ARC DESIGN
RESOURCES INC.

CIVIL ENGINEERING
LAND SURVEYING
5291 Zenith Parkway
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STORMWATER MANAGEMENT REPORT

Historic Auto Attractions – Fire Truck Museum
Roscoe, IL 61073
Arc Project Number: 20034

Prepared By:
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Prepared By: Jack Ott
Review Engineer: Lauren Downing, P.E.

Prepared For:
Wayne Lensing

Issued For:
1. Agency Review

Issued For Date:
1. 03/11/2026

Project Overview

The project is located at 13825 Metric Road, Roscoe, IL 61073. The project is located on the south side of the existing 63.76-acre property, and the development area consists of 1.67 acres of the property.

The property is surrounded by existing commercial/industrial properties to the south and west and agricultural land to the north and east. The scope of the proposed project includes a new building and parking lot.

The proposed development is a small portion of the property and drains to an existing on-site detention basin. The following report will evaluate the expansion of the detention needed to control the new flows from this project while meeting the Roscoe requirements for an allowable release rate not exceeding 0.2 cfs/acre for the 100-year storm.

Storm events used in analysis are those specified in the ISWS Bulletin 75, “Precipitation Frequency Study for Illinois” (Angle and Markus, March 2020). All storms between the 5-minute and 48-hour durations were analyzed as part of this study to ensure the design meets the previously established criteria. HydroCAD version 10.00-25 was used to analyze the stormwater runoff using the drainage analysis method SCS TR-20.

Existing Conditions

The existing study area is approximately 1.67 acres. Currently this area flows to the northeast to the existing detention basin. It is assumed that all previously designed and constructed work on the property that affects the detention basin has been constructed per plans and Village of Roscoe requirements. See Appendix A for the Existing Drainage Plan.

Proposed Conditions

The development of this site will include a new building, parking lot, and an expansion to the existing detention basin. See Appendix B for the Proposed Drainage Plan.

The Village of Roscoe and Winnebago County require an allowable release rate of 0.2 cfs/acre, which would result in a release rate of 0.334 cfs for the proposed development area. However, the proposed development is a modification of an existing basin system which was developed prior to the current requirements. Therefore, we are proposing to model the development area and assume a constant conservative release rate of 0.2 cfs. The resulting volume will then be added to the existing basin to supplement its volume and ensure that it has adequate capacity to handle the runoff volume.

The required volume to control the flows from this development was estimated to be no larger than 0.5 acre-feet. The calculations were generated by restricting the outflow to 0.2 cfs and the area used in the calculations was 1.67 acres which includes the entire development area not just the new impervious area. This results in a volume of 0.496 acre-feet. Conservatively, 0.5 ac-ft is considered for the required volume. See Appendix C for the HydroCAD estimate. See Appendix D for the Detention Basin Expansion Exhibit.

Proposed Detention Expansion

The existing detention basin will need to be expanded by at least 0.5 acre-feet to meet Village of Roscoe requirements. The detention basin is proposed to expand between the elevations of 759.00 and 765.00. See Table 1 for the Existing Detention Basin Storage between those elevations and Table 2 for the Proposed Detention Basin Storage. The detention was only evaluated within a small area of the basin and does not incorporate the entire system. The previous HWL was 767'. Therefore, the increase in volume is provided below the HWL of the existing system.

Existing Detention Basin Storage			
Pond Elevation (ft)	Pond Area (acres)	Incremental Volume (acre-feet)	Sum (acre-feet)
759.00	0.207	0.000	0.000
760.00	0.405	0.306	0.306
761.00	0.687	0.546	0.852
762.00	0.975	0.831	1.683
763.00	1.346	1.161	2.844
764.00	1.839	1.593	4.436
765.00	2.398	2.118	6.555

Table 1: Existing Detention Basin Storage

Proposed Detention Basin Storage			
Pond Elevation (ft)	Pond Area (acres)	Incremental Volume (acre-feet)	Sum (acre-feet)
759.00	0.207	0.000	0.000
760.00	0.595	0.401	0.401
761.00	0.842	0.718	1.119
762.00	1.094	0.968	2.087
763.00	1.428	1.261	3.348
764.00	1.880	1.654	5.003
765.00	2.398	2.139	7.141

