Planning Commission Staff Report

November 16, 2022 (Originally approved at Jan. 19, 2022, Meeting)

Site Plan Case SP-2021-2-Rev1

Mainstreet Chrysler Dodge Jeep Ram – Paint Shop

211 Plaza Dr. (Directly West of the Dealership)

Project Facts

Applicant
Davidson Architects & Engineers
Mr. Keegan Amos

Address
211 Plaza Dr.
(Directly West of the Dealership)

Property ID
106-24-0-10-01-035.01-0

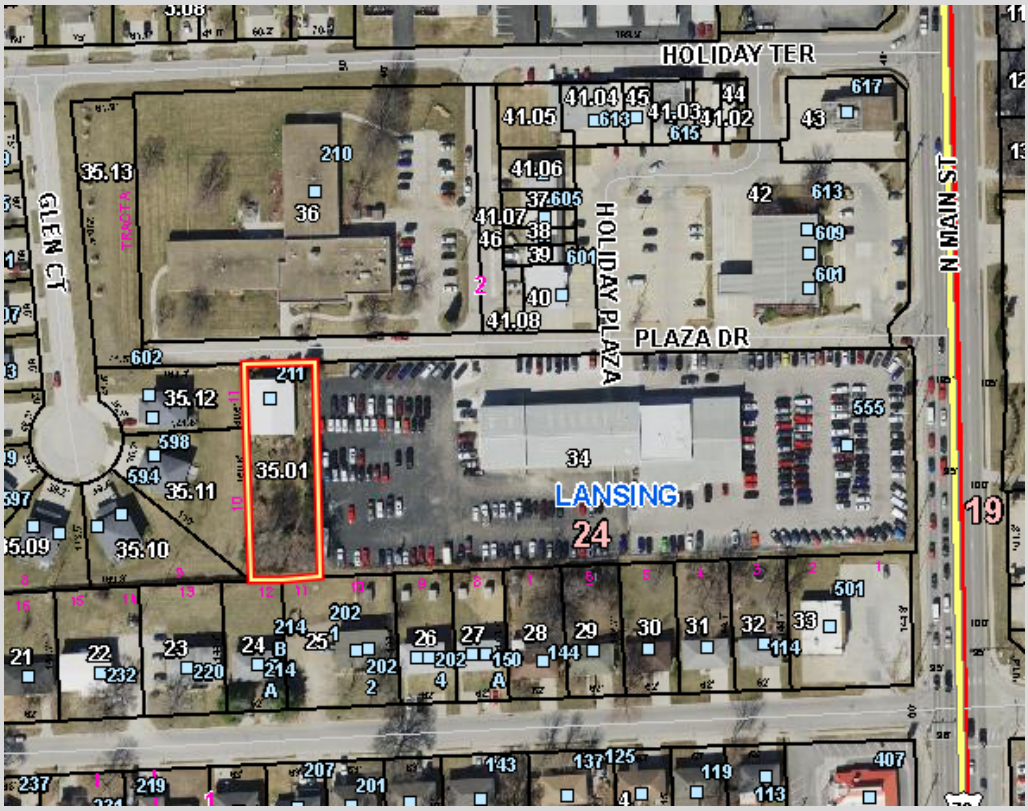
Zoning
B-3 – Regional Business District

Future Land Use
Commercial

Land
18,144.96 SF (0.42 acres)

Building
Existing: 2,880 SF
Original Approved: 8,920 SF
Proposed: 9,600 SF

Requested Approvals
Site Plan Revision &
Stormwater Waiver (Staff Level)



Project Summary

The Applicant proposes to remove the existing structure and construct a new 9,600 S.F. building. Originally, the applicant was approved on January 19, 2022, during the Planning Commission meeting to construct an addition of 6,040 S.F. on an existing 2,880 S.F. single-story building to make an automotive shop (paint shop) facility. The proposed use of an automotive shop (paint shop) facility has not changed. This is an existing building site that was formally used to store vehicles and the excess ground to the south was undeveloped green space. The plan includes the addition, site work, landscaping, parking lot improvements, and fence reconfiguration. Approval of this Site Plan would authorize the applicant to continue construction under an already approved building permit on the property, subject to any conditions added during the approval process at the Planning Commission meeting.

The applicant applied for and was granted a variance by the Board of Zoning Appeals reducing the side setback on the West side of the property from 10' to 6' to accommodate this project.

An updated site plan, and building plans, are attached to this report.

The timeline of the project, should this application be approved, is to proceed to construction as quickly as possible.

For reference, the applicant did request a waiver to allow a small increase in runoff from the project. City Staff has approved this request due to the runoff only impacting the neighboring property to the east, which is owned by the same owner. The small increase in water runoff will flow across the neighboring property and enter the Public Storm Sewer along Main Street. The updated stormwater report is included for reference only.

Summary of Open Items

Staff identified the following open items that require further discussion at the Planning Commission meeting. Please see the remainder of this report for more information on each open item.

Community & Economic Development Department

1. Outstanding items from the Site Plan Review are noted in the body of the report below.

Public Works Department & City Engineer

1. Stormwater items as noted in body of report below.

Wastewater Department

1. Wastewater items as noted in body of report below.

Open Items – Community & Economic Development Department

Site Plan Application items

The Community & Economic Development Director has reviewed the site plan for conformance with the site plan requirements as outlined in the Unified Development Ordinance (UDO), as well as the Site Plan Application, and found the following items of concern:

The Director reviewed this site plan application for the following:

1. In general, any site plan in compliance with all requirements of this code shall be approved.
    - *The existing structure is a Nonconforming Structure Per Section 4.02, Table 4-1 General Development Standards, and will be removed.* ***The plans as drawn are not set back 10 feet from the residential district which is allowed due to a variance request approved by the Board of Zoning Appeals on January 5th, 2022, reducing the western edge setback on the property to 6' which is what the original building was.***
    - *The Landscape Plan is in compliance with Article 6 – Site & Landscape Requirements, and the planting requirements in Table 6-1.*
    - *The Access and Parking Plan is in compliance with required counts and shared parking arrangement standards per Article 7.04.*
2. In making a determination of compliance, or for site plans accompanying any discretionary review or administrative relief, the review body shall consider whether:
    - The site is capable of accommodating the buildings, proposed use, access, and other site design elements required by the code and will not negatively impact the function and design of rights-of-way or adjacent property.
        - *Because the variance was approved by the Board of Zoning Appeals, the proposed development does fit on the site as designed.*
    - The design and arrangement of buildings and open spaces is consistent with good planning, landscape design, and site engineering principles and practices.
        - *Proposed site arrangement and landscape design is appropriate for the site and context*.

- The architecture and building design use quality materials and the style is appropriate for the context considering the proportion, massing, and scale of different elements of the building.
    - *The new building is proposed to be made of architectural metal panels and pre-finished metal rake trim, consistent with the existing building and the neighboring building to the east. The proposed architectural style and building materials appear to be appropriate for the site, which is in B-3 – Regional Business District along K-7.*
- The overall design is compatible to the context considering the location and relationships of other buildings, open spaces, natural features, or site design elements.
    - *The proposed design appears to be appropriate for the context, which is in B-3 – Regional Business District along K-7.*
- Whether any additional site-specific conditions are necessary to meet the intent and design objectives of any of the applicable development standards.
    - *Not applicable.*

3. The application meets the criteria for all other reviews needed to build the project as proposed.
    - *Official review has been completed by other appropriate City Departments, including Public Works and Wastewater. Fulfillment of all criteria as outlined in the UDO has been required and an active building permit exists for the project.*
4. The recommendations of professional staff.
    - *Staff recommends approval of this site development plan.*

The site plan does not show the current zoning, but the site is zoned as B-3 – Regional Business District per the Lansing Zoning Map.

There is no trash enclosure shown on the proposed development. It is assumed that any needed trash services for the property will either be handled within the building or will utilize the next-door property owned by the same owner.

The Director has worked with Leavenworth County Fire District #1 to obtain approval for the project. The Fire Department has agreed that installing pavement markings on the property to ensure that a fire lane always exists is adequate for this development.

Open Items – Public Works Department

Site Plan Application items

The Public Works Director / City Engineer has reviewed the site plan for conformance with City requirements and found no missing items or nonconformances other than the stormwater waiver outlined in this Staff Report.

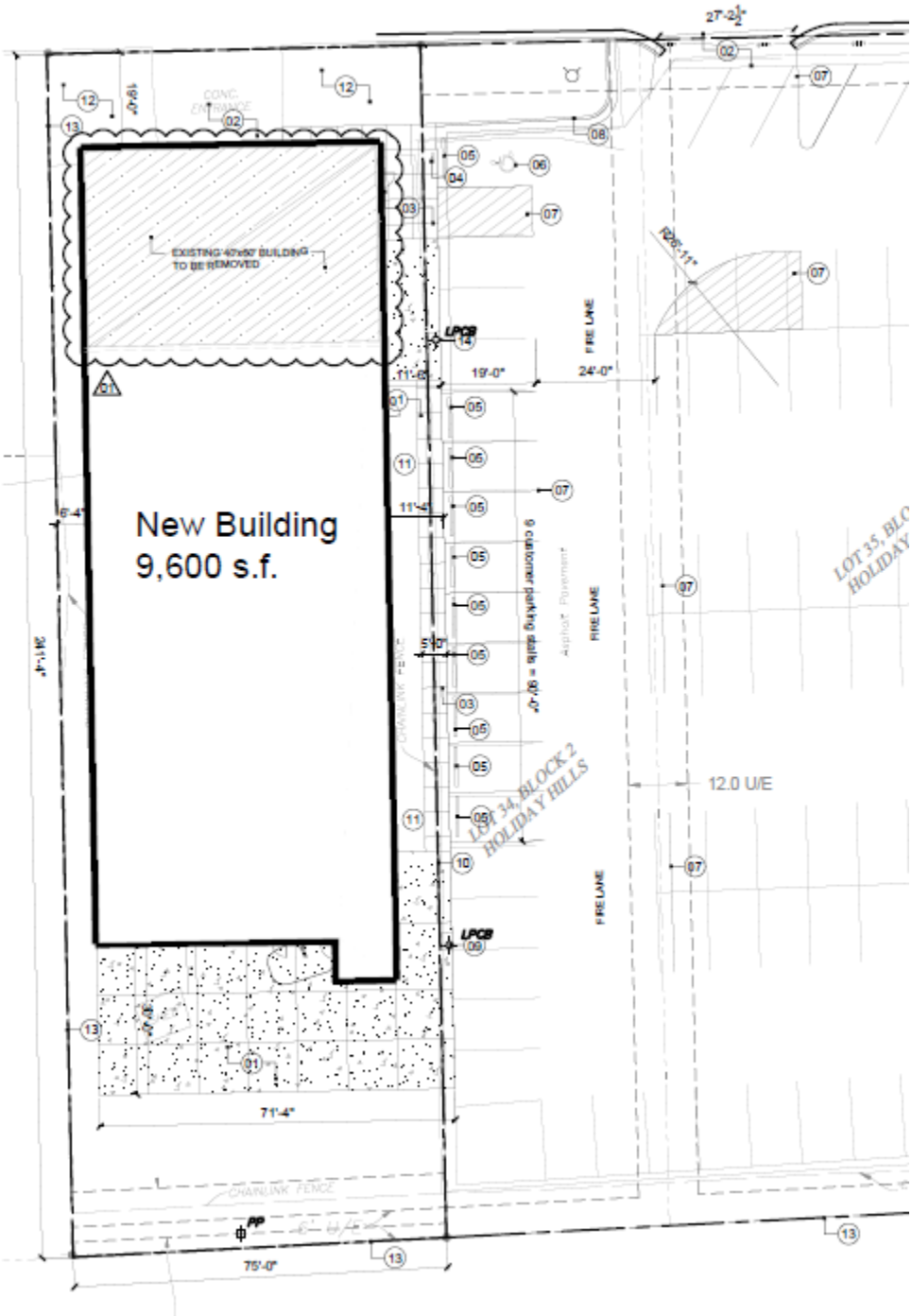
Open Items – Wastewater Department

Site Plan Application items

The Wastewater Director has reviewed the site plan for conformance with City requirements and found no items of concern.

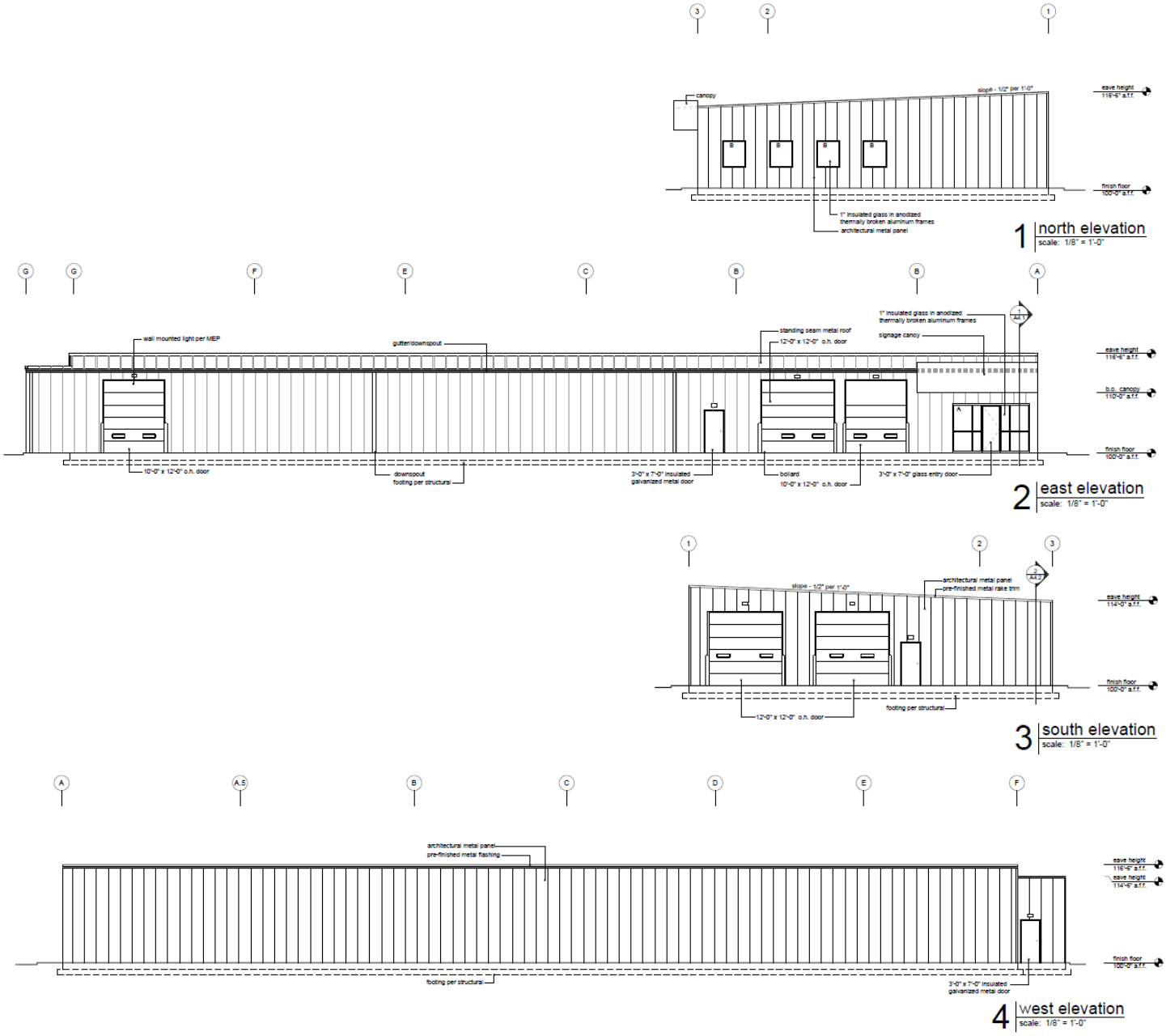
Building Site Plan

Below is the building Site Plan that shows the location of the building on the lot:



Building Elevations

Below are the building elevations:



Acknowledgments

The following City of Lansing staff members reviewed this project and provided information for this report:

- Matthew R. Schmitz, MPA – Director, Community & Economic Development
- Michael Spickelmier, P.E – Director, Public Works / City Engineer
- Anthony Zell, MBA – Director, Wastewater

Notice of City Codes

The Applicant is subject to all applicable City codes within the Municipal Code – whether specifically stated in this report or not – including, but not limited to, Zoning, Buildings and Construction, Subdivisions, and Sign Code. The Applicant is also subject to all applicable Federal, State, and local laws.

