

Stormwater Summary

FOR

LS Industrial

City of Lee's Summit
Jackson County, Missouri

November 17, 2023

Prepared for:

LS Industrial
4 East Franklin St.
Liberty, MO 64068

Prepared by:

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GBA



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Introduction:

George Butler Associates, Inc. (GBA) has been hired to complete planning and construction submittals for the LS Industrial development located in Lee's Summit, Missouri.

The LS Industrial development encompasses approximately 50 acres near the southwest corner of the intersection of Missouri Highway 291 and U.S. Highway 50 in Lee's Summit Missouri. The project area is bounded by SE Bailey Road to the north, SE 16th Street to the south, Union Pacific railroad tracks to the east, and Missouri Highway 291 to the west. This phase of the project will grade a swale along an existing ditch. There will be no development at this time, other than the realignment of the existing ditch and no impervious area will be added to the site. The purpose of this project is to make the impacts to the existing channel as approved by the current USACE 404 permit. No stormwater treatment or detention is proposed at this time. The proposed swale is intended to operate similar to existing conditions. Future development phases will replace this swale with a series of enclosed storm sewer, basins, and swales.

The site consists of hydrologic type C and D soils per the NRCS soil report. The site lies within Flood Zone X, areas determined to be outside the 0.2% annual chance flood, per FEMA FIRM 29095C0438G, dated January 20, 2017, and FIRM 29095C0419G, dated January 20, 2017. See Appendix A for NRCS soil report and FEMA maps.

U.S. Army Corps of Engineers jurisdictional waters exist on site and a 404 permit has been secured and executed (permit no. 2017-00785). 12,247 stream credits and 0.11 acres of wetland credit have been purchased from an approved mitigation bank. See Appendix A for permit.

The existing channel conditions consists of grass and short brush, no enclosed storm sewer or rock lining are in place or planned to be removed. Approximately 49.14 acres drain south through the ditch. A composite "C" value for this drainage area was determined to be "C" = 0.55. A time of concentration determined to be 36.88 minutes. A corresponding storm intensity of 4.95 in/hr for the 100-year design storm was calculated using APWA 5600. A peak flow of 167.3 cfs was calculated using the rational method. See appendix A for calculations and drainage map.

A proposed 10-foot-wide flat bottom ditch with 3:1 side slope, will be graded to replace the existing channel. Grass will be established along the channel and side slopes of the ditch. See ditch calculations and profile sheets Appendix B.

The proposed swale is intended to replace the existing ditch per the U.S. Army Corps of Engineers permit. The construction of the swale will make the permitted impacts to the existing channel and allow the permit to be closed out. The proposed swale will operate similar to existing conditions. No stormwater treatment or detention is part of this plan. Future phases of site development will remove this ditch and replace with a series of swales and basins.

APPENDIX A – EXISTING CONDITIONS

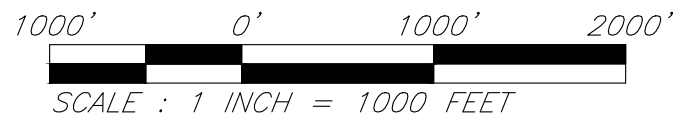
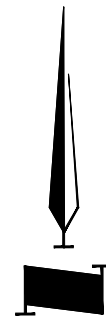
Exhibit 1 – Location Map

Exhibit 2 – FEMA Flood Insurance Rate Map, FIRMette

Exhibit 3 – USDA Soil Resource Report

Plan Sheet 6 – Existing Conditions Drainage Map

Exhibit 5 – U.S. Army Corps of Engineers Permit



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.

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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 Missouri State Plane West Zone (FIPS zone 2403). The horizontal datum was NAD 83, GRS 1980 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, NNGS12
National Geodetic Survey
SSMCC-3 #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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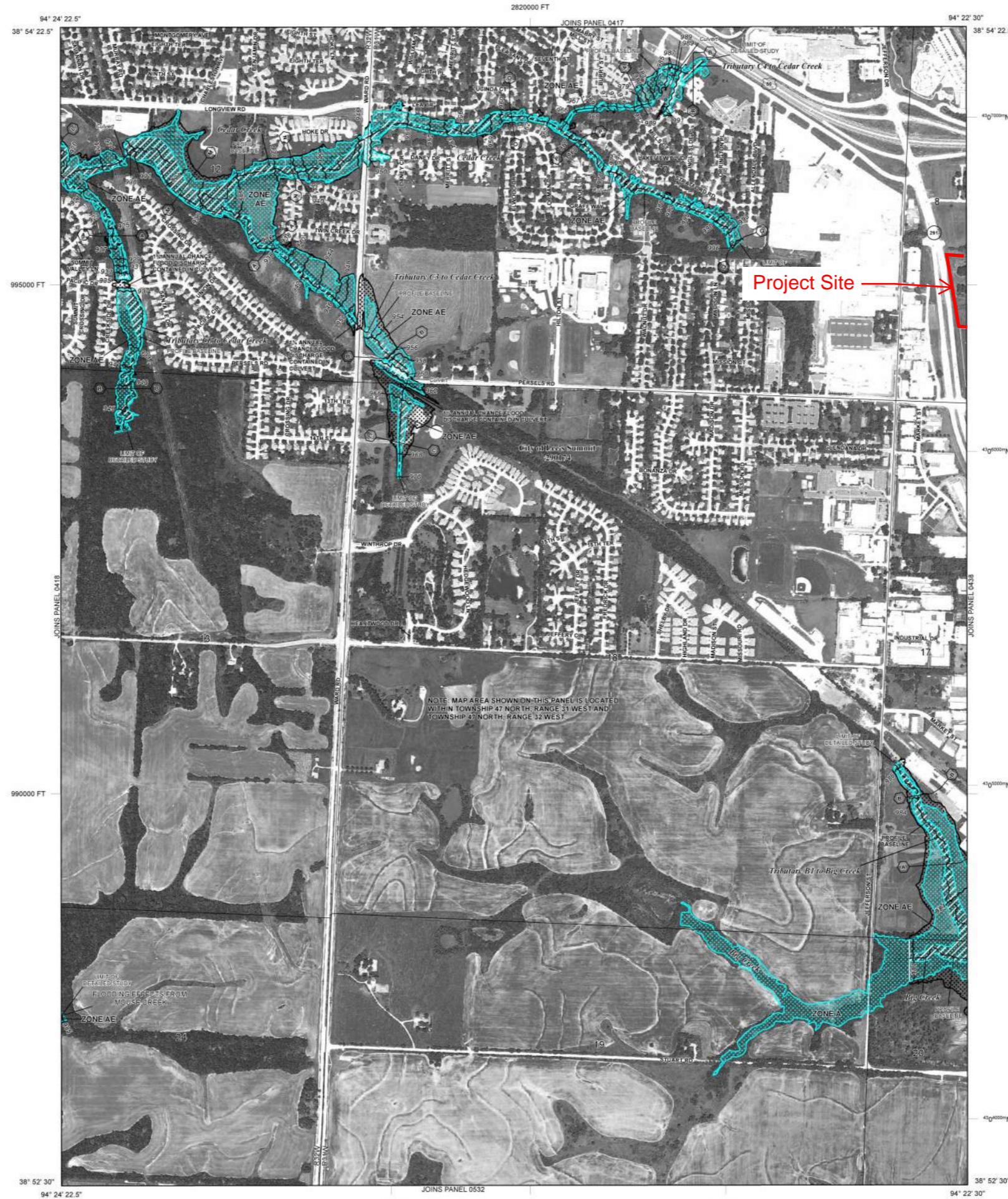
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

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 for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) 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.

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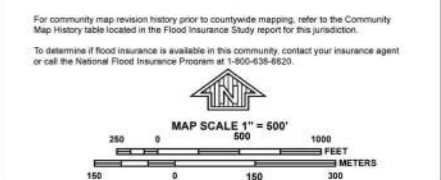
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels, community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which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

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.



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 Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently dismantled. 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 and/or levee; 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 D** 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**
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- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
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Refer to Map Repositories list on Map Index
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September 29, 2006
- EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**
January 20, 2017 - to change Special Flood Hazard Areas.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0419G

FIRM FLOOD INSURANCE RATE MAP JACKSON COUNTY, MISSOURI AND INCORPORATED AREAS

PANEL 419 OF 625
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEE'S SUMMIT, CITY OF	290174	0419	G

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MAP REVISED JANUARY 20, 2017
Federal Emergency Management Agency

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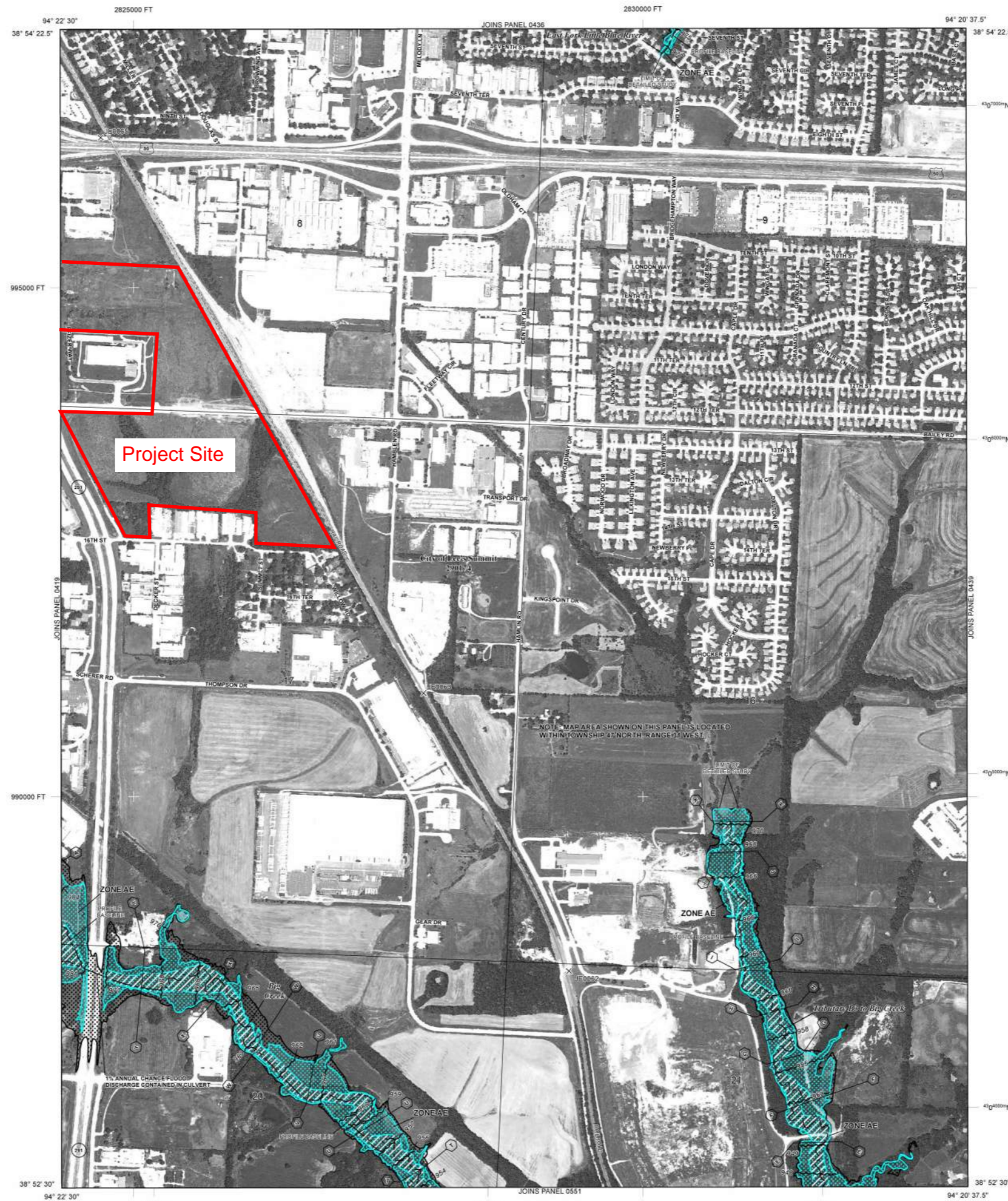
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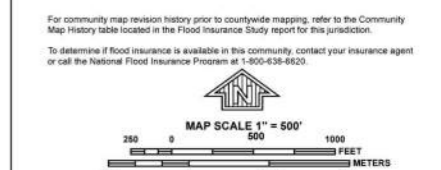
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MAP NUMBER 29095C0438G
MAP REVISED JANUARY 20, 2017
Federal Emergency Management Agency



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 Jackson County, Missouri

The Grove- Lee's Summit



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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report

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

Custom Soil Resource Report

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

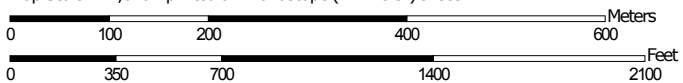
Soil Map

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: 1:7,620 if printed on A landscape (11" x 8.5") sheet.



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: Jackson County, Missouri
 Survey Area Data: Version 18, Sep 16, 2017

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

Date(s) aerial images were photographed: Oct 14, 2014—Oct 10, 2016

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
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	68.6	66.0%
10181	Udarents-Urban land-Sampsel complex, 5 to 9 percent slopes	35.4	34.0%
Totals for Area of Interest		104.0	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

Custom Soil Resource Report

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.

