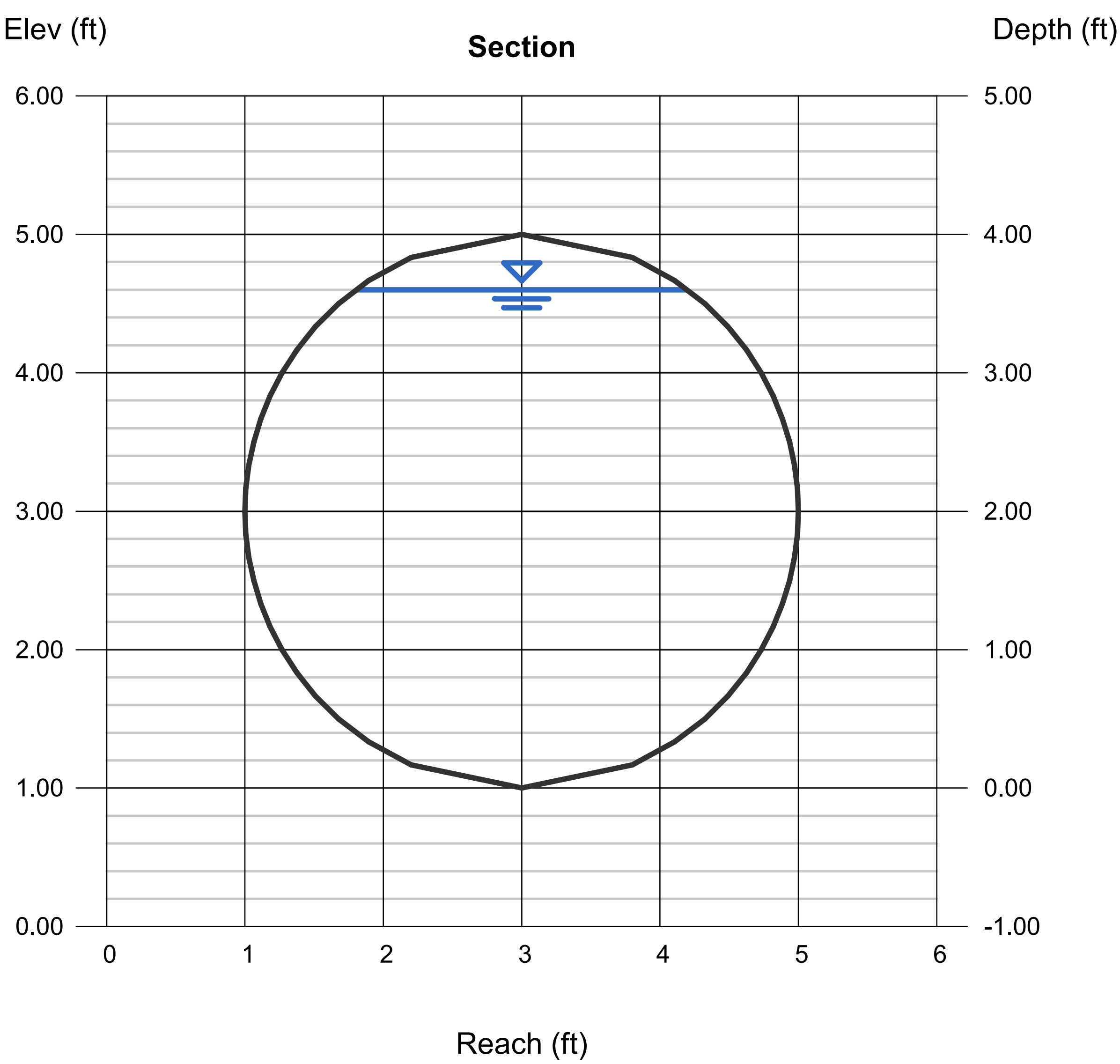
48 INCH CONCRETE PIPE (FLOWING FULL)

Circular
Diameter (ft) = 4.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.013

Calculations
Compute by: Q vs Depth
No. Increments = 10

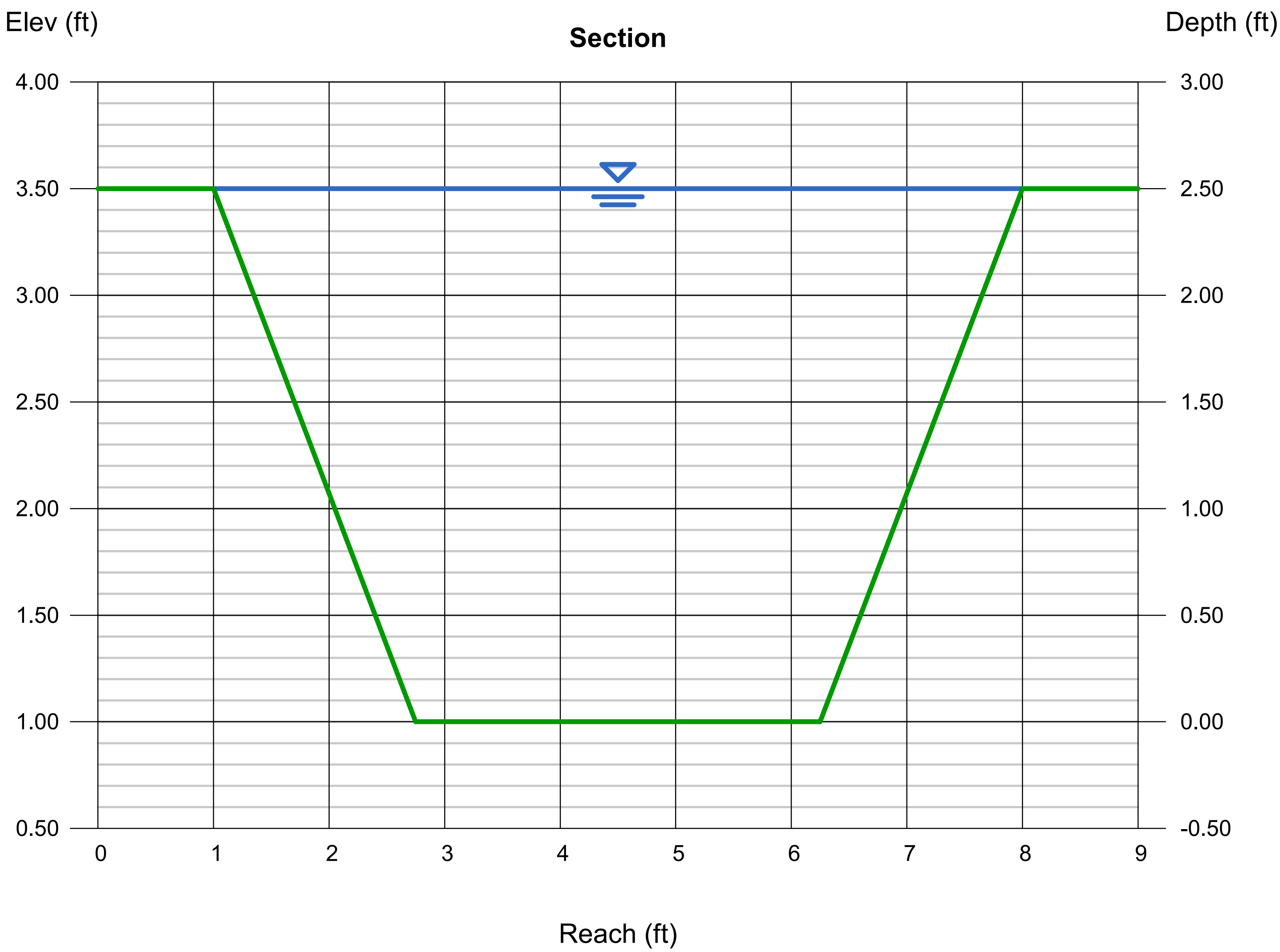
Highlighted
Depth (ft) = 3.60
Q (cfs) = 108.29
Area (sqft) = 11.92
Velocity (ft/s) = 9.09
Wetted Perim (ft) = 10.00
Crit Depth, Yc (ft) = 3.15
Top Width (ft) = 2.39
EGL (ft) = 4.88



Channel Report

3-3W

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.50	Depth (ft)	= 2.50
Side Slopes (z:1)	= 0.70, 0.70	Q (cfs)	= 33.97
Total Depth (ft)	= 2.50	Area (sqft)	= 13.13
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.59
Slope (%)	= 0.50	Wetted Perim (ft)	= 9.60
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.31
		Top Width (ft)	= 7.00
Calculations		EGL (ft)	= 2.60
Compute by:	Q vs Depth		
No. Increments	= 10		



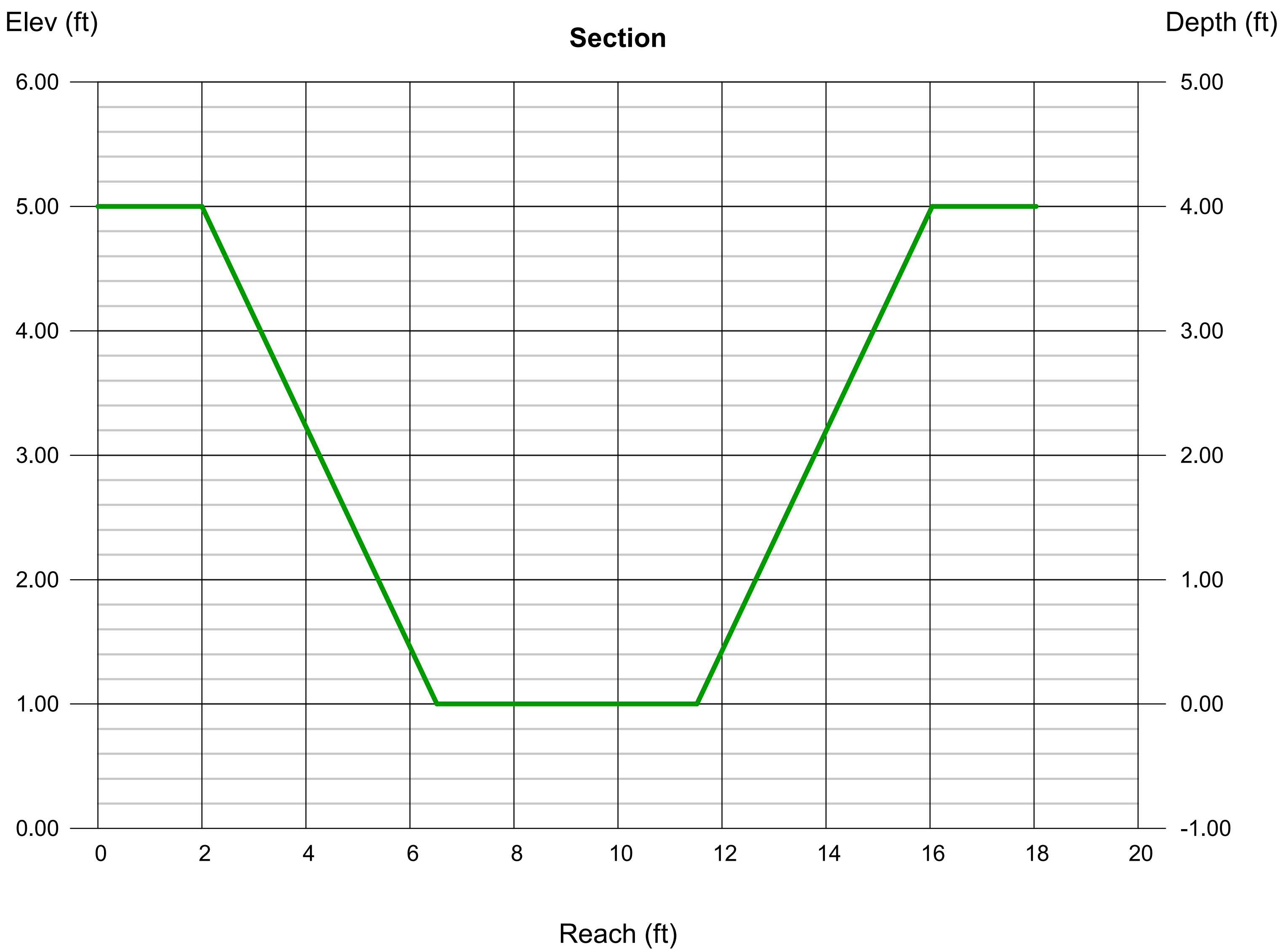
Channel Report

3-6W

Trapezoidal
Bottom Width (ft) = 5.00
Side Slopes (z:1) = 1.13, 1.13
Total Depth (ft) = 4.00
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.080

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 4.00
Q (cfs) = 85.41
Area (sqft) = 38.08
Velocity (ft/s) = 2.24
Wetted Perim (ft) = 17.07
Crit Depth, Yc (ft) = 1.81
Top Width (ft) = 14.04
EGL (ft) = 4.08



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jan 15 2020

3-4E

Trapezoidal

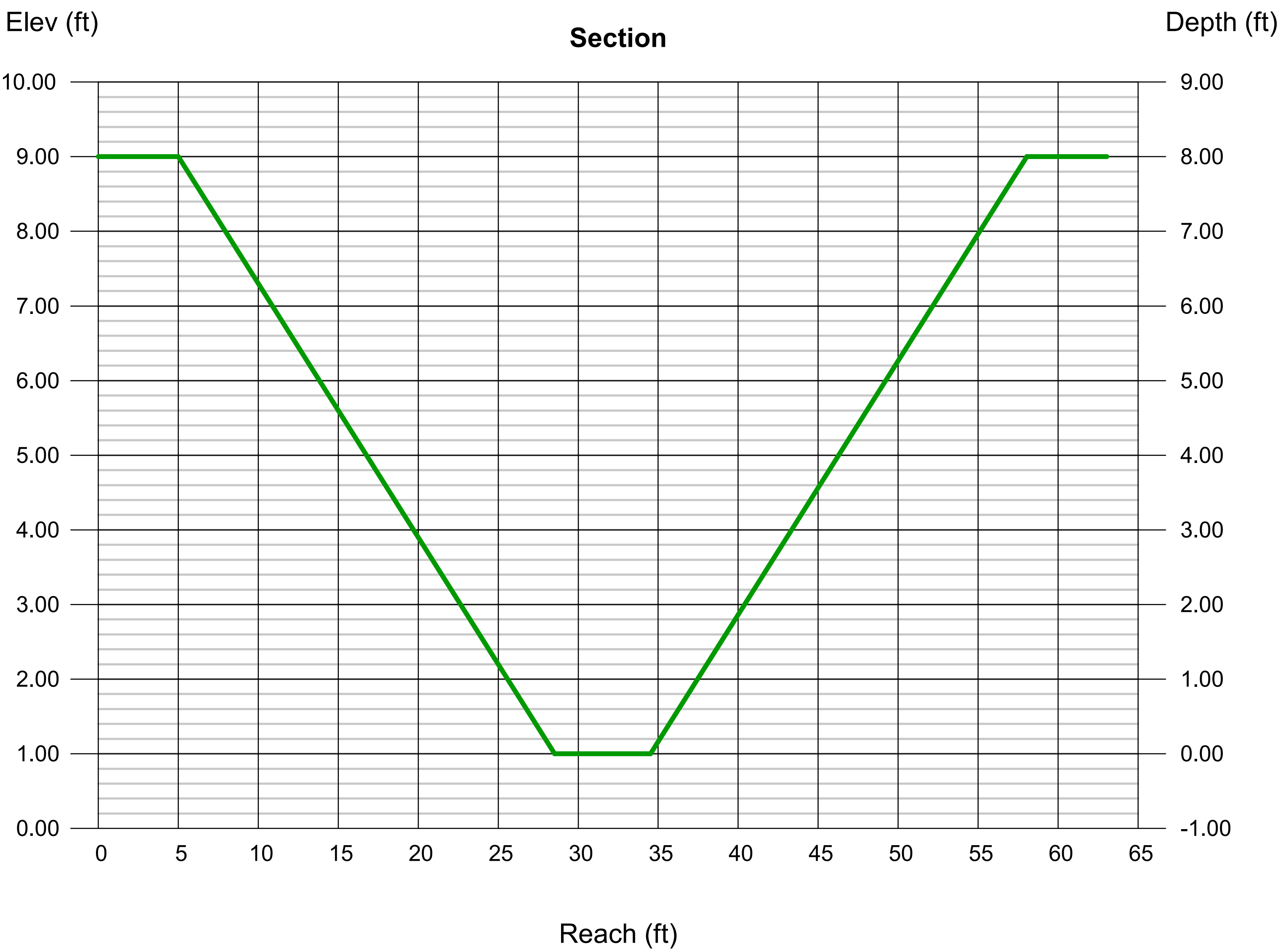
Bottom Width (ft)	= 6.00
Side Slopes (z:1)	= 2.94, 2.94
Total Depth (ft)	= 8.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.080

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 8.00
Q (cfs)	= 813.08
Area (sqft)	= 236.16
Velocity (ft/s)	= 3.44
Wetted Perim (ft)	= 55.69
Crit Depth, Yc (ft)	= 4.54
Top Width (ft)	= 53.04
EGL (ft)	= 8.18



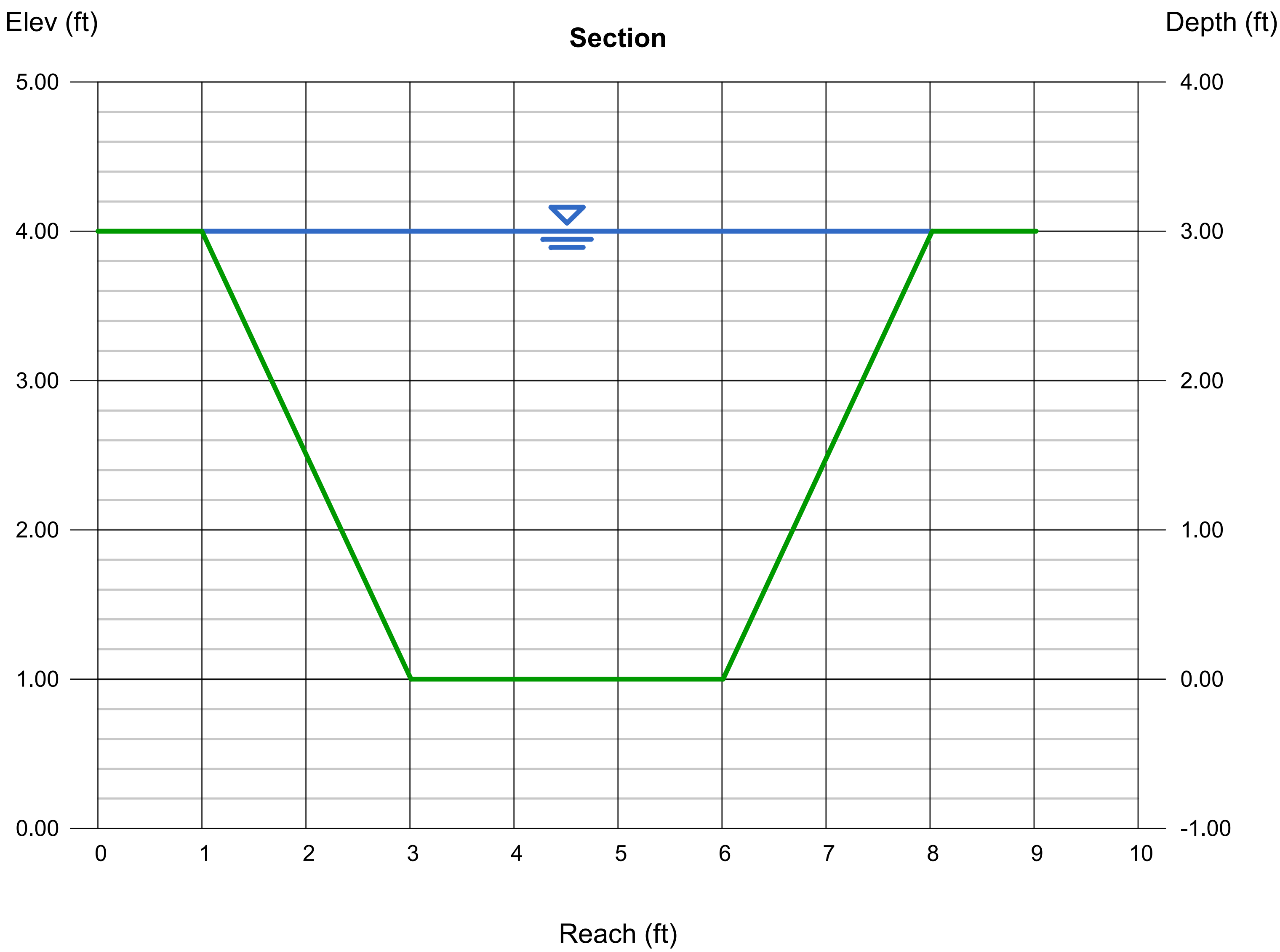
Channel Report

3-8E

Trapezoidal
Bottom Width (ft) = 3.00
Side Slopes (z:1) = 0.67, 0.67
Total Depth (ft) = 3.00
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.080

Calculations
Compute by: Q vs Depth
No. Increments = 10

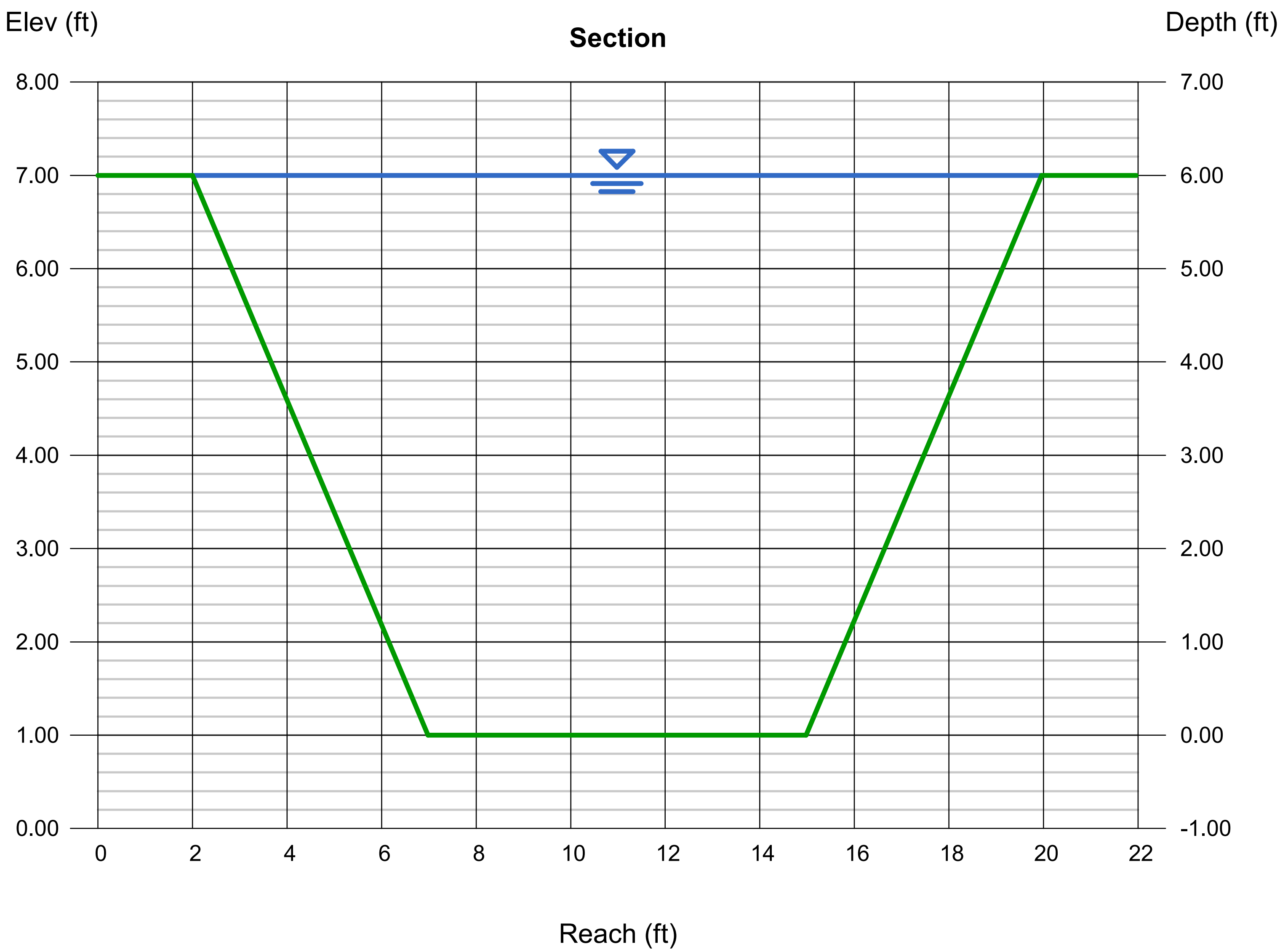
Highlighted
Depth (ft) = 3.00
Q (cfs) = 25.53
Area (sqft) = 15.03
Velocity (ft/s) = 1.70
Wetted Perim (ft) = 10.22
Crit Depth, Yc (ft) = 1.20
Top Width (ft) = 7.02
EGL (ft) = 3.04



Channel Report

3-8W

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 8.00	Depth (ft)	= 6.00
Side Slopes (z:1)	= 0.83, 0.83	Q (cfs)	= 226.86
Total Depth (ft)	= 6.00	Area (sqft)	= 77.88
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.91
Slope (%)	= 0.50	Wetted Perim (ft)	= 23.59
N-Value	= 0.080	Crit Depth, Yc (ft)	= 2.66
		Top Width (ft)	= 17.96
Calculations		EGL (ft)	= 6.13
Compute by:	Q vs Depth		
No. Increments	= 10		

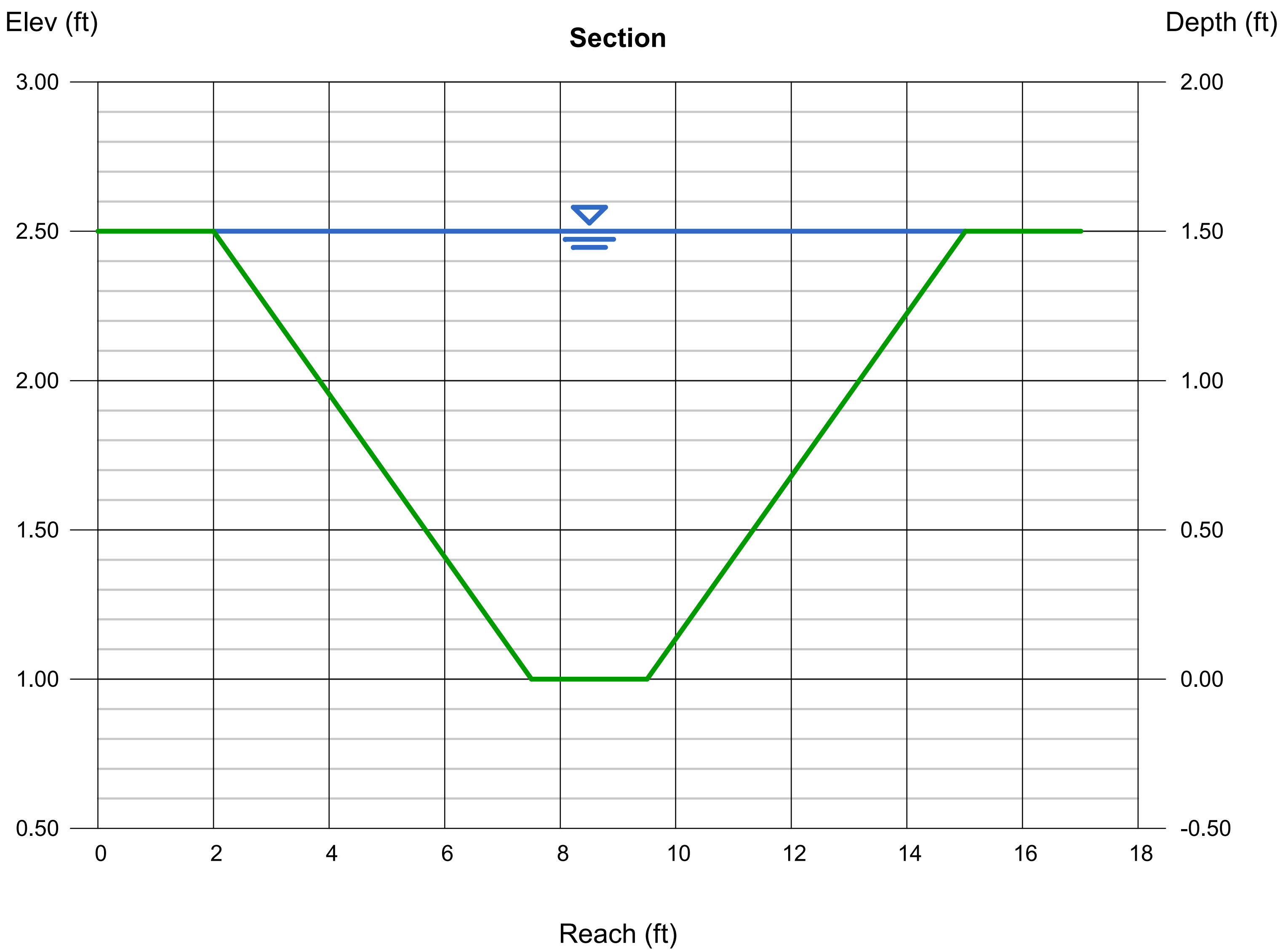


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

3-9S

Trapezoidal			**Highlighted**	
Bottom Width (ft)	= 2.00		Depth (ft)	= 1.50
Side Slopes (z:1)	= 3.67, 3.67		Q (cfs)	= 21.05
Total Depth (ft)	= 1.50		Area (sqft)	= 11.26
Invert Elev (ft)	= 1.00		Velocity (ft/s)	= 1.87
Slope (%)	= 0.50		Wetted Perim (ft)	= 13.41
N-Value	= 0.050		Crit Depth, Yc (ft)	= 0.92
			Top Width (ft)	= 13.01
Calculations			EGL (ft)	= 1.55
Compute by:	Q vs Depth			
No. Increments	= 10			



Channel Report

3-9W

Trapezoidal

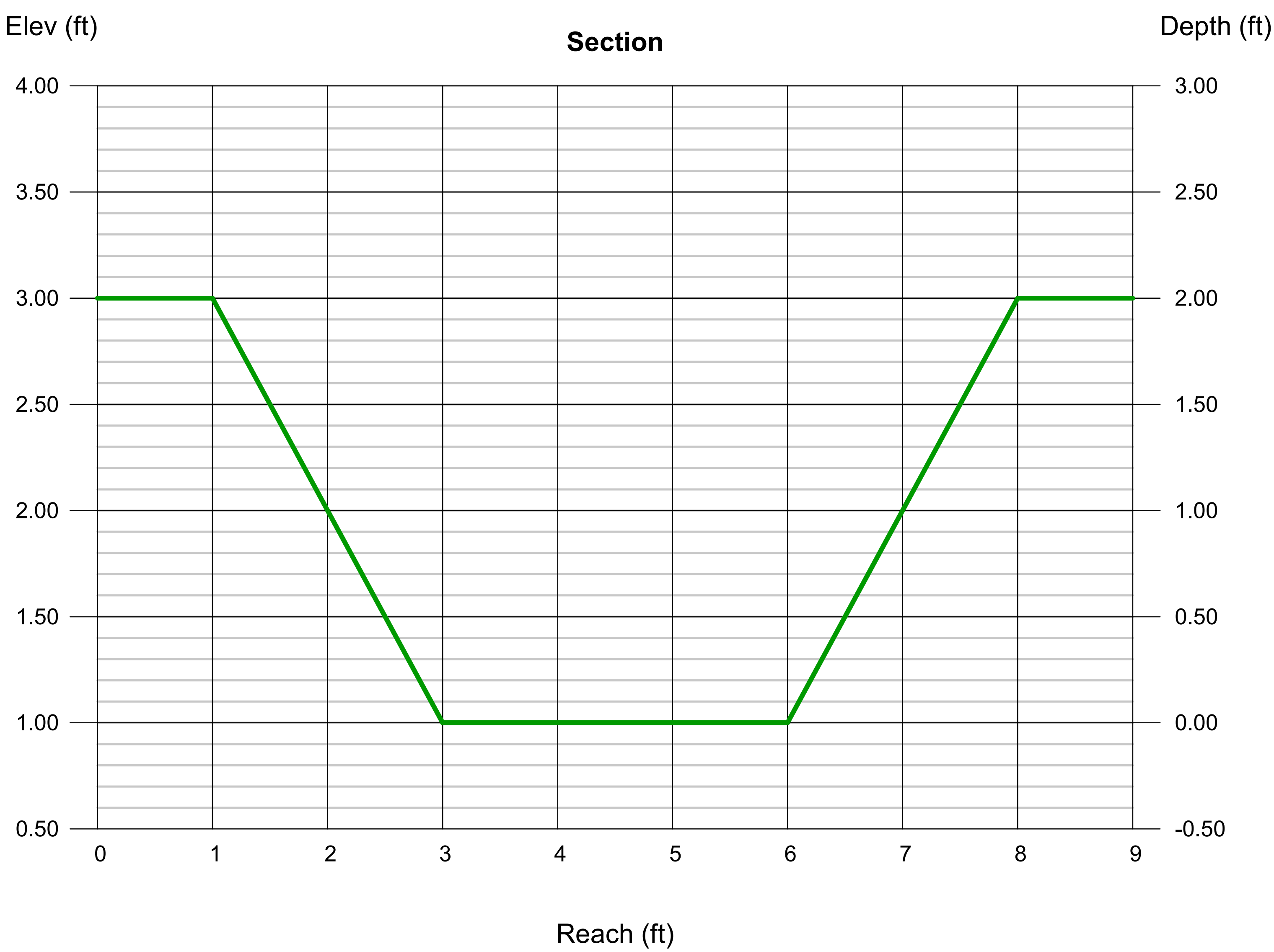
Bottom Width (ft)	=	3.00
Side Slopes (z:1)	=	1.00, 1.00
Total Depth (ft)	=	2.00
Invert Elev (ft)	=	1.00
Slope (%)	=	0.50
N-Value	=	0.050

Calculations

Compute by:		Q vs Depth
No. Increments	=	10

Highlighted

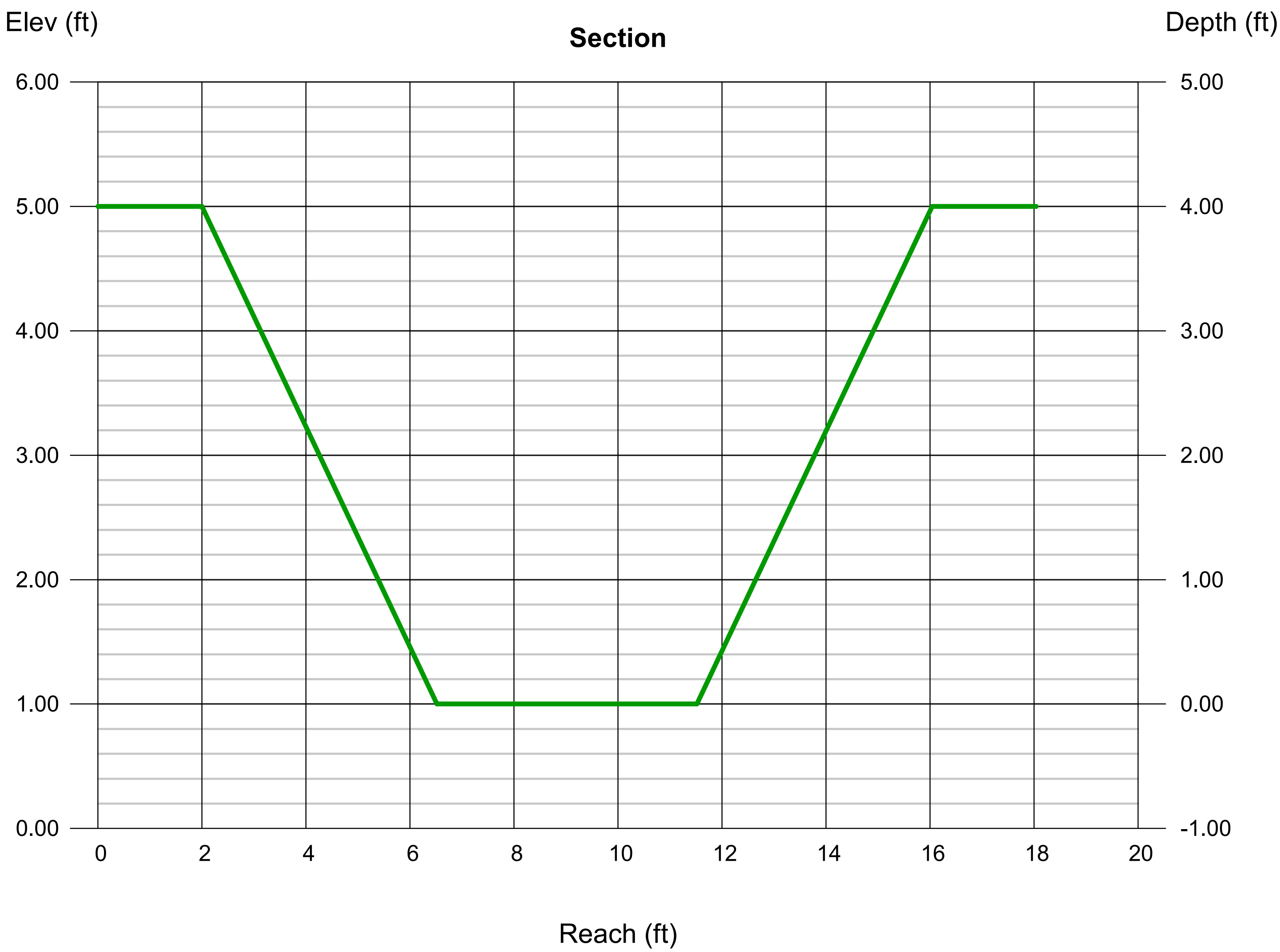
Depth (ft)	=	2.00
Q (cfs)	=	23.14
Area (sqft)	=	10.00
Velocity (ft/s)	=	2.31
Wetted Perim (ft)	=	8.66
Crit Depth, Yc (ft)	=	1.09
Top Width (ft)	=	7.00
EGL (ft)	=	2.08



Channel Report

3-14N

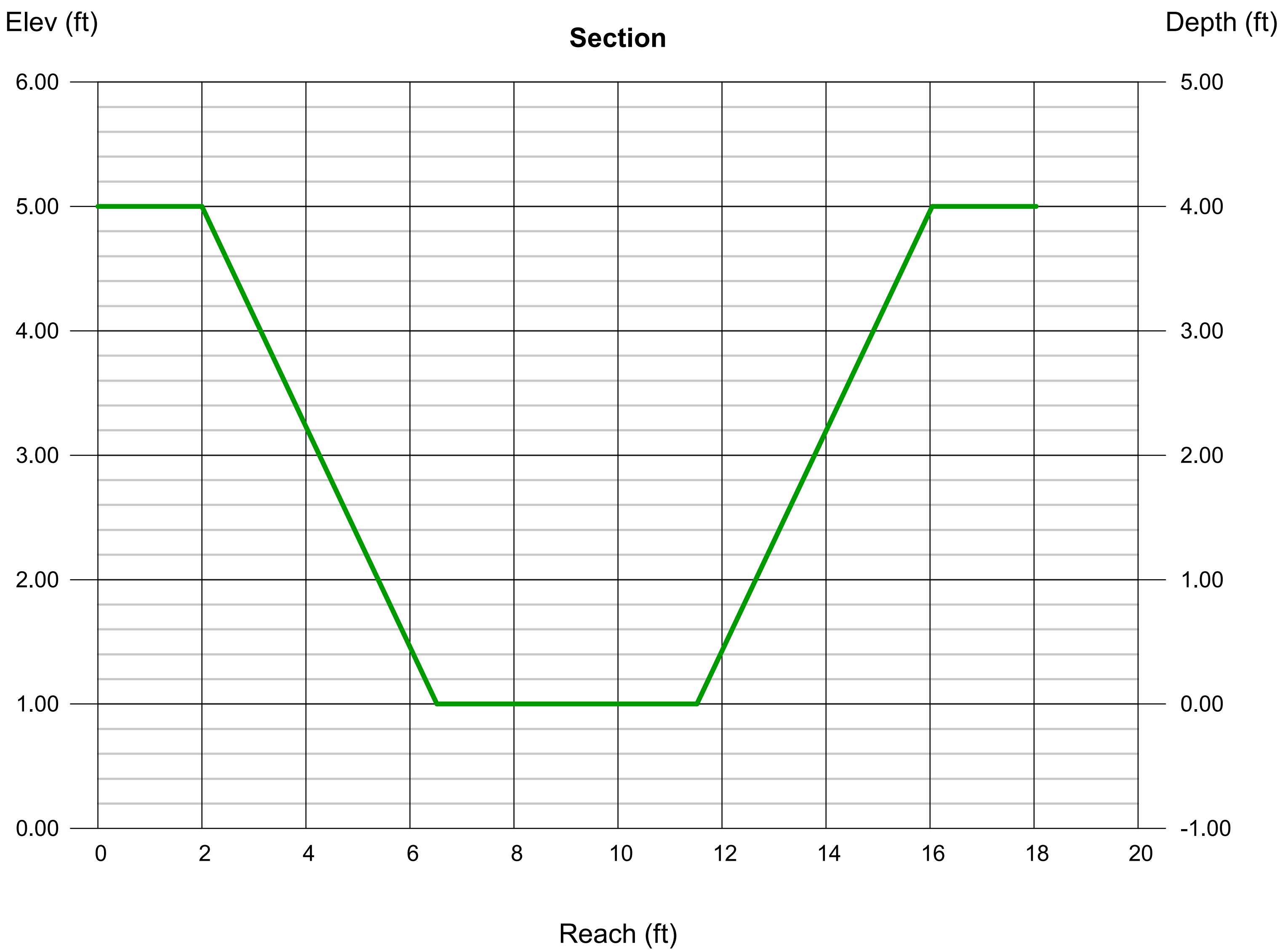
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 5.00	Depth (ft)	= 4.00
Side Slopes (z:1)	= 1.13, 1.13	Q (cfs)	= 136.66
Total Depth (ft)	= 4.00	Area (sqft)	= 38.08
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 3.59
Slope (%)	= 0.50	Wetted Perim (ft)	= 17.07
N-Value	= 0.050	Crit Depth, Yc (ft)	= 2.37
		Top Width (ft)	= 14.04
Calculations		EGL (ft)	= 4.20
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-15E

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 5.00	Depth (ft)	= 4.00
Side Slopes (z:1)	= 1.13, 1.13	Q (cfs)	= 85.41
Total Depth (ft)	= 4.00	Area (sqft)	= 38.08
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.24
Slope (%)	= 0.50	Wetted Perim (ft)	= 17.07
N-Value	= 0.080	Crit Depth, Yc (ft)	= 1.81
		Top Width (ft)	= 14.04
Calculations		EGL (ft)	= 4.08
Compute by:	Q vs Depth		
No. Increments	= 10		

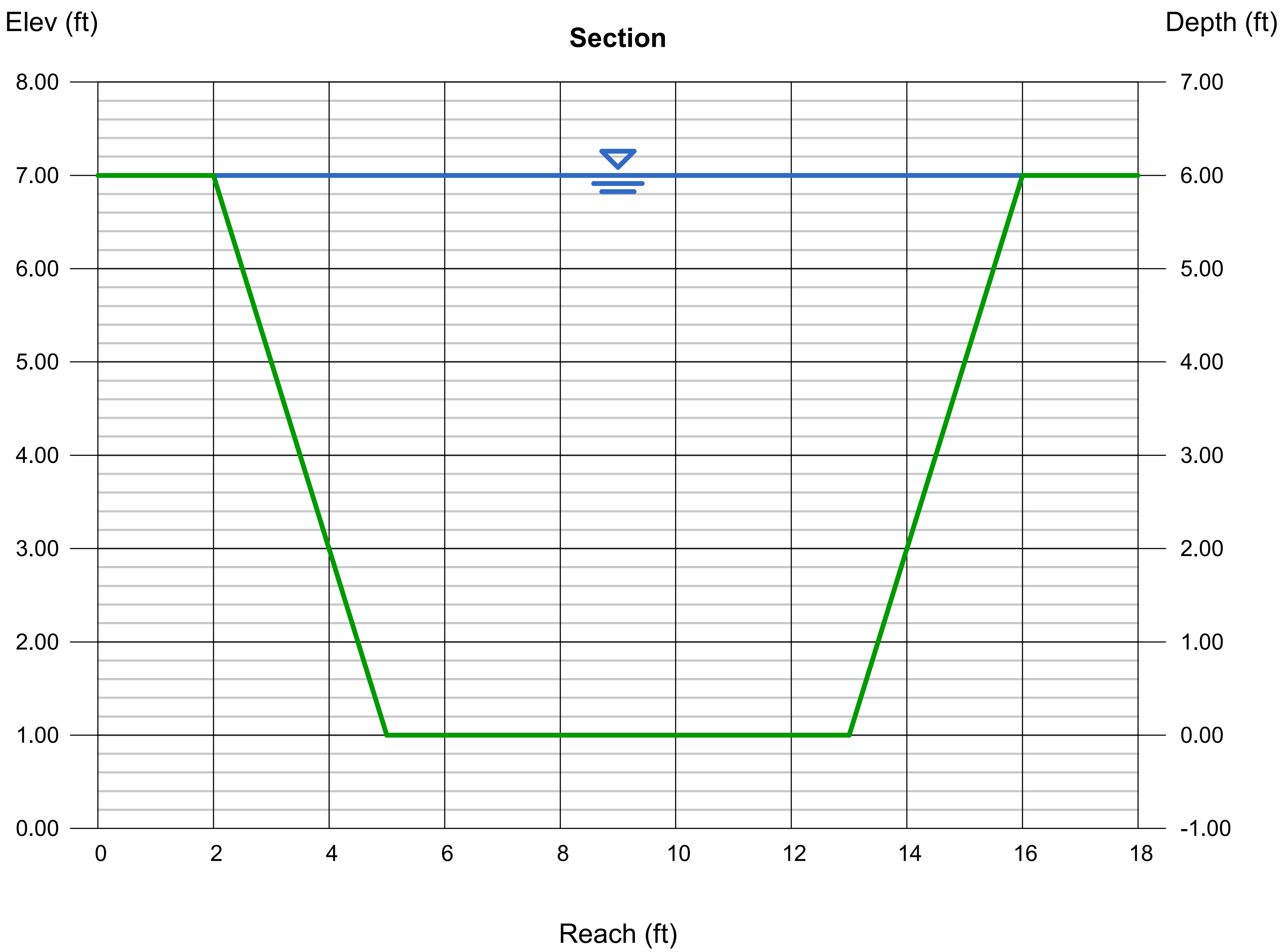


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Tuesday, Jan 14 2020

3-16N

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 8.00	Depth (ft)	= 6.00
Side Slopes (z:1)	= 0.50, 0.50	Q (cfs)	= 293.84
Total Depth (ft)	= 6.00	Area (sqft)	= 66.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 4.45
Slope (%)	= 0.50	Wetted Perim (ft)	= 21.42
N-Value	= 0.050	Crit Depth, Yc (ft)	= 3.24
		Top Width (ft)	= 14.00
Calculations		EGL (ft)	= 6.31
Compute by:	Q vs Depth		
No. Increments	= 10		