Table 2: Proposed Detention Basin Storage

***The volume of the detention basin has increased by 0.586 acre-feet and meets the Village of Roscoe requirements.**

Conclusion

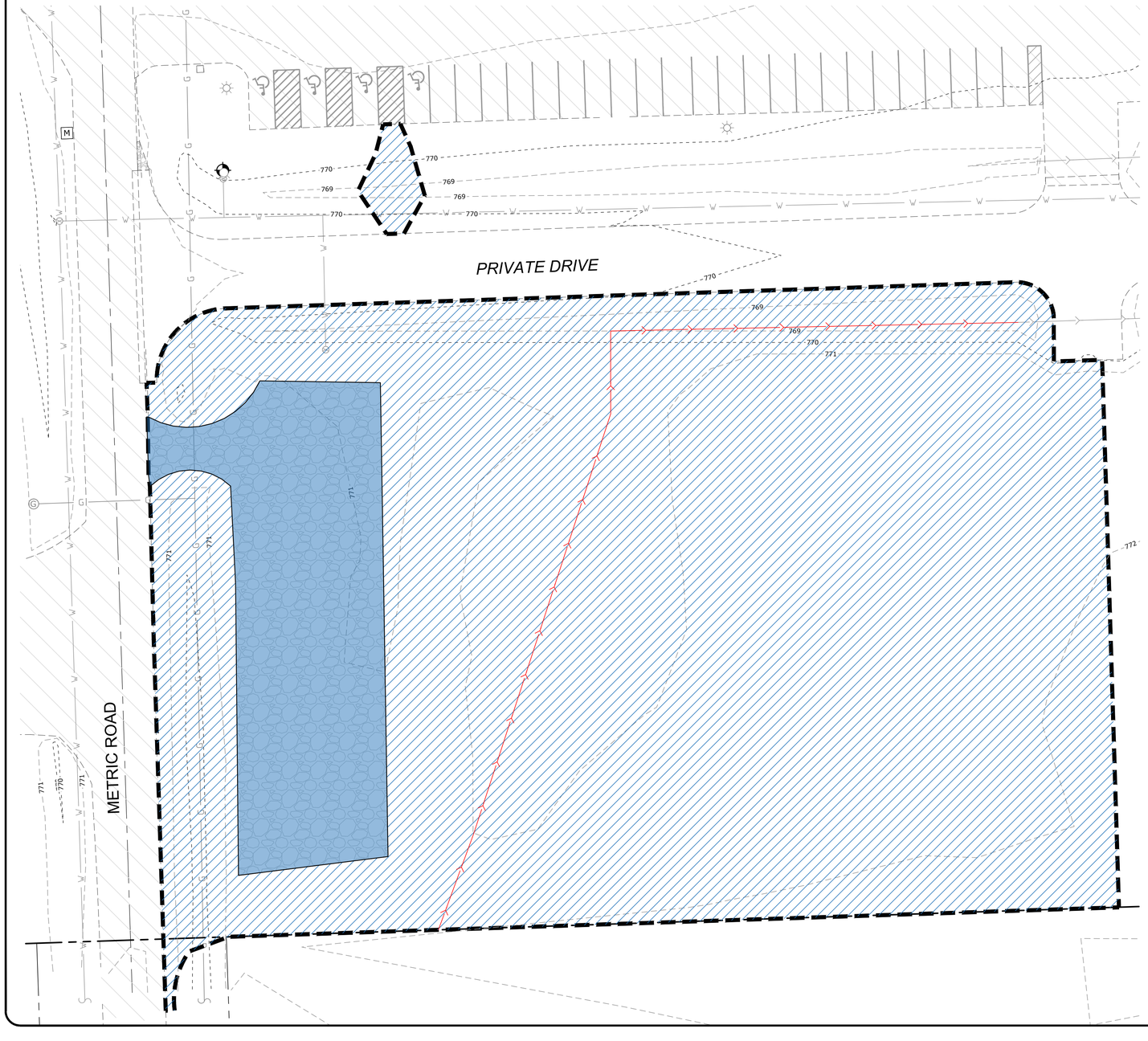
Based on the included analysis and calculations, runoff generated from the proposed development is controlled by the on-site detention facility; therefore, no adverse impacts are anticipated from this development.

Appendices

Appendix A: Existing Drainage Plan
Appendix B: Proposed Drainage Plan
Appendix C: Required Storage Calculations
Appendix D: Detention Basin Expansion Exhibit
Appendix E: WSS Soil Report

Appendix A: Existing Drainage Plan

SUMMARY		
	10-YEAR	100-YEAR
WATERSHED 1		
WEIGHTED RUNOFF C	66	66
PEAK RUNOFF (CFS)	6.10 (12-HR)	16.57 (6-HR)



N
0 20' 30' 40'

LEGEND

- PROPERTY LINE
- 800 EXISTING GROUND CONTOUR
- WATERSHED 1 PERVIOUS AREA
- WATERSHED 1 IMPERVIOUS AREA
- WATERSHED Tc PATH

