Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

March 8, 2022 Project No. 21-7362

10426 Locust XC, LLC
3010 Old Ranch Parkway, Suite 470
Seal Beach, CA 90740

Subject: Design Level Percolation Testing Report for Onsite Sewage Disposal System, 10426 Locust Avenue, Bloomington, California

References: HPA Architecture, Conceptual Site Plan-Scheme 4, 10426 Locust Ave., Bloomington, County of San Bernardino, CA, Job #21641, dated January 7, 2022.

San Bernardino County Public Health Environmental Health Services, Percolation Testing and Reporting Standards for Onsite Wastewater Treatment Systems, dated September 2019.

As requested and authorized, TGR Geotechnical, Inc. (TGR) has completed design level percolation testing for the proposed onsite sewage disposal system located on the north side of the subject site located at 10426 Locust Avenue in the city of Bloomington, California. This report presents the results of our field investigation and testing, discussion of our findings, and provides percolation rates and recommendations for the proposed leach field.

PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to determine the general percolation rates and physical characteristics of the onsite soils in order to provide percolation rates for the proposed onsite sewage disposal system at the northern portion of the subject site. Services provided for this study are in accordance with our proposal dated February 15, 2022 and consisted of the following:

- Excavation, logging and percolation testing of four (4) hollow-stem auger borings to an approximate depth of 5 feet below existing grade. The percolation testing procedures were performed in accordance with the referenced County of San Bernardino On-Site Wastewater Treatment System Guidelines.
- Laboratory testing of selected samples for in-situ moisture content and Passing No. 200 sieve.
- Preparation of this report presenting the results of the percolation testing and recommendations for the proposed leach field.

SITE DESCRIPTION

The subject site is located at 10426 Locust Avenue in the city of Bloomington, California (Figure 1, Site Location Map). The subject site is currently a 2.73-acre dirt and asphalt covered parcel of land currently being used for miscellaneous storage, trailer parking, out-buildings, etc. It is our understanding that the proposed development will consist of a 55,023 square foot industrial building with associated truck docks and ramps to the southwest, parking lots to the north and southeast, and landscaping to the east. Further information regarding property layout, boring

locations and proposed sewage disposal system location are shown on Plate 1, Boring Location Map.

FIELD INVESTIGATION

Field exploration was performed on February 23, 2022 by members from our firm who logged the borings and obtained representative samples, which were subsequently transported to the laboratory for further review and testing. The approximate locations of the borings are indicated on the enclosed Boring Location Map (Plate 1).

The subsurface conditions were explored by drilling, sampling, and logging four (4) borings with a truck mounted hollow stem auger drill rig. Borings P-1 through P-4 were advanced to an approximate depth of 5 feet below existing grade in the area of the proposed leach field and utilized for percolation testing. Subsequent to percolation testing, all borings were backfilled with soil cuttings. The log of borings presenting soil conditions and descriptions are presented on Plates 2 through 5.

The drill rig was equipped with a sampling apparatus to allow for recovery of driven modified California Ring Sampler (CRS), 3-inch outside diameter, and 2.42-inch inside diameter and SPT samples.

The samples were driven using an automatic 140-pound hammer falling freely from a height of 30 inches. The blow counts for CRS were converted to equivalent SPT blow counts. Soil descriptions were entered on the logs in general accordance with the Unified Soil Classification System (USCS). Driven samples and bulk samples of the earth materials encountered at selected intervals were recovered from the borings. The locations and depths of the soil samples recovered are indicated on the boring logs on Plates 2 through 5.

SUBSURFACE SOIL CONDITIONS

Based on our site reconnaissance and subsurface excavations, the site is underlain by approximately 5 feet of olive brown, fine grained silty sand with some fine to coarse grained gravel. A more detailed description of these materials is provided in the boring logs included on Plates 2 through 5. Soils encountered were classified according to the Unified Soil Classification System (USCS).

GROUNDWATER

Subsurface water was not encountered to a depth of approximately 5 feet below existing grade during our subsurface exploration and was not encountered to a depth of approximately 26.5 feet during our previous investigation at the subject site (TGR, 2021).

USGS groundwater data from wells nearest to the subject site indicate a historic high groundwater of approximately 252 feet below existing grade (USGS 340521117212005 001S005W13B005S) and 982 feet above NAVD 1988 (USGS 340606117223804 001S005W11F004S.)