Jackson County, Missouri

10082—Arisburg-Urban land complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w7ld
Elevation: 750 to 1,130 feet
Mean annual precipitation: 39 to 45 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Arisburg and similar soils: 61 percent
Urban land: 30 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arisburg

Setting

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

Typical profile

Ap - 0 to 6 inches: silt loam
A - 6 to 13 inches: silt loam
Bt - 13 to 19 inches: silty clay loam
Btg - 19 to 56 inches: silty clay loam
BCg - 56 to 79 inches: silty clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: Loess Upland Prairie (R107BY007MO)
Hydric soil rating: No

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Sharpsburg

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loess Upland Prairie (R109XY002MO)
Hydric soil rating: No

Sampsel

Percent of map unit: 3 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Concave
Ecological site: Interbedded Sedimentary Upland Savanna (R109XY010MO)
Hydric soil rating: Yes

Greenton

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Loess Upland Prairie (R109XY002MO)
Hydric soil rating: No

10181—Udarents-Urban land-Sampsel complex, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1n85g
Elevation: 600 to 900 feet
Mean annual precipitation: 33 to 43 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 175 to 220 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Udarents and similar soils: 41 percent

Urban land: 39 percent

Sampsel and similar soils: 15 percent

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

Description of Udarents

Setting

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Mine spoil or earthy fill

Typical profile

C1 - 0 to 5 inches: silt loam

C2 - 5 to 80 inches: silty clay loam

Properties and qualities

Slope: 5 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Deep Loess Upland Prairie (R107BY002MO)

Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Hydric soil rating: No

Description of Urban Land

Setting

Landform: Hillslopes

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Side slope

Across-slope shape: Convex

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Description of Sampsel

Setting

Landform: Hillslopes
Landform position (two-dimensional): Foothlope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from shale

Typical profile

Ap - 0 to 13 inches: silty clay loam
Bt - 13 to 80 inches: silty clay

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: Interbedded Sedimentary Upland Savanna (R109XY010MO)
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

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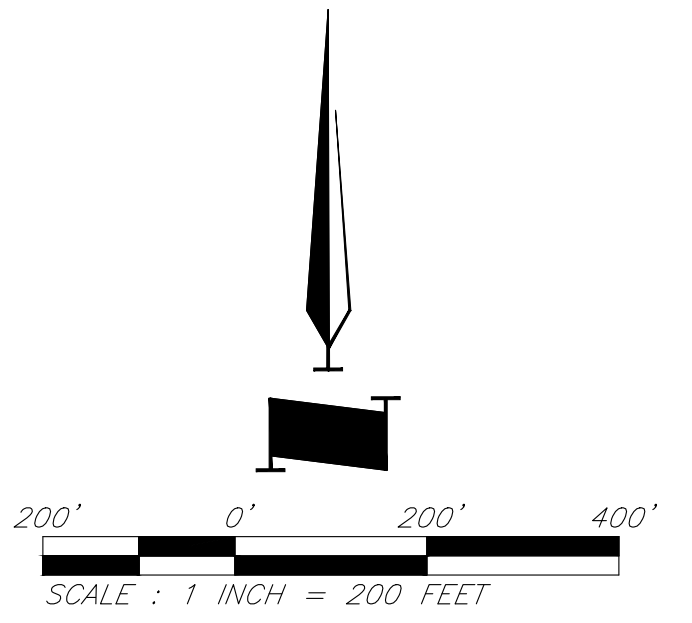
C:\Users\SCHEWE\1\AppData\Local\Temp\AutoPublish_129372\13958.01\2020.dwg Layout: C6 Existing Conditions Drainage Map -- Friday November 17, 2023, 3:06pm -- Copyright 2023, George Butler Associates, Inc. Architect 20212, Professional Engineer 000133, Professional Land Surveyor 000269



GBA 9801 Renner Blvd., Ste. 300 Lenexa, KS 66219 913.492.0400 gbateam.com		DATE: 2-25-2022		
		DESIGN BY: CEL		
		DRAWN BY: DRV/KNJ		
Clint Loumaster Professional Engineer License No. 2011009651		PROJECT NO.: 13958.01		
		SHEET NO. C6 / TOTAL SHEETS C8		
Preliminary Development Plan LS Industrial, LLC Lee's Summit, Missouri				
NO.	DATE	REVISIONS	BY	APPROVED

LEGEND

- Existing Drainage Boundary
- Existing Contour Major
- Existing Contour Minor



Existing Drainage Map

Rational Method Calculations:

$$Q = K \cdot i \cdot A$$

Drainage Area – A = 49.14 acres

K coefficient (100yr storm) = 1.25

Time of concentration – Tc = 36.86 min

Rainfall intensity calculated from Tc – $i = \frac{331}{Tc+30}$ in/hr

$$Q = 1.25 \cdot 4.95 \text{ in/hr} \cdot 49.14 \text{ acres} = \underline{\mathbf{167.3\text{cfs}}}$$

*Equations used came from the APWA 5602.2 and 5602.6 sections.



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, KANSAS CITY DISTRICT
636 FEDERAL BUILDING
601 E. 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

February 12, 2018

Regulatory Branch
(NWK-2017-00785)

Mr. Daren Fristoe
The Grove at Lee's Summit, LLC
P.O. Box 57
Lee's Summit, Missouri 64063

Dear Mr. Fristoe:

As requested by your application, received on May 18, 2017, enclosed is a proposed Department of the Army (DA) permit, in duplicate, with drawings attached. When executed, the permit will authorize your plan to grade and fill two tributaries and two wetlands of Big Creek, for construction of a mixed-use development called The Grove. Additionally, the permit will authorize the temporary impacts to a tributary for installation of a sanitary sewer. The project is located in Sections 8 and 17, Township 47 north, Range 31 west, in Lee's Summit, Jackson County, Missouri.

A copy of the water quality certification issued for your work, by the Missouri Department of Natural Resources has been attached to the enclosed DA permit. As stated in general condition "5" of the enclosed permit document, the conditions presented in the state's water quality certification are incorporated into the special conditions of the permit by reference.

This letter contains an initial proffered permit for your proposed project. If you object to the permit because of certain terms and conditions therein, you may request that the permit be modified accordingly. Enclosed you will find a Notification of Administrative Appeal Options and Process and Request for Appeal (NAO-RFA) form. If you request reconsideration of this decision you must submit a completed NAO-RFA form to the Kansas City District at the following address:

District Commander
ATTN: Mark D. Frazier
Chief, Regulatory Branch
U.S. Army Engineer District, Kansas City
601 East 12th Street, Suite 402
Kansas City, MO 64106-2824
Voice: 816-389-3990 FAX: 816-389-2032

In order for an NAO-RFA to be accepted by the U.S. Army Corps of Engineers (Corps), the Corps must determine that it is complete, that it meets the criteria for reconsideration under 33 CFR Part 331.6.b., and that it has been received by the District Office within 60 days of the date of the NAO-RFA. Should you decide to submit an NAO-RFA form, it must be received at the above address by April 13, 2018. It is not necessary to submit an NAO-RFA form to the District Office if you do not object to the provisions of your initial proffered permit.

If you wish to accept the permit in its present form, please sign the original and duplicate copy of the enclosed permit document. Each copy of the permit document should be signed on page 3 above the word "Permittee," dated, and returned within 30 days from the date of this letter. Also, the application fee of \$100 should be paid by check made payable to USAED-KC and remitted with the permit document. A

preaddressed envelope is enclosed for your convenience. Upon receipt of the properly signed documents and the application fee, the permit will be executed and returned to you for your files. Your signature on the standard permit means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

Special condition "a" of the permit document requires you to complete and return a "Compliance Certification" upon completion of the authorized work and any required mitigation. The "Compliance Certification" form will be provided to you when your DA permit is executed.

In addition to the general and special conditions of this IP, special conditions have been added in order to replace the lost aquatic resources and to protect Threatened and Endangered Species that result from the authorized project.

1. The permittee must purchase 12,247 stream credits and 0.11 acres of wetland credit from an approved mitigation bank in the service area of the project. The current approved mitigation bank within the service area of the project is the Camp Branch Wetland and Stream Mitigation Bank. The compensatory mitigation credit purchase must be completed prior to the commencement of work within our regulatory jurisdiction. You must submit a receipt of payment from the mitigation provider that includes the amount of credits purchased and the date of credit purchase. Receipts submitted by authorized agents will not be accepted.

2. Please be aware that the endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*), may be present within your project area. To "not adversely affect" the listed species, the permittee must avoid cutting and clearing trees within the project area during the bats' active season March 31 – November 1. If you anticipate timber clearing within these dates, please contact the Corps of Engineers, Regulatory Branch, for further consultation with the United States Fish and Wildlife Service.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. You may also call and request a paper copy of the survey which you may complete and return to us by mail or fax.

If you have any questions concerning this matter, please feel free to write me or to contact Ms. Kailey Jones at (816) 389-2123 or by email at kailey.j.jones@usace.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "David R. Hibbs", with a stylized flourish at the end.

David R. Hibbs
Regulatory Program Manager
Regulatory Branch

Enclosures

DEPARTMENT OF THE ARMY PERMIT

Permittee The Grove at Lee's Summit, LLC

Permit No. NWK-2017-00785

Issuing Office U.S. Army Engineer District, Kansas City

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below, and with the plans and drawings attached hereto which are incorporated in and made a part of this permit.

Project Description: This permit authorizes the general grading and fill of 1,948 linear feet (LF) of intermittent tributary, 840 LF of ephemeral tributary, and 0.11 acres of two adjacent wetlands; and the temporary impact to 72 LF of intermittent tributary for excavation and installation of a sanitary sewer, as shown on the attached drawings.

Permit Drawings: Location map, aerial map, proposed impact maps: 4 sheets total, dated 25 January 2018.

Project Location: In two unnamed tributaries and two adjacent wetlands of Big Creek, in Sections 8 and 17, Township 47 north, Range 31 west, in Lee's Summit, Jackson County, Missouri.

(38.89492°, -94.37007°)

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on 31 December 2020. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

See continuation sheets, pages 4 and 5, of this document.

Further Information:

I. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

Section 404 of the Clean Water Act (33 U.S.C. 1344).

Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorization required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

- a. You fail to comply with the terms and conditions of this permit.
- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE)

(DATE)

(PRINTED NAME AND TITLE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT ENGINEER)
DOUGLAS B. GUTTORMSEN, COLONEL
BY: David R. Hibbs, Regulatory Program Manager

(DATE)

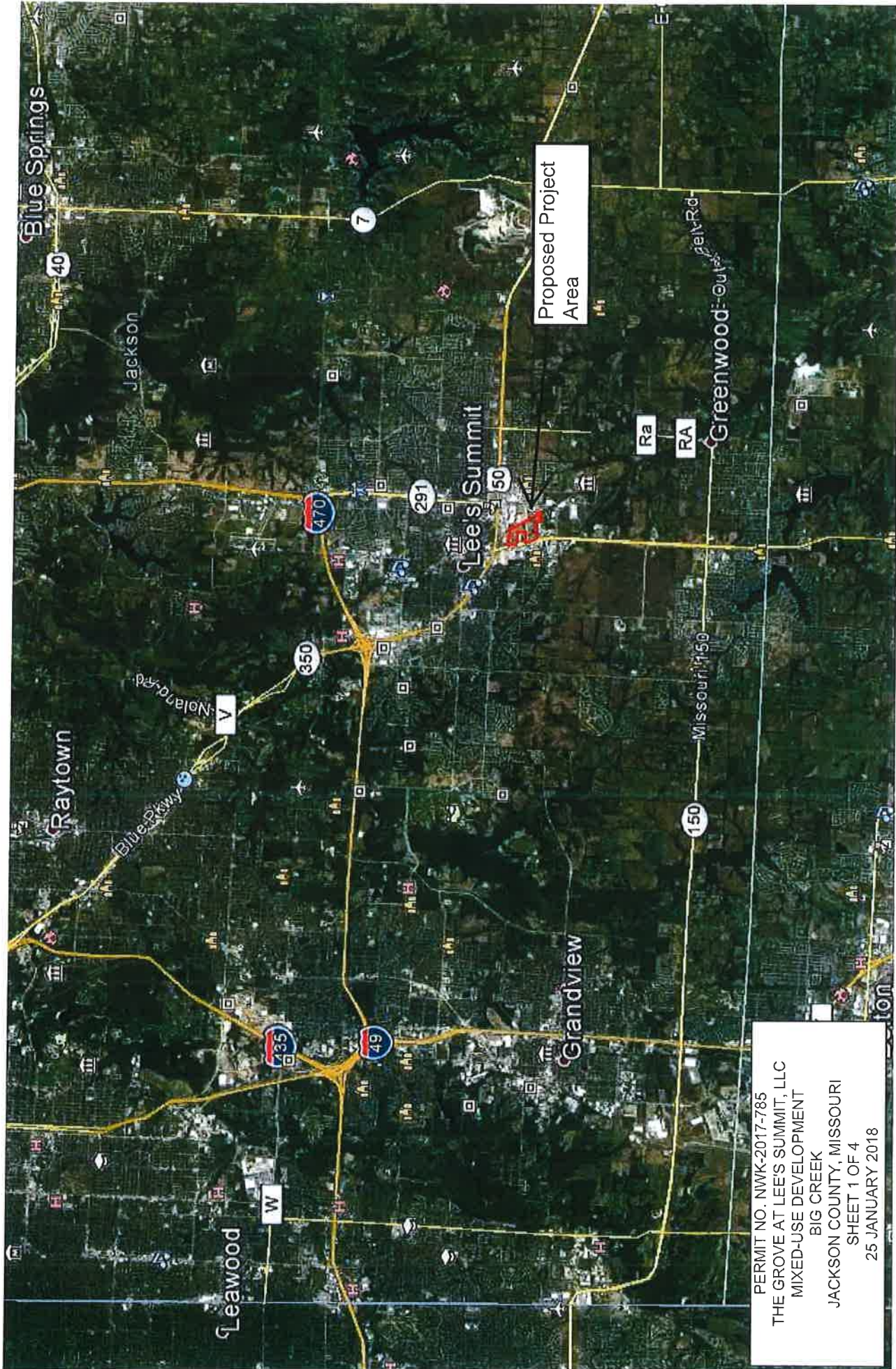
When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

