STORM WATER DRAINAGE REPORT

705 SE HIGH STREET

LOT 9A, LOT 11A, LOT 13A

BLOCK 5, LOWES ADDITION

LEE'S SUMMIT, MISSOURI

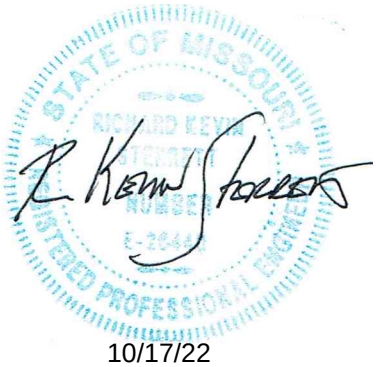
PREPARED FOR

705 HIGH STREET LLC

PREPARED BY

HG CONSULT, INC.

October 17, 2022



10/17/22

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3. Project Overview

The proposed project is a 3 lot, 0.49 acre residential subdivision developed in central part of Lee's Summit, Jackson County, Missouri. This is a subdivision with development on all four sides. The existing storm water flows to this site from the west to the east. Existing Drainage Area 1 drains to the east, Drainage Area 2 drains to the north onto High Street and Drainage Area 3 Drains internally to an offsite Inlet. These existing drainage areas will be divided partly to discharge to an existing field inlet on the north side of 3rd Street. This is accomplished by crossing over existing lots to change the area of discharge from these lots.

4. Drainage Assessment of the Project Site

After development this site will be diverting storm water from the ridge of each duplex to the north and to the south. The drainage to the north will drain directly to High Street and the drainage to the south will drain through a surface swale to a proposed field inlet. This drainage will be piped by a series of HDPE pipes to the public storm sewer system on the north side of 3rd Street.

The after development drainage area drains to the north (High Street DA-2) and to the south to a proposed field inlet (DA-1 and DA-3).

Rational method of calculating storm water flow:

Q = kCIA C = 0.66

Area 1 Calculation

Q_{10} = (1.00) (0.66) (7.35) (0.48) = 2.32 cfs

Q_{100} = (1.25) (0.66) (10.32) (0.48) = 4.08 cfs

Area 2 Calculation

Q_{10} = (1.00) (0.66) (7.35) (0.27) = 1.31 cfs

Q_{10} = (1.25) (0.66) (10.32) (0.27) = 2.30 cfs

Area 3 Calculation

Q_{10} = (1.00) (0.66) (7.35) (0.04) = 0.19 cfs

Q_{10} = (1.25) (0.66) (10.32) (0.04) = 0.34 cfs

Discharge rates for Proposed Conditions

Drainage Area	Area (ac)	Q10 (cfs)	Q100 (cfs)
DA-1	0.48	2.32	4.08
DA-2	0.27	1.31	2.30
DA-3	0.04	0.19	0.34
Total	0.72	3.48	6.13

Curve Numbers are based on APWA, Section 5600. Time of concentration was considered using TR-55; however, due to the small size of the drainage basin and the amount of impervious area on the site that will just be conveying sheet flow, a time of concentration of 5 minutes was assumed. This is the minimum time of concentration per APWA 5600.