Recommendation

Staff recommends approval of Project # SP-2021-02-Rev1, Site Plan for Mainstreet Chrysler Dodge Jeep Ram – Paint Shop at 211 Plaza Dr., subject to the following conditions:

1. Outstanding items listed in this Staff Report from Department Heads must be addressed; and
2. All plans must be resubmitted with corrections as shown in this staff report and accompanying markups.

List of Reviewed Plans

Sheet #	Title	Submitted By	Date on Document
A1.1	Site Plan	DAE	10-07-2022
A2.1	Floor Plan	DAE	10-07-2022
A3.1	North, East, South, West Elevations	DAE	10-07-2022

DAE *Davidson Architects & Engineers*

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

project location:

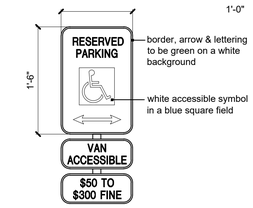
legal description:

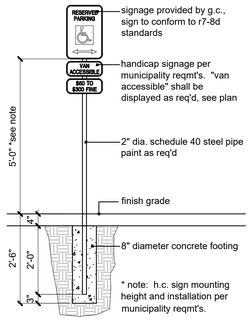
a tract of land in lot 34, block2, holiday hills addition to the city of lansing, leavenworth county, kansas, more fully described as follows: beginning at a point 502.80 feet south and 706.87 feet west of the northeast corner of section 24, township 9 south, range 22 east of the 6th p.m., thence south 00°00'05" west for a distance of 241.32 feet to the south right-of-way line of plaza lane, thence north 89°53'00" east for a distance of 75.00 feet to the point of beginning.

site synopsis:

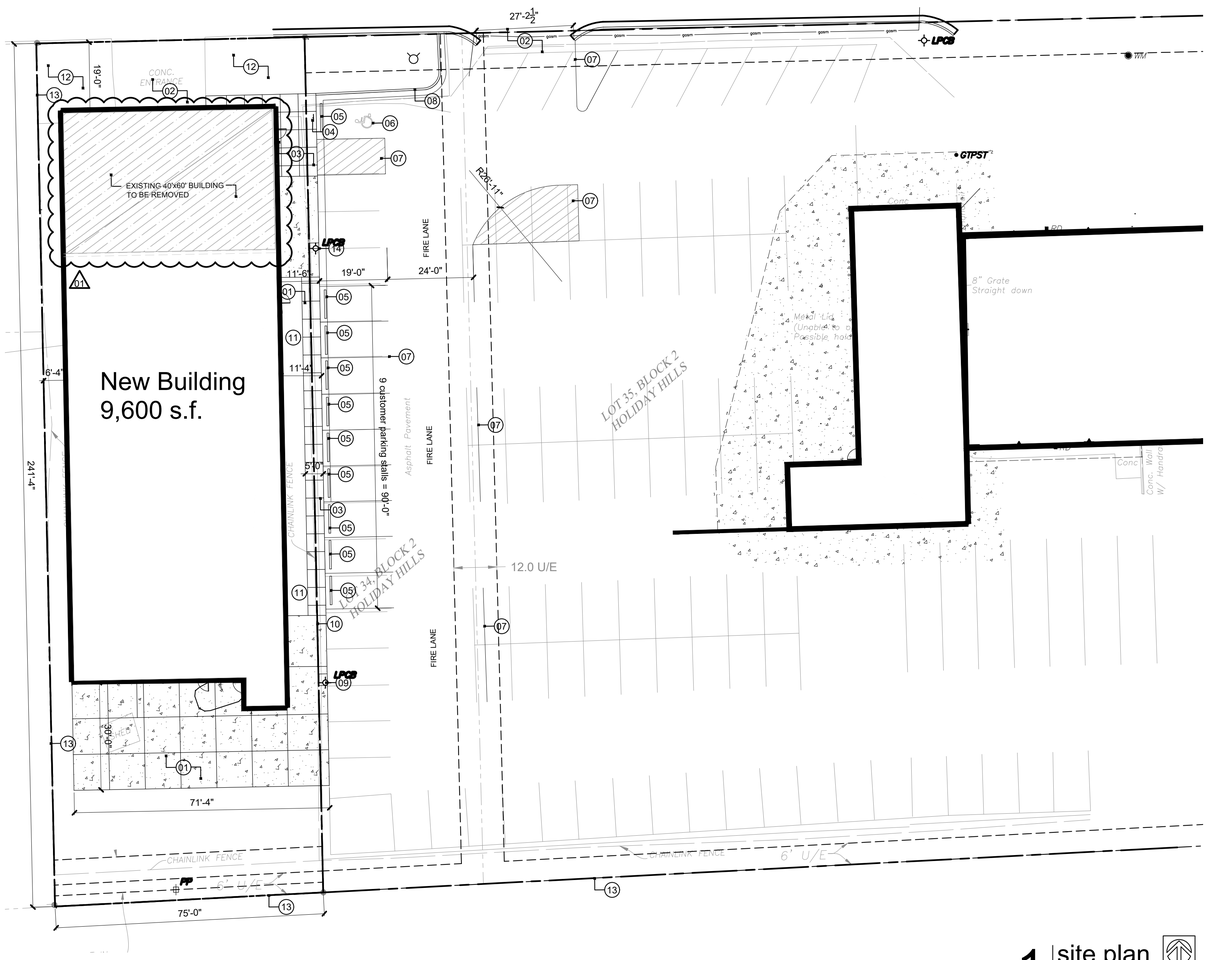
governing municipality:	Lansing, Kansas
site area:	+/- 18,019 sq.ft. (+/- 0.414 acres)
zoning:	B-3
building stories:	one (existing and proposed)
parking requirements:	1 per employee (10) & 2 per service bay (3) = 16 spaces req'd
new parking provided:	9 stalls + 2 handicap stalls

*all parking will be provided on adjacent lot that has the same owner.

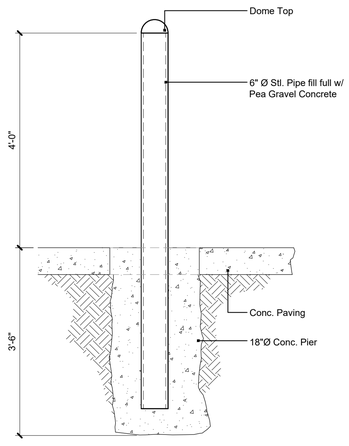


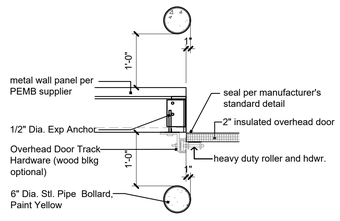


2 handicap signage
scale: not to scale



1 site plan
scale: 1" = 20'-0" north





3 detail - bollard
scale: 3/4" = 1'-0"

construction notes: (##)

1. furnish and install concrete pavement, to abutt to existing asphalt pavement per civil.
2. existing drive to remain.
3. concrete sidewalk, 4" thick with 6x6 10/10 wwf steel mesh. control joints at 5'-0" o.c. broom finish for non-slip surface. to abutt to existing asphalt pavement per civil.
4. furnish and install handicap parking signage.
5. furnish and install parking stop.
6. handicap striping and universal symbol painted with 4" stroke.
7. parking lot striping to be white with 4" stroke.
8. existing concrete curb and gutter to remain.
9. existing parking lot lighting. concrete to not be poured against pole, block out around as shown on site plan.
10. existing fence to removed on east side of building.
11. green space.
12. existing green space.
13. furnish and install a new decorative screening fence per owner requirements.
14. relocate existing parking lot light 10' south.

EDWARD JOHN DAVIDSON JR. LICENSED 4089 KANSAS PROFESSIONAL ARCHITECT

A Proposed Body Shop Addition and Remodel for

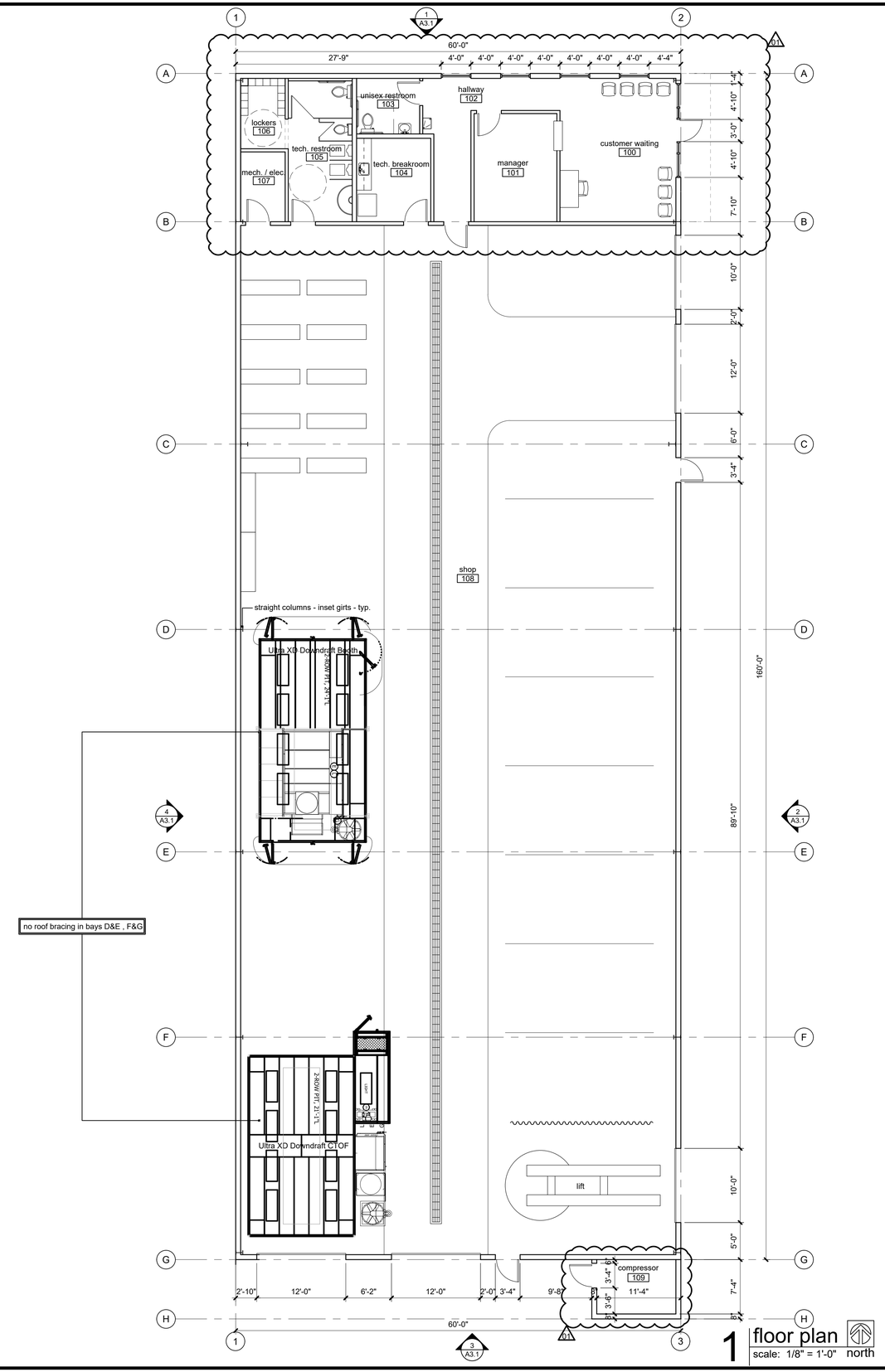
MainStreet of Lansing

555 N Main Street
Lansing, KS 66043

date
01.20.2022
drawn by
kka
checked by
dae
revisions

10.07.2022 permit # 1915	01

sheet number
A1.1
drawing type
permit
project number
21148



1 floor plan

scale: 1/8" = 1'-0" north

davidson
architecture&engineering

4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

EDWARD JOHN DAVIDSON JR. LICENSED 4089 KANSAS PROFESSIONAL ARCHITECT

A Proposed Body Shop Addition and Remodel for

Main Street of Lansing

555 N Main Street
Lansing, Kansas 66043

date
01.20.2022
drawn by
kka
checked by
dae
revisions

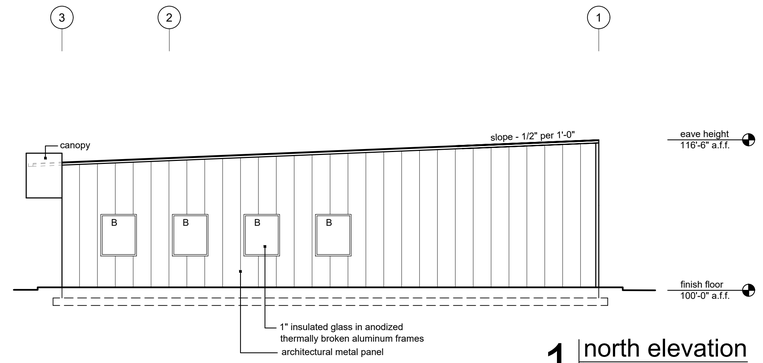
10.07.2022	01
permit # 1915	

sheet number

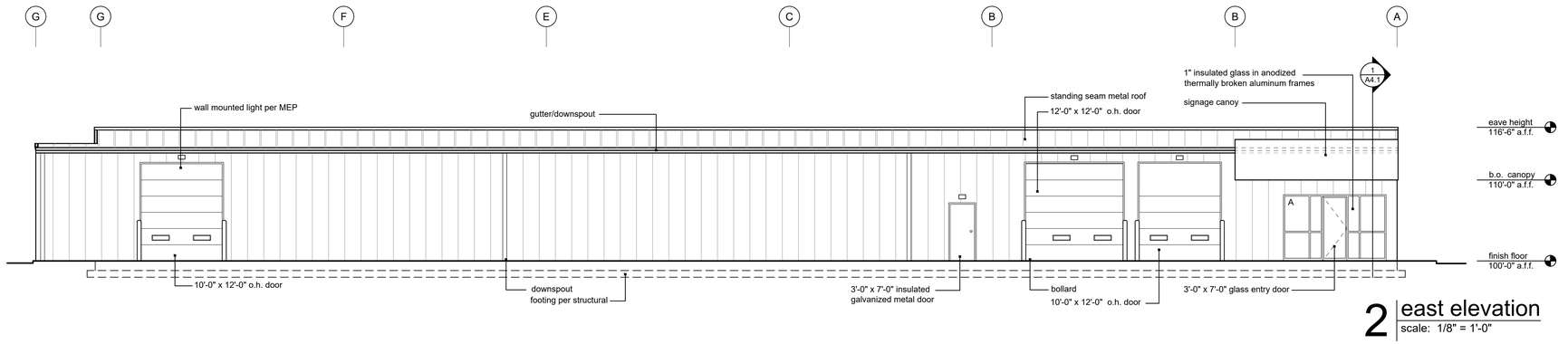
A2.1

drawing type
permit
project number
21148

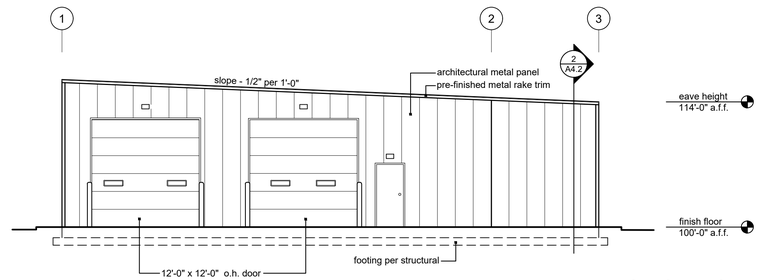
davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com