Seasonal and long-term fluctuations in the groundwater may occur as a result of variations in subsurface conditions, rainfall, run-off conditions and other factors. Therefore, variations from our observations may occur. Static groundwater is not anticipated to impact the proposed development.

PERCOLATION TESTING AND PROCEDURE

Percolation testing was performed in general accordance with the procedures of the San Bernardino County Public Health Environmental Health Services, Percolation Testing and Reporting Standards for Onsite Wastewater Treatment Systems. The purpose of this testing was to assess the general percolation rates of the onsite soils for the design of an onsite sewage disposal system.

Four percolation borings, P-1 through P-4, were excavated to a depth of 5 feet below existing grade in the general vicinity of the proposed leach field. The borings measured approximately 8 inches in diameter, the bottoms of the borings were filled with approximately 2 inches of gravel and a 4-inch diameter perforated PVC pipe was placed in the center of the boring to minimize caving.

The borings were filled with approximately 12 inches of clear water during pre-soaking and 10 inches of water seeped away in 10 minutes or less. Based on the outcome of the pre-soak procedure and the granular nature of the onsite sandy soils, testing was conducted immediately after the pre-soak.

Testing was performed by filling each of the percolation test borings with approximately 8 to 12 inches of water. Final time intervals were adjusted to ensure a drop in water of greater than 1 inch, but not more than 3 inches occurred for each reading. A minimum of 6 consecutive measurements were taken.

SUMMARY OF PERCOLATION TEST RESULTS

Results reported are the most conservative reading in minute per inch drop (MPI). Field test data is presented on Tables 1 through 4. A summary of test results is provided in the table below:

BORING NUMBER	DEPTH OF BORING (FEET)	PERCOLATION RATE (MPI)	SOIL DESCRIPTION
P-1	5	2.60	Silty Sand
P-2	5	1.74	Silty Sand
P-3	5	2.60	Silty Sand
P-4	5	1.32	Silty Sand

Based on the obtained field data, onsite soils percolated at rates ranging from 1.32 minutes per inch to 2.60 minutes per inch. An MPI between the mean and most conservative MPI should be utilized in the design of the proposed onsite sewage disposal system. The mean value was 2.07 MPI and the most conservative value was 2.60 MPI, therefore the recommended design value is 2.33 MPI.

The application rate for 2.33 MPI is equal to 1.2 gallons per square foot per day (0.83 ft^2/g/day).

DISCUSSION OF RESULTS AND CONCLUSIONS

Based on our field investigation the soil characteristics are defined as favorable: onsite soils are uniform in the vicinity of the proposed leach field, there is no shallow groundwater or bedrock and no slopes in the disposal area.

Measurements were taken with a groundwater depth probe with accuracy of 1/100 of a foot, no caving occurred during percolation testing and only minor siltation occurred within the test borings.

There is sufficient area on the subject site to support an individual sewage disposal system that will meet the current codes and standards of the Environmental Health Services Division, County of San Bernardino.

The groundwater table will not encroach within the current allowable limit set forth by county and state requirements. Leach beds may not be founded in fill soils, only cut materials or undisturbed natural ground. Leach beds may not be installed under driveways or paved areas.

Minimum soil coverage of one (1) foot over the lines is required. Leach beds should be installed as close to ground surface as possible to promote loss of effluent through evapotranspiration. Leach lines should be installed along ground contours of equal elevation to maintain uniform depth.

LIMITATIONS

Soil materials vary in character between excavations. Site conditions may vary due to seasonal changes or other factors. Therefore, we assume no responsibility or liability for work, testing or recommendations performed or provided by others.

Since our study is based upon the site materials observed, engineering research and analyses, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice, and no warranty is expressed or implied. Standards of practice are subject to change with time.

Respectfully submitted,

TGR GEOTECHNICAL, INC.