Special Conditions:

- a. You must sign and return a “Compliance Certification” after you complete the authorized work and any required mitigation. Your signature will certify that you completed the work in accordance with this permit, including general and specific conditions, and that any required mitigation was completed in accordance with the permit conditions.
- b. The permittee must purchase 12,247 stream credits and 0.11 acres of wetland credit from an approved mitigation bank in the service area of the project. The current approved mitigation bank within the service area of the project is the Camp Branch Wetland and Stream Mitigation Bank. The compensatory mitigation credit purchase must be completed prior to the commencement of work within our regulatory jurisdiction. You must notify the project proponent that they must submit a receipt of payment from the mitigation provider that includes the amount of credits purchased and the date of credit purchase. Receipts submitted by authorized agents will not be accepted.
- c. Please be aware that the endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*), may be present within your project area. To “not adversely affect” the listed species, the permittee must avoid cutting and clearing trees within the project area during the bats’ active season March 31 – November 1. If you anticipate timber clearing within these dates, please contact the Corps of Engineers, Regulatory Branch, for further consultation with the United States Fish and Wildlife Service.
- d. If any part of the authorized work is performed by a contractor, before starting work you must discuss the terms and conditions of this permit with the contractor; and, you must give a copy of this entire permit to the contractor.
- e. You must use clean, uncontaminated materials for fill in order to minimize excessive turbidity by leaching of fines, as well as to preclude the entrance of deleterious and/or toxic materials into the waters of the United States by natural runoff or by leaching.
- f. You must dispose of excess concrete and wash water from concrete trucks and other concrete mixing equipment in a nonwetland area above the ordinary high water mark and at a location where the concrete and wash water cannot enter the water body or an adjacent wetland area.
- g. You must excavate, dredge and/or fill in the watercourse in a manner that will minimize increases in suspended solids and turbidity which may degrade water quality and damage aquatic life outside the immediate area of operation.
- h. You must immediately remove and properly dispose of all debris during every phase of the project in order to prevent the accumulation of unsightly, deleterious and/or toxic materials in or near the water body.
- i. You must not dispose of any construction debris or waste materials below the ordinary high water mark of any water body, in a wetland area, or at any location where the materials could be introduced into the water body or an adjacent wetland as a result of runoff, flooding, wind, or other natural forces.
- j. You must store all construction materials, equipment, and/or petroleum products, when not in use, above anticipated high water levels.



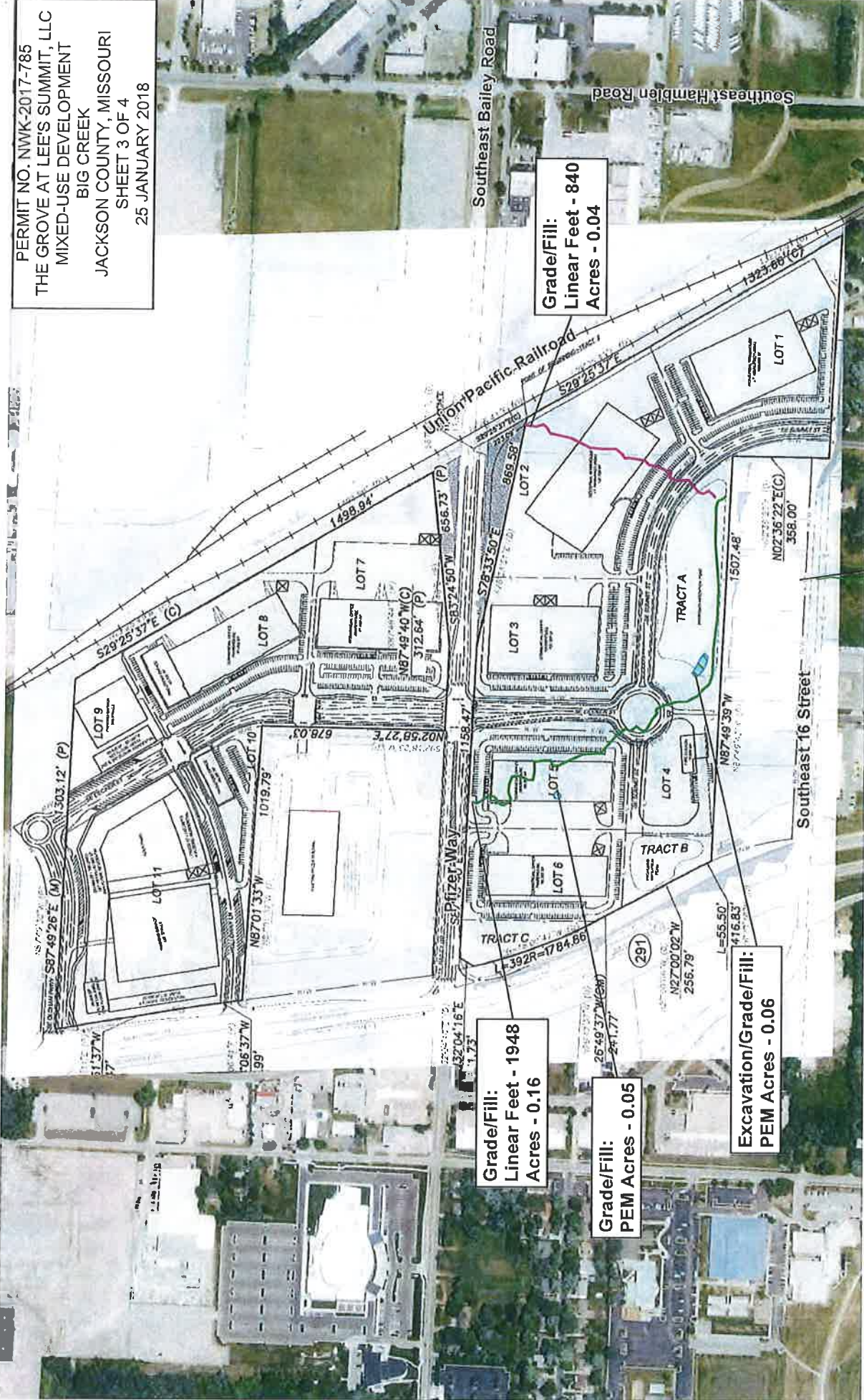
Proposed Project Area

PERMIT NO. NWK-2017-785
THE GROVE AT LEES SUMMIT, LLC
MIXED-USE DEVELOPMENT
BIG CREEK
JACKSON COUNTY, MISSOURI
SHEET 1 OF 4
25 JANUARY 2018



PERMIT NO. NWK-2017-785
THE GROVE AT LEE'S SUMMIT, LLC
MIXED-USE DEVELOPMENT
BIG CREEK
JACKSON COUNTY, MISSOURI
SHEET 2 OF 4
25 JANUARY 2018

PERMIT NO. NWK-2017-785
 THE GROVE AT LEE'S SUMMIT, LLC
 MIXED-USE DEVELOPMENT
 BIG CREEK
 JACKSON COUNTY, MISSOURI
 SHEET 3 OF 4
 25 JANUARY 2018

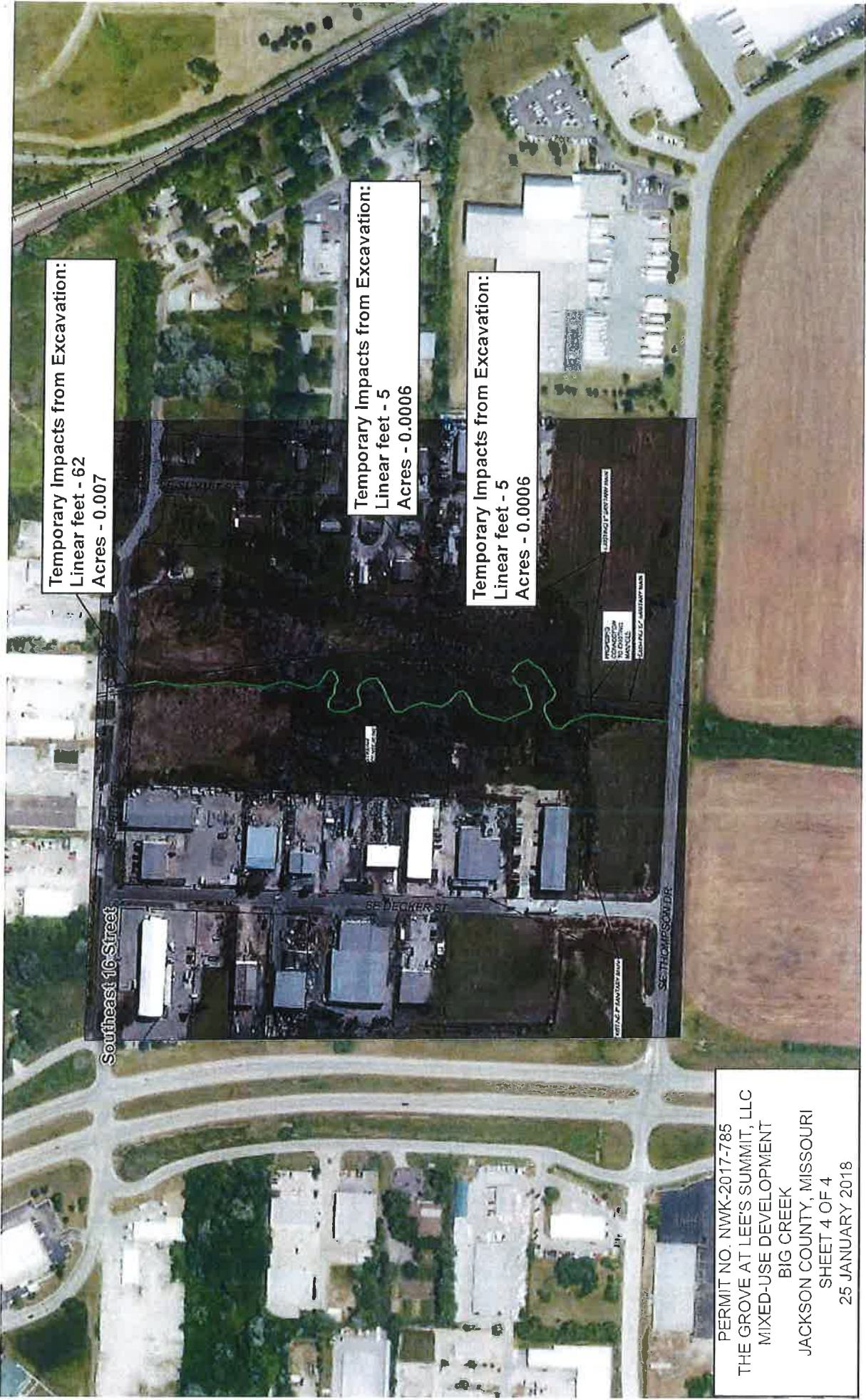


Grade/Fill:
 Linear Feet - 840
 Acres - 0.04

Grade/Fill:
 Linear Feet - 1948
 Acres - 0.16

Grade/Fill:
 PEM Acres - 0.05

Excavation/Grade/Fill:
 PEM Acres - 0.06

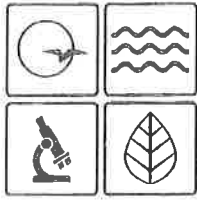


Temporary Impacts from Excavation:
Linear feet - 62
Acres - 0.007

Temporary Impacts from Excavation:
Linear feet - 5
Acres - 0.0006

Temporary Impacts from Excavation:
Linear feet - 5
Acres - 0.0006

PERMIT NO. NWK-2017-785
THE GROVE AT LEE'S SUMMIT, LLC
MIXED-USE DEVELOPMENT
BIG CREEK
JACKSON COUNTY, MISSOURI
SHEET 4 OF 4
25 JANUARY 2018



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

NOV 22 2017

Mr. Robert Dunn
The Grove at Lee's Summit, LLC
P.O. Box 57
Lee's Summit, MO 64063

RE: 2017-00785/CEK007233 in Jackson County

Dear Mr. Dunn:

The Missouri Department of Natural Resources' Water Protection Program has reviewed your request for Clean Water Act Section 401 Water Quality Certification (WQC) to accompany the U.S. Army Corps of Engineers' (USACE) Permit for 2017-00785 in which you are proposing to develop two parcels, one approximately 35 acres and one approximately 48 acres for the construction of The Grove at Lee's Summit, LLC mixed-use development. The proposal includes the construction of multi-family residential, commercial offices, and industrial warehouse space with associated amenities and stormwater detention.