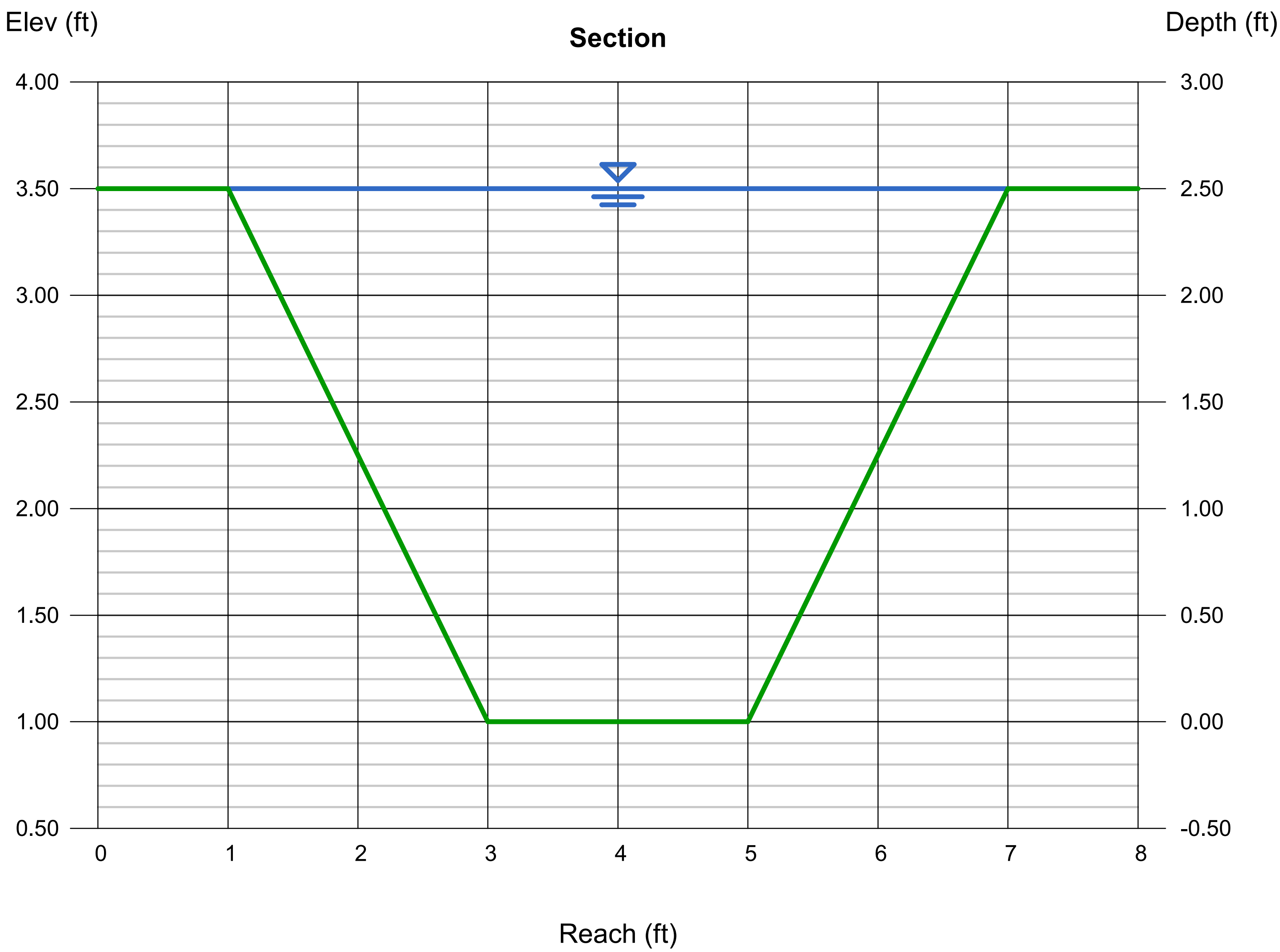


Channel Report

3-17E

Trapezoidal	
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 0.80, 0.80
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050
Calculations	
Compute by:	Q vs Depth
No. Increments	= 10

Highlighted	
Depth (ft)	= 2.50
Q (cfs)	= 23.60
Area (sqft)	= 10.00
Velocity (ft/s)	= 2.36
Wetted Perim (ft)	= 8.40
Crit Depth, Yc (ft)	= 1.36
Top Width (ft)	= 6.00
EGL (ft)	= 2.59



Channel Report

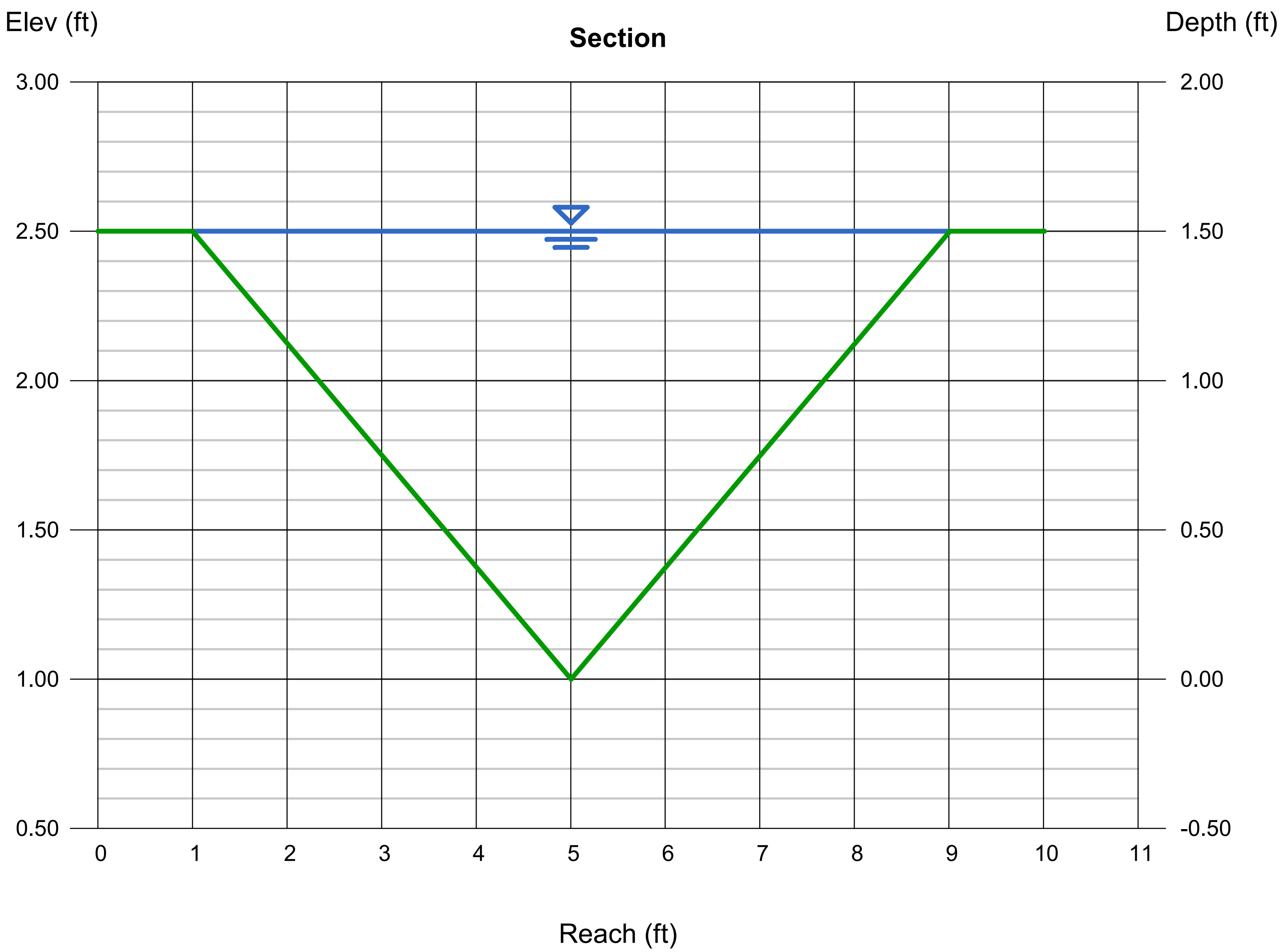
3-18E

Triangular
Side Slopes (z:1) = 2.67, 2.67
Total Depth (ft) = 1.50

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.50
Q (cfs) = 9.974
Area (sqft) = 6.01
Velocity (ft/s) = 1.66
Wetted Perim (ft) = 8.55
Crit Depth, Yc (ft) = 0.98
Top Width (ft) = 8.01
EGL (ft) = 1.54



Channel Report

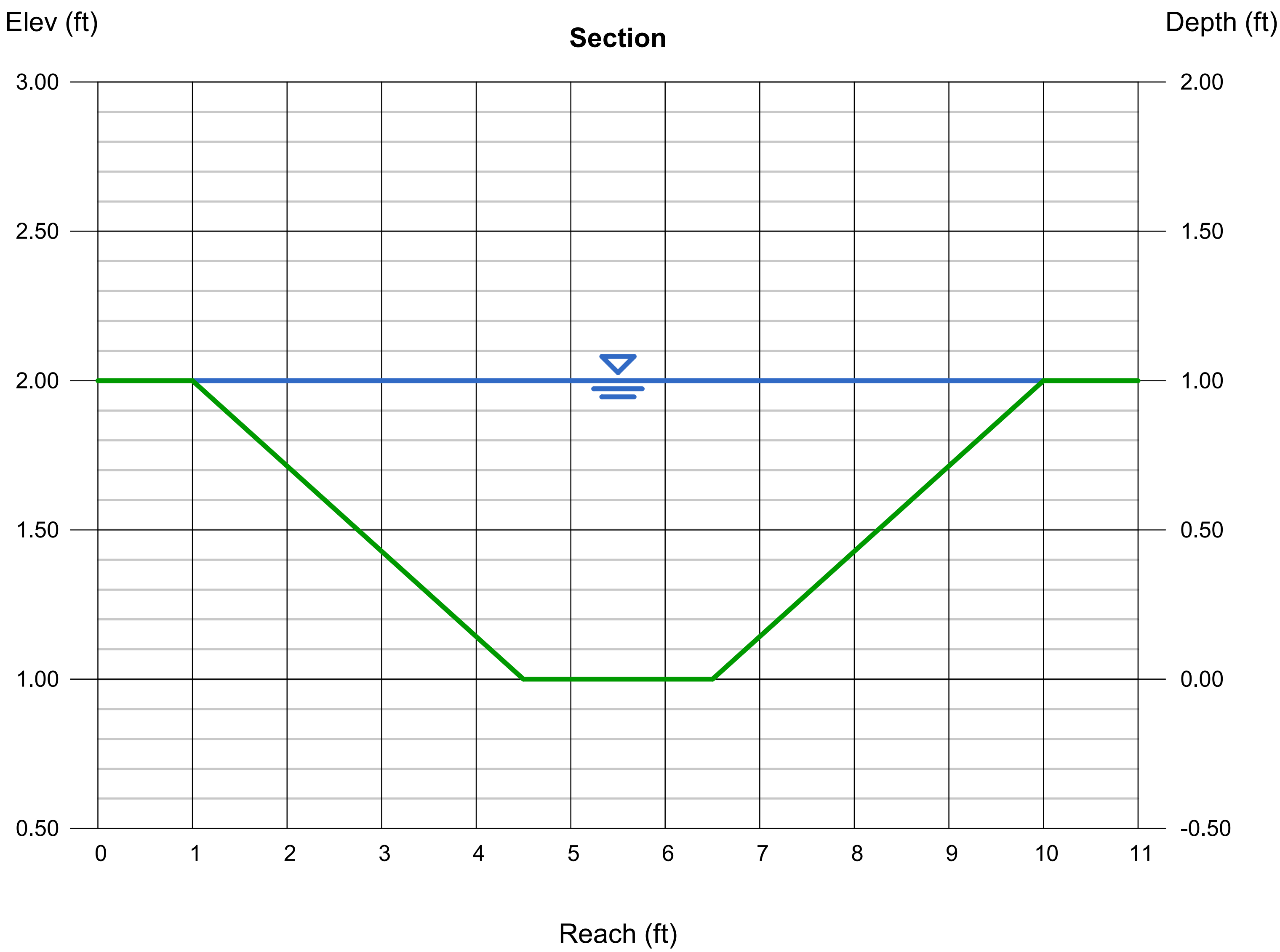
Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Tuesday, Jan 14 2020

3-18N

Trapezoidal
Bottom Width (ft) = 2.00
Side Slopes (z:1) = 3.50, 3.50
Total Depth (ft) = 1.00
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

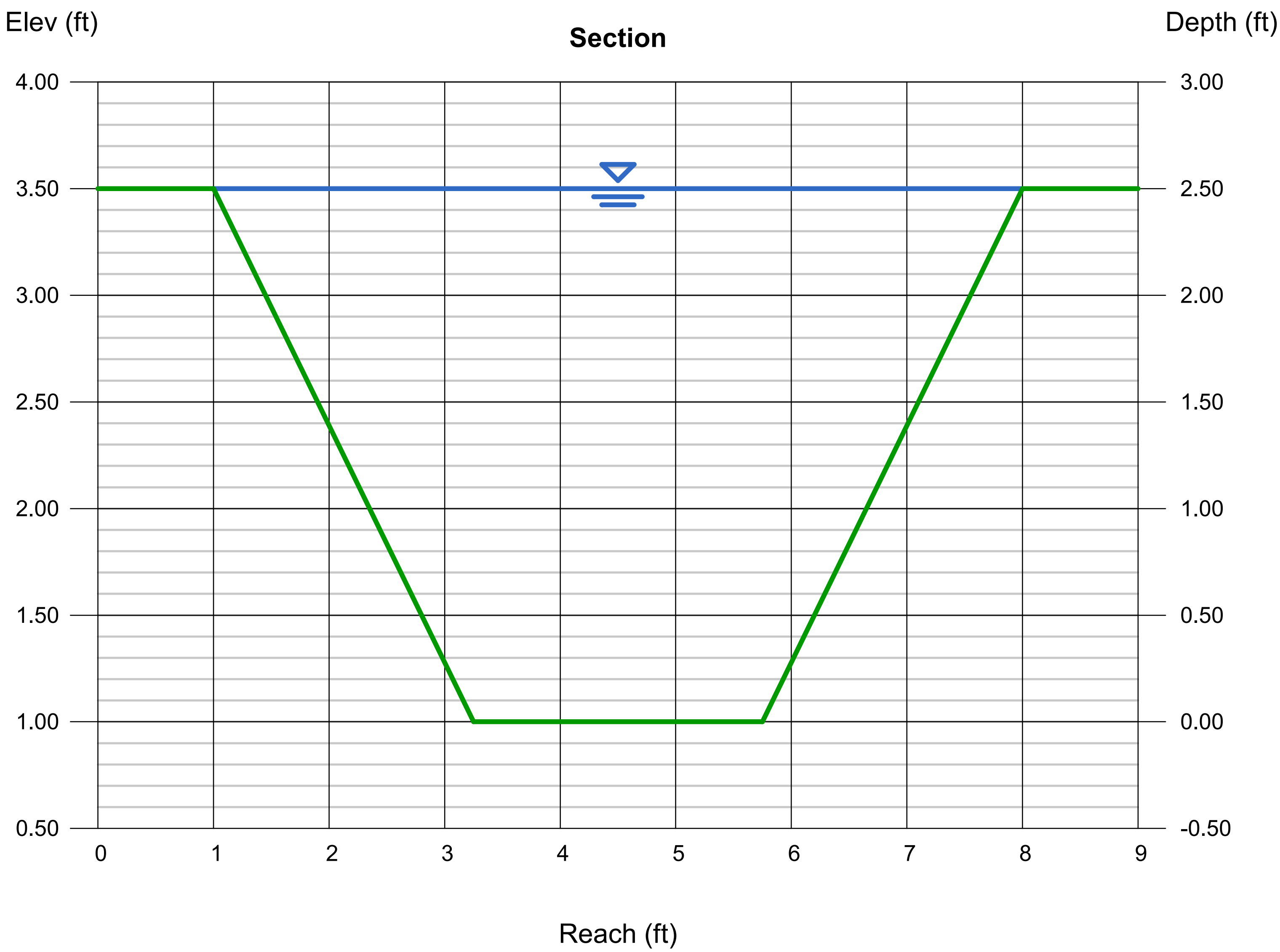
Highlighted
Depth (ft) = 1.00
Q (cfs) = 8.154
Area (sqft) = 5.50
Velocity (ft/s) = 1.48
Wetted Perim (ft) = 9.28
Crit Depth, Yc (ft) = 0.58
Top Width (ft) = 9.00
EGL (ft) = 1.03



Channel Report

3-18W

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.50	Depth (ft)	= 2.50
Side Slopes (z:1)	= 0.90, 0.90	Q (cfs)	= 29.53
Total Depth (ft)	= 2.50	Area (sqft)	= 11.88
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.49
Slope (%)	= 0.50	Wetted Perim (ft)	= 9.23
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.38
		Top Width (ft)	= 7.00
Calculations		EGL (ft)	= 2.60
Compute by:	Q vs Depth		
No. Increments	= 10		

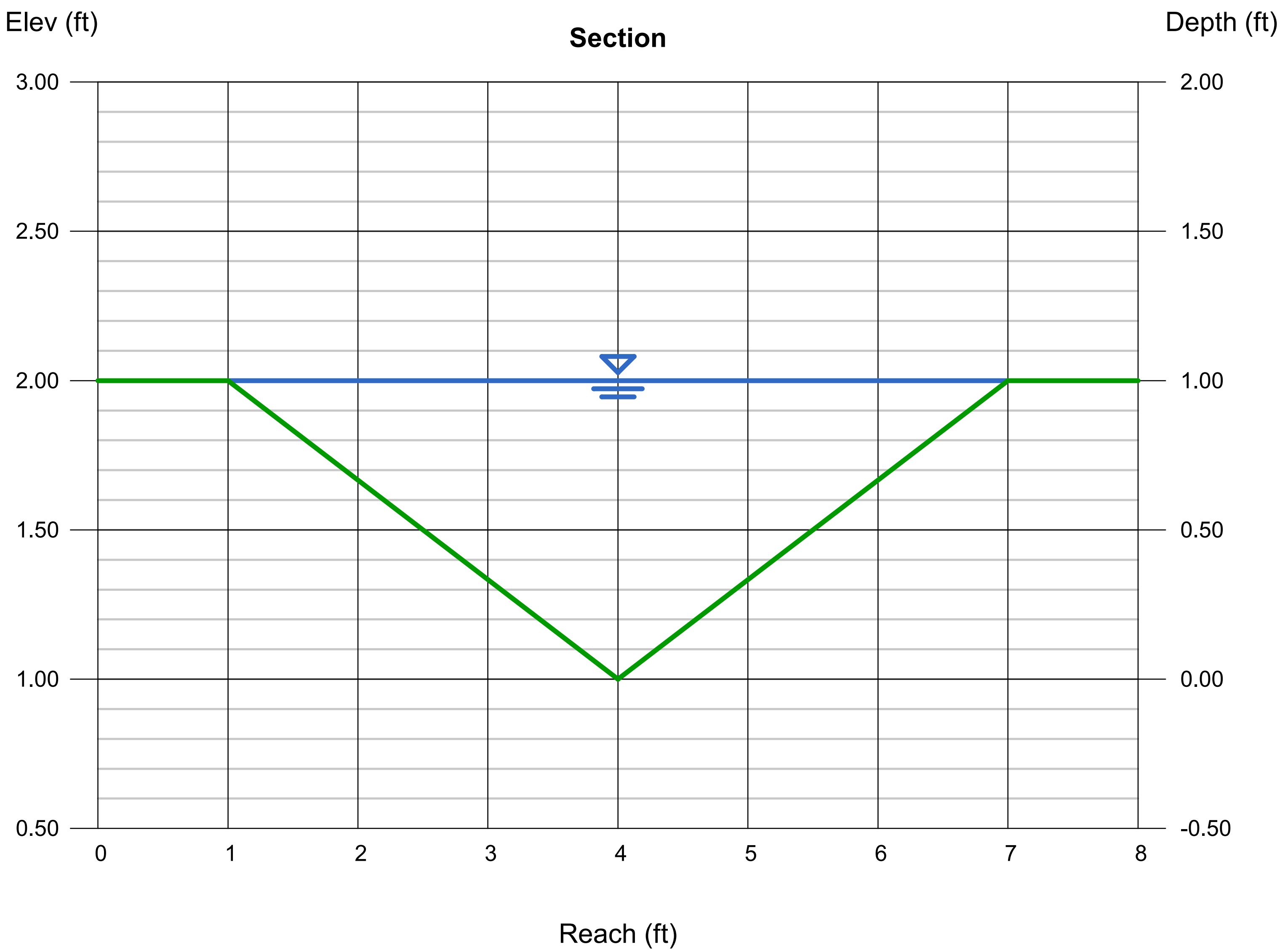


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

3-20S

Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.00
Total Depth (ft)	= 1.00	Q (cfs)	= 3.834
		Area (sqft)	= 3.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.28
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.32
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.64
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-23S

Trapezoidal

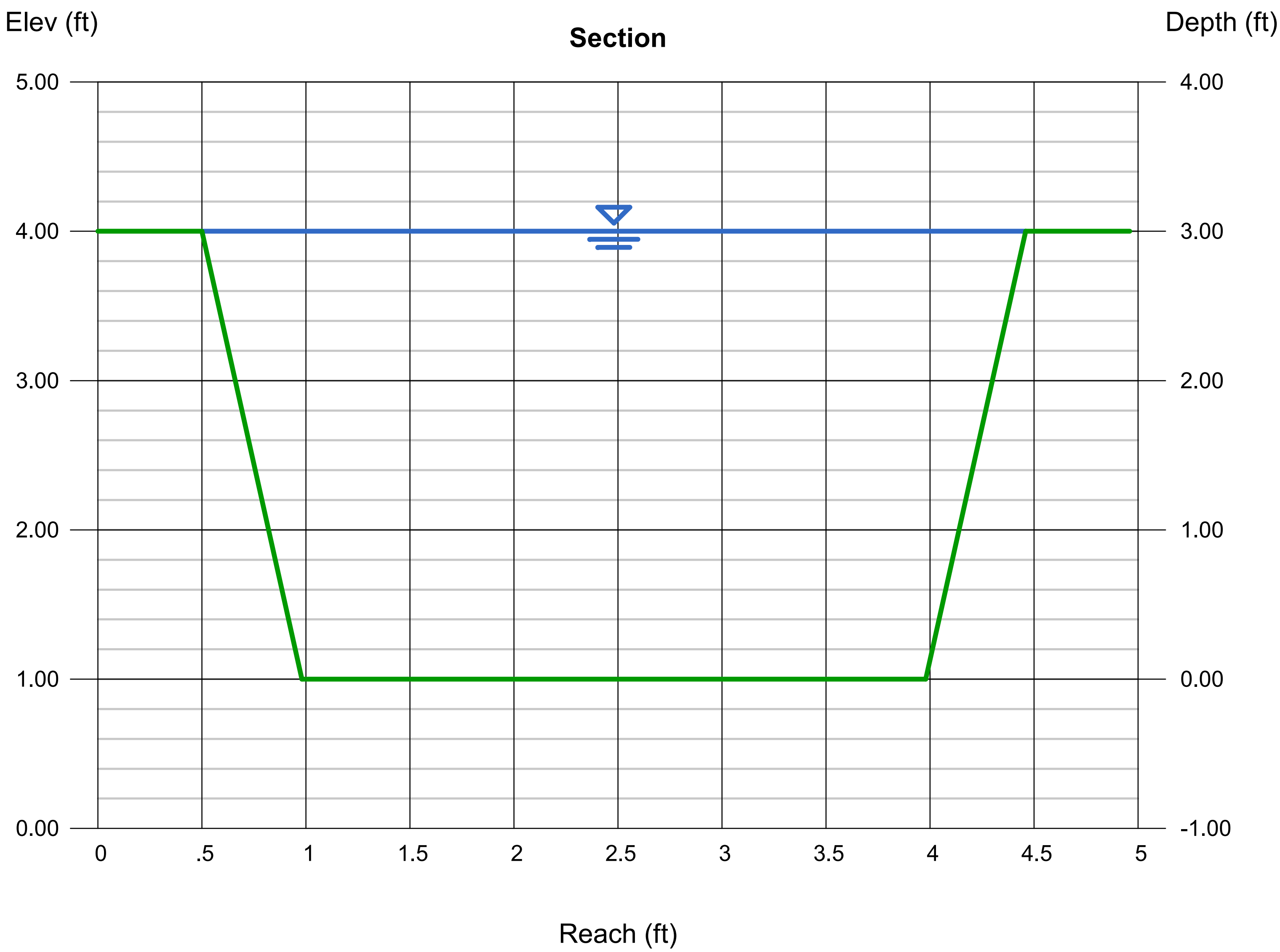
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 0.16, 0.16
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 3.00
Q (cfs)	= 24.09
Area (sqft)	= 10.44
Velocity (ft/s)	= 2.31
Wetted Perim (ft)	= 9.08
Crit Depth, Yc (ft)	= 1.24
Top Width (ft)	= 3.96
EGL (ft)	= 3.08

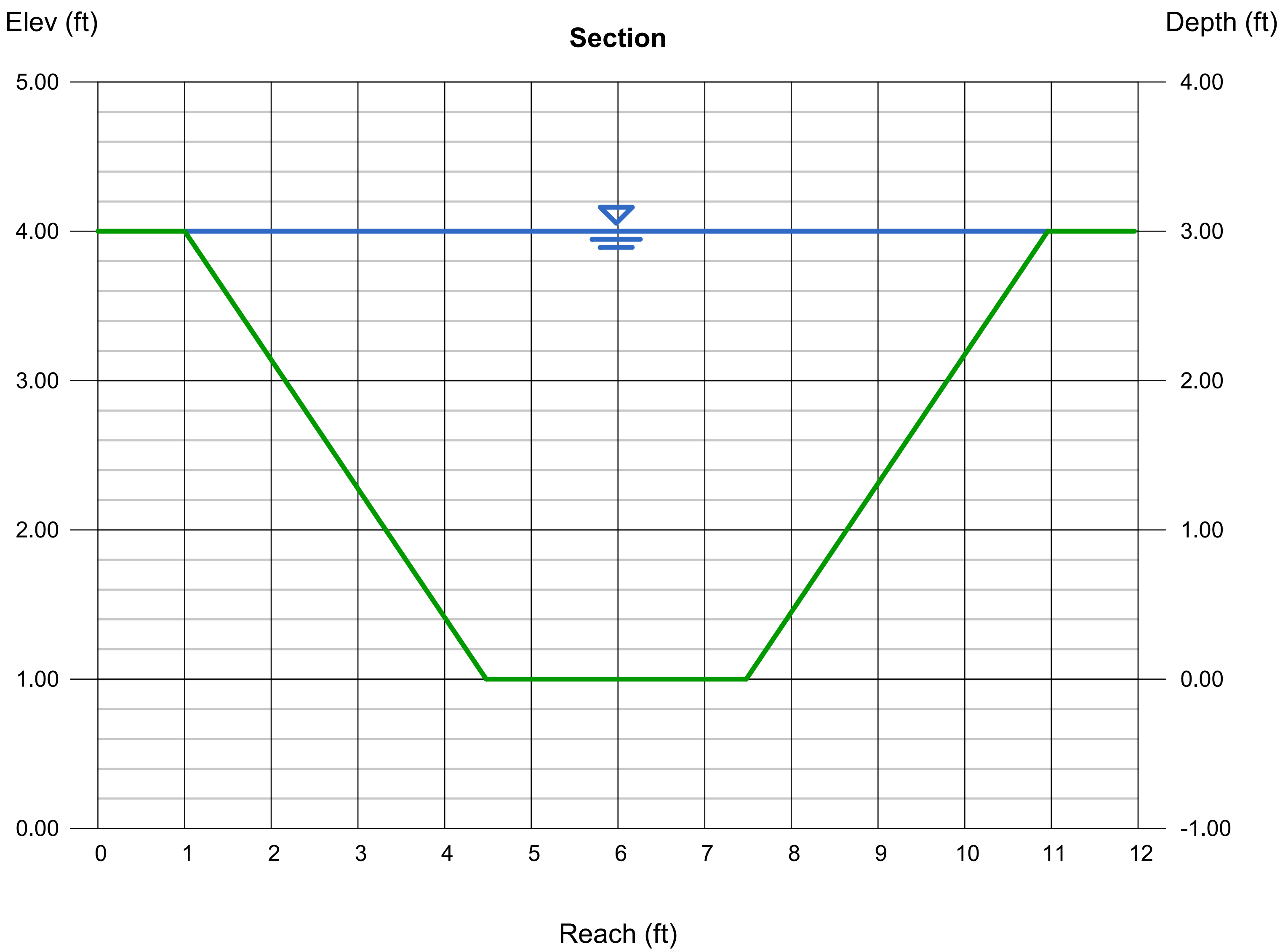


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

3-24E

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 3.00
Side Slopes (z:1)	= 1.16, 1.16	Q (cfs)	= 55.78
Total Depth (ft)	= 3.00	Area (sqft)	= 19.44
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.87
Slope (%)	= 0.50	Wetted Perim (ft)	= 12.19
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.76
		Top Width (ft)	= 9.96
Calculations		EGL (ft)	= 3.13
Compute by:	Q vs Depth		
No. Increments	= 10		



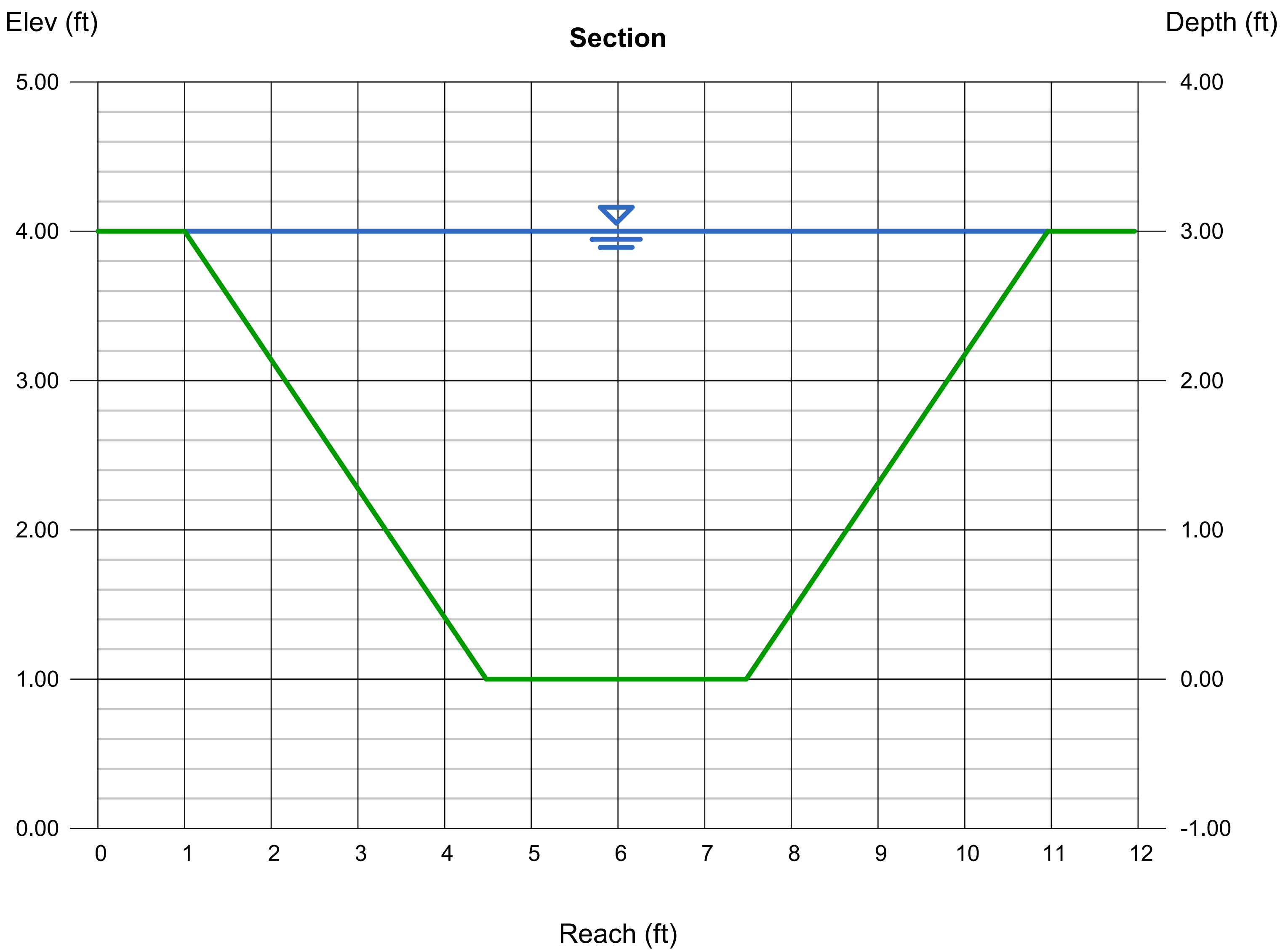
Channel Report

3-24S

Trapezoidal
Bottom Width (ft) = 3.00
Side Slopes (z:1) = 1.16, 1.16
Total Depth (ft) = 3.00
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 3.00
Q (cfs) = 55.78
Area (sqft) = 19.44
Velocity (ft/s) = 2.87
Wetted Perim (ft) = 12.19
Crit Depth, Yc (ft) = 1.76
Top Width (ft) = 9.96
EGL (ft) = 3.13



Channel Report

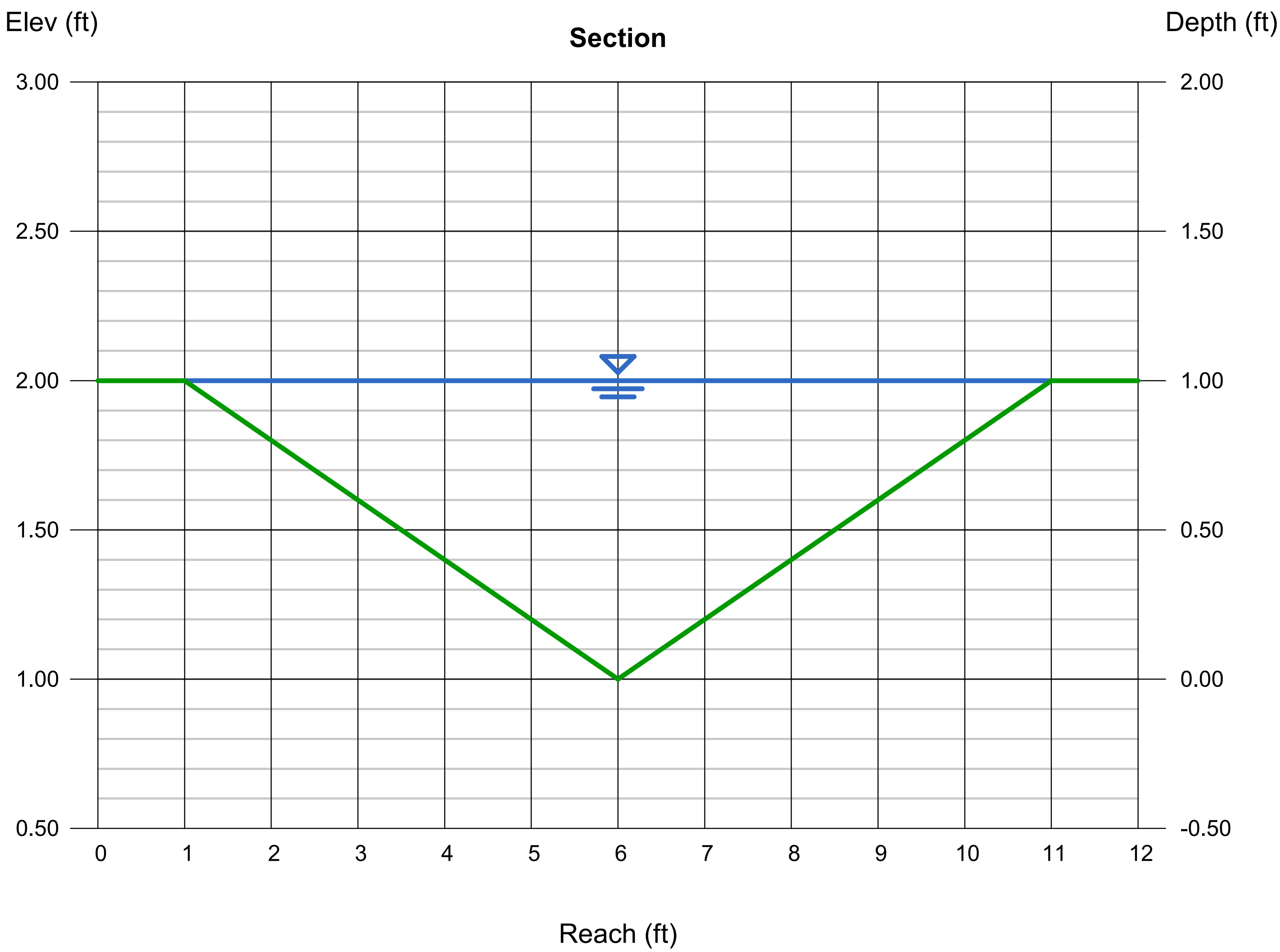
3-25N

Triangular
Side Slopes (z:1) = 5.00, 5.00
Total Depth (ft) = 1.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.00
Q (cfs) = 6.532
Area (sqft) = 5.00
Velocity (ft/s) = 1.31
Wetted Perim (ft) = 10.20
Crit Depth, Yc (ft) = 0.64
Top Width (ft) = 10.00
EGL (ft) = 1.03

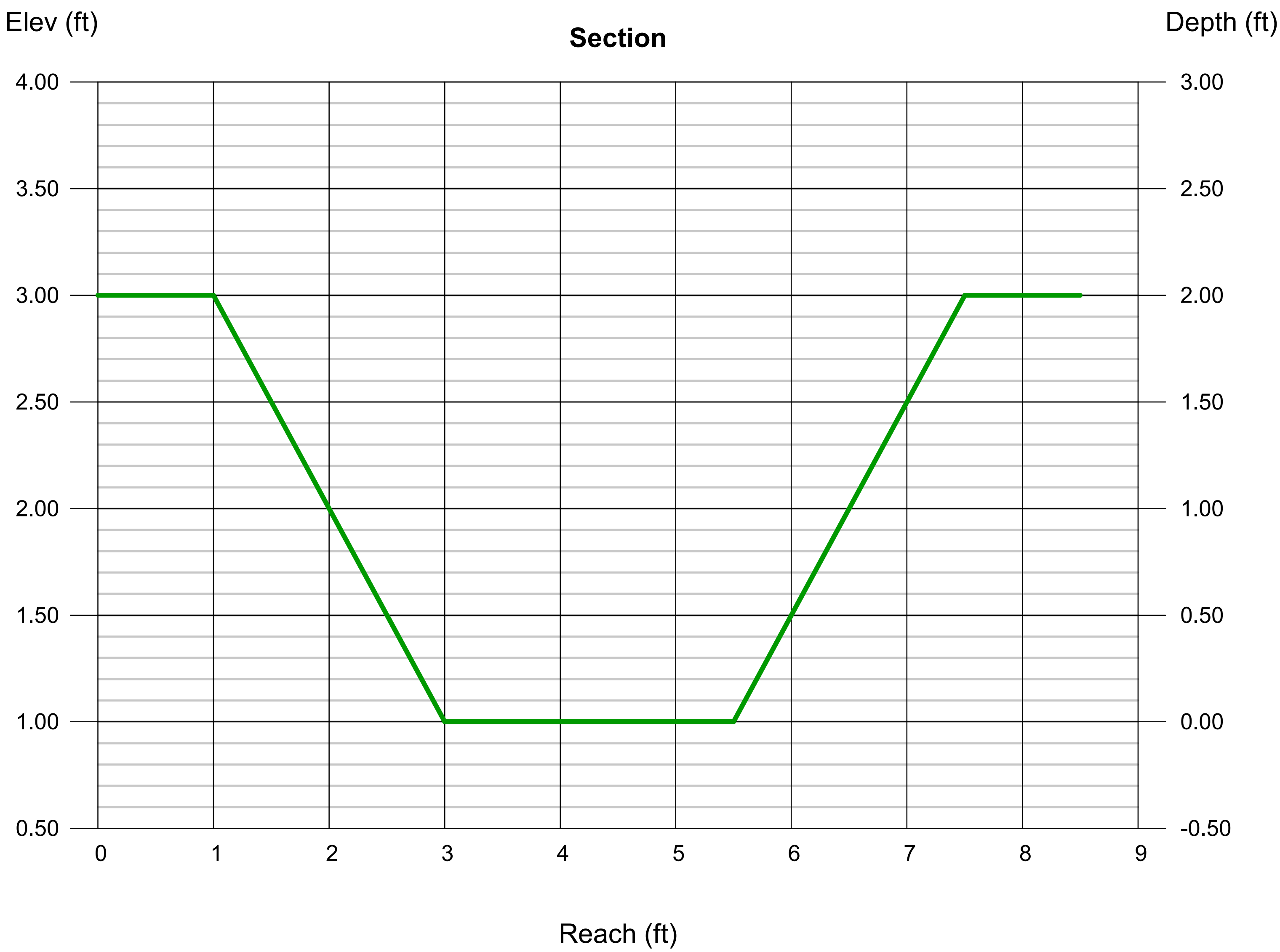


Channel Report

3-25W

Trapezoidal		Highlighted	
Bottom Width (ft)	= 2.50	Depth (ft)	= 2.00
Side Slopes (z:1)	= 1.00, 1.00	Q (cfs)	= 20.20
Total Depth (ft)	= 2.00	Area (sqft)	= 9.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.24
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.16
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.09
		Top Width (ft)	= 6.50
		EGL (ft)	= 2.08

Calculations
Compute by: Q vs Depth
No. Increments = 10



Channel Report

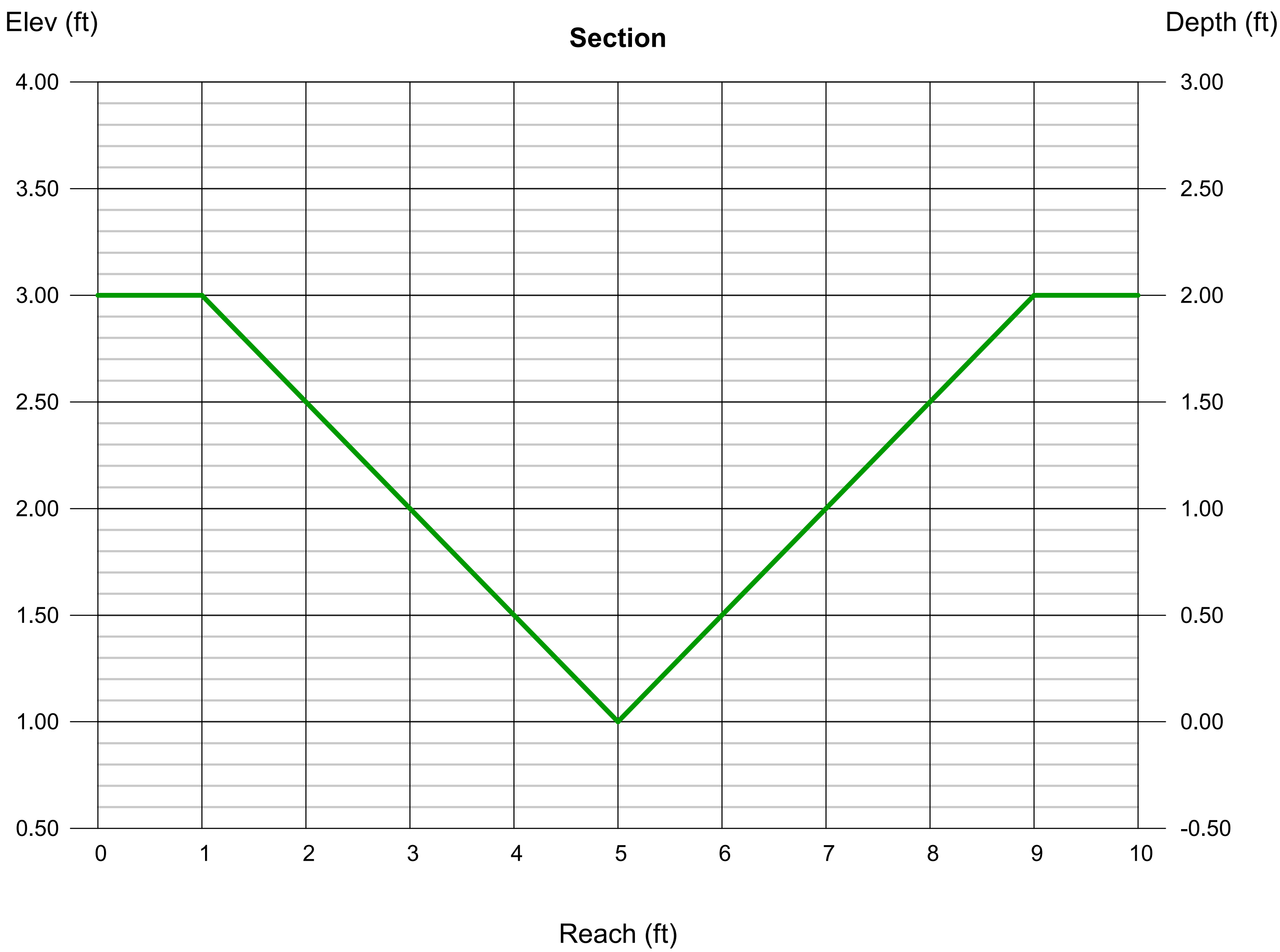
3-26N

Triangular
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 2.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