Robert Aguilar
Staff Engineer

REGISTERED PROFESSIONAL ENGINEER
SANJAY GOVIL
No. GE2382
EXP. 6/30/2022
GEOTECHNICAL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL GEOLOGIST
EDWARD LOUIS BURROWS
No. 1750
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Sanjay Govil, PhD, PE, GE 2382
Principal Geotechnical Engineer

Edward L. Burrows, MS, PG, CEG 1750
Principal Engineering Geologist

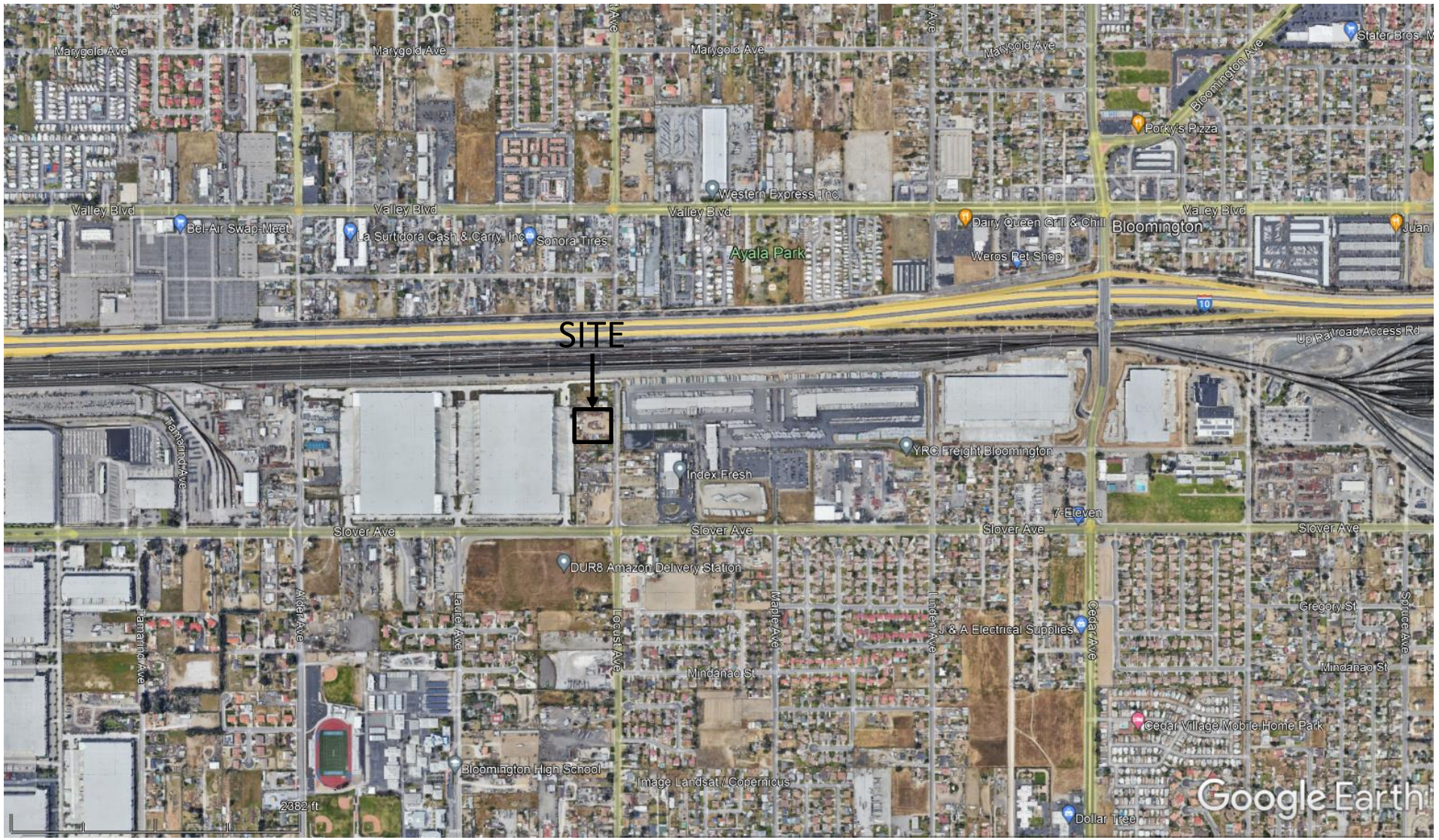
Attachments: Figure 1 – Site Location Map

