AMENDED FINAL DEVELOPMENT PLAN
STORMWATER
MANAGEMENT REPORT

5000 BRADENTON AVENUE
SARNOVA HEADQUARTERS

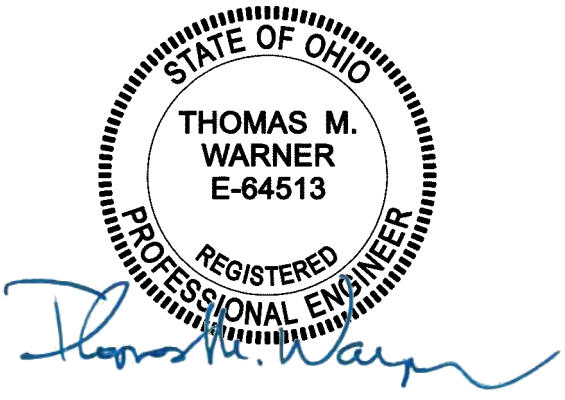
CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

Prepared By:

ADVANCED
CIVIL DESIGN

ENGINEERS & SURVEYORS
781 SCIENCE BLVD., SUITE 100
GAHANNA, OHIO 43230
Ph: 614-428-7750
Fax: 614-428-7755

Date:
January 30, 2025



twarner@advancedcivildesign.com

TABLE OF CONTENTS

STORMWATER MANAGEMENT REVIEW:

Site Summary: 3

Design Methodology: 3

Pre-Developed Conditions: 3

Post-Construction Conditions: 4

Conclusion: 4

APPENDICES:

APPENDIX A: Tributary Maps
APPENDIX B: Soil Survey
APPENDIX C: Pre-Developed HydroCAD Calculations
APPENDIX D: Post-Developed HydroCAD Calculations

Site Summary:

The Sarnova Headquarters redevelopment project is located on the north side of Bradenton Avenue in the City of Dublin, Franklin County, Ohio. The project site is surrounded by existing commercial development to the west, north, & east, and Bradenton Avenue to the south. The total site is approximately 3.094 acres and consists of an existing office building with associated parking. The project consists of redeveloping the rear amenity space and front building entry.

Design Methodology:

Stormwater management calculations within this report follow the guidance of the City of Dublin, Stormwater Management Design Manual (Interim Update: dated January, 2019), for the water quantity and water quality requirements. Hydrology and hydraulics were modeled with the HydroCAD software suite using TR-55 methodology and a Type-II rainfall distribution. Pond routing for the project will be performed using the storage indication method. Located in the City of Dublin, Stormwater Management Design Manual, are the precipitation frequencies for the 1, 2, 5, 10, 25, 50, and 100 year storm events used to evaluate rainfall and runoff.

Design Event (yr)	**1**	**2**	**5**	**10**	**25**	**50**	**100**
Rainfall Depth (in)	2.20	2.63	3.24	3.74	4.44	5.02	5.63

Table 1 - Design Storm Rainfall Depths

Pre-Developed Conditions:

A review of the record plans provided by the City of Dublin shows that the existing site provided stormwater detention within the parking lot. See table below with record ponding information and field verified as-built ponding conditions.

Site Ac. (S.F.)	**Impervious Area** Ac. (S.F.)	**Lot Coverage** (%)	**Impervious Area Removal** Ac. (S.F.)
5.24 (228,254)	3.094 (134,791)	59.05	0.135 (5,905)

Table 2 – Existing Conditions

Area	**1**	**2**	**5**	**10**	**25**	**50**	**100**
Runoff Rate (cfs)	14.04	17.86	23.28	27.72	33.91	39.02	44.36
Runoff Volume (af)	0.545	0.705	0.939	1.135	1.411	1.641	1.883

Table 3 – Existing Runoff Conditions

Structure No.	**Ponding Required**	**Ponding Provided**	**As-Built Ponding Provided**
1	2,280	2,891	2,158
2	2,592	2,560	1,155
3	3,384	3,478	2,756
4	2,520	4,080	4,085
5	1,296	1,802	2,243
6	1,584	2,102	2,357
7	1,380	1,925	2,386
8	1,248	1,709	2,395
TOTAL	**16,284**	**20,574**	**19,533**

Table 4 – Record Detention Summary

Post-Construction Conditions:

The existing site runoff is conveyed by existing storm sewers to the Cramer Ditch along the north side of the project site. The proposed increase in impervious surface is less than 2,000 square feet and the runoff volume is not greater than current runoff volumes.

Site Ac. (S.F.)	Impervious Area Ac. (S.F.)	Lot Coverage (%)	Impervious Area Net Increase Ac. (S.F.)
5.24 (228,254)	3.126 (136,176)	59.66	0.032 (1,385)

Table 5 – Proposed Conditions

Area	1	2	5	10	25	50	100
Runoff Rate (cfs)	14.04	17.86	23.28	27.72	33.91	39.02	44.36
Runoff Volume (af)	0.545	0.705	0.939	1.135	1.411	1.641	1.883

Table 6 – Proposed Runoff Conditions

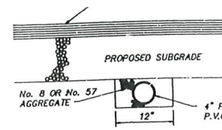
Structure No.	Ponding Required	Ponding Provided	As-Built Ponding Provided	Amended Ponding Provided
1	2,280	2,891	2,158	2,158
2	2,592	2,560	1,155	462
3	3,384	3,478	2,756	2,366
4	2,520	4,080	4,085	4,085
5	1,296	1,802	2,243	2,158
6	1,584	2,102	2,357	2,357
7	1,380	1,925	2,386	2,386
8	1,248	1,709	2,395	2,395
TOTAL	**16,284**	**20,574**	**19,533**	**18,366**

Table 7 – Amended Detention Summary

Conclusion:

The proposed redevelopment of the site does not increase runoff rates or volume therefore meeting the City of Dublin regulations.

APPENDIX A
TRIBUTARY MAPS



SUBGRADE DRAIN TRENCH DETAIL

(A) Install 15 foot lengths of 4" perforated P.V.C. underdrain at all structures within pavement areas per the above detail. The underdrain is to be installed at a 1.00% grade toward the structure, with the upstream end plugged, and the invert at the structure 18" below the proposed rim elevation. The underdrain shall be protected from construction traffic after installation.

(B) 6" Roof Drain Leaders @ 1.00 % Min.

(C) 6" Roof Drain Leader @ 1.00 % Min.

(D) Area Drains w/ 6" Pipe T.C. 868.0

LOCATION MAP
NO SCALE

GENERAL NOTES

The City of Dublin Standard Construction Regulations dated January 1985, and any supplements thereto, shall govern all construction items that are a part of this plan, unless otherwise noted.

The Contractor shall notify the City of Dublin Engineer's Office at least 48 hours prior to any construction.

The Contractor shall obtain all necessary permits.

The Contractor shall perform all work in accordance with applicable Federal, State and Local Safety Requirements.

All items of work called for on the plans for which no specific method of payment is provided shall be performed by the Contractor and the cost of same shall be included in the price bid for the various related items.

Utilities shown are from best available records and field investigation, and are not necessarily complete or exact. The Contractor is responsible for the investigation, location, support, protection, and restoration of all existing utilities and appurtenances whether shown on these plans or not. The Contractor shall expose all utilities or structures prior to construction to verify the vertical and horizontal effect on the proposed construction. The Contractor shall call, toll free, the Ohio Utilities Protection Service (1-800-362-2764) 72 hours prior to construction and shall notify all utility companies at least 48 hours PRIOR to work in the vicinity of their underground lines.

All field tile broken during excavation shall be replaced to its original condition, or connected to the storm sewer system as directed by the City Engineer.

The Standard Catch Basins located in pavement areas shall have heavy duty grates (similar to Neenah R-4852 Grate with R-4899 Frame).

At all utility crossings the backfill shall consist of compacted granular material between the deeper and shallower pipe. Where proposed utilities or services cross proposed or existing pavement areas, backfill shall be in accordance with Item 23, Granular Backfill.

Construction shall not begin until all easements have been secured and submitted to the City of Dublin for recording.

NOTE RE: BORINGS
Borings have been made and logs of each hole are plotted and are available for inspection at the Engineer's Office. The borings are for convenience only and were performed by the firm listed on each boring log and do not represent in any way WORK performed by the ENGINEER or the OWNER. The borings, test excavations, and other subsurface investigations, if any are incomplete, are not a part of the CONTRACT DOCUMENTS, and are not warranted to show actual subsurface conditions.

NOTE RE: BLASTING
When and if it is necessary, for the prosecution of the WORK, to resort to blasting with explosives, the Contractor shall be bound by the provisions of Item 903.02 of the City of Columbus, Construction and Material Specifications. Blasting shall be extended fifty (50) feet beyond any main-line utilities and twenty-five (25) feet beyond any services which are to be extended in the future.

NOTE RE: TEMPORARY SOIL EROSION AND SEDIMENT CONTROL
During construction the Contractor shall provide adequate drainage and proper soil erosion control measures for protection of all adjacent roads and lands. Refer to Item 207, Temporary Soil Erosion and Sediment Control, of the State of Ohio, Department of Transportation Construction and Material Specifications.

ESTIMATE OF QUANTITIES

ITEM	QUANTITY	UNIT	DESCRIPTION
4	500	L.F.	4" Perforated PVC. Underdrain
17	519	L.F.	8" Storm Pipe, C-76 Class III w/ Type 1 Bedding
17	250	L.F.	10" Storm Pipe, C-76 Class III w/ Type 1 Bedding
17	265	L.F.	12" Storm Pipe, C-76 Class III w/ Type 1 Bedding
18	8	Ea.	Standard Catch Basin (City of Columbus A-5133)
	Lump	Sum	Area Drains & 6" Pipe
	Lump	Sum	Roof Drain Leaders
	Lump	Sum	Concrete Masonry (Retaining Wall)
	0.6	C.Y.	Concrete Masonry (Headwall)
	6	C.Y.	Rock Channel Protection, Type "B"

Structure No.	Ponding Required	Ponding Provided	Storage Elevation
1	2280	2891	872.1
2	2592	2580	872.1
3	3384	3478	872.1
4	2520	4080	872.1
Subtotal	10,776	13,009	
5	1295	1802	872.0
6	1584	2102	872.0
7	1380	1925	872.0
8	1249	1709	872.0
Subtotal	5508	7538	
Total	16,284 C.F.	20,574 C.F.	