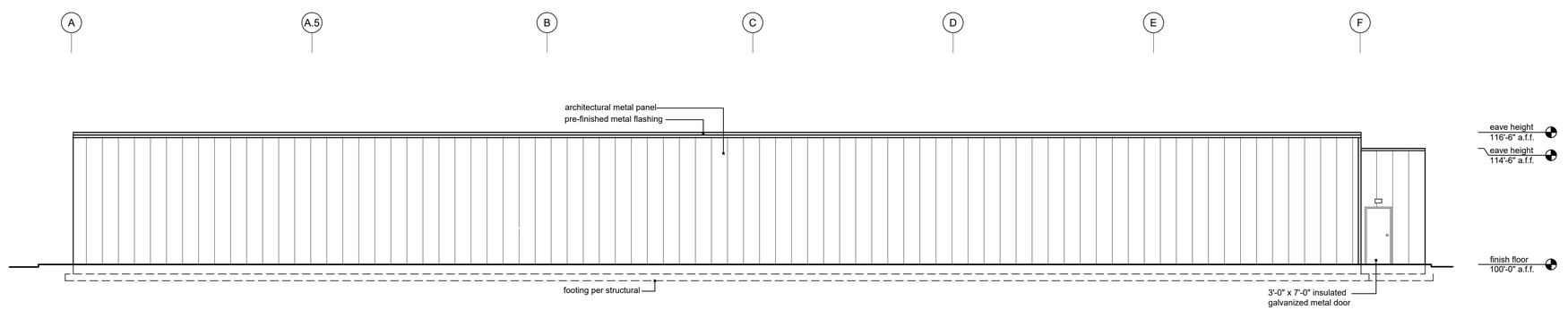
1 north elevation
scale: 1/8" = 1'-0"



2 east elevation
scale: 1/8" = 1'-0"



3 south elevation
scale: 1/8" = 1'-0"



4 west elevation
scale: 1/8" = 1'-0"

Main Street of Lansing

A Proposed Body Shop Addition and Remodel for

555 N Main Street
Lansing, Kansas 66043

date
01.20.2022
drawn by
kka
checked by
dae
revisions

10.07.2022	01
permit # 1915	

sheet number
A3.1
drawing type
permit
project number
21148

The owner/developer is respectfully requesting a waiver from the following requirements defined in the City of Lansing, KS Engineering Design Criteria:

DC/4-1 Design Criteria for Storm Drainage Facilities Section A. General

A. GENERAL. This section sets forth the minimum technical criteria for the analysis and design of drainage systems in the City of Lansing. All development plans submitted for approval to the City of Lansing, and all permits applied for that will increase the amount of impervious surface by 5,000 square feet or more, must be accompanied by an adequate storm drainage system analysis and design in accordance with the criteria as hereinafter described.

The proposed development is limited to 18,018.5 square feet parcel, or 0.41 acres. The proposed increase in impervious area is approximately 8,072 square feet.

Anticipated increases in peak flow are less than 1.5 cfs (cubic feet per second) in all design storm events (10, 25 & 100 yr) due to the small overall property footprint. All runoff is directed to the adjacent property owned by the developer where it is then conveyed to the public storm sewer network.

davidson
ARCHITECTURE + ENGINEERING

Micro Stormwater Study

for:

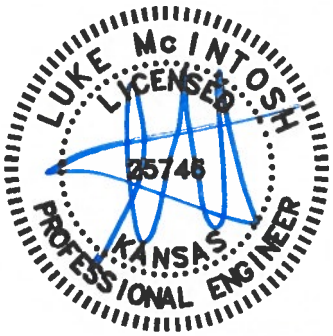
Main Street of Lansing Paint Shop Addition

211 Plaza Drive
Lansing, Jackson County, Kansas 66043
Section 24 – T09S – R22E

Prepared for:
Main Street of Lansing
555 N Main St
Lansing, KS 66043
844-514-8469

Prepared by:
Davidson Architecture & Engineering, LLC
Luke McIntosh, P.E.
4301 Indian Creek Parkway
Overland Park, Kansas 66207
913.451.9390 (phone)
Luke@davidsonae.com

Revised 10.24.2022



10-24-2022

Table of Contents

Appendices

General Information

The project property is located at 211 Plaza Drive, immediately adjacent to the MainStreet of Lansing automotive dealership located at 555 N Main Street.

The site is located within Sections 24 and 35, T09S, R22E. The project will consist of a 6,080 sq. ft. addition to an existing 2,844 sq. ft. metal building, with associated new sidewalks and concrete door aprons. Refer to Figure 1 for location map.

The project is located within the Little Blue River watershed. The majority of the site (95%) is hydrological soil group C and is classified as Sharpsburg silty clay loam complex with 1 to 4 percent slopes.

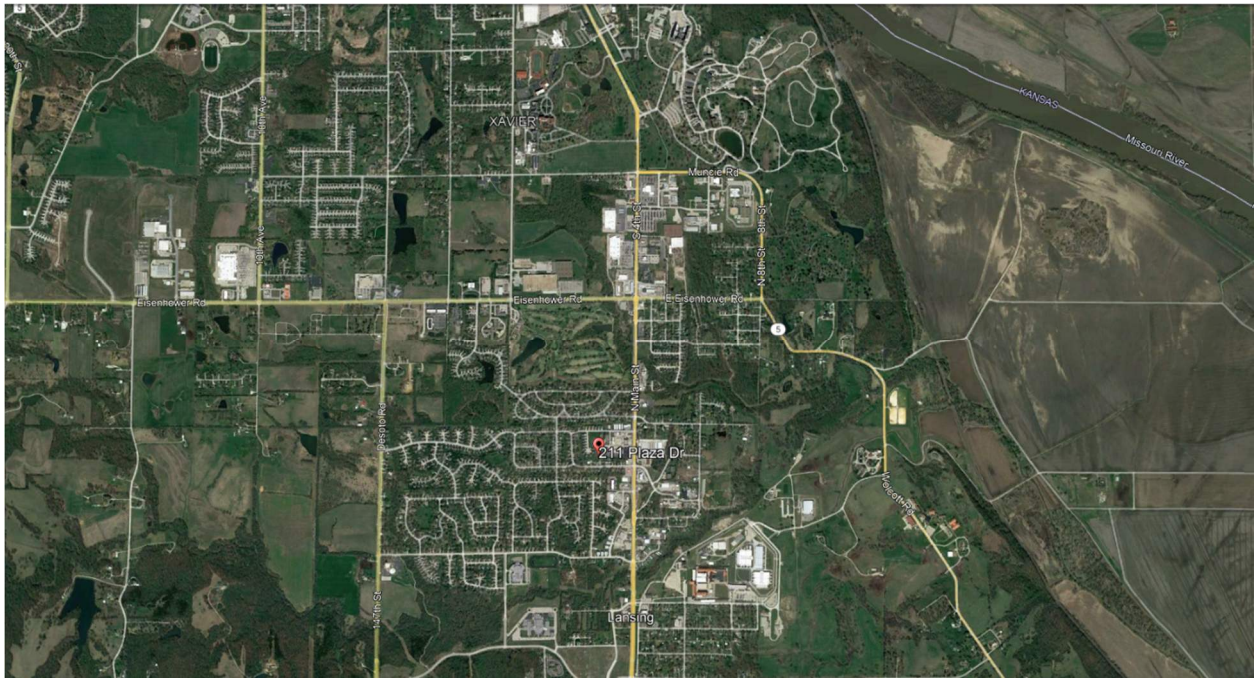


Figure 1 – Location Map (no scale)

Methodology

Existing and Proposed conditions were modeled and analyzed using Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2020 (Hydraflow). Hydraflow Hydrographs Extension for AutoCAD 2021 is used to determine runoff flow amounts for existing and proposed site conditions. Hydraflow computes the rational method runoff hydrographs by convoluting a rainfall hyetograph through a unit hydrograph. Convolution is known as linear superpositioning and means that each ordinate of the rainfall hyetograph is multiplied by each ordinate of the unit hydrograph, thus creating a series of hydrographs. These hydrographs are then summed to form the final runoff hydrograph.

Existing Condition Analysis

The existing metal building is located near the north edge of the project property with an access drive connection to the private Plaza Drive. There is no onsite storm water runoff collection infrastructure. Runoff from the small site generally sheet flows in multiple directions away from the existing building onto adjacent private property. The existing **0.41**-acre project property is 20% impervious (C=0.42).

Soils encountered near the site are primarily (95.0%) Sharpsburg silty clay loam complex, 1 to 4 percent slopes, hydrological soil group C. A small portion (5%) of the site is classified as Sharpsburg silty clay loam with 4 to 8 percent slopes, hydrological soil group C. See Appendix A.

The site lies within Flood Zone X, areas determined to be outside the 0.2% annual chance floodplain, as depicted on the FEMA Flood Insurance Rate Map (FIRM) Map No. 20103C0144G, Effective Date: 7/16/2015. The Flood Insurance Rate Map is included in Appendix A.

Table 1: Existing Runoff Comparison

	Drainage Area (Ac.)	10-year event (cfs)	25-year event (cfs)	100-year event (cfs)	10-year volume (cu. ft.)	25-year vol. (cu. ft.)	100-year vol. (cu. ft.)
Ex. Area A-1	0.41	1.33	1.62	2.08	479	582	748

Proposed Condition Analysis

The proposed development consists of a new 9,600 sq. ft. metal building with associated sidewalks and concrete door aprons. The proposed runoff was analyzed using the Rational Method. The proposed 0.41-acre building addition site was analyzed with 0.30-acre of impervious area and 0.11-acre of pervious area (C=0.74).

The increase in hydrograph volume from existing to proposed conditions is addressed by the proposed extended dry detention. See the Pond Report included on page 11 of Appendix D.

Table 2: Proposed Runoff Comparison (Gross total)

	Drainage Area (Ac.)	10-year (cfs)	25-year (cfs)	100-year (cfs)	10-year volume (cu. ft.)	25-year vol. (cu. ft.)	100-year vol. (cu. ft.)
Prop. Area Combined	0.18	2.32	2.82	3.62	835	1,014	1,303

See Appendix C for Hydraflow results.

Table 3: Existing and Proposed Peak Runoff Comparison

		Drainage Area (ac)	10-year event (cfs)	25-year event(cfs)	100-year event (cfs)
Existing	Onsite Area Peak Q	0.41	1.33	1.62	2.10
Proposed	Onsite Area Peak Q	0.41	2.32	2.82	3.62
	Peak Flow Increase:		**0.99 cfs**	**1.2 cfs**	**1.52 cfs**

The total imperviousness of the project site was increased by approximately 0.22-acres. The small increase in peak flow is summarized in Table 3, above.

The drainage map, provided in Appendix B, depicts the proposed drainage patterns for the site.

Table 4: Existing and Proposed Hydrograph Volume Comparison

	Onsite Area, 0.41 Acres		
	10-year volume (cu.ft)	25-year volume (cu.ft.)	100-year volume (cu.ft.)
Existing	479	582	748
Proposed	835	1,014	1,303
Difference	**356**	**432**	**555**

The existing building will be demolished completely. The new ±9600 square foot building's roof will slope entirely to the east, where it will 'daylight' at grade and sheet flow across the adjacent paved parking lot with common ownership.

This runoff will be released to sheet flow on the adjacent existing paved parking lot. The adjacent paved parking lot is a ±3.46 ac. and is essentially 100% impervious with roofs, concrete, & asphalt. The existing flow pattern is generally west-to-east and diverts to each side of the existing dealership building. There is no apparent on-site storm water infrastructure; Overland sheet flow eventually makes it way to the K-7 (Main Street) right-of-way before being captured by the public storm sewer infrastructure network.

Summary

The owner/developer is respectfully requesting a waiver from the following requirements defined in the City of Lansing, KS Engineering Design Criteria:

DC/4-1 Design Criteria for Storm Drainage Facilities Section A. General
A. GENERAL. This section sets forth the minimum technical criteria for the analysis and design of drainage systems in the City of Lansing. All development plans submitted for approval to the City of Lansing, and all permits applied for that will increase the amount of impervious surface by 5,000 square feet or more, must be accompanied by an adequate storm drainage system analysis and design in accordance with the criteria as hereinafter described.

The proposed development is limited to 18,018.5 square feet parcel, or 0.41 acres. The proposed increase in impervious area is approximately 9,511 square feet.
Anticipated increases in peak flow are less than 1.5 cfs (cubic feet per second) in all design storm events (10, 25 & 100 yr) due to the small overall property footprint, see Table 3 above.

The onsite existing flow patterns will be modified as the new building roof and majority of exterior grade (0.35 of 0.41 acres, 85%) will be redirected to the adjacent paved parking lot to the east of the project site, under common ownership. This flow does not leave owner property until it reaches the public storm sewer network at Main Street. Temporary erosion and sediment controls will be implemented and maintained throughout construction.

