Exhibit "11-A"

Preliminary Stormwater Infiltration Feasibility Assessment

Dynes Townhomes Development
NWC of E. Gilkey Road & S. Anacortes Street
Burlington, Washington

Prepared For:

Corner 9 Properties, LLC
504 E Fairhaven Avenue
Burlington, Washington

Attn: Anna Nelson, AICP

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September 15, 2022
Project No. 22-0654

Corner 9 Properties, LLC
504 E Fairhaven Avenue
Burlington, WA 98223

Attn: **Anna Nelson, AICP**

Regarding: **Preliminary Stormwater Infiltration Feasibility Assessment**
Dynes Townhomes Development
NWC of E. Gilkey Road and S. Anacortes Street
Burlington, WA 98223
(Parcel #s: P62772, P72173, P72175, P133596, P133597, P72178, P72179, & P72181)

Dear Ms. Nelson:

As requested, GeoTest Services, Inc. (GeoTest) is pleased to submit the following report summarizing the results of our preliminary infiltration feasibility assessment for the proposed Dynes Townhomes Development to be located at the above parcels in Burlington, Washington (see *Vicinity Map*, Figure 1). This report has been prepared in general accordance with the terms and conditions established in our services agreement dated June 21, 2022.

We appreciate the opportunity to provide geotechnical services on this project and look forward to assisting you during the construction phase. Should you have any further questions regarding the information contained within the report, or if we may be of service in other regards, please contact the undersigned.

Respectfully,
GeoTest Services, Inc.

JOSEPH SCHMIDT
STATE OF WASHINGTON
55631
REGISTERED
PROFESSIONAL ENGINEER

09/15/2022

Megan Yakavonis, G.I.T.
Staff Geologist

Joe Schmidt, P.E.
Project Geotechnical Engineer

Enclosed: Preliminary Infiltration Feasibility Report

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PURPOSE AND SCOPE OF SERVICES

The purpose of this evaluation is to investigate subsurface conditions beneath the site to develop stormwater infiltration feasibility recommendations for use by the civil engineer. Our scope of services includes the following tasks:

- Exploration of soil and groundwater conditions underlying the site by excavating 8 test pits (TP-1 through TP-8) with a client provided excavator and operator, under direction of a GeoTest Staff Geologist.

- Laboratory testing on representative samples to classify and evaluate the engineering characteristics of the soils encountered. This analysis includes subcontracted testing of representative samples for soil suitability for the purpose of on-site treatment.

- To provide an illustrated written report containing a description of surface, subsurface and groundwater conditions, with findings and recommendations pertaining to the feasibility of onsite stormwater infiltration, including preliminary infiltration rates based on grain size analysis per the *2012/14 Stormwater Management Manual for Western Washington (SMMWW)*.

PROJECT DESCRIPTION

The project site is located to the northwest of the intersection of East Gilkey Road and South Anacortes Street in Burlington, Washington. The irregularly shaped site is composed of 8 individual parcels and encompasses approximately 10.85 acres. The subject area is largely undeveloped and surfaced with field grasses, with the exception of a north-central area which contain agricultural facilities. The project site is bisected by Gages Slough, which runs generally northeast-southwest through the subject area.

It is our understanding that there are plans to construct a residential development at the project site. Based on the preliminary site plan provided by Corner 9 Properties, LLC, we understand that residential development will consist of townhomes constructed to the northwest and southeast of Gages Slough. We anticipate that the existing agricultural facility and associated structures will be demolished as part of the planned development. The project will include new stormwater management facilities, which are still in the preliminary design phase regarding size and location.

For permitting and civil design purposes, the client representative has requested our services to evaluate the stormwater infiltration potential of the onsite soils. At the time of this report, the 2012/14 *Stormwater Management Manual for Western Washington* (SMMWW) is the stormwater document currently adopted by the City of Burlington, per Chapter 14.05.090 (Stormwater, drainage, and erosion control requirements) of the Burlington Municipal Code.