TOTAL PROPERTY AREA = 63.76 ACRES

WATERSHED 1 = 1.67 ACRES

- Tc LENGTH = 360'
- PERVIOUS AREA = 1.46 ACRES
- IMPERVIOUS AREA = 0.21 ACRES

FLOWS EAST TO DRY CREEK

HYDROLOGIC SOIL GROUP B IS USED

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PROJECT NAME
OWNER'S NAME

HISTORIC AUTO ATTRACTIONS - FIRE TRUCK MUSEUM

13825 METRIC ROAD
ROSCOE, IL
WINNEBAGO COUNTY

WAYNE LENSING
13825 METRIC ROAD
ROSCOE, IL 61073
(815) 389-7917

CONSULTANTS

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SHEET TITLE

FIRE TRUCK MUSEUM - EXISTING DRAINAGE PLAN

DRAWN	TRS
CHECKED	LND
PM	RCS

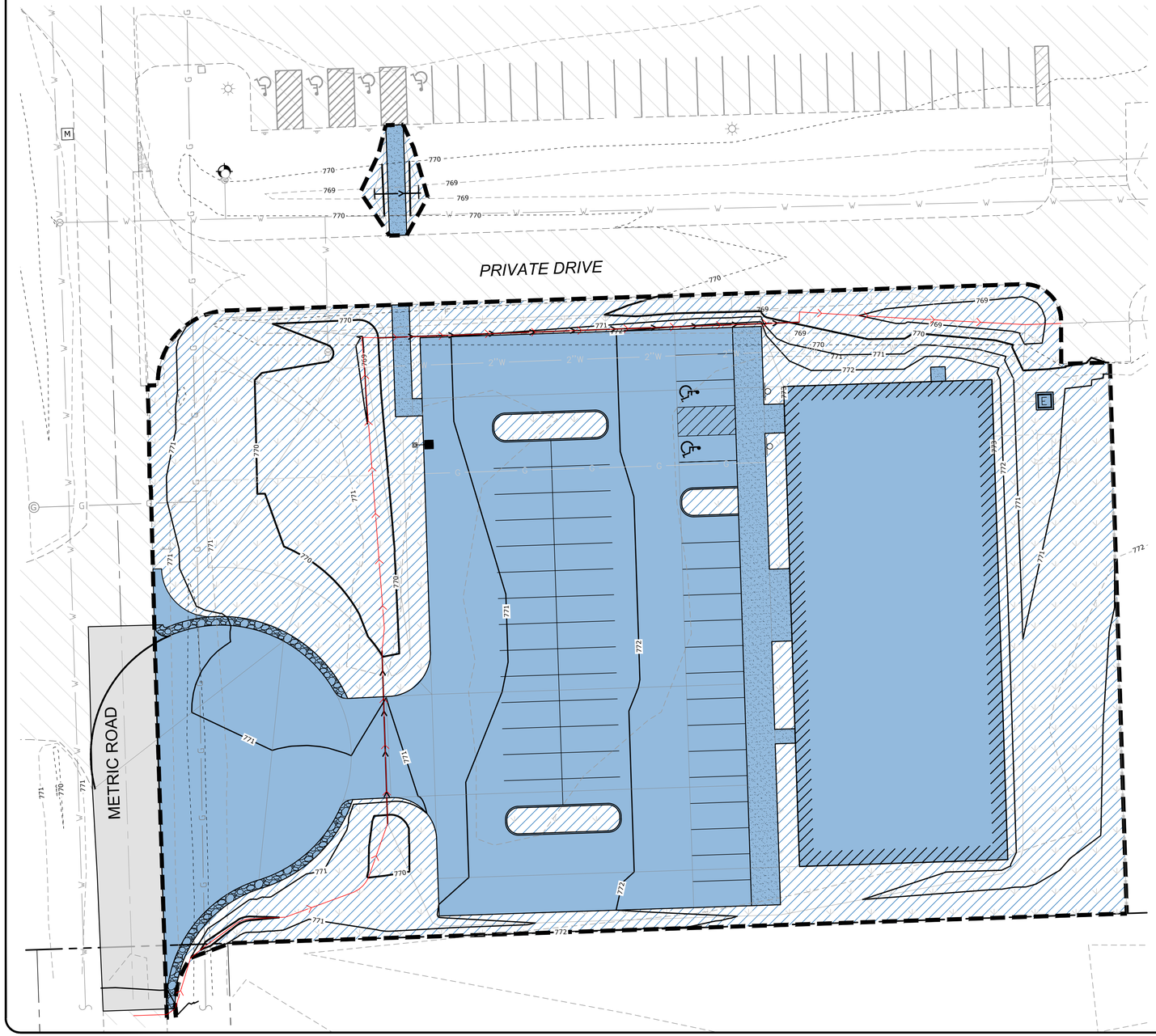
PROJECT NUMBER
SHEET NUMBER

20034

EDP

Appendix B: Proposed Drainage Plan

SUMMARY		
	10-YEAR	100-YEAR
WATERSHED 1		
WEIGHTED RUNOFF C	83	83
PEAK RUNOFF (CFS)	14.19 (3-HR)	30.03 (3-HR)



N
0 20' 30' 40'

LEGEND

- PROPERTY LINE
- 800 EXISTING GROUND CONTOUR
- 800 EXISTING GROUND CONTOUR
- WATERSHED 1 PERVIOUS AREA
- WATERSHED 1 IMPERVIOUS AREA
- WATERSHED Tc PATH