Plate 1 – Boring Location Map
Plates 2 through 5 – Boring Logs

Tables 1 through 4 – Percolation Testing Field Logs

Distribution: (1) Addressee

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com



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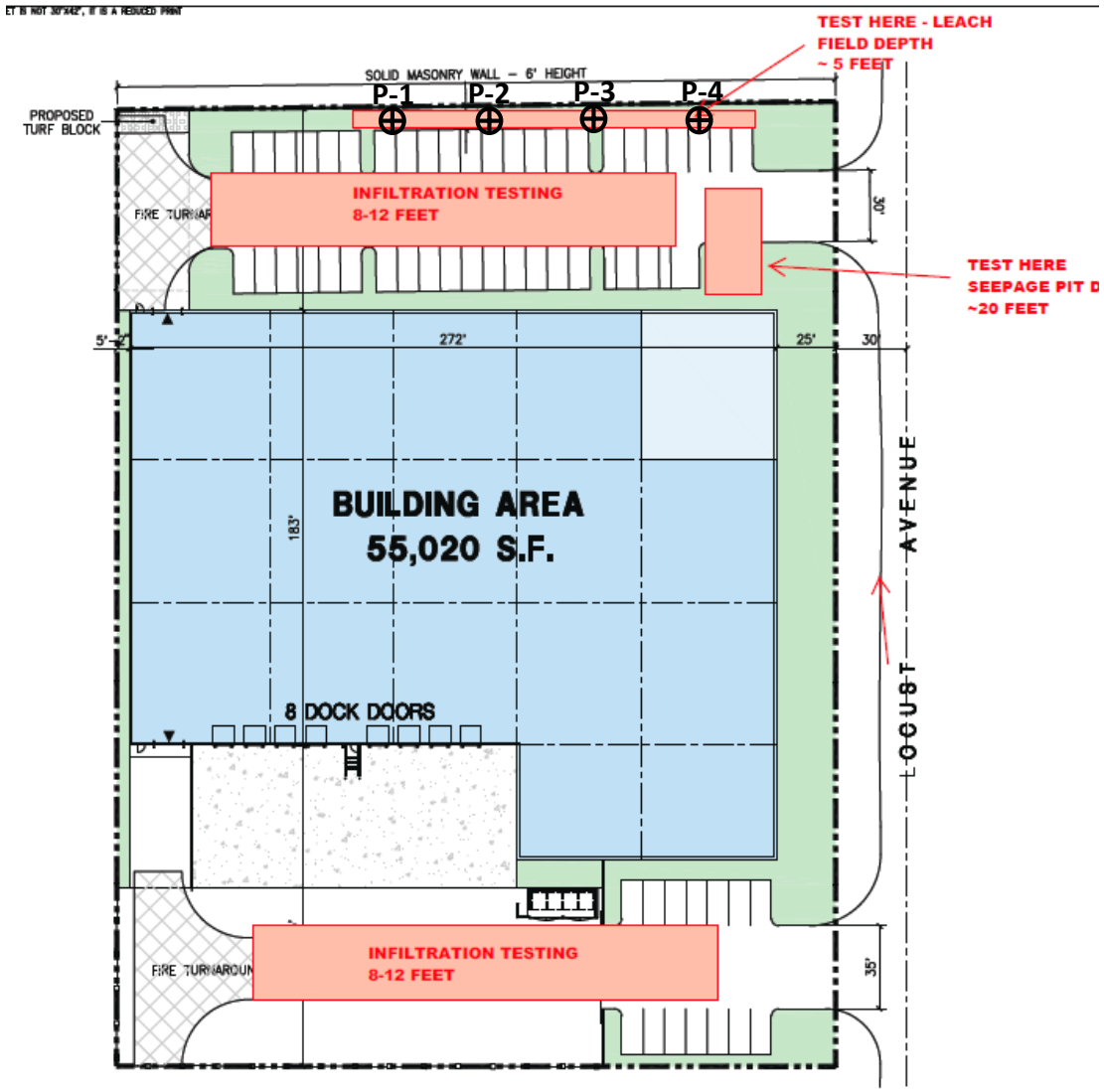
SITE LOCATION MAP
10426 LOCUST AVENUE
BLOOMINGTON, CALIFORNIA