Required storage volume

NOTE: Shaded areas represent the limits of ponding.

STANDARD DRAWINGS

The Standard Drawings listed on this plan shall be considered a part thereof.

City of Dublin	City of Columbus
#8 #17	AA-5133
	AA-5139
	AA-5130
	AA-5137

BENCH MARKS

S.W. Corner of East End of Culvert Wingwall located on the East side of Frantz Road near the S.E. Corner of the site.
Elev. 862.63 (U.S.G.S. Datum)

N.E. Corner of headwall located on the west side of Frantz Road near the N.E Corner of site.
Elev. 863.81 (U.S.G.S. Datum)

Approved this _____ day of _____, 1988

City Engineer, Dublin, Ohio

David M. Bray ~ Registered Engineer No. 43757

Date

C.F. BIRD & R.J. BULL, INC.
ENGINEERS/SURVEYORS
3673 W. DUBLIN - GRANVILLE ROAD
WORTHINGTON, OHIO 43235

THE DAIMLER GROUP

PONDING AREAS, SITE GRADING & STORM SEWER IMPROVEMENTS FOR THE FRANK GATES BUILDING LLEWELLYN FARMS WEST

SCALE: 1"=30'
DWN: CKD: DAD
JOB NO. 88-022
1/2

GRAPHIC SCALE

0 15 30 60

1 inch = 30 feet

DETENTION PONDING TABLE

STRUCTURE NO.	PONDING REQUIRED (CF) (RECORD)	PONDING PROVIDED (CF) (RECORD)	AS-BUILT PONDING PROVIDED (CF)	**AMENDED PONDING PROVIDED (CF)**
1	2,280	2,891	2,158	**2,158**
2	2,592	2,560	1,155	**462**
4	3,384	3,478	2,756	**2,366**
4	2,520	4,080	4,085	**4,085**
5	1,296	1,802	2,243	**2,158**
6	1,584	2,102	2,357	**2,357**
7	1,380	1,925	2,386	**2,386**
8	1,248	1,709	2,395	**2,395**
TOTAL	16,284	20,574	19,533	**18,366**

PLAN PREPARED BY:
ADVANCED CIVIL DESIGN ENGINEERS SURVEYORS
781 Science Boulevard, Suite 100
Gahanna, Ohio 43230
ph. 614.428.7750
fax. 614.428.7755

PLAN PREPARED FOR:
sarnova
5000 TUTTLE CROSSING BLVD.
DUBLIN, OHIO 43016

CITY OF DUBLIN, FRANKLIN COUNTY, OHIO

AMENDED FINAL DEVELOPMENT PLAN

FOR

5000 BRADENTON AVENUE
SARNOVA HEADQUARTERS

DETENTION PONDING MAP

Issue Dates:
XX/XX/XX: Issued For

Date: 01/24/2025
Scale: 1" = 30'

Drawn By:	Checked By:
CLE	DDD

Project Number:
24-0023-186

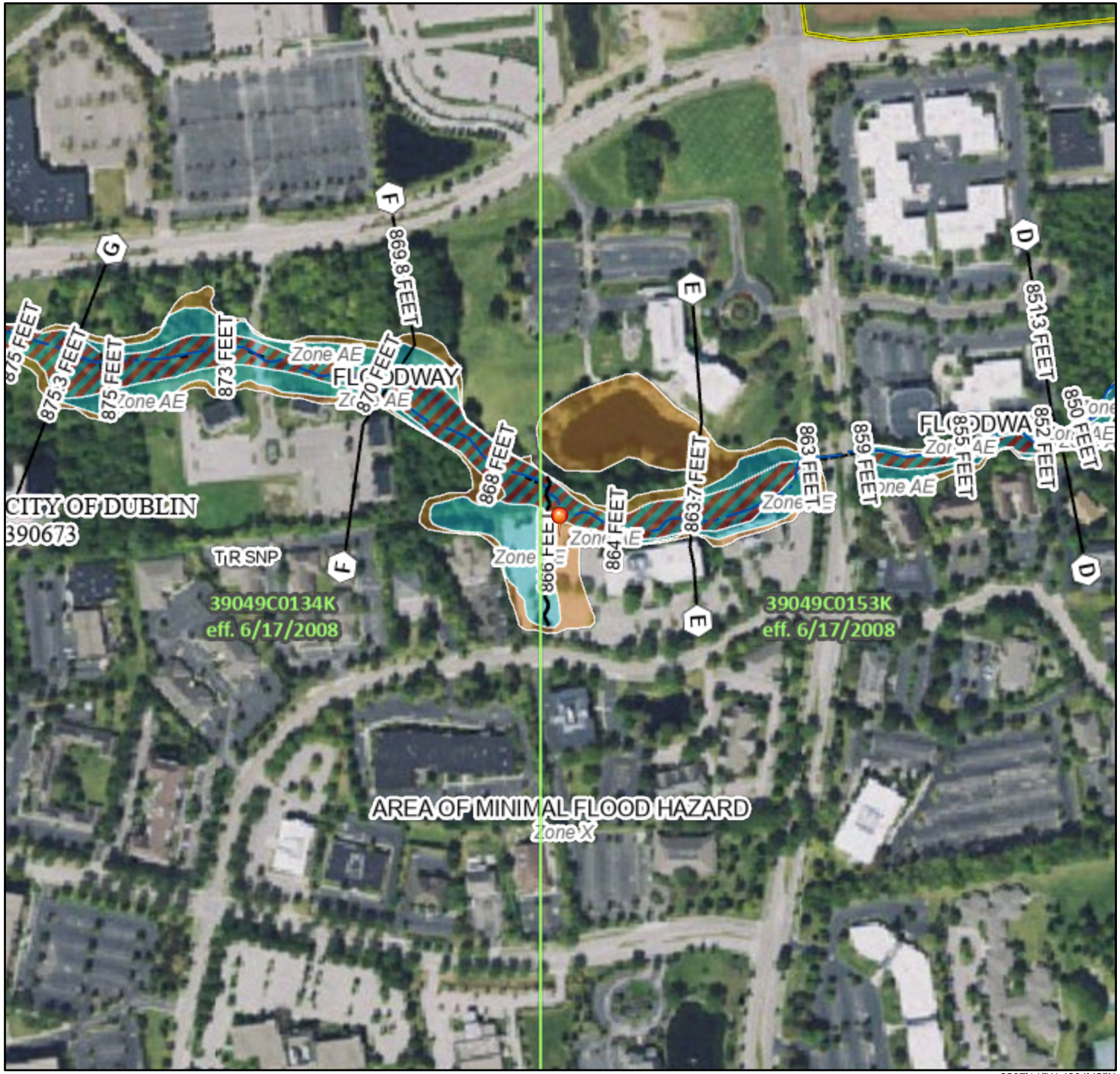
Drawing Number:
1 / 1

Z:\24-0023-186\DWG\PRODUCTION DRAWINGS\STORM\Detetnion Ponding Areas.dwg GRADING PLAN Jan 26, 2025 - 4:34:32pm cecheleberry

National Flood Hazard Layer FIRMette

FEMA

83°7'48"W 40°5'10"N



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

1:6,000

83°7'11"W 40°4'42"N

Basemap Imagery Source: USGS National Map 2023

Legend

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

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/18/2024 at 12:13 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.

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. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX B
SOIL SURVEY

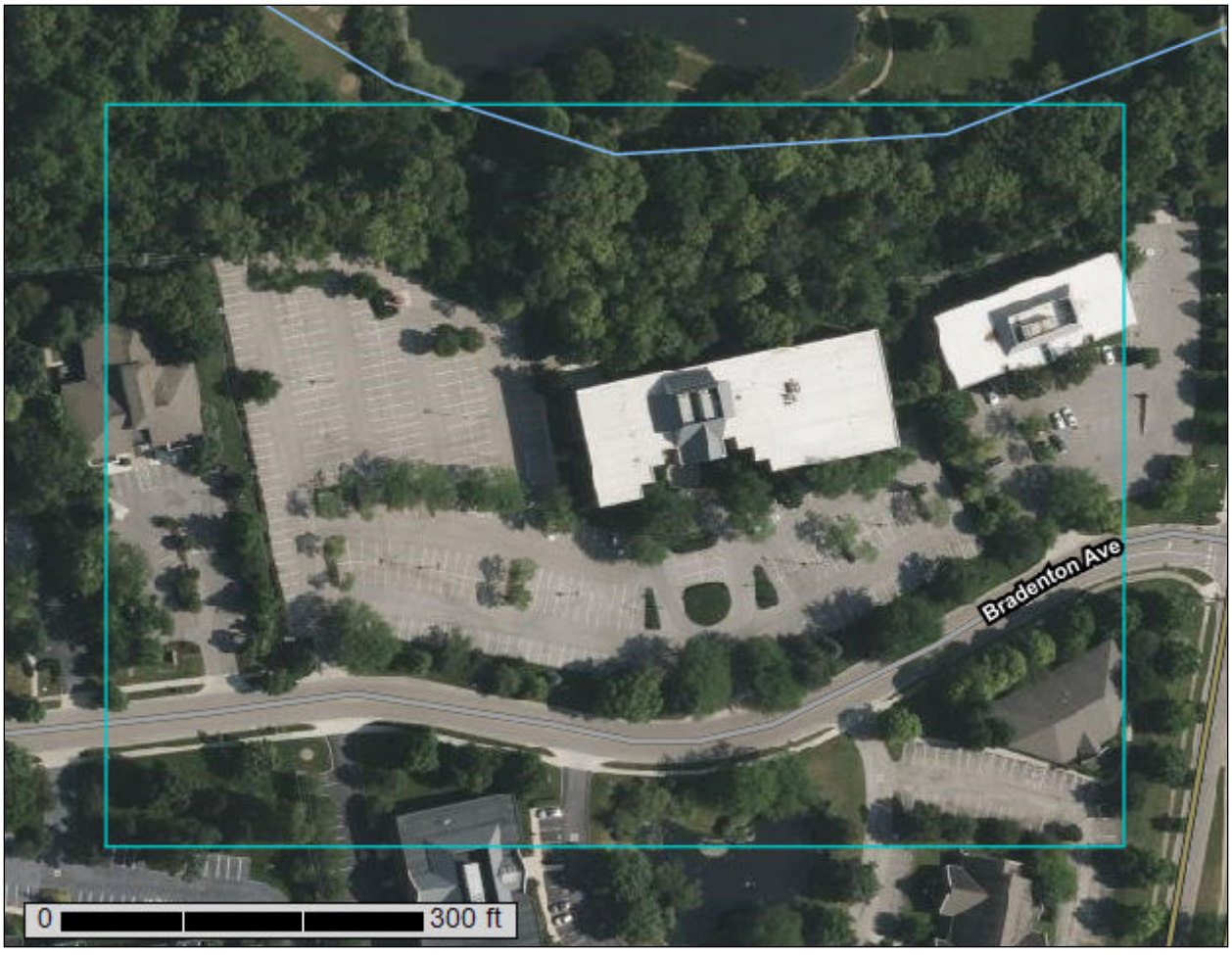
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Franklin County, Ohio