SITE CONDITIONS

This section includes a description of the general surface and subsurface conditions observed at the project site during the time of our field investigation. Interpretations of site conditions are based on the results and review of available information, site reconnaissance, subsurface explorations, laboratory testing, and previous experience in the project vicinity.

Surface Conditions

The general vicinity around the subject area is urban and well-developed with residential housing and commercial properties. The BNSF railroad defines the western property boundary, and South Anacortes Street defines some of the eastern boundary. Single family residences border the project area to the north and the subject site is bordered to the south by an agricultural processing facility. South Pine Street intersects the center of the collective property area from the north but terminates at a gravel driveway about mid-way through the area. The Skagit River is located approximately 3,000 feet east of the subject property.

Image 1 - Surface conditions of the south portion of the subject site. Perspective is from the end of South Pine Street, facing south-southeast, picture taken July 15, 2022.

The subject property itself is mostly undeveloped, with the exception of three former agricultural processing facilities, a barn, and two single family residences on the west side of the property. Scattered mature trees and landscape vegetation are located within the residential parcels. Outside of those structures, the property is dominated by generally flat, grassy fields. Gages Slough bisects the collective properties and is oriented roughly northeast-southwest. At the time of our site visit, the channel was roughly 60 feet or so in width and contained an unknown depth of very slow-moving water. Along the margins of the slough, vegetation transitions to low-lying

wetland grass, shrubs, and sparse adolescent to mature trees. The overall topographic trend of the site shows a very gradual decrease in elevation from approximately 39 feet above sea level (ASL) at the northwest corner of the subject site to approximately 29 feet ASL in the southeast corner. Near Gages Slough, topography gently slopes down towards the channel, on both sides, to roughly 24 feet ASL.

Image 2 - Surface conditions of the north portion of the subject site, following the completion of exploration TP-8. Perspective is facing generally north, picture taken July 15, 2022.

Subsurface Soil Conditions

Subsurface conditions were investigated by conducting 8 test pit explorations (TP-1 though TP-8) under the observation and direction of a GeoTest Staff Geologist on July 15, 2022. The explorations were advanced to depths between 7.5 and 10.75 feet below ground surface (BGS), in areas determined by the project design team as potential locations for stormwater infiltration facilities. Representative grab samples were generally obtained at approximately 2-foot intervals or upon changes in stratigraphy. Test pit explorations were performed with a rubber-tracked excavator and operator provided by the client. Soils were classified in general accordance with the American Society for Testing and Materials (ASTM) D2487 and D2488. See Figure 2 – *Site and Exploration Plan* for approximate exploration locations. A *Soil Classification System and Key* is

presented as Figure 3. Detailed logs of the test pit explorations can be found as Figures 4 through 7 and laboratory testing results are presented in Figures 8 through 10.

Image 3 – The Gages Slough. Perspective is from the north bank, facing south-southeast, picture taken July 15, 2022.

The subsurface soils across the project site were found to be relatively uniform and consisted of approximately 0.5 to 2 feet of topsoil extending from the surfacing, over approximately 2 to 4 feet of silty sand to silt, interpreted to be overbank or lahar runout deposits. Below that unit we generally encountered coarser, poorly graded sand with minor silt to silty sand, interpreted as Skagit River alluvium, which extended to the termination depths of our explorations.

Undocumented fill soils were encountered underlying a thin layer of topsoil within exploration TP-1 and extended down to the contact with the native alluvial soils at approximately 3.25 feet BGS. No overbank/lahar runout deposits were encountered at this location. Detailed descriptions of each unit are presented below.

Topsoil/Reworked Topsoil

The topsoil encountered across the subject property generally varied between a loose to medium dense, brown, dry, very silty sand and a stiff to very stiff, brown, dry to damp, very sandy silt with elevated organic content. We observed numerous rootlets, associated with the surface vegetation, within the topsoil. In TP-3 and TP-5 we encountered trace anthropogenic debris (plastic and metal fragments) likely a result of local reworking of the surface soils. The topsoil

observed within TP-7 contained elevated gravel content and exhibited highly compacted conditions. TP-7 was located between two of the existing agricultural facilities. We anticipate the near-surface soils at this location and in the immediate vicinity have been reworked through construction and general agricultural activities over time and include imported fill soils. The topsoil, reworked topsoil/fill soils ranged in thickness between 0.5 to 2.0 feet.