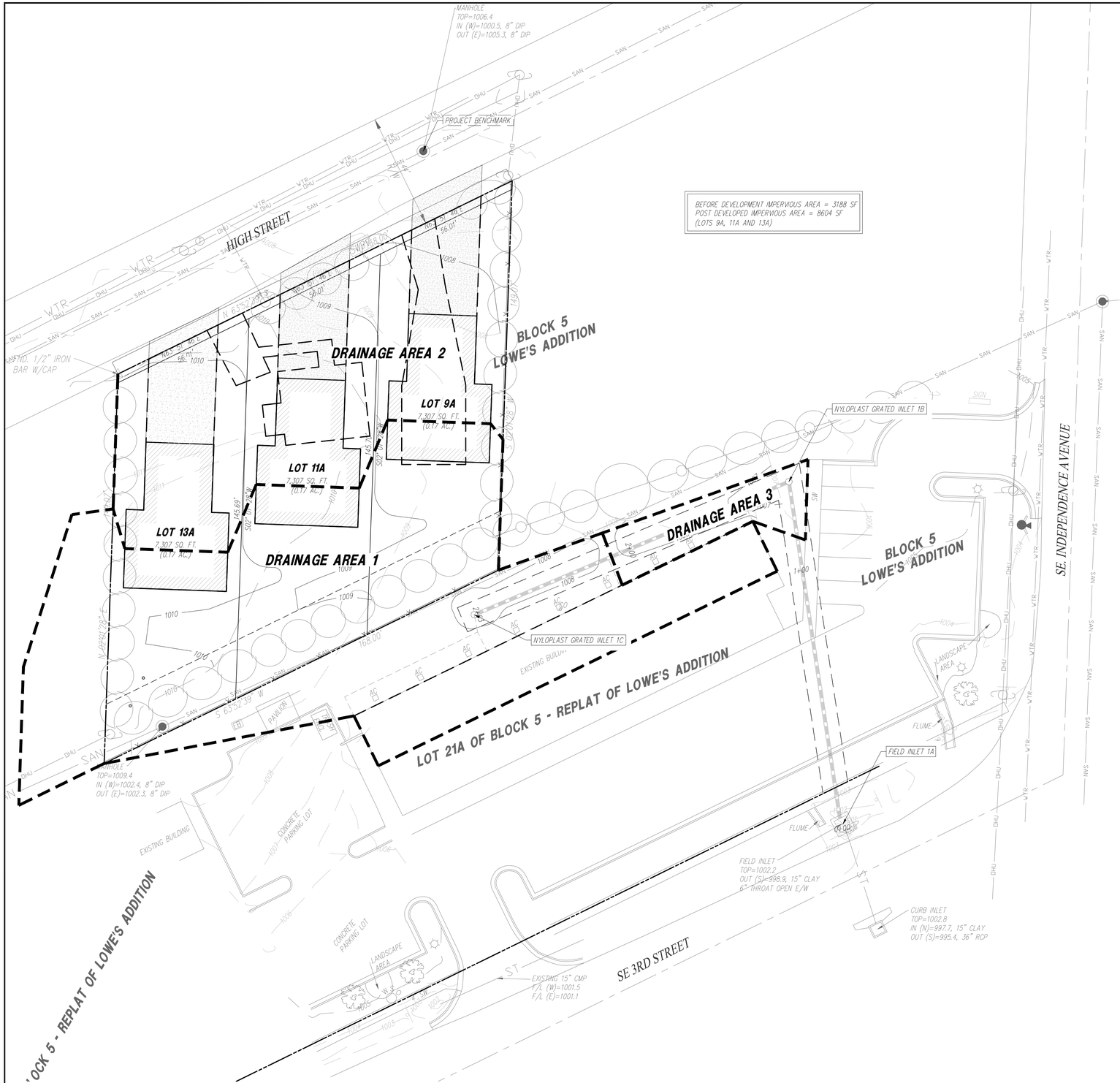
5. Temporary Erosion and Sediment Control

During construction, it will be necessary to control erosion and sediment from the site during storms within the construction timeframe. To ensure that sediment does not enter the existing storm system, perimeter containment is controlled by silt fence installation and inlet protection. These erosion control devices, and their maintenance throughout the construction timeframe, are required by ordinance and the details for them are referenced by the City's Design and Construction Manual.

6. Conclusion

The proposed project is a proposed residential subdivision. The report has been prepared to evaluate the storm water discharge. Even though there is an increase in impervious coverage due to the 3 (three) proposed houses, it has been shown that with the addition of the basin inlets on the south side of property, there will be very minimal impact or increase in sheet flow to the downstream areas.

A waiver is requested, to the City of Lee's Summit, MO City Engineer, that no detention shall be required since the amount of additional storm water is negligible and handled through the proposed underground system.