Appendix A:

NRCS Web Soil Survey Information

FIRM Map

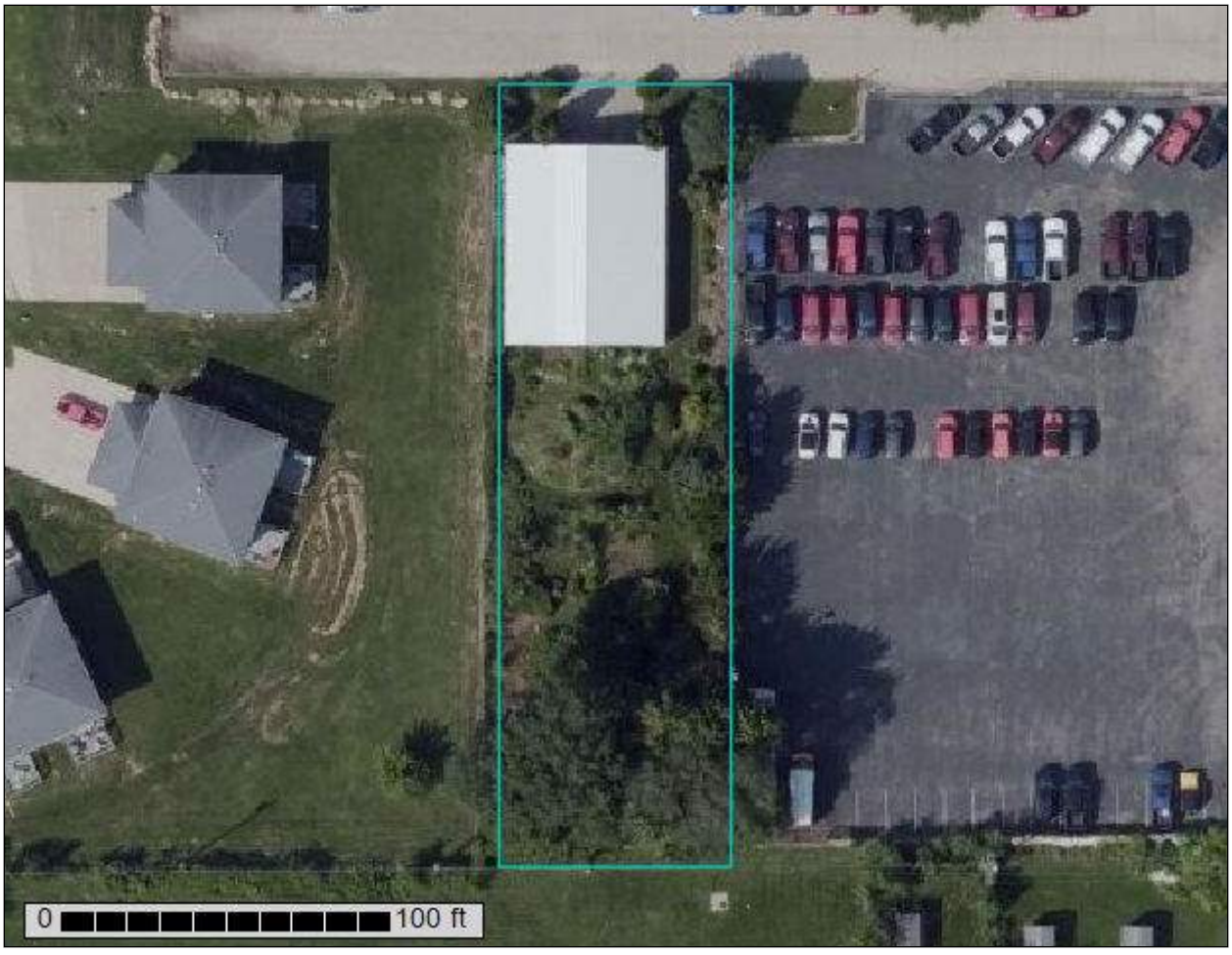
United States Department of Agriculture

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 Leavenworth County, Kansas



December 29, 2021

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

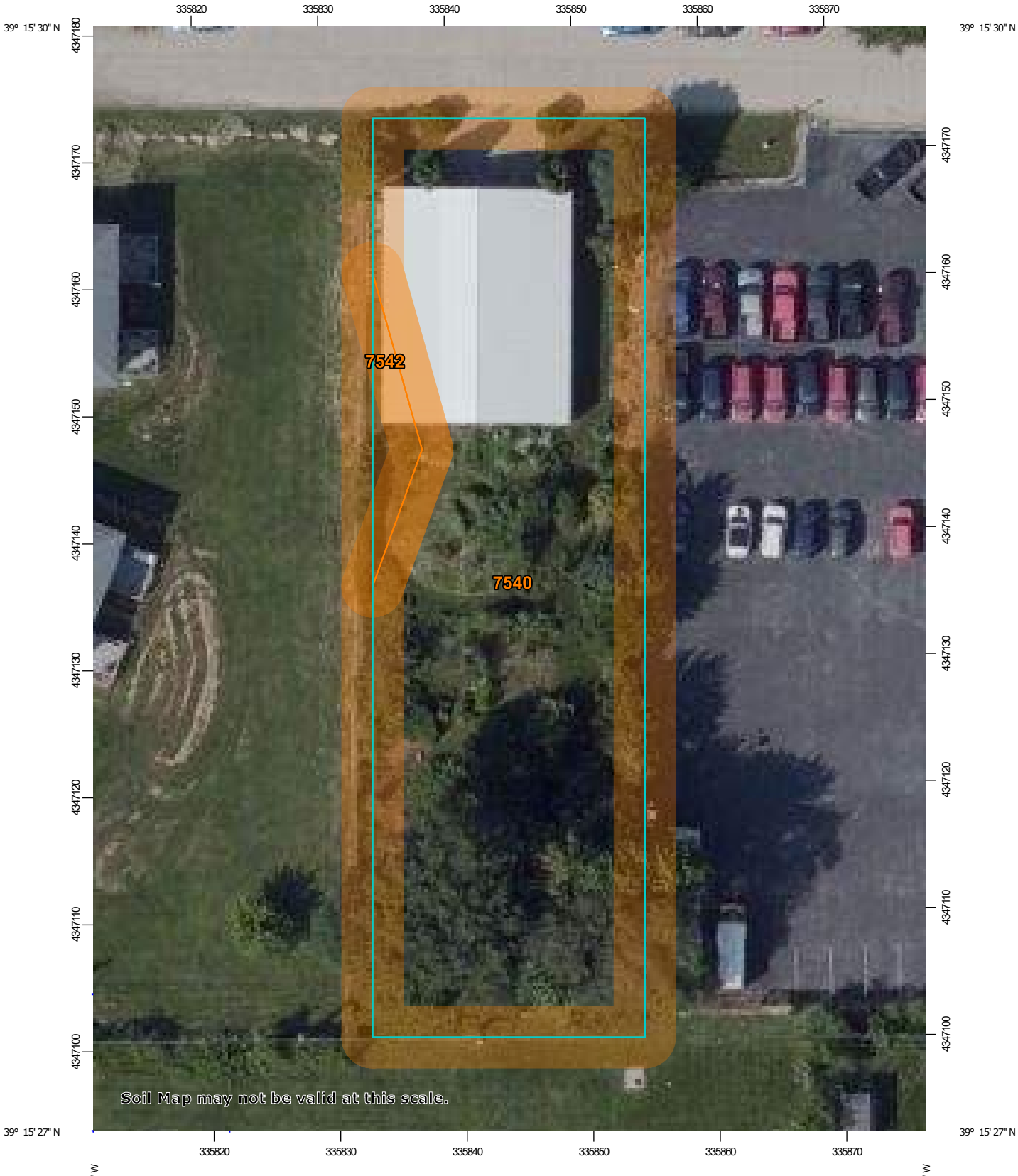
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:424 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 5 10 20 30

Feet: 0 20 40 80 120

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Leavenworth County, Kansas
Survey Area Data: Version 16, Sep 14, 2021

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

Date(s) aerial images were photographed: Jul 16, 2019—Sep 23, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7540	Sharpsburg silty clay loam, 1 to 4 percent slopes	0.4	96.9%
7542	Sharpsburg silty clay loam, 4 to 8 percent slopes, eroded	0.0	3.1%
Totals for Area of Interest		**0.4**	**100.0%**

Map Unit Descriptions

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

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

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

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

onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Leavenworth County, Kansas

7540—Sharpsburg silty clay loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2q4rw
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Sharpsburg

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 12 inches: silty clay loam
Bt1 - 12 to 18 inches: silty clay loam
Bt2 - 18 to 46 inches: silty clay loam
BC - 46 to 58 inches: silty clay loam
C - 58 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 45 to 50 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Forage suitability group: Loam (G106XY100NE)

Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Wymore
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R106XY007KS - Clay Upland (PE 30-37)
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Pawnee
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R106XY007KS - Clay Upland (PE 30-37)
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Sarcoxie
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

7542—Sharpsburg silty clay loam, 4 to 8 percent slopes, eroded

Map Unit Setting
National map unit symbol: 2q4rx
Elevation: 980 to 1,660 feet
Mean annual precipitation: 28 to 39 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 158 to 203 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Sharpsburg, eroded, and similar soils: 85 percent

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

Description of Sharpsburg, Eroded

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 6 inches: silty clay loam
A - 6 to 10 inches: silty clay loam
Bt1 - 10 to 14 inches: silty clay loam
Bt2 - 14 to 46 inches: silty clay loam
BC - 46 to 58 inches: silty clay loam
C - 58 to 79 inches: silty clay loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
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 45 to 50 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Forage suitability group: Loam (G106XY100NE)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Minor Components

Sarcoxie, eroded

Percent of map unit: 8 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Shelby, eroded

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Other vegetative classification: Loam (G106XY100NE)
Hydric soil rating: No

Grundy, eroded

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R106XY007KS - Clay Upland (PE 30-37)
Other vegetative classification: Clayey Subsoil (G106XY210NE)
Hydric soil rating: No

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

AOI Inventory

This folder contains a collection of tabular reports that present a variety of soil information. Included are various map unit description reports, special soil interpretation reports, and data summary reports.

Map Unit Description (Brief, Generated) (211 Plaza Dr Paint Shop)

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 in this report, along with the maps, provide information on the composition of map units and properties of their components.

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.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous

areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated) (211 Plaza Dr Paint Shop)

Leavenworth County, Kansas

Map Unit: 7540—Sharpsburg silty clay loam, 1 to 4 percent slopes

Component: Sharpsburg (85%)

The Sharpsburg component makes up 85 percent of the map unit. Slopes are 1 to 4 percent. This component is on hillslopes on uplands. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 47 inches during February, March, April, May. Organic matter content in the surface horizon is about 3 percent. This component is in the R106XY015KS Loamy Upland (PE 30-37) ecological site. Nonirrigated land capability classification is 2e. Irrigated land capability classification is 3e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Wymore (5%)

Generated brief soil descriptions are created for major soil components. The Wymore soil is a minor component.

Component: Pawnee (5%)

Generated brief soil descriptions are created for major soil components. The Pawnee soil is a minor component.

Component: Sarcoxie (5%)

Generated brief soil descriptions are created for major soil components. The Sarcoxie soil is a minor component.

Map Unit: 7542—Sharpsburg silty clay loam, 4 to 8 percent slopes, eroded

Component: Sharpsburg, eroded (85%)

The Sharpsburg, eroded component makes up 85 percent of the map unit. Slopes are 4 to 8 percent. This component is on hillslopes on uplands. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 47 inches during February, March, April, May. Organic matter content in the surface horizon is about 3 percent. This component is in the R106XY015KS Loamy Upland (PE 30-37) ecological site. Nonirrigated land capability classification is 3e. Irrigated land capability classification is 4e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Sarcoxie, eroded (8%)

Generated brief soil descriptions are created for major soil components. The Sarcoxie, eroded soil is a minor component.

Component: Shelby, eroded (5%)

Generated brief soil descriptions are created for major soil components. The Shelby, eroded soil is a minor component.

Component: Grundy, eroded (2%)

Generated brief soil descriptions are created for major soil components. The Grundy, eroded soil is a minor component.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was NAD 1983 State Plane Kansas North, zone 1501. The **Horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov/.

Base Map Information shown on this FIRM was provided in digital format by Leavenworth County GIS Department. This information was photogrammetrically compiled at a scale of 1:1,200 from aerial photography dated 2012.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

The "profile baselines" represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile baseline", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

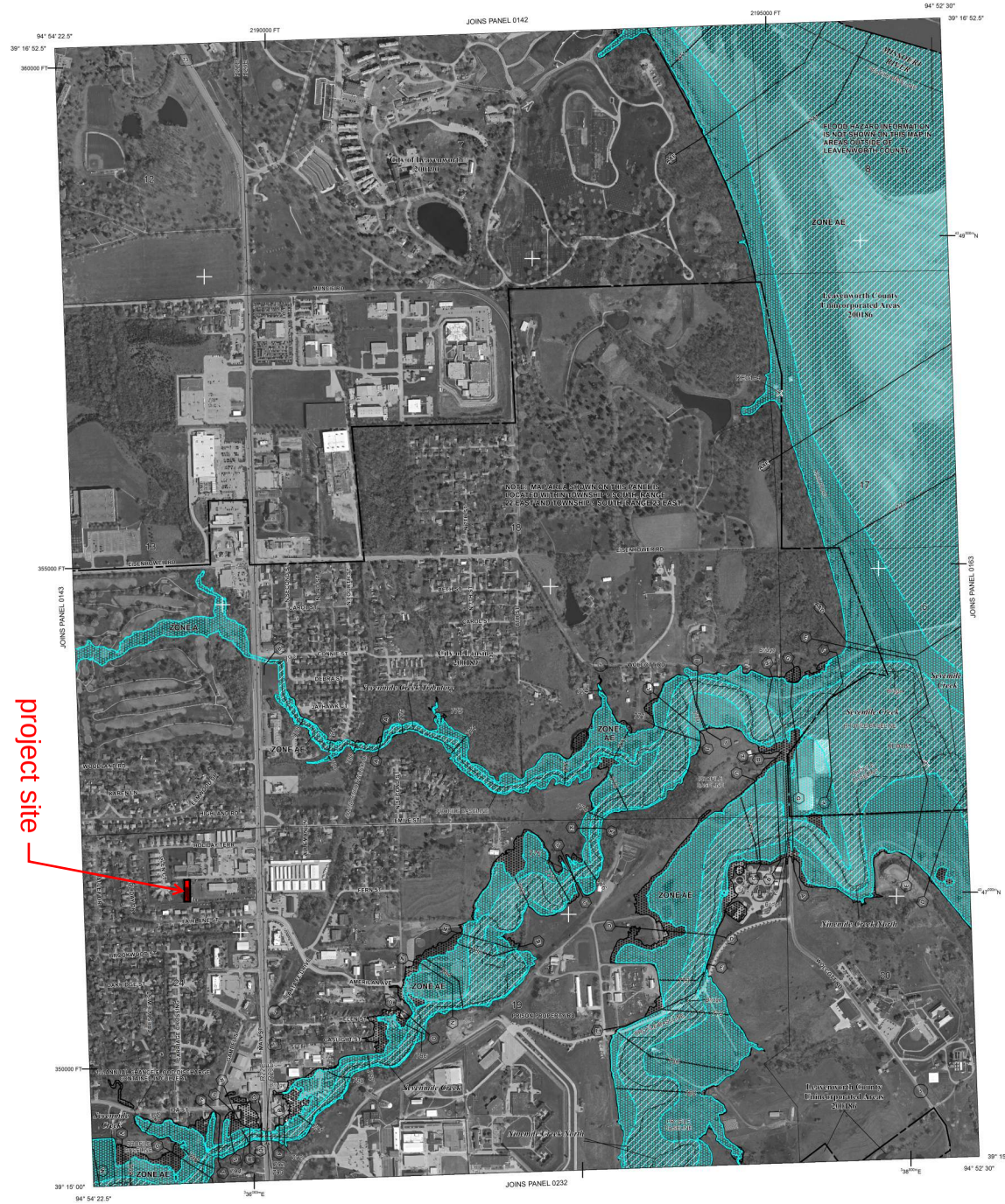
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

LEAVENWORTH COUNTY, KANSAS FIRM PANEL LOCATOR DIAGRAM



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAS)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.
- CBRS and OPA boundary
- International, State, or County boundary
- Corporate, Extraterritorial Jurisdiction, or Urban Growth boundary
- Area Not Included boundary
- Military Reservation, Native American Lands boundary
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276 000mE — 1000-meter Universal Transverse Mercator grid values, zone 14
- 600000 FT — 5000-foot grid ticks: Kansas State Plane coordinate system (FIPS 1501), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile
- Culvert, Flume, Penstock, or Aqueduct
- Road or Railroad Bridge

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 18, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
July 16, 2015 - to reflect updated topographic information

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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