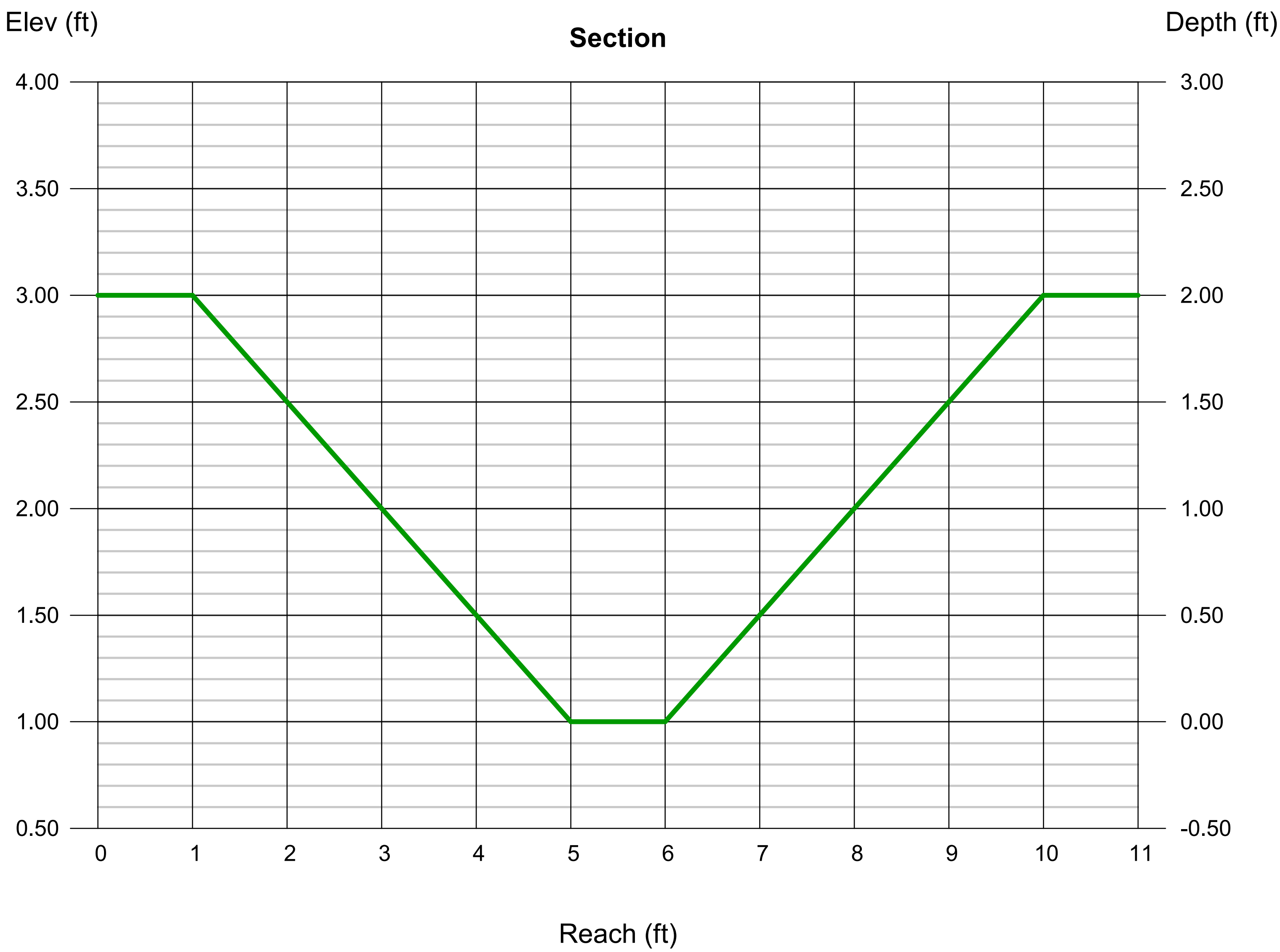
Highlighted
Depth (ft) = 2.00
Q (cfs) = 15.61
Area (sqft) = 8.00
Velocity (ft/s) = 1.95
Wetted Perim (ft) = 8.94
Crit Depth, Yc (ft) = 1.31
Top Width (ft) = 8.00
EGL (ft) = 2.06



Channel Report

3-26S

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 1.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 2.00, 2.00	Q (cfs)	= 21.09
Total Depth (ft)	= 2.00	Area (sqft)	= 10.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.11
Slope (%)	= 0.50	Wetted Perim (ft)	= 9.94
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.25
		Top Width (ft)	= 9.00
Calculations		EGL (ft)	= 2.07
Compute by:	Q vs Depth		
No. Increments	= 10		

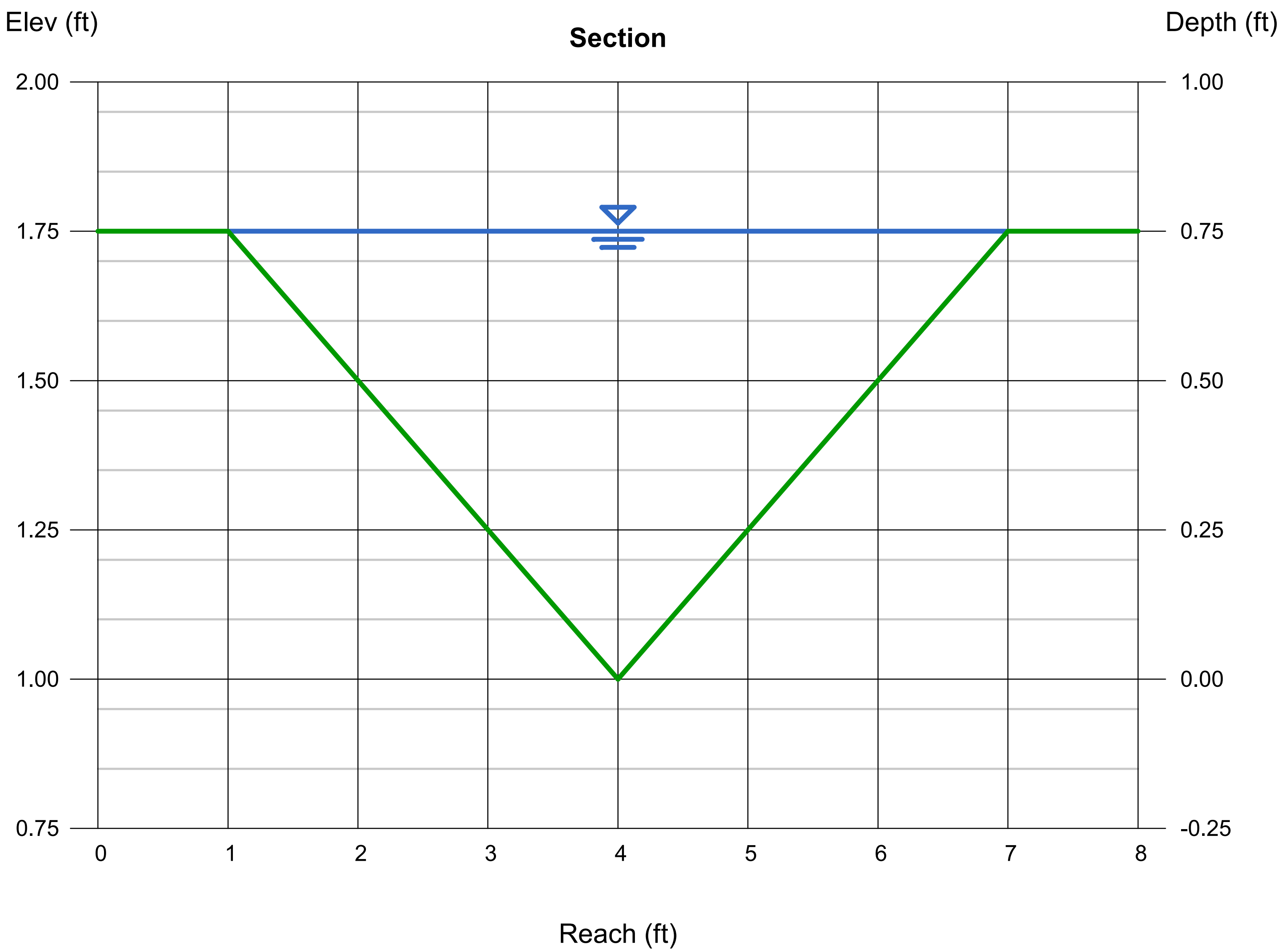


Channel Report

3-26W

Triangular	
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 0.75
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050
Calculations	
Compute by:	Q vs Depth
No. Increments	= 10

Highlighted	
Depth (ft)	= 0.75
Q (cfs)	= 2.409
Area (sqft)	= 2.25
Velocity (ft/s)	= 1.07
Wetted Perim (ft)	= 6.18
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 6.00
EGL (ft)	= 0.77



Channel Report

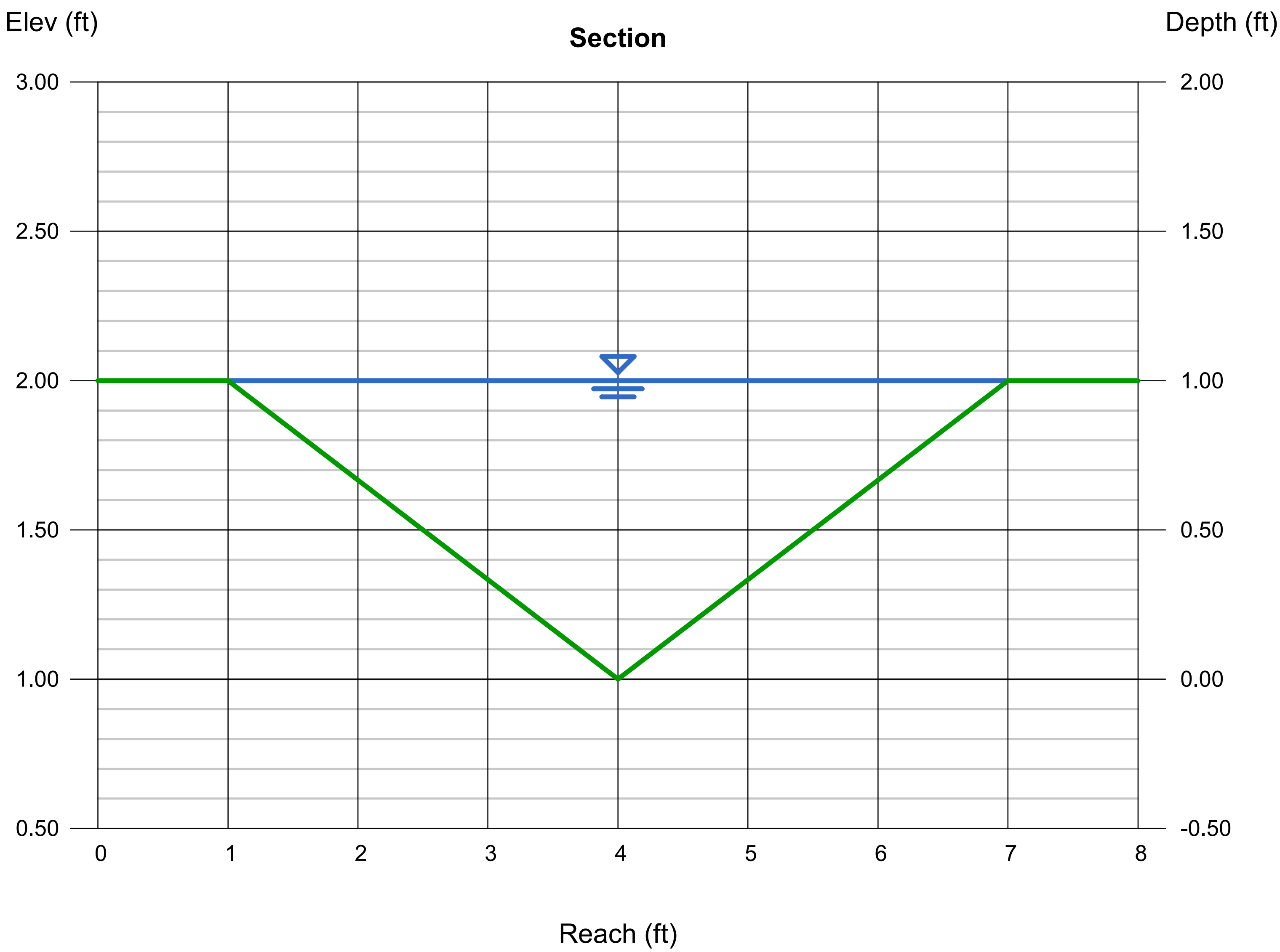
3-27S

Triangular
Side Slopes (z:1) = 3.00, 3.00
Total Depth (ft) = 1.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.00
Q (cfs) = 3.834
Area (sqft) = 3.00
Velocity (ft/s) = 1.28
Wetted Perim (ft) = 6.32
Crit Depth, Yc (ft) = 0.64
Top Width (ft) = 6.00
EGL (ft) = 1.03



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

3-31E

Trapezoidal

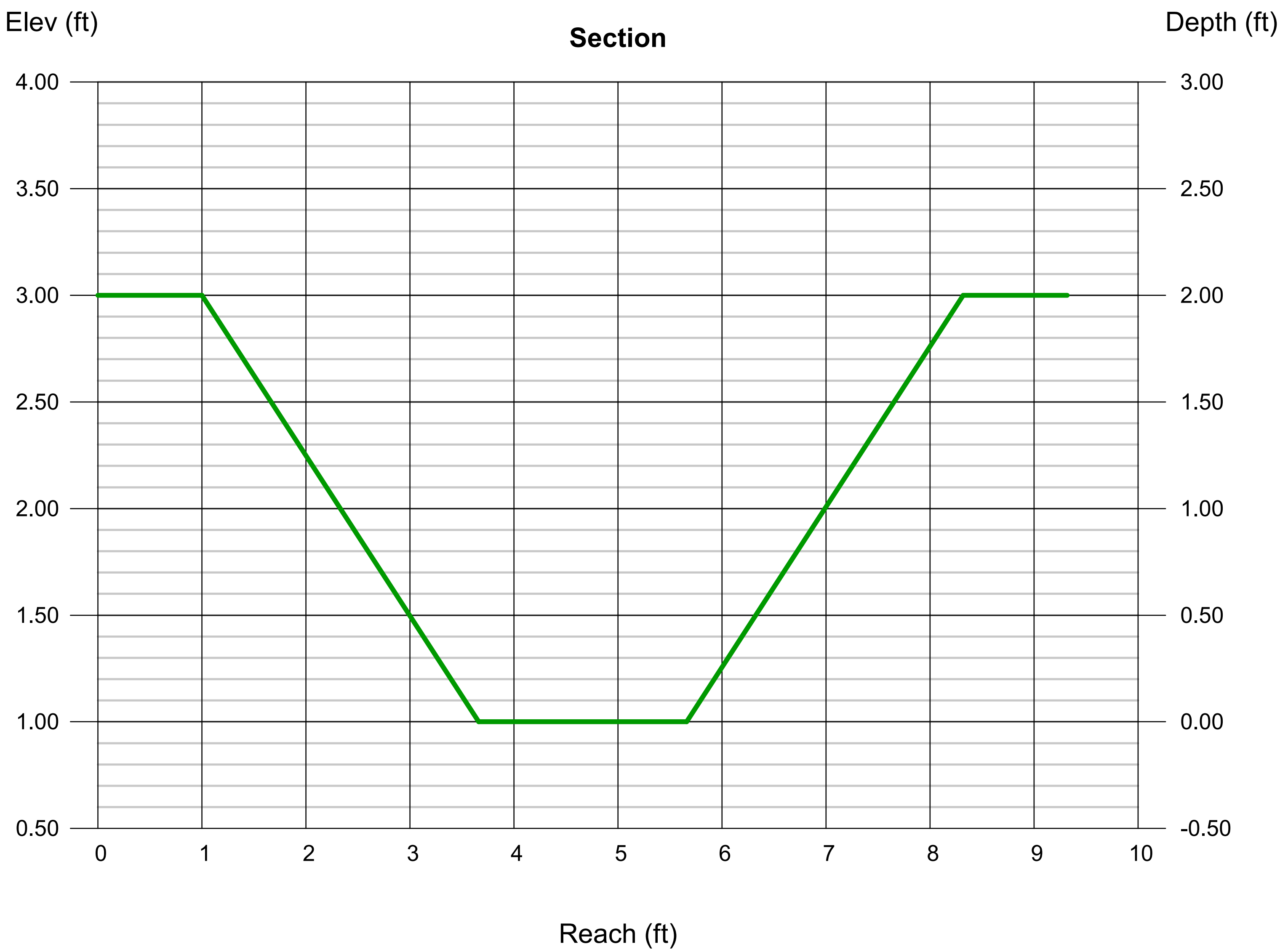
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 1.33, 1.33
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

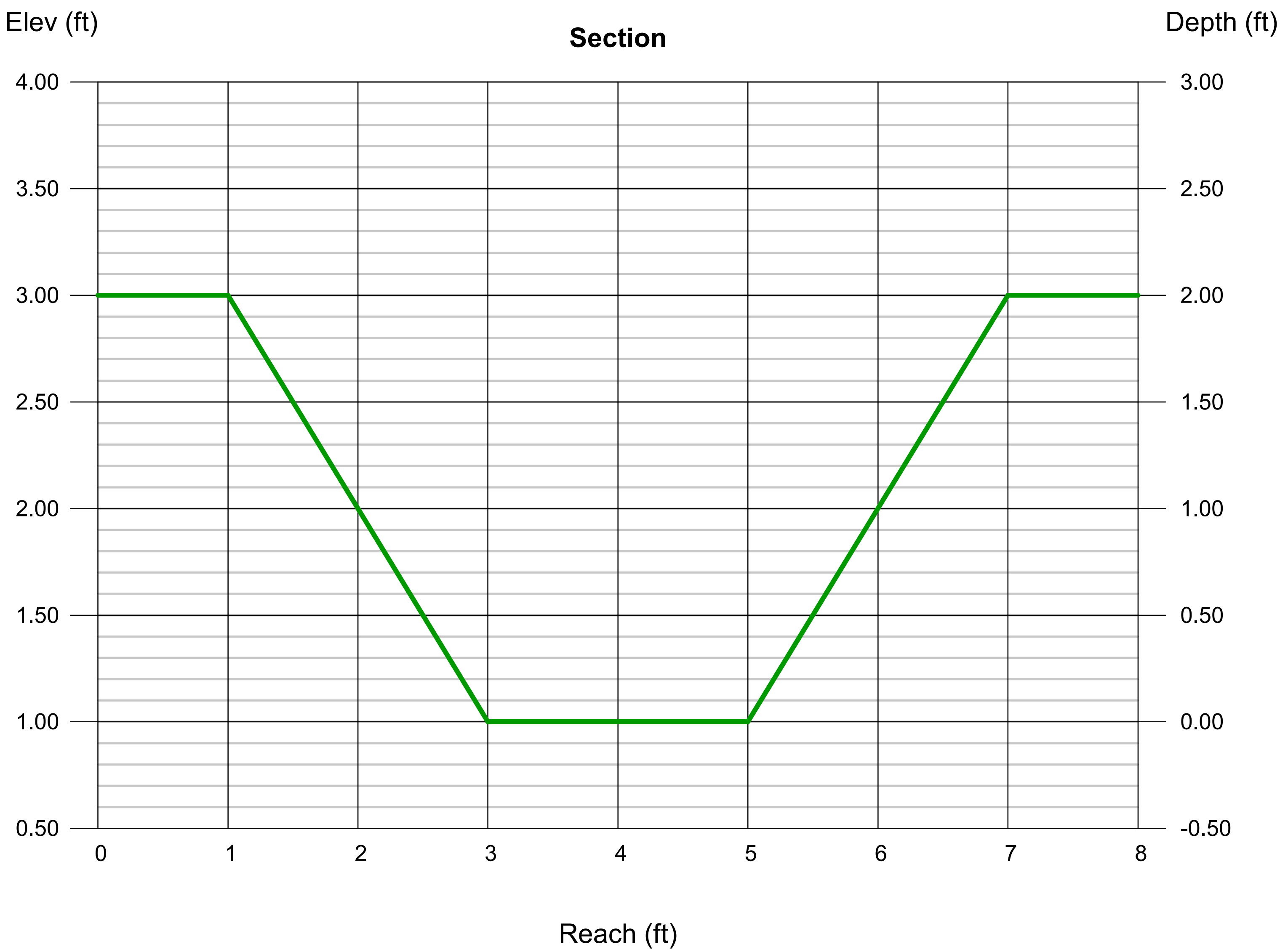
Depth (ft)	= 2.00
Q (cfs)	= 20.58
Area (sqft)	= 9.32
Velocity (ft/s)	= 2.21
Wetted Perim (ft)	= 8.66
Crit Depth, Yc (ft)	= 1.15
Top Width (ft)	= 7.32
EGL (ft)	= 2.08



Channel Report

3-31S

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 1.00, 1.00	Q (cfs)	= 17.31
Total Depth (ft)	= 2.00	Area (sqft)	= 8.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.16
Slope (%)	= 0.50	Wetted Perim (ft)	= 7.66
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.10
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 2.07
Compute by:	Q vs Depth		
No. Increments	= 10		



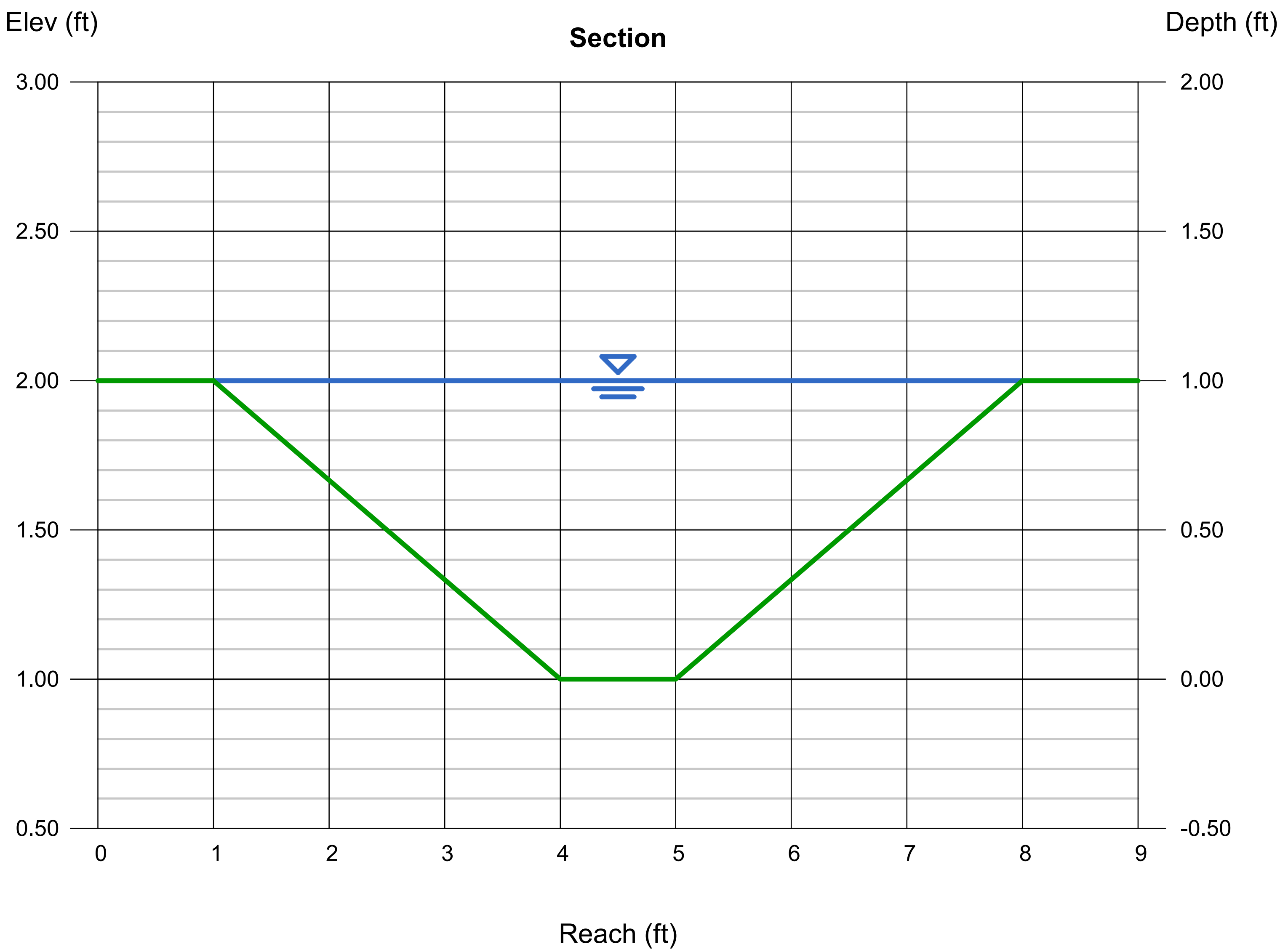
Channel Report

3-32E

Trapezoidal
Bottom Width (ft) = 1.00
Side Slopes (z:1) = 3.00, 3.00
Total Depth (ft) = 1.00
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.00
Q (cfs) = 5.615
Area (sqft) = 4.00
Velocity (ft/s) = 1.40
Wetted Perim (ft) = 7.32
Crit Depth, Yc (ft) = 0.60
Top Width (ft) = 7.00
EGL (ft) = 1.03



Channel Report

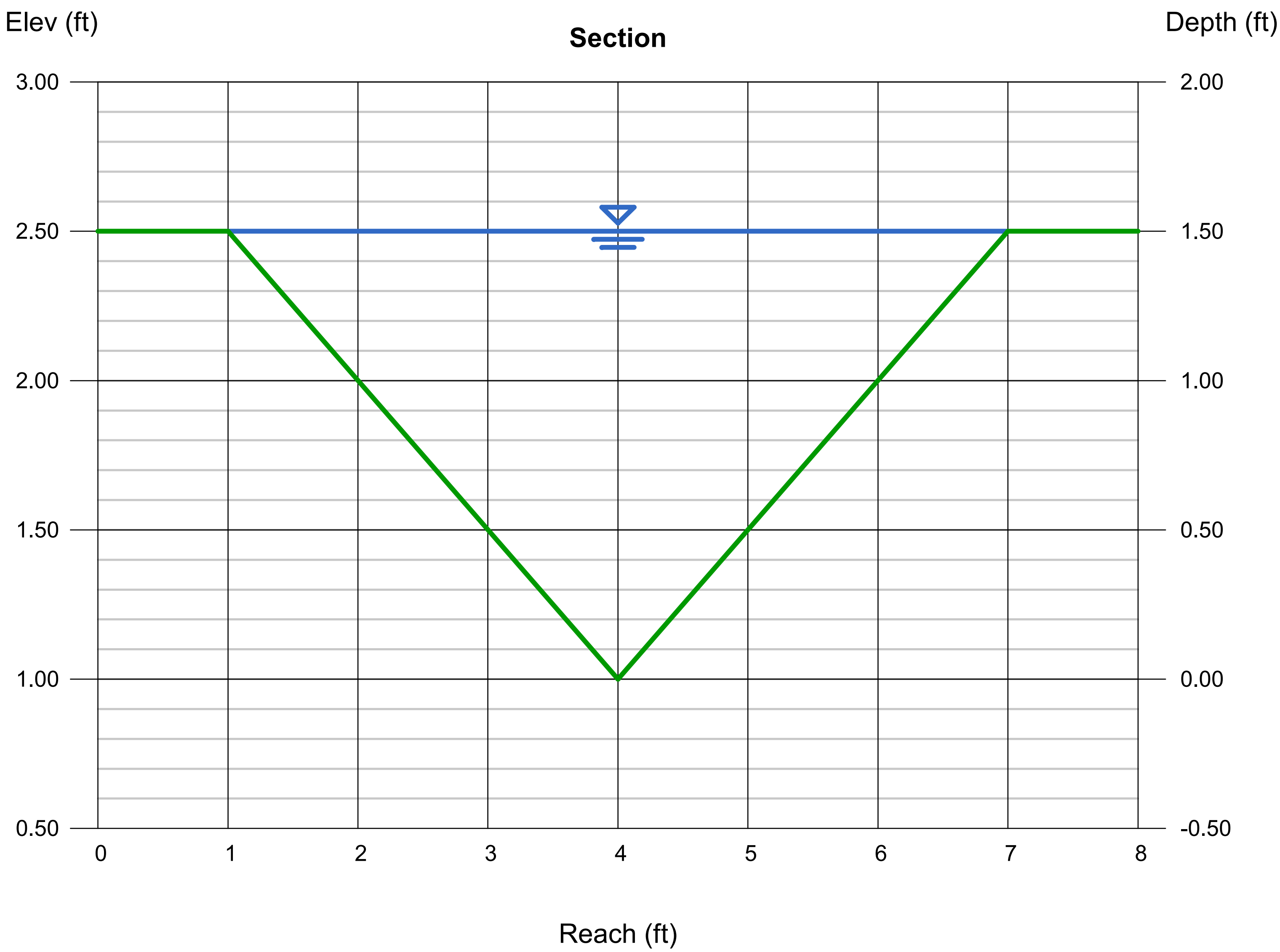
3-33N

Triangular
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 1.50

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 1.50
Q (cfs) = 7.246
Area (sqft) = 4.50
Velocity (ft/s) = 1.61
Wetted Perim (ft) = 6.71
Crit Depth, Yc (ft) = 0.97
Top Width (ft) = 6.00
EGL (ft) = 1.54

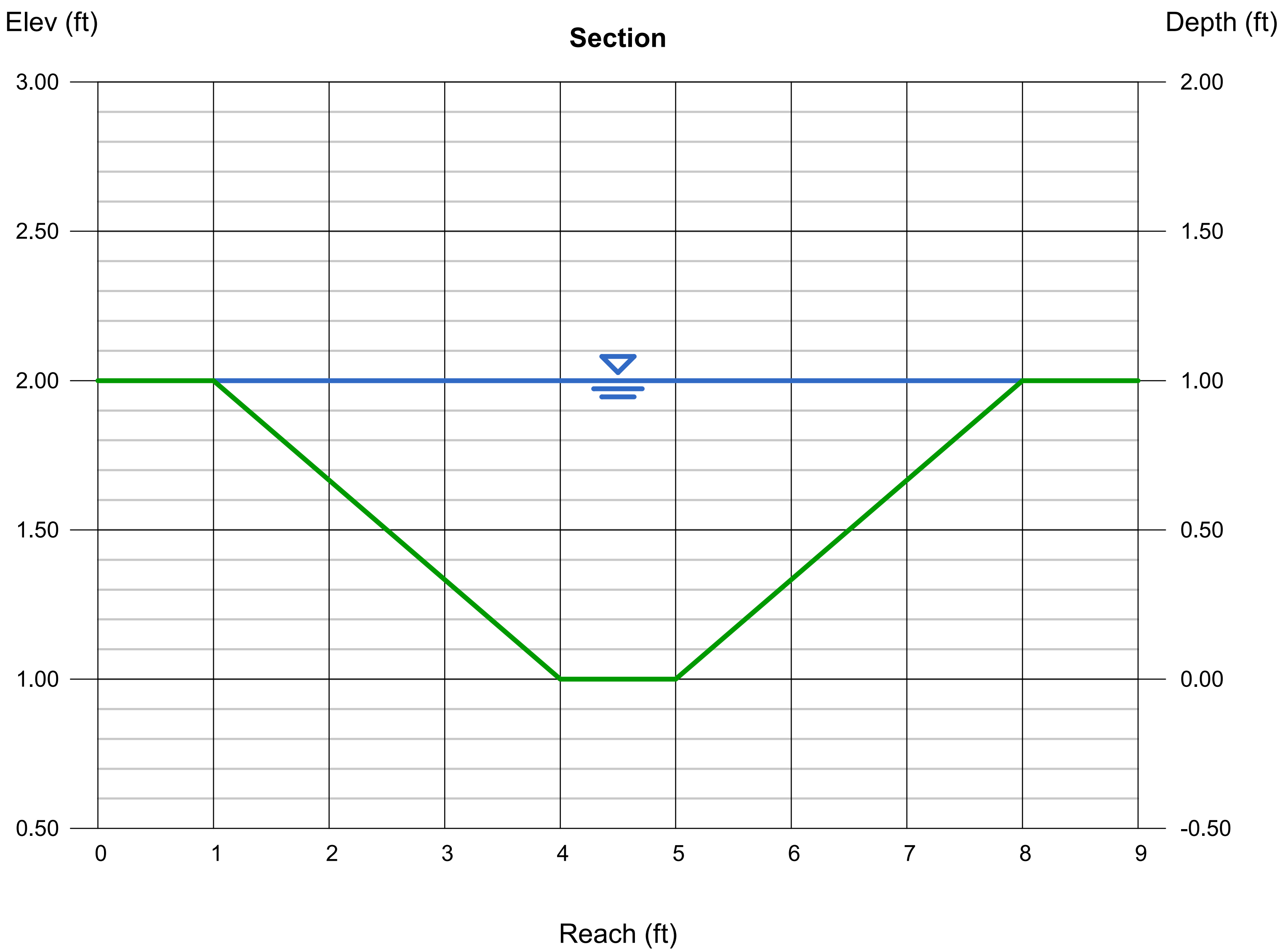


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

3-33W

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 1.00	Depth (ft)	= 1.00
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 5.615
Total Depth (ft)	= 1.00	Area (sqft)	= 4.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.40
Slope (%)	= 0.50	Wetted Perim (ft)	= 7.32
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.60
		Top Width (ft)	= 7.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-34E

Triangular

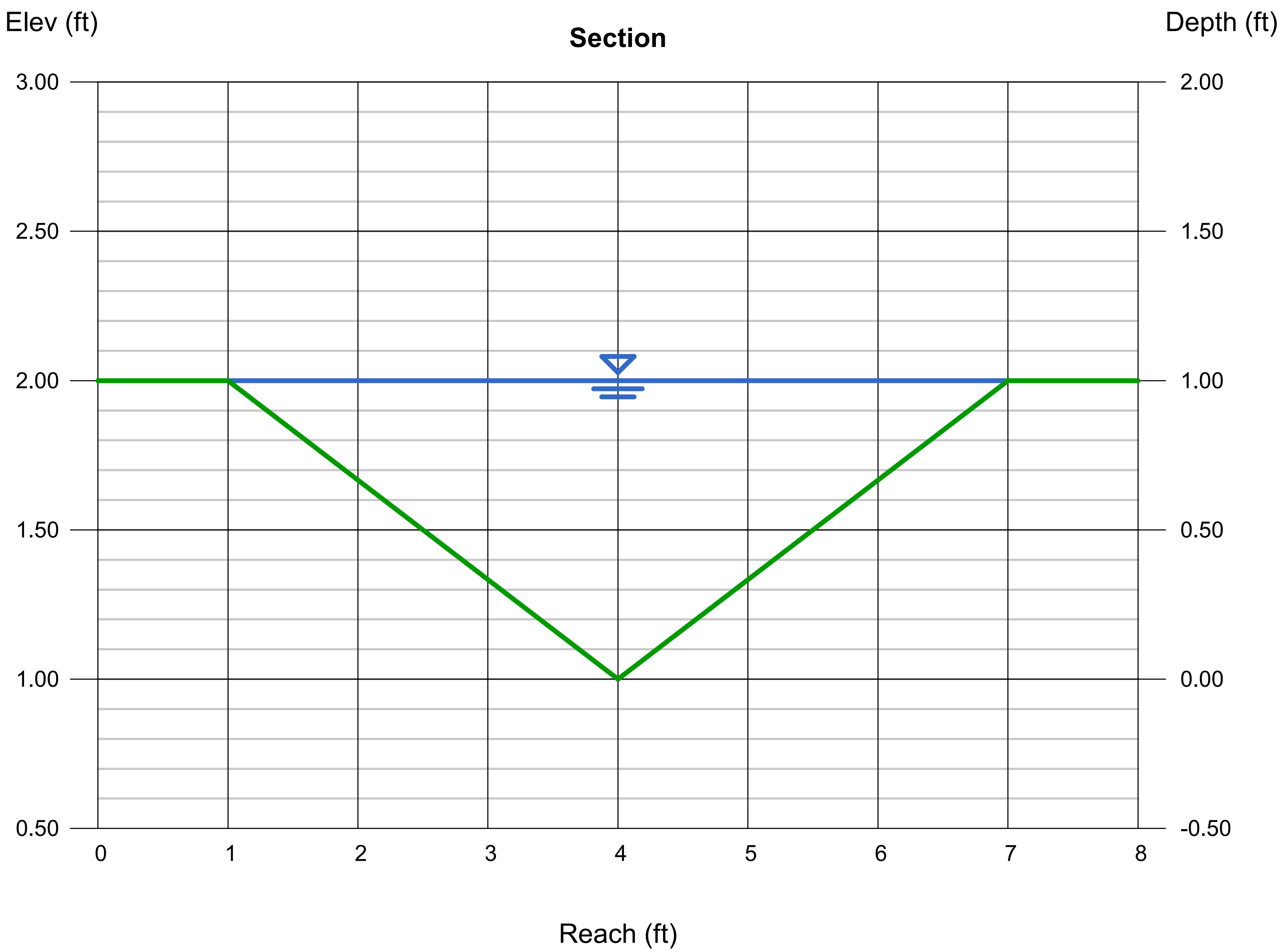
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.00
Q (cfs)	= 3.834
Area (sqft)	= 3.00
Velocity (ft/s)	= 1.28
Wetted Perim (ft)	= 6.32
Crit Depth, Yc (ft)	= 0.64
Top Width (ft)	= 6.00
EGL (ft)	= 1.03

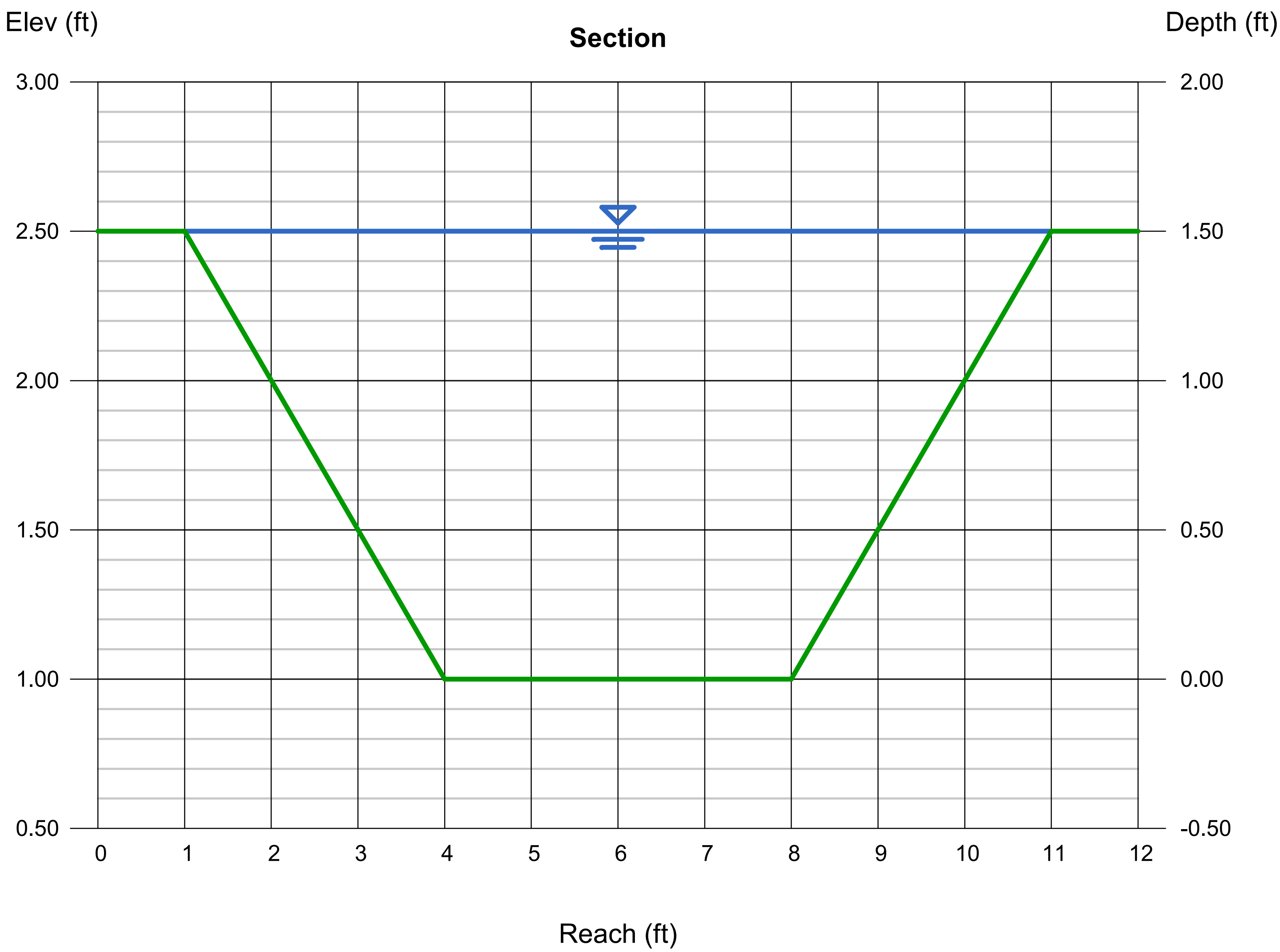


Channel Report

3-34N

Trapezoidal	
Bottom Width (ft)	= 4.00
Side Slopes (z:1)	= 2.00, 2.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050
Calculations	
Compute by:	Q vs Depth
No. Increments	= 10

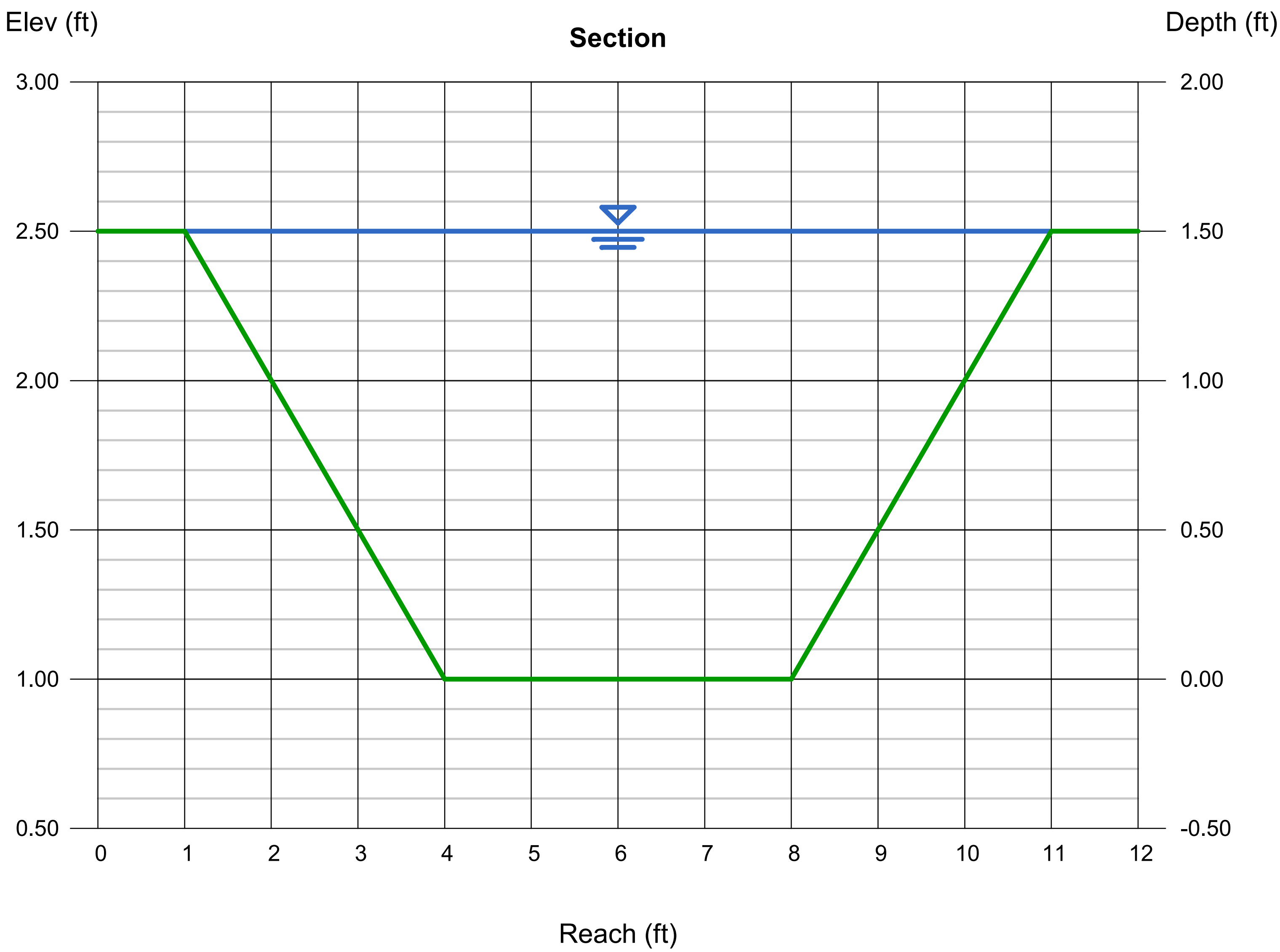
Highlighted	
Depth (ft)	= 1.50
Q (cfs)	= 21.78
Area (sqft)	= 10.50
Velocity (ft/s)	= 2.07
Wetted Perim (ft)	= 10.71
Crit Depth, Yc (ft)	= 0.84
Top Width (ft)	= 10.00
EGL (ft)	= 1.57



Channel Report

3-34W

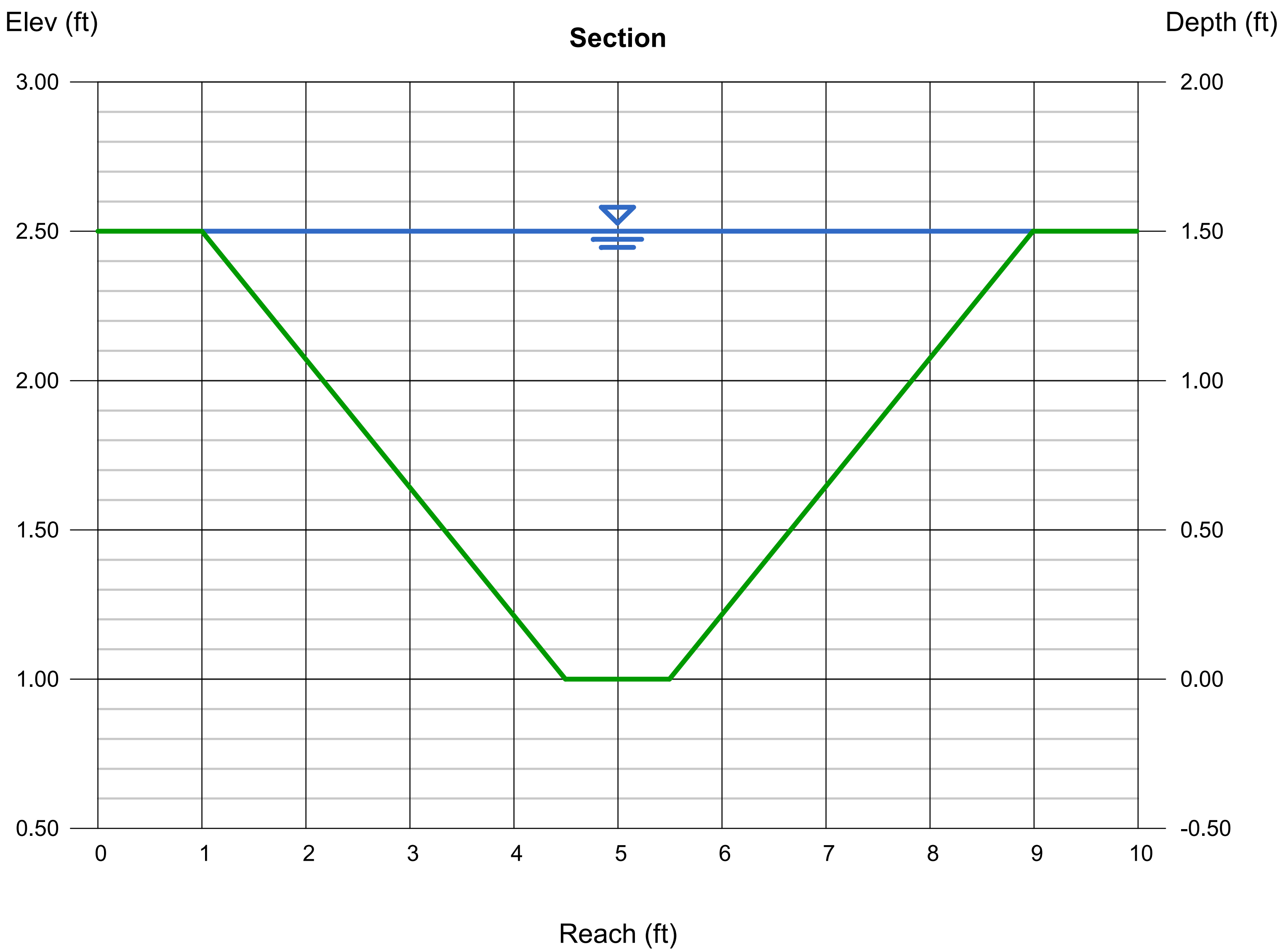
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 4.00	Depth (ft)	= 1.50
Side Slopes (z:1)	= 2.00, 2.00	Q (cfs)	= 21.78
Total Depth (ft)	= 1.50	Area (sqft)	= 10.50
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.07
Slope (%)	= 0.50	Wetted Perim (ft)	= 10.71
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.84
		Top Width (ft)	= 10.00
Calculations		EGL (ft)	= 1.57
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-35N