Undocumented Fill

The undocumented fill soils encountered at TP-1 underlying the thin layer of topsoil were described as a medium dense to dense, tan, very silty sand with scattered roots, charcoal, and plastic fragments. The fill soils are mostly composed of reworked native soils and were likely placed during the development of the adjacent properties. This unit extended to a depth of approximately 3.25 feet BGS where contact with the native alluvial soils was encountered.

Image 4 – Typical subsurface conditions encountered during our explorations. Exploration TP-5 shown in image, picture taken July 15, 2022.

Overbank/Lahar Runout Deposit

Underlying the topsoil layer, we generally encountered a light colored, fine-grained soil deposit which we interpret as either overbank flood deposits from the Gages Slough, or potentially as prehistoric lahar runout deposits from the slough and/or the nearby Skagit River. The composition of this unit was found to vary across the site between silty and sandy soils. These

deposits ranged from a medium dense, light gray, dry, slightly silty, poorly graded sand, to a very stiff, tan, damp to dry, slightly sandy silt. Within select explorations, interbedding between silty sands and sandy silts was observed. However, bedding was typically massive or poorly defined. These deposits tended to contain rootlets, small charcoal, and other organic fragments. Unit thickness ranged between about 2 and 4 feet and extended to approximately 3 to 5.5 feet BGS. According to our lab testing, the fines content of the silty soils was typically around 70% to 93%, with the sandy deposits containing 7% to 13% fines. "Fines" refer to the percentage of material by weight that passes the #200 sieve, representing silt and clay sized particles.

Skagit River Alluvium

Soils interpreted to be Skagit River alluvium were generally encountered at depths between 3.0 and 5.5 feet BGS underlying the overbank/lahar runout deposits. These soils were described as medium dense to dense, tan to dark gray, damp to wet, slightly to very silty, poorly graded sand. Instances of interbedding between clean sand and silty sands within this unit was observed within select explorations, however, bedding was not well defined. The sands of the alluvium tended to be medium to coarse grained, darker in color, and occasionally micaceous. The fines content was observed to be around 4% to 7% in the for the clean sands, and up to about 32% for the siltier sands. This unit extended to the maximum depth of all explorations.

General Geologic Conditions

General geologic conditions at the project site were reviewed using to the *Surficial Geologic Map of the Port Townsend 30- by 60-minute Quadrangle, Puget Sound Region, Washington* (Pessl, et al., 1989) and the Washington State DNR *Geologic Information Portal* webpage. According to Pessl, the geologic materials underlying the project site consist of Holocene-aged Younger Alluvium sediments (Unit Qyal). This unit is described as moderately to well-sorted silt, clay, and fine sand with minor sand and pebble gravel associated with the local river and stream systems. Disseminated organic material is common. This unit also may contain interbeds or layers of volcaniclastic material (lahars) from volcanic eruptions of Cascade Volcanoes. The *Geologic Information Portal* maps the subject property as underlain specifically by Holocene- to Pleistocene-aged lahar deposits of the Kennedy Creek assemblage (Qvl_k). The unit is described as moderately to well-bedded assemblages of lahars, dacite pyroclastic flow and surge deposits, air-fall ash, minor lacustrine and alluvium deposits, and rare dacite flows originating from Glacier Peak. Deposits are generally coarser in proximity to Glacier Peak and more fine-grained and well-sorted downstream.

The subsurface materials encountered at the project site generally support the mapped geology, as described above. It should be noted that the published geology is representative of regional conditions and that some variation between on-site soils and mapped geologic units should generally be anticipated.