TOTAL PROPERTY AREA = 63.76 ACRES

WATERSHED 1 = 1.67 ACRES

- Tc LENGTH = 536'
- PERVIOUS AREA = 0.69 ACRES
- IMPERVIOUS AREA = 0.98 ACRES

FLOWS EAST TO DRY CREEK

HYDROLOGIC SOIL GROUP B IS USED

NET CHANGE: + 0.77 AC OF IMPERVIOUS AREA

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FIRE TRUCK MUSEUM - PROPOSED DRAINAGE PLAN

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PM	RCS

PROJECT NUMBER
SHEET NUMBER

20034

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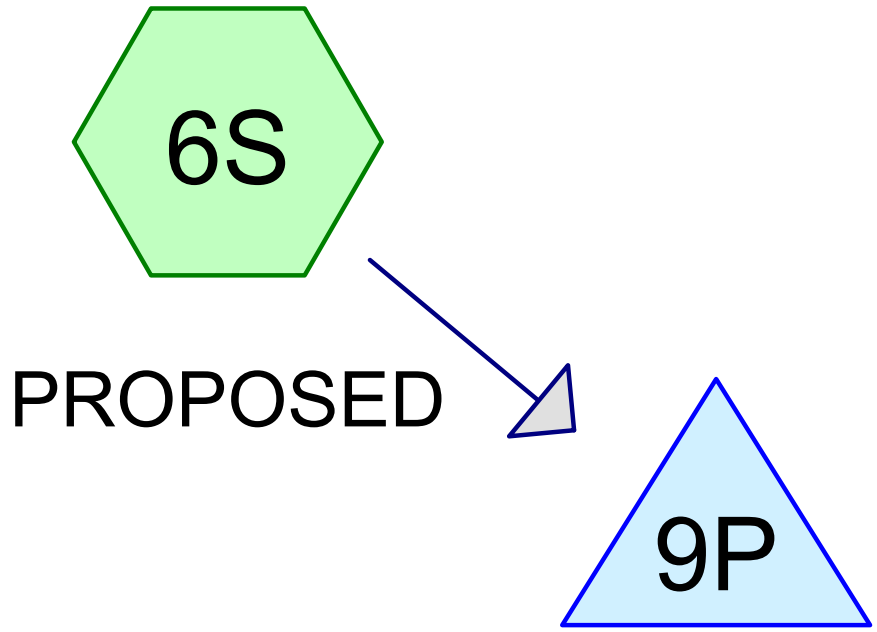
Appendix C: Required Storage Calculations



Pond to check size with allowable

Subcat Reach Pond Link

Routing Diagram for 2026 03-10 Fire Truck Museum
Prepared by {enter your company name here}, Printed 3/11/2026

Events for Pond 9P: Pond to check size with allowable

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
10-yr, 5-min	0.28	0.11	0.00	0.11	100.01	0.001
10-yr, 10-min	2.51	0.21	0.01	**0.20**	100.07	0.018
10-yr, 15-min	4.41	0.22	0.02	0.20	100.15	0.037
10-yr, 30-min	6.87	0.25	0.05	0.20	100.31	0.076
10-yr, 1-hr	10.22	0.28	0.08	0.20	100.47	0.119
10-yr, 2-hr	13.36	0.31	0.11	0.20	100.66	0.164
10-yr, 3-hr	14.19	0.32	0.12	0.20	100.73	0.182
10-yr, 6-hr	13.51	0.34	0.14	0.20	100.82	0.204
10-yr, 12-hr	12.65	0.35	0.15	0.20	100.88	0.221
10-yr, 18-hr	10.75	0.35	0.15	0.20	100.90	0.226
10-yr, 24-hr	9.40	0.36	0.16	0.20	100.93	0.232
10-yr, 48-hr	5.76	0.35	0.15	0.20	100.87	0.218
100-yr, 5-min	1.99	0.21	0.01	0.20	100.06	0.014
100-yr, 10-min	8.71	0.25	0.05	0.20	100.27	0.067
100-yr, 15-min	13.12	0.28	0.08	0.20	100.45	0.113
100-yr, 30-min	18.41	0.33	0.13	0.20	100.79	0.196
100-yr, 2-hr	29.29	0.45	0.25	0.20	101.49	0.371
100-yr, 3-hr	**30.03**	0.48	0.28	0.20	101.64	0.410
100-yr, 6-hr	27.17	0.51	0.31	0.20	101.81	0.452
100-yr, 12-hr	24.51	0.53	0.33	0.20	101.92	0.480
100-yr, 18-hr	20.32	0.53	0.33	0.20	101.95	0.487
100-yr, 24-hr	17.61	**0.54**	**0.34**	0.20	**101.99**	**0.496**
100-yr, 48-hr	10.49	0.51	0.31	0.20	101.83	0.458