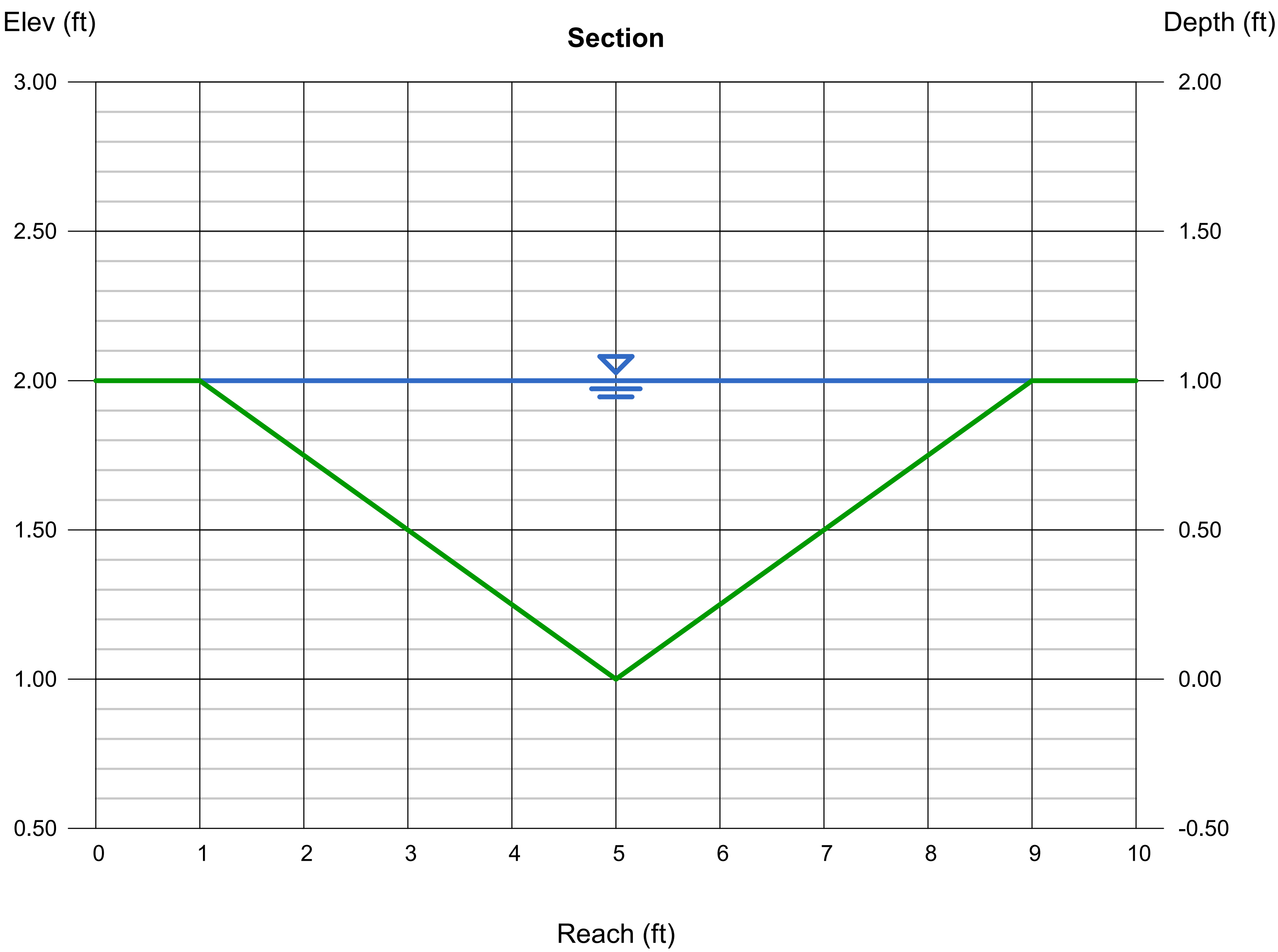
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 1.00	Depth (ft)	= 1.50
Side Slopes (z:1)	= 2.33, 2.33	Q (cfs)	= 12.04
Total Depth (ft)	= 1.50	Area (sqft)	= 6.74
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.79
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.61
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.92
		Top Width (ft)	= 7.99
Calculations		EGL (ft)	= 1.55
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-36E

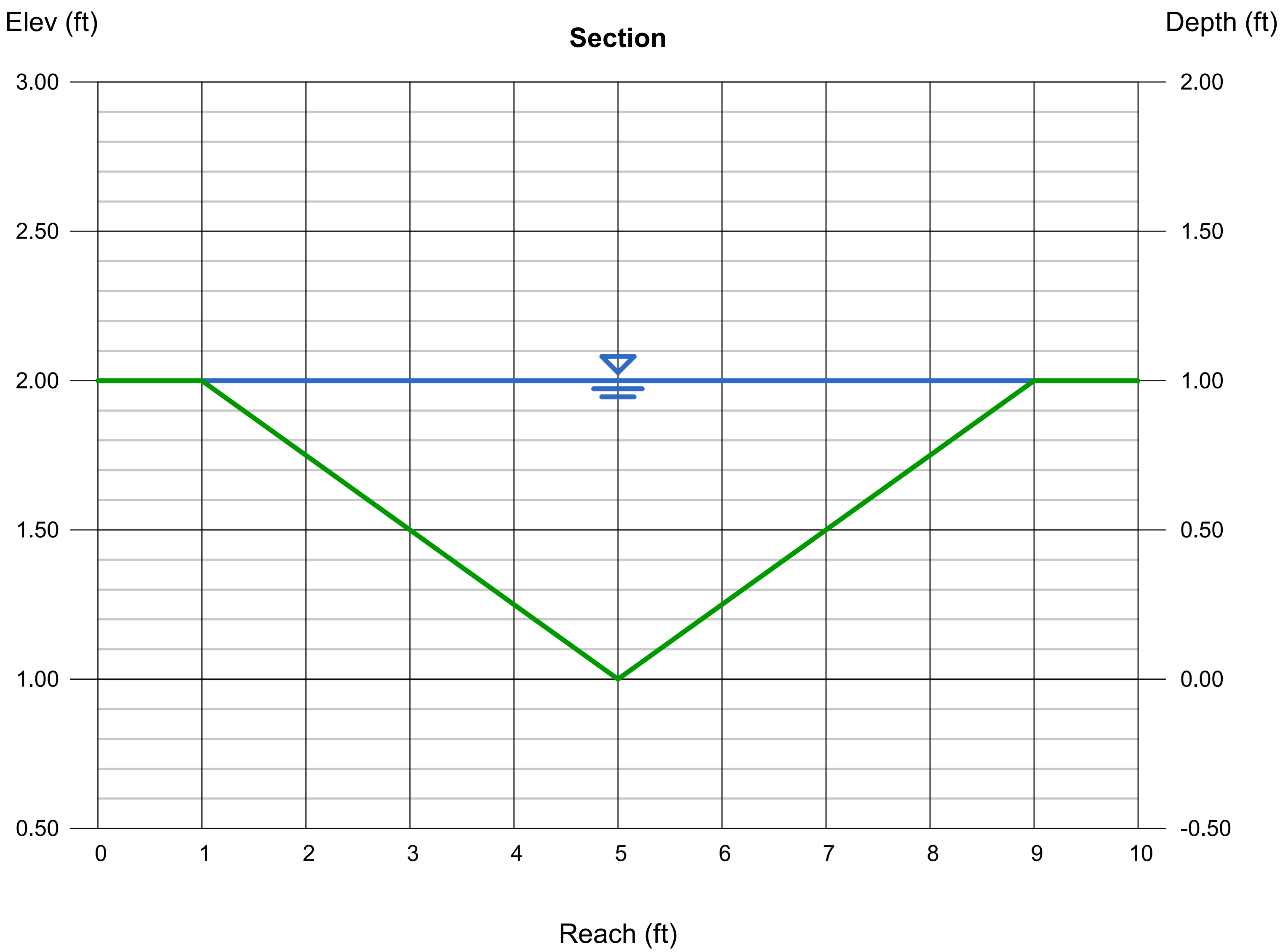
Triangular		**Highlighted**	
Side Slopes (z:1)	= 4.00, 4.00	Depth (ft)	= 1.00
Total Depth (ft)	= 1.00	Q (cfs)	= 5.188
		Area (sqft)	= 4.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.30
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.25
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.64
		Top Width (ft)	= 8.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-37W

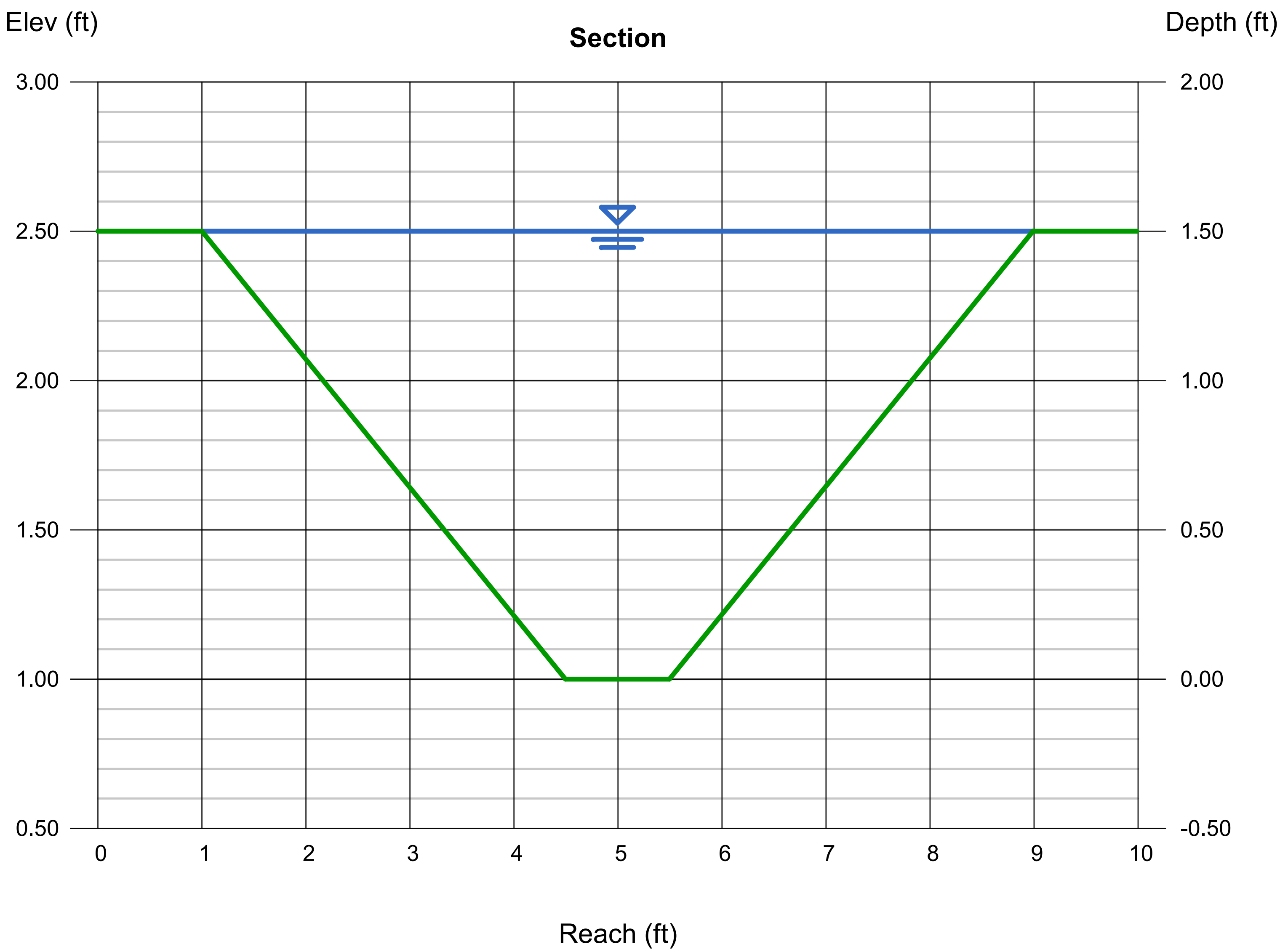
Triangular		**Highlighted**	
Side Slopes (z:1)	= 4.00, 4.00	Depth (ft)	= 1.00
Total Depth (ft)	= 1.00	Q (cfs)	= 5.188
		Area (sqft)	= 4.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.30
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.25
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.64
		Top Width (ft)	= 8.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-40E

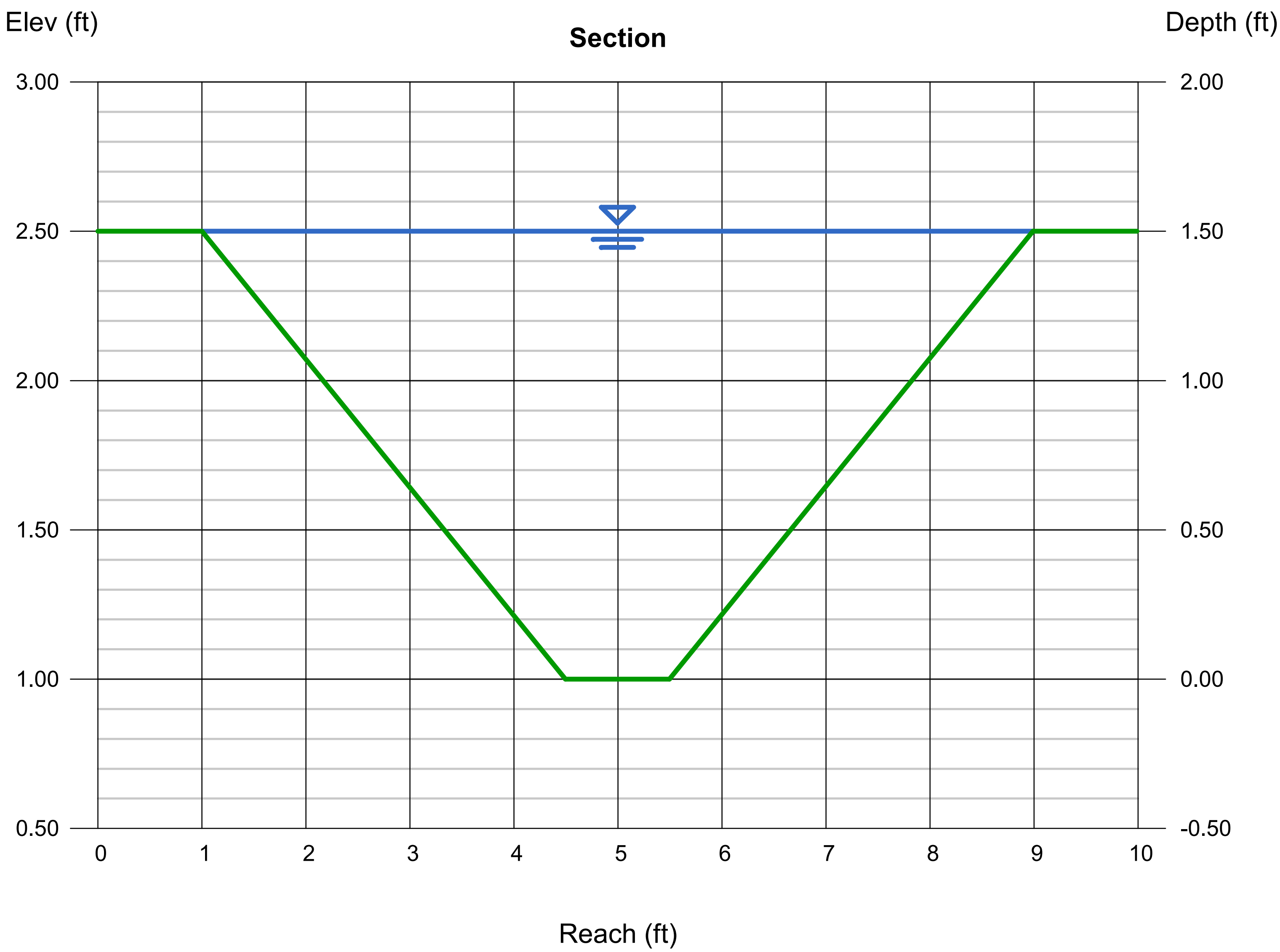
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 1.00	Depth (ft)	= 1.50
Side Slopes (z:1)	= 2.33, 2.33	Q (cfs)	= 12.04
Total Depth (ft)	= 1.50	Area (sqft)	= 6.74
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.79
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.61
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.92
		Top Width (ft)	= 7.99
Calculations		EGL (ft)	= 1.55
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-40S

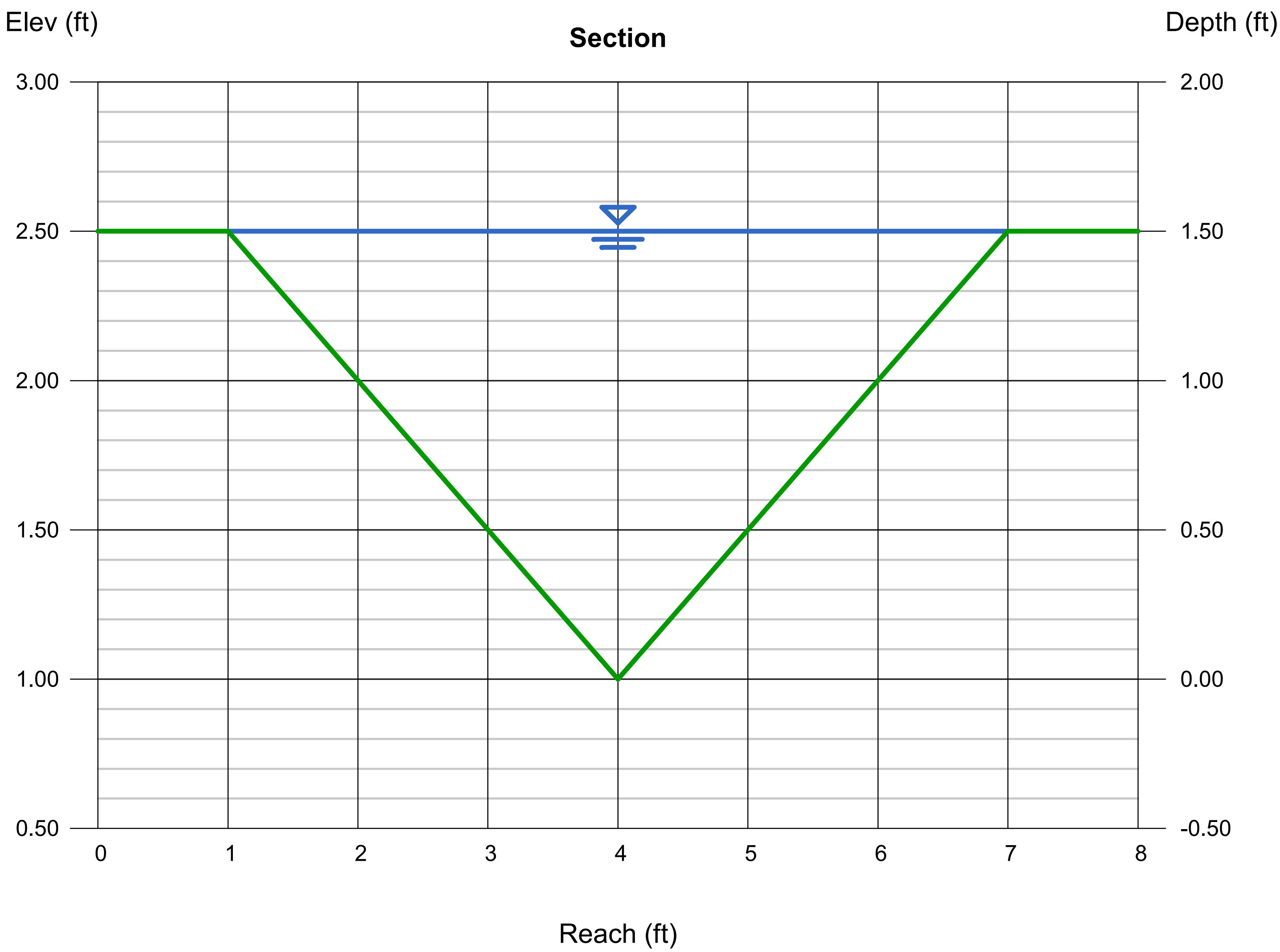
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 1.00	Depth (ft)	= 1.50
Side Slopes (z:1)	= 2.33, 2.33	Q (cfs)	= 12.04
Total Depth (ft)	= 1.50	Area (sqft)	= 6.74
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.79
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.61
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.92
		Top Width (ft)	= 7.99
Calculations		EGL (ft)	= 1.55
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-40\W

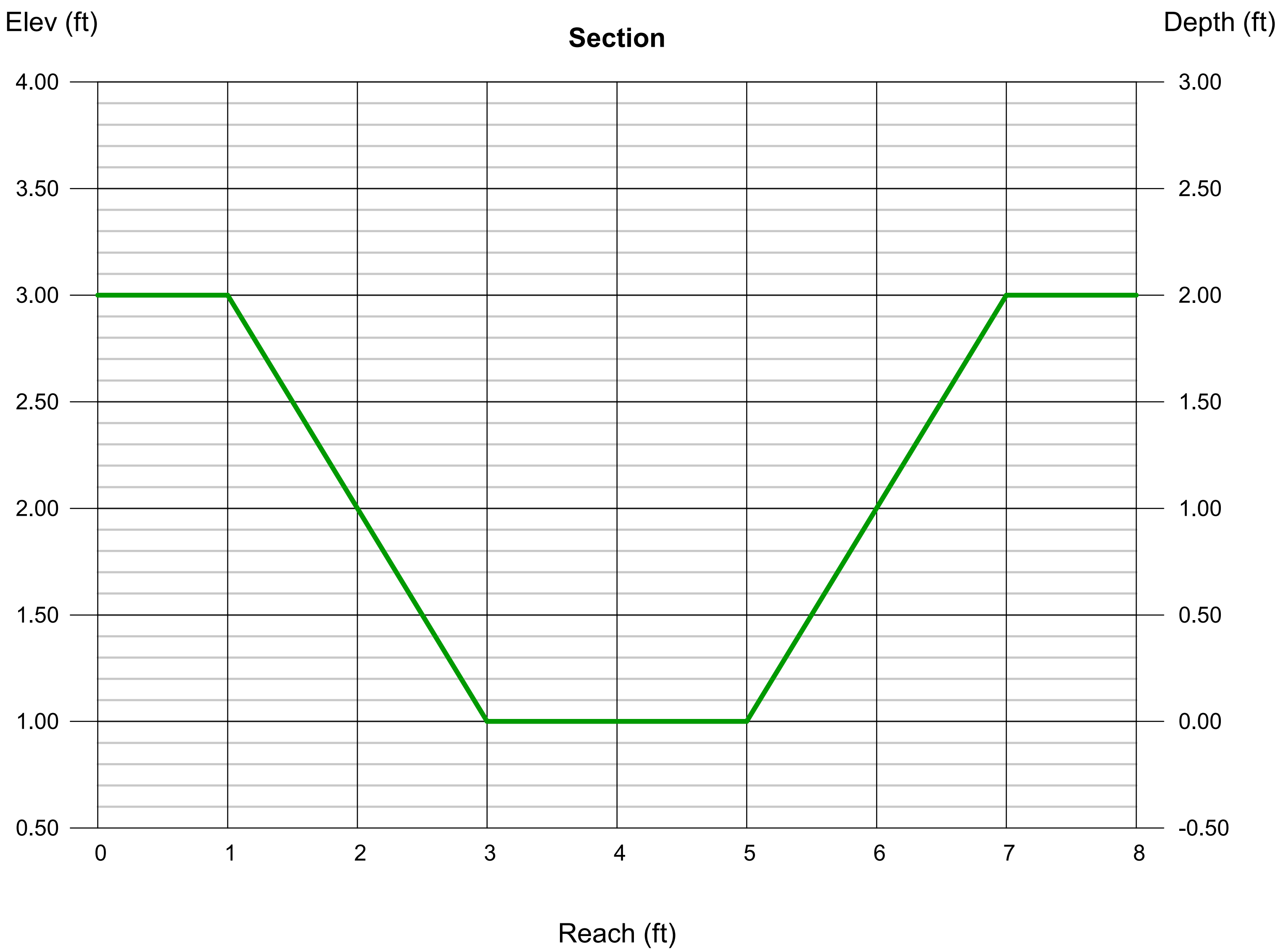
Triangular		**Highlighted**	
Side Slopes (z:1)	= 2.00, 2.00	Depth (ft)	= 1.50
Total Depth (ft)	= 1.50	Q (cfs)	= 7.246
		Area (sqft)	= 4.50
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.61
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.71
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.97
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 1.54
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-41E

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 1.00, 1.00	Q (cfs)	= 17.31
Total Depth (ft)	= 2.00	Area (sqft)	= 8.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.16
Slope (%)	= 0.50	Wetted Perim (ft)	= 7.66
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.10
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 2.07
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

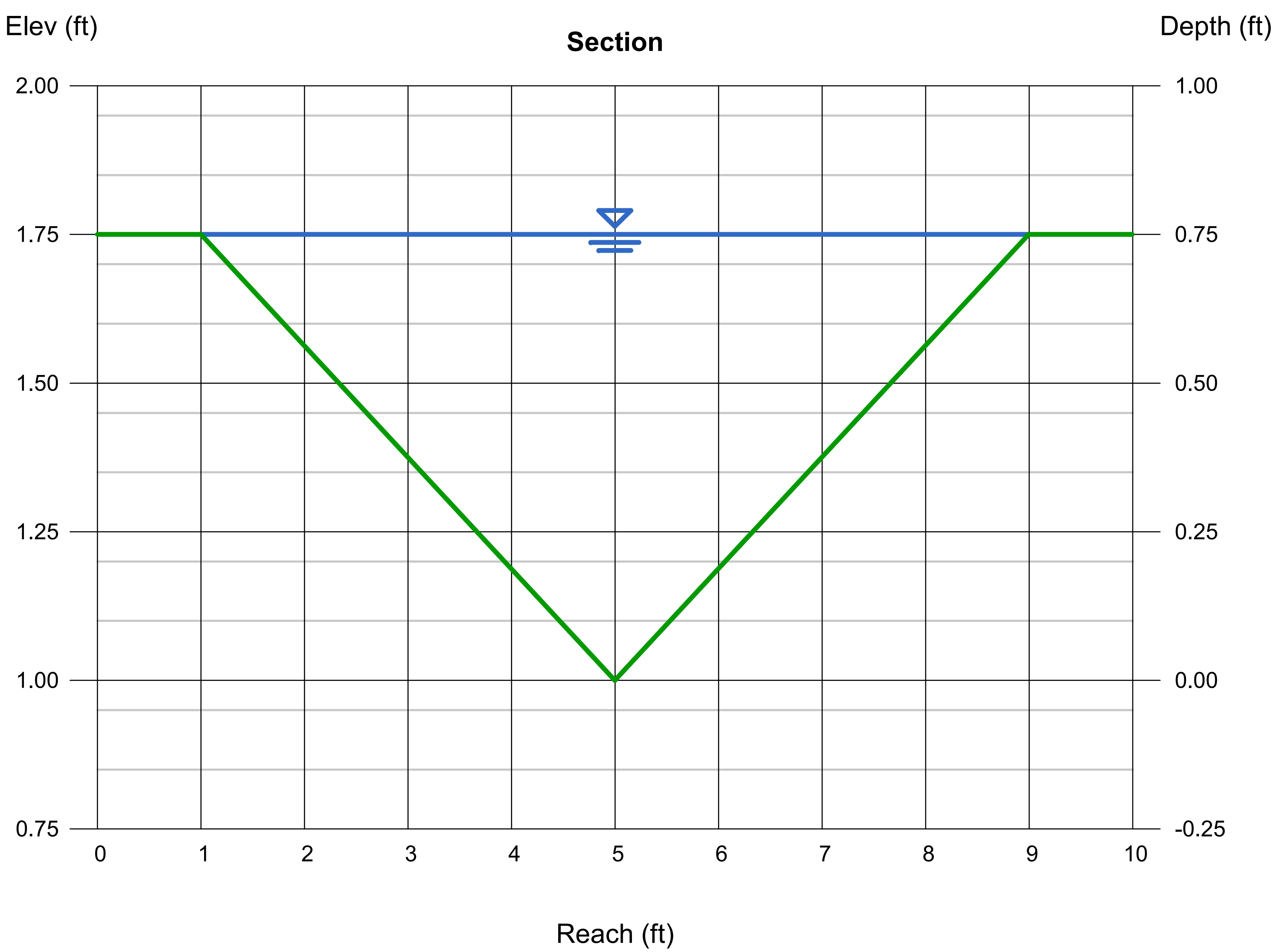
23-42E

Triangular
Side Slopes (z:1) = 5.33, 5.33
Total Depth (ft) = 0.75

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 0.75
Q (cfs) = 3.238
Area (sqft) = 3.00
Velocity (ft/s) = 1.08
Wetted Perim (ft) = 8.13
Crit Depth, Yc (ft) = 0.48
Top Width (ft) = 7.99
EGL (ft) = 0.77



Channel Report

23-43N

Trapezoidal

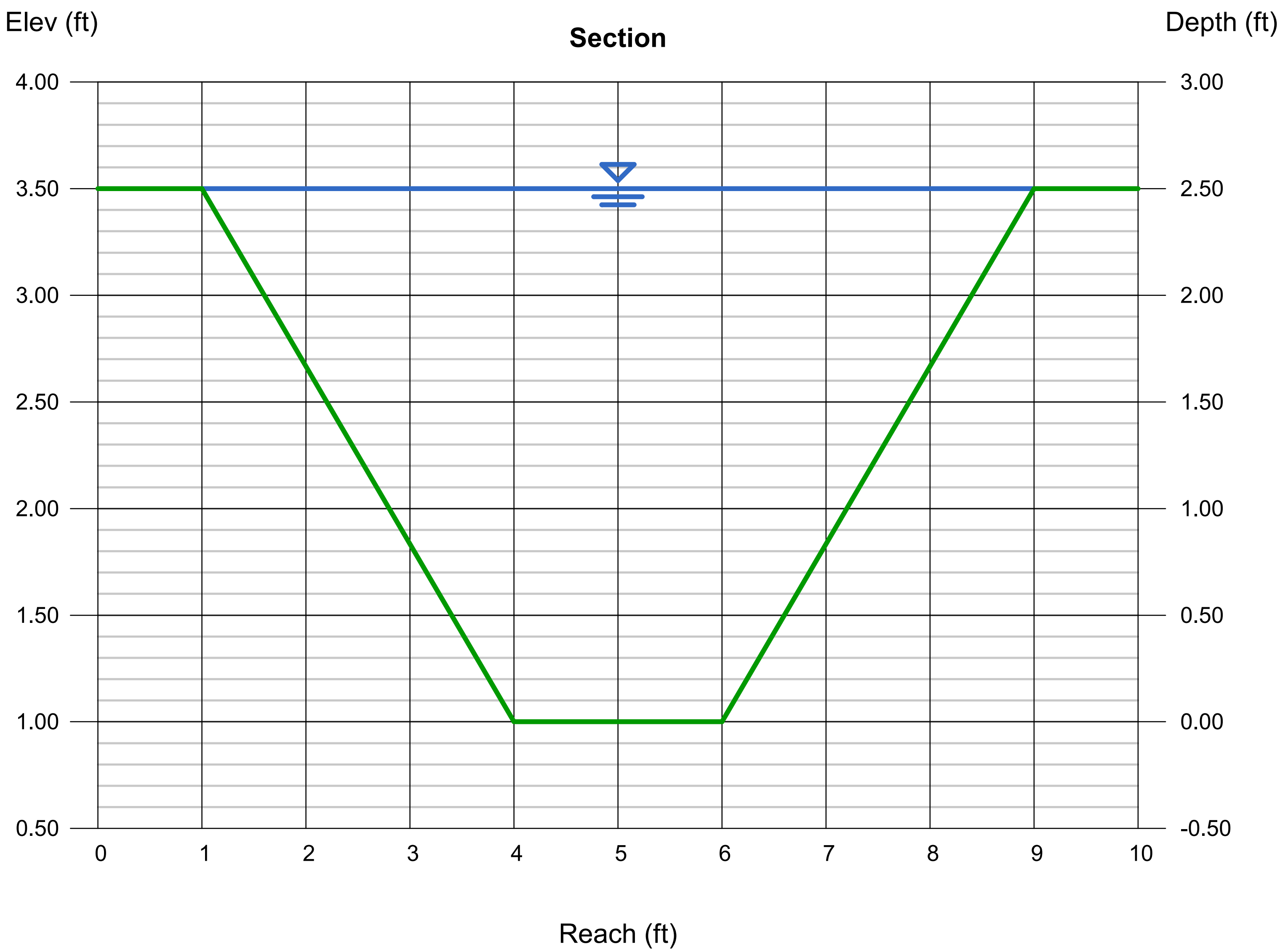
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 1.20, 1.20
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

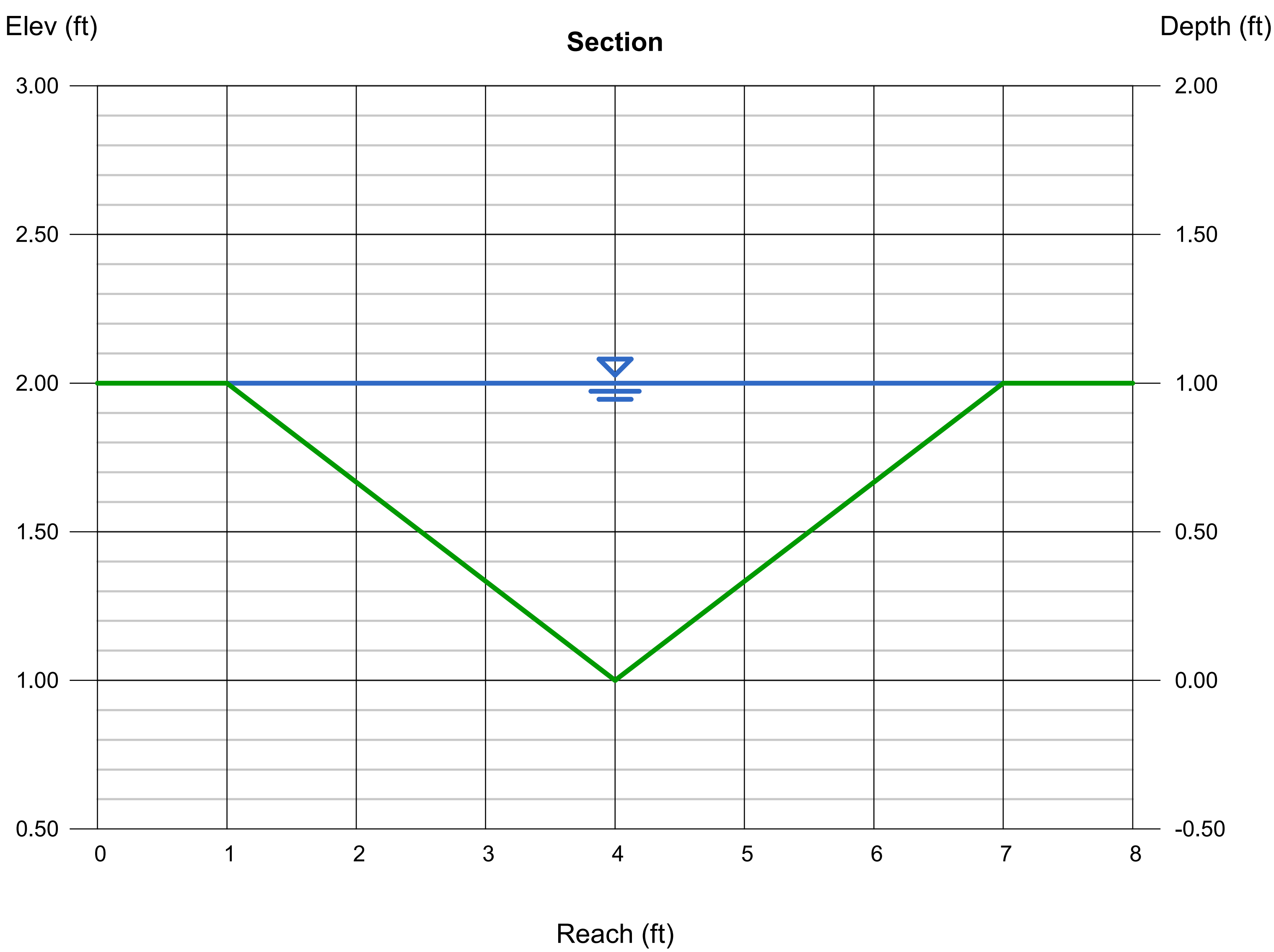
Depth (ft)	= 2.50
Q (cfs)	= 30.88
Area (sqft)	= 12.50
Velocity (ft/s)	= 2.47
Wetted Perim (ft)	= 9.81
Crit Depth, Yc (ft)	= 1.46
Top Width (ft)	= 8.00
EGL (ft)	= 2.59



Channel Report

23-43S

Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.00
Total Depth (ft)	= 1.00	Q (cfs)	= 3.834
		Area (sqft)	= 3.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.28
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.32
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.64
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		

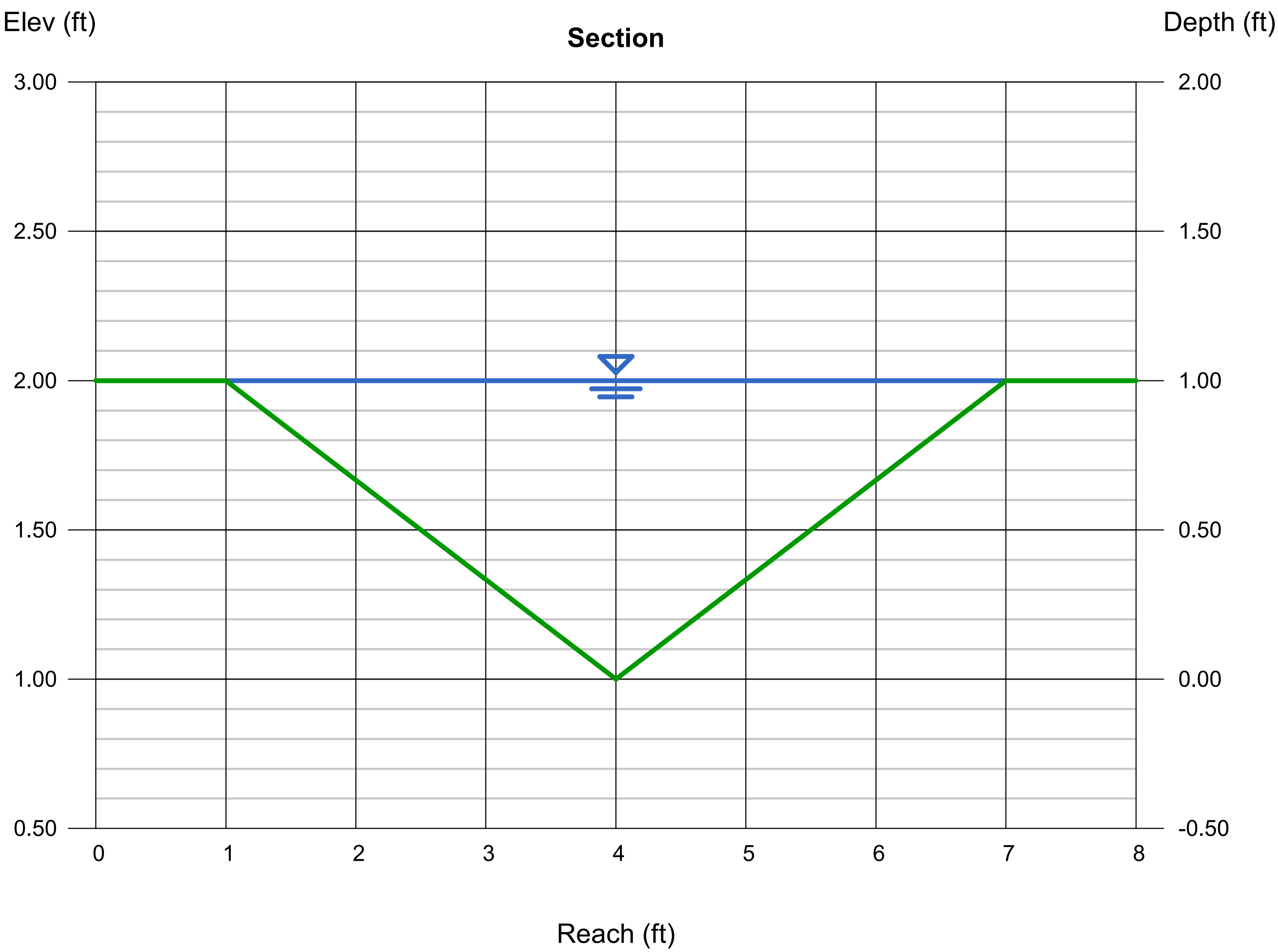


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

23-43W

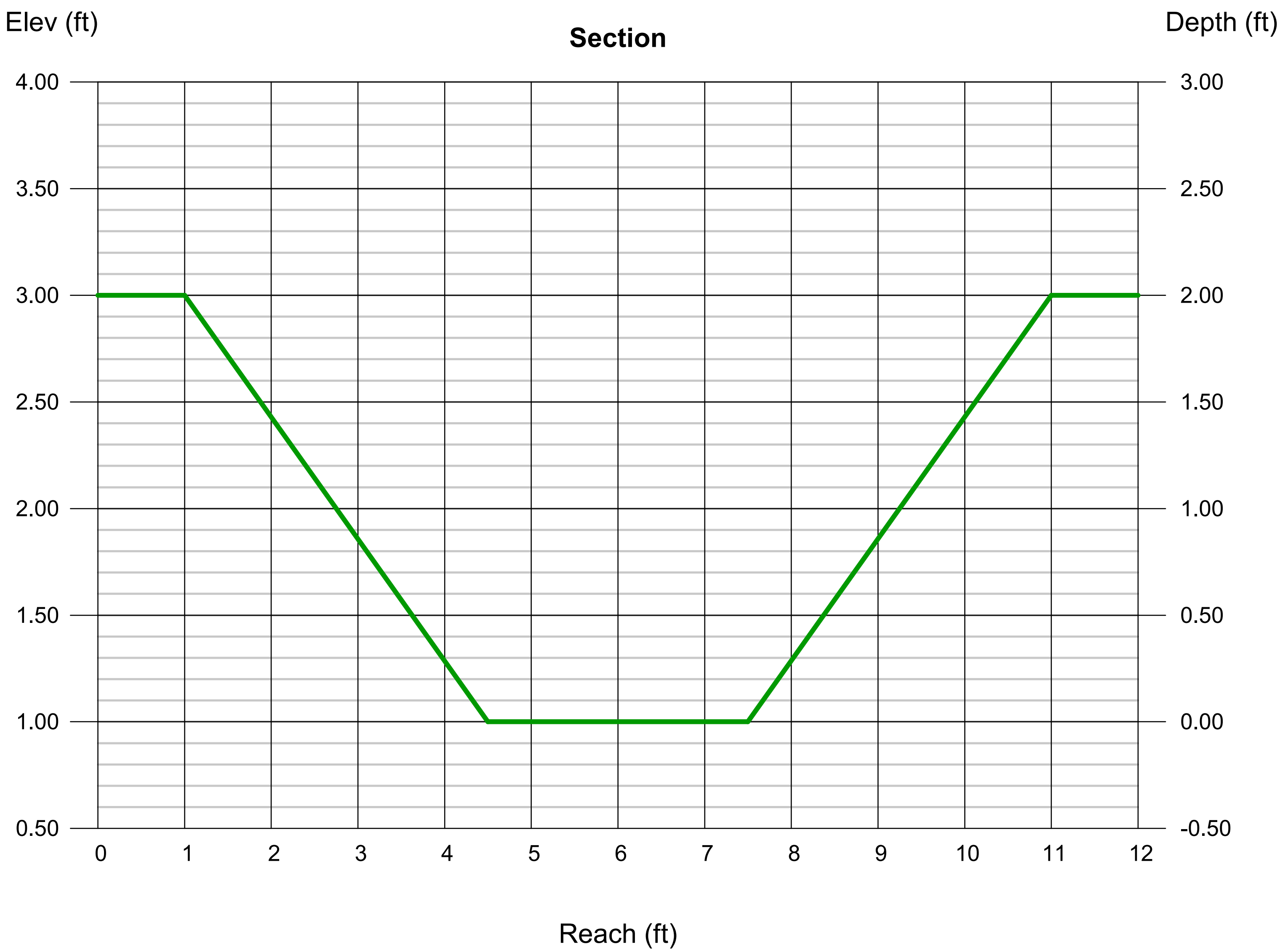
Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.00
Total Depth (ft)	= 1.00	Q (cfs)	= 3.834
		Area (sqft)	= 3.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.28
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.32
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.64
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-44N