Groundwater

At the time of our investigation on July 15, 2022, groundwater was encountered in test pit TP-6, located at the southern extent of the subject property, southeast of Gages Slough. At this location rapid groundwater seepage was encountered at approximately 6.5 feet BGS. The groundwater seepage observed during the explorations is interpreted to represent the regional groundwater table and coincided with the approximate level of Gages Slough. Groundwater was not encountered within any of the remaining test pits located north and west of Gages Slough. The lack of groundwater within these locations is due to the higher elevation of this area of the site. According to the provided drawings the area northwest of the slough is approximately 6 feet higher in elevation than to the southeast of the waterway.

Faint to moderate orange mottling was observed within TP-3 and TP-5 through TP-8. In general, the appearance of mottling is related to repeated saturation and drying of soils over time from seasonal meteoric, perched, or transient water, or the fluctuations of the local groundwater table. However, we did not observe a strong mottling horizon which would indicate a seasonal high groundwater level. Based on our experience in the area we anticipate that groundwater elevations will be highest in the late winter and/or early spring.

A review of the Washington State Department of Ecology *Well Log Viewer* webpage and previous GeoTest projects in the vicinity indicate that a shallow regional groundwater table is present in the area. Groundwater elevations were reported to be approximately 9 to 11 feet BGS in well logs located north and south of the project site. Groundwater studies conducted elsewhere in Burlington, in similar proximity to the Gages Slough as the subject site, have reported groundwater levels that average closer to 3 to 7 feet BGS, however elevation determination is not precise in this regard.

The groundwater conditions reported on the exploration logs are for the specific locations and dates indicated, and therefore may not be indicative of other locations and/or times. Groundwater levels are variable and groundwater conditions will fluctuate depending on local subsurface conditions, precipitation, and changes in on-site and off-site use.

Web Soil Survey

According to the United States Department of Agriculture (USDA) *Natural Resource Conservation Service* (NRCS) *Web Soil Survey* website, 4 relevant soil units are present on the subject property. The soils consist of Briscot fine sandy loam, Mt. Vernon very fine sandy loam, Sumas silt loam, and Urban land-Mt. Vernon-Field complex. Please reference Image 5 below for approximate locations of each unit at the project site and Table 1 for general characteristics for the mapped soils.

Image 5 – Screenshot retrieved from the *USDA NRCS Web Soil Survey Website* of the project area and near vicinity depicting the location of the mapped soil types. Approximate borders of the subject area shown in black.

Table 1: USDA NRCS Soil Classifications				
Map Unit Symbol	Briscot fine sandy loam	Mt. Vernon very fine sandy loam	Sumas silt loam	Urban land-Mt. Vernon-Field Complex
Map Unit Name	21	96	136	152
Soil Description	Fine sandy loam underlain by stratified fine sand to silt loam over silt loam	Ashy very fine sandy loam underlain by stratified ashy sand to very fine sandy loam over stratified fine sand to silt loam	Silt loam underlain by silty clay loam over coarse sand	**Mt. Vernon** - Ashy very fine sandy loam underlain by stratified ashy sand to very fine sandy loam over stratified fine sand to silt loam **Field** – Silt loam underlain by stratified sand to loamy fine sand and very fine sandy loam
Landform	Flood Plains	Flood Plains	Flood plains, deltas	Flood plains, natural levees
Parent Material	Alluvium	Alluvium and volcanic ash	Alluvium	Alluvium and volcanic ash
Land Capability Classification	3w	3w	3w	**Urban land** – 8s **Mt. Vernon & Field** – 3w
Erosion K Factor, Whole Soil	0.49	0.64	0.37	N/A
Hydrologic Soil Group	C	C	C	**Mt. Vernon** – C **Field** – B

CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation of the data collected during this investigation, it is our opinion that onsite stormwater infiltration is potentially feasible in select areas of the project site. However, it should be noted that our subsurface investigations were conducted in mid-July, outside of the winter wet season when groundwater elevations are typically at their highest. As such, it should be understood that further studies, such as wet season groundwater monitoring, will be needed to confirm feasibility and to complete the design of the stormwater management facilities.