Summary for Subcatchment 6S: PROPOSED

[49] Hint: Tc<2dt may require smaller dt

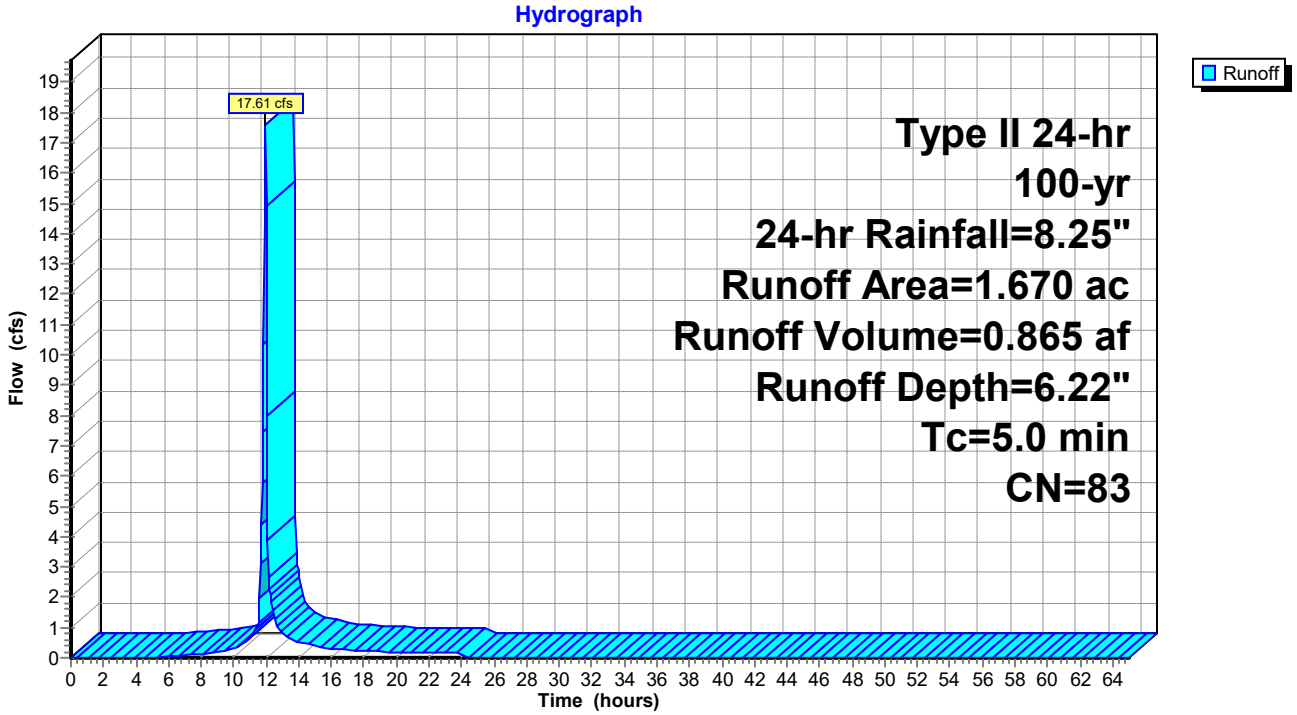
Runoff = 17.61 cfs @ 11.95 hrs, Volume= 0.865 af, Depth= 6.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-65.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr, 24-hr Rainfall=8.25"

Area (ac)	CN	Description
0.980	98	Paved parking, HSG B
0.690	61	>75% Grass cover, Good, HSG B
1.670	83	Weighted Average
0.690		41.32% Pervious Area
0.980		58.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: PROPOSED



Summary for Pond 9P: Pond to check size with allowable

Inflow Area = 1.670 ac, 58.68% Impervious, Inflow Depth = 6.22" for 100-yr, 24-hr event
Inflow = 17.61 cfs @ 11.95 hrs, Volume= 0.865 af
Outflow = 0.54 cfs @ 13.87 hrs, Volume= 0.865 af, Atten= 97%, Lag= 115.0 min
Discarded = 0.34 cfs @ 13.87 hrs, Volume= 0.382 af
Primary = 0.20 cfs @ 9.15 hrs, Volume= 0.483 af

Routing by Stor-Ind method, Time Span= 0.00-65.00 hrs, dt= 0.05 hrs
Peak Elev= 101.99' @ 13.87 hrs Surf.Area= 0.165 ac Storage= 0.496 af

Plug-Flow detention time= 472.8 min calculated for 0.864 af (100% of inflow)
Center-of-Mass det. time= 473.1 min (1,263.5 - 790.4)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1.500 af	**Custom Stage Data (Prismatic)** Listed below