The proposed development would permanently fill 1,948 linear feet (LF) of intermittent stream, 840 LF of an ephemeral tributary, and 0.11 acre of emergent wetland. Additionally, the applicant has proposed to temporarily impact 72 LF of intermittent Tributary 1 for the placement of a sanitary sewer line in three locations.

The proposed project is located in Sections 8 and 17, Township 47 North, Range 31 West in Lees Summit, Jackson County, Missouri. Approximate geographic coordinates for the center of the project are 38.89492°N and 94.37007°W. Approximate geographic coordinates for aquatic impacts and impact sizes are as follows:

Streams	Impact Size (LF)	Latitude (°N)	Longitude (°W)
Intermittent	1,948	38.895822	94.372770
Ephemeral tributary	840	38.895311	94.367827
Wetland	Impact Size (Acres)	Latitude (°N)	Longitude (°W)
Emergent wetland	0.06	38.893489	94.370988
Emergent wetland	0.05	38.894936	94.372635



Recycled paper

This WQC is being issued under Section 401 of Public Law 95-217, The Clean Water Act of 1977 and subsequent revisions. This office certifies the proposed project will not cause the general or numeric criteria to be exceeded nor impair beneficial uses established in the Water Quality Standards, 10 CSR 20-7.031, provided the following conditions are met:

1. The 2,788 LF of stream impacts were assessed using the 2013 State of Missouri Stream Mitigation Method and determined to require 12,247 stream mitigation credits. Compensatory mitigation shall be satisfied by the purchase of 12,247 credits from the Camp Branch Wetland and Stream Mitigation Bank or other approved in-lieu fee provider or mitigation bank. A copy of the purchase document shall be provided to the Department at the address below prior to the start of work within jurisdictional waters at the site.
2. The Grove at Lee's Summit, LLC shall purchase 0.11 wetland acres as mitigation credit from the Camp Branch Wetland and Stream Mitigation Bank or other approved in-lieu fee provider or mitigation bank. A copy of the purchase document shall be provided to the Department at the address below prior to the start of work within jurisdictional waters at the site.
3. Antidegradation requirements dictate all appropriate and reasonable Best Management Practices (BMPs) related to erosion and sediment control, project stabilization and prevention of water quality degradation are applied and maintained; for example, preserving vegetation, streambank stability, and basic drainage. BMPs shall be properly installed prior to conducting authorized activities and maintained, repaired and/or replaced as needed during all phases of the project to limit the amount of discharge of water contaminants to waters of the state. The project shall not involve more than normal stormwater or incidental loading of sediment caused by project activities so as to comply with Missouri's general water quality criteria [10 CSR 20-7.031(4); Page 16 at <http://www.sos.mo.gov/cmsimages/adrules/csr/current/10csr/10c20-7a.pdf>].
4. Streambed gradient downstream of the project shall not be adversely altered during project construction. No project shall accelerate bed or bank erosion outside of the project area.
5. The project shall not allow the filling of jurisdictional springs such as those associated with a water body's point of origin or located in a streambed.
6. Conduct project activity at low flows and water levels to limit the amount of sediment disturbance caused by the heavy equipment.
7. All precautions shall be taken to avoid the release of wastes or fuel to streams and other adjacent waters as a result of this operation. Petroleum products spilled into any water or on the banks where the material may enter waters of the state shall be immediately cleaned up and disposed of properly. Any such spills of petroleum shall be reported as soon as possible, but no later than 24 hours after discovery to the Department's Environmental Emergency Response phone line at 573-634-2436 or website at <http://dnr.mo.gov/env/esp/esp-eer.htm>.

8. Only clean, nonpolluting fill shall be used.
9. Any waste concrete or concrete rinsate shall be disposed of in a manner that does not result in any discharge to the jurisdictional water ways.
10. Clearing of vegetation and trees shall be the minimum necessary to accomplish the activity, except for the removal of invasive or noxious species and placement of ecologically beneficial practices.
11. Disturbed areas shall be restored to a stable condition to protect water quality as soon as possible. Seeding, mulching and needed fertilization should be within three days of final contouring. To ensure erosion and deposition of soil in waters of the state are not occurring from this project, onsite inspections of these areas should be conducted as necessary to ensure successful revegetation and stabilization.
12. Acquisition of a WQC shall not be construed or interpreted to imply the requirements for other permits are replaced or superseded, including Clean Water Act Section 402 National Pollutant Discharge Elimination System Permits. Permits or any other requirements shall remain in effect. Questions regarding permit requirements may be directed to the Department's Kansas City Regional Office by phone at 816-251-0700.
13. Land disturbance activities disturbing one or more acres of total area for the entire project may require a stormwater permit. Instructions on how to apply for and receive the online land disturbance permit are located at www.dnr.mo.gov/env/wpp/epermit/help.htm. Questions regarding permit requirements may be directed to the Department's Land Disturbance phone line at 573-526-2082 or toll free at 855-789-3889.
14. The city of Lee's Summit is covered under Municipal Separate Storm Sewer System Permit MO-R040016 with measures to control and possibly treat stormwater. You shall comply with all stormwater requirements of the city's Stormwater Management Plan and any related ordinances.
15. Representatives from the Department shall be allowed upon request on the project property, which includes the site(s) where the authorized activity takes place and any associated compensatory mitigation site(s), to inspect the authorized activity and mitigation efforts as deemed necessary by the Department to ensure compliance with WQC conditions and water quality standards. The applicant or their consultant shall submit any requested information deemed necessary by the Department to ensure compliance with WQC conditions.
16. The WQC is based on the plans as submitted. Should any plan modifications occur, please contact the Department to determine whether the WQC remains valid or needs to be amended or revoked.

Mr. Robert Dunn

Page 4


Pursuant to Chapter 644, RSMo, commonly referred to as the Missouri Clean Water Law, and fec regulations under 10 CSR 20-6.011(2)(I), this WQC shall be valid only upon payment of a fee of \$150. The enclosed invoice contains the necessary information on how to submit your fee. Payment must be received within ten business days of receipt of this WQC. Upon receipt of the fee, the applicable office of the USACE will be informed the WQC is now in effect and final.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20-1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC is by mail at Administrative Hearing Commission, United States Post Office Building, Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, MO 65102 by phone at 573-751-2422, by fax at 573-751-5018, and by website at www.oa.mo.gov/ahc.

This WQC is part of the USACE's permit. Water Quality Standards must be met during any operations authorized. If you have any questions, please contact Mr. Mike Irwin by phone at 573-522-1131, by email at mike.irwin@dnr.mo.gov, or by mail at Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176. Thank you for working with the Department to protect our environment.

Sincerely,

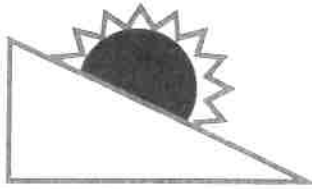
WATER PROTECTION PROGRAM


Chris Wieberg
Director

CW:mip

Enclosure

- c: Ms. Sherry Bell, Fiscal Management Section, Budget and Fees Unit
- Mr. Jesse Cochran, Kansas City Regional Office
- Ms. Kailey Jones, U.S. Army Corps of Engineers, Kansas City District
- Mr. Kelsey Kropp, TranSystems
- Ms. Corinne Rosania, Kansas City Regional Office
- Mr. Steve Sturgess, Kansas City Regional Office
- Ms. Terrie Williams, Kansas City Regional Office



SWALLOW TAIL LLC

Tuesday, March 13, 2018

Mrs. Kailey Jones
US Army Corps of Engineers
Regulatory Division Kansas City District
635 Federal Building 601 East 12th Street
Kansas City Missouri 64106

RE: Mitigation Credit Purchase NWK-2017-00785 The Grove at Lee's Summit LLC
CONFIRMATION OF CREDIT PURCHASE

Dear Mrs. Jones,

By means of this correspondence, we have assigned mitigation credit for the aforementioned permit as follows:

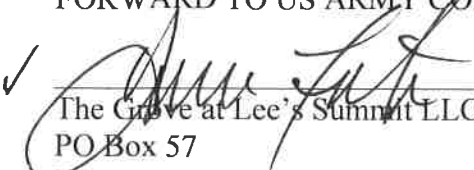
SITE NAME: CAMP BRANCH WETLAND AND STREAM MITIGATION BANK
CREDITS: 0.11 WETLAND CREDITS
12,247 STREAM CREDITS

The applicant has been instructed to submit separate correspondence signifying their purchase of said credits. A hardcopy of this correspondence has been mailed to the project representative.

Sincerely,
SWALLOW TAIL LLC
David L. Flick
David L. Flick
Managing Member

Copy: Mr. Doug Berka, US Army Corps of Engineers

APPLICANT CONFIRMATION
FORWARD TO US ARMY CORPS OF ENGINEERS AFTER SIGNING BELOW:

✓ 

The Grove at Lee's Summit LLC
PO Box 57
Lee's Summit MO 64063
Attn: Daren Fristoe

24820 Miller Road • Harrisonville, MO 64701
(816) 810-8377
dflick@terratechnologies.com

MITIGATION CREDIT AGREEMENT

This MITIGATION CREDIT AGREEMENT (Agreement) is made and entered into as of February 12, 2018, (the “Effective Date”), by and between Swallow Tail LLC (“Seller”) and The Grove at Lee’s Summit, LLC (“Purchaser”).

WITNESSETH:

WHEREAS Purchaser has applied for a U. S. Army Corps of Engineers (“USACOE”) permit under Section 404 of the Clean Water Act to allow impacts to Jurisdictional Waters (“Project”). Project Number assigned by the USACOE is NWK-2017-00785. The project manager with the Corps of Engineers is Kailey Jones.

WHEREAS, as a condition to the issuance of a permit from the USACOE, the Purchaser is required to compensate for said impacts, and elects to satisfy part of the requirement through the purchase of mitigation credits in the Sellers’ Camp Branch Creek Stream and Wetland Mitigation Bank (“Mitigation Bank”).

WHEREAS, the USACOE has determined that Purchaser is allowed to purchase credits due to permanent impacts resulting from the activities at the subject site.

NOW, THEREFORE, for and in consideration of the mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which are hereby mutually acknowledged, it is agreed as follows:

- 1) RECITALS: The recitals are hereby incorporated by this reference.

2) COMPENSATION: Purchaser shall, subject to the terms and conditions hereinafter provided, pay to the Seller the sum of **Four hundred ninety-five thousand nine hundred and thirty DOLLARS (\$495,930)** (“Purchase Price”) for 0.11 wetland credits and 12,247 stream credits at the Mitigation Bank. The Purchase Price is derived from the unit cost of \$55,000 per wetland credit and \$40 per stream credit. Purchase Price is to be paid in the manner following:

a.) PURCHASE PRICE: Upon signing this Agreement, Purchaser will pay the total balance due, or \$495,930.

3) SELLERS WARRANTY: In consideration of the Purchase Price, Seller affirms that it has sufficient credits in the Mitigation Bank to satisfy the credits required by Purchaser and agrees to sell such credits to Purchaser. It is understood and agreed that Purchaser shall have no obligation to perform any responsibility or incur any liability associated with the creation, development, maintenance and/or management of the Mitigation Bank.

4) NOTICES: Any notices required or permitted hereunder shall be sufficiently given if delivered by overnight courier, by United States mail, return receipt requested to the parties hereto as follows:

If to Seller: Swallow Tail LLC c/o Terra Technologies Inc.
6240 West 135th Street, Suite 100
Overland Park, KS 66223
Attn: Mr. David Flick

If to Purchaser: The Grove at Lee’s Summit LLC
PO Box 57
Lee’s Summit MO 64063
Attn: Daren Fristoe

Any notice given pursuant hereto by overnight courier shall be effective after recipient signs for notice; any notice given pursuant hereto by United States mail, return receipt requested, shall be effective as of receipt of confirmation by the sending party.

5) PRIOR AGREEMENTS: This Agreement shall supersede any and all prior understandings and agreements between the parties hereto, whether written or oral, with respect to the subject matter hereof and may be amended only by a written instrument executed by or on behalf of both Seller and Purchaser.

6) APPLICABLE LAW: Purchaser and Seller shall be contractually bound to this Agreement, which shall be governed by the laws of the state of Missouri and subject to the requirements of any applicable federal law or regulation. Changes in federal, state or local laws, however, which might have otherwise impacted this Agreement shall not be enforced retroactively after execution of this Agreement.

7) CONTRACT ACCEPTANCE: This Agreement is null and void if not executed by both parties within 180 days after the Effective Date of the Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the Effective Date.