MAP SCALE 1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0144G

FIRM
FLOOD INSURANCE RATE MAP

LEAVENWORTH COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 144 OF 425
(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LANSING, CITY OF	200189	0144	G
LEAVENWORTH COUNTY	200186	0144	G
LEAVENWORTH, CITY OF	200190	0144	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

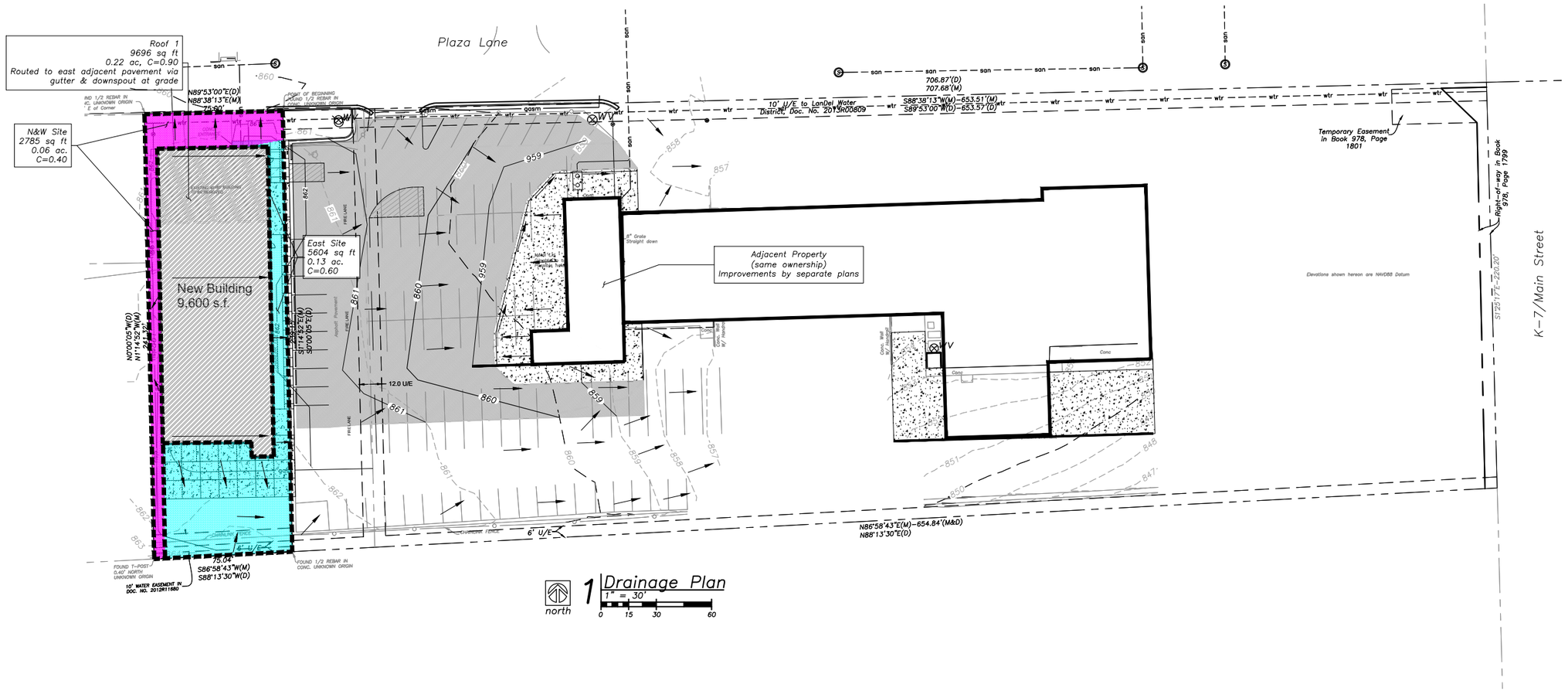
MAP NUMBER
20103C0144G
MAP REVISED
JULY 16, 2015

Federal Emergency Management Agency

Appendix B:

Proposed Condition Drainage Map

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9380
fax: 913.451.9381
www.davidsonae.com



north **1** *Drainage Plan*
1" = 30'
0 15 30 60

Property Legend

- right of way
- property lines
- easements
- setbacks

Grading Legend

- existing minor contour
- existing major contour
- proposed minor contour
- proposed major contour

ONE CALL KANSAS 811
Know what's below.
Call before you dig.

Floodplain Note:

This property lies within Flood Zone X, defined as areas outside the 0.2% annual chance floodplain, as shown on the Flood Insurance Rate Map, prepared by Federal Emergency Agency's National Flood Insurance Program for the City of Lansing, Leavenworth County, Kansas, Map Number 20103C0144G, dated July 16, 2015.

Impervious Area Summary:

Project Site Area:	*18,018.5 sq ft. (0.41 ac.)*
Adjacent Site Area:	*≈151,000 sq ft (3.46 ac.)*
Total Area:	*3.87 ac.*
Existing Conditions:	
Project Site Impervious Area:	*3,451.4 sq ft. (0.08 ac.)*
Adjacent Impervious	*151,000 sq. ft. (3.46 ac.)*
Project Site Green Space:	*14,567.10 sq ft. (0.33 ac.)*
Adjacent Green Space	*0 sq ft. (0 ac.)*
Post Construction:	
Project Site Impervious Area:	*12,962 sq ft. (0.30 ac.)*
Adjacent Impervious	*151,000 sq ft. (3.46 ac.)*
Project Site Green Space:	*5056.5 sq ft. (0.11 ac.)*
Adjacent Green Space	*0 sq ft. (0 ac.)*

Impervious Area Increase: 9510.6 sq ft. (0.22 ac.),
*or, **5.68% increase** in impervious of 3.87 ac. total.*

LUKE D. MORTON
25746
KANSAS
PROFESSIONAL ENGINEER

A Proposed Body Shop Addition and Remodel for

MainStreet of Lansing

555 N Main Street
Lansing, KS 66043

date
01.20.2022
drawn by
DAE
checked by
LDM
revisions

10.24.2022	1

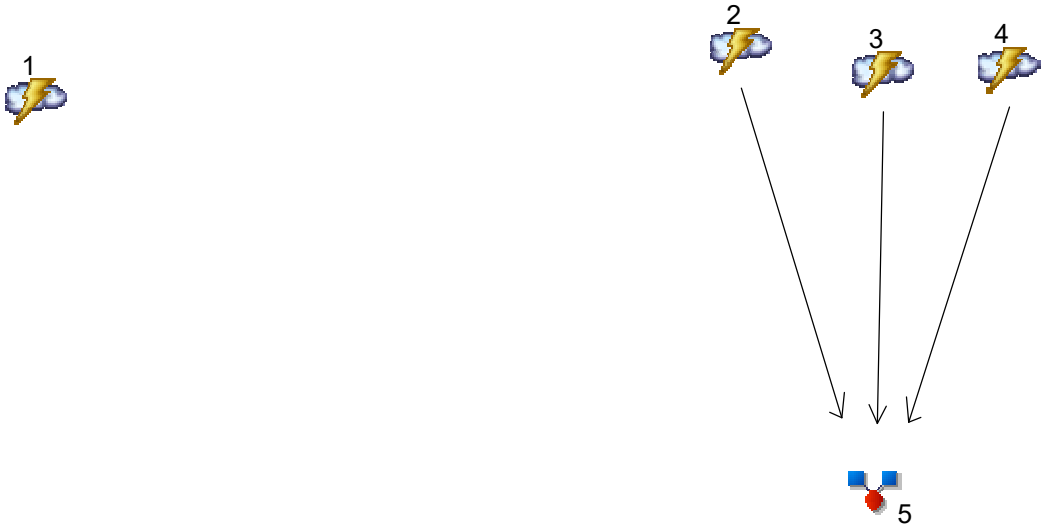
sheet number
C3.1
drawing type
permit
project number
21148

Appendix C:

Hydraflow Output Data

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023



Hydrograph Return Period Recap

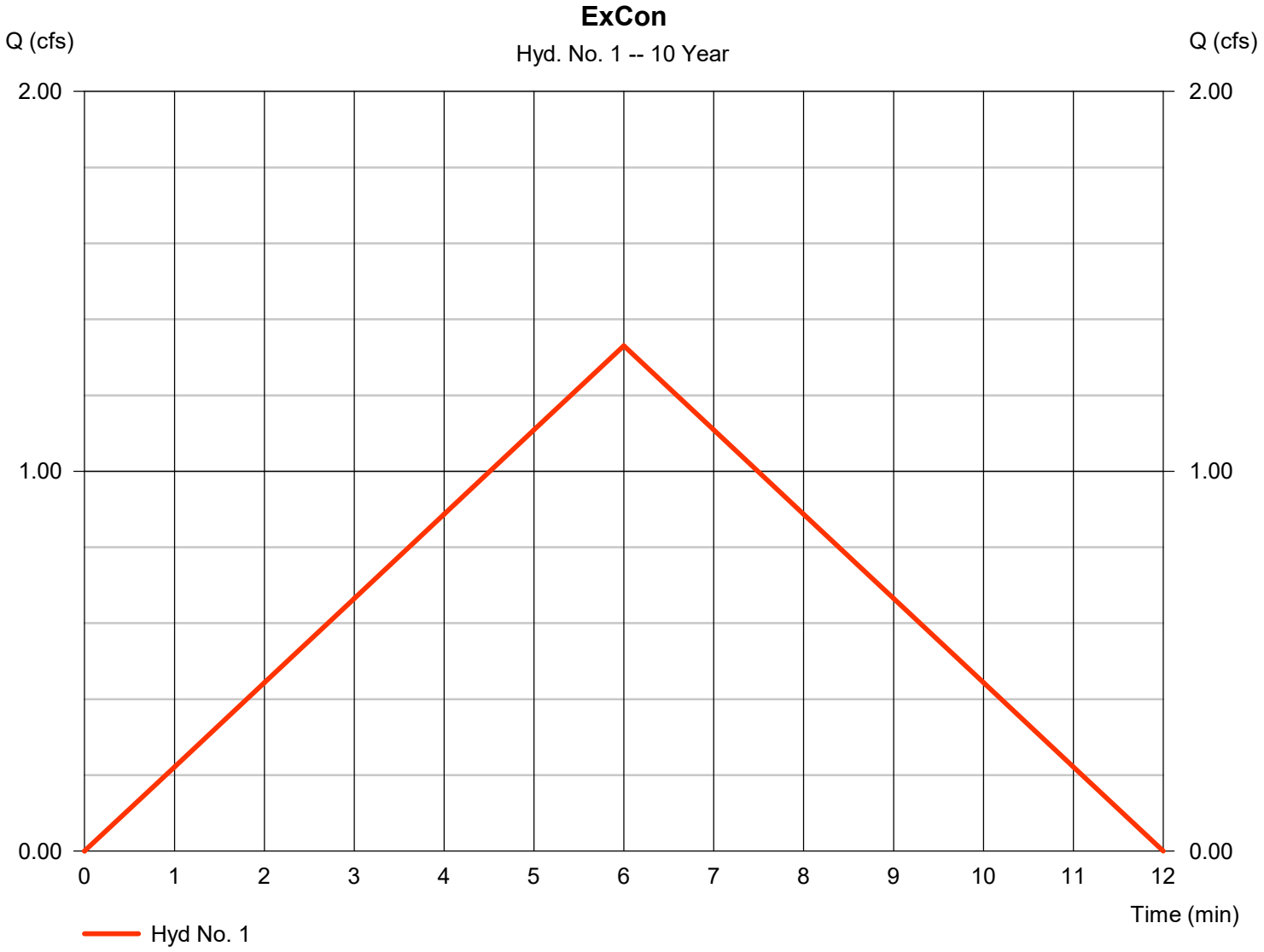
Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	0.764	0.900	-------	1.134	1.331	1.617	1.845	2.078	ExCon
2	Rational	------	0.878	1.035	-------	1.304	1.530	1.860	2.121	2.390	Roofs to Daylight
3	Rational	------	0.106	0.125	-------	0.158	0.185	0.225	0.257	0.290	NW Undetained
4	Rational	------	0.346	0.408	-------	0.514	0.603	0.733	0.836	0.941	east side undetained
5	Combine	2, 3, 4	1.330	1.568	-------	1.975	2.318	2.818	3.214	3.621	Post Dev Gross

Hydrograph Report

Hyd. No. 1

ExCon

Hydrograph type	=	Rational	Peak discharge	=	1.331 cfs
Storm frequency	=	10 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	479 cuft
Drainage area	=	0.410 ac	Runoff coeff.	=	0.42
Intensity	=	7.727 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

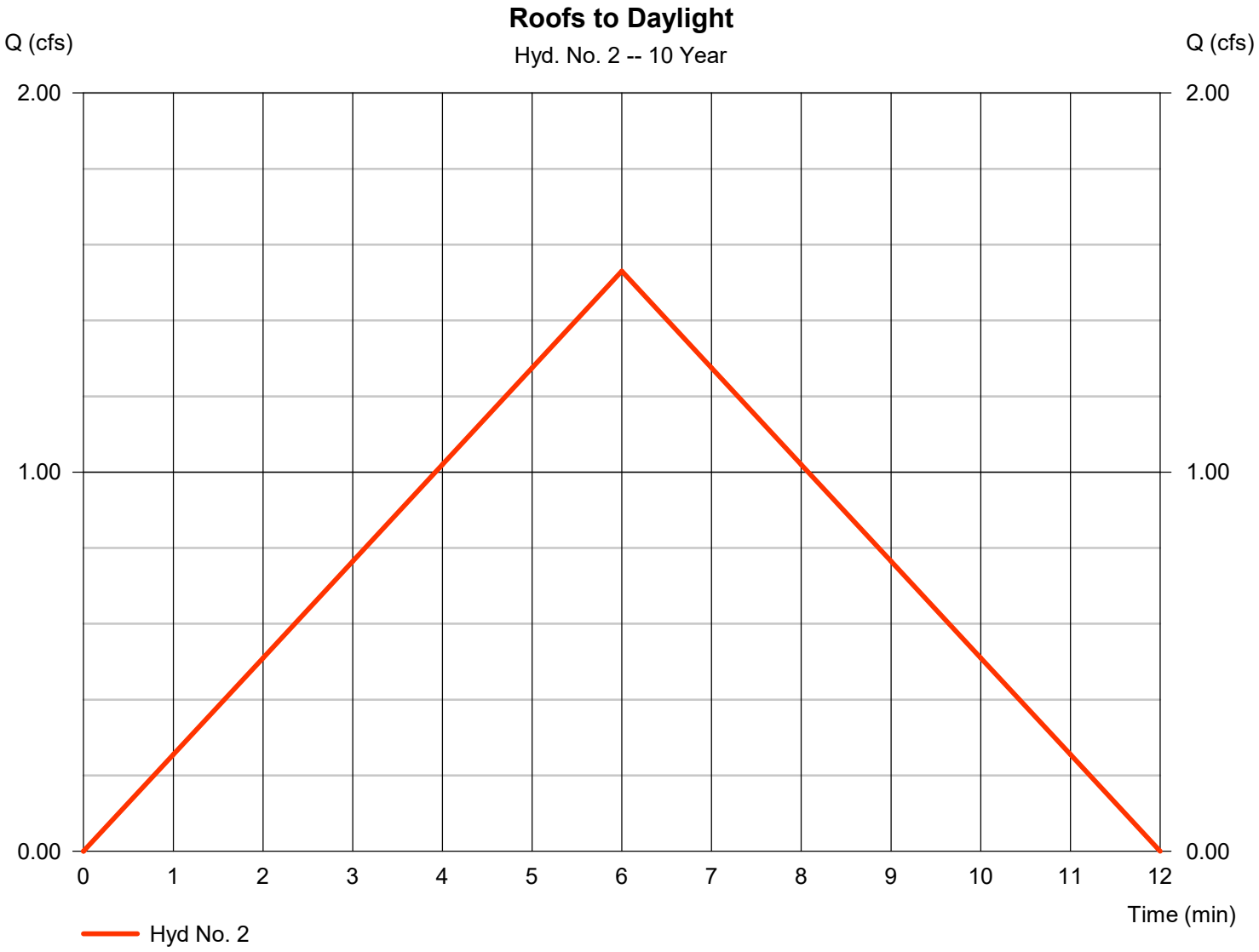


Hydrograph Report

Hyd. No. 2

Roofs to Daylight

Hydrograph type	=	Rational	Peak discharge	=	1.530 cfs
Storm frequency	=	10 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	551 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.9
Intensity	=	7.727 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