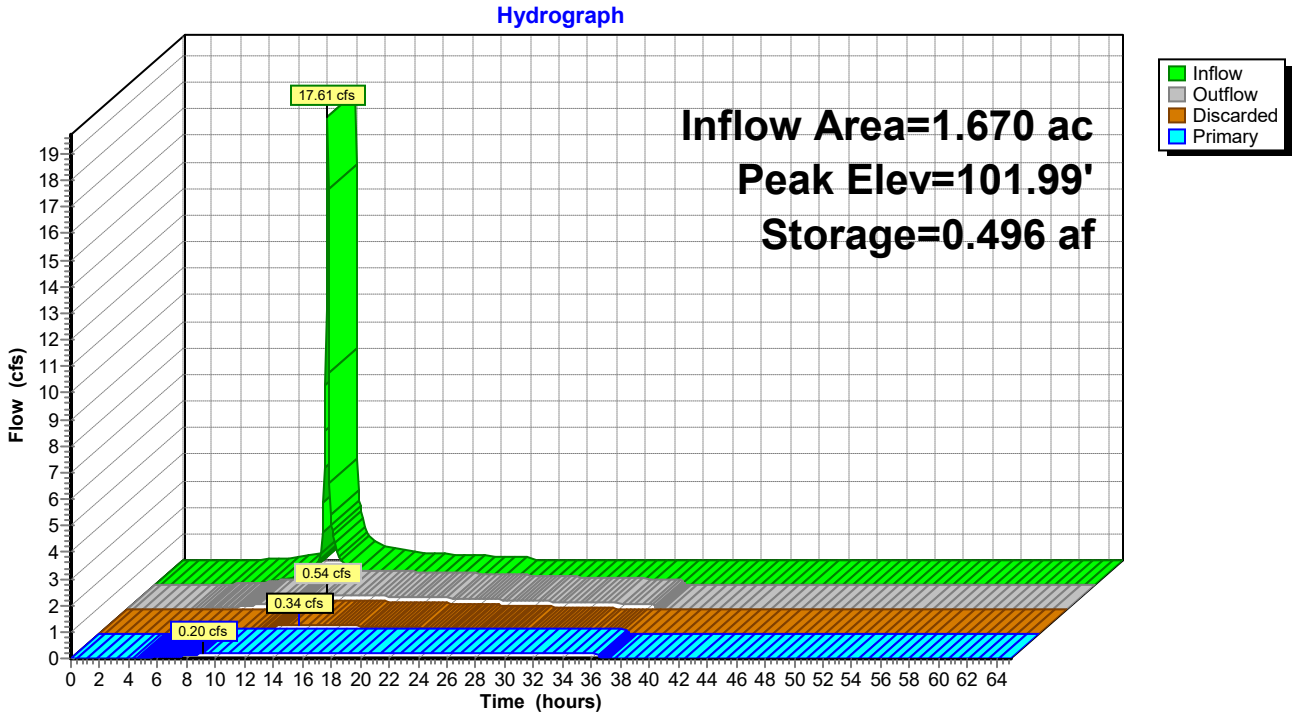
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
100.00	0.000	0.000	0.000
106.00	0.500	1.500	1.500

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 12.00'
#2	Primary	100.00'	**Special & User-Defined** Head (feet) 0.00 0.01 15.00 Disch. (cfs) 0.000 0.200 0.200

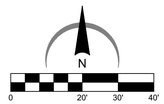
Discarded OutFlow Max=0.34 cfs @ 13.87 hrs HW=101.99' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.34 cfs)

Primary OutFlow Max=0.20 cfs @ 9.15 hrs HW=100.01' (Free Discharge)
↑—**2=Special & User-Defined** (Custom Controls 0.20 cfs)

Pond 9P: Pond to check size with allowable



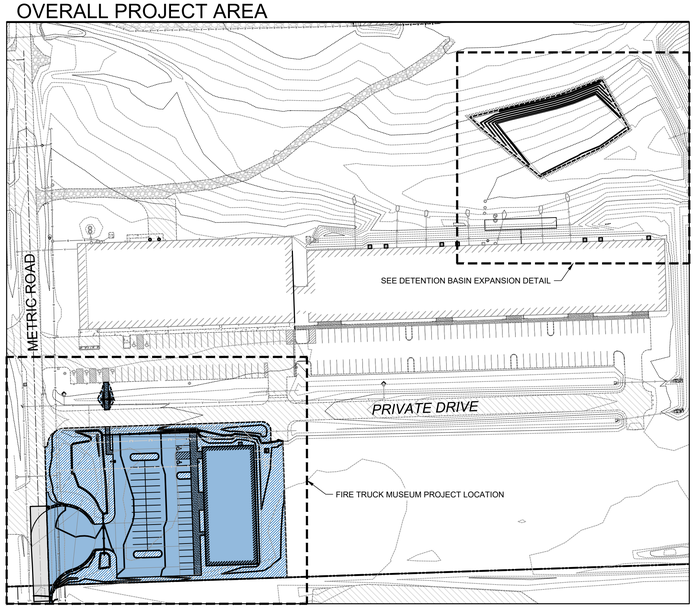
Appendix D: Detention Basin Expansion Exhibit