September 18, 2024

Preface

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

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

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

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

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

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

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Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....11
Map Unit Descriptions.....11
Franklin County, Ohio.....13
CeB—Celina silt loam, 2 to 6 percent slopes.....13
CrA—Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes.....14
Ko—Kokomo silty clay loam, 0 to 2 percent slopes.....16
MoB—Milton silt loam, 2 to 6 percent slopes.....17
MoC2—Milton silt loam, 6 to 12 percent slopes, eroded.....19
References.....21

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.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,580 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N 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 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Franklin County, Ohio
Survey Area Data: Version 22, Sep 6, 2023

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

Date(s) aerial images were photographed: May 21, 2023—Aug 8, 2023

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
CeB	Celina silt loam, 2 to 6 percent slopes	4.5	38.1%
CrA	Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes	2.3	19.4%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	0.7	5.5%
MoB	Milton silt loam, 2 to 6 percent slopes	2.3	19.0%
MoC2	Milton silt loam, 6 to 12 percent slopes, eroded	2.1	18.0%
Totals for Area of Interest		**11.9**	**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, Ohio

CeB—Celina silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2rwj9
Elevation: 820 to 1,180 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Celina and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Celina

Setting

Landform: Till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess derived from quartzite over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt - 9 to 38 inches: clay loam
2Cd - 38 to 79 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Brookston

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Kokomo

Percent of map unit: 5 percent
Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

CrA—Crosby silt loam, Southern Ohio Till Plain, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2thy7
Elevation: 520 to 1,550 feet
Mean annual precipitation: 36 to 44 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Crosby

Setting

Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty material or loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
BE - 8 to 11 inches: silt loam
Bt1 - 11 to 14 inches: silt loam
2Bt2 - 14 to 28 inches: silty clay loam
2BCt - 28 to 36 inches: loam
2Cd - 36 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Minor Components

Kokomo, drained

Percent of map unit: 5 percent
Landform: Swales, water-lain moraines, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Celina, eroded

Percent of map unit: 4 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Side slope, nose slope, head slope, crest, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Miamian, eroded

Percent of map unit: 1 percent
Landform: Recessionial moraines, ground moraines, water-lain moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, nose slope, head slope, crest, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Ko—Kokomo silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2rwj8
Elevation: 820 to 1,140 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 145 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Kokomo

Setting

Landform: Depressions on till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy glaciofluvial deposits derived from sedimentary rock over loamy till derived from limestone and dolomite

Typical profile

Ap - 0 to 11 inches: silty clay loam
Btg - 11 to 41 inches: clay loam
Bt - 41 to 64 inches: clay loam
2C - 64 to 79 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

Minor Components

Celina

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Crosby

Percent of map unit: 5 percent
Landform: Till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

MoB—Milton silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2w0vm
Elevation: 740 to 1,180 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 48 to 55 degrees F

Frost-free period: 145 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Milton and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Milton

Setting

Landform: Moraines, ridges, knolls
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Other silty material and/or loess over loamy till derived from limestone

Typical profile

Ap - 0 to 8 inches: silt loam
Bt1 - 8 to 19 inches: silty clay loam
2Bt2 - 19 to 29 inches: clay loam
3R - 29 to 39 inches: bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F111XA019IN - Moderately Deep Restricted
Hydric soil rating: No

Minor Components

Randolph

Percent of map unit: 5 percent
Landform: Moraines, ridges, knolls
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA008IN - Wet Till Ridge
Hydric soil rating: No

Miamian, bedrock substratum

Percent of map unit: 1 percent
Landform: Moraines, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F111XA009IN - Till Ridge
Hydric soil rating: No

Millsdale

Percent of map unit: 1 percent
Landform: Depressions, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F111XA007IN - Till Depression Flatwood
Hydric soil rating: Yes

MoC2—Milton silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 5mqs
Elevation: 800 to 1,000 feet
Mean annual precipitation: 27 to 45 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 155 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Milton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Milton

Setting

Landform: Till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey till over residuum

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 27 inches: silty clay loam
H3 - 27 to 31 inches: channery clay
H4 - 31 to 35 inches: weathered bedrock

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F111XB303IN - Dry Bedrock Forest, F111XA009IN - Till Ridge
Hydric soil rating: No

Minor Components

Ritchey

Percent of map unit: 8 percent
Landform: Till plains
Ecological site: F111XB303IN - Dry Bedrock Forest

Celina

Percent of map unit: 7 percent
Landform: Moraines, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear

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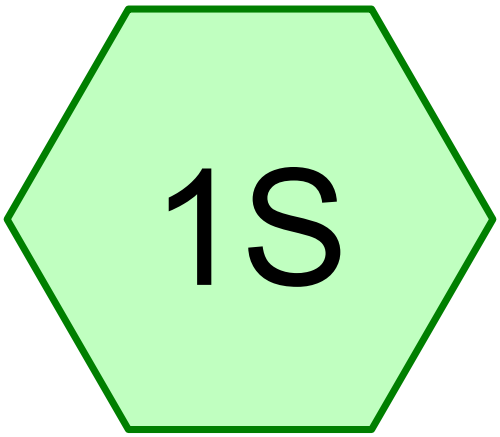
APPENDIX C
PRE-DEVELOPED HYDROCAD CALCULATIONS



Pre-Dev

Subcat Reach Pond Link

Routing Diagram for Sarnova
Prepared by Advanced Civil Design, Inc, Printed 1/26/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Dublin 001	Type II 24-hr		Default	24.00	1	2.20	2
2	Dublin 002	Type II 24-hr		Default	24.00	1	2.63	2
3	Dublin 005	Type II 24-hr		Default	24.00	1	3.24	2
4	Dublin 010	Type II 24-hr		Default	24.00	1	3.74	2
5	Dublin 025	Type II 24-hr		Default	24.00	1	4.44	2
6	Dublin 050	Type II 24-hr		Default	24.00	1	5.02	2
7	Dublin 100	Type II 24-hr		Default	24.00	1	5.63	2

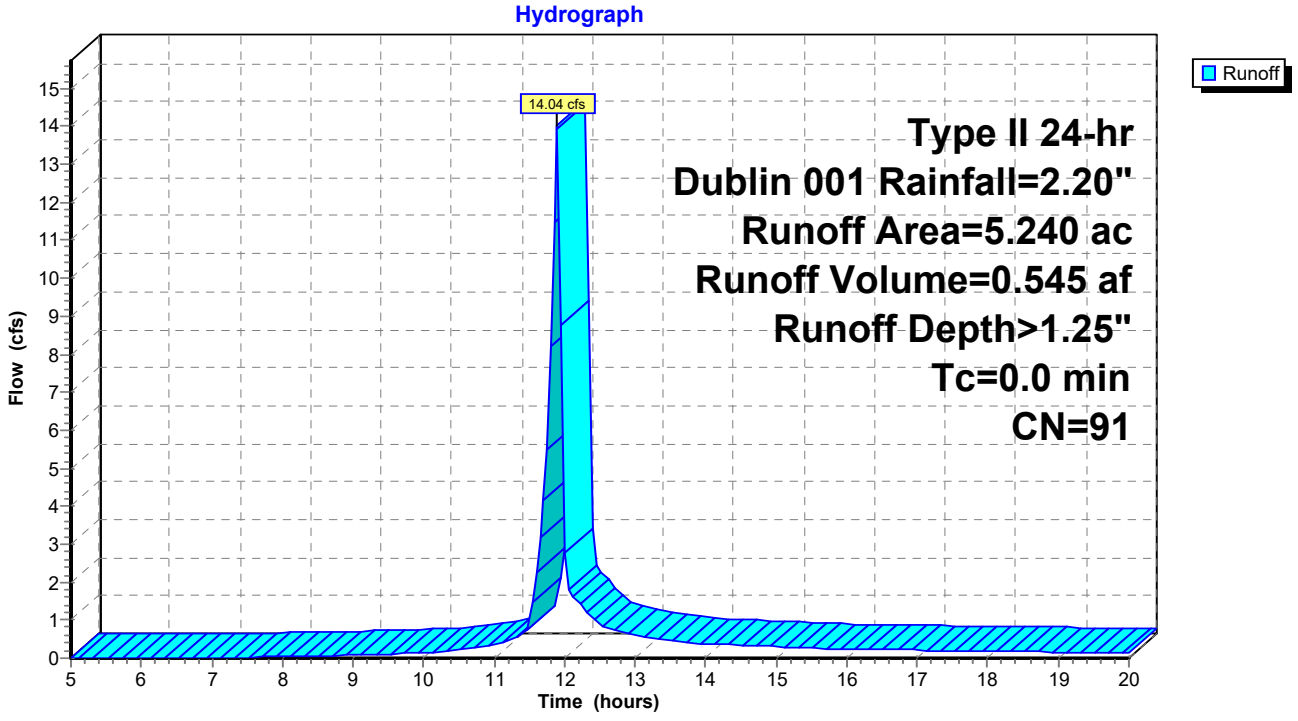
Summary for Subcatchment 1S: Pre-Dev

Runoff = 14.04 cfs @ 11.89 hrs, Volume= 0.545 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 001 Rainfall=2.20"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev



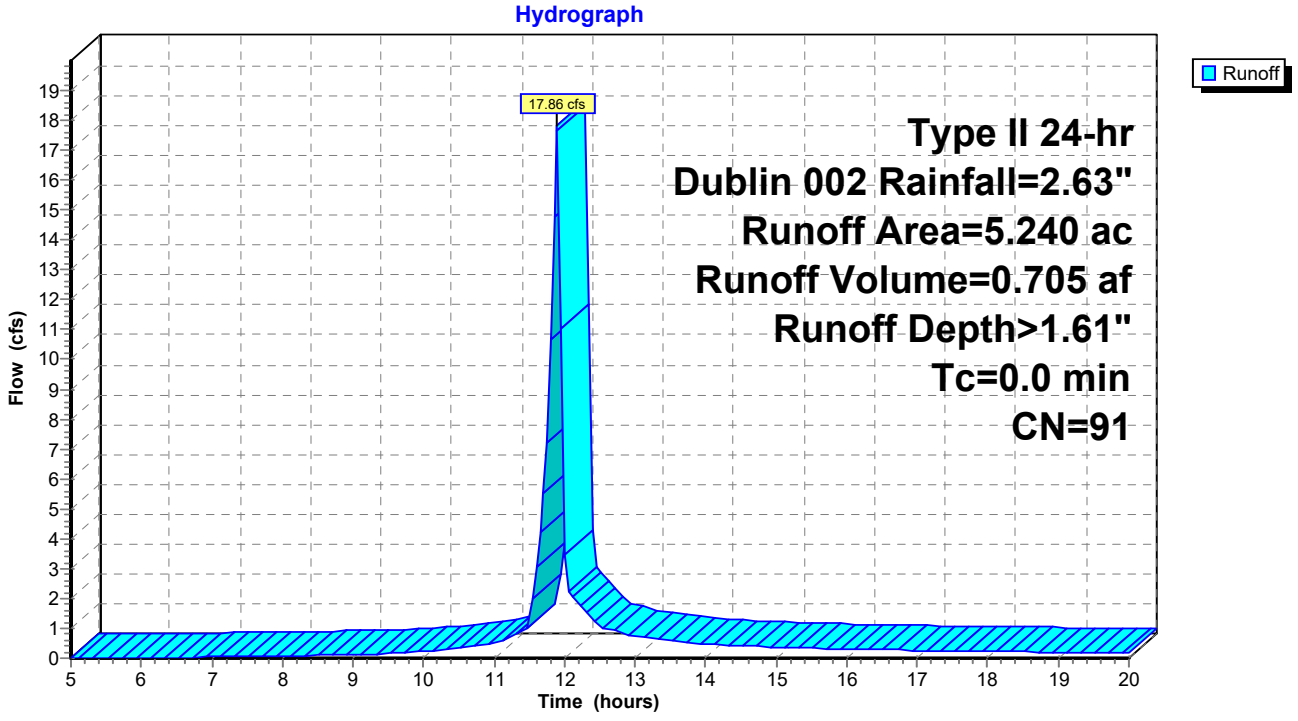
Summary for Subcatchment 1S: Pre-Dev

Runoff = 17.86 cfs @ 11.89 hrs, Volume= 0.705 af, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 002 Rainfall=2.63"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev



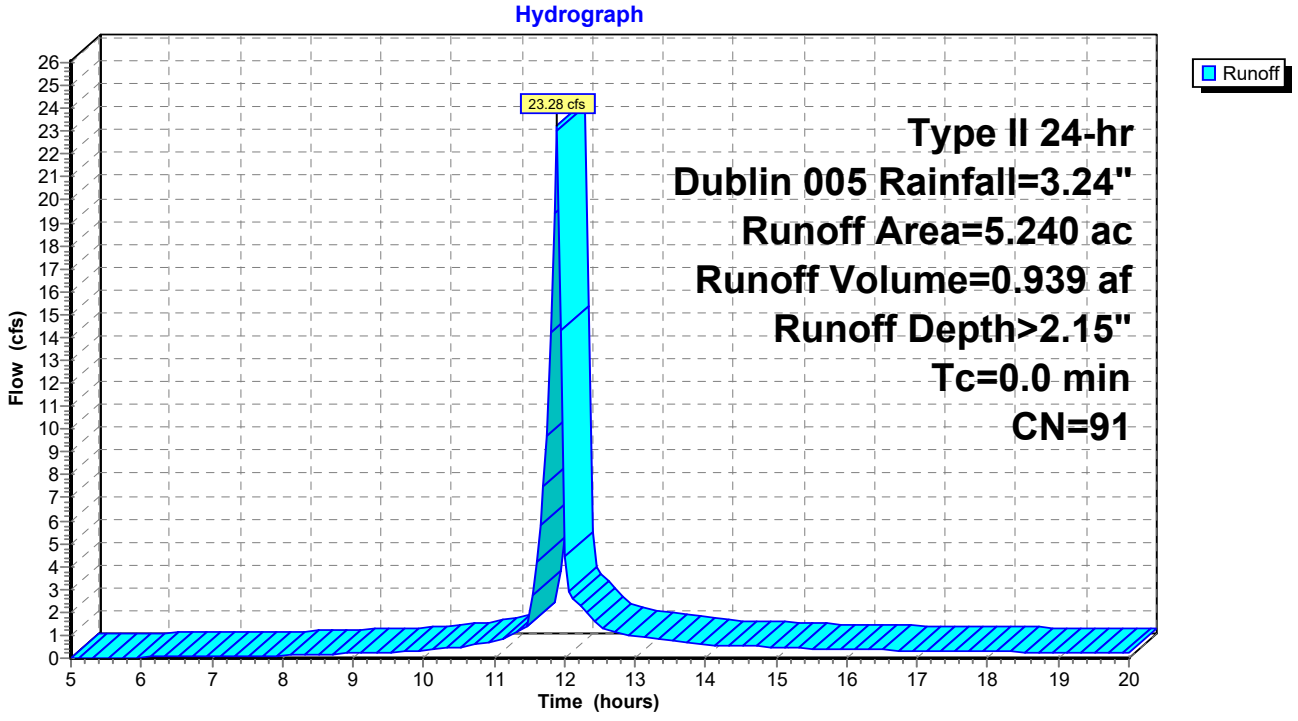
Summary for Subcatchment 1S: Pre-Dev

Runoff = 23.28 cfs @ 11.89 hrs, Volume= 0.939 af, Depth> 2.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 005 Rainfall=3.24"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev



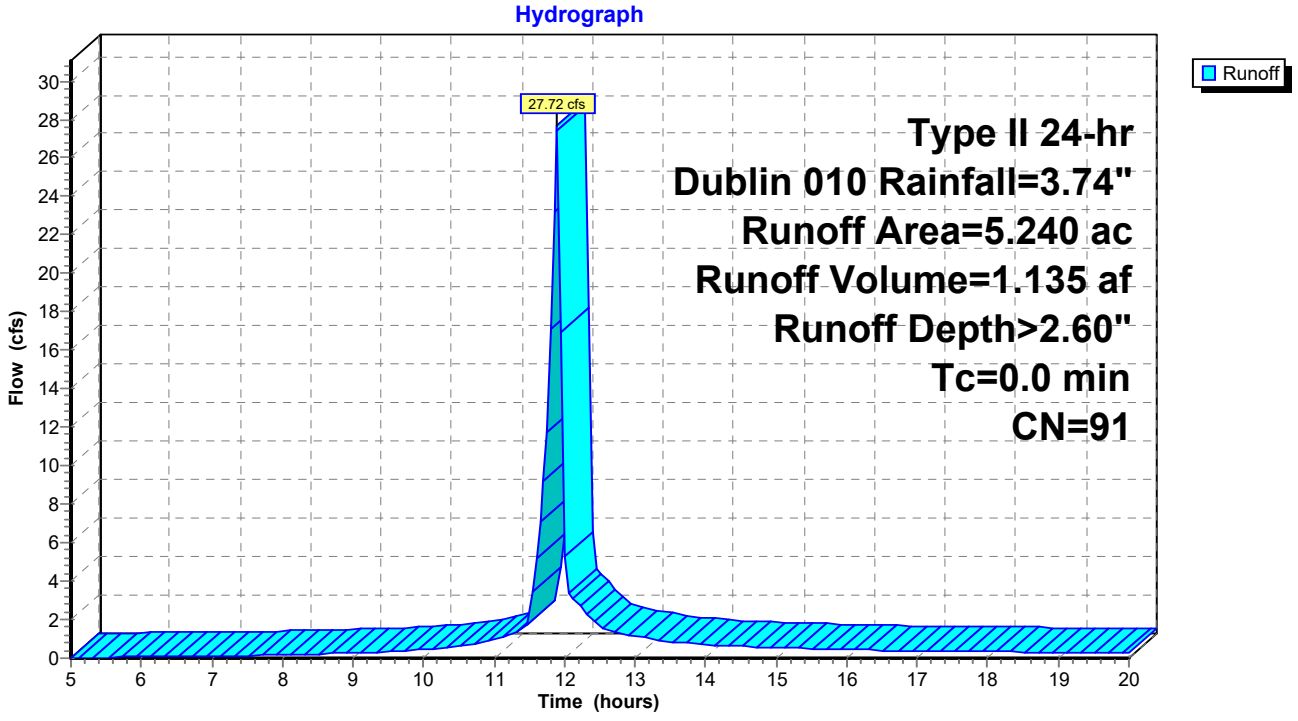
Summary for Subcatchment 1S: Pre-Dev

Runoff = 27.72 cfs @ 11.89 hrs, Volume= 1.135 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 010 Rainfall=3.74"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev