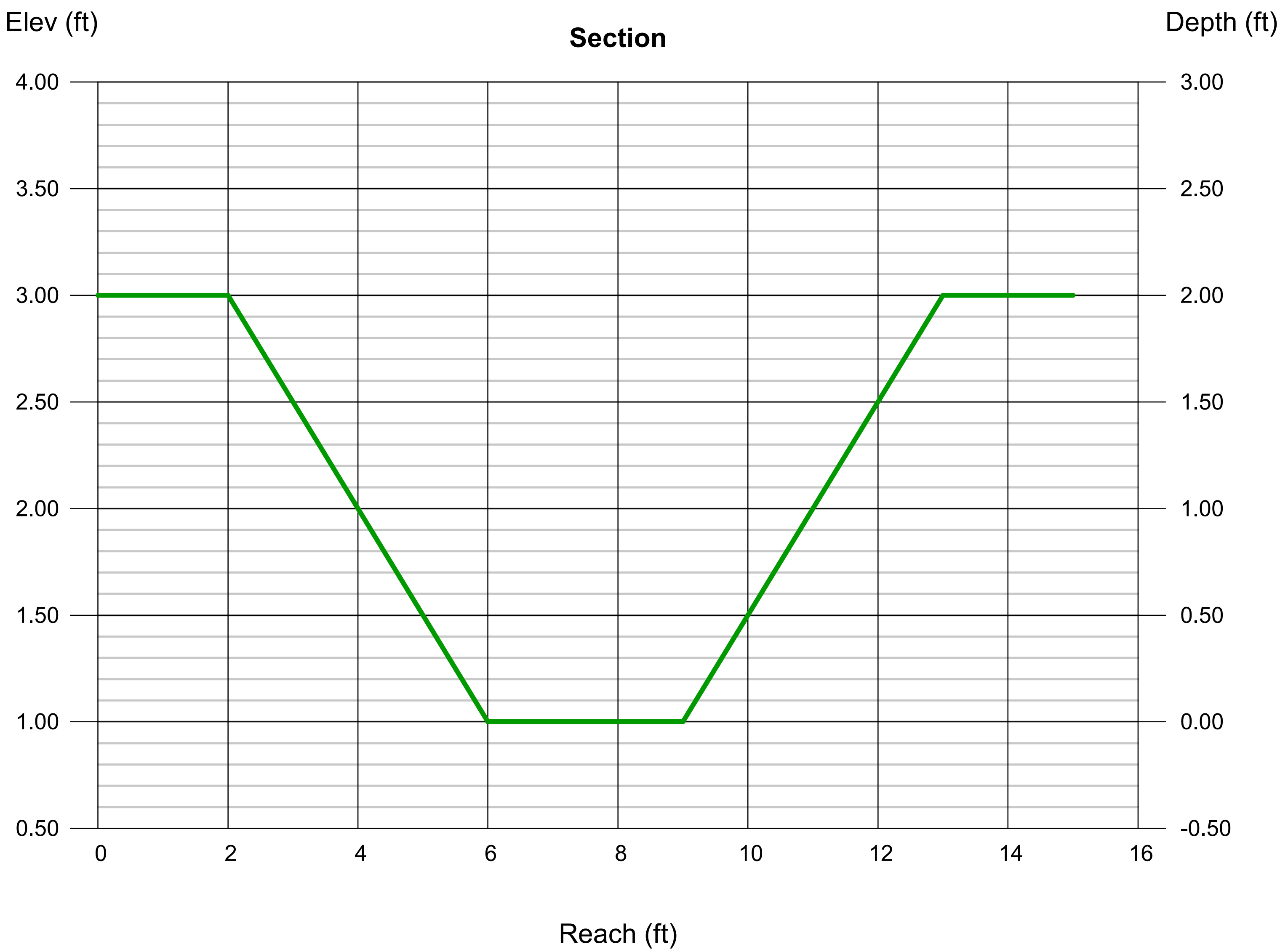
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 1.75, 1.75	Q (cfs)	= 30.43
Total Depth (ft)	= 2.00	Area (sqft)	= 13.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.34
Slope (%)	= 0.50	Wetted Perim (ft)	= 11.06
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.17
		Top Width (ft)	= 10.00
Calculations		EGL (ft)	= 2.09
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-45N

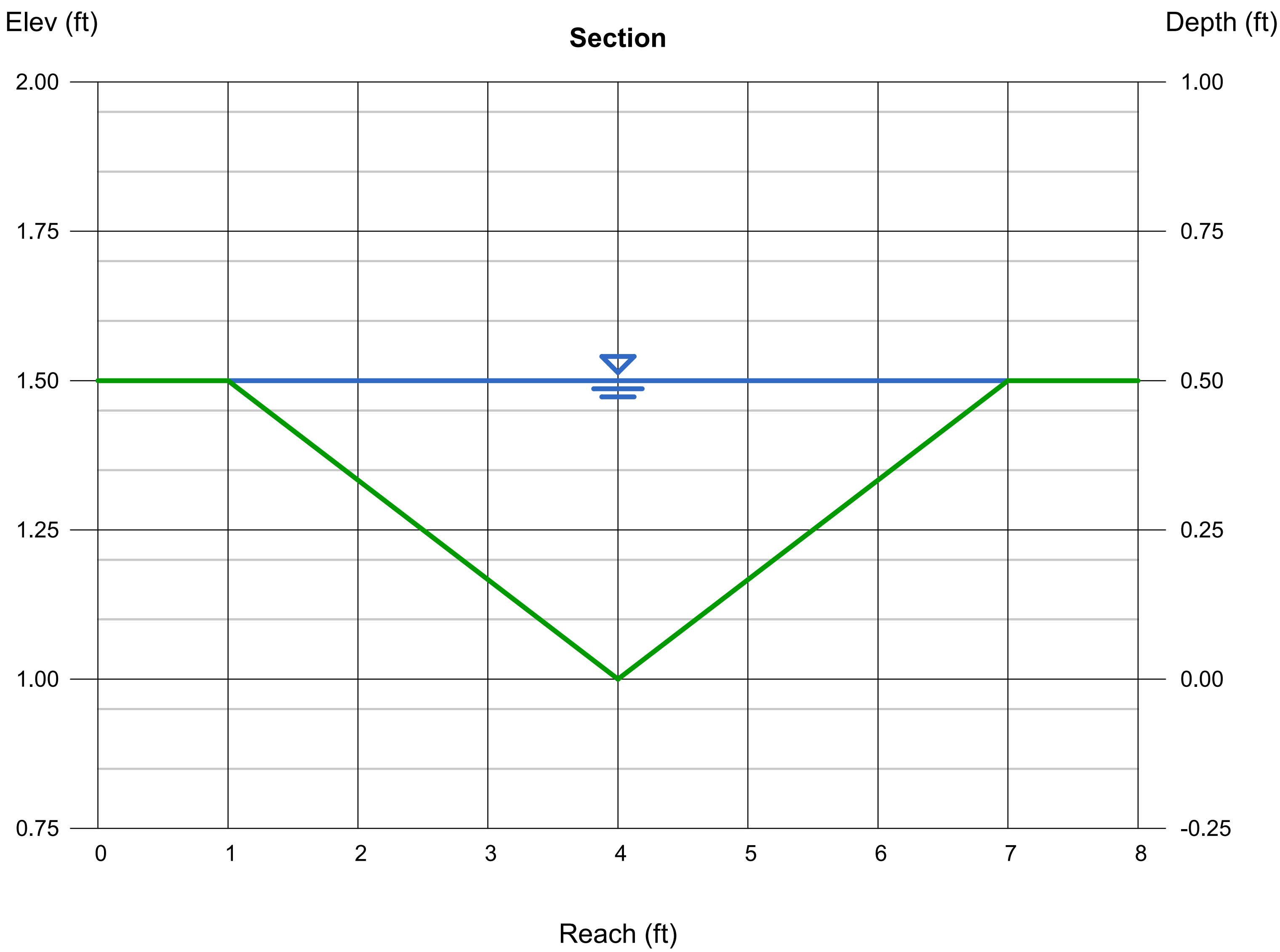
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 2.00, 2.00	Q (cfs)	= 32.71
Total Depth (ft)	= 2.00	Area (sqft)	= 14.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.34
Slope (%)	= 0.50	Wetted Perim (ft)	= 11.94
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.19
		Top Width (ft)	= 11.00
Calculations		EGL (ft)	= 2.08
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-45C

Triangular		**Highlighted**	
Side Slopes (z:1)	= 6.00, 6.00	Depth (ft)	= 0.50
Total Depth (ft)	= 0.50	Q (cfs)	= 1.239
		Area (sqft)	= 1.50
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 0.83
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.08
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.31
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 0.51
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-46N

Trapezoidal

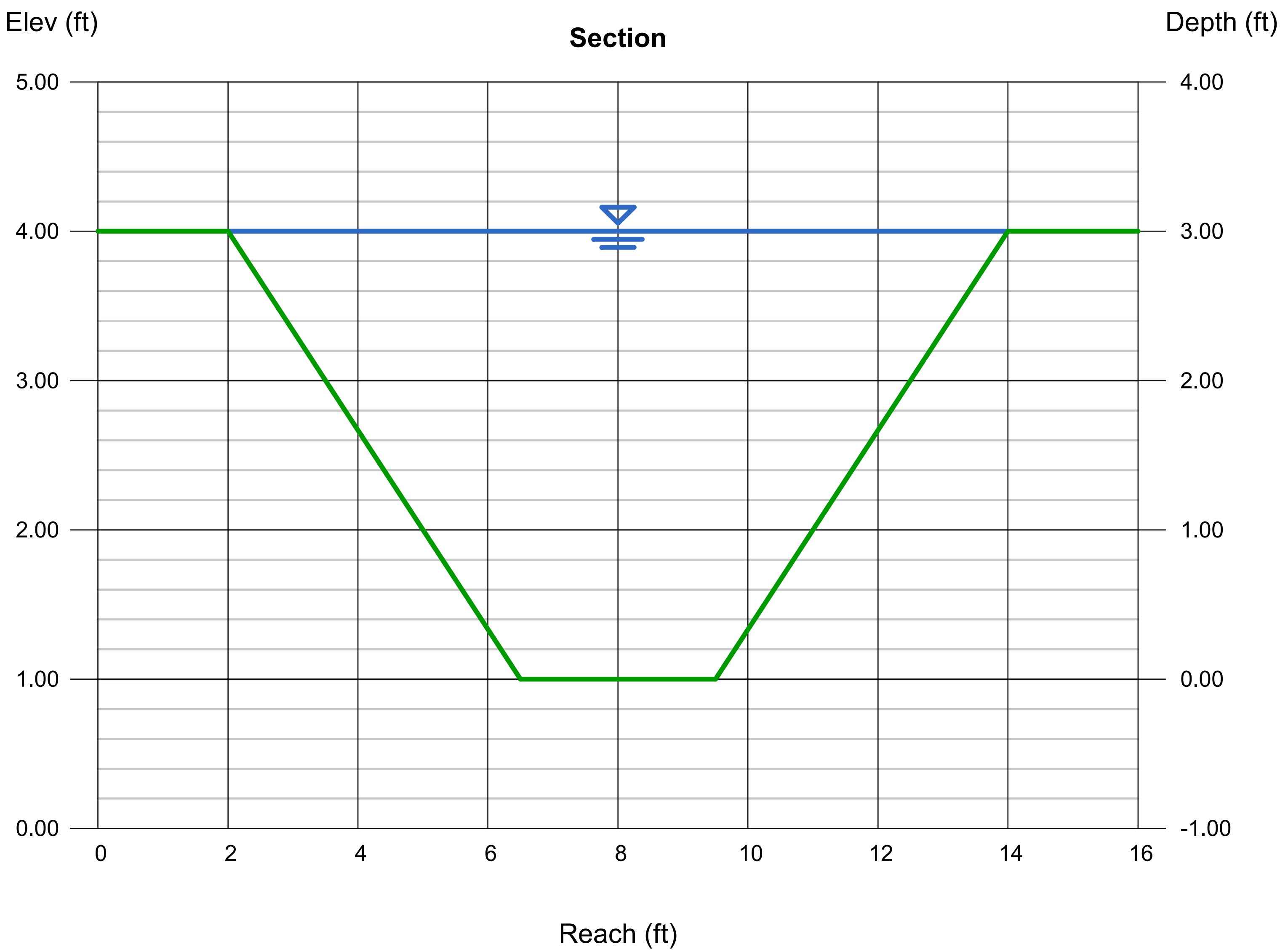
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 1.50, 1.50
Total Depth (ft)	= 3.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 3.00
Q (cfs)	= 65.46
Area (sqft)	= 22.50
Velocity (ft/s)	= 2.91
Wetted Perim (ft)	= 13.82
Crit Depth, Yc (ft)	= 1.82
Top Width (ft)	= 12.00
EGL (ft)	= 3.13



Channel Report

23-49E

Trapezoidal

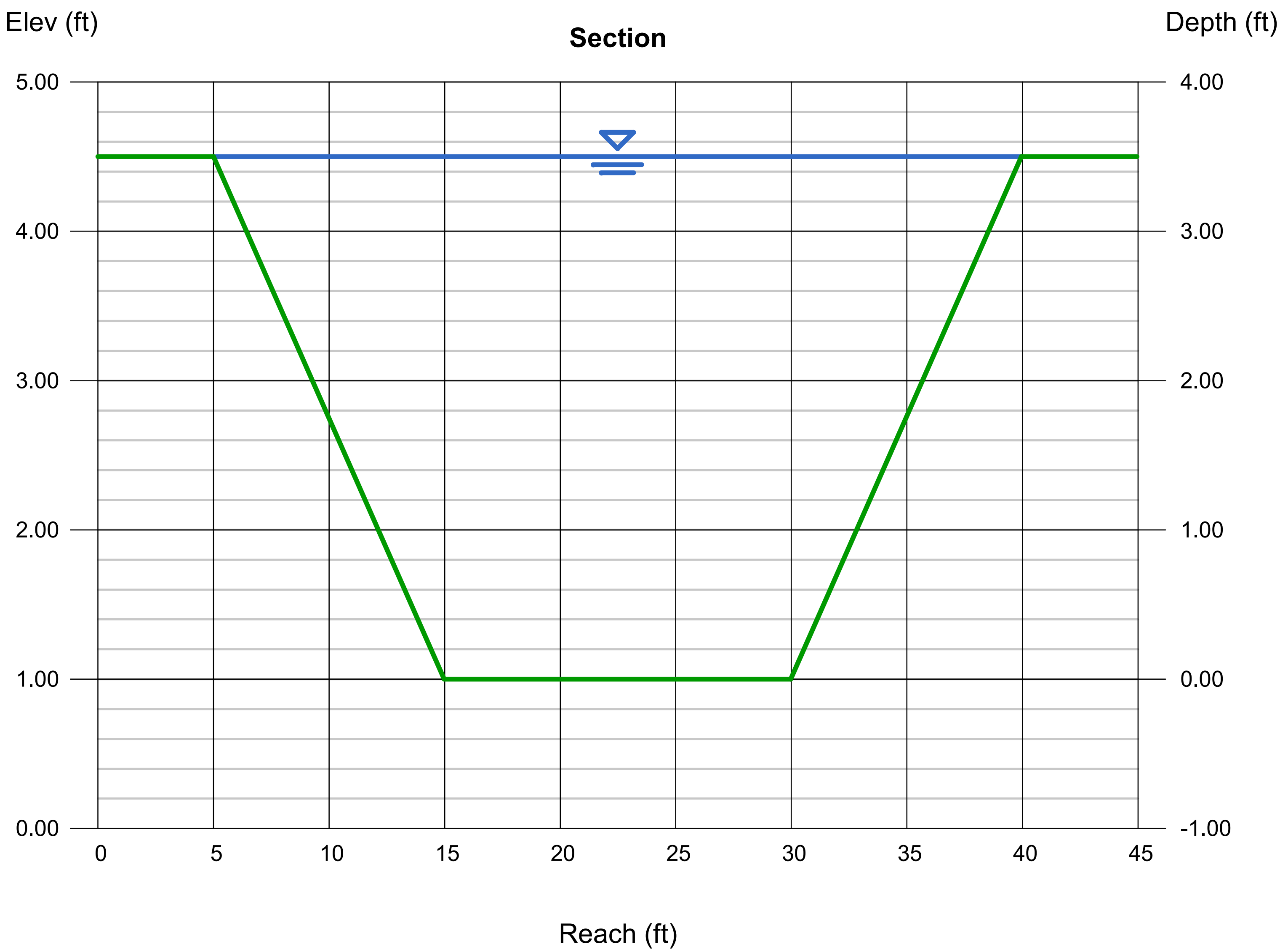
Bottom Width (ft)	= 15.00
Side Slopes (z:1)	= 2.85, 2.85
Total Depth (ft)	= 3.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

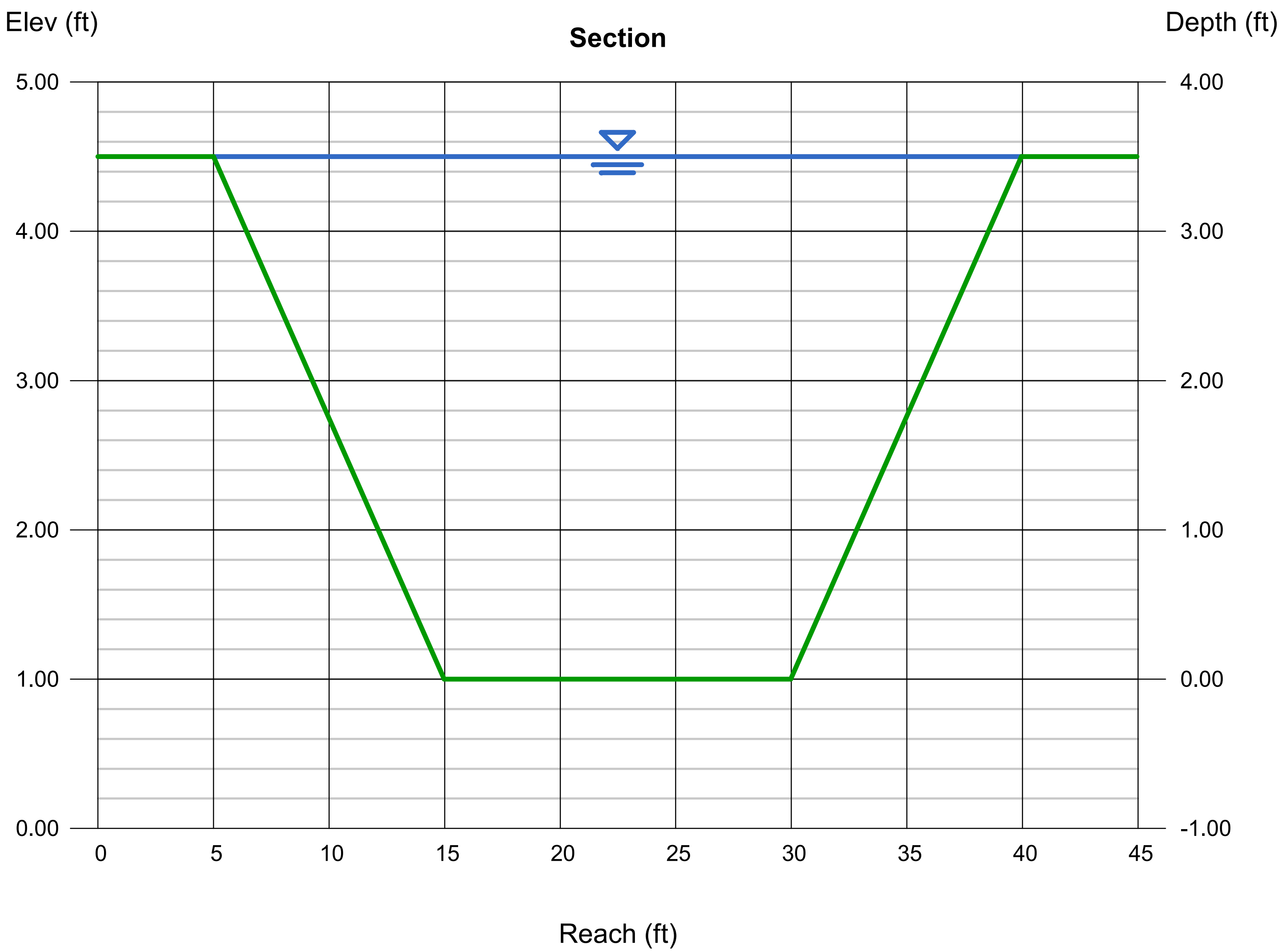
Depth (ft)	= 3.50
Q (cfs)	= 331.08
Area (sqft)	= 87.41
Velocity (ft/s)	= 3.79
Wetted Perim (ft)	= 36.14
Crit Depth, Yc (ft)	= 2.15
Top Width (ft)	= 34.95
EGL (ft)	= 3.72



Channel Report

23-51S

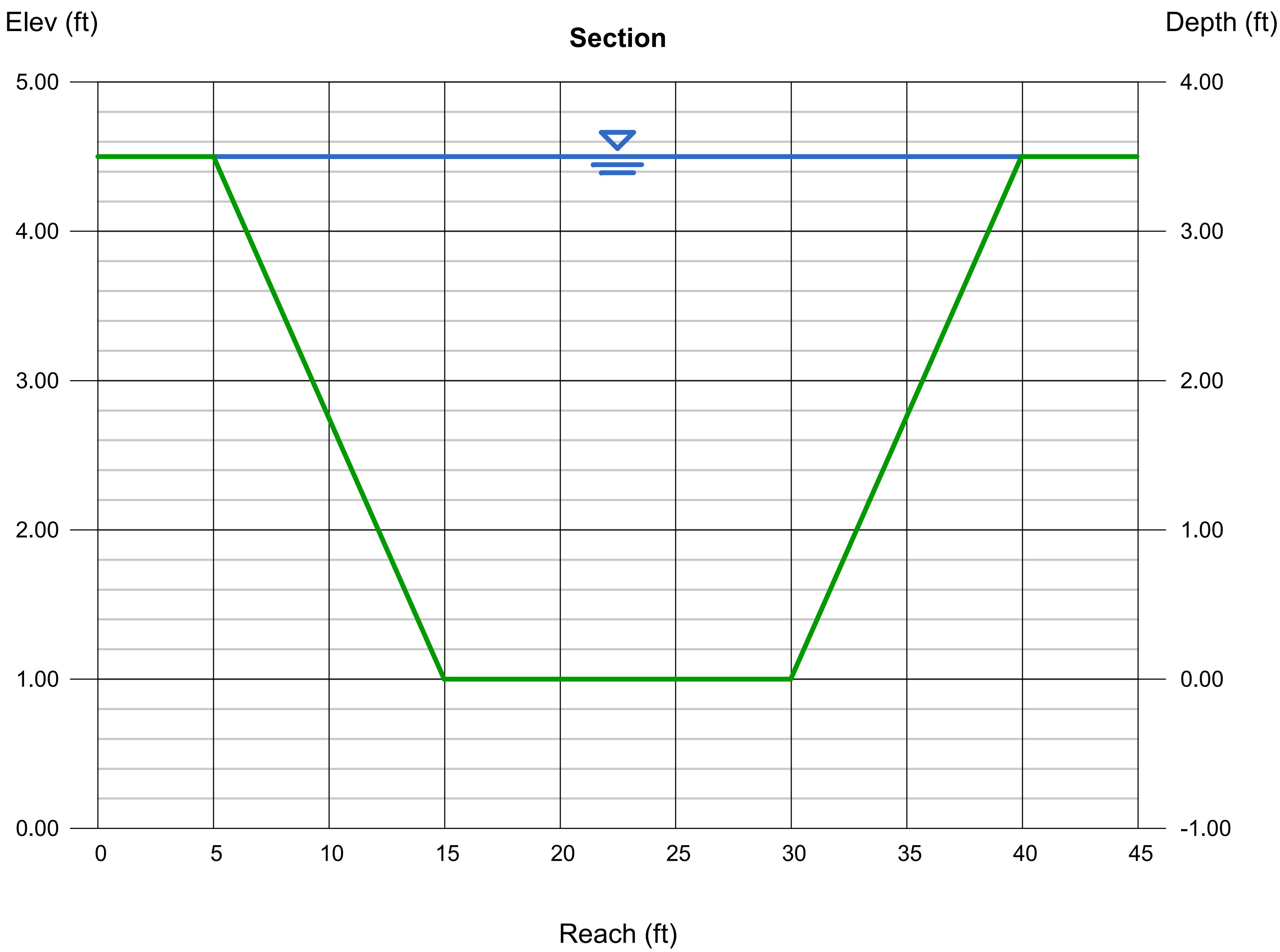
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 15.00	Depth (ft)	= 3.50
Side Slopes (z:1)	= 2.85, 2.85	Q (cfs)	= 331.08
Total Depth (ft)	= 3.50	Area (sqft)	= 87.41
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 3.79
Slope (%)	= 0.50	Wetted Perim (ft)	= 36.14
N-Value	= 0.050	Crit Depth, Yc (ft)	= 2.15
		Top Width (ft)	= 34.95
Calculations		EGL (ft)	= 3.72
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-51S

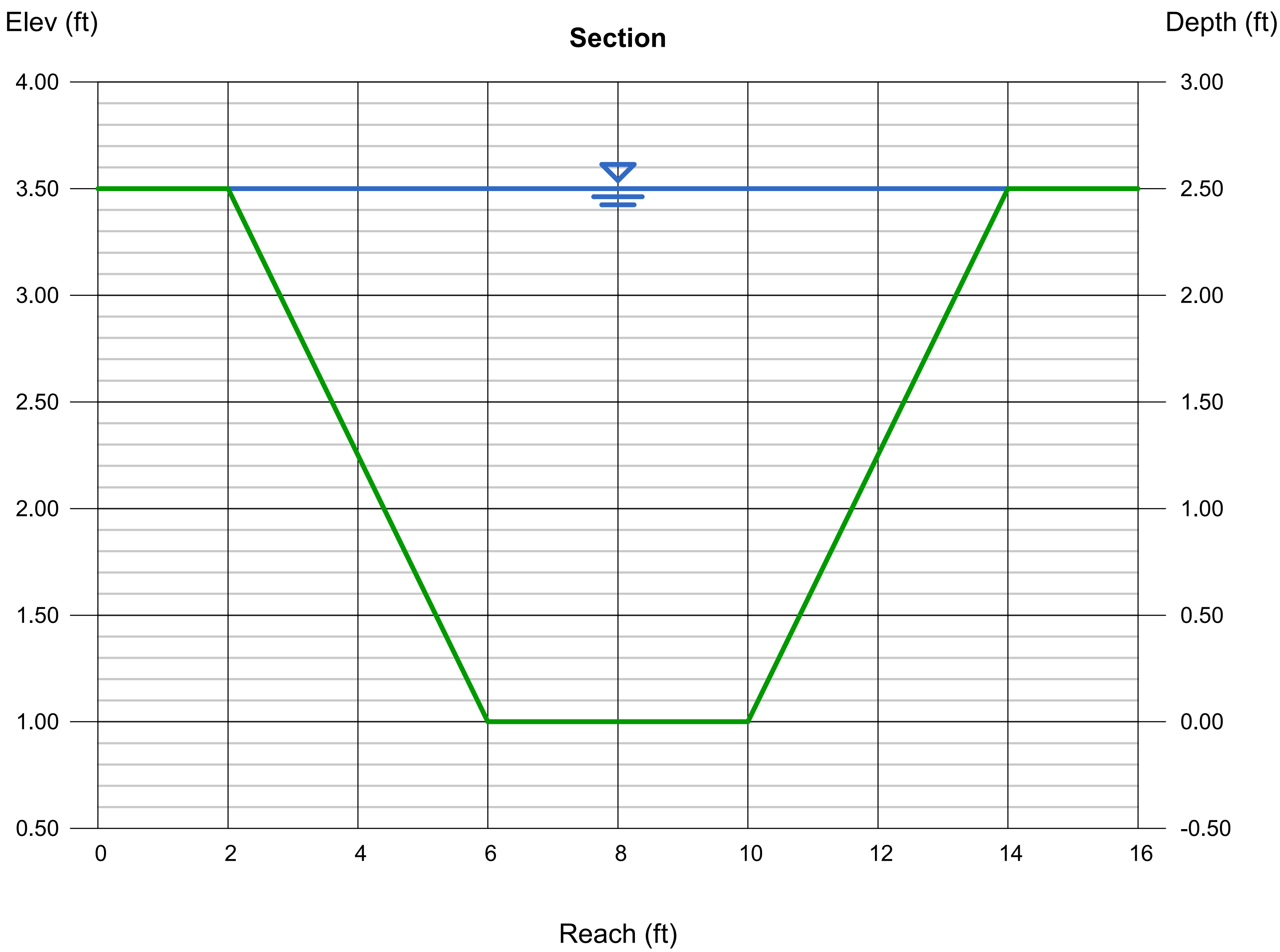
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 15.00	Depth (ft)	= 3.50
Side Slopes (z:1)	= 2.85, 2.85	Q (cfs)	= 331.08
Total Depth (ft)	= 3.50	Area (sqft)	= 87.41
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 3.79
Slope (%)	= 0.50	Wetted Perim (ft)	= 36.14
N-Value	= 0.050	Crit Depth, Yc (ft)	= 2.15
		Top Width (ft)	= 34.95
Calculations		EGL (ft)	= 3.72
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-52N

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 4.00	Depth (ft)	= 2.50
Side Slopes (z:1)	= 1.60, 1.60	Q (cfs)	= 34.25
Total Depth (ft)	= 2.50	Area (sqft)	= 20.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.71
Slope (%)	= 0.50	Wetted Perim (ft)	= 13.43
N-Value	= 0.080	Crit Depth, Yc (ft)	= 1.13
		Top Width (ft)	= 12.00
Calculations		EGL (ft)	= 2.55
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

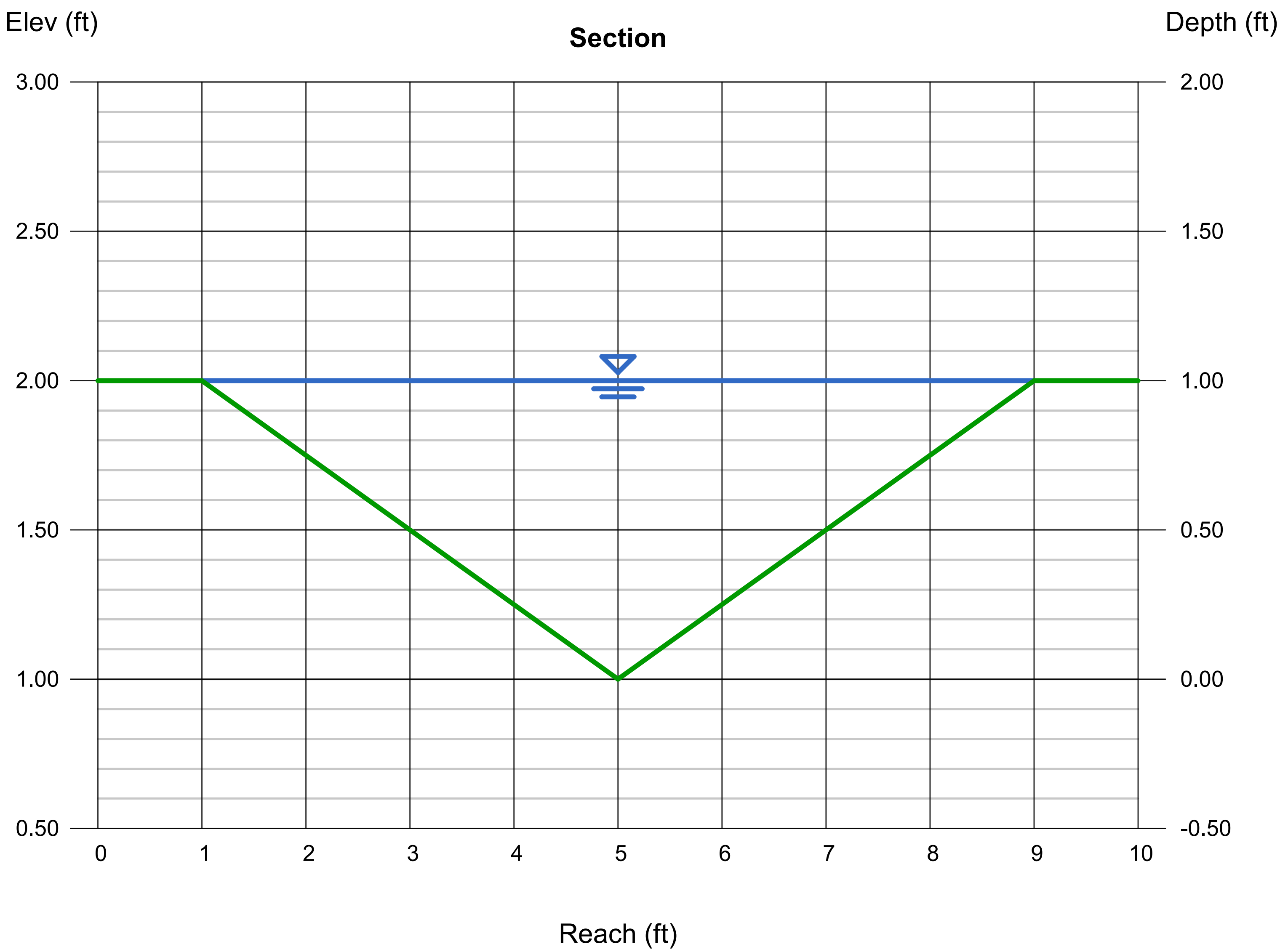
3-55N

Triangular
Side Slopes (z:1) = 4.00, 4.00
Total Depth (ft) = 1.00

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

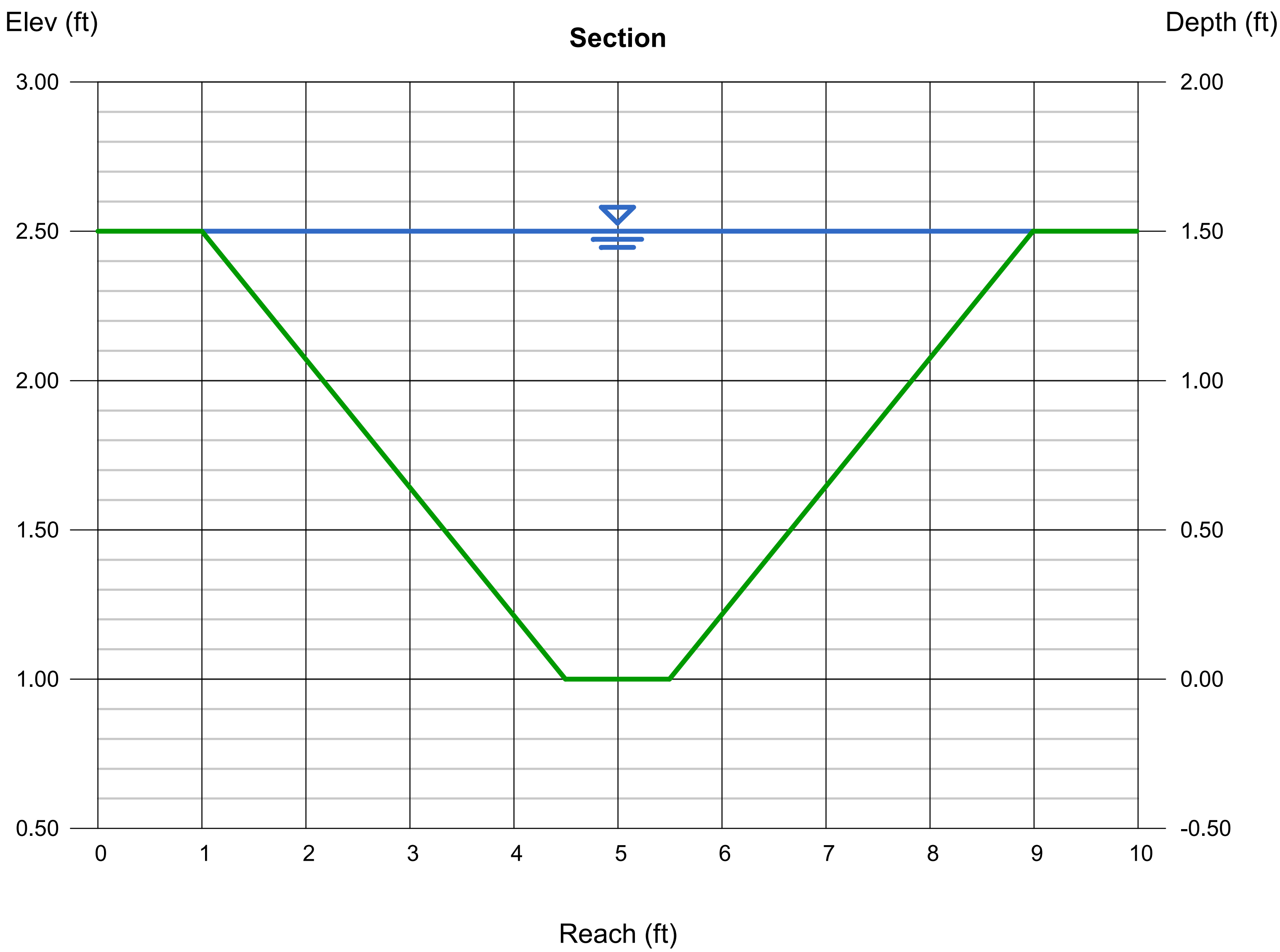
Highlighted
Depth (ft) = 1.00
Q (cfs) = 5.188
Area (sqft) = 4.00
Velocity (ft/s) = 1.30
Wetted Perim (ft) = 8.25
Crit Depth, Yc (ft) = 0.64
Top Width (ft) = 8.00
EGL (ft) = 1.03



Channel Report

3-56E

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 1.00	Depth (ft)	= 1.50
Side Slopes (z:1)	= 2.33, 2.33	Q (cfs)	= 12.04
Total Depth (ft)	= 1.50	Area (sqft)	= 6.74
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.79
Slope (%)	= 0.50	Wetted Perim (ft)	= 8.61
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.92
		Top Width (ft)	= 7.99
Calculations		EGL (ft)	= 1.55
Compute by:	Q vs Depth		
No. Increments	= 10		

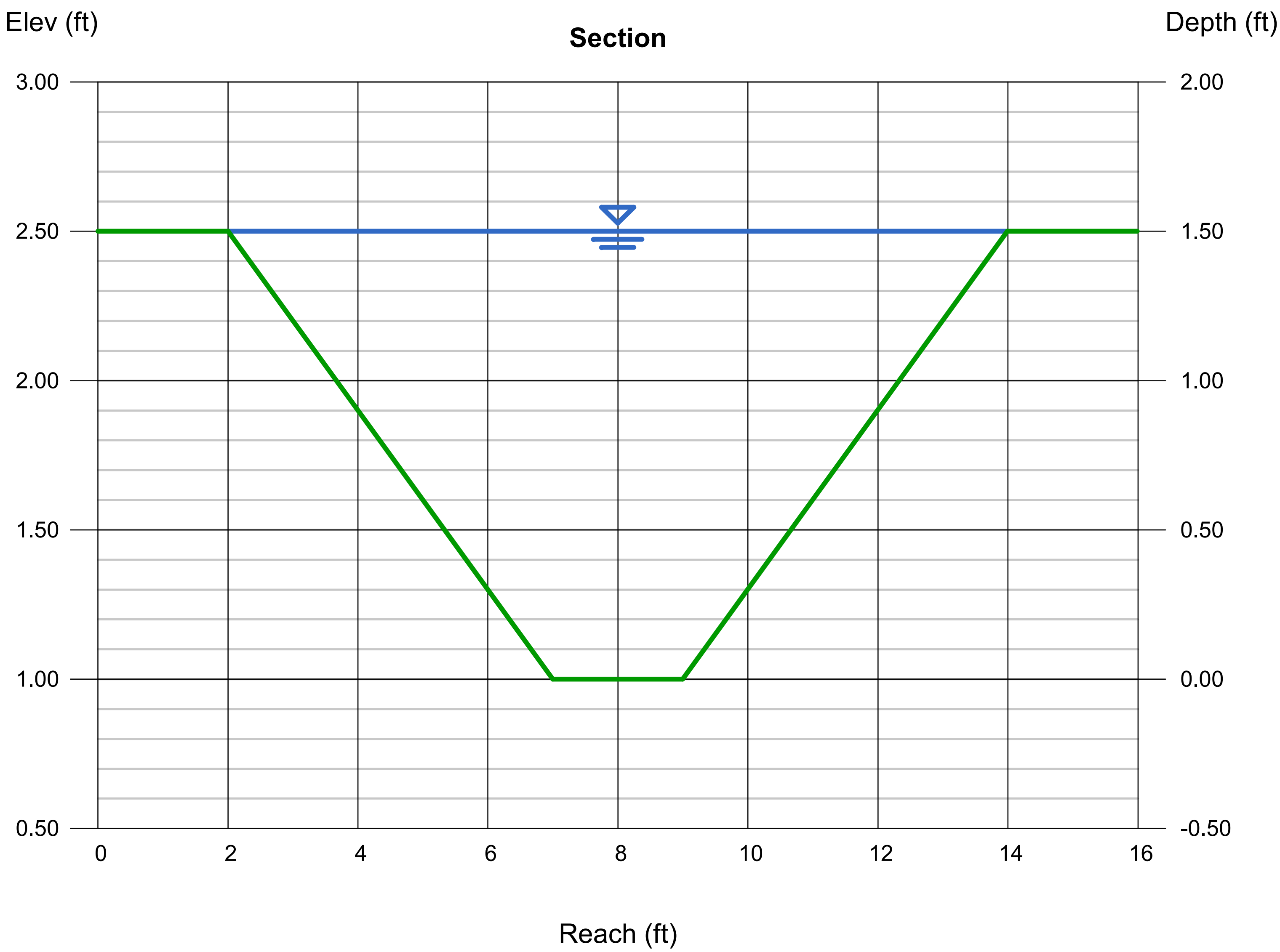


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jan 14 2020

3-56S

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 1.50
Side Slopes (z:1)	= 3.33, 3.33	Q (cfs)	= 19.69
Total Depth (ft)	= 1.50	Area (sqft)	= 10.49
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.88
Slope (%)	= 0.50	Wetted Perim (ft)	= 12.43
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.92
		Top Width (ft)	= 11.99
Calculations		EGL (ft)	= 1.55
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-56W

Trapezoidal

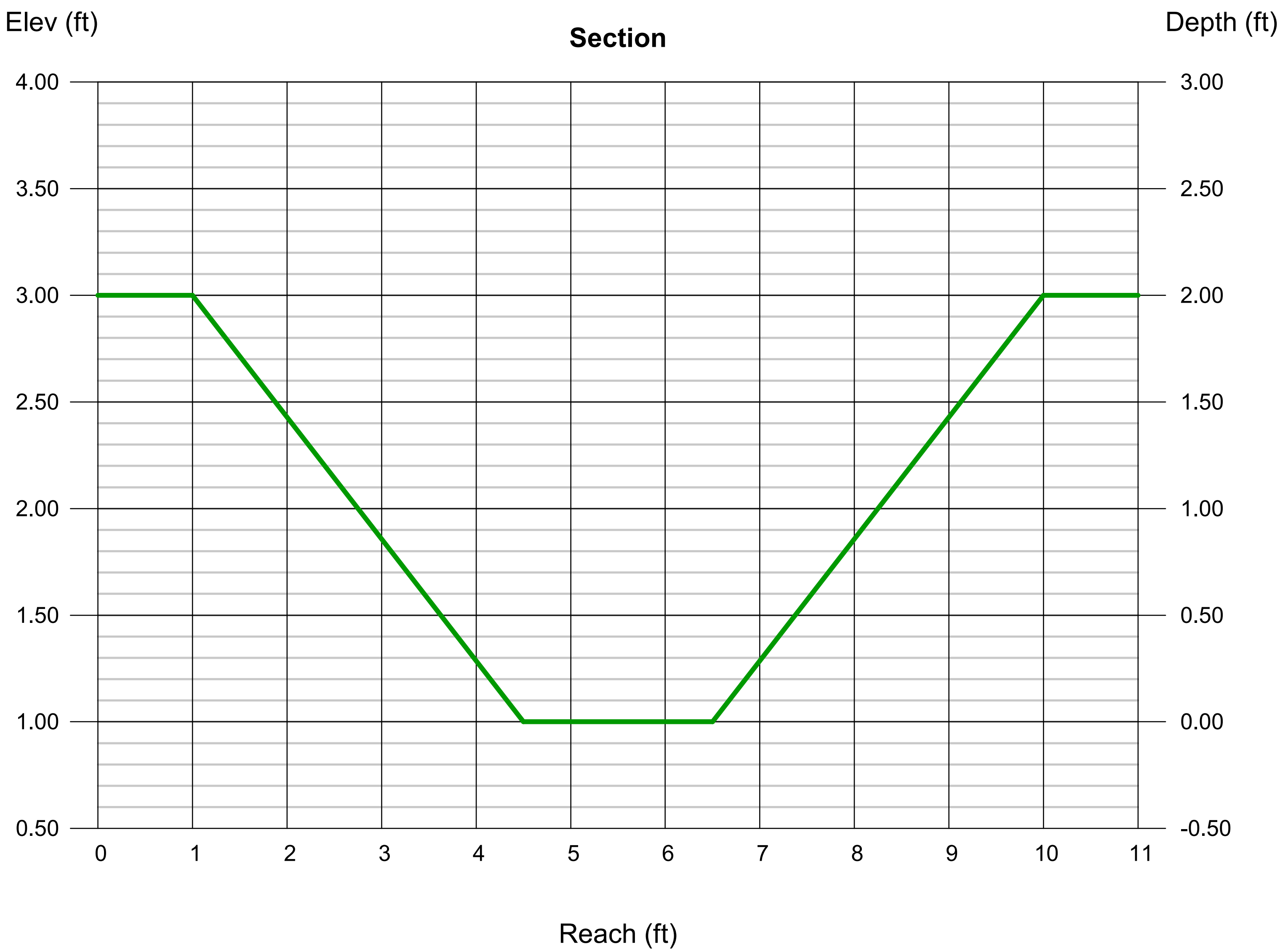
Bottom Width (ft)	= 2.00
Side Slopes (z:1)	= 1.75, 1.75
Total Depth (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.050

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 24.53
Area (sqft)	= 11.00
Velocity (ft/s)	= 2.23
Wetted Perim (ft)	= 10.06
Crit Depth, Yc (ft)	= 1.20
Top Width (ft)	= 9.00
EGL (ft)	= 2.08