DRAINAGE AREA 1 (20811 SF)

PRIOR TO DEVELOPMENT:
- 6943 SF PERVIOUS OFFSITE
- 3602 SF IMPERVIOUS OFFSITE
- 10266 SF PERVIOUS ONSITE

AFTER DEVELOPMENT:
- 6943 SF PERVIOUS OFFSITE
- 3602 SF IMPERVIOUS OFFSITE
- 8493 SF PERVIOUS ONSITE
- 1773 SF IMPERVIOUS ONSITE

DRAINAGE AREA 2 (11817 SF)

PRIOR TO DEVELOPMENT:
- 8630 SF PERVIOUS ONSITE
- 3187 SF IMPERVIOUS OFFSITE

AFTER DEVELOPMENT:
- 4979 SF PERVIOUS ONSITE
- 6838 SF IMPERVIOUS ONSITE

DRAINAGE AREA 3 (1536 SF)

PRIOR TO DEVELOPMENT:
- 1536 SF PERVIOUS OFFSITE

AFTER DEVELOPMENT:
- 1536 SF PERVIOUS OFFSITE

Rational method of calculating storm water flow:
$Q = kCIA$ $C = 0.66$

Area 1 Calculation
$Q_{10} = (1.00)(0.66)(7.35)(0.48) = 2.32$ cfs
$Q_{100} = (1.25)(0.66)(10.32)(0.48) = 4.08$ cfs

Area 2 Calculation
$Q_{10} = (1.00)(0.66)(7.35)(0.27) = 1.31$ cfs
$Q_{100} = (1.25)(0.66)(10.32)(0.27) = 2.30$ cfs

Area 3 Calculation
$Q_{10} = (1.00)(0.66)(7.35)(0.04) = 0.19$ cfs
$Q_{100} = (1.25)(0.66)(10.32)(0.04) = 0.34$ cfs

KEY

PROPOSED		EXISTING
979	Grades	960
	Drainage Area	

PROPOSED DRAINAGE AREA 3 (1536 SF)
PRIOR TO DEVELOPMENT:
- 1536 SF PERVIOUS OFFSITE

AFTER DEVELOPMENT:
- 1536 SF PERVIOUS OFFSITE

**All storm sewer piping is designed to carry the 100 year storm event. Storm events that are not carried by storm sewer piping is routed overland in parking lot until the overland flow reaches the south curb line then into flumes.

PROJECT BENCHMARK:

#1 Top of Sanitary Manhole lid in street on north side of project.
N: 1000374.6290
E: 2826739.8680
TOP ELEV. 1006.44

NO.	DATE	REVISION	BY	CK/APP
1	11/19/21	Staff Comments from 7/29/21	EDH	RKS
2	5/26/22	MOVED STORM PIPE AWAY FROM INDEPENDENCE	EDH	RKS
3	10/12/22	CHANGED PIPE SIZE TO 15" AND REFERENCE COMMENTS FROM GENE WILLIAMS	EDH	RKS

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STATE OF MISSOURI
R. KEVIN STERRETT
NUMBER E-26440
REGISTERED PROFESSIONAL ENGINEER
10/12/22