Stormwater Infiltration Potential

The near surface native sandy alluvial deposits encountered throughout the project site underlying the overbank/lahar runout deposits have, generally, low fines content and may be suitable for onsite infiltration of stormwater. However, local groundwater conditions may limit the location and design options of infiltration facilities in order to be compliant with the *2012/14 SMMWW*. The alluvial soils were generally encountered at depths ranging from approximately 3 to 5.5 feet BGS. Per Site Suitability Criteria, SSC-5 of the *SMMWW*, the base of stormwater infiltration basins or trenches are required to have a minimum of 5 feet of vertical separation from the seasonal high groundwater elevation. In some cases, the separation may be reduced to 3 feet, provided a mounding analysis be performed and deemed acceptable. Therefore, the capacity for infiltration for the alluvial deposits will be highly dependent on the seasonal high groundwater elevation of the project site. As such, we recommend that a shallow groundwater

monitoring study be conducted in order to confirm the seasonal high groundwater elevations across the site.

Groundwater monitoring studies should be conducted between the months of October to April, per the SMMWW. This monitoring period captures the fluctuations in groundwater conditions during the winter wet season, in which the region sees the highest precipitation. A wet season monitoring study is not included in our current scope of work. GeoTest can provide this service under a separate scope of work.

The siltier overbank/lahar runout deposits encountered at the project site overlying the alluvial soils may also be suitable for onsite infiltration. However, these soil deposits have elevated and variable fines content and therefore will have a reduced capacity for onsite infiltration compared to the underlying alluvial deposits. Due to the fines content of these soils, a Pilot Infiltration Test (PIT) will need to be performed in order to provide infiltration rates for these soils. PIT testing was not included in this scope of services but can be provided at additional cost if the overbank/lahar runout deposits are considered for onsite infiltration. As such, the recommendations and rates below are for the native sandy alluvial soils and do not apply to the siltier overbank/lahar runout deposits. GeoTest can provide rates and recommendations once a PIT test has been completed to assess these soils.

During our subsurface investigation conditions representative of a regional groundwater condition were encountered at an approximate depth of 6.5 feet BGS in TP-6. This exploration was located to the southeast of Gages Slough, this area has a surface elevation roughly 6 feet lower than the portion of the subject site to the northwest of the waterway. Based on previous projects located adjacent to Gages Slough, groundwater elevations were found to rise up to 4 feet during the winter wet season (October through April). As such, we anticipate that seasonal high-water elevations at the project site would likely rise at least 4 feet from the elevations encountered during our investigation in mid-July. Therefore, it is our opinion that due to the seasonal high groundwater elevations that conventional infiltration **will not** be feasible in the portion of the site located to the southeast of Gages Slough. Limited infiltration through the use of Low Impact Development (LID) methods requiring minimal separation the seasonal high groundwater elevation (i.e., pervious pavements) may be feasible in this area. Additionally, seasonal groundwater monitoring can be performed in this area of the site to confirm seasonal high-water levels.

Conceptual Infiltration Rates

At the time of this report the base elevation and specific location of stormwater management facilities have not been determined. In order to assist with the project design, we are providing **preliminary** infiltration rates using the Grain Size Analysis method outlined in Volume III, Section 3.3.6(3) of the *2012/14 SMMWW* to be used in the **conceptual** sizing of the planned facilities. It should be noted that rates below assume 5 feet of separation and do not take into account the

effects of groundwater mounding. As detailed above, a **wet season groundwater monitoring study will need to be completed at the project site in order to determine design level infiltration rates and confirm infiltration feasibility**. Based on the results of the monitoring study and the location and depth of the planned facilities, a mounding analysis may also need to be needed to confirm infiltration rates. A mounding analysis is not included in our current scope of work.