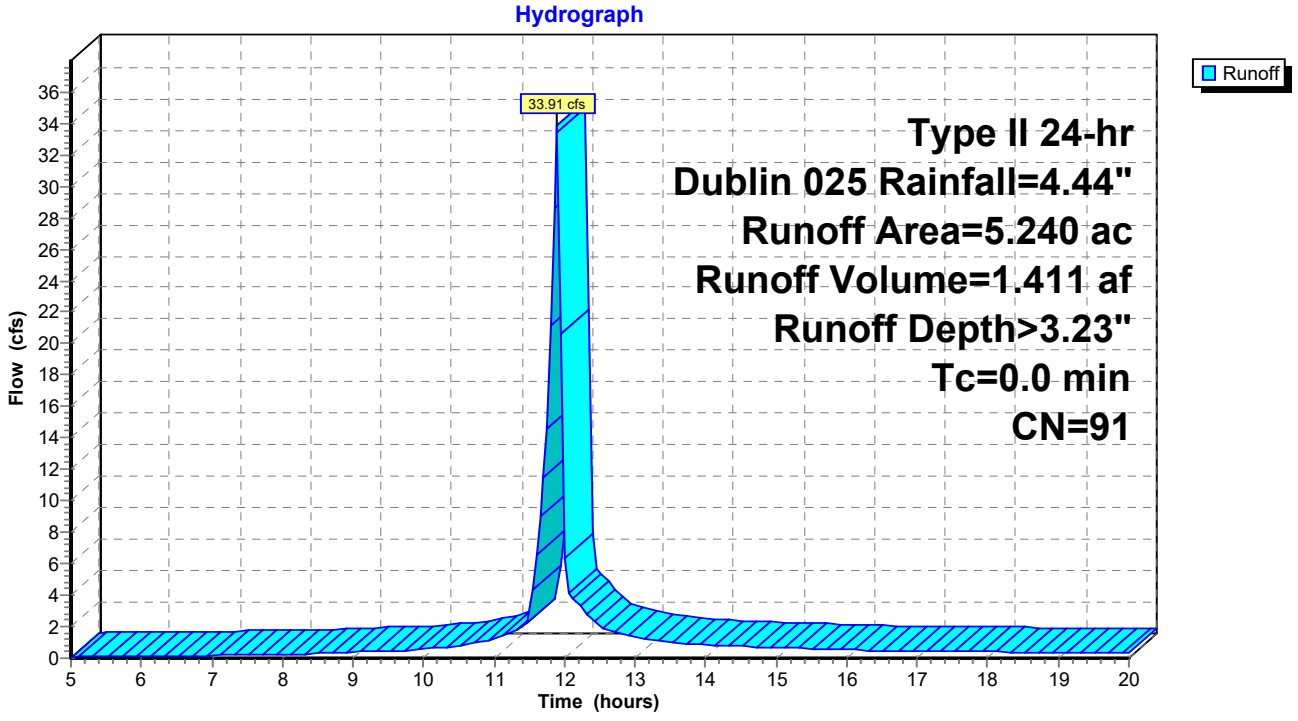
Summary for Subcatchment 1S: Pre-Dev

Runoff = 33.91 cfs @ 11.89 hrs, Volume= 1.411 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 025 Rainfall=4.44"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev



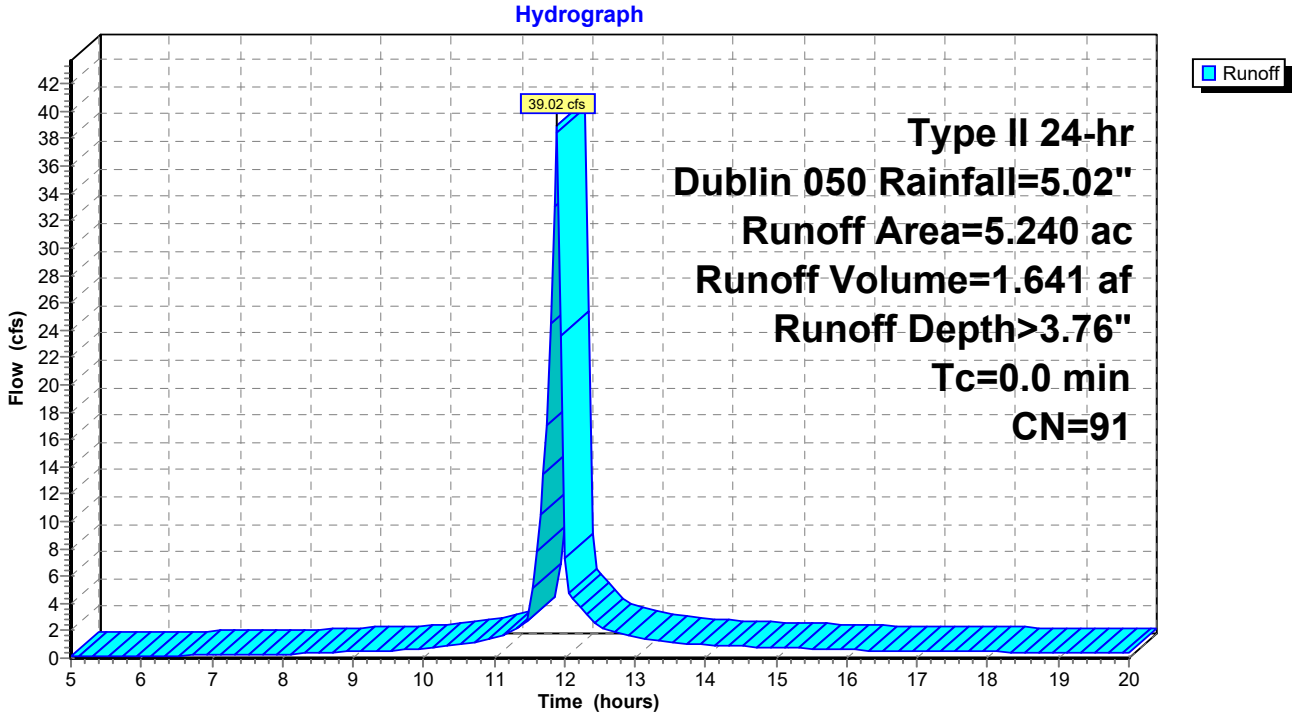
Summary for Subcatchment 1S: Pre-Dev

Runoff = 39.02 cfs @ 11.89 hrs, Volume= 1.641 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 050 Rainfall=5.02"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev



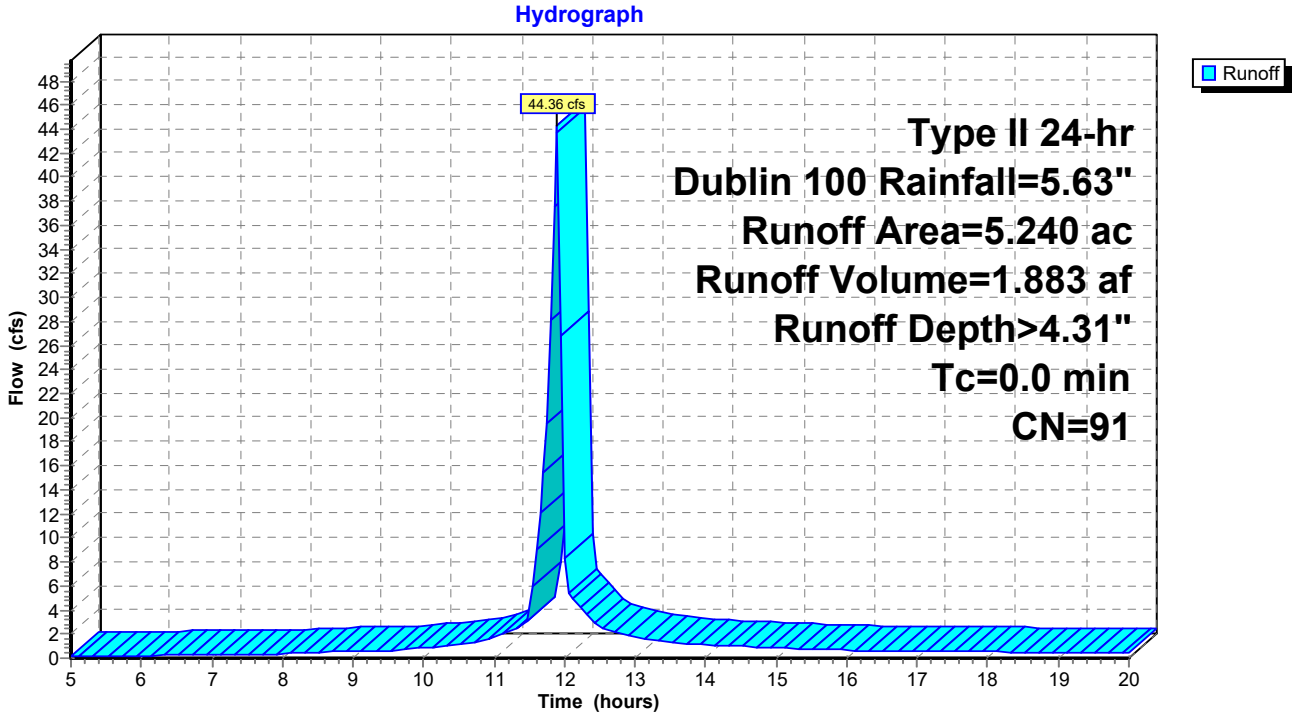
Summary for Subcatchment 1S: Pre-Dev

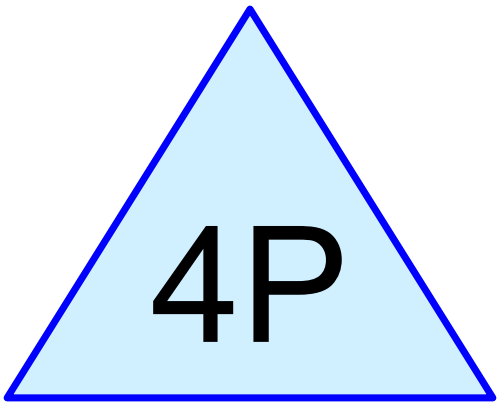
Runoff = 44.36 cfs @ 11.89 hrs, Volume= 1.883 af, Depth> 4.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 100 Rainfall=5.63"