Purchaser

The Grove at Lee's Summit, LLC

By:


Daren Fristoe

Seller

Swallow Tail LLC

By:

David L. Flick
David L. Flick

THE GROVE AT LEES SUMMIT LLC

2300 MAIN ST STE 900
KANSAS CITY, MO 64108-2408

6873

90/7162

DATE 03-09-18

PAY TO THE
ORDER OF Swallow Tail LLC

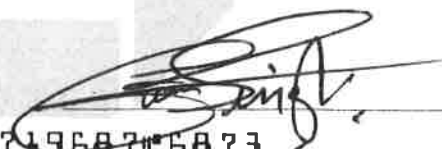
\$ 495,930

Four Hundred Ninety Five Thousand Nine hundred Thirty ⁰⁰/₁₀₀ 00/100
DOLLARS

CHASE 

JPMorgan Chase Bank, N.A.
www.Chase.com

The Grove Water & Stream
MEMO Credits



⑆322271627⑆

20071968716873


APPENDIX B – PROPOSED CONDITIONS

Exhibit 6 – Swale Calculations (Flow Master)


Exhibit 7 – Proposed Swale Plan Sheets

Worksheet : Trapezoidal Channel - 1

Uniform Flow | Gradually Varied Flow | Messages

Solve For: Normal Depth  Friction Method: Manning Formula

Roughness Coefficient	0.030	...	Flow Area:	28.2	ft ²
Channel Slope:	0.010	ft/ft	Wetted Perimeter:	21.5	ft
Normal Depth:	21.9	in	Hydraulic Radius:	15.7	in
Left Side Slope:	3.000	H:V	Top Width:	20.94	ft
Right Side Slope:	3.000	H:V	Critical Depth:	20.6	in
Bottom Width:	10.00	ft	Critical Slope:	0.013	ft/ft
Discharge:	167.23	cfs	Velocity:	5.93	ft/s
			Velocity Head:	0.55	ft
			Specific Energy:	2.37	ft
			Froude Number:	0.901	
			Flow Type:	Subcritical	

 Calculation Successful.

C:\13958.01\Civil\3D\Production Drawings\Exhibits\Swale Grading Drawings\Exhibits\Swale Grading Drawings.dwg Layout: T OVERALL GRADING --- Thursday, October 25, 2023, 11:41am --- Copyright 2023, George Butler Associates, Inc.



CAUTION!
 Numerous Utilities on site. Contractor to verify location and elevation of all utilities prior to commencing construction.

GBA
 9801 Renner Blvd., Ste. 300
 Lenexa, KS 66219
 913.492.0400
 gbateam.com

DATE: 10-05-2023
 DESIGN BY: CEL
 DRAWN BY: BIB
 PROJECT NO.: 13958.01
 SHEET NO.: 1
 TOTAL SHEETS: 4

Clint Loumaster
 Professional Engineer
 License No. 2011009651

Mass Grading Plans
LS Industrial, LLC
 Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED



Know what's below.
 Call before you dig.

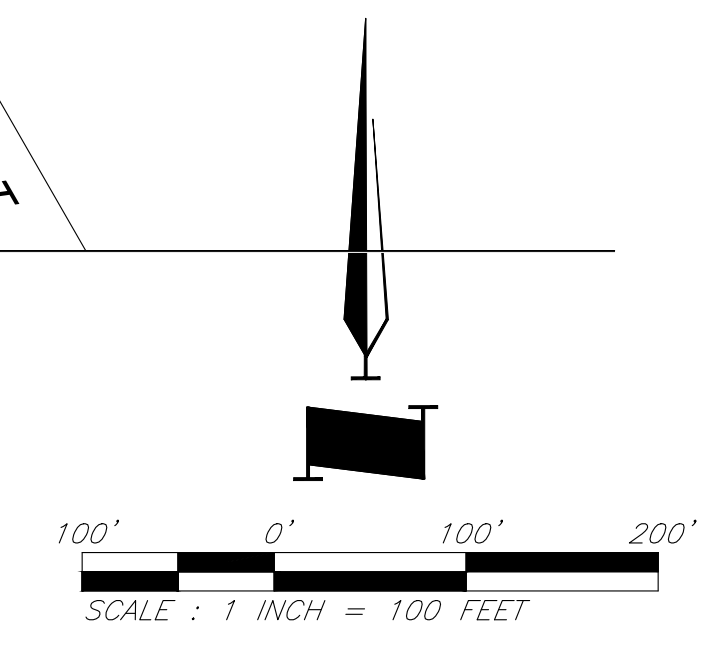
LEGEND

- Proposed Contour Major
- Proposed Contour Minor
- Existing Contour Major
- Existing Contour Minor

Swale A

Number	Radius	Length	Line/Chord Direction	Northing/Easting
L1	905.63		S30°33'17"E	N 993703.6332 E 2824921.3087
C1	100.00	99.96	S59°11'28"E	N 992923.7548 E 2825381.6962
L2	610.04		S87°49'40"E	N 992874.6627 E 2825464.0202

- Notes:**
- Grading:**
- TC elevations noted on plans are to the top of the back of the concrete curb.
 - All earthwork within the Right-Of-Way shall be governed by City Specifications, unless specifically modified by the Geotechnical report. The Contractor shall be responsible for engaging a Geotechnical Engineer to monitor compaction for the project. The Engineer shall prepare a report detailing the compaction across the site.
- Erosion Control:**
- The Contractor is responsible for providing erosion and sediment control BMP's to prevent sediment from reaching paved areas, storm sewer systems, drainage courses, and adjacent properties. In the event the prevention measures are not effective, the contractor shall remove any debris, silt, or mud and restore the Right-Of-Way, or adjacent properties to original or better condition.
 - The Contractor shall sod all disturbed areas within the Public Street Right-of-Way unless otherwise noted in the plans.
 - No trees shall be damaged or removed without prior authorization from owner unless otherwise shown on this plan.



Overall Grading Plan

C:\13958.01\Civil 3D\Production Drawings\Exhibits\Swale Grading Exhibit\13958.0102720.dwg Layout - 2 GRADING PLAN -- Thursday, October 05, 2023, 11:41am -- Copyright 2023, George Butler Associates, Inc.

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9801 Renner Blvd., Ste. 300
Lenexa, KS 66219
913.492.0400
gbateam.com

DATE:	10-05-2023
DESIGN BY:	CEL
DRAWN BY:	BIB
PROJECT NO.:	13958.01
SHEET NO.:	2
TOTAL SHEETS:	4

Clint Loumaster Professional Engineer License No. 2011009651		Mass Grading Plans LS Industrial, LLC Lee's Summit, Missouri	
NO.	DATE	REVISIONS	BY APPROVED

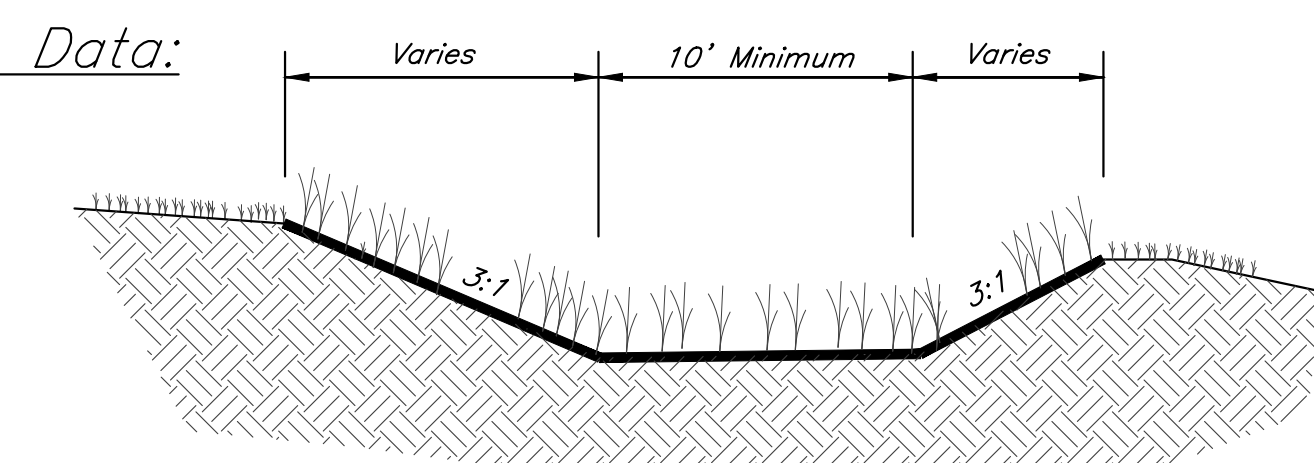
LEGEND

- Proposed Contour Major
- Proposed Contour Minor
- Existing Contour Major
- Existing Contour Minor
- Flow Arrow
- Match Line

Swale A

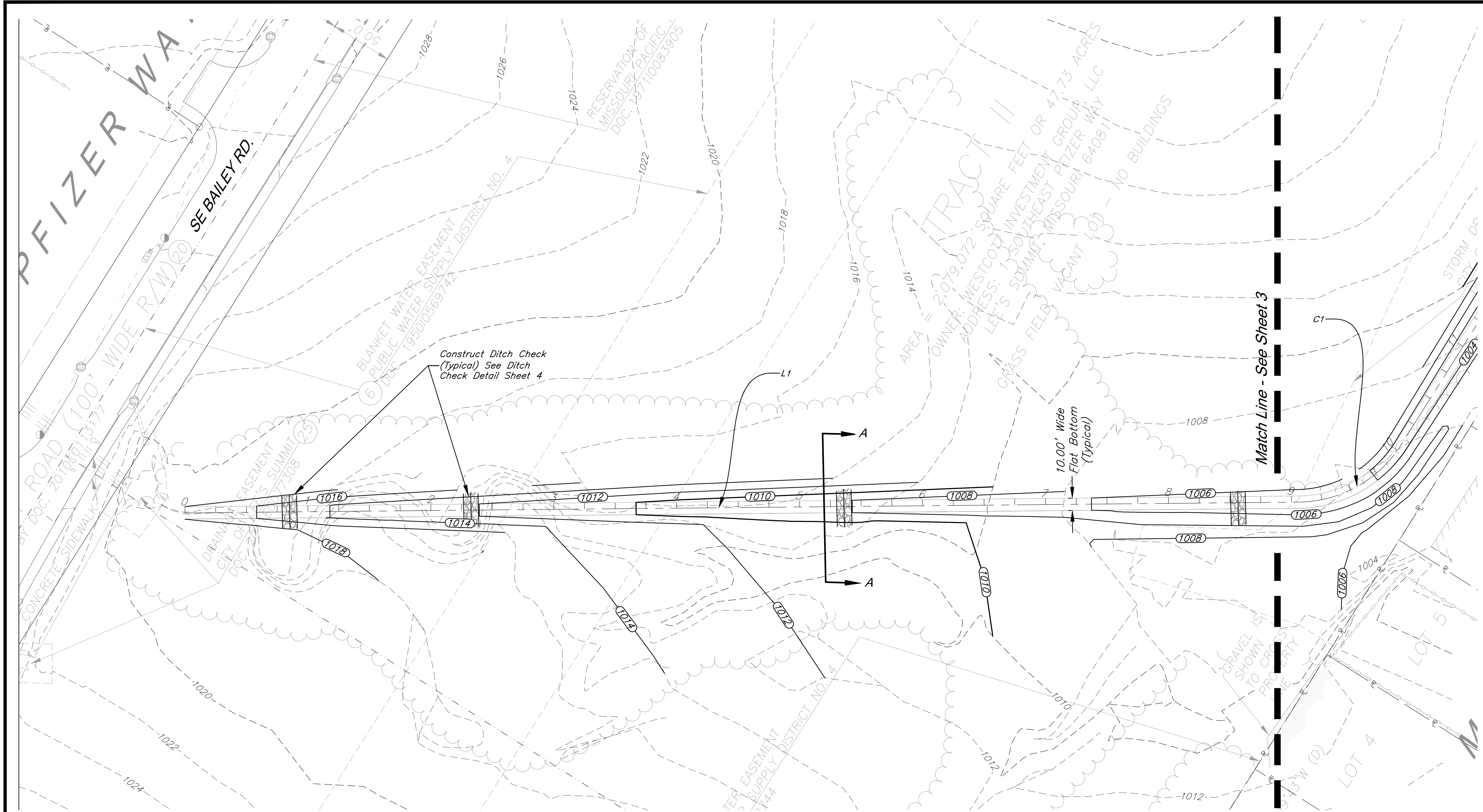
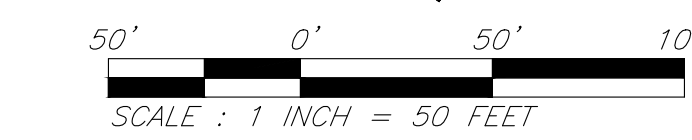
Number	Radius	Length	Line/Chord Direction	Northing/Easting
L1		905.63	S30°33'17"E	N 993703.6332 E 2824921.3087
C1	100.00	99.96	S59°11'28"E	N 992923.7548 E 2825381.6962
L2		610.04	S87°49'40"E	N 992874.6627 E 2825464.0202

Bioswale Data:
Q100 Depth: 4.5'