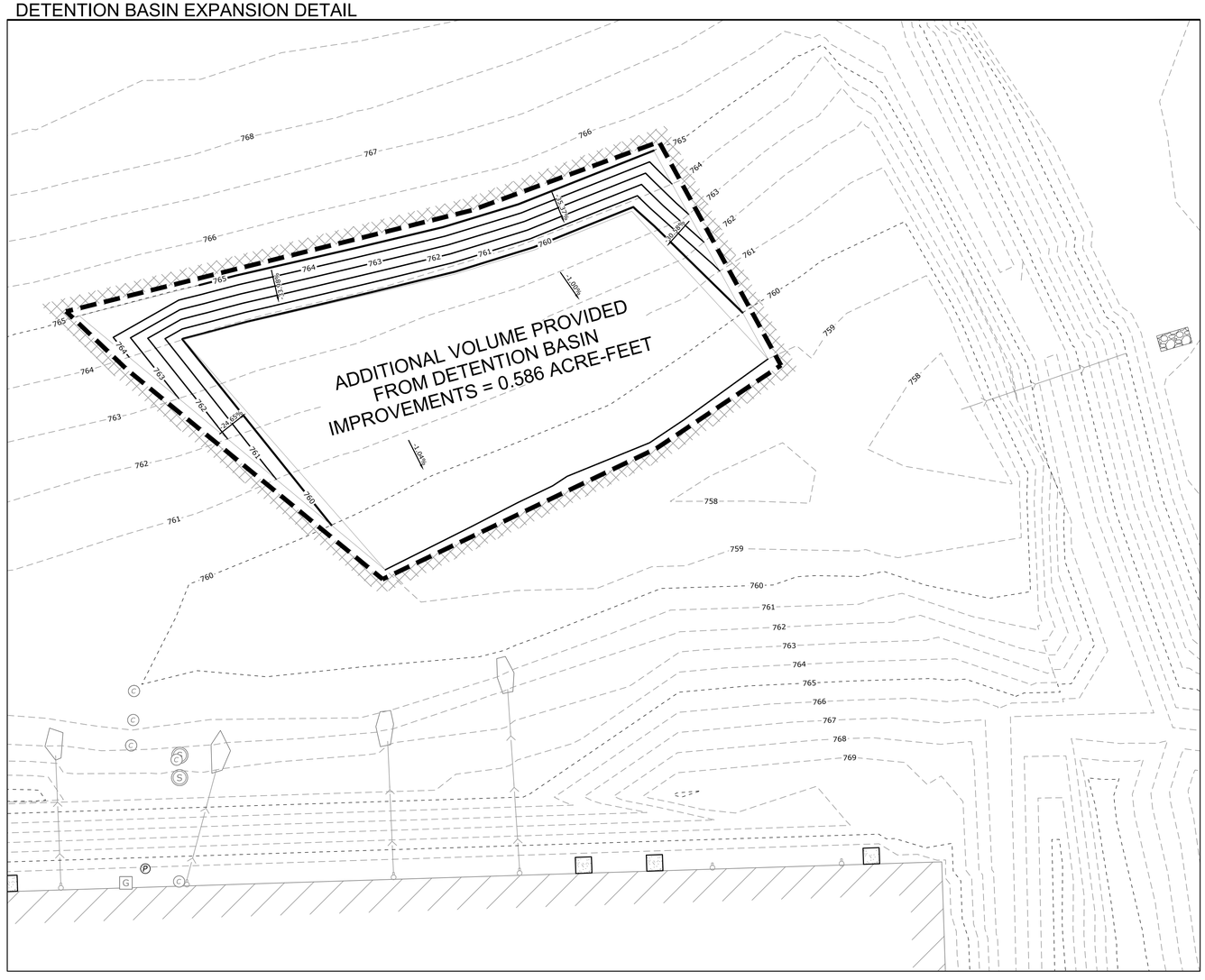
LEGEND

- PROPERTY LINE
- 800 EXISTING GROUND CONTOUR
- 800 EXISTING GROUND CONTOUR
- WATERSHED 1 PERVIOUS AREA
- WATERSHED 1 IMPERVIOUS AREA

OVERALL PROJECT AREA



DETENTION BASIN EXPANSION DETAIL



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FIRE TRUCK MUSEUM - DETENTION BASIN EXPANSION EXHIBIT

DRAWN	TRS
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PM	RCS

PROJECT NUMBER
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20034

EX - DBE

Appendix E: WSS Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Winnebago County, Illinois

March 3, 2026

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

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.