Channel Report

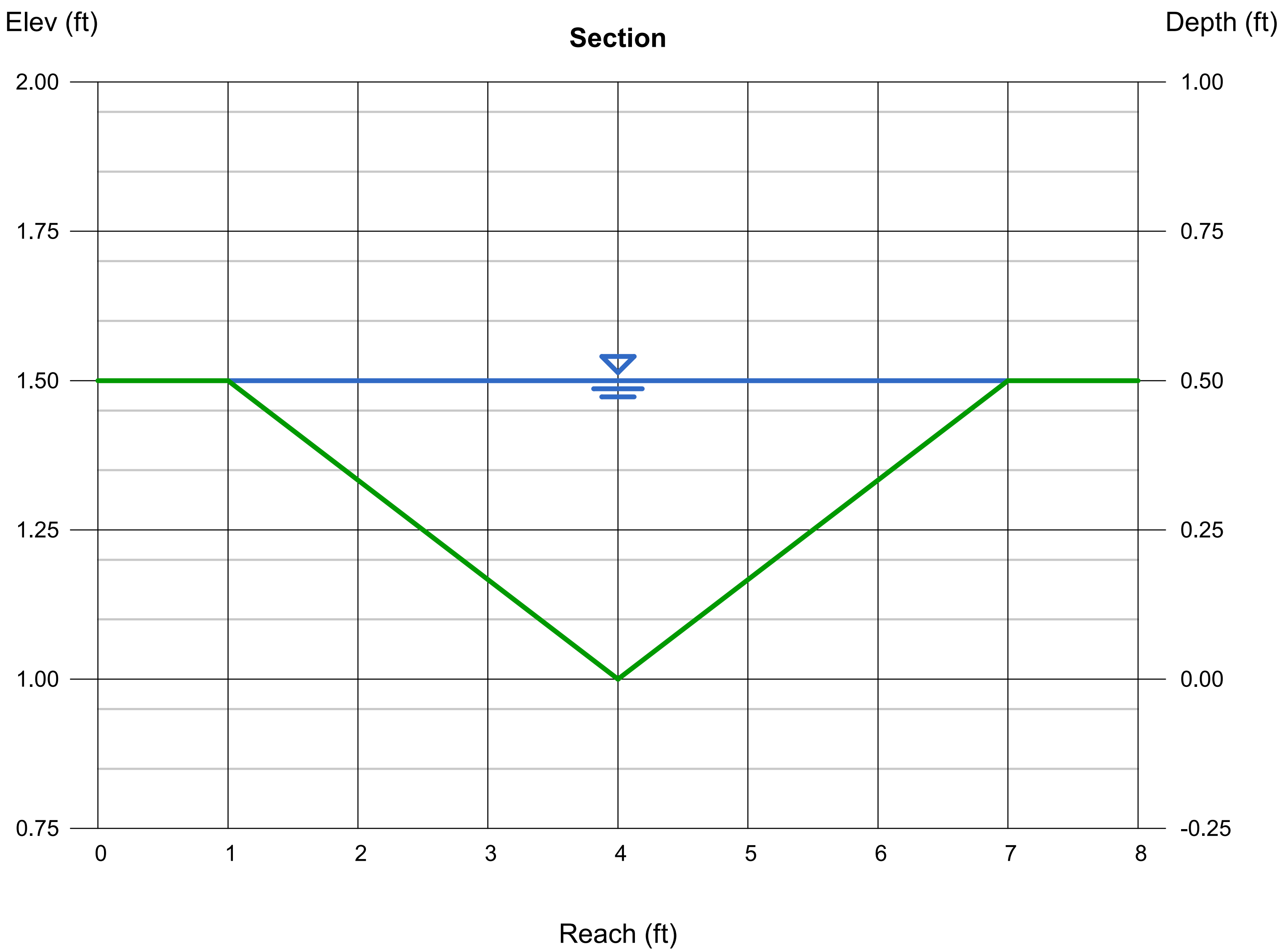
23-57S

Triangular
Side Slopes (z:1) = 6.00, 6.00
Total Depth (ft) = 0.50

Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

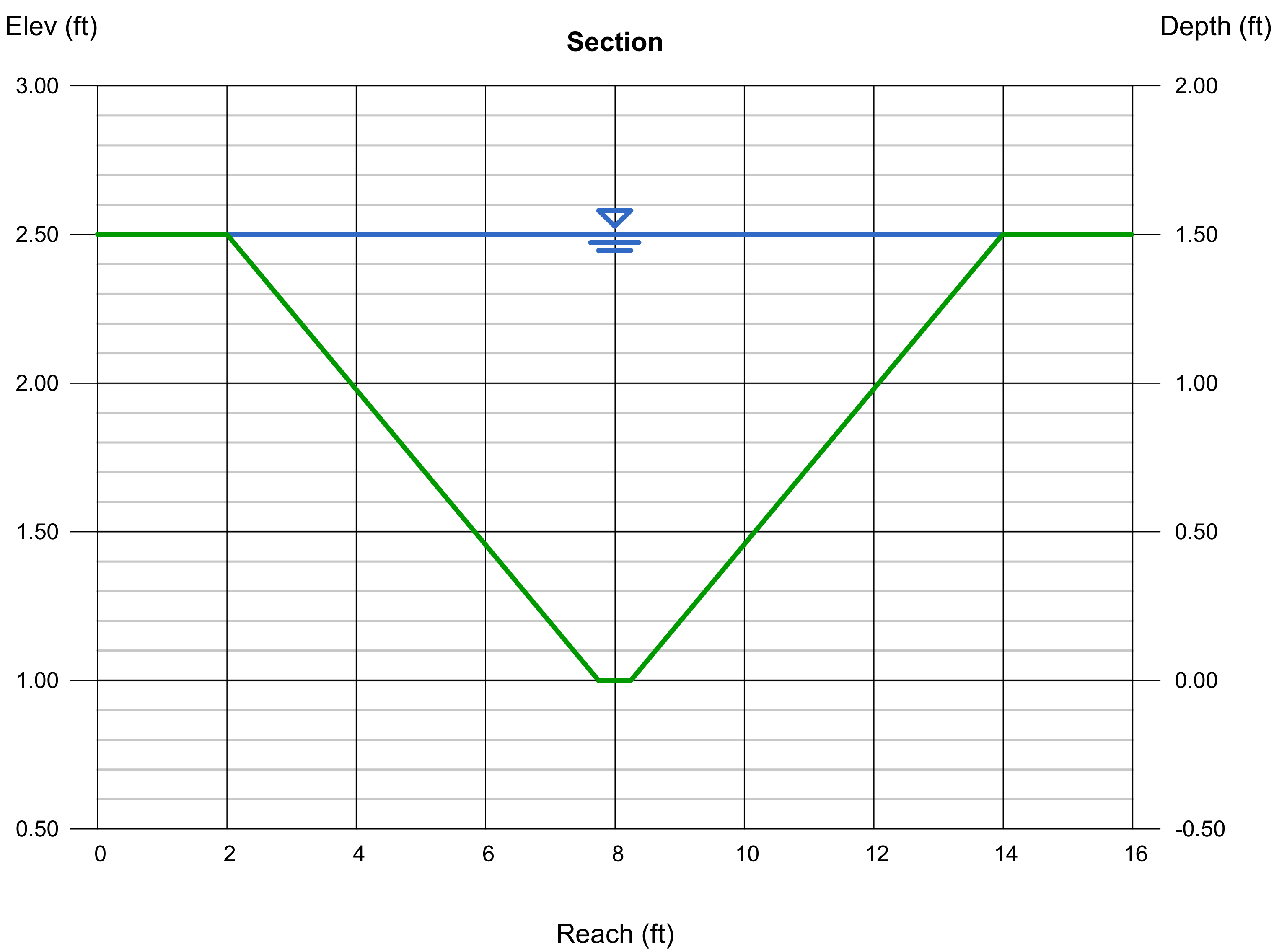
Highlighted
Depth (ft) = 0.50
Q (cfs) = 1.239
Area (sqft) = 1.50
Velocity (ft/s) = 0.83
Wetted Perim (ft) = 6.08
Crit Depth, Yc (ft) = 0.31
Top Width (ft) = 6.00
EGL (ft) = 0.51



Channel Report

23-58C

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 0.50	Depth (ft)	= 1.50
Side Slopes (z:1)	= 3.83, 3.83	Q (cfs)	= 16.35
Total Depth (ft)	= 1.50	Area (sqft)	= 9.37
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.75
Slope (%)	= 0.50	Wetted Perim (ft)	= 12.38
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.97
		Top Width (ft)	= 11.99
Calculations		EGL (ft)	= 1.55
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-64E

Trapezoidal

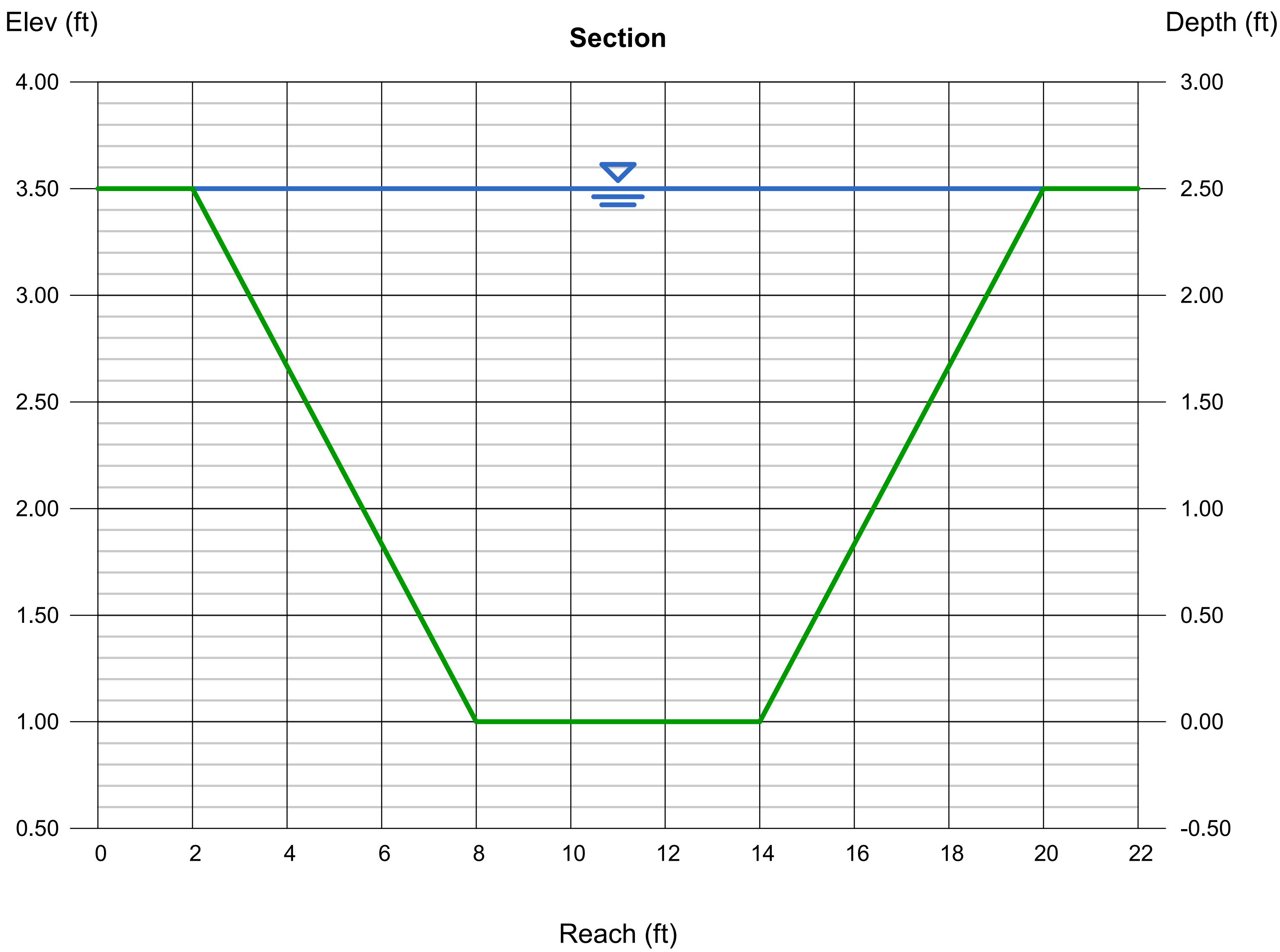
Bottom Width (ft)	= 6.00
Side Slopes (z:1)	= 2.40, 2.40
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.100

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

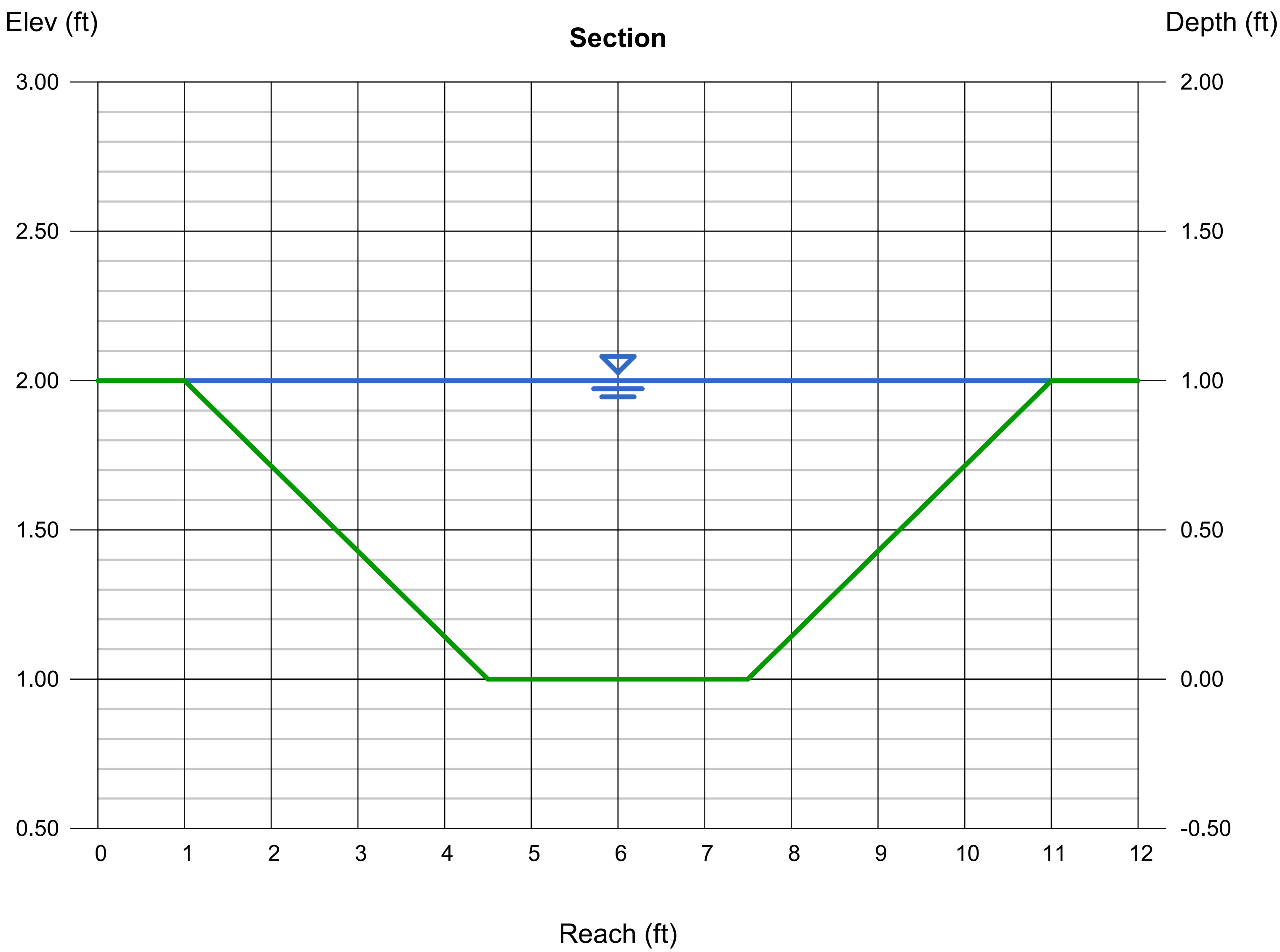
Depth (ft)	= 2.50
Q (cfs)	= 42.75
Area (sqft)	= 30.00
Velocity (ft/s)	= 1.43
Wetted Perim (ft)	= 19.00
Crit Depth, Yc (ft)	= 1.02
Top Width (ft)	= 18.00
EGL (ft)	= 2.53



Channel Report

23-64S

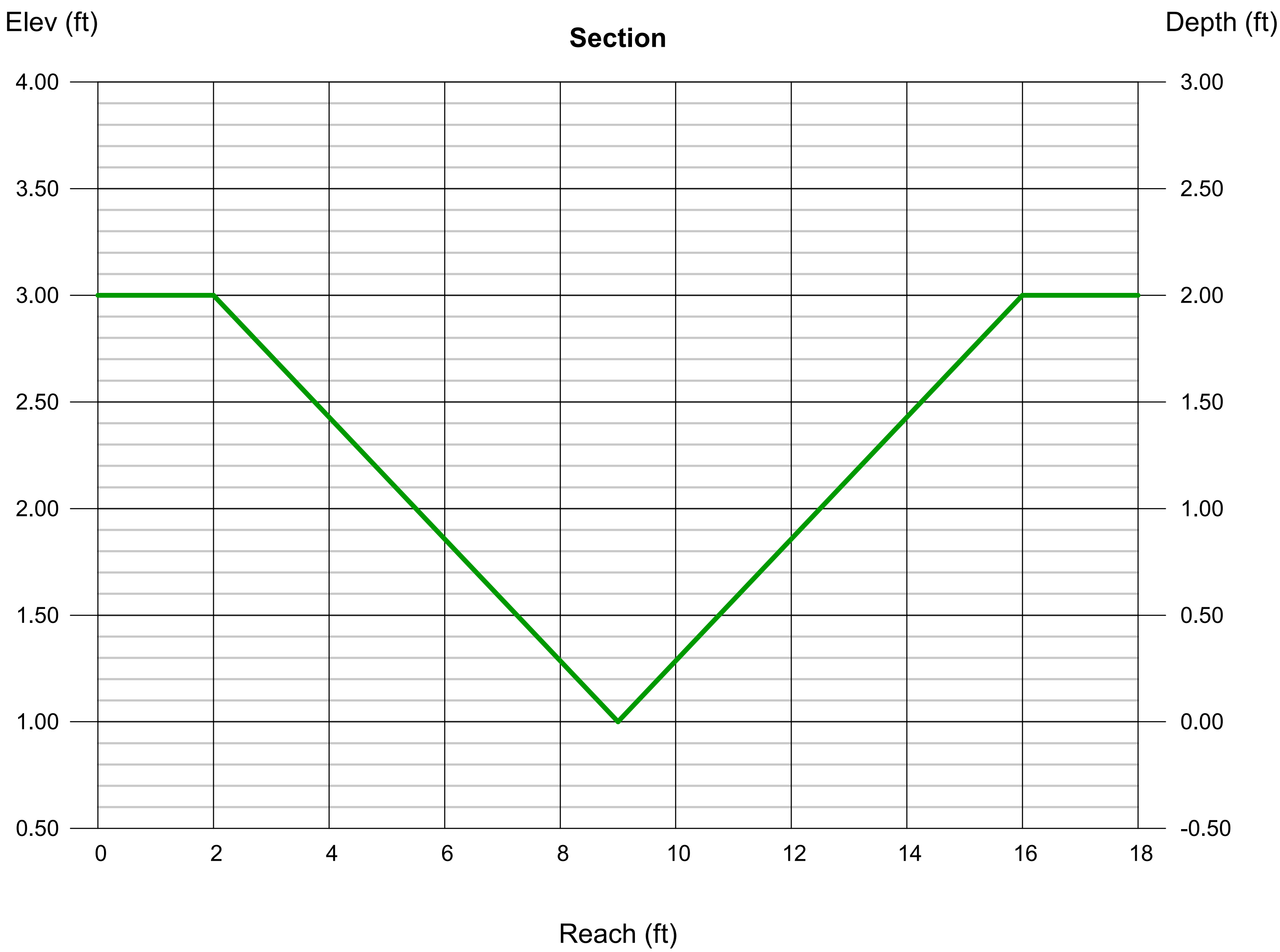
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 1.00
Side Slopes (z:1)	= 3.50, 3.50	Q (cfs)	= 5.031
Total Depth (ft)	= 1.00	Area (sqft)	= 6.50
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 0.77
Slope (%)	= 0.50	Wetted Perim (ft)	= 10.28
N-Value	= 0.100	Crit Depth, Yc (ft)	= 0.38
		Top Width (ft)	= 10.00
Calculations		EGL (ft)	= 1.01
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-66C

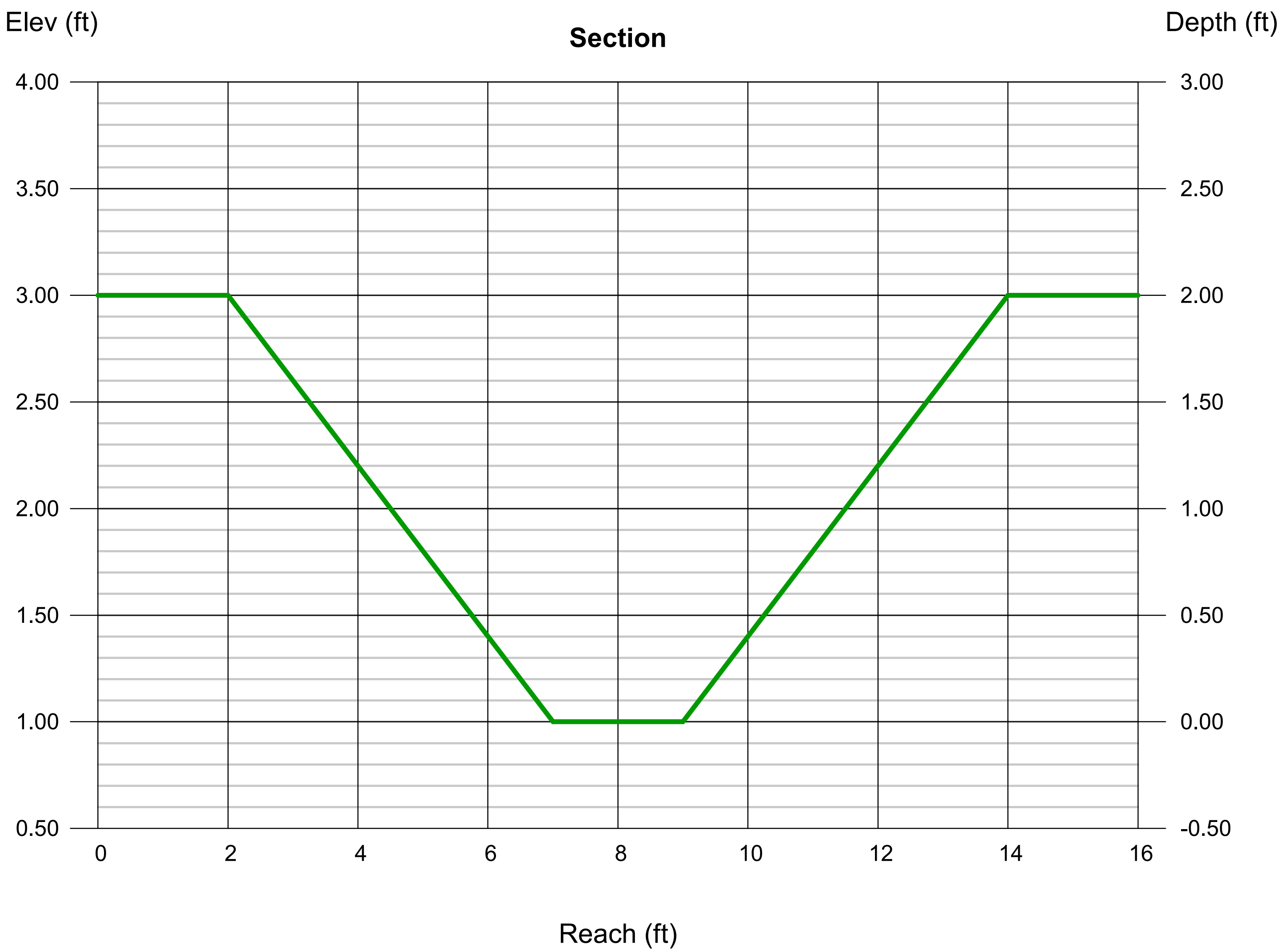
Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.50, 3.50	Depth (ft)	= 2.00
Total Depth (ft)	= 2.00	Q (cfs)	= 28.66
		Area (sqft)	= 14.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.05
Slope (%)	= 0.50	Wetted Perim (ft)	= 14.56
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.34
		Top Width (ft)	= 14.00
Calculations		EGL (ft)	= 2.07
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-67N

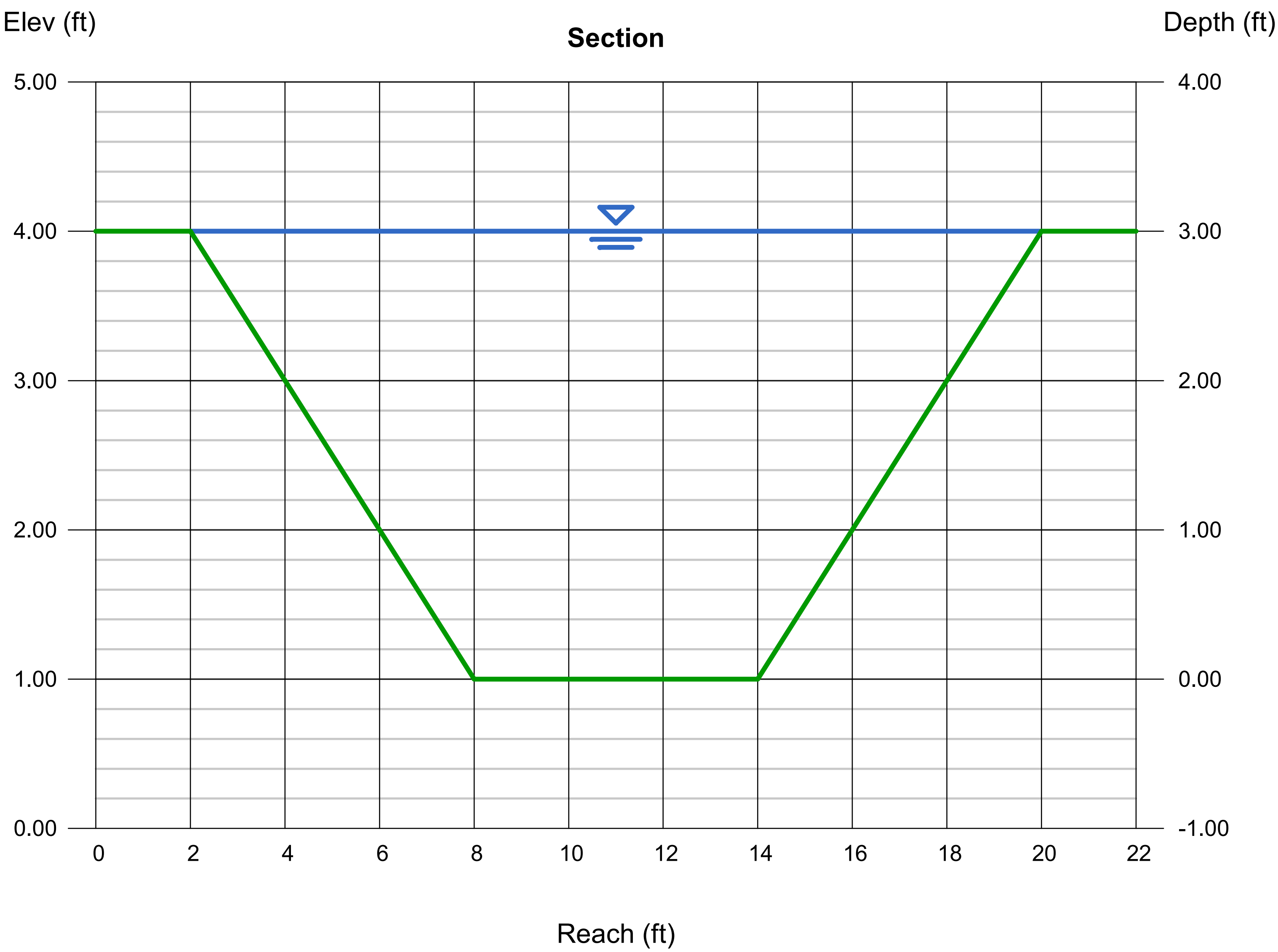
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 2.50, 2.50	Q (cfs)	= 31.28
Total Depth (ft)	= 2.00	Area (sqft)	= 14.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.23
Slope (%)	= 0.50	Wetted Perim (ft)	= 12.77
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.24
		Top Width (ft)	= 12.00
Calculations		EGL (ft)	= 2.08
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-67W

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 6.00	Depth (ft)	= 3.00
Side Slopes (z:1)	= 2.00, 2.00	Q (cfs)	= 114.20
Total Depth (ft)	= 3.00	Area (sqft)	= 36.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 3.17
Slope (%)	= 0.50	Wetted Perim (ft)	= 19.42
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.82
		Top Width (ft)	= 18.00
Calculations		EGL (ft)	= 3.16
Compute by:	Q vs Depth		
No. Increments	= 10		



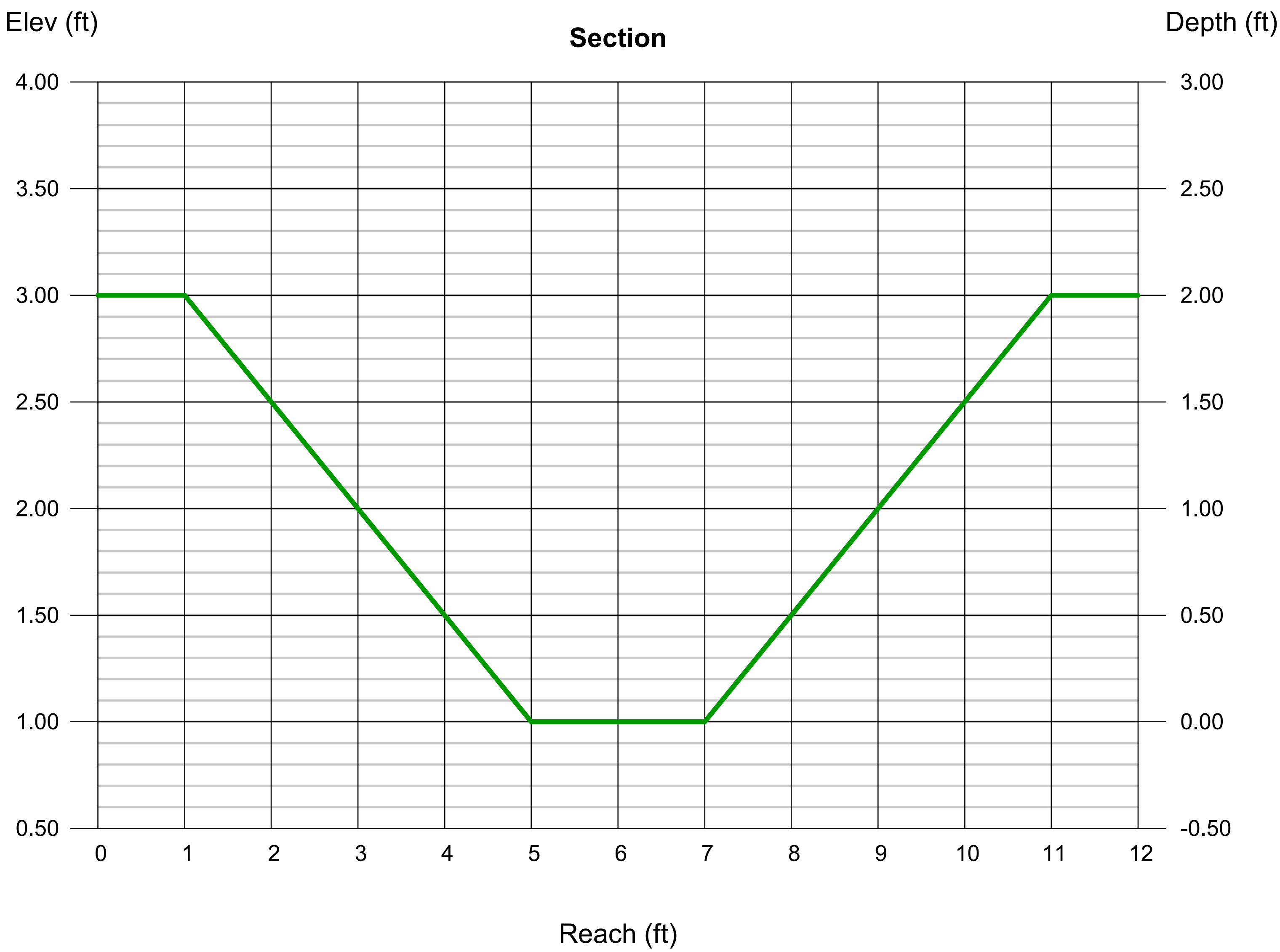
Channel Report

3-68C

Trapezoidal
Bottom Width (ft) = 2.00
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

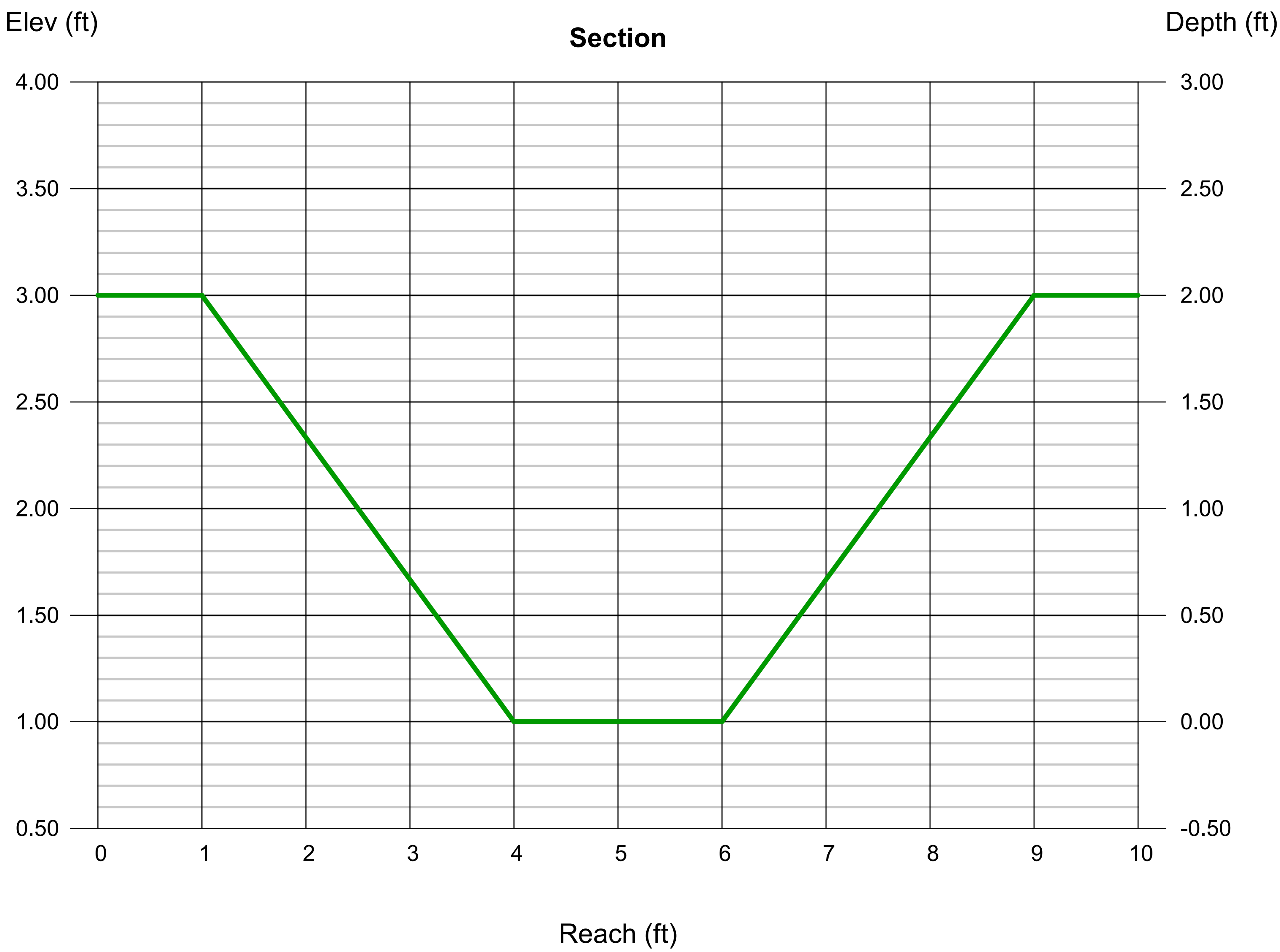
Highlighted
Depth (ft) = 2.00
Q (cfs) = 26.82
Area (sqft) = 12.00
Velocity (ft/s) = 2.23
Wetted Perim (ft) = 10.94
Crit Depth, Yc (ft) = 1.21
Top Width (ft) = 10.00
EGL (ft) = 2.08



Channel Report

3-68W

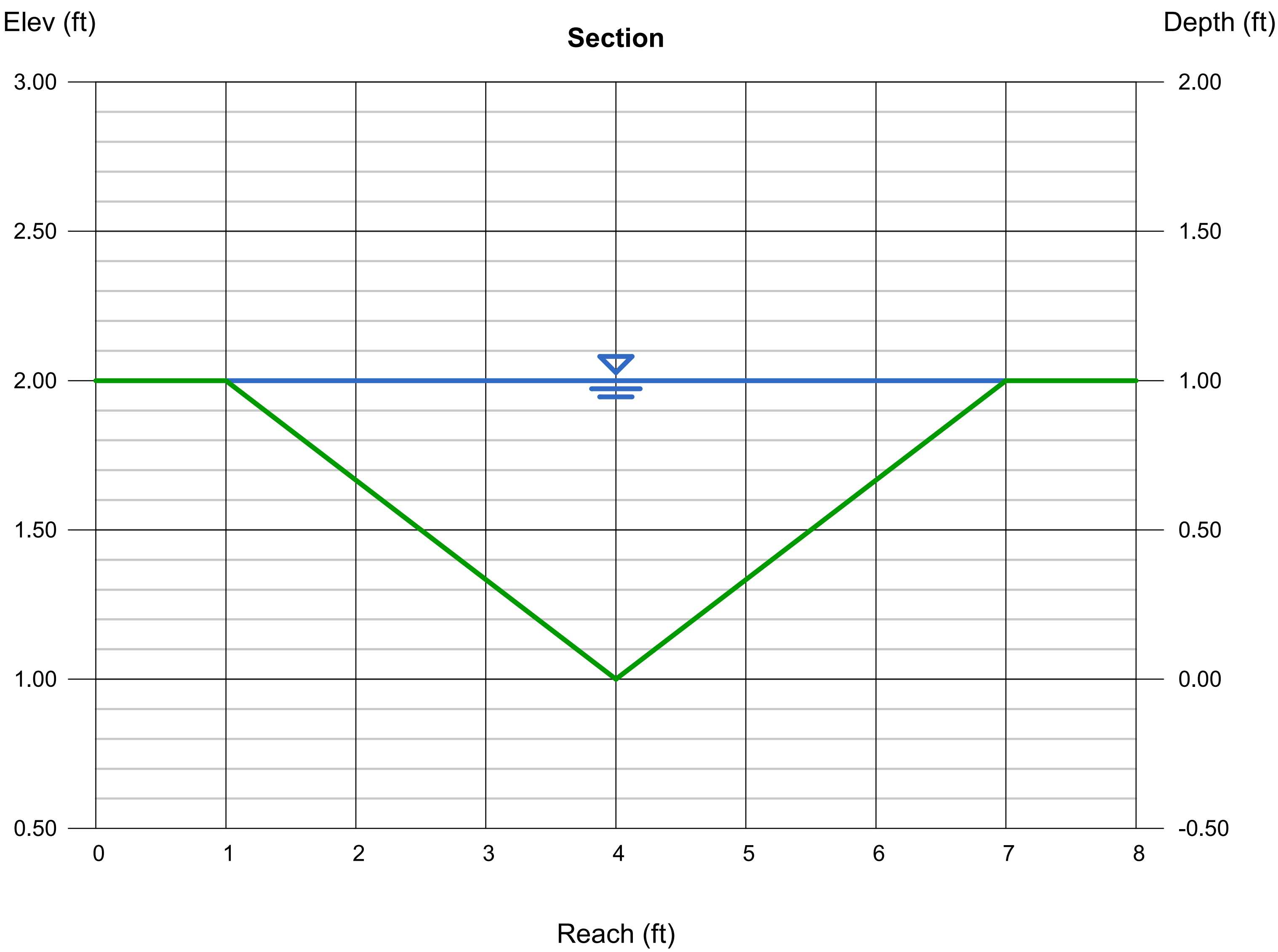
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 1.50, 1.50	Q (cfs)	= 22.20
Total Depth (ft)	= 2.00	Area (sqft)	= 10.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.22
Slope (%)	= 0.50	Wetted Perim (ft)	= 9.21
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.17
		Top Width (ft)	= 8.00
Calculations		EGL (ft)	= 2.08
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-69S

Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.00
Total Depth (ft)	= 1.00	Q (cfs)	= 3.834
		Area (sqft)	= 3.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.28
Slope (%)	= 0.50	Wetted Perim (ft)	= 6.32
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.64
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 1.03
Compute by:	Q vs Depth		
No. Increments	= 10		

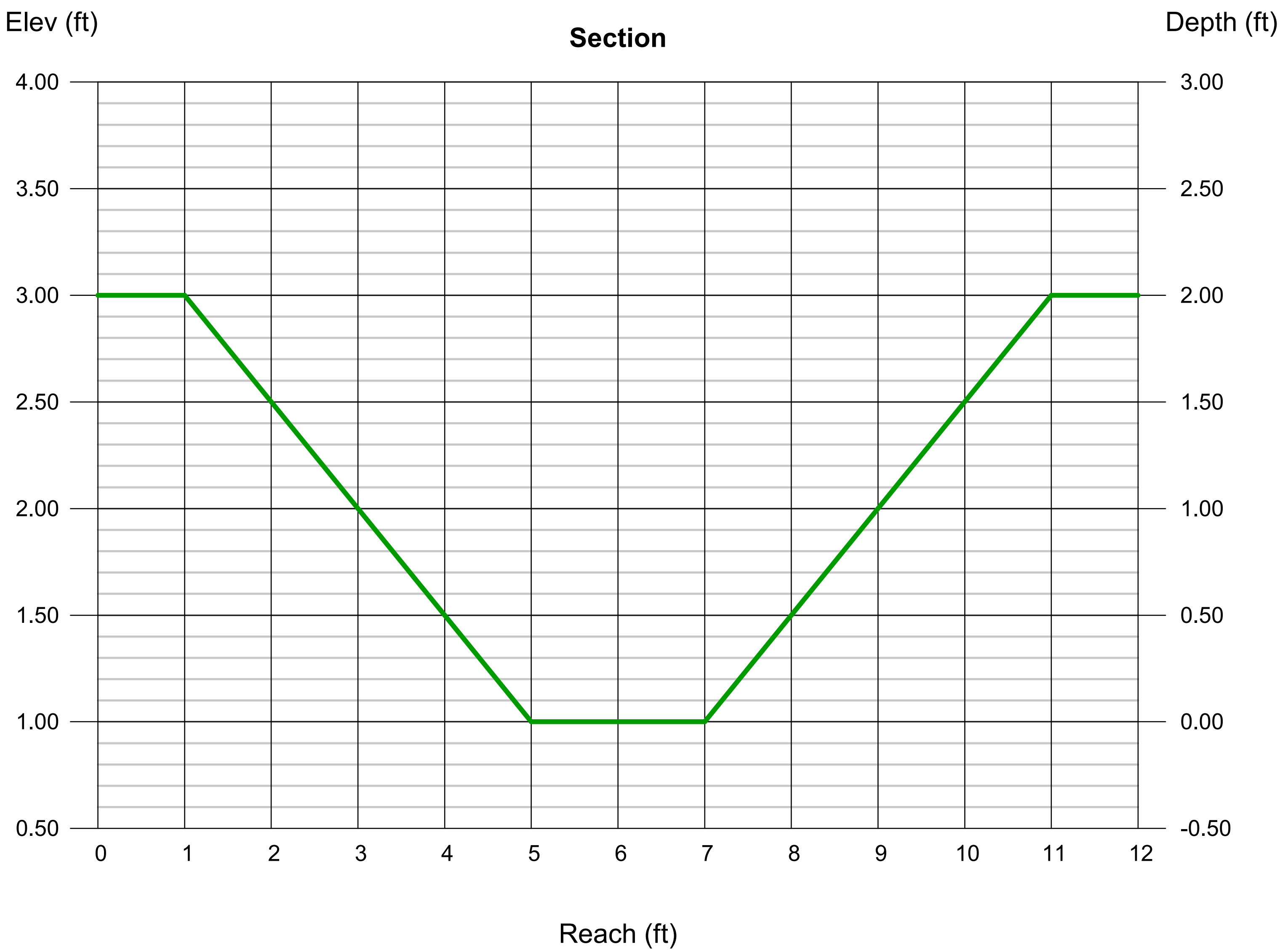


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Wednesday, Jan 15 2020

3-70N

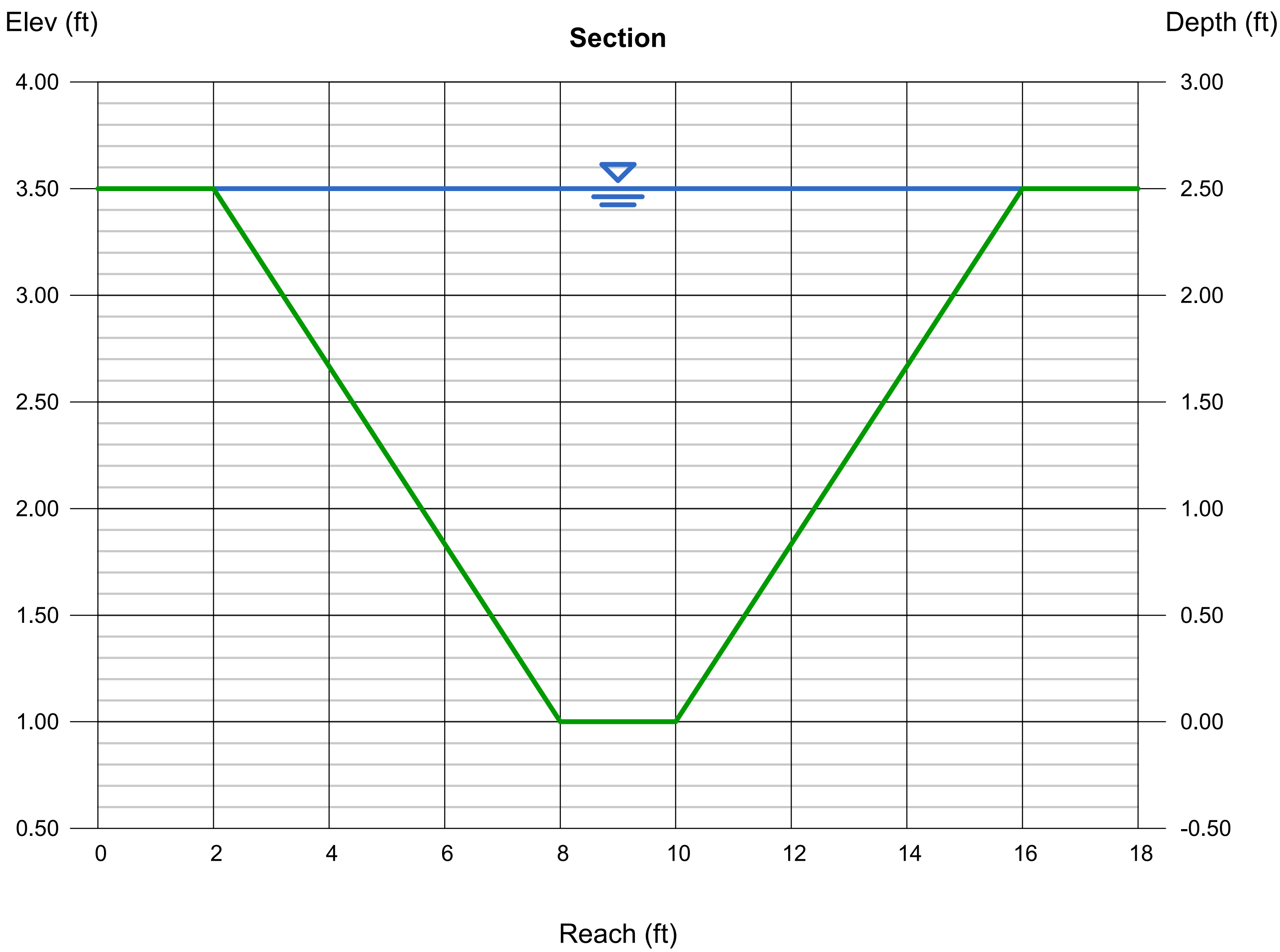
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 2.00
Side Slopes (z:1)	= 2.00, 2.00	Q (cfs)	= 26.82
Total Depth (ft)	= 2.00	Area (sqft)	= 12.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.23
Slope (%)	= 0.50	Wetted Perim (ft)	= 10.94
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.21
		Top Width (ft)	= 10.00
Calculations		EGL (ft)	= 2.08
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