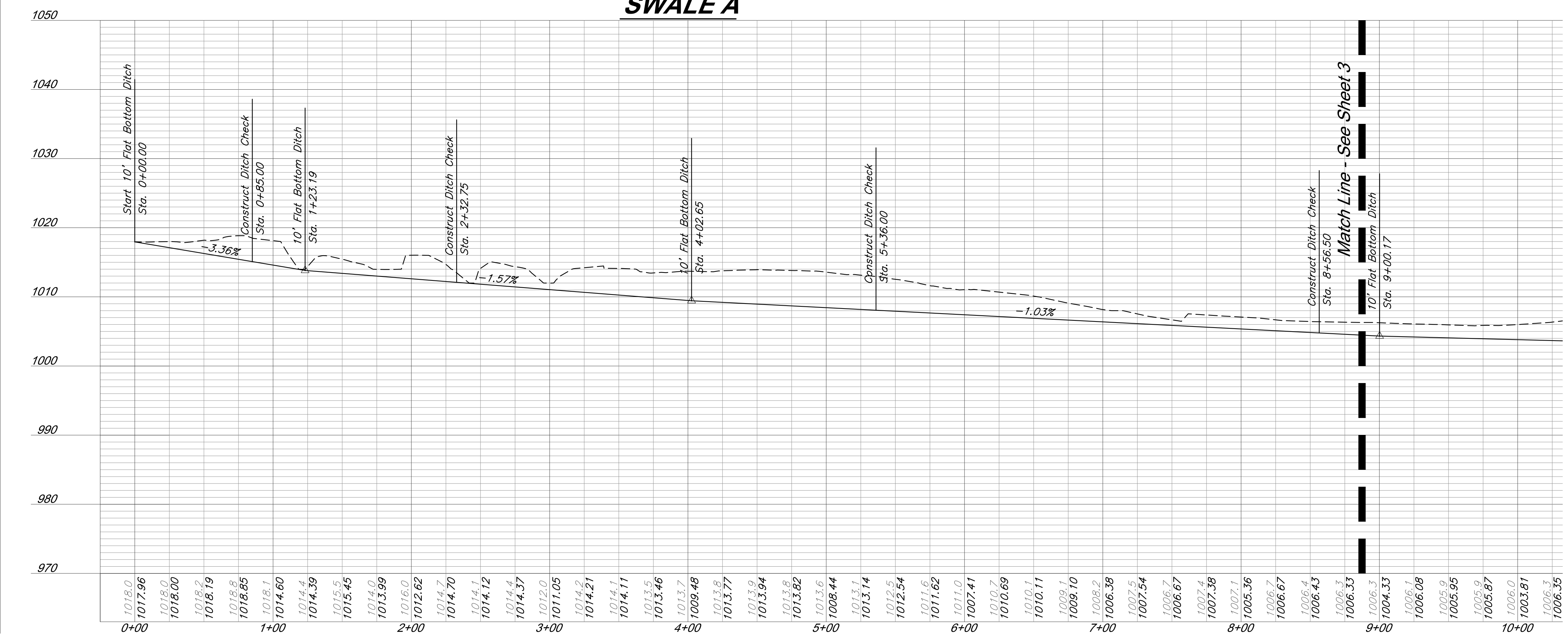


10' Flat Bottom Ditch

SECTION A-A
Not To Scale



SWALE A

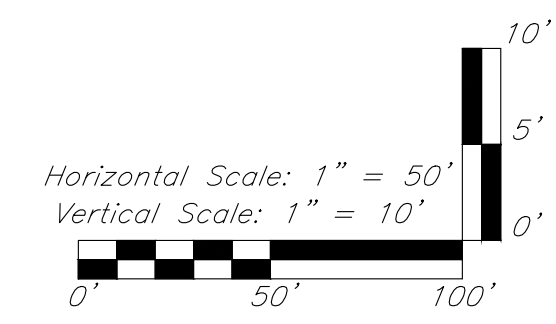


CAUTION!
Numerous Utilities on site. Contractor to verify location and elevation of all utilities prior to commencing construction.



Know what's below.
Call before you dig.

Grading Plan



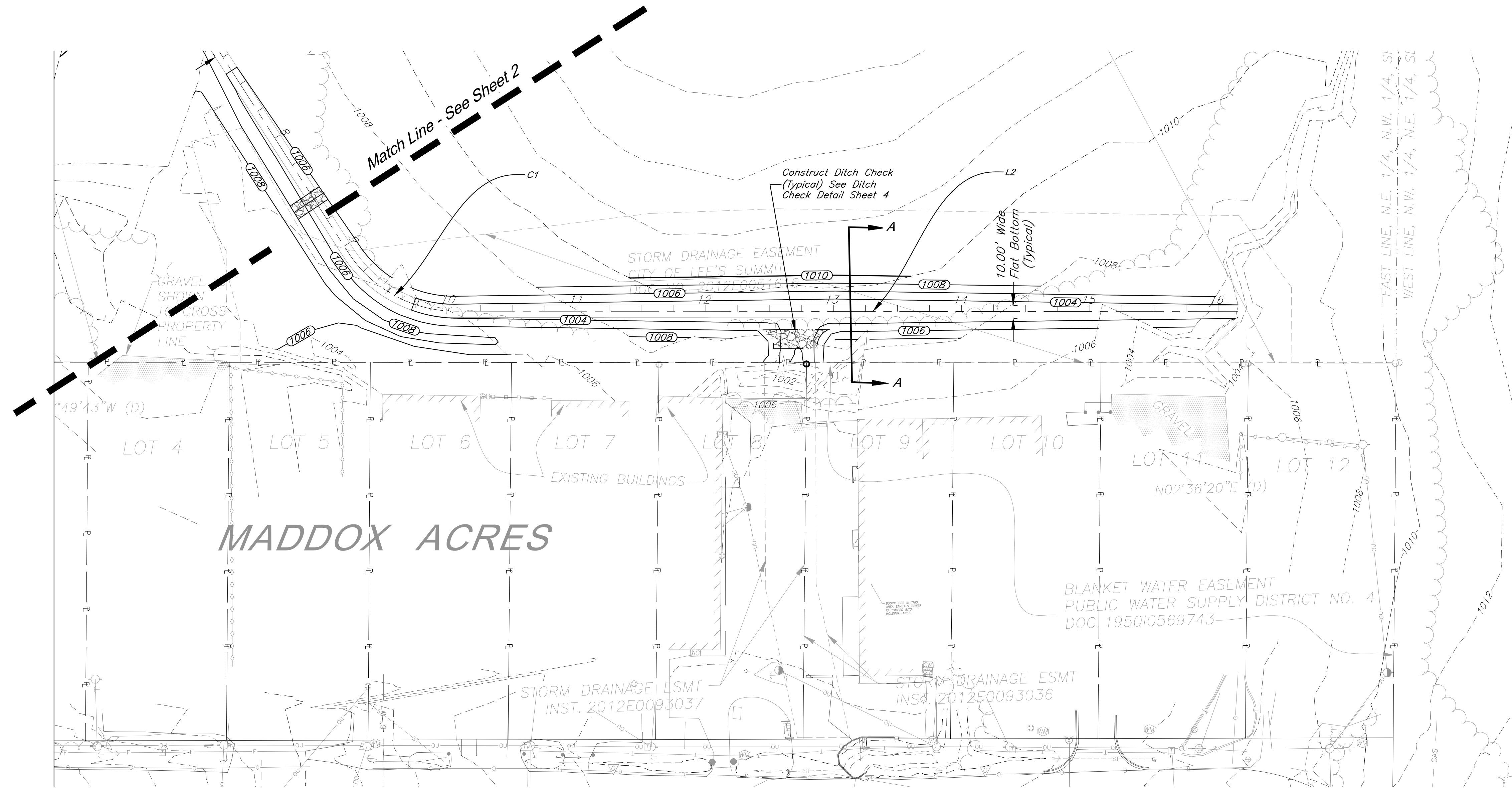
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GBA

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Lenexa, KS 66219
913.492.0400
gbateam.com

DATE:	10-05-2023
DESIGN BY:	CEL
DRAWN BY:	BIB
PROJECT NO.:	13958.01
SHEET NO.:	3
TOTAL SHEETS:	4

Clint Loumaster Professional Engineer License No. 2011009651		Mass Grading Plans LS Industrial, LLC Lee's Summit, Missouri	
NO.	DATE	REVISIONS	BY APPROVED



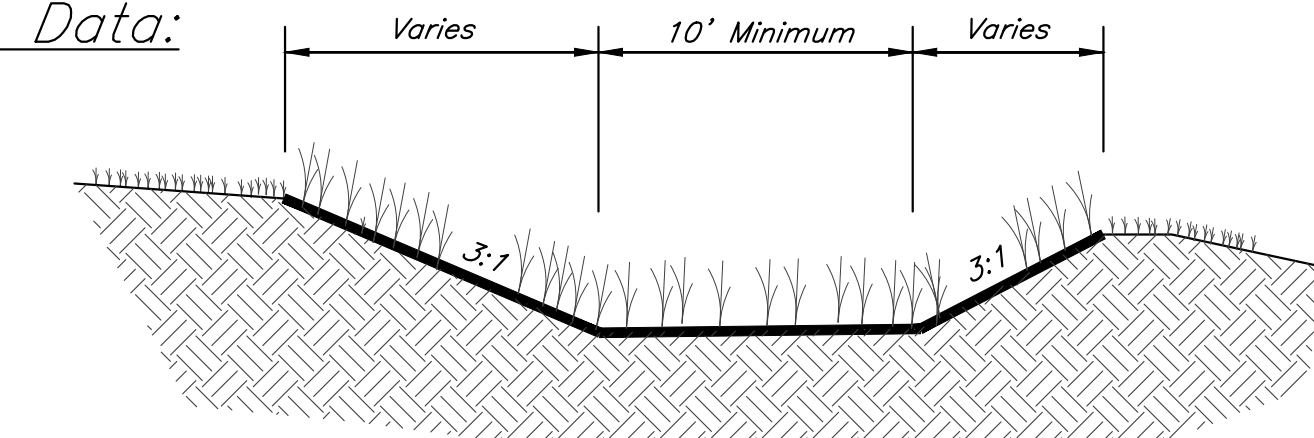
LEGEND

- Proposed Contour Major
- Proposed Contour Minor
- Existing Contour Major
- Existing Contour Minor
- Flow Arrow
- Match Line

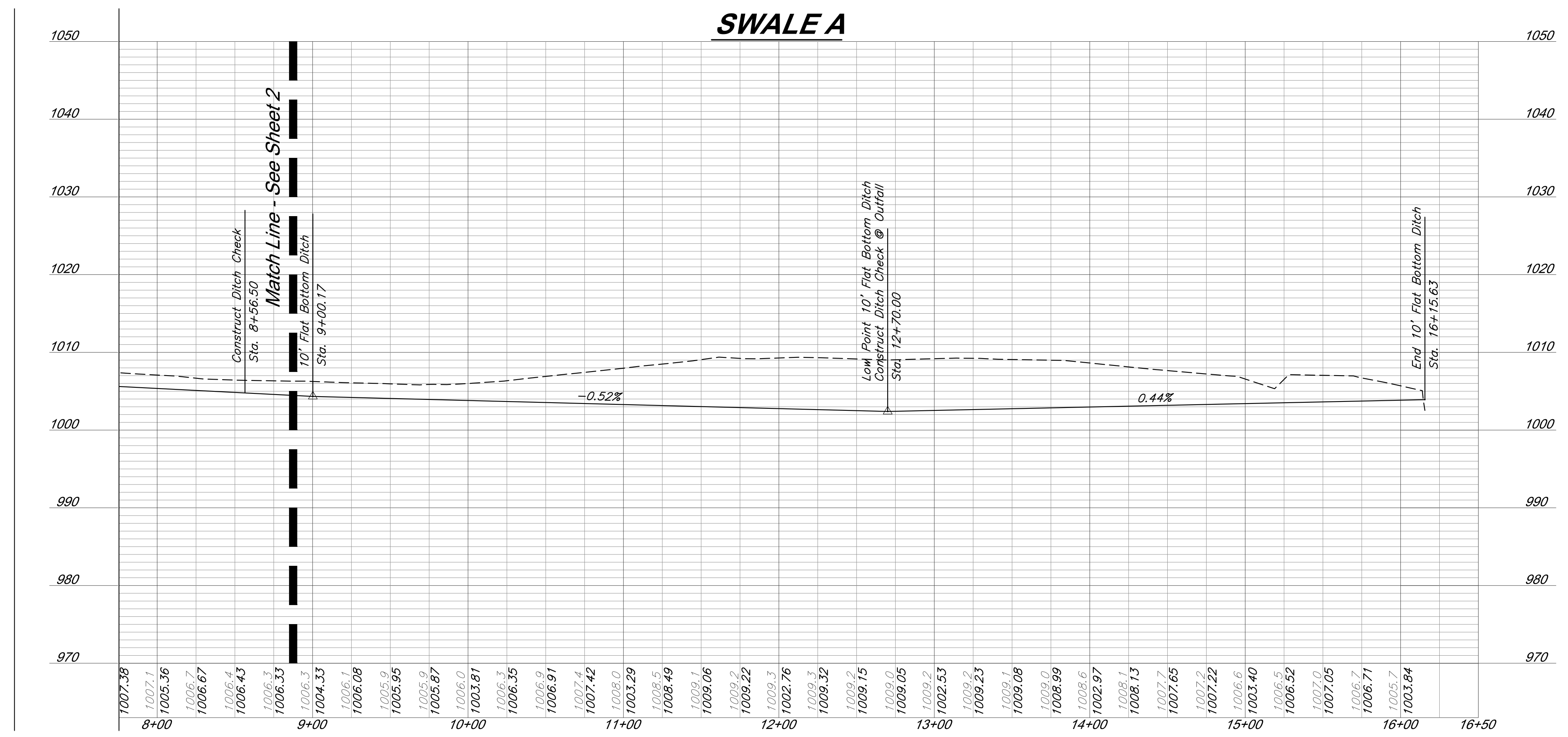
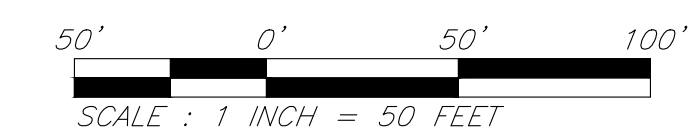
Swale A