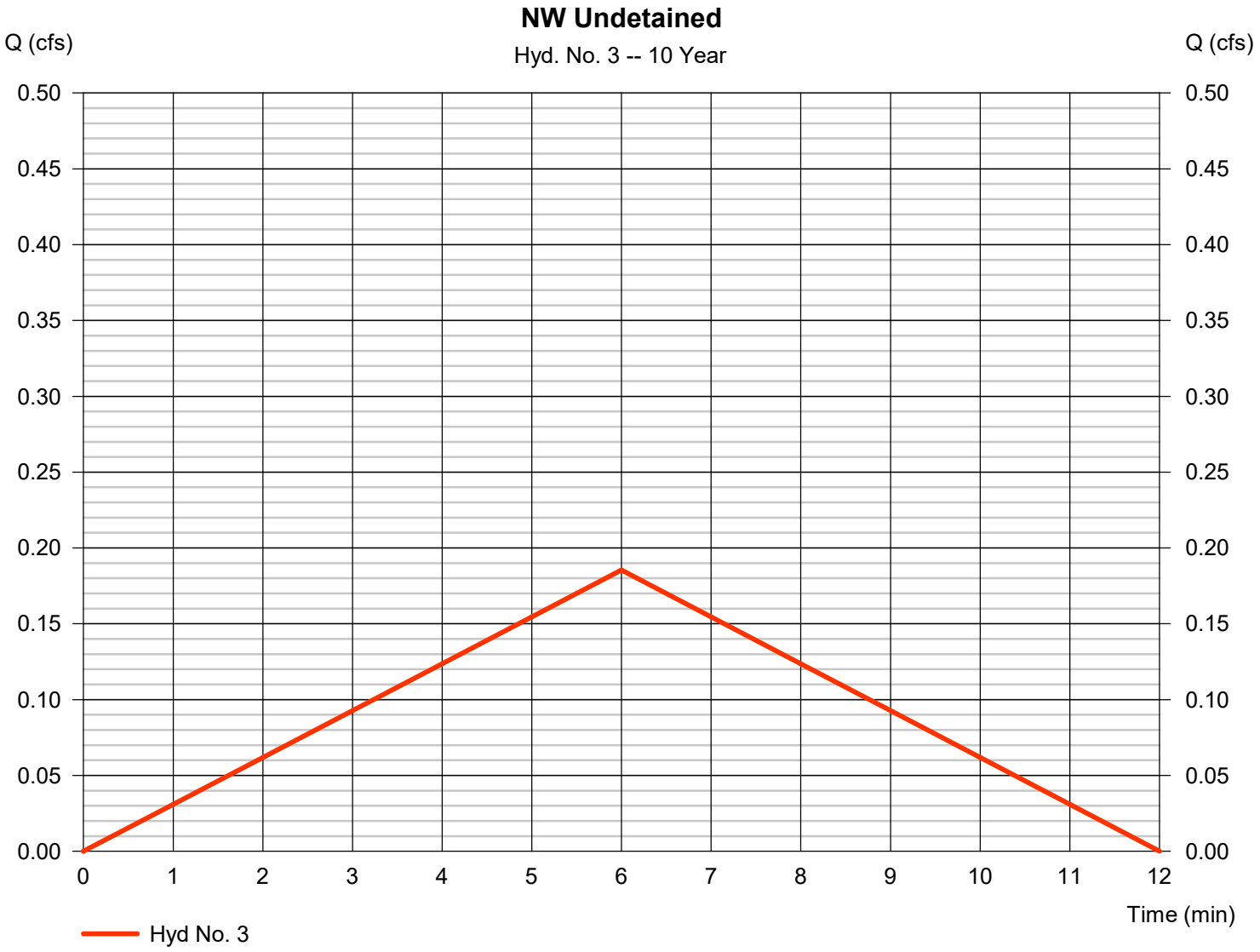


Hydrograph Report

Hyd. No. 3

NW Undetained

Hydrograph type	=	Rational	Peak discharge	=	0.185 cfs
Storm frequency	=	10 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	67 cuft
Drainage area	=	0.060 ac	Runoff coeff.	=	0.4
Intensity	=	7.727 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

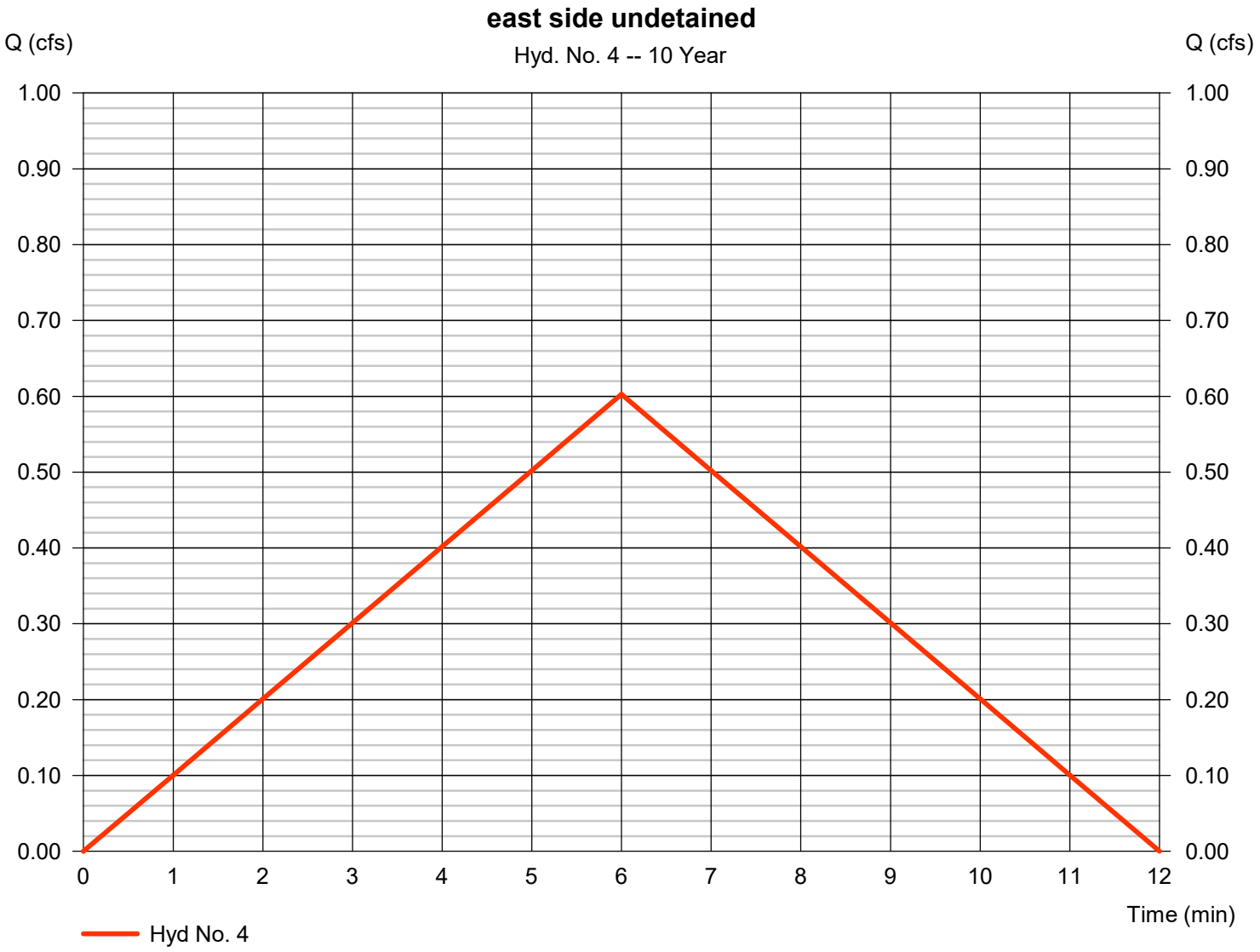


Hydrograph Report

Hyd. No. 4

east side undetained

Hydrograph type	=	Rational	Peak discharge	=	0.603 cfs
Storm frequency	=	10 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	217 cuft
Drainage area	=	0.130 ac	Runoff coeff.	=	0.6
Intensity	=	7.727 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

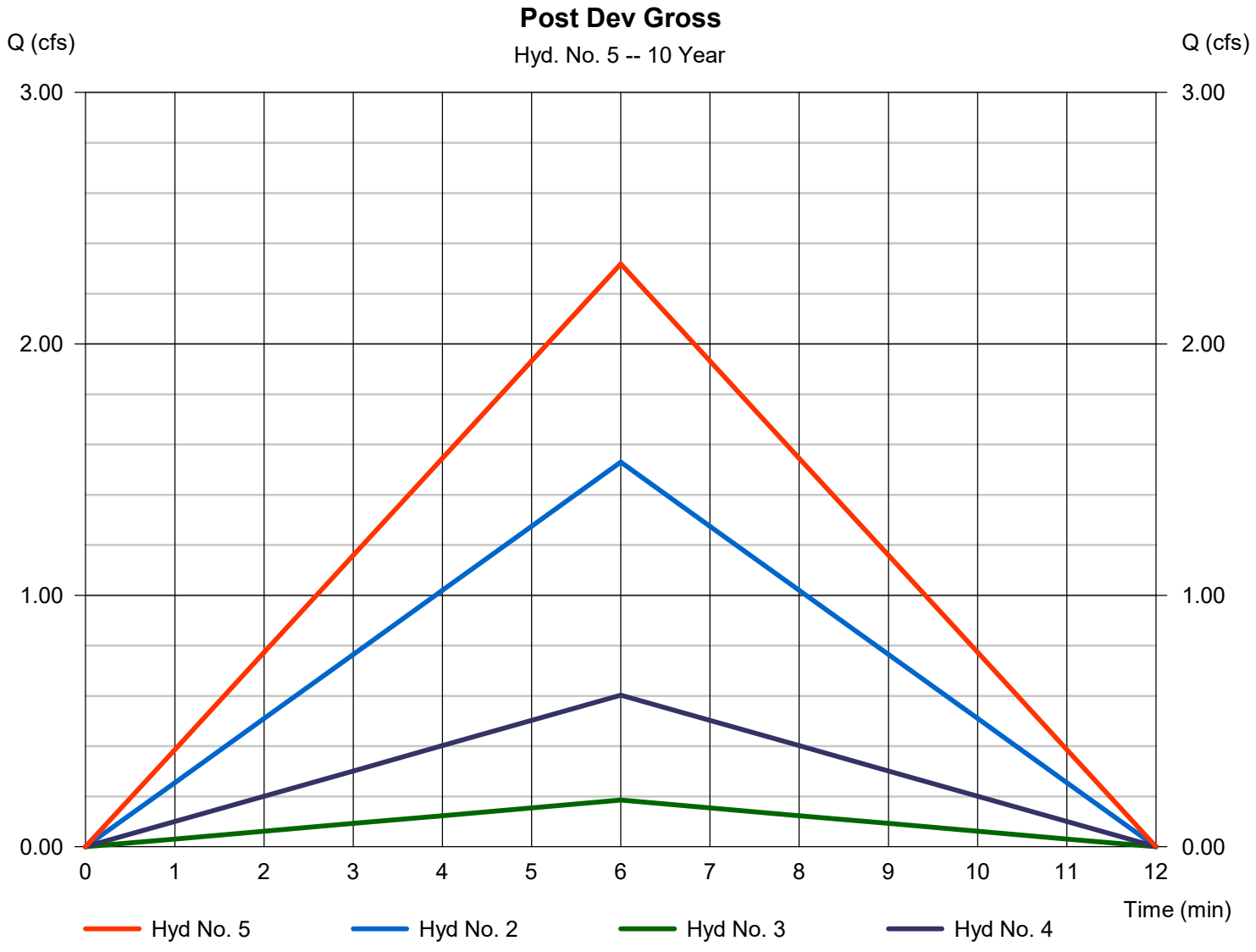


Hydrograph Report

Hyd. No. 5

Post Dev Gross

Hydrograph type	=	Combine	Peak discharge	=	2.318 cfs
Storm frequency	=	10 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	835 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	0.410 ac

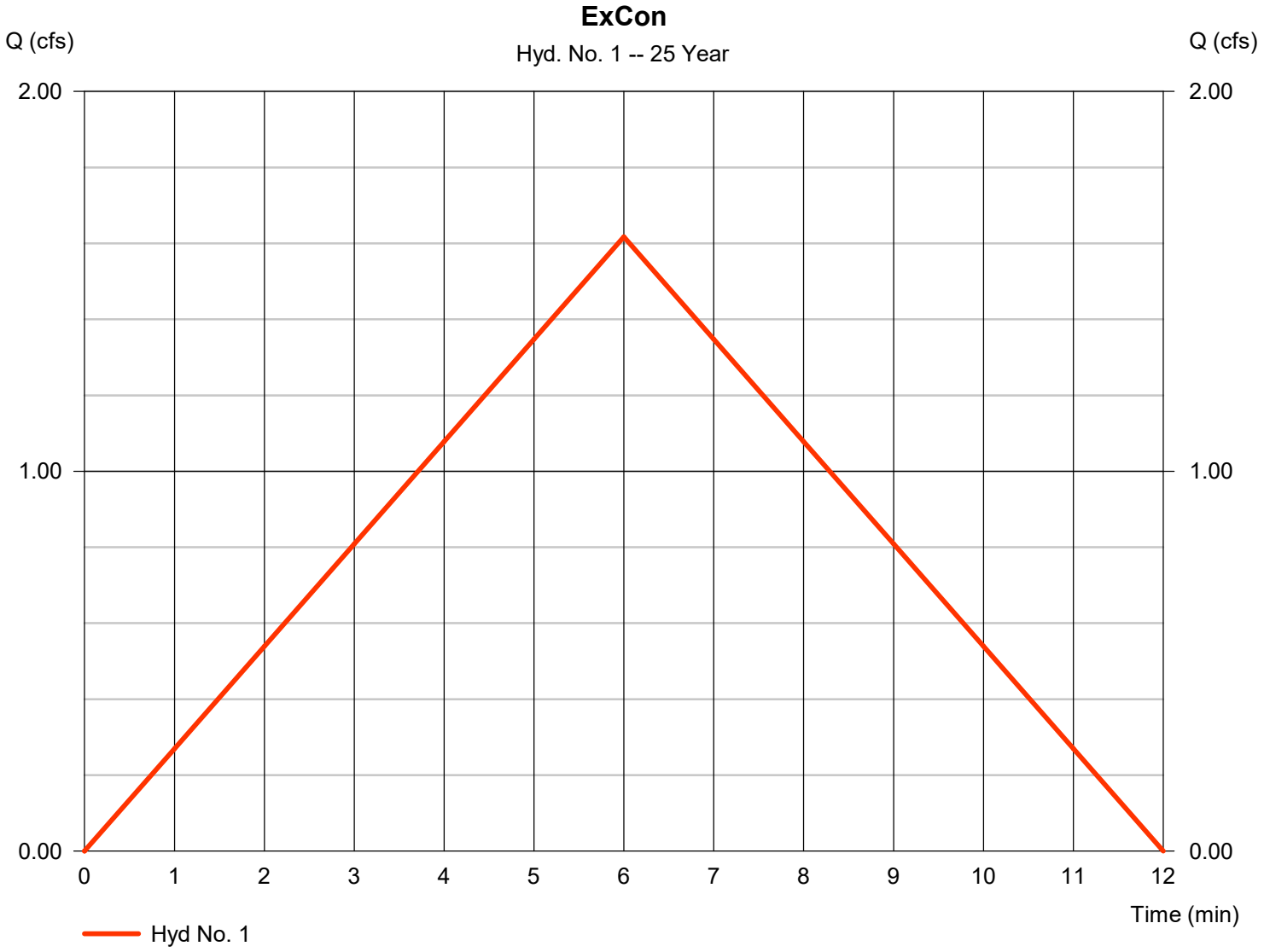


Hydrograph Report

Hyd. No. 1

ExCon

Hydrograph type	=	Rational	Peak discharge	=	1.617 cfs
Storm frequency	=	25 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	582 cuft
Drainage area	=	0.410 ac	Runoff coeff.	=	0.42
Intensity	=	9.392 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