3-70W

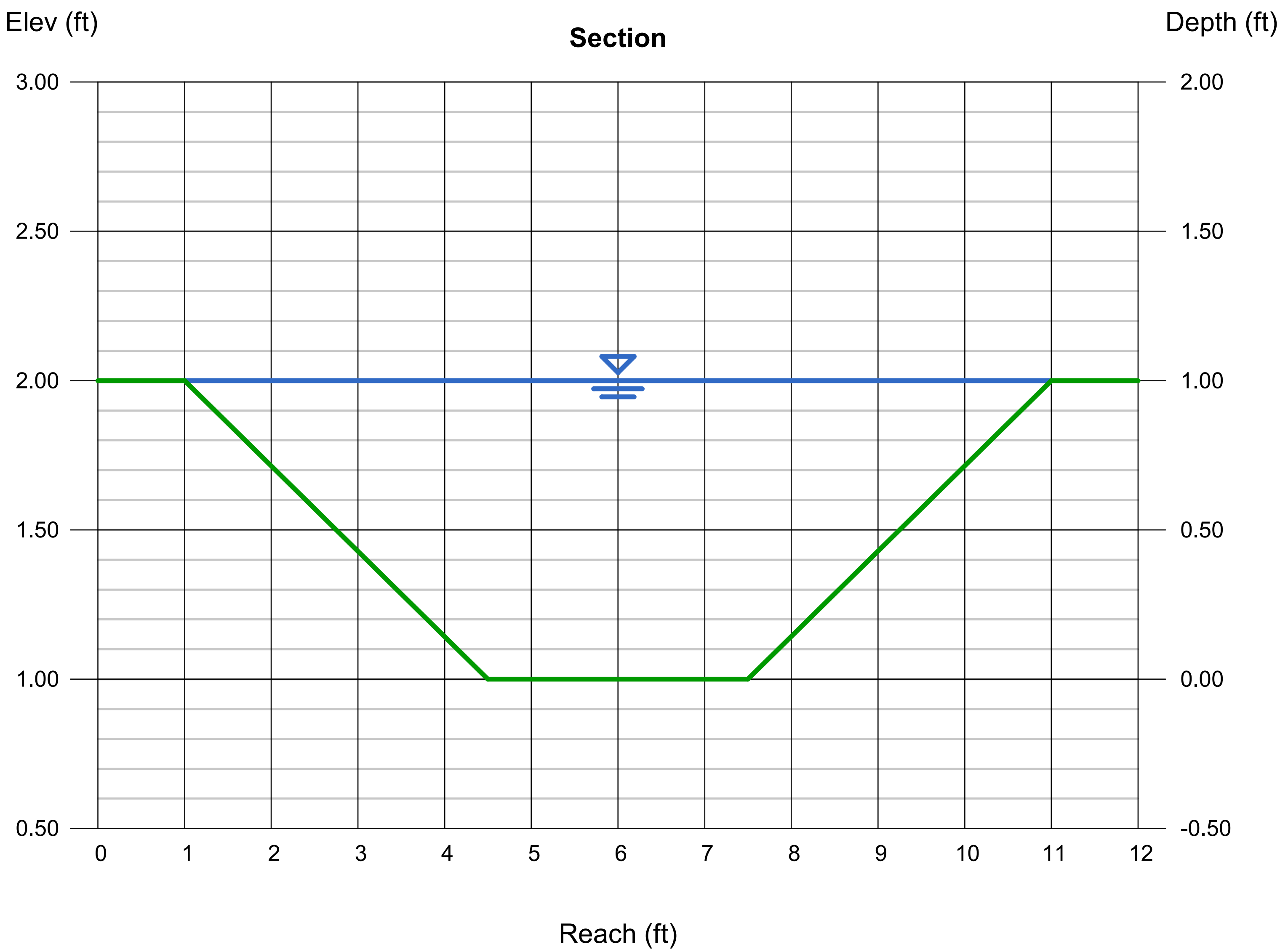
Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.00	Depth (ft)	= 2.50
Side Slopes (z:1)	= 2.40, 2.40	Q (cfs)	= 50.92
Total Depth (ft)	= 2.50	Area (sqft)	= 20.00
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.55
Slope (%)	= 0.50	Wetted Perim (ft)	= 15.00
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.59
		Top Width (ft)	= 14.00
Calculations		EGL (ft)	= 2.60
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-71E

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 3.00	Depth (ft)	= 1.00
Side Slopes (z:1)	= 3.50, 3.50	Q (cfs)	= 10.06
Total Depth (ft)	= 1.00	Area (sqft)	= 6.50
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.55
Slope (%)	= 0.50	Wetted Perim (ft)	= 10.28
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.57
		Top Width (ft)	= 10.00
Calculations		EGL (ft)	= 1.04
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-72S

Trapezoidal

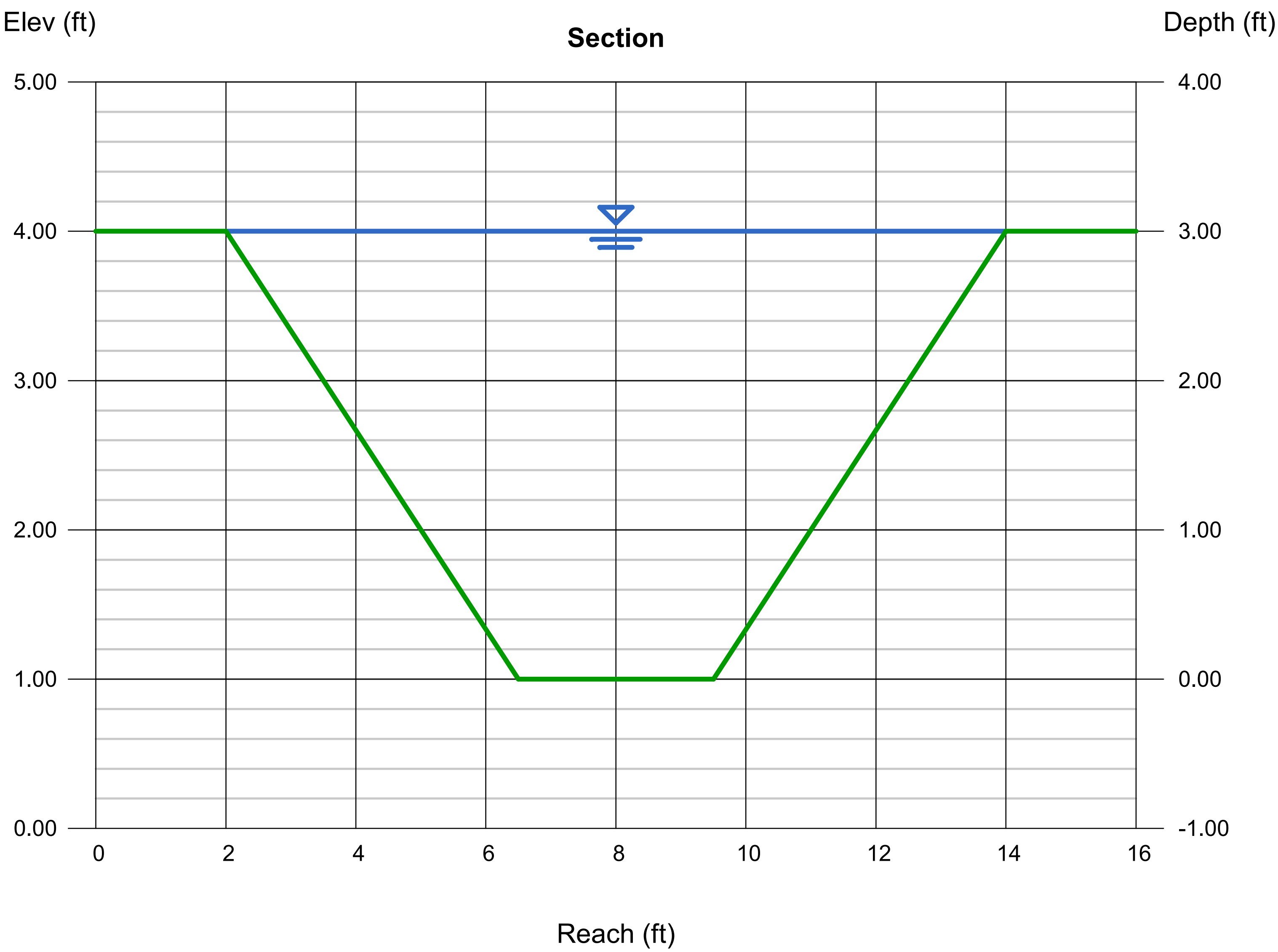
Bottom Width (ft)	=	3.00
Side Slopes (z:1)	=	1.50, 1.50
Total Depth (ft)	=	3.00
Invert Elev (ft)	=	1.00
Slope (%)	=	0.50
N-Value	=	0.050

Calculations

Compute by:		Q vs Depth
No. Increments	=	10

Highlighted

Depth (ft)	=	3.00
Q (cfs)	=	65.46
Area (sqft)	=	22.50
Velocity (ft/s)	=	2.91
Wetted Perim (ft)	=	13.82
Crit Depth, Yc (ft)	=	1.82
Top Width (ft)	=	12.00
EGL (ft)	=	3.13

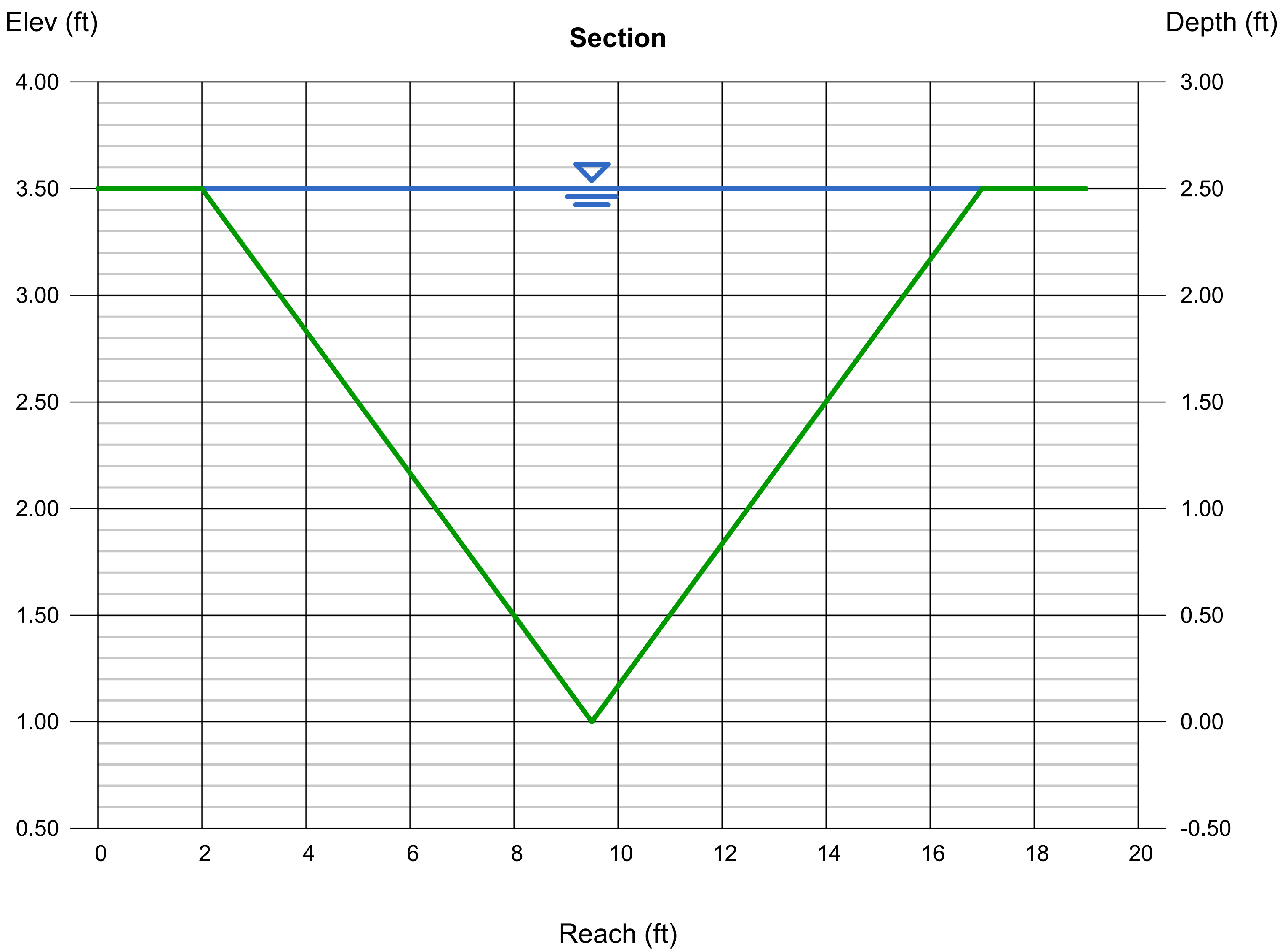


Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jan 15 2020

23-73S

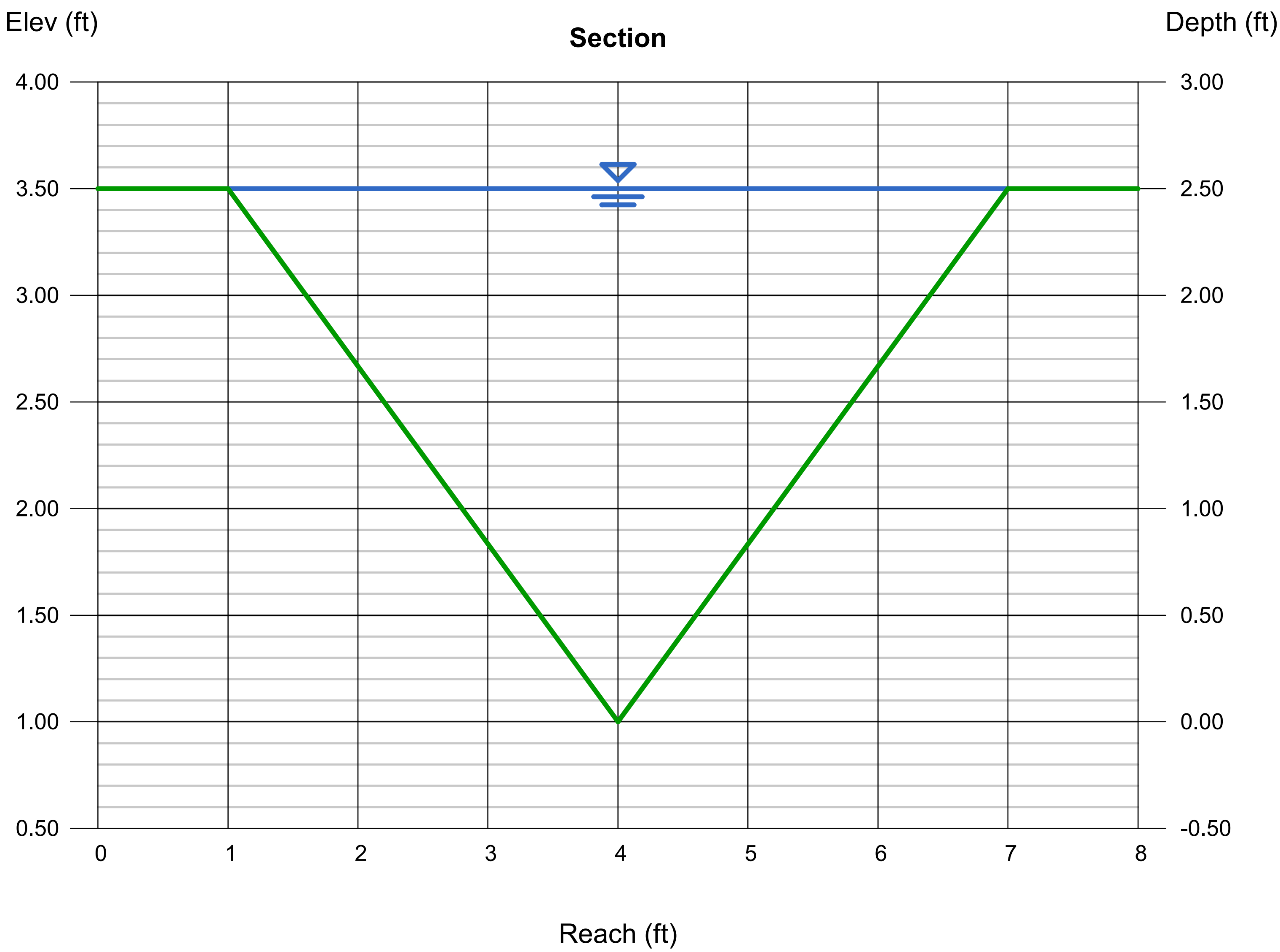
Triangular		**Highlighted**	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 2.50
Total Depth (ft)	= 2.50	Q (cfs)	= 44.15
		Area (sqft)	= 18.75
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.35
Slope (%)	= 0.50	Wetted Perim (ft)	= 15.81
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.69
		Top Width (ft)	= 15.00
Calculations		EGL (ft)	= 2.59
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-77N

Triangular		**Highlighted**	
Side Slopes (z:1)	= 1.20, 1.20	Depth (ft)	= 2.50
Total Depth (ft)	= 2.50	Q (cfs)	= 15.34
		Area (sqft)	= 7.50
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 2.05
Slope (%)	= 0.50	Wetted Perim (ft)	= 7.81
N-Value	= 0.050	Crit Depth, Yc (ft)	= 1.60
		Top Width (ft)	= 6.00
Calculations		EGL (ft)	= 2.57
Compute by:	Q vs Depth		
No. Increments	= 10		



Channel Report

23-82C

Trapezoidal

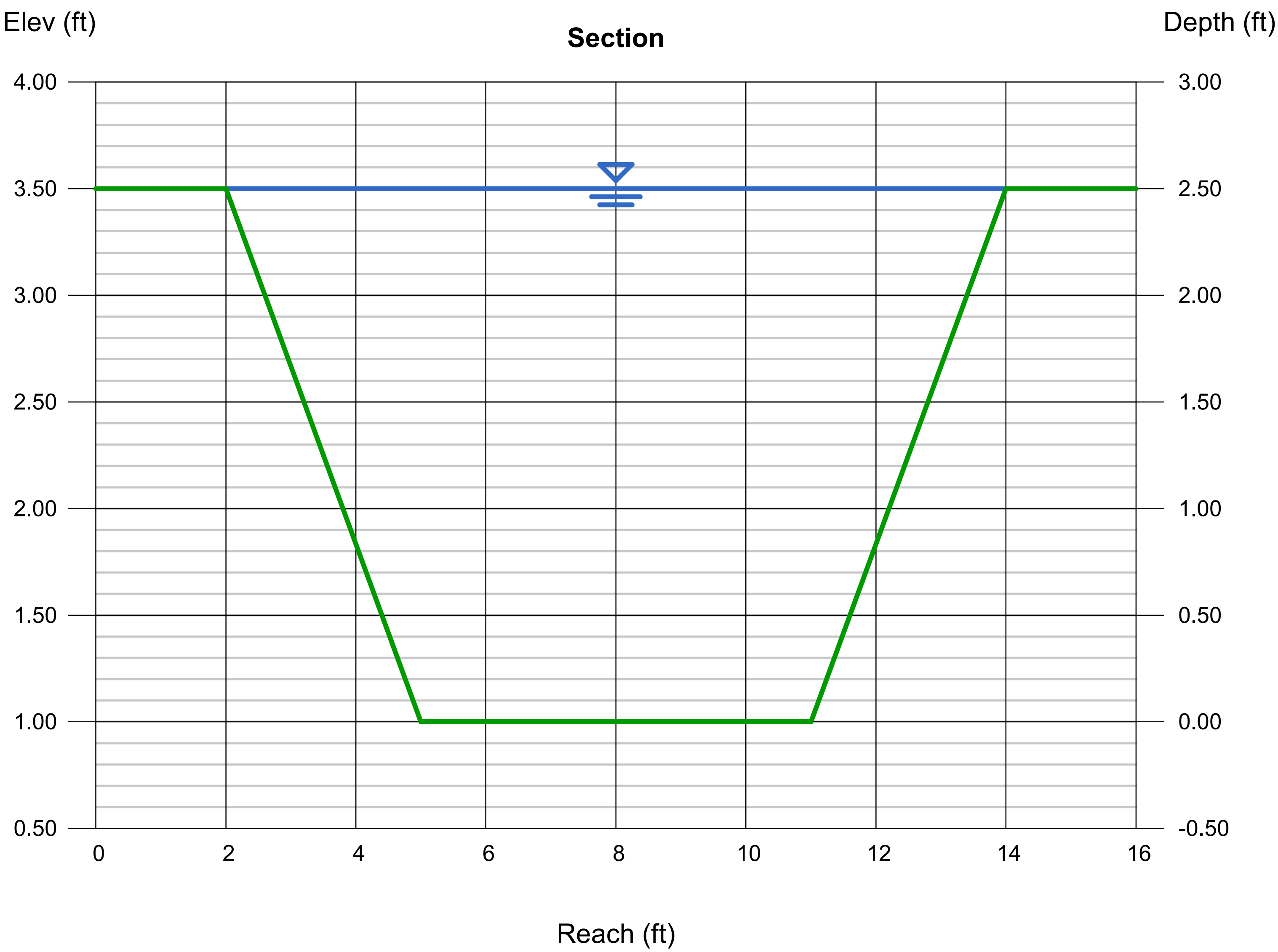
Bottom Width (ft)	=	6.00
Side Slopes (z:1)	=	1.20, 1.20
Total Depth (ft)	=	2.50
Invert Elev (ft)	=	1.00
Slope (%)	=	0.50
N-Value	=	0.013

Calculations

Compute by:		Q vs Depth
No. Increments	=	10

Highlighted

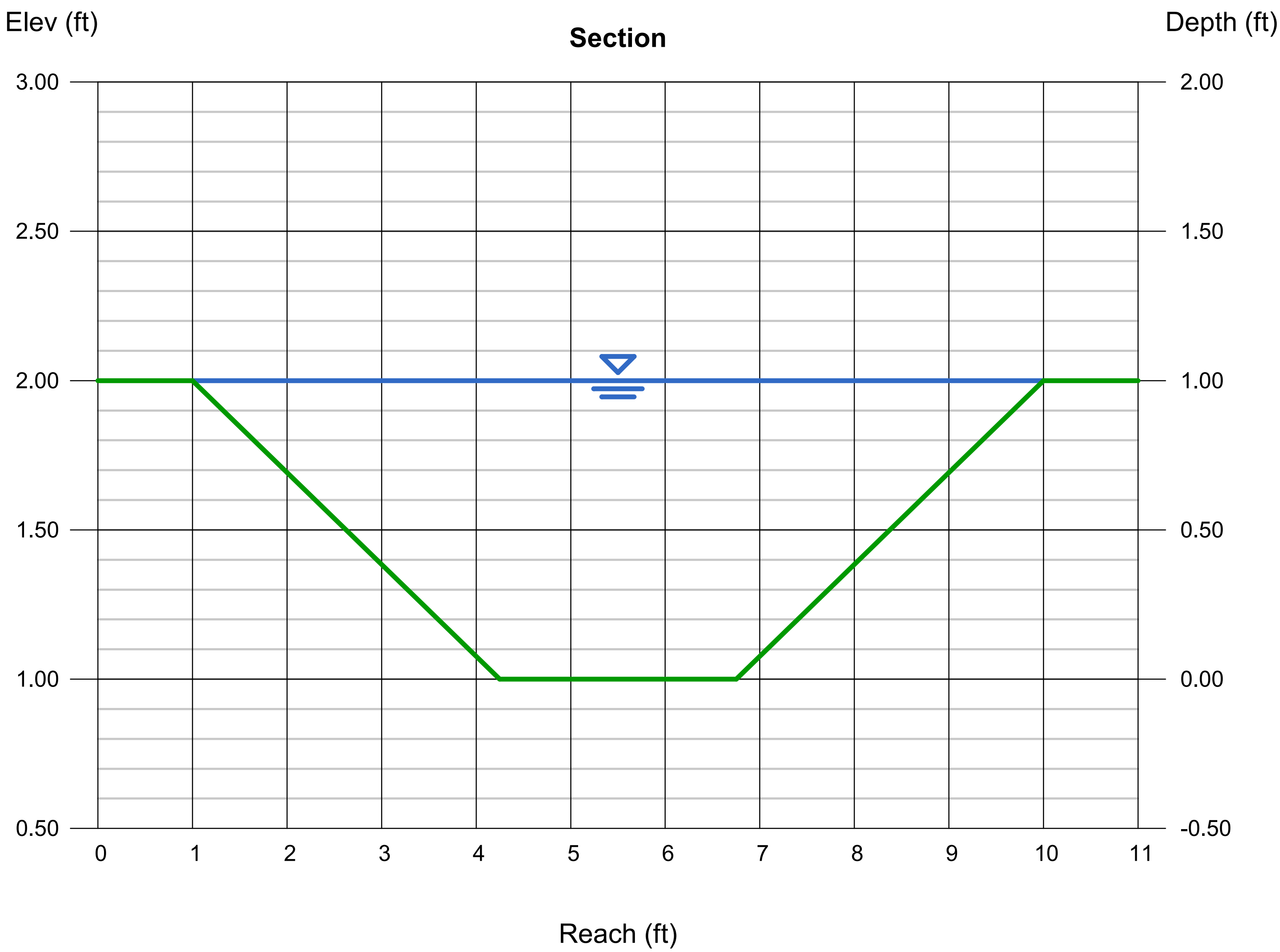
Depth (ft)	=	2.50
Q (cfs)	=	251.85
Area (sqft)	=	22.50
Velocity (ft/s)	=	11.19
Wetted Perim (ft)	=	13.81
Crit Depth, Yc (ft)	=	2.50
Top Width (ft)	=	12.00
EGL (ft)	=	4.45



Channel Report

23-85N

Trapezoidal		**Highlighted**	
Bottom Width (ft)	= 2.50	Depth (ft)	= 1.00
Side Slopes (z:1)	= 3.25, 3.25	Q (cfs)	= 8.768
Total Depth (ft)	= 1.00	Area (sqft)	= 5.75
Invert Elev (ft)	= 1.00	Velocity (ft/s)	= 1.52
Slope (%)	= 0.50	Wetted Perim (ft)	= 9.30
N-Value	= 0.050	Crit Depth, Yc (ft)	= 0.57
		Top Width (ft)	= 9.00
Calculations		EGL (ft)	= 1.04
Compute by:	Q vs Depth		
No. Increments	= 10		



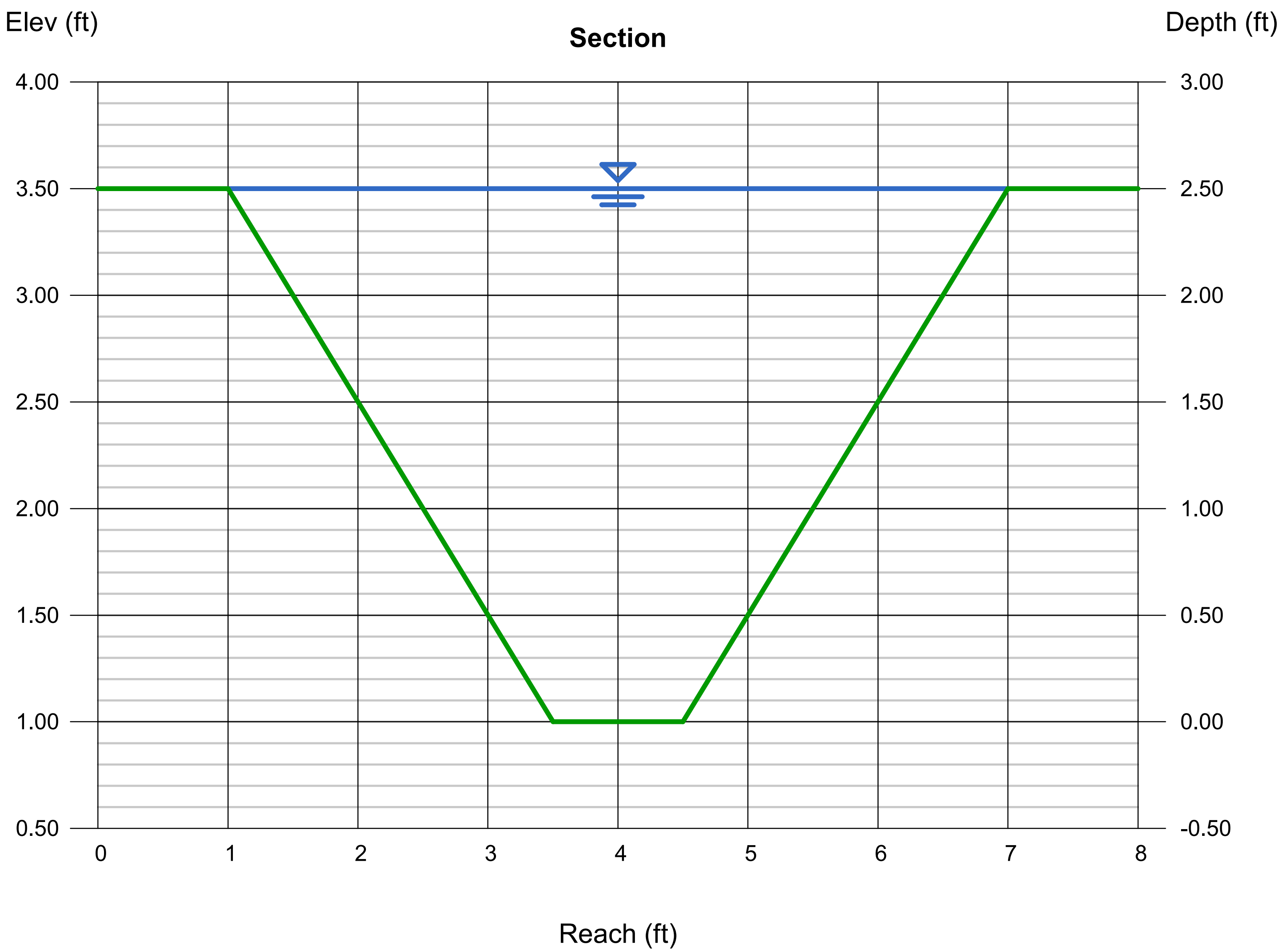
Channel Report

23-86C

Trapezoidal
Bottom Width (ft) = 1.00
Side Slopes (z:1) = 1.00, 1.00
Total Depth (ft) = 2.50
Invert Elev (ft) = 1.00
Slope (%) = 0.50
N-Value = 0.050

Calculations
Compute by: Q vs Depth
No. Increments = 10

Highlighted
Depth (ft) = 2.50
Q (cfs) = 19.41
Area (sqft) = 8.75
Velocity (ft/s) = 2.22
Wetted Perim (ft) = 8.07
Crit Depth, Yc (ft) = 1.46
Top Width (ft) = 6.00
EGL (ft) = 2.58



Attachment J

Block Analysis Summary

Dewberry

Block	Block Direction	Street Name	Conveyance	Dim.	Description	Flow Capacity	Sub-Basin Flow	Recc. Pipe Size	Reccomendation
3-1	N	South St.	Curbing			-	5.82	18"	
	E	11th St.	Curbing			-	5.82	18"	Clean out structures
	S	20th St.	Curbing			-	5.82	18"	
	W	12th St.	Ditch	●7' Wide ● 3.5' Bottom ● 2.5' Deep	Grassed, Sandy	33.97	5.82	18"	Replace clogged culverts
						-			
3-2	N	2nd Ave.	Curbing			-	-	-	
	E	-	-			-	-	-	
	S	20th St.	Curbing			-	-	-	
	W	11th St.	Curbing			-	-	-	Clean out structures
3-3	N	20th St.	Curbing			-	4.66		
	E	11th St.	Pipe/Curbing	42" RCP		71.73	98.54	48"	Clean out structures, upsize pipe
	S		N/A			-	4.66	18"	
	W	12th St.	Ditch/Pipe	●7' Wide ● 3.5' Bottom ● 2.5' Deep ● 18" Pipe	Grassed, Sandy	33.97 7.43	2.68	18"	
	C	-	Pipe	42" RCP		71.14	97.42	48"	Upsize pipe
3-4	N	20th St.	Curbing/Piping	42" RCP		71.14	101.7	48"	
	E	-	Ditch	●55' Wide ● 6' Bottom ● 8' Deep		813.1	9.15	24"	Maintain ditch
	S	-	N/A			-	-		
	W	11th St.	Curbing/Piping	42" RCP		71.14	101.34	48"	Clean out structures
3-5	N	-	-			-	8.019	24"	
	E	15th St.	-			-	8.019	24"	
	S	Ave. M	-			-	8.019	24"	
	W	Jefferson St.	-			-	8.019	24"	
3-6	N	-	-			-	-		
	E	Hickory St.	-			-	8.92	24"	
	S	Ave. M	-			-	2.74	18"	
	W	15th St.	Ditch	●14' Wide ● 5' Bottom ● 4' Deep	Light brush	85.41	2.74	48"	Match ditch capacity
3-7	N	-	-			-	-		
	E	Earl King St.	-			-	-		
	S	Ave. M	Pipe	15" ADS		4.57	Unknown	18"	Find out what pipe is capturing
	W	Hickory St.	-			-	-		

Dewberry

3-8	N	-	Pipe	36" RCP		47.16	85.39	48"	Upsize pipe
	E	12th St.	Ditch/Pipe	• 7' Wide • 3' Bottom • 3' Deep	Light brush	25.53	27.23	30"	Maintain ditch
	S	-				-	-		
	W	Walnut St.	Ditch	• 18' Wide • 8' Bottom • 6' Deep	Light brush	226.9	55.48	42"	Maintain ditch
3-9	N	-	Pipe	42" RCP		71.14	92.76	48"	Upsize pipe
	E	-	-			-	-		
	S	Ave. M	Ditch	• 13' Wide • 2' Bottom • 1.5' Deep	Grassed	21.05	3.66	18"	Replace clogged culverts
	W	12th St.	Ditch/Pipe	• 9' Wide • 3' Bottom • 2' Deep • 18" ADS	Grassed	23.14 7.43	21.551	18"	Uncover existing inlet
3-10	N	-	-			-	-		
	E	10th St.	Pipe	30" RCP		29	9.15	24"	
	S	Ave. M	-			-	0.53	18"	Re-establish historical ditch
	W	11th St.	-			-	5.33	18"	
3-11	N	-	-			-	-		
	E	9th St.	-			-	-		
	S	Ave. M	-			-	-		
	W	10th St.	-			-	-		
3-12	N	-	-			-	-		
	E	8th St.	-			-	-		
	S	Ave. M	-			-	-		
	W	9th St.	-			-	-		
3-13	N	-	-			-	-		
	E	7th St.	-			-	-		
	S	Ave. M	-			-	-		
	W	8th St.	-			-	-		
3-14	N	Ave. M	Pipe/Ditch	• 14' Wide • 5' Bottom • 4' Deep • 36" RCP	Grassed	136.7 47.16	8.02	48"	Match ditch capacity
	E	15th St.	-			-	8.02	24"	
	S	Ave. L	-			-	8.02	24"	
	W	Jefferson St.	-			-	8.02	24"	

3-15	N	Ave. M	Pipe	48" RCP		108.29	16.94		
	E	14th St.	Ditch/Pipe	●14' Wide ● 5' Bottom ● 4' Deep ● 24" ADS	Light Brush	85.41	12.51	48" Pipe	
	S	Ave. L	Pipe	18" ADS		-	14.48	24"	Upsize pipe
	W	15th St.	-			-	8.92	24"	
3-16	N	Ave. M	Ditch	●14' Wide ●8' Bottom ●6' Deep	Grassed	293.8	55.48	42"	
	E	-	-			-	-		
	S	Ave. L	-			-	-	24"	
	W	14th St.	-			-	-	24"	
3-17	N	-	-			-	-	-	
	E	12th St.	Ditch	●6' Wide ● 2' Bottom ●2.5' Deep	Grassed	23.6	27.23	30"	Match ditch capacity
	S	Ave. L	-			-	-	24"	
	W	-	-			-	-	-	
3-18	N	Ave. M	Ditch	●9' Wide ●2' Bottom ●1' Deep	Grassed	8.15	7.171	18"	
	E	11th St.	Ditch	●8' Wide ●1.5' Deep	Grassed	9.97	7.171	18"	
	S	Ave. L	-			-	7.171	18"	
	W	12th St.	Ditch	●7' Wide ●2.5' Bottom ●2.5' Deep	Grassed	29.53	10.72	24"	
3-19	N	Ave. M	-			-	3.43	18"	Re-establish historical ditch
	E	10th St.	Pipe	30" RCP		29	8.62	24"	
	S	Ave. L	Ditch	●8' Wide ●2' Bottom ●2' Deep	Grassed	22.2	1.9	24"	Replace clogged culvert, match ditch capacity
	W	11th St.	-			-	1.9	18"	
3-20	N	Ave. M	Pipe	24" RCP		16	1.39	24"	
	E	9th St.	-			-	4.88	18"	
	S	Ave. L	Pipe/Ditch	●6' Wide ● 1' Deep ● 18" ADS	Grassed	3.83 7.43	9.03	24"	
	W	10th St.	-			-	4.88	18"	
3-21	N	Ave. M	-			-	-	-	
	E	8th St.	-			-	2.28	18"	
	S	Ave. L	Pipe	15" RCP		4.57	4.15	18"	

	W	9th St.	-			-	2.28	18"	
3-22	N	Ave. M	-			-	-	-	
	E	7th St.	-			-	-	-	
	S	Ave. L	-			-	-	-	
	W	8th St.	-			-	-	-	
3-23	N	Ave. L	Pipe	18" ADS		4.57	3.59	18"	
	E	13th St.	-			-	-	-	
	S	Ave. K	Ditch/Pipe	● 4' Wide ● 3' Bottom ● 3' Deep ● 18" RCP	Grassed	24.09 7.43	4.22	30"	Determine what connected 18" is capturing, match ditch capacity
	W	Hickory St.	-			-	3.59	18"	
3-24	N	Ave. L	-			-	4.51	18"	
	E	12th St.	Ditch	●10' Wide ●3' Bottom ●3' Deep	Grassed	55.78	27.23	30"	
	S	Ave. K	Ditch	●10' Wide ●3' Bottom ●3' Deep	Grassed	55.78	4.51	18"	
	W	13th St.	-			-	4.51	18"	
3-25	N	Ave. L	Ditch	●10' Wide ●1' Deep	Grassed	6.53	1.83	18"	
	E	11th St.	-			-	1.82	18"	
	S	Ave. K	-			-	4.51	18"	
	W	12th St.	Ditch	●7.5' Wide ●2.5' Bottom ●2' Deep	Grassed	20.2	1.72	30"	Match ditch capacity
3-26	N	Ave. L	Ditch	● 8' Wide ● 2' Bottom	Grassed	15.61	6.3	24"	Match ditch capacity
	E	10th St.	Pipe	30" RCP		29	11.405	30"	
	S	Ave. K	Ditch	● 9' Wide ● 1' Bottom ● 2' Deep	Grassed	21.09	5.105	24"	Match ditch capacity
	W	11th St.	Ditch	● 6' Wide ● .75' Deep	Grassed	2.41	5.105	18"	Match ditch capacity
3-27	N	Ave. L	-			-	13.88	24"	
	E	9th St.	-			-	2.6	18"	
	S	Ave. K	Ditch	● 6' Wide ● 1' Deep	Grassed	3.83	2.6	18"	
	W	10th St.	-			-	4.85	18"	
3-28	N	Ave. L	Pipe	15" RCP		4.57	1.87	18"	
	E	8th St.	-			-	2.06	18"	
	S	Ave. K	-			-	2.06	18"	
	W	9th St.	-			-	1.81	18"	

3-29	N	Ave. L	-			-	4.29	18"	
	E	7th St.	-			-	4.29	18"	
	S	Ave. K	Pipe	15" RCP		4.57	4.29	18"	Upsize pipe
	W	8th St.	-			-	4.29	18"	
3-30	N	Ave. K	-			-	4.22	18"	
	E	13th St.	-			-	4.22	18"	
	S	Fulton St.	-			-	4.22	18"	
	W	Hickory St.	-			-	4.22	18"	
3-31	N	Ave. K	-			-	10.17	24"	
	E	12th St.	Ditch	• 6' Wide • 2' Bottom • 2' Deep	Grassed	20.58	18.21	30"	Match ditch capacity
	S	Fulton St.	Ditch	• 6' Wide • 2' Bottom • 2' Deep	Grassed	17.31	10.17	30"	Match ditch capacity
	W	13th St.	-			-	10.17	24"	
3-32	N	Ave. K	-			-	1.71	18"	
	E	11th St.	Ditch	• 7' Wide • 1' Bottom • 1' Deep	Grassed	5.61	1.71	18"	Match ditch capacity
	S	Fulton St.	-			-	1.48	18"	
	W	12th St.	-			-	1.71	18"	
3-33	N	Ave. K	Ditch	• 6' Wide • 1.5' Deep	Grassed	7.246	5.111	18"	Match ditch capacity
	E	10th St.	Pipe	30" RCP		29	8.14	30"	
	S	Fulton St.	-			-	8.14	24"	
	W	11th St.	Ditch	• 7' Wide • 1' Bottom • 1' Deep	Grassed	5.61	3.4	18"	Match ditch capacity
3-34	N	Ave. K	Ditch	• 10' Wide • 4' Bottom • 1.5' Deep	Grassed	21.78	10.86	24"	Match ditch capacity
	E	9th St.	Ditch	• 6' Wide • 1' Deep	Grassed	3.83	4.07	18"	Match ditch capacity
	S	Fulton St.	-			-	4.07	18"	
	W	10th St.	Ditch	• 10' Wide • 4' Bottom • 1.5' Deep	Grassed	21.78	3.4	18"	Match ditch capacity
3-35	N	Ave. K	Ditch	• 8' Wide • 1' Bottom • 1.5' Deep • 18" RCP	Grassed	12.04 7.43	4.06	18"	Match ditch capacity
	E	8th St.	-			-	4.96	18"	
	S	Fulton St.	-			-	4.96	18"	
	W	9th St.	-			-	4.96	18"	

3-36	N	Ave. K	-			-	8.16	24"	
	E	7th St.	Ditch	• 8' Wide • 1' Deep	Grassed	5.19	3.87	18"	Match ditch capacity
	S	Fulton St.	-			-	3.5	18"	
	W	8th St.	-			-	3.87	18"	
3-37	N	Ave. K	-			-	3.12	18"	
	E	6th St.	-			-	5.01	18"	
	S	Fulton St.	-			-	5.01	18"	
	W	7th St.	Ditch	• 8' Wide • 1' Deep	Grassed	5.19	5.01	18"	Match ditch capacity
23-38	N	Ave. K	-			-	3.57	18"	
	E	5th St.	-			-	3.57	18"	
	S	Fulton St.	-			-	3.57	18"	
	W	6th St.	-			-	5	18"	
23-39	N	-	-			-	-		
	E	-	-			-	-		
	S	-	-			-	-		
	W	-	-			-	-		
3-40	N	MLK Jr. Ave.	-			-	-		
	E	13th St.	Ditch	• 8' Wide • 1' Bottom • 1.5' Deep	Grassed	12.04	-		
	S	Ave. I	Ditch	• 8' Wide • 1' Bottom • 1.5' Deep	Grassed	12.04	-		
	W	Hickory St.	Ditch	• 6' Wide • 1.5' Deep	Grassed	7.25	-		
3-41	N	MLK Jr. Ave.	-			-	8.04	24"	
	E	12th St.	Ditch	• 6' Wide • 2' Bottom • 2' Deep	Grassed	17.31	8.04	24"	Match ditch capacity
	S	Ave. I	-			-	8.04	24"	
	W	13th St.	-			-	8.04	24"	
23-42	N	MLK Jr. Ave.	-			-	2.27	18"	
	E	11th St.	Ditch	• 8' Wide • .75' Deep	Grassed	3.23	2.27	18"	Match ditch capacity
	S	Ave. I	-			-	2.27	18"	
	W	12th St.	-			-	2.27	18"	

23-43	N	MLK Jr. Ave.	Ditch	● 8' Wide ● 2' Bottom ● 2.5' Deep	Grassed	30.88	11.39	24"	Match ditch capacity
	E	10th St.	-			-	9.12	24"	
	S	Ave. I	Ditch	● 6' Wide ● 1' Deep	Grassed	3.83	9.12	24"	Widen ditch
	W	11th St.	Ditch	● 6' Wide ● 1' Deep	Grassed	3.83	9.12	24"	Widen ditch
23-44	N	MLK Jr. Ave.	Ditch/Pipe	● 10' Wide ● 3' Bottom ● 2' Deep ● 15"ADS	Grassed	30.43 4.57	16.27	30"	Upsize pipe
	E	9th St.	-			-	4.88	18"	
	S	Ave. I	-			-	4.88	18"	
	W	10th St.	-			-	4.88	18"	
23-45	N	MLK Jr. Ave.	Ditch	● 10' Wide ● 2' Bottom ● 2' Deep ● Double 18" RCP	Grassed	32.71 14.86	27.22	36"	Match ditch capacity, upsize pipes
	E	8th St.	-			-	5.99	18"	
	S	Ave I	-			-	5.99	18"	
	W	9th St.	-			-	5.99	18"	
	Center		Ditch	● 6' Wide ● 6" Deep	Grassed	1.24	5.99	18"	Match ditch capacity
23-46	N	MLK Jr. Ave.	Ditch	● 12' Wide ● 3' Bottom ● 3' Deep	Grassed	65.46	30.1	36"	Match ditch capacity
	E	7th St.	Pipe	36" RCP		47.16	37.56	36"	
	S	Ave. I	-			-	3.59	18"	
	W	8th St.	-			-	3.59	18"	
23-47	N	MLK Jr. Ave.	Pipe	36" RCP		47.16	6.43	18"	
	E	6th St.	-			-	3.72	18"	
	S	Ave. I	-			-	3.72	18"	
	W	7th St.	Pipe	36" RCP		47.16	39.1	36"	
23-48	N	MLK Jr. Ave.	Pipe	36" RCP		47.16	7.89	18"	
	E	5th St.	-			-	6.91	18"	
	S	Ave. I	-			-	1.66	18"	
	W	6th St.	-			-	4.26	18"	
23-49	N	-	Pipe	36" RCP		47.16	7.89	18"	
	E	-	Ditch	● 35' Wide ● 15' Bottom ● 3.5' Deep	Tidal waters	331.1	41.71	36"	Maintain ditch
	S	Ave. I	Pipe	Double 36" RCP		94.32	116.339	42"	
	W	5th St.	-			-	6.91	18"	