PROJECT NO. 21-7362

FIGURE 1



P-4 ⊕ APPROXIMATE LOCATION OF PERCOLATION BORING

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BORING LOCATION MAP
10426 LOCUST AVENUE
BLOOMINGTON, CALIFORNIA

PROJECT NO. 21-7362

PLATE 1

LOG OF EXPLORATORY BORING P - 1

Project Number:	**21-7362**	Logged By:	**RA**
Project Name:	**10426 Locust Avenue, Bloomington**	Project Engineer:	**SG**
Date Drilled:	**2/23/22 - 2/23/22**	Drill Type:	**CME 75 Hollow Stem**
Ground Elev:	**1083**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is dirt, gravel and sparce vegetation.			
1080								Silty SAND- olive brown, moist, medium dense, fine grained sand, some fine to coarse grained gravel.			
					15		SM		6		-200= 26.0%
	5							Total Depth: 5 feet. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1075											

LOG OF BORING 21-7362 LOCUST AVE BLOOMINGTON.GPJ TGR GEOTECH.GDT 3/7/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 2

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING P - 2

Project Number:	**21-7362**	Logged By:	**RA**
Project Name:	**10426 Locust Avenue, Bloomington**	Project Engineer:	**SG**
Date Drilled:	**2/23/22 - 2/23/22**	Drill Type:	**CME 75 Hollow Stem**
Ground Elev:	**1083**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1080	0							Surface is dirt, gravel and sparce vegetation.			
								Silty SAND- olive brown, moist, medium dense, fine grained sand, some fine to coarse grained gravel.			
				⊠	26		SM		6		-200= 17.9%
	5							Total Depth: 5 feet. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1075											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 3

TGR GEOTECHNICAL, INC.

LOG OF BORING 21-7362 LOCUST AVE BLOOMINGTON.GPJ TGR GEOTECH.GDT 3/7/22

LOG OF EXPLORATORY BORING P - 3

Project Number:	**21-7362**	Logged By:	**RA**
Project Name:	**10426 Locust Avenue, Bloomington**	Project Engineer:	**SG**
Date Drilled:	**2/23/22 - 2/23/22**	Drill Type:	**CME 75 Hollow Stem**
Ground Elev:	**1083**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is dirt, gravel and sparce vegetation.			
1080								Silty SAND- olive brown, moist, medium dense, fine grained sand, some fine to coarse grained gravel.			
					17		SM		12		-200= 38.9%
	5							Total Depth: 5 feet. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1075											

LOG OF BORING 21-7362 LOCUST AVE BLOOMINGTON.GPJ TGR GEOTECH.GDT 3/7/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 4

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING P - 4

Project Number:	**21-7362**	Logged By:	**RA**
Project Name:	**10426 Locust Avenue, Bloomington**	Project Engineer:	**SG**
Date Drilled:	**2/23/22 - 2/23/22**	Drill Type:	**CME 75 Hollow Stem**
Ground Elev:	**1083**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1080	0							Surface is dirt, gravel and sparce vegetation.			
								Silty SAND- olive brown, moist, medium dense, fine grained sand, some fine to coarse grained gravel.			
				■	27		SM		8		-200= 25.4%
	5							Total Depth: 5 feet. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1075											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 5

TGR GEOTECHNICAL, INC.

LOG OF BORING 21-7362 LOCUST AVE BLOOMINGTON.GPJ TGR GEOTECH.GDT 3/7/22

Boring/Excavation Percolation Testing Field Log

Table 1

Project Location	10426 Locust Avenue, Bloomington
Earth Description	Silty Sand
Tested By	RA
Liquid Description	Clear Water
Measurement Method	Groundwater Probe
Start Time Pre-Soak	12:00 PM
End Time for Pre-Soak	12:20 PM

Boring/Test Number	P-1
Dimensions of Excavation	8 inch Diameter
Depth of Excavation	5 feet
Initial Water Depth	4 feet
Depth of Invert of BMP	5 feet
Depth to Water Table	>100 feet
Water Remaining in Boring (Y/N)	N

Reading Number	Time Start/End (hh:mm)	Elapsed Time (min)	Initial Depth to Water (inches)	Final Depth to Water (inches)	Change in Water Level (inches)	Percolation Rate for Reading (MPI)
1	12:21 PM 12:26 PM	5	44.40	47.16	2.76	1.81
2	12:27 PM 12:32 PM	5	44.76	47.64	2.88	1.74
3	12:33 PM 12:38 PM	5	45.24	48.00	2.76	1.81
4	12:39 PM 12:44 PM	5	45.00	46.80	1.80	2.78
5	12:45 PM 12:51 PM	5	44.52	46.56	2.04	2.45
6	12:52 PM 12:57 PM	5	45.12	47.04	1.92	2.60