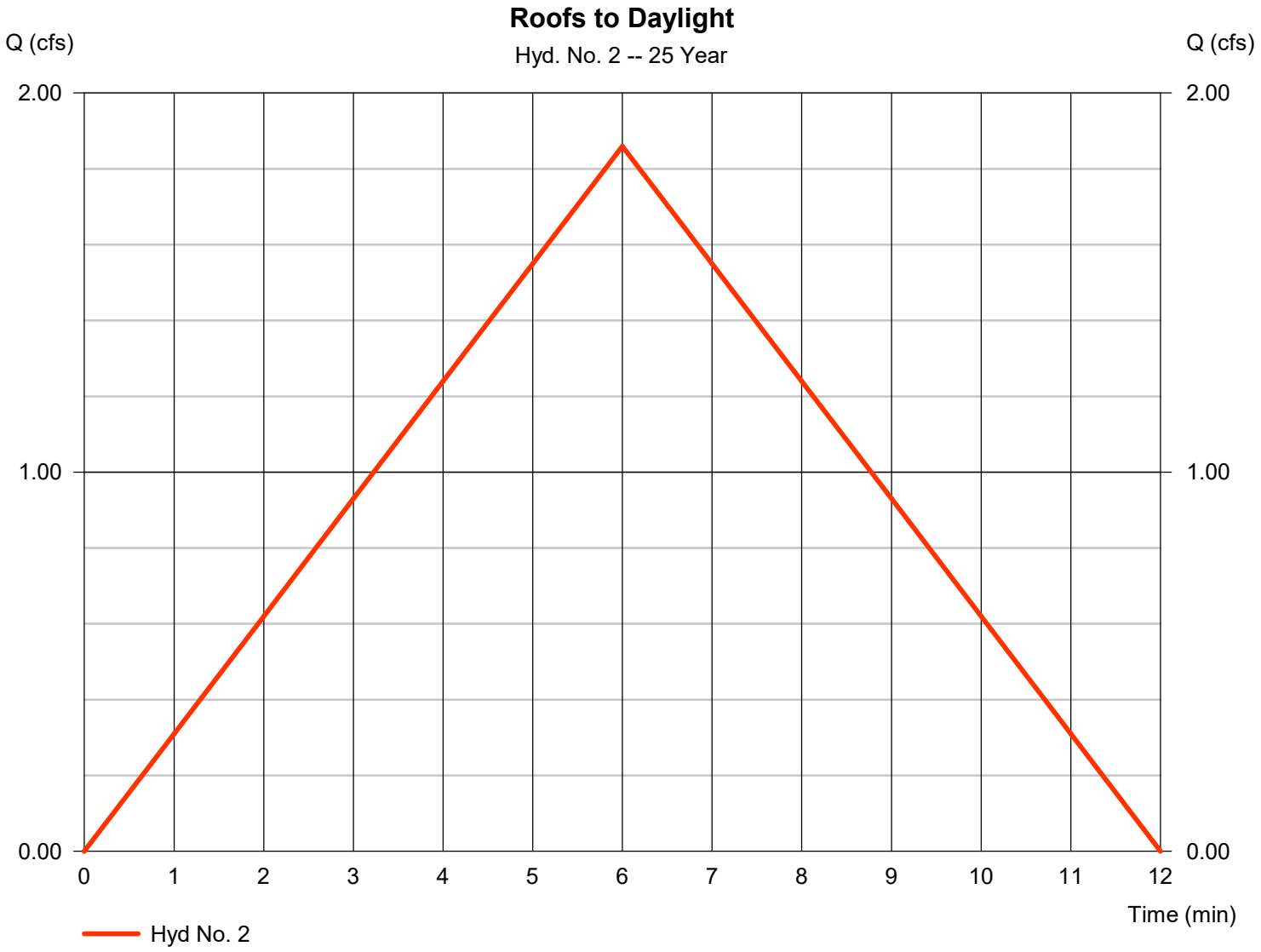


Hydrograph Report

Hyd. No. 2

Roofs to Daylight

Hydrograph type	=	Rational	Peak discharge	=	1.860 cfs
Storm frequency	=	25 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	669 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.9
Intensity	=	9.392 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

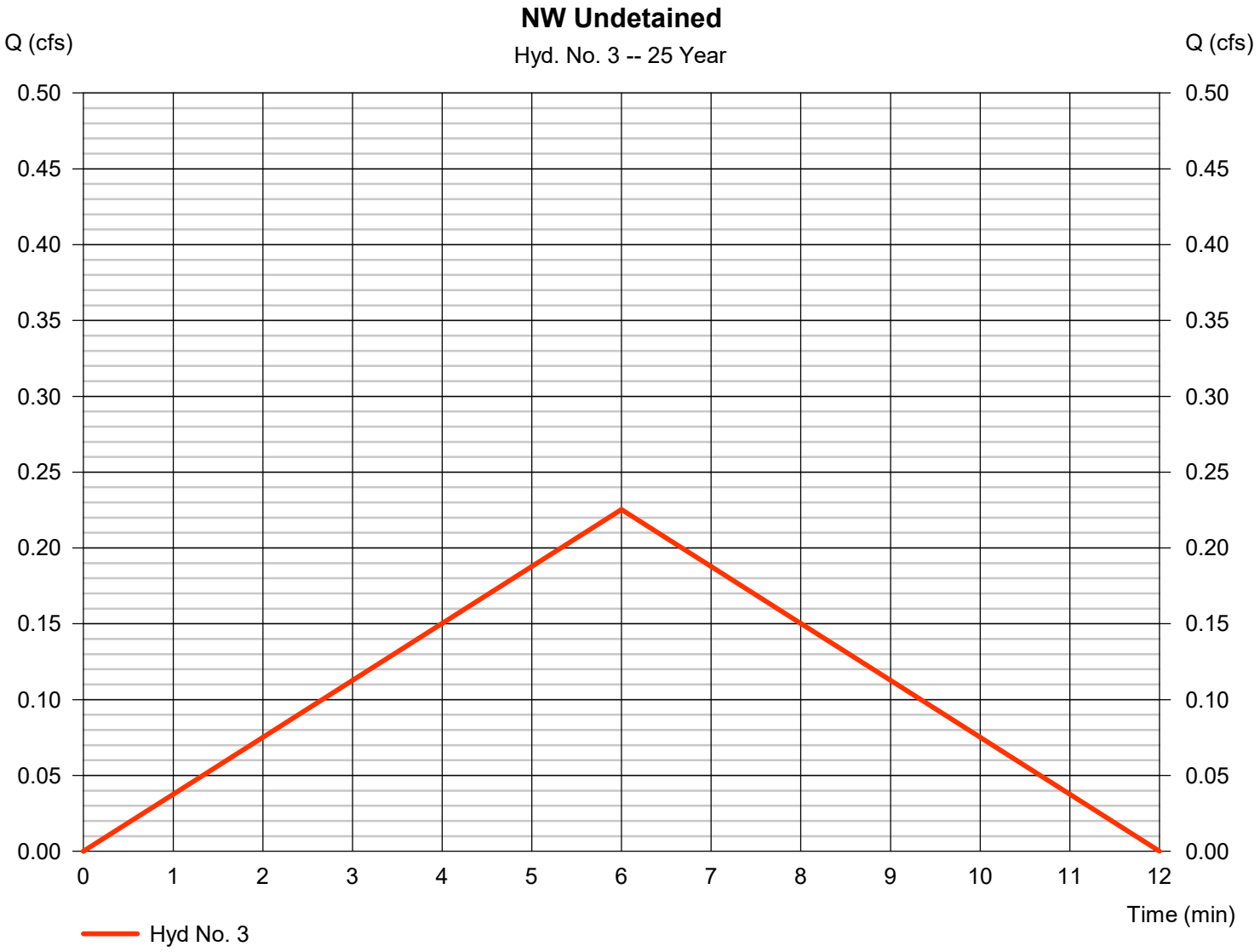


Hydrograph Report

Hyd. No. 3

NW Undetained

Hydrograph type	=	Rational	Peak discharge	=	0.225 cfs
Storm frequency	=	25 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	81 cuft
Drainage area	=	0.060 ac	Runoff coeff.	=	0.4
Intensity	=	9.392 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

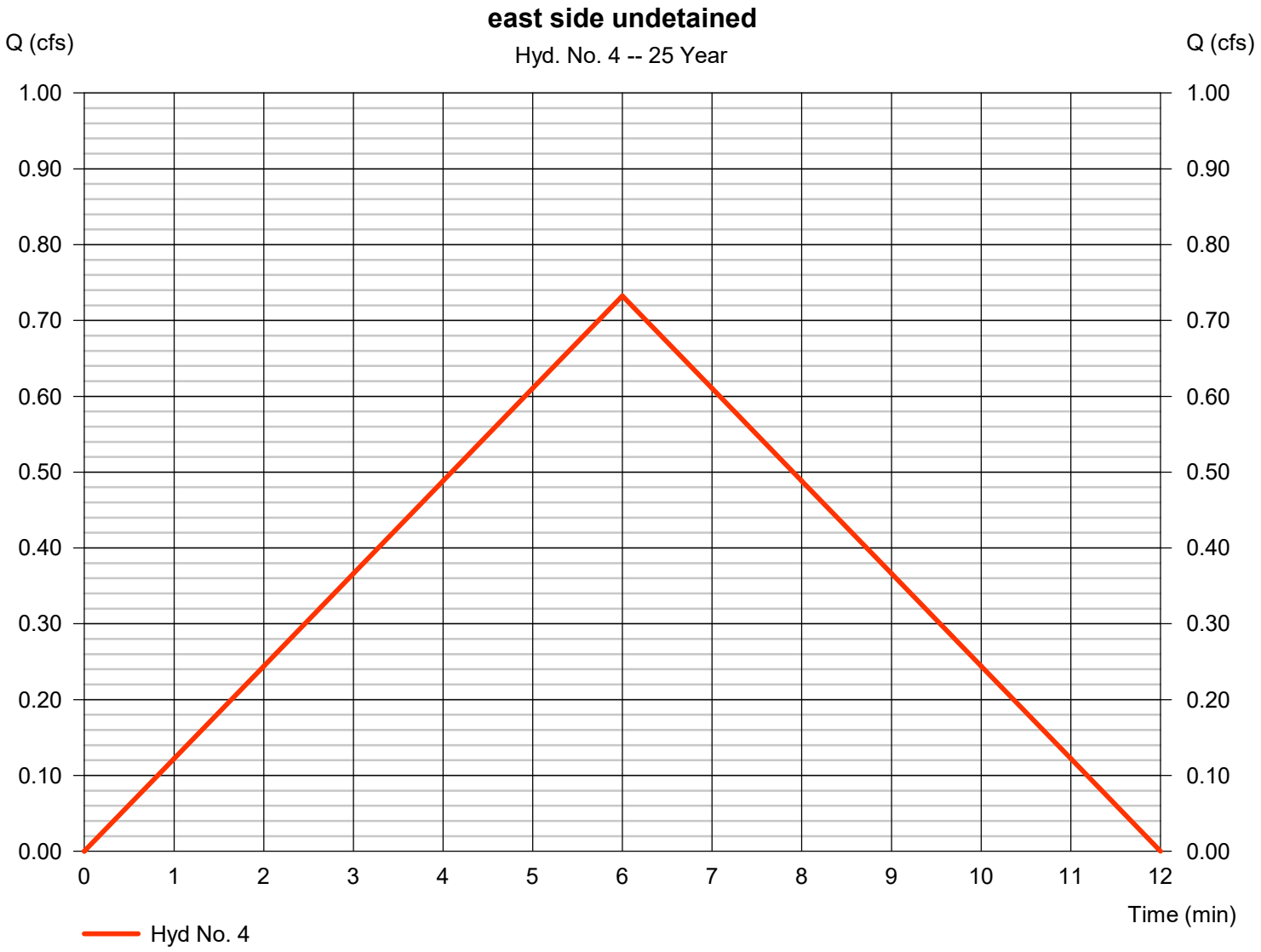


Hydrograph Report

Hyd. No. 4

east side undetained

Hydrograph type	=	Rational	Peak discharge	=	0.733 cfs
Storm frequency	=	25 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	264 cuft
Drainage area	=	0.130 ac	Runoff coeff.	=	0.6
Intensity	=	9.392 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