23-50	N	-	-			-	-	-	
	E	Market St.	-			-	-	-	
	S	Ave. I	Ditch	• 35' Wide • 15' Bottom • 3.5' Deep	Tidal waters	331.1	169.179	48"	Maintain ditch
	W	-	-			-	41.71	36"	
23-51	N	-	-			-	-		
	E	-	-			-	-		
	S	Ave. I	Ditch	• 35' Wide • 15' Bottom • 3.5' Deep	Tidal waters	331.1	-	48"	Maintain ditch
	W	Market St.	-			-	-		
3-52	N	-	Ditch	• 12' Wide • 4' Bottom • 2.5' Deep	Light Brush	34.25			
	E	16th St.	-			-			
	S	Ave. H	-			-			
	W	St. Vincents St.	Pipe	18" RCP		7.43			
3-53	N	-	Pipe	24" RCP		16			
	E	Maple St.	-			-			
	S	Ave. H	Pipe	18" RCP		7.43			
	W	16th St.	Pipe	36" RCP		47.16			
3-54	N	Pipe	Pipe	24" RCP		16			
	E	-	-			-			
	S	-	-			-			
	W	Pipe	Pipe	18" RCP		7.43			
3-55	N	Ave. I	Ditch	• 8' Wide • 1' Deep	Grassed	5.19			
	E	13th St.	-			-	1.31	18"	
	S	Ave. H	-			-	1..31	18"	
	W	Hickory St.	Curbing			-			
3-56	N	Ave. I	-			-	-		
	E	12th St.	Ditch	• 8' Wide • 1' Bottom • 1.5' Deep	Grassed	12.04	12.3	24"	Match ditch capacity
	S	Ave. H	Ditch	• 12' Wide • 2' Bottom • 1.5' Deep	Grassed	19.69	12.3	24"	Match ditch capacity
	W	13th St.	Ditch	• 9' Wide • 2' Bottom • 2' Deep	Grassed	24.53	12.3	24"	Match ditch capacity

23-57	N	Ave. I	Pipe	18" ADS		7.43	7.19	18"	
	E	10th St.	-			-	5.69	18"	
	S	Ave. G	Ditch	● 6' Wide ● 0.5' Deep	Grassed	1.24	10.6	24"	Establish connectivity to pipe system at southern corner
	W	12th St.	-			-		-	
23-58	N	Ave. I	-			-	7.19	18"	
	E	9th St.	-			-	7.19	18"	
	S	Ave. H	Pipe	18" RCP		7.43	7.822	18"	
	W	10th St.	-			-	7.19	18"	
	Center		Ditch	● 12' Wide ● 0.5' Bottom ● 1.5' Deep	Grassed	16.35	7.19	24"	Match ditch capacity
23-59	N	Ave. I	-			-	5.99	18"	
	E	8th St.	-			-	6.08	18"	
	S	Ave. H	-			-	6.08	18"	
	W	9th St.	-			-	1.67	18"	
23-60	N	Ave. I	-			-	6.91	18"	
	E	7th St.	-			-	6.91	18"	
	S	Ave. H	Pipe	Unknown		-	6.91	18"	Clean out inlet
	W	8th St.	-			-	6.91	18"	
23-61	N	Ave. I	Pipe	36" RCP	Tidal waters	47.16	54.8	42"	Upsize pipes
	E	6th St.	-			-	11.98	24"	
	S	Ave. H	-			-	11.98	24"	
	W	7th St.	-			-	11.98	24"	
23-62	N	Ave. I	Pipe	36" RCP	Tidal waters	47.16	56.46	42"	Upsize pipe
	E	5th St.	Pipe	48" RCP	Tidal waters	108.29	57.6	42"	
	S	Ave. H	-			-	5.14	18"	
	W	6th St.	Pipe	18" RCP		7.43	11.13	24"	
23-63	N	Ave. I	Pipe	24" RCP		16	2.28	18"	
	E	4th St.	-			-	2.89	18"	
	S	Ave. H	-			-	4.5	18"	
	W	5th St.	-			-	6.91	18"	

23-64	N	Ave. I	-			-	-	-	
	E	Big Bend Scenic Byway	Ditch	• 18' Wide •6' Bottom • 2.5' Deep	Heavy brush, Tidal water	42.75	11.13	36"	Match ditch capacity
	S	-	Ditch	• 10' Wide •3' Bottom • 1' Deep	Heavy brush, Tidal water	5.03	11.13	18"	Match ditch capacity
	W	4th St.	-			-	11.13		
23-65	N	Ave. I	Ditch	24" RCP	Tidal Water	16	-	-	
	E	Commerce St.	Pipe	18" RCP	Tidal Water	-	-	-	
	S	-	Ditch	Unknown	Heavy brush, Tidal Water	-	-	-	Clean out ditch
	W	Big Bend Scenic Byway	-			-	-	-	
3-66	N	Ave. H	Ditch	• 18' Wide • 6' Bottom • 3' Deep	Grassed	114.2			
	E	16th St.	-			-			
	S	Ave. G	-			-			
	W	St. Vincents St.	-			-			
	Center	-	Ditch	• 7' Wide • 2' Deep	Grassed	28.66			
3-67	N	Ave H	Ditch	• 12' Wide • 2' Bottom • 2' Deep	Grassed	31.28			
	E	Maple St.	-			-			
	S	Ave. G	-			-			
	W	16th St.	Ditch	• 18' Wide • 6' Bottom • 3' Deep	Grassed	114.2			
3-68	N	Ave. H	-			-	5	18"	
	E	Hickory St.	-			-	5	18"	
	S	Ave. G	-			-	2.8	18"	
	W	Maple St.	Ditch	• 8' Wide • 2' Bottom • 2' Deep	Grassed	22.2	2.8	18"	
	Center		Ditch	• 10' Wide • 2' Bottom • 2' Deep	Grassed	26.82	2.8	18"	Establish connectivity
3-69	N	Ave. H	-			-	0.656	18"	
	E	13t St.	-			-	7.63	18"	
	S	Ave. G	Ditch	• 6' Wide • 1' Deep	Grassed	3.83	4.85	18"	Establish connectivity
	W	Hickory St.	-			-	4.85	18"	

3-70	N	Ave. H	Ditch	• 10' Wide • 2' Bottom • 2' Deep	Grassed	26.82	7.63	30"	Match ditch capacity
	E	12th St.	-			-		-	
	S	Ave. G	Pipe	18" RCP		7.43	7.63	18"	
	W	13th St.	Ditch	• 14' Wide • 2' Bottom • 2.5' Deep	Grassed	50.92	9.596	36"	Match ditch capacity
23-71	N	Ave. H	-			-	1.68	18"	
	E	9th St.	Ditch	• 10' Wide • 3' Bottom • 1' Deep	Grassed	10.06	-	-	
	S	Ave. G	-			-	4.36	18"	
	W	10th St.	-			-	-	-	
23-72	N	Ave. H	-			-	12.1	24"	
	E	8th St.	-				12.1	24"	
	S	Ave. G	Ditch	• 12' Wide • 3' Bottom • 3' Deep	Grassed	65.46	52.362	42"	Match ditch capacity
	W	9th St.	Pipe	24" RCP		16	35.902	36"	Upsize pipe
23-73	N	Ave. H	-			-	3.91	18"	
	E	8th St.	-			-	3.91	18"	
	S	Ave. G	Ditch	• 15' Wide • 2.5' Deep	Grassed	44.15	99.907	48"	Widen ditch
	W	9th St.	-			-	6.5	18"	
23-74	N	Ave. H	-			-	4.4	18"	
	E	6th St.	-			-	4.4	18"	
	S	Ave. G	Pipe	36" RCP		47.16	39.54	36"	
	W	7th St.	Pipe	48" RCP		108.29	51.905	48"	
23-75	N	Ave. H	Pipe	48" RCP		108.29	51.905	>48"	Upsize Pipe
	E	5th St.	-			-			
	S	Ave. G	Pipe	12" RCP		2.52	4.04	18"	Upsize Pipe
	W	6th St.	Pipe	36" RCP		47.16	160.152	>48"	Upsize Pipe
	Center		Pipe	18" & 24" RCP		7.43 & 16	106.197	48"	Upsize Pipe, Install pond
23-76	N	Ave. H	-	-		-	5.69	18"	
	E	4th St.	-	-		-	8.99	24"	
	S	Ave. G	-	-		-	8.99	24"	
	W	5th St.	-	-		-	8.99	24"	
23-77	N	Ave. G	Ditch	• 6' Wide • 2.5' Deep	Grassed	15.34	4.88	24"	Match ditch capacity
	E	10th St.	-			-	3.56	18"	
	S	Ave. F	-			-	4.88	18"	
	W	11th St.	-			-	4.21	18"	

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23-78	N	Ave. G	-			-	4.36	18"	
	E	9th St.	-			-	4.36	18"	
	S	Ave. F	-			-	4.36	18"	
	W	10th St.	-			-	3.56	18"	
23-79	N	Ave G	-			-	4.36	18"	
	E	8th St.	-			-	4.36	18"	
	S	Ave. F	-			-	33.915	36"	
	W	9th St.	-			-	4.36	18"	
23-80	N	Ave. G	Pipe	24" RCP		16	2.19	18"	
	E	7th St.	-			-	6.49	18"	
	S	Ave. F	-			-	6.49	18"	
	W	8th St.	-			-	0.93	18"	
	Center		Pipe	24" RCP		16	41.045	36"	Upsize pipe
23-81	N	Ave. G	-			-	2.19	18"	
	E	6th St.	-			-	6.49	18"	
	S	Ave. F	-			-	6.49	18"	
	W	7th St.	-			-	11.49	24"	
23-82	N	Ave. G	-			-	27.43	30"	
	E	5th St.	Pipe	18" RCP		7.43	10.41	24"	Upsize Pipe
	S	Ave. F	-			-	17.02	24"	
	W	6th St.	-			-	6.49	18"'	
	Center		Ditch	• 12' Wide • 6' Bottom • 2.5' Deep	Concrete	251.8	27.43	30"	Match ditch capacity
23-83	N	Ave. G	-			-	4.05	18"'	
	E	4th St.	-			-	-		
	S	Ave. F	Pipe	18" RCP		7.43	9	24"	
	W	5th St.	-			-	1.41	18"'	
23-84	N	Ave. F	-			-	8.93	24"	
	E	10th St.	-			-	12.99	24"	
	S	Hwy. 98	Curbing			-	-		
	W	11th St.	-			-	-		

Dewberry

23-85	N	Ave. F.	Ditch	• 9' Wide • 2.5' Bottom • 1' Deep	Grassed	8.77	12.99	24"	
	E	9th St.	-			-	5.58	18"'	
	S	Hwy. 98	Curbing			-	-		
	W	10th St.	-			-	5.58	18"'	
	Center		Ditch	Unknown	Heavy brush	-	5.58	18"'	
23-86	N	Ave. F	Pipe	30" RCP		29	28.61	30"	
	E	8th St.	-			-	8.41	24"	
	S	Hwy. 98	Curbing			-	8.41	24"	
	W	9th St.	Pipe	30" RCP		29	18.5	30"	
			Pipe/Ditch	• 6' Wide • 1' Bottom • 2.5' Deep	Grassed	19.41	12.85	24"	Clean out ditch
23-87	N	Ave. F	Pipe	36" RCP		47.16	29.56	30"	
	E	6th St.	-			-	6.49	18"	
	S	Hwy. 98	Curbing			-	-		
	W	8th St.	-			-	3.92	18"	
23-88	N	Ave. F	Pipe	18" RCP		7.43	0.728	18"	
	E	5th St.	-			-	10.73	24"	
	S	Hwy. 98	-			-	-	-	
	W	6th St.	-			-	17.02	24"	
23-89	N	Ave. F	Pipe	18" RCP		7.43	12.27	24"	Upsize Pipe
	E	4th St.	-			-	10.73	24"	Upsize Pipe
	S	Ave. E	-			-	-		
	W	5th St.	-				10.73	24"	Upsize Pipe
	Center		Pipe	18" RCP		7.43	10.73	24"	Upsize Pipe

Attachment K

2016 Potential Projects Map

Table 3
High Priority Drainage Problems

Map No.	Location of Problem Area	Comments	Cost Estimate
101	Ball Field Stormwater Park	Construct stormwater park for water quality in Batter Park Basin	$ 600,000.00
102	Water Street and Avenue F	Replace/retrofit a section of existing outfall pipe system that is old and apparently undersized.	$ 250,000.00
103	Water and Avenue G	Add inlets, Pipe, water quality vault and reconstruct (crown) Water Street	$ 525,000.00
104	Avenue I Water Quality Improvements	Drainage infrastructure and Water Quality Improvement project.	$ 650,000.00
105	Scipio boat Basin Drainage Improvements	Add inlets, Pipe, water quality vault and reconstruct (crown) roadway	$ 45,000.00
106	US 98 and 16th Street (12th Street Basin Conveyance)	Reconstruct the Conveyance system to drain to bay and add water quality improvements	$ 1,500,000.00
107	Poloronis/Butler Drainage Improvements	Drainage infrastructure improvement project.	$ 20,000.00
108	Prado Outfall Drainage Improvements	Option 1: Outfall improvement to include upstream basin flooding issues.	$ 150,000.00
108	Prado Outfall Drainage Improvements	Option 2: Outfall from alley to downstream roadway (only).	$ 85,000.00
109	Bobby Cato / 25th Street / Ellis Van Fleet Roadway and Drainage Improvements	Major redesign and construction of the 12th Street Basin closed conveyance system. Extremely large and expensive project for City. Routine maintenance schedule will help tremendously.	$ 300,000.00
110	6th Street (Schroeder) Drainage Improvements	Construct roadway drainage conveyance system to alley (Zingarelli paved drainage way). Mr. Schroeder has stated that he will donate a drainage easement.	$ 50,000.00
		*Total	$ 4,090,000.00

*NOTE: Total excludes $85,000 for #108 - Option 2. #108 - Option 1 was selected over #108 - Option 2

- PROJECTS COMPLETED
- PROJECTS IN CONSTRUCTION
- PROJECTS NOT PURSUED

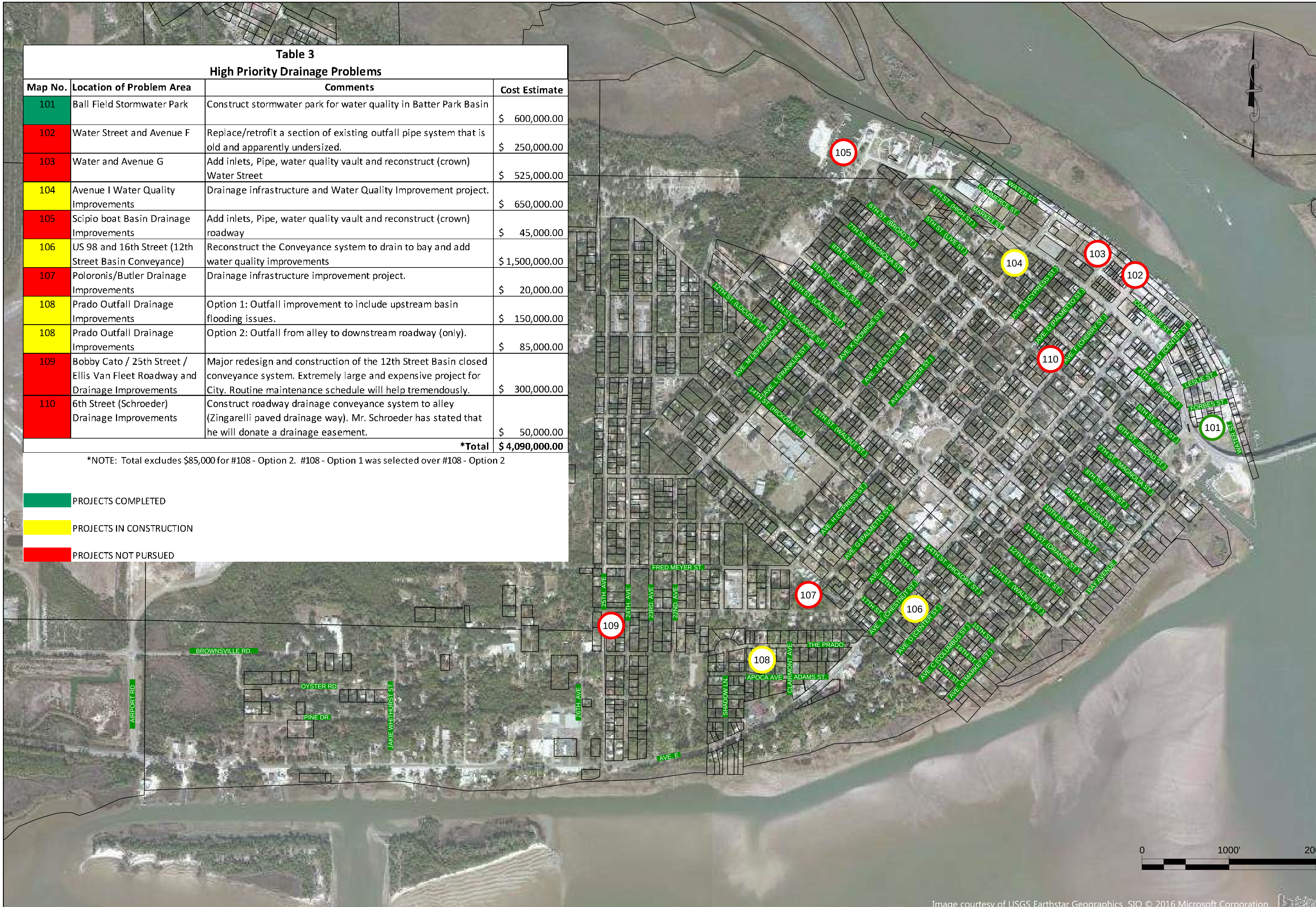


TABLE 3 HIGH PRIORITY DRAINAGE PROJECT

APALACHICOLA DRAINAGE REPORT PROJECTS

CITY OF APALACHICOLA

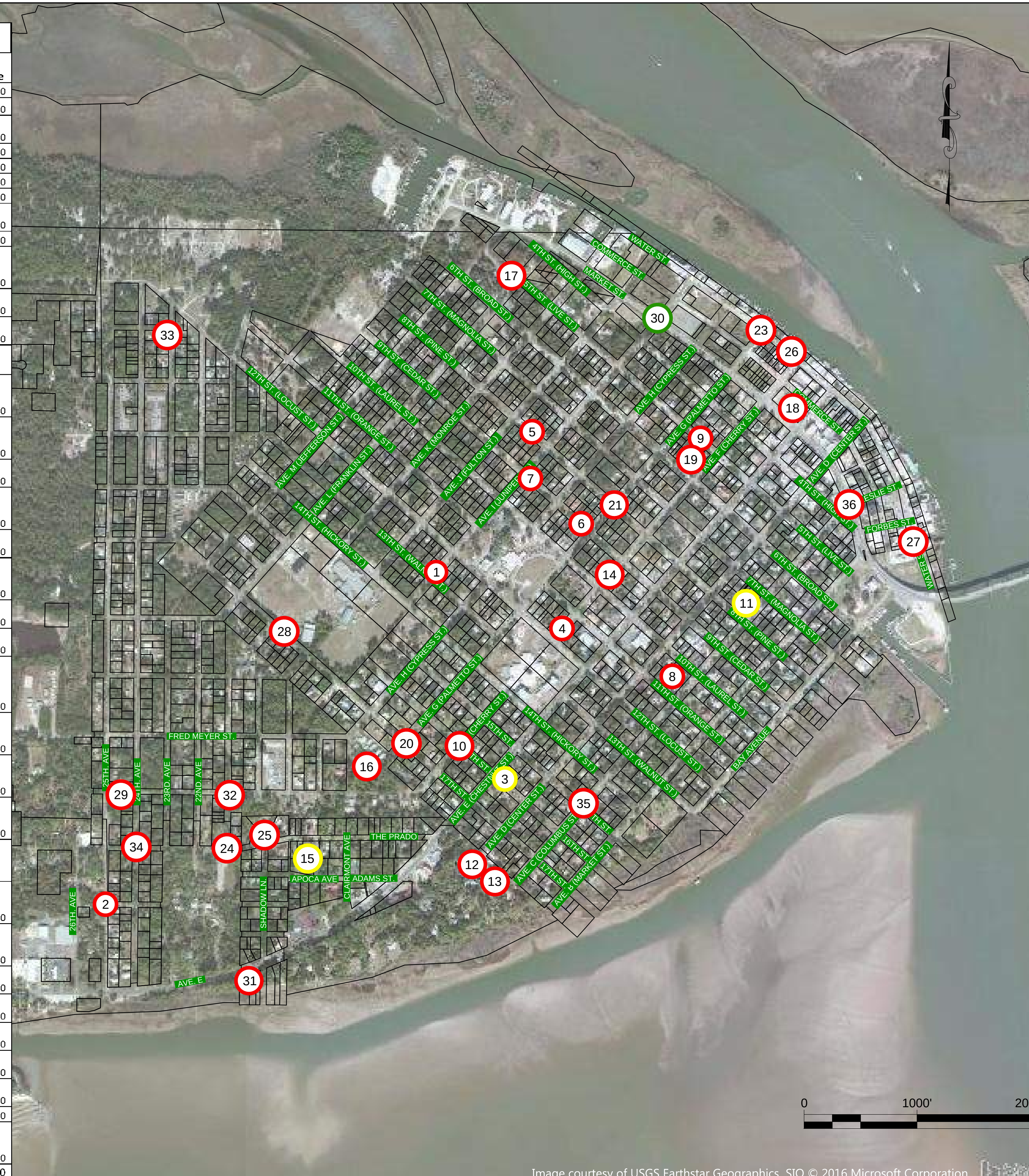
FRANKLIN COUNTY, FLORIDA

PREBLE-RISH
Dewberry
502 East Park Ave.,
Tallahassee, Florida 32301
850.354.5183

Date: 12/13/16
Designed: A.O.A.
Drawn: RAJ
Checked: A.O.A.
Project No.: 219.000
Sheet No.: 1
Seal:

Table 2
Identified Drainage Problems

Map No.	Location of Problem Area	Comments	Cost Estimate
1	13th and Avenue I	Drainage Infrastructure improvement project.	$ 10,000.00
2	41 25th Avenue (Mr. Dykes)	Neighbors filled low area, causing localized nuisance flooding.	$ 2,000.00
3	US 98 and 16th Street	Clogged major outfall floods. Immediate temporary maintenance required. See Table 3 #106 for capital cost of required construction	$ 5,000.00
4	195 Avenue F (Brent Mabry)	Drainage infrastructure improvement project.	$ 15,000.00
5	164 8th Street	Drainage infrastructure improvement project.	$ 10,000.00
6	150 9th Street (New Drain)	Drainage infrastructure improvement project.	$ 10,000.00
7	9th and Avenue I (New Drain	Drainage infrastructure improvement project.	$ 10,000.00
8	Alley, Block 39between 10th street and 11th Street (Gibson)	Drainage infrastructure improvement project. Add inlets and pipe.	$ 25,000.00
9	102 5th Street	Zingarelli Maintenance	$ 500.00
10	Avenue F, 17th Street and 16th Street Area	Major redesign and construction of the 12th Street Basin closed conveyance system. Extremely large and expensive project for City, Routine maintenance schedule will help tremendously. (Cost includes maintenance only)	$ 10,000.00
11	Conveyance improvements: 7th and 8th / Avenue and Avenue D	Drainage infrastructure improvement project: Replace existing (vcp), add inlet and improve upstream open ditch.	$ 35,000.00
12	Myrtle Avenue and Center Street	Residential flooding. Drainage infrastructure improvement project: Add inlets and improve upstream downstream conveyance.	$ 25,000.00
13	36 Myrtle Ave (Drew Morgan)	Residential flooding. Drainage infrastructure improvement project: Add inlets and improve upstream downstream conveyance. Cost included in #12	$ -
14	Ave F at 9th Street and 10th Street	Several properties experience nuisance flooding. Roadway side ditch maintenance may resolve a large part of the problem. Old pipe on Ave F may be collapsed or completely silted.	$ 2,000.00
15	Prado Outfall	Downstream conveyance requires replacement. Two Options: Major improvement to resolve 12th Street flooding. Relatively minor to replace existing dilapidated corrugated metal pipe.	$ 85,000.00
16	Poloronis/Butler Area	Improve and restore drainage way to historical flow direction. Several options. Listed cost is least expensive option.	$ 20,000.00
17	Scipio Boat Basin and Bay Avenue	Drainage infrastructure improvement project: Add inlets and piping to improve roadway drainage. Current problem will destroy roadway pavement.	$ 45,000.00
18	Apalachicola Chamber of Commerce Parking Lot	Property flooding. Drainage infrastructure improvement project: add inlets and piping to convey off-site drainage.	$ 10,000.00
19	101 6th Street (Schroeder)	Property flooding. Drainage infrastructure improvement project: Add inlets and piping to redirect roadway and off-site drainage.Owner has stated that he is willing to donate drainage easement.	$ 50,000.00
20	17th Street and Ave G (Bryce Ward)	Property flooding. Drainage infrastructure improvement project: Add inlets and piping to improve roadway and off-site drainage.	$ 25,000.00
21	8th and Avenue G (Louis Van Fleet)	Periodic maintenance required. Problems may be resolved when Item 11 is implemented.	$ 2,000.00
23	Water Street and Avenue G	Drainage Infrastructure improvement project: Add inlets and piping to improve roadway drainage. Current problem will destroy roadway pavement. Wee Table 3, #103 for capital cost including water quality vault construction.	$ 100,000.00
24	103 21st Street (Mr. Dick White)	Drainage infrastructure improvement project: Add inlets and piping to improve drainage. Periodic maintenance will help the problem. This problem may be resolved with a substantial Prado outfall improvement.	$ 25,000.00
25	Sunset Park	Drainage infrastructure improvement project: Add inlets and piping to improve drainage. Periodic maintenance will help the problem. This problem may be resolved with a substantial Prado outfall improvement.	$ 20,000.00
26	Water Street and Avenue F	Existing outfall is below tide line. System is undersized for tidal influence. Temporary maintenance required. Survey complete. See Table 3, #102 for capital cost of required	$ 7,000.00
27	Water Street and Forbes	County recently designed and constructed a French drain system for this area. To date the flooding problem is not resolved. Survey complete. County is slated to provide a remedy when they repave Water Street.	$ -
28	17th Street Open Drainage Ditch (High School)	Safety hazard. Drainage infrastructure improvement project: Add inlets and piping to enclose large open ditch. Other options are available and discussed at City Commission Meeting	$ 205,000.00
29	Bobby Cato, 25th Avenue and Ellis Van Fleet Street	Drainage and roadway infrastructure improvement project: Add inlets and piping to ensure positive drainage to 23rd Street ditch. Paving will reduce corrosion and maintenance. Design plans complete.	$ 300,000.00
30	Avenue I / Scipio Basin Outfall	Frequent maintenance of existing baffle box. Consider additional water quality improvements.	$ 3,000.00
31	Bay Colony Outfall	City to ensure that the existing open conveyance ditch remains clean and operational. Upstream residential properties have experienced flooding.	$ 2,000.00
32	21st Avenue (Butler) Replace Cross Drain	Replace collapsed cross drain culvert pipe at Ellis Van Fleet Street.	$ 20,000.00
33	22nd and 23rd Avenues at 17th Street	Reconstruct ditches, driveway culverts and outfall.	$ 80,000.00
34	Prado and 24th Avenue Roadway Swales	Improve roadside drainage.	$ 50,000.00
35	15th Street and Avenue C	Improve roadside drainage.	$ 30,000.00
36	Gibson Inn to Water Street; Commerce St. from Avenue E to Avenue F	Replace non-functioning drainage pipes	$ 200,000.00
		Total	$ 1,438,500.00



PREBLE-RISH

Dewberry

502 East Park Ave.
Tallahassee, Florida 32301
850.354.5183

AYODEJI AJOSE-ADEOGUN, P.E. 65524
850-354-5181

COA# 8794

Date:	12/13/16
Designed:	A.O.A.
Drawn:	RAJ
Checked:	A.O.A.
Project No.:	219.000
Sheet No.:	1

Seal:

TABLE 2 IDENTIFIED DRAINAGE PROBLEMS

APALACHICOLA DRAINAGE REPORT PROJECTS
CITY OF APALACHICOLA

FRANKLIN COUNTY, FLORIDA

Attachment L

FDEP Mean High Water

Florida Department of Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

Mean High Water Procedure Approval

Date: 05-Nov-13

Surveyor's Name:

Firm Name:

Address:

Phone: FAX:

****

Point Identification Number: 2127 County: Franklin

USGS 7.5-Minute Quad Map Name: APALACHICOLA

Mean High Water (MHW) : 0.73 ft Mean Low Water (MLW): -0.38 ft

Datum: NAVD 88

Unit of measurement: Feet Tidal Epoch: 1983 - 2001

Procedure: Extend the above MHW height to job site.

Source of Data: The Land Boundary Information System internet web site (www.labins.org)

This form constitutes approval of the method to be used to survey the mean high water line within one half mile of the point identified above.

****

Retain this form for record keeping. Submit a copy of it with the completed survey to the Bureau of Survey and Mapping within 90 days of the completion of the survey.

Contact:
Division of State Lands
Bureau of Surveying and Mapping
Mean High Water Section
(850)245-2606

More Protection, Less Process
www.dep.state.fl.us

Attachment M

References

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2]	Hydrologic condition [3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

1 Average runoff condition, and I_a=0.2S
2 Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.
3 Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

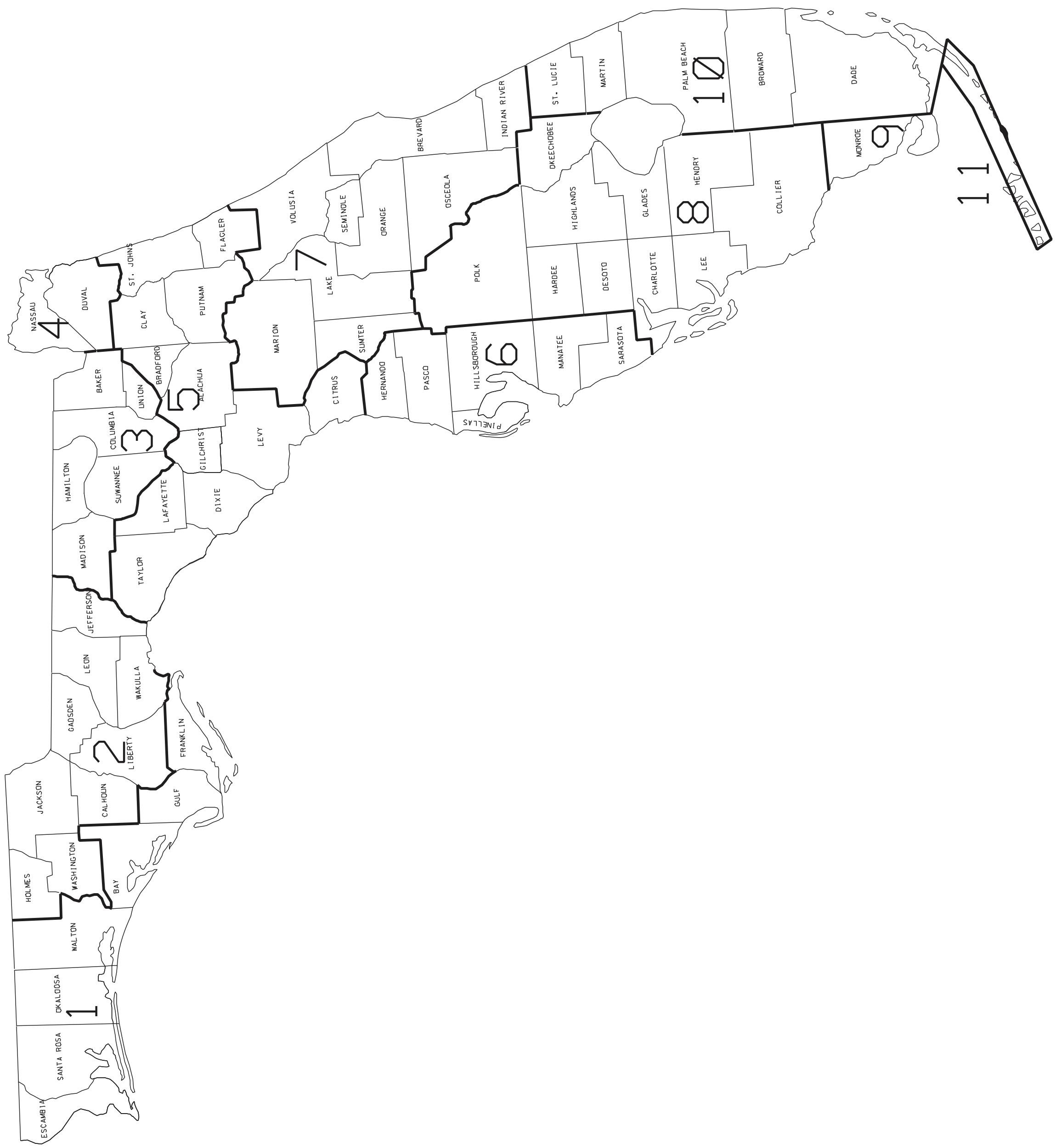
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

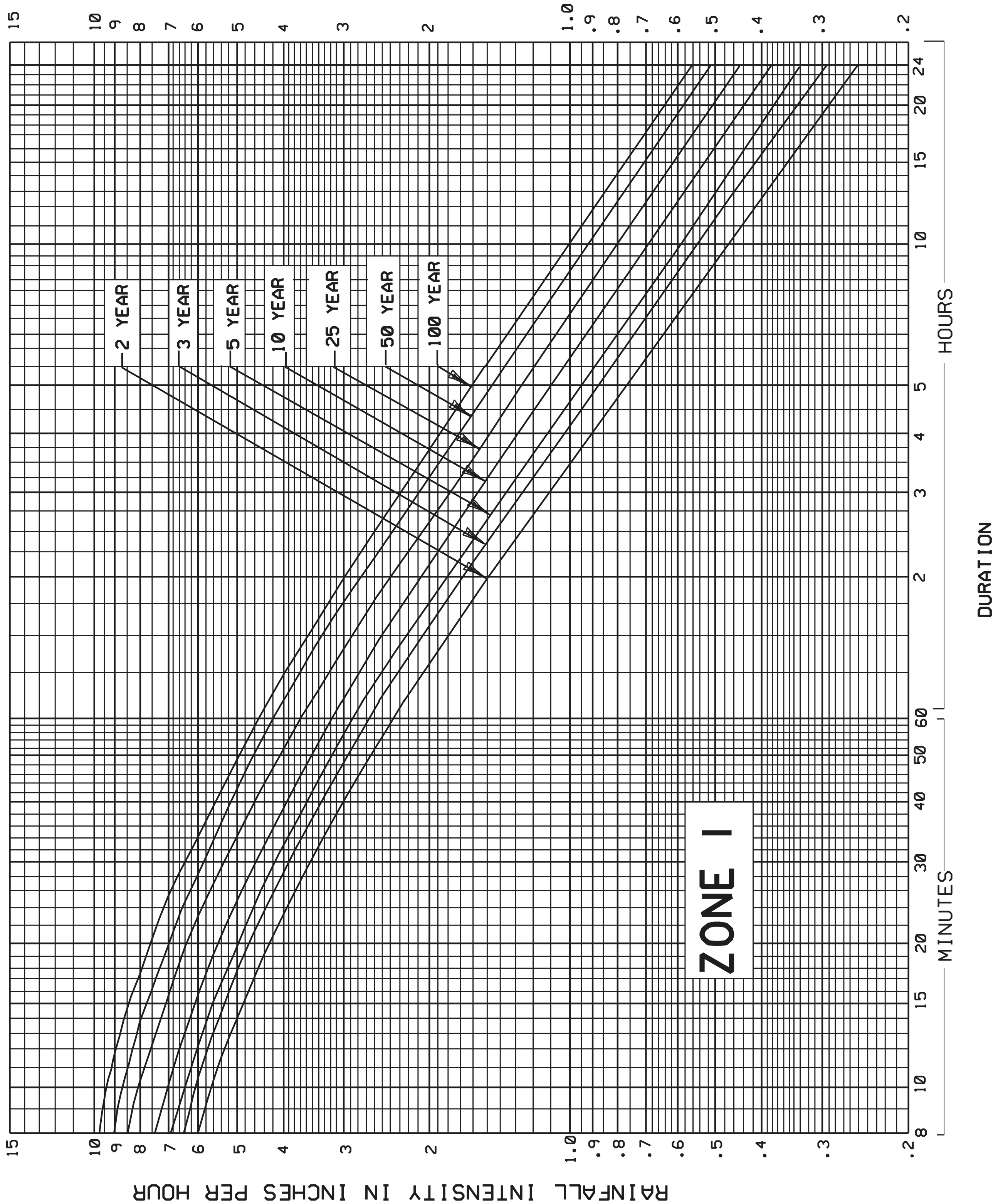
Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2]	A [3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

ZONES FOR PRECIPITATION IDF CURVES DEVELOPED BY THE DEPARTMENT





RAINFALL INTENSITY-DURATION-FREQUENCY CURVES
ZONE 1

Show

Manning's n Values

Reference tables for Manning's n values for Channels, Closed Conduits Flowing Partially Full, and Corrugated Metal Pipes.

Manning's n for Channels (Chow, 1959).

Type of Channel and Description	Minimum	Normal	Maximum
Natural streams - minor streams (top width at floodstage < 100 ft)			
1. Main Channels			
a. clean, straight, full stage, no rifts or deep pools	0.025	0.030	0.033
b. same as above, but more stones and weeds	0.030	0.035	0.040
c. clean, winding, some pools and shoals	0.033	0.040	0.045
d. same as above, but some weeds and stones	0.035	0.045	0.050
e. same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
f. same as "d" with more stones	0.045	0.050	0.060
g. sluggish reaches, weedy, deep pools	0.050	0.070	0.080
h. very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.100	0.150
2. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages			
a. bottom: gravels, cobbles, and few boulders	0.030	0.040	0.050
b. bottom: cobbles with large boulders	0.040	0.050	0.070
3. Floodplains			
a. Pasture, no brush			
1.short grass	0.025	0.030	0.035
2. high grass	0.030	0.035	0.050
b. Cultivated areas			
1. no crop	0.020	0.030	0.040
2. mature row crops	0.025	0.035	0.045
3. mature field crops	0.030	0.040	0.050
c. Brush			
1. scattered brush, heavy weeds	0.035	0.050	0.070
2. light brush and trees, in winter	0.035	0.050	0.060
3. light brush and trees, in summer	0.040	0.060	0.080
4. medium to dense brush, in winter	0.045	0.070	0.110
5. medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
1. dense willows, summer, straight	0.110	0.150	0.200
2. cleared land with tree stumps, no sprouts	0.030	0.040	0.050
3. same as above, but with heavy growth of sprouts	0.050	0.060	0.080
4. heavy stand of timber, a few down trees, little	0.080	0.100	0.120

undergrowth, flood stage below branches			
5. same as 4. with flood stage reaching branches	0.100	0.120	0.160
4. Excavated or Dredged Channels			
a. Earth, straight, and uniform			
1. clean, recently completed	0.016	0.018	0.020
2. clean, after weathering	0.018	0.022	0.025
3. gravel, uniform section, clean	0.022	0.025	0.030
4. with short grass, few weeds	0.022	0.027	0.033
b. Earth winding and sluggish			
1. no vegetation	0.023	0.025	0.030
2. grass, some weeds	0.025	0.030	0.033
3. dense weeds or aquatic plants in deep channels	0.030	0.035	0.040
4. earth bottom and rubble sides	0.028	0.030	0.035
5. stony bottom and weedy banks	0.025	0.035	0.040
6. cobble bottom and clean sides	0.030	0.040	0.050
c. Dragline-excavated or dredged			
1. no vegetation	0.025	0.028	0.033
2. light brush on banks	0.035	0.050	0.060
d. Rock cuts			
1. smooth and uniform	0.025	0.035	0.040
2. jagged and irregular	0.035	0.040	0.050
e. Channels not maintained, weeds and brush uncut			
1. dense weeds, high as flow depth	0.050	0.080	0.120
2. clean bottom, brush on sides	0.040	0.050	0.080
3. same as above, highest stage of flow	0.045	0.070	0.110
4. dense brush, high stage	0.080	0.100	0.140
5. Lined or Constructed Channels			
a. Cement			
1. neat surface	0.010	0.011	0.013
2. mortar	0.011	0.013	0.015
b. Wood			
1. planed, untreated	0.010	0.012	0.014
2. planed, creosoted	0.011	0.012	0.015
3. unplaned	0.011	0.013	0.015
4. plank with battens	0.012	0.015	0.018
5. lined with roofing paper	0.010	0.014	0.017
c. Concrete			
1. trowel finish	0.011	0.013	0.015
2. float finish	0.013	0.015	0.016
3. finished, with gravel on bottom	0.015	0.017	0.020
4. unfinished	0.014	0.017	0.020
5. gunite, good section	0.016	0.019	0.023
6. gunite, wavy section	0.018	0.022	0.025
7. on good excavated rock	0.017	0.020	

8. on irregular excavated rock	0.022	0.027	
d. Concrete bottom float finish with sides of:			
1. dressed stone in mortar	0.015	0.017	0.020
2. random stone in mortar	0.017	0.020	0.024
3. cement rubble masonry, plastered	0.016	0.020	0.024
4. cement rubble masonry	0.020	0.025	0.030
5. dry rubble or riprap	0.020	0.030	0.035
e. Gravel bottom with sides of:			
1. formed concrete	0.017	0.020	0.025
2. random stone mortar	0.020	0.023	0.026
3. dry rubble or riprap	0.023	0.033	0.036
f. Brick			
1. glazed	0.011	0.013	0.015
2. in cement mortar	0.012	0.015	0.018
g. Masonry			
1. cemented rubble	0.017	0.025	0.030
2. dry rubble	0.023	0.032	0.035
h. Dressed ashlar/stone paving	0.013	0.015	0.017
i. Asphalt			
1. smooth	0.013	0.013	
2. rough	0.016	0.016	
j. Vegetal lining	0.030		0.500

Manning's n for Closed Conduits Flowing Partly Full (Chow, 1959).

Type of Conduit and Description	Minimum	Normal	Maximum
1. Brass, smooth:	0.009	0.010	0.013
2. Steel:			
Lockbar and welded	0.010	0.012	0.014
Riveted and spiral	0.013	0.016	0.017
3. Cast Iron:			
Coated	0.010	0.013	0.014
Uncoated	0.011	0.014	0.016
4. Wrought Iron:			
Black	0.012	0.014	0.015
Galvanized	0.013	0.016	0.017
5. Corrugated Metal:			
Subdrain	0.017	0.019	0.021
Stormdrain	0.021	0.024	0.030
6. Cement:			
Neat Surface	0.010	0.011	0.013
Mortar	0.011	0.013	0.015
7. Concrete:			
Culvert, straight and free of debris	0.010	0.011	0.013
Culvert with bends, connections, and some debris	0.011	0.013	0.014
Finished	0.011	0.012	0.014
Sewer with manholes, inlet, etc., straight	0.013	0.015	0.017
Unfinished, steel form	0.012	0.013	0.014
Unfinished, smooth wood form	0.012	0.014	0.016

Unfinished, rough wood form	0.015	0.017	0.020
8. Wood:			
Stave	0.010	0.012	0.014
Laminated, treated	0.015	0.017	0.020
9. Clay:			
Common drainage tile	0.011	0.013	0.017
Vitrified sewer	0.011	0.014	0.017
Vitrified sewer with manholes, inlet, etc.	0.013	0.015	0.017
Vitrified Subdrain with open joint	0.014	0.016	0.018
10. Brickwork:			
Glazed	0.011	0.013	0.015
Lined with cement mortar	0.012	0.015	0.017
Sanitary sewers coated with sewage slime with bends and connections	0.012	0.013	0.016
Paved invert, sewer, smooth bottom	0.016	0.019	0.020
Rubble masonry, cemented	0.018	0.025	0.030

Manning's n for Corrugated Metal Pipe (AISI, 1980).

Type of Pipe, Diameter and Corrugation Dimension	**n**
1. Annular 2.67 x 1/2 inch (all diameters)	0.024
2. Helical 1.50 x 1/4 inch	
8" diameter	0.012
10" diameter	0.014
3. Helical 2.67 x 1/2 inch	
12" diameter	0.011
18" diameter	0.014
24" diameter	0.016
36" diameter	0.019
48" diameter	0.020
60" diameter	0.021
4. Annular 3x1 inch (all diameters)	0.027
5. Helical 3x1 inch	
48" diameter	0.023
54" diameter	0.023
60" diameter	0.024
66" diameter	0.025
72" diameter	0.026
78" diameter and larger	0.027
6. Corrugations 6x2 inches	
60" diameter	0.033
72" diameter	0.032
120" diameter	0.030
180" diameter	0.028

FishXing Version 3.0 Beta, 2006

TABLE 1 *Values of Runoff Coefficient* C

URBAN AREAS:	
Type of drainage area	Runoff coefficient C
Lawns: Sandy soil, flat 2% Sandy soil, average, 2 - 7% Sandy soil, steep, 7% Heavy soil, flat, 2% Heavy soil, average, 2 - 7% Heavy soil, steep, 7%	0.05 - 0.10 0.10 - 0.15 0.15 - 0.20 0.13-0.17 0.18 - 0.22 0.25 - 0.35
Business: Downtown areas Neighborhood areas	0.70 - 0.95 0.50.0.70
Residential: Single-family areas Multi units, detached Multi units, attached Suburban Apartment dwelling areas	0.30 - 0.50 0.40 - 0.60 0.60 - 0.75 0.25 - 0.40 0.50 - 0.70
Industrial: Light areas Heavy areas	 0.50 - 0.80 0.60 - 0.90
Parks, cemeteries	0.10 - 0.25
Playgrounds	0.20 - 0.35
Railroad yard areas	0.20 - 0.40
Unimproved areas	0.10 - 0.30
Streets: Asphaltic Concrete Brick	0.70 - 0.95 0.80 - 0.95 0.70 - 0.85
Drives and walks Roofs	0.75 - 0.85 0.75 - 0.95

AGRICULTURAL AREAS:

Topography and Vegetation	Runoff Coefficient C Soil Texture		
	Soil Texture		
	Open Sandy Loam	Clay and Silt Loam	Tight Clay
Woodland Flat 0 - 5% Slope Rolling 5 - 10% Slope Hilly 10 - 30% Slope	 0.10 0.25 0.30	 0.30 0.35 0.50	 0.40 0.50 0.60
Pasture Flat Rolling Hilly	0.10 0.16 0.22	0.30 0.36 0.42	0.40 0.55 0.60
Cultivated Flat Rolling Hilly	 0.30 0.40 0.52	 0.50 0.60 0.72	 0.60 0.70 0.82