Number	Radius	Length	Line/Chord Direction	Northing/Easting
L1		905.63	S30°33'17"E	N 993703.6332 E 2824921.3087
C1	100.00	99.96	S59°11'28"E	N 992923.7548 E 2825381.6962
L2		610.04	S87°49'40"E	N 992874.6627 E 2825464.0202

Bioswale Data:
Q100 Depth: 4.5'



SECTION A-A
Not To Scale

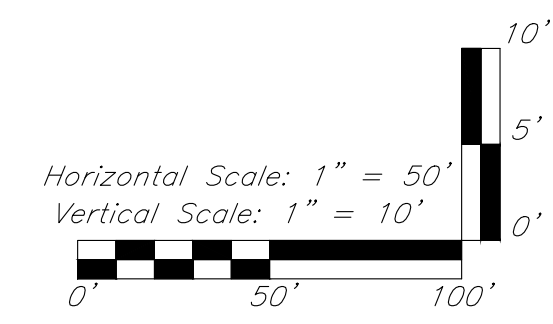


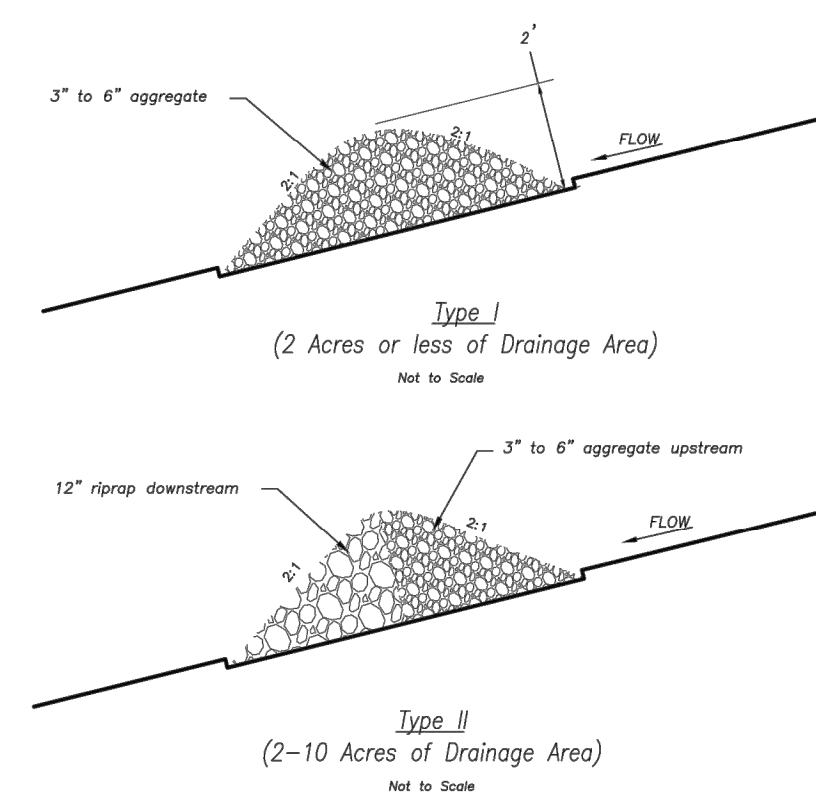
CAUTION!
Numerous Utilities on site. Contractor to verify location and elevation of all utilities prior to commencing construction.



Know what's below.
Call before you dig.

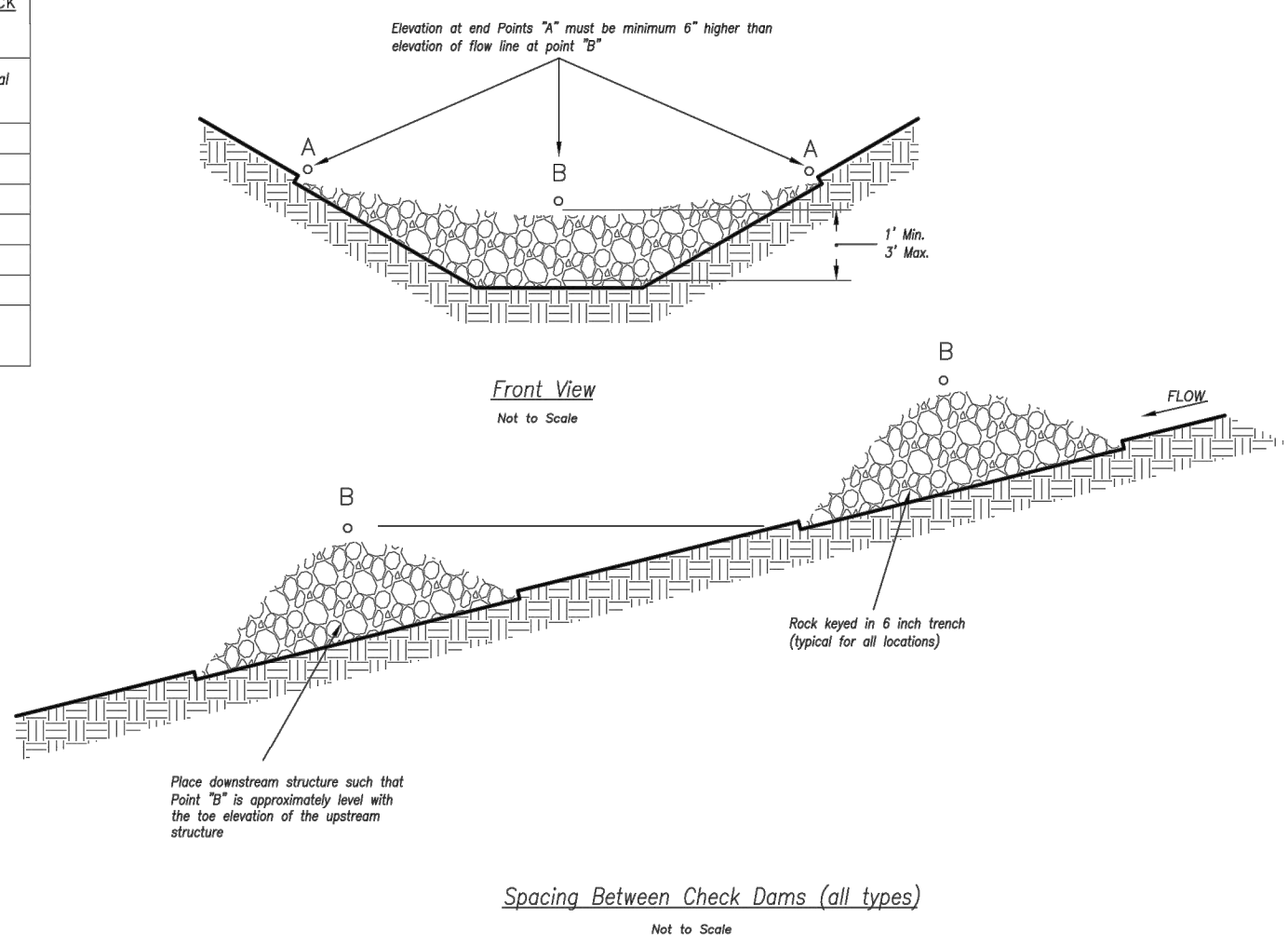
Grading Plan





Ditch Centerline Slope (X : Y)	Spacing Interval (Feet)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29

Note: Use this spacing only for Rock Ditch Checks.

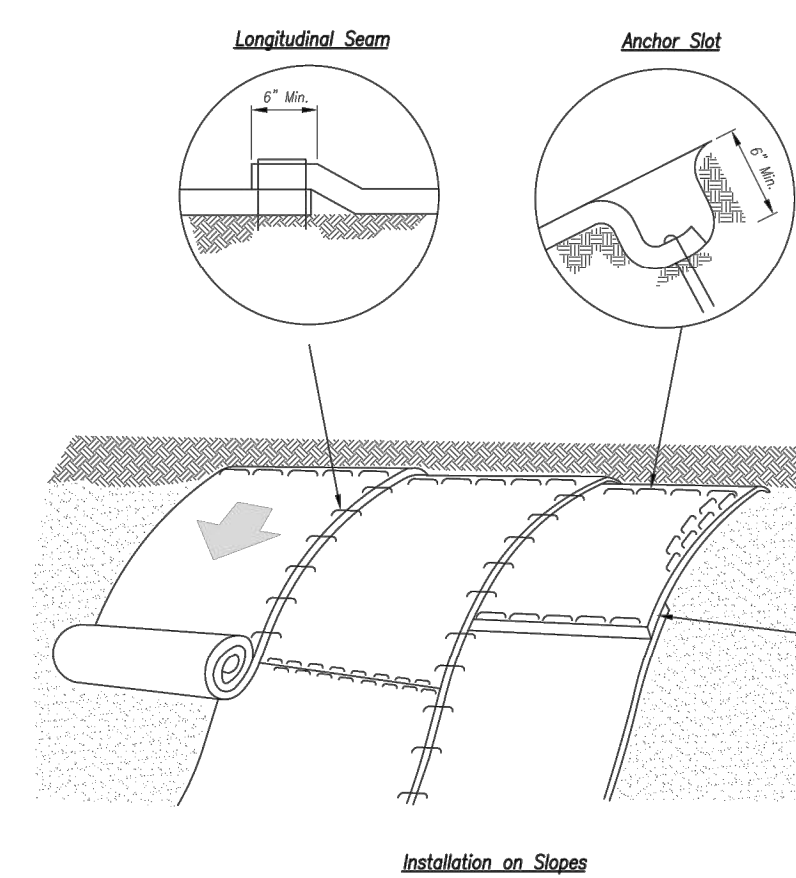


- Notes:**
- Rock check dams shall be used only for drainage areas less than 10 acres unless approved by the City Engineer.
 - The rock checks only in situations where the ditch slope exceeds 6E.
- Maintenance:**
- Remove and dispose of sediment deposits when the deposit approaches 1/2 the height of the ditch check.
 - Replace and reshape as necessary to maintain function and integrity of installation.

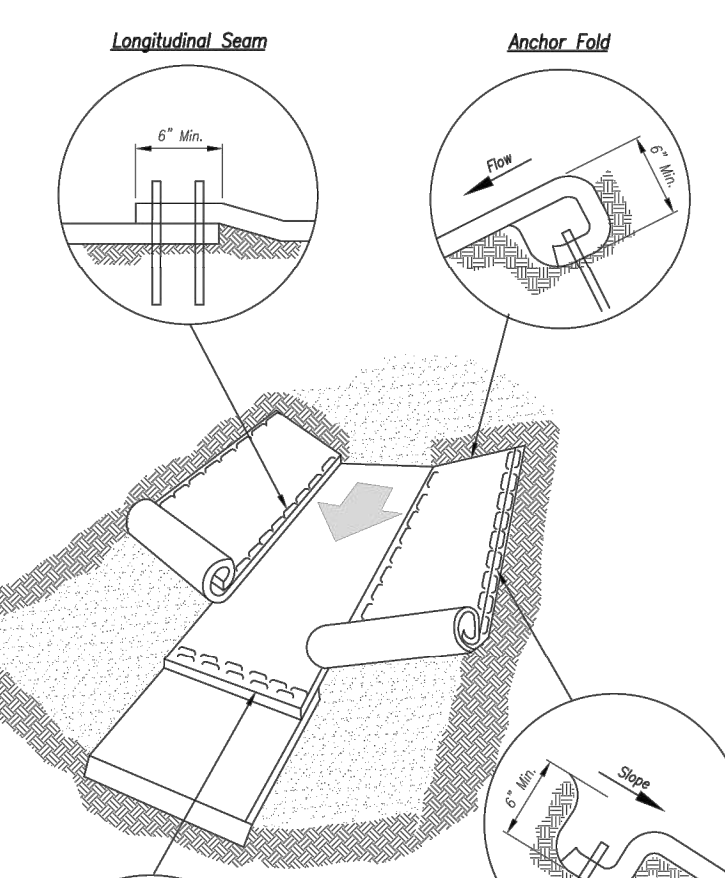
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APWA
KANSAS CITY METRO CHAPTER
STANDARD DRAWING NUMBER ESC-10
ADOPTED: 10/24/2016

ROCK DITCH CHECKS

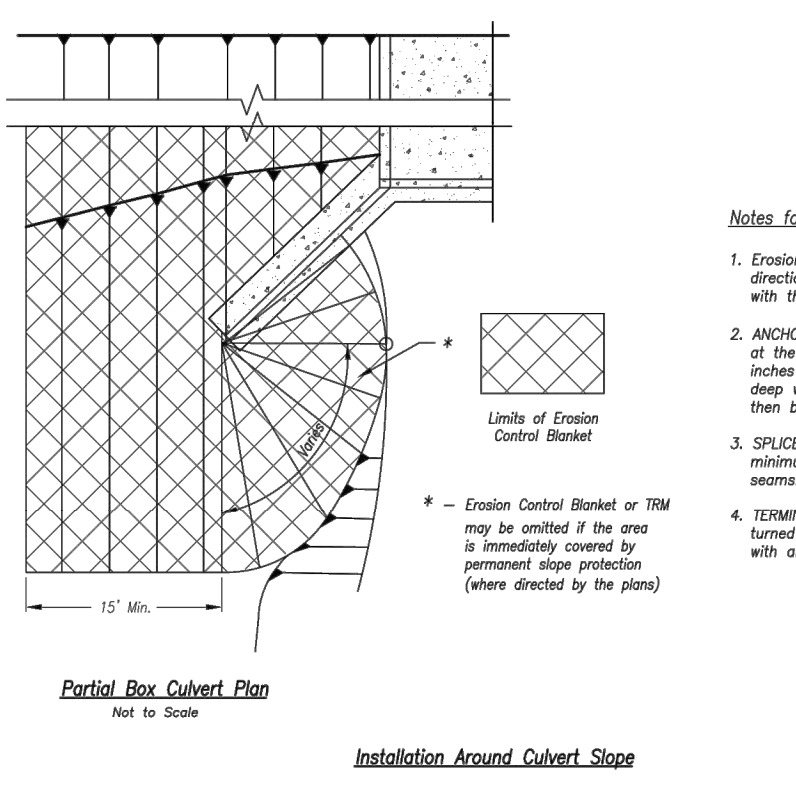
Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.