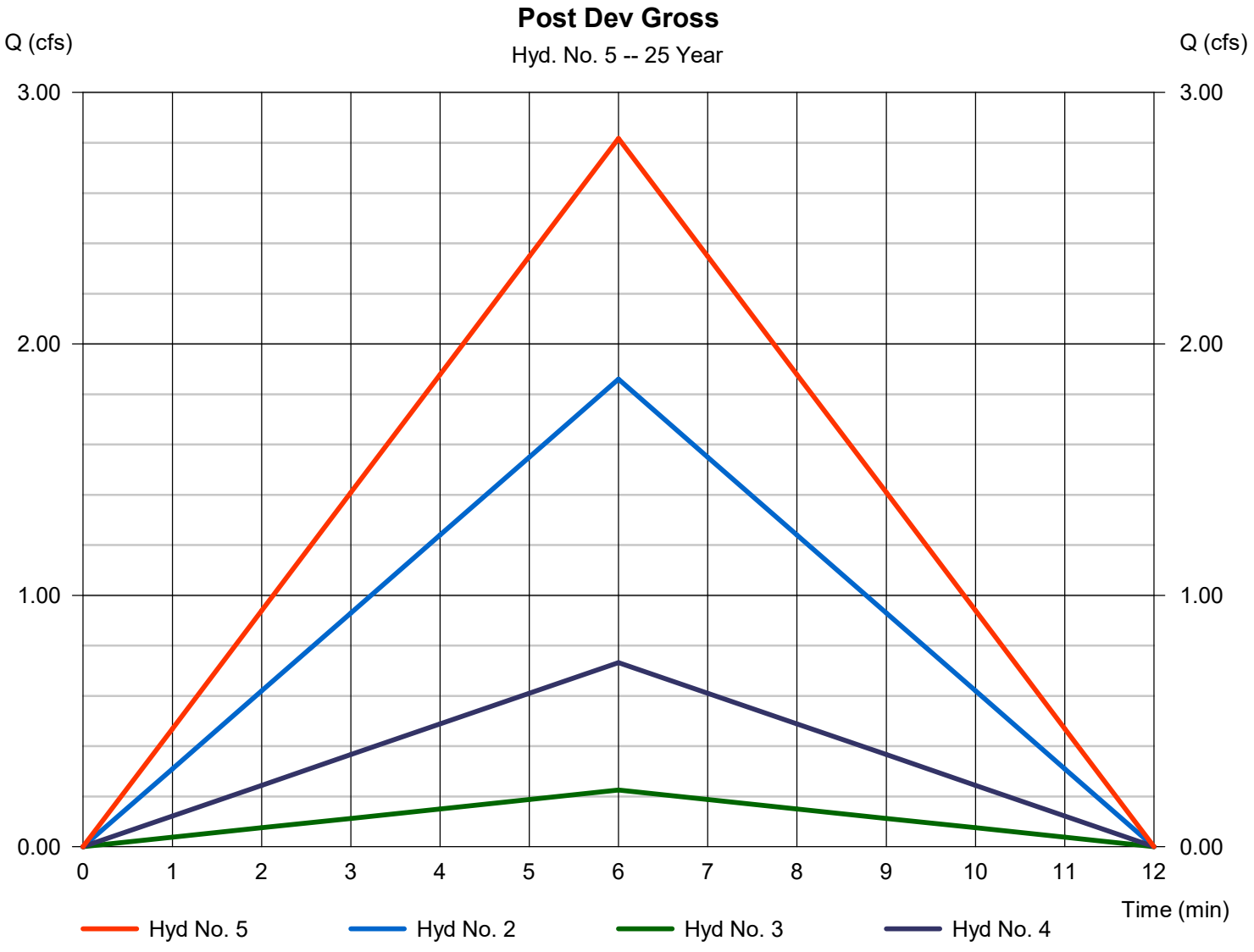


Hydrograph Report

Hyd. No. 5

Post Dev Gross

Hydrograph type	=	Combine	Peak discharge	=	2.818 cfs
Storm frequency	=	25 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	1,014 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	0.410 ac

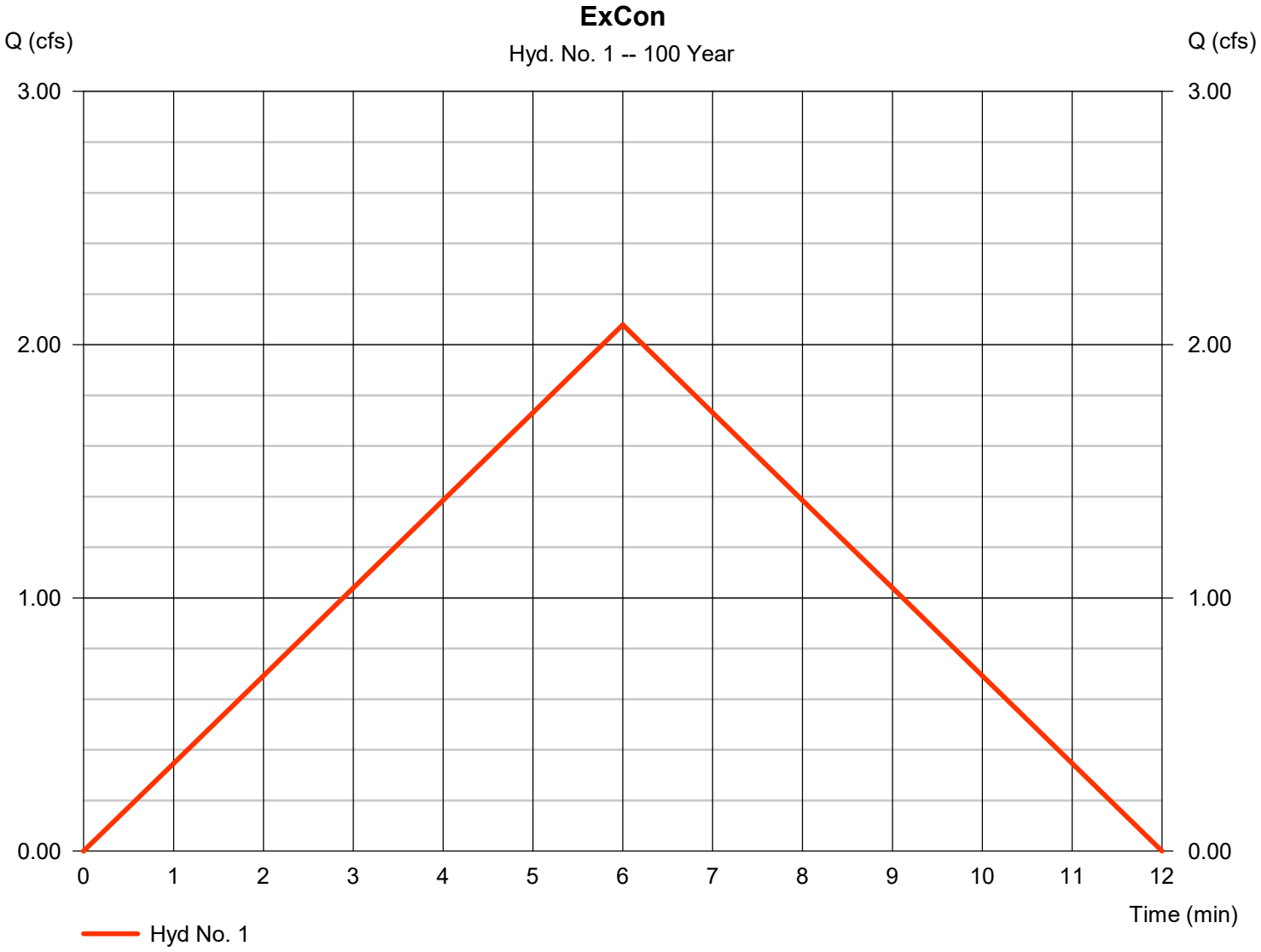


Hydrograph Report

Hyd. No. 1

ExCon

Hydrograph type	=	Rational	Peak discharge	=	2.078 cfs
Storm frequency	=	100 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	748 cuft
Drainage area	=	0.410 ac	Runoff coeff.	=	0.42
Intensity	=	12.069 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

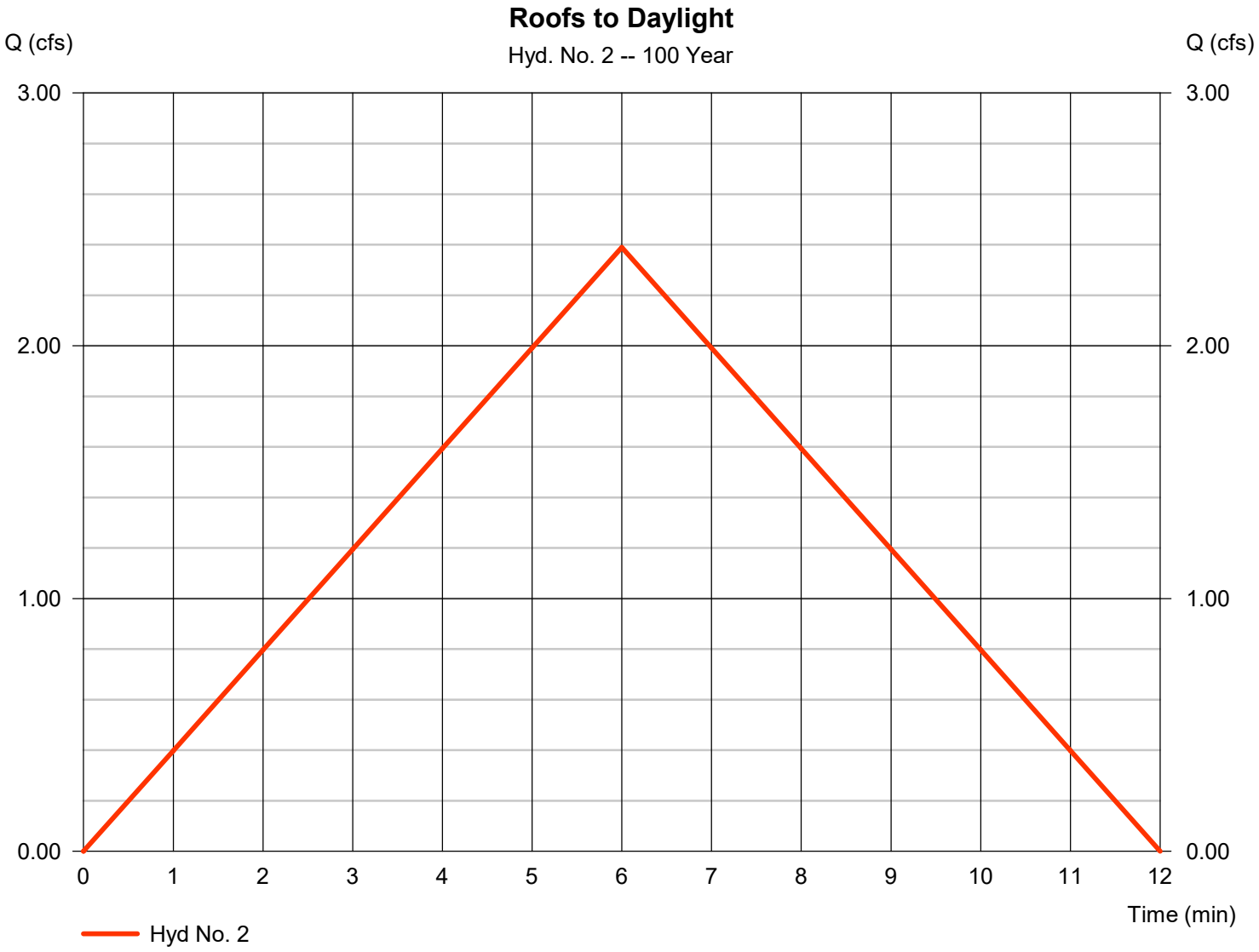


Hydrograph Report

Hyd. No. 2

Roofs to Daylight

Hydrograph type	=	Rational	Peak discharge	=	2.390 cfs
Storm frequency	=	100 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	860 cuft
Drainage area	=	0.220 ac	Runoff coeff.	=	0.9
Intensity	=	12.069 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1



Hydrograph Report

Hyd. No. 3

NW Undetained

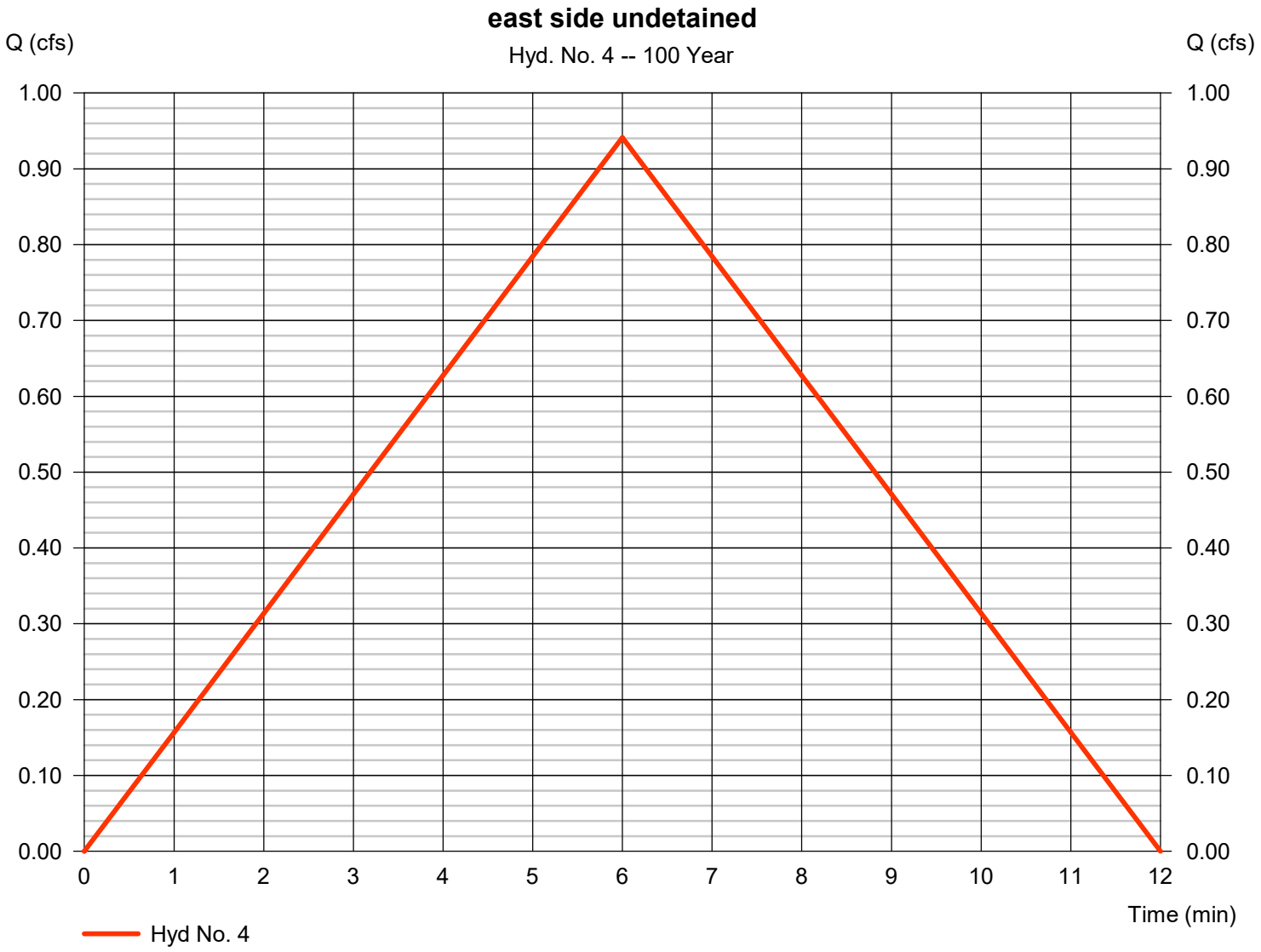
Hydrograph type	=	Rational	Peak discharge	=	0.290 cfs
Storm frequency	=	100 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	104 cuft
Drainage area	=	0.060 ac	Runoff coeff.	=	0.4
Intensity	=	12.069 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1

Hydrograph Report

Hyd. No. 4

east side undetained

Hydrograph type	=	Rational	Peak discharge	=	0.941 cfs
Storm frequency	=	100 yrs	Time to peak	=	6 min
Time interval	=	1 min	Hyd. volume	=	339 cuft
Drainage area	=	0.130 ac	Runoff coeff.	=	0.6
Intensity	=	12.069 in/hr	Tc by User	=	6.00 min
IDF Curve	=	Lansing KS.IDF	Asc/Rec limb fact	=	1/1



Hydrograph Report

Hyd. No. 5

Post Dev Gross

Hydrograph type	= Combine	Peak discharge	= 3.621 cfs
Storm frequency	= 100 yrs	Time to peak	= 6 min
Time interval	= 1 min	Hyd. volume	= 1,303 cuft
Inflow hyds.	= 2, 3, 4	Contrib. drain. area	= 0.410 ac