Boring/Excavation Percolation Testing Field Log

Table 2

Project Location	10426 Locust Avenue, Bloomington
Earth Description	Silty Sand
Tested By	RA
Liquid Description	Clear Water
Measurement Method	Groundwater Probe
Start Time Pre-Soak	10:31 AM
End Time for Pre-Soak	10:51 AM

Boring/Test Number	P-2
Dimensions of Excavation	8 inch Diameter
Depth of Excavation	5 feet
Initial Water Depth	4 feet
Depth of Invert of BMP	5 feet
Depth to Water Table	>100 feet
Water Remaining in Boring (Y/N)	N

Reading Number	Time Start/End (hh:mm)	Elapsed Time (min)	Initial Depth to Water (inches)	Final Depth to Water (inches)	Change in Water Level (inches)	Percolation Rate for Reading (MPI)
1	10:52 AM 10:57 AM	5	44.76	47.76	3.00	1.67
2	10:58 AM 11:03 AM	5	43.20	46.32	3.12	1.60
3	11:04 AM 11:09 AM	5	44.40	47.40	3.00	1.67
4	11:10 AM 11:15 AM	5	45.12	48.36	3.24	1.54
5	11:16 AM 11:21 AM	5	45.72	48.72	3.00	1.67
6	11:22 AM 11:27 AM	5	45.24	48.12	2.88	1.74

Boring/Excavation Percolation Testing Field Log

Table 3

Project Location	10426 Locust Avenue, Bloomington
Earth Description	Silty Sand
Tested By	RA
Liquid Description	Clear Water
Measurement Method	Groundwater Probe
Start Time Pre-Soak	9:49 AM
End Time for Pre-Soak	10:09 AM

Boring/Test Number	P-3
Dimensions of Excavation	8 inch Diameter
Depth of Excavation	5 feet
Initial Water Depth	4 feet
Depth of Invert of BMP	5 feet
Depth to Water Table	>100 feet
Water Remaining in Boring (Y/N)	N

Reading Number	Time Start/End (hh:mm)	Elapsed Time (min)	Initial Depth to Water (inches)	Final Depth to Water (inches)	Change in Water Level (inches)	Percolation Rate for Reading (MPI)
1	10:10 AM 10:15 AM	5	44.52	47.64	3.12	1.60
2	10:16 AM 10:21 AM	5	44.88	46.80	1.92	2.60
3	10:22 AM 10:27 AM	5	44.28	46.20	1.92	2.60
4	10:28 AM 10:33 AM	5	44.64	46.80	2.16	2.31
5	10:34 AM 10:39 AM	5	44.52	46.80	2.28	2.19
6	10:40 AM 10:45 AM	5	44.88	47.04	2.16	2.31

Boring/Excavation Percolation Testing Field Log

Table 4

Project Location	10426 Locust Avenue, Bloomington
Earth Description	Silty Sand
Tested By	RA
Liquid Description	Clear Water
Measurement Method	Groundwater Probe
Start Time Pre-Soak	12:50 PM
End Time for Pre-Soak	1:05 PM

Boring/Test Number	P-4
Dimensions of Excavation	8 inch Diameter
Depth of Excavation	5 feet
Initial Water Depth	4 feet
Depth of Invert of BMP	5 feet
Depth to Water Table	>100 feet
Water Remaining in Boring (Y/N)	N

Reading Number	Time Start/End (hh:mm)	Elapsed Time (min)	Initial Depth to Water (inches)	Final Depth to Water (inches)	Change in Water Level (inches)	Percolation Rate for Reading (MPI)
1	1:06 PM 1:11 PM	5	43.92	48.84	4.92	1.02
2	1:12 PM 1:15 PM	3	45.24	48.00	2.76	1.09
3	1:16 PM 1:19 PM	3	44.52	47.04	2.52	1.19
4	1:20 PM 1:23 PM	3	44.64	46.92	2.28	1.32
5	1:24 PM 1:27 PM	3	44.40	47.04	2.64	1.14
6	1:28 PM 1:31 PM	3	44.76	47.04	2.28	1.32