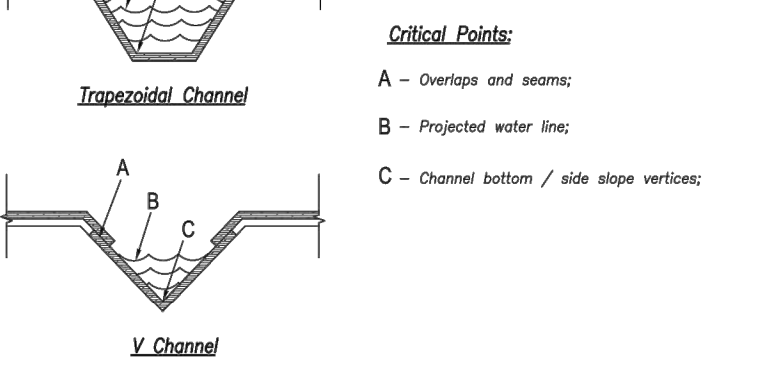
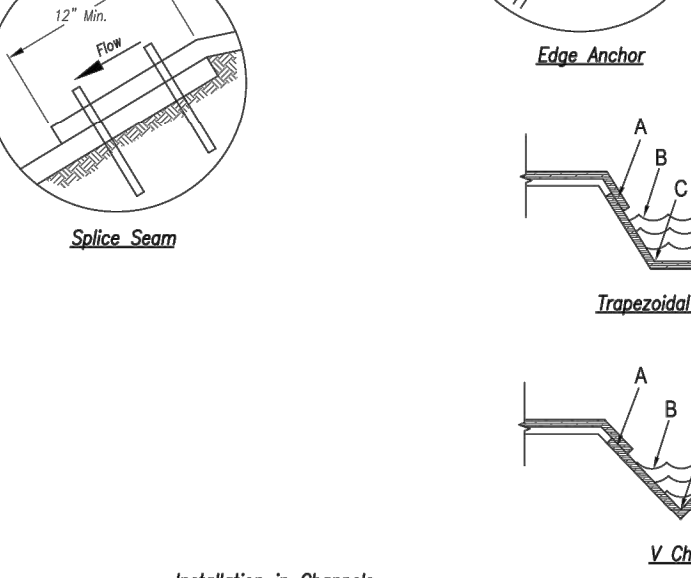
- General Notes:**
- APWA Specifications 2150 and Design Guidance 5100 shall be referenced to select type of blanket or mat to be used.
 - Typical anchors and patterns/spacing shall be installed according to the manufacturer's instructions.
 - LONGITUDINAL SEAMS:** The edges of the blanket or mat should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.
- Maintenance:**
- Form or degraded product shall be repaired or replaced, unless such degradation is within the functional longevity specified by the manufacturer.
 - Edges or seams that are loose or frayed shall be secured.



- Notes for Installation in Channels:**
- Erosion Control Blankets and TRMs shall be laid in the direction of the flow, with the first course at the centerline of channel, where applicable, in order for the mat to be in contact with the soil, by the mat loosely, avoiding stretching.
 - ANCHOR FOLD:** The top of the mat should be folded under, burlap and secured with wood or other approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot 6 inches wide x 6 inches deep, anchored in the bottom of the slot, specified, and the mat folded over the top as shown in detail.
 - SPLICE SEAM:** When splices are necessary, overlap and a minimum of 12 inches in direction of water flow. Stagger splice seams.
 - CHECK SLOTS:** Establish check slots transverse to slope every 30 feet; the slots should be 6 inches wide x 6 inches deep. The mat shall be cut to a length 12 inches beyond the slot. The top of the upstream mat shall be installed, secured and buried similar to the edge anchor fold. The upstream mat shall then cover the slot and be anchored as shown.
 - EDGE ANCHORS:** Lay outside edge of mat into trench at top of the slope and anchor.
 - TERMINUS:** The bottom edge of the mat shall be anchored.



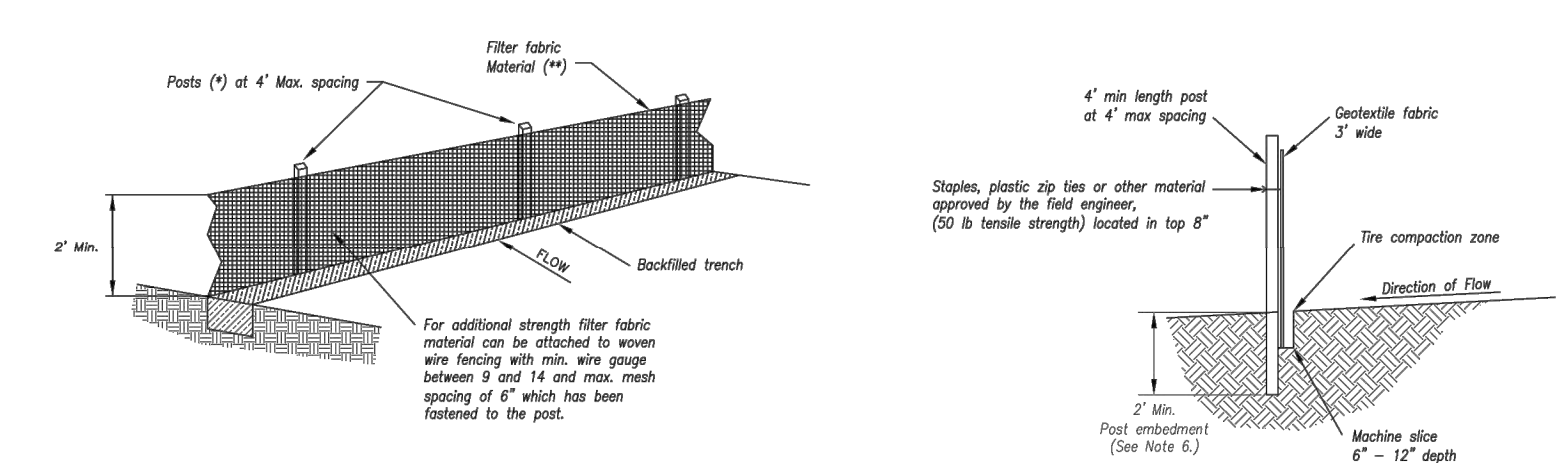
- Notes for Installation on Slopes:**
- Erosion Control Blankets and TRMs shall be laid in the direction of the slope, in order for blanket to be in contact with the soil, top blanket loosely, avoiding stretching.
 - ANCHOR SLOTS:** The top of the blanket should be "slotted" in" of the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then installed, topped and sealed.
 - SPLICE SEAM:** When splices are necessary, overlap and a minimum of 8 inches in direction of water flow. Stagger splice seams.
 - TERMINAL FOLD:** The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.



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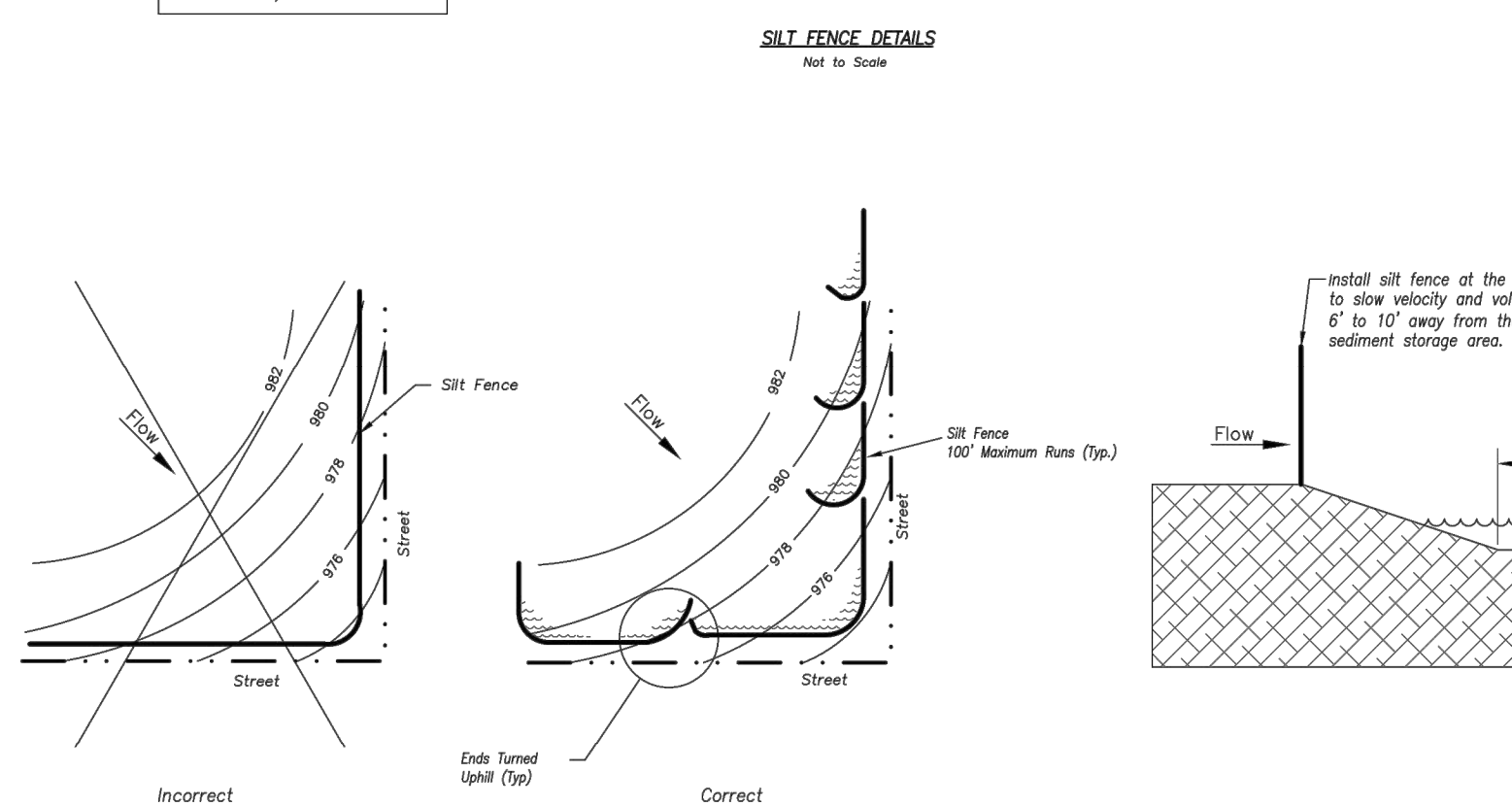
EROSION CONTROL BLANKETS AND TURF REINFORCEMENT MATS

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.



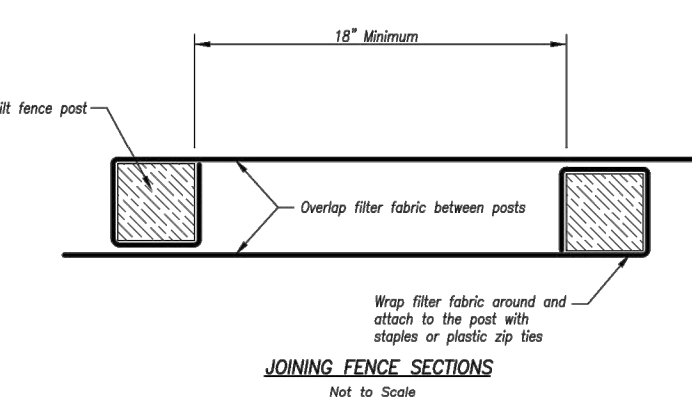
- (*) EGGS:**
- MIN. LENGTH 4"
 - MATERIAL 1 1/2" x 1 1/2"
 - NO.2 SOUTHERN PINE 2 1/2" x 2 1/2"
 - STEEL 1.33 LB/FT

(*) - Geotextile Fabric shall meet the requirements of ASTM D 2875



- Notes:**
- In order to contain water, the ends of the silt fence must be turned uphill (Figure A).
 - Long perimeter runs of silt fence must be broken up into several smaller segments to minimize water concentrations (Figure A).
 - Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.
 - Attach fabric to upstream side of post.
 - Install posts a minimum of 2' into the ground.
 - Trenching will only be allowed for small or difficult installation, where staking machine cannot be reasonably used.

- Maintenance:**
- Remove and dispose of sediment deposits when the deposit approaches 1/2 the height of silt fence.
 - Repair as necessary to maintain function and structure.



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SILT FENCE

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