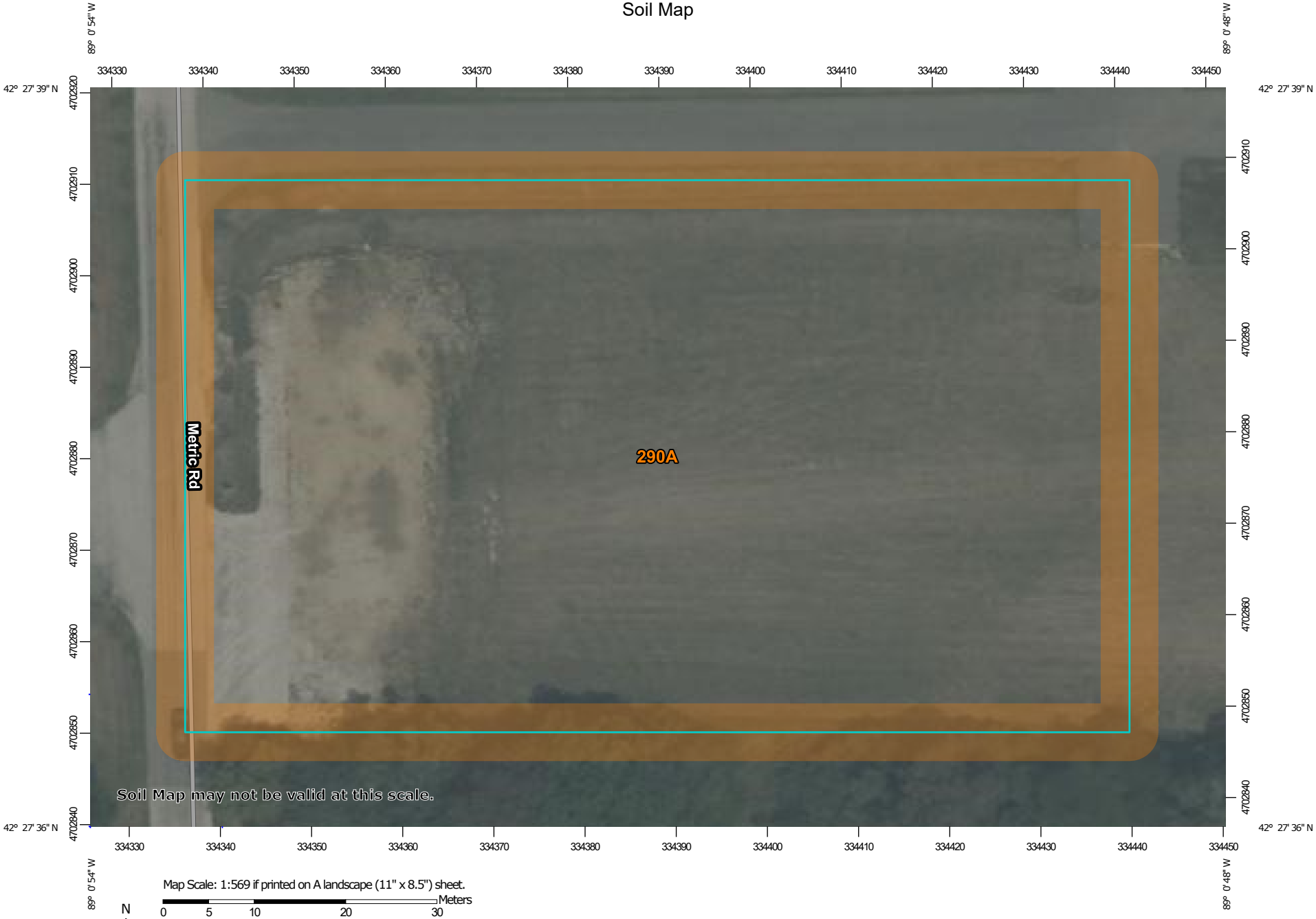
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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: 1:569 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Winnebago County, Illinois
Survey Area Data: Version 21, Sep 1, 2025

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

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 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
290A	Warsaw loam, 0 to 2 percent slopes	1.6	100.0%
Totals for Area of Interest		**1.6**	**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.

Winnebago County, Illinois

290A—Warsaw loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tjx9
Landscape: Uplands
Elevation: 680 to 1,020 feet
Mean annual precipitation: 33 to 37 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 138 to 193 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Warsaw

Setting

Landscape: Uplands
Landform: Outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over calcareous sandy and gravelly outwash

Typical profile

Ap - 0 to 15 inches: loam
Bt - 15 to 31 inches: clay loam
2C - 31 to 79 inches: stratified very gravelly loamy sand to extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: 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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
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: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F095XB010WI - Loamy and Clayey Upland

Forage suitability group: Mod AWC, adequately drained (G095BY005WI)
Other vegetative classification: Mod AWC, adequately drained (G095BY005WI)
Hydric soil rating: No

Minor Components

Will

Percent of map unit: 5 percent
Landscape: Plains
Landform: Kames, Stream terraces, Outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XA004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

Kane

Percent of map unit: 5 percent
Landscape: Uplands
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Hydric soil rating: No

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