Area (ac)	CN	Description
3.094	98	Paved parking, HSG D
2.146	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.146		40.95% Pervious Area
3.094		59.05% Impervious Area

Subcatchment 1S: Pre-Dev





As-Built Ponding

Subcat Reach Pond Link

Routing Diagram for Sarnova
Prepared by Advanced Civil Design, Inc, Printed 1/26/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Dublin 100	Type II 24-hr		Default	24.00	1	5.63	2

Summary for Pond 4P: As-Built Ponding

Volume	Invert	Avail.Storage	Storage Description
#1	865.30'	2,158 cf	**1 (Irregular)** Listed below (Recalc)
#2	865.30'	1,155 cf	**2 (Irregular)** Listed below (Recalc)
#3	865.30'	2,756 cf	**3 (Irregular)** Listed below (Recalc)
#4	865.30'	4,085 cf	**4 (Irregular)** Listed below (Recalc)
#5	865.30'	2,243 cf	**5 (Irregular)** Listed below (Recalc)
#6	865.30'	2,357 cf	**6 (Irregular)** Listed below (Recalc)
#7	865.30'	2,386 cf	**7 (Irregular)** Listed below (Recalc)
#8	865.30'	2,395 cf	**8 (Irregular)** Listed below (Recalc)
		19,533 cf	Total Available Storage

(1)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,242	321.0	2,158	2,158	8,198

(2)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	3,294	260.0	1,155	1,155	5,378

(3)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	8,006	544.0	2,756	2,756	23,548

(4)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	11,938	563.0	4,085	4,085	25,222

(5)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,493	418.0	2,243	2,243	13,902

(6)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,828	340.0	2,357	2,357	9,197

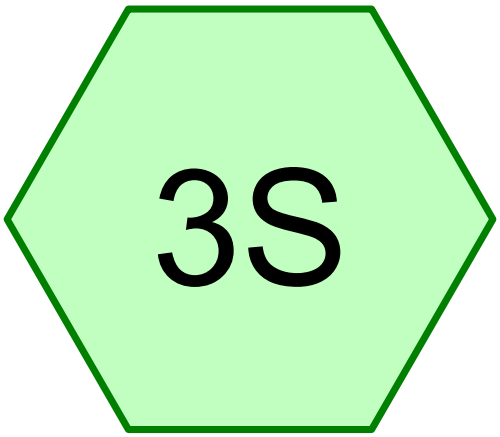
(7)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,914	314.0	2,386	2,386	7,844

8

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,940	314.0	2,395	2,395	7,844

APPENDIX D
POST-DEVELOPED HYDROCAD CALCULATIONS



Post-Dev

Subcat Reach Pond Link

Routing Diagram for Sarnova
Prepared by Advanced Civil Design, Inc, Printed 1/26/2025

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Dublin 001	Type II 24-hr		Default	24.00	1	2.20	2
2	Dublin 002	Type II 24-hr		Default	24.00	1	2.63	2
3	Dublin 005	Type II 24-hr		Default	24.00	1	3.24	2
4	Dublin 010	Type II 24-hr		Default	24.00	1	3.74	2
5	Dublin 025	Type II 24-hr		Default	24.00	1	4.44	2
6	Dublin 050	Type II 24-hr		Default	24.00	1	5.02	2
7	Dublin 100	Type II 24-hr		Default	24.00	1	5.63	2

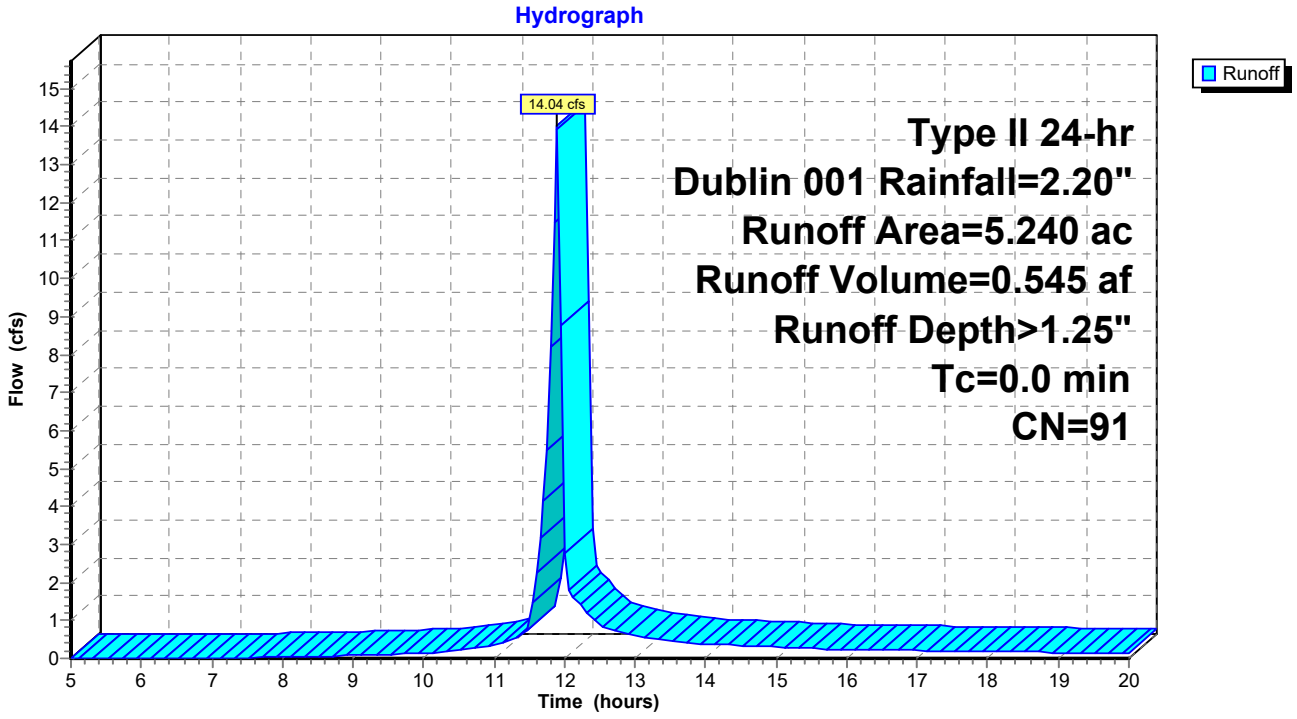
Summary for Subcatchment 3S: Post-Dev

Runoff = 14.04 cfs @ 11.89 hrs, Volume= 0.545 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 001 Rainfall=2.20"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev



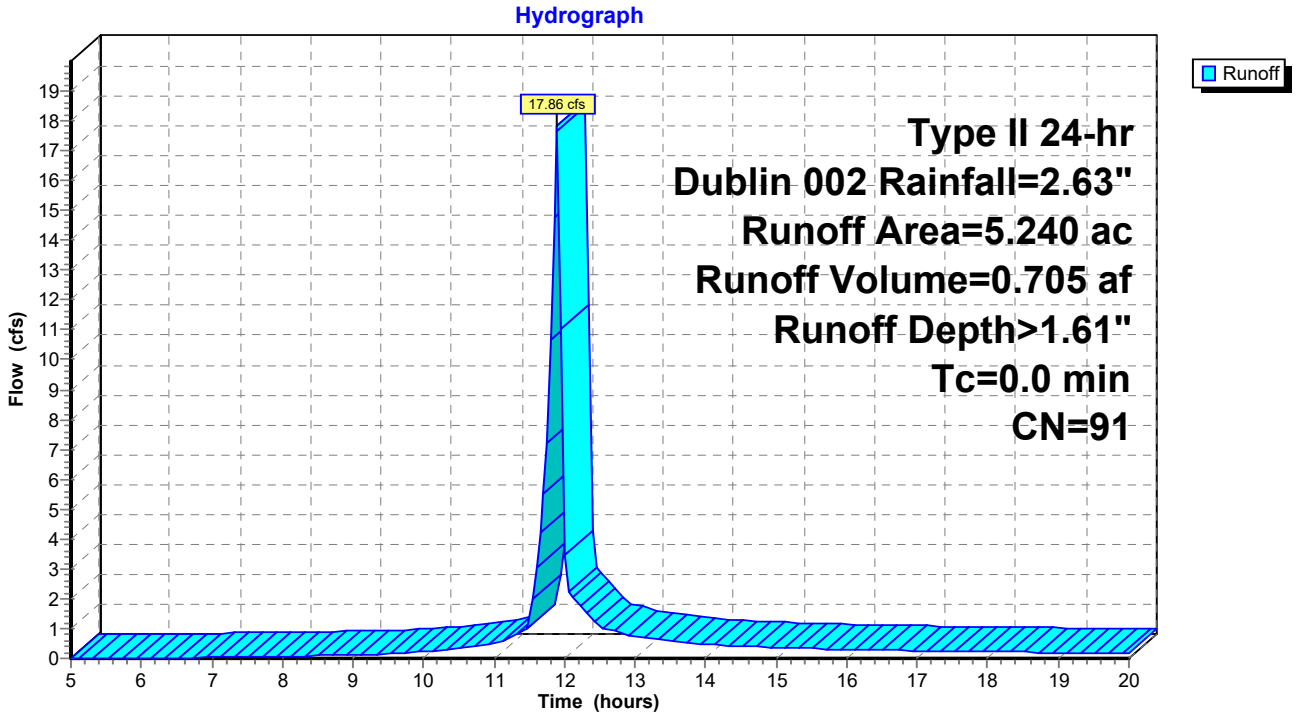
Summary for Subcatchment 3S: Post-Dev

Runoff = 17.86 cfs @ 11.89 hrs, Volume= 0.705 af, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 002 Rainfall=2.63"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev



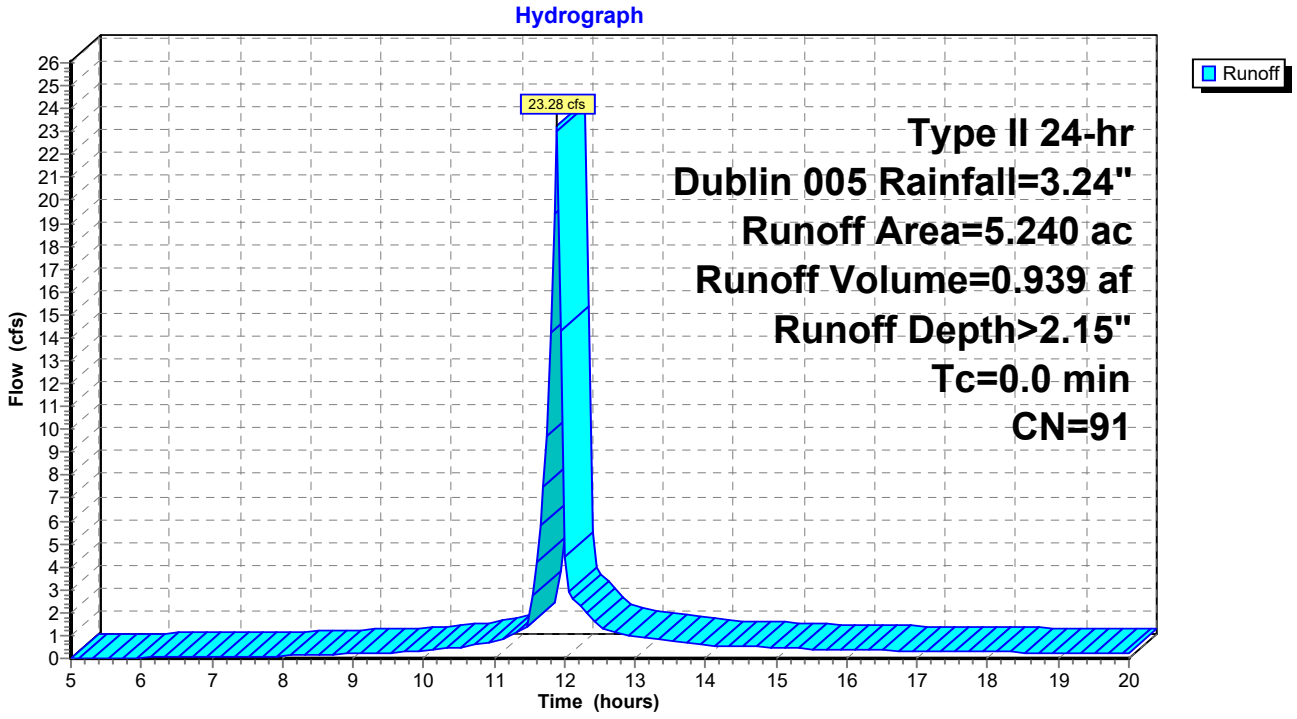
Summary for Subcatchment 3S: Post-Dev

Runoff = 23.28 cfs @ 11.89 hrs, Volume= 0.939 af, Depth> 2.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 005 Rainfall=3.24"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev



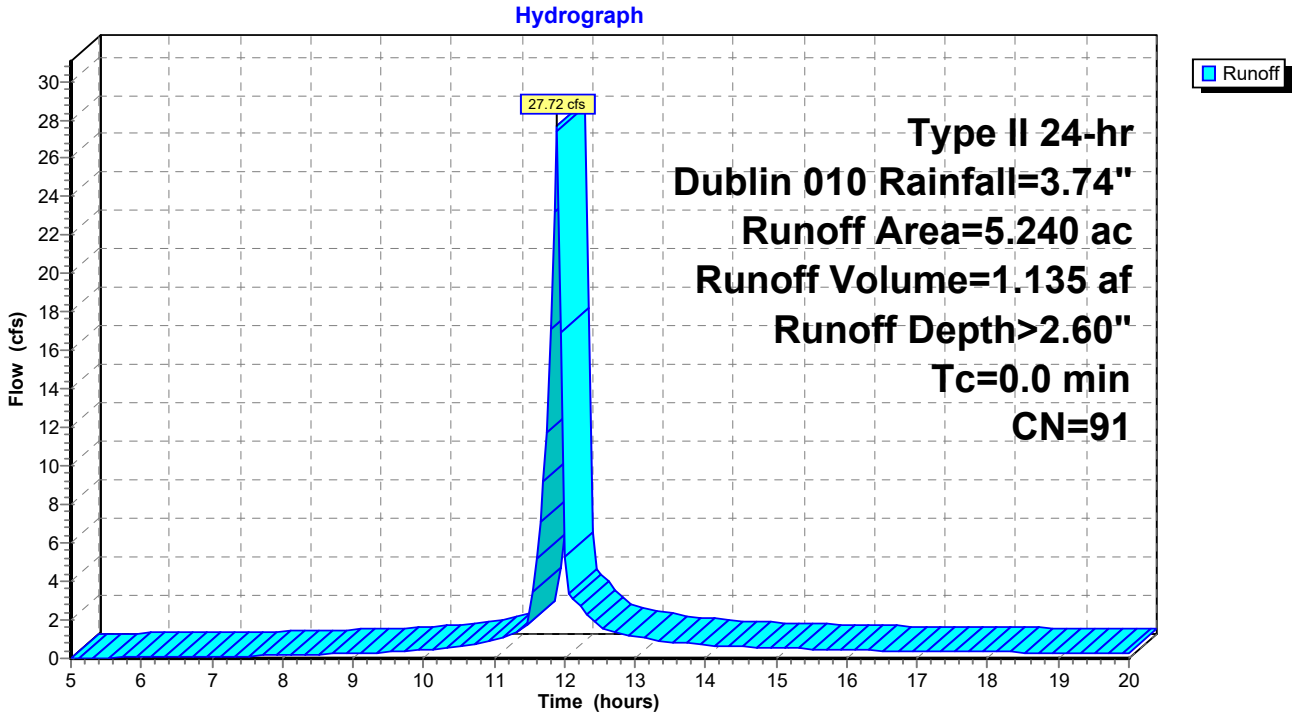
Summary for Subcatchment 3S: Post-Dev

Runoff = 27.72 cfs @ 11.89 hrs, Volume= 1.135 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 010 Rainfall=3.74"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev



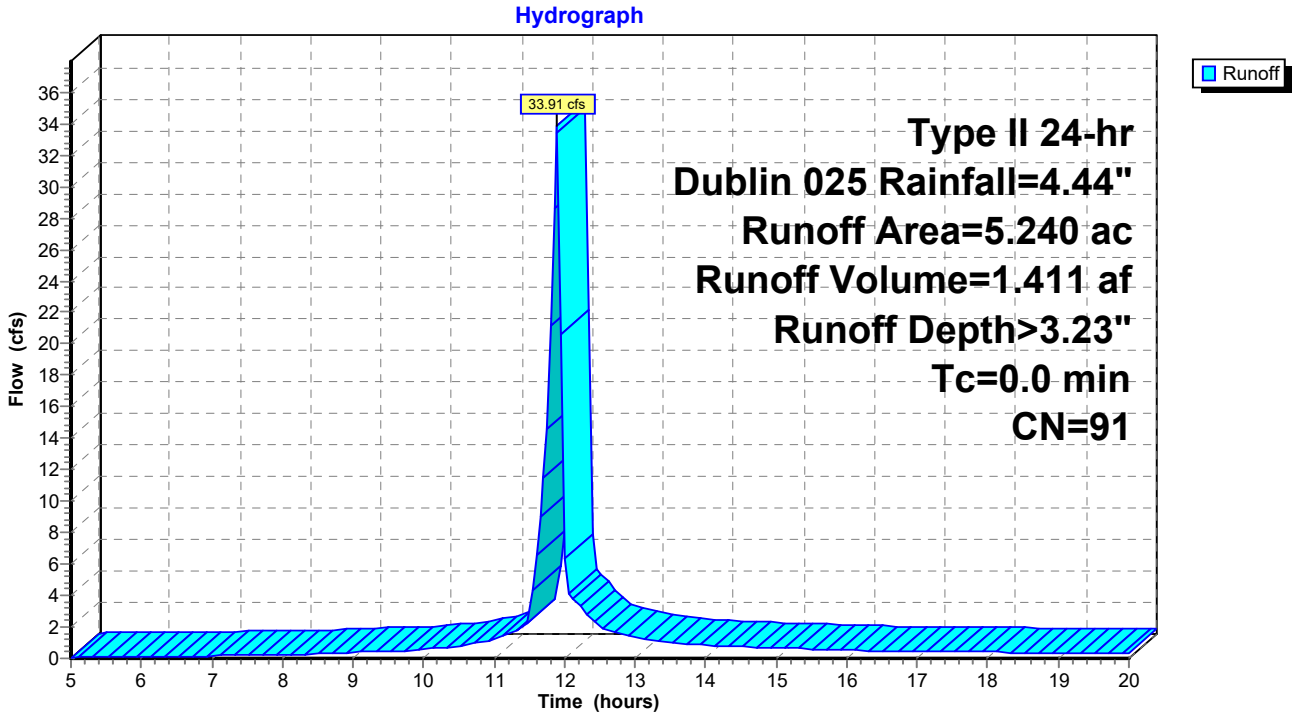
Summary for Subcatchment 3S: Post-Dev

Runoff = 33.91 cfs @ 11.89 hrs, Volume= 1.411 af, Depth> 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 025 Rainfall=4.44"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev



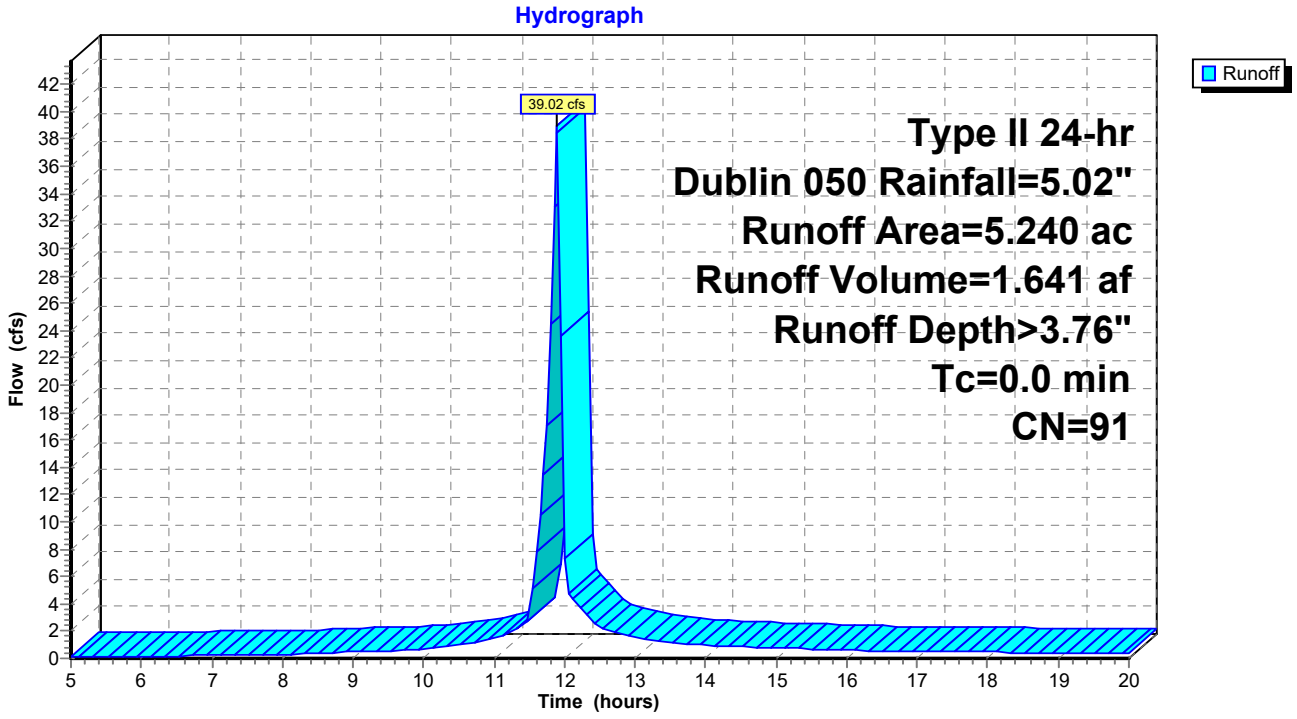
Summary for Subcatchment 3S: Post-Dev

Runoff = 39.02 cfs @ 11.89 hrs, Volume= 1.641 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 050 Rainfall=5.02"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev



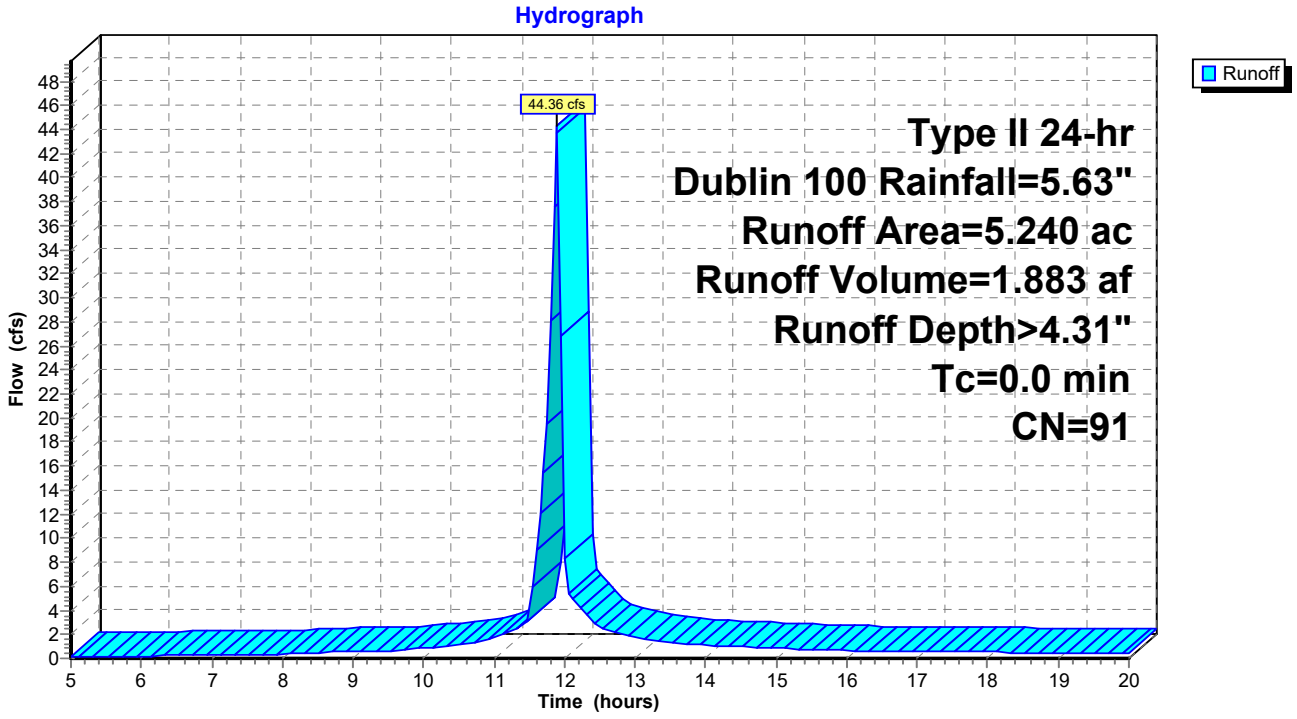
Summary for Subcatchment 3S: Post-Dev

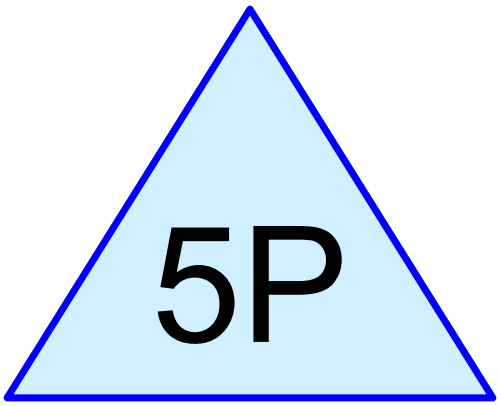
Runoff = 44.36 cfs @ 11.89 hrs, Volume= 1.883 af, Depth> 4.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr Dublin 100 Rainfall=5.63"

Area (ac)	CN	Description
3.140	98	Paved parking, HSG D
2.100	80	>75% Grass cover, Good, HSG D
5.240	91	Weighted Average
2.100		40.08% Pervious Area
3.140		59.92% Impervious Area

Subcatchment 3S: Post-Dev





Pr.Cond.Ponding

Subcat Reach Pond Link

Routing Diagram for Sarnova
Prepared by Advanced Civil Design, Inc, Printed 1/26/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	Dublin 100	Type II 24-hr		Default	24.00	1	5.63	2

Summary for Pond 5P: Pr.Cond.Ponding

Volume	Invert	Avail.Storage	Storage Description
#1	865.30'	2,158 cf	**1 (Irregular)** Listed below (Recalc)
#2	865.90'	462 cf	**2 (Irregular)** Listed below (Recalc)
#3	865.30'	2,366 cf	**3 (Irregular)** Listed below (Recalc)
#4	865.30'	4,085 cf	**4 (Irregular)** Listed below (Recalc)
#5	865.30'	2,158 cf	**5 (Irregular)** Listed below (Recalc)
#6	865.30'	2,357 cf	**6 (Irregular)** Listed below (Recalc)
#7	865.30'	2,386 cf	**7 (Irregular)** Listed below (Recalc)
#8	865.30'	2,395 cf	**8 (Irregular)** Listed below (Recalc)
		18,366 cf	Total Available Storage

(1)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,242	321.0	2,158	2,158	8,198

(2)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.90	8	12.0	0	0	8
866.30	3,294	260.0	462	462	5,376

(3)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,857	386.0	2,366	2,366	11,855

(4)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	11,938	563.0	4,085	4,085	25,222

(5)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,244	392.0	2,158	2,158	12,226

(6)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,828	340.0	2,357	2,357	9,197

(7)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,914	314.0	2,386	2,386	7,844

8

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
865.30	8	12.0	0	0	8
866.30	6,940	314.0	2,395	2,395	7,844