R. KEVIN STERRETT, MO E-26440

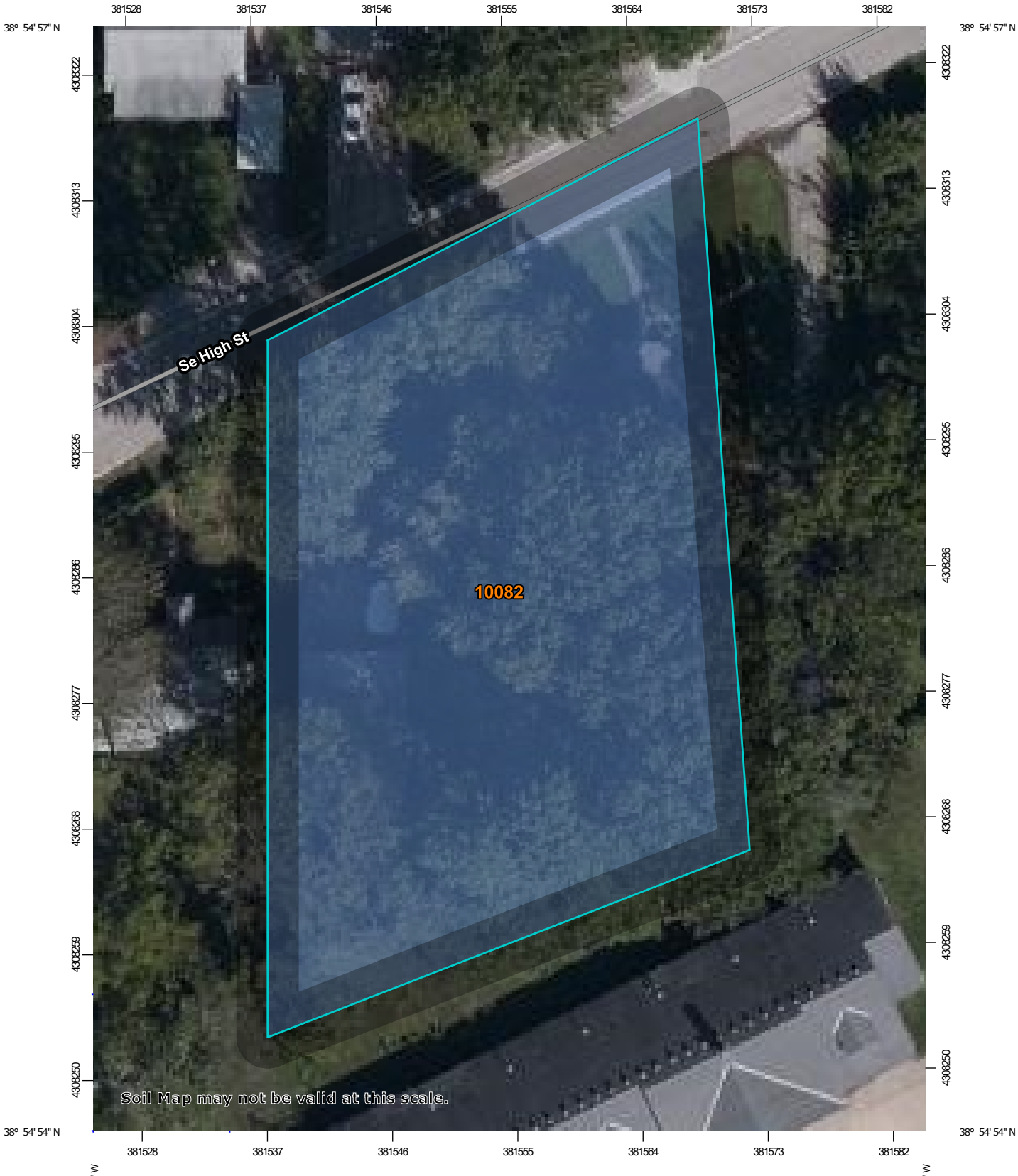
Consult engineers Inc planners
CORPORATE LICENSE No. E2010005873

DRAINAGE AREA MAP

705 SE HIGH STREET DUPLEXES
LEE'S SUMMIT - JACKSON COUNTY - MISSOURI

X-REF NO.	21118B
DRAWING NO.	21085
DATE	OCTOBER 7, 2021
JOB NO.	21085
SHEET OF	5 OF 7

AASHTO Group Classification (Surface)—Jackson County, Missouri
(705 HIGH STREET)



Map Scale: 1:386 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 15 30 60 90

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 Rating Polygons

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Lines

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Points

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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 24, Aug 31, 2022

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

Date(s) aerial images were photographed: Sep 6, 2019—Nov 16, 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.

AASHTO Group Classification (Surface)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	A-6	0.4	100.0%
Totals for Area of Interest			**0.4**	**100.0%**

Description

AASHTO group classification is a system that classifies soils specifically for geotechnical engineering purposes that are related to highway and airfield construction. It is based on particle-size distribution and Atterberg limits, such as liquid limit and plasticity index. This classification system is covered in AASHTO Standard No. M 145-82. The classification is based on that portion of the soil that is smaller than 3 inches in diameter.

The AASHTO classification system has two general classifications: (i) granular materials having 35 percent or less, by weight, particles smaller than 0.074 mm in diameter and (ii) silt-clay materials having more than 35 percent, by weight, particles smaller than 0.074 mm in diameter. These two divisions are further subdivided into seven main group classifications, plus eight subgroups, for a total of fifteen for mineral soils. Another class for organic soils is used.

For each soil horizon in the database one or more AASHTO Group Classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)