From the explorations located north and west of Gages Slough, 3 representative samples of the alluvial deposits were selected and analyzed in accordance with the grain size method referenced above. The total correction factor applied to initial saturated hydraulic conductivity (Ksat) values was 0.144 and based on the below variables.

- Site variability and number of locations tested (CFv) = 0.4
- Test Method – Grain Size Analysis: (CFt) = 0.4
- Degree of influent control to prevent siltation & bio-buildup (CFm) = 0.9

Based on discussions with the project design team, an additional correction factor, beyond those specified by the *SMMWW*, to account for the potential effects of groundwater mounding is to be included in our **conceptual** infiltration rates. *This correction factor has been included in order to aid in the conceptual sizing of the stormwater management facilities and overall project feasibility. It should be understood that this additional correction factor does not fully represent the effects of groundwater mounding and that full analysis has not been completed at this time.*

Based on the grain size approach and with the incorporation of the discussed correction factors, a preliminary infiltration rate of ***1.5 inches per hour*** can be utilized in the **conceptual** sizing of stormwater management facilities founded in the native sandy alluvial soils at the project site.

Stormwater Treatment

The stormwater facilities on-site may require some form of pollutant pretreatment with an existing or amended soil prior to on-site infiltration or offsite discharge. The reuse of onsite topsoil is often the most sustainable and cost-effective method for pollutant treatment purposes. Cation exchange capacities, organic contents, and pH of near surface site soils were tested to determine possible pollutant treatment suitability. We subcontracted Northwest Agricultural Consultants to perform testing on five representative soil samples for cation exchange capacities, organic contents, and pH. A summary of the laboratory testing results is presented in Table 2 below.

Suitability for onsite pollutant treatment is determined in accordance with Site Suitability Criteria, SSC-6 of the SMMWW. Soils with an organic content of greater than or equal to 1 percent and a cation exchange capacity of greater than or equal to 5 meq/100 grams are characterized as suitable for stormwater treatment. Based on the results shown in Table 2, the topsoil as

depicted in the above samples appears to be suitable for use as treatment for pollutant generating surfaces. The test results for the near-surface overbank/lahar deposits were variable, with one sample meeting the criteria for treatment and one sample that did not. Due this variability we do not recommend using these soils for treatment purposes without conducting additional testing to further evaluate these soils. Additionally, the Skagit River alluvium deposits did not show adequate cation exchange capacity for use as stormwater treatment.

Table 2: Cation Exchange Capacity, Organic Content, and pH Laboratory Test Results

Test Pit ID	Sample Depth (ft)	Geologic Unit	Cation Exchange Capacity (meq/100 grams)	Organic Content (%)	pH
TP-3	0.25	Topsoil	11.4	4.51	6.2
TP-3	1.25	Overbank/Lahar Runout Deposits	10.2	3.78	6.6
TP-4	3.5	Upper Alluvium	4.7	1.58	6.7
TP-8	0.25	Topsoil	12.3	4.94	6.7
TP-8	1.0	Overbank/Lahar Runout Deposits	4.4	1.59	7.0
Test Method			SM 4500-H^+ B	ASTM D2974	EPA 9081

Notes:
--2012/14 SMMWW SSC-6 Criteria for Treatment:
- CEC ≥ 5.0 meq/100g
- Organic Content ≥ 1%

Please understand that per SSC-4 of the SMMWW, for soils used as runoff treatment media, the design (long-term) infiltration rates must be 3 inches per hour or less. Compaction of the native soil will reduce the infiltration rate and additional laboratory testing may be required to determine the precent compaction required to obtain the desired rate of infiltration for soils to be used as treatment media.

On-site soils can be amended by mixing higher silt content soils or adding mulch (or other admixtures) to elevate the cation exchange capacity and organic contents, if required. On-site amended soil may require additional testing to confirm compliance with ecological regulations. GeoTest is available to perform additional laboratory testing as part of an expanded scope of services if the soil is to be amended. Alternatively, the owner may elect to import amended soils with the desired properties for the planned treatment facilities.

Geotechnical Consultation and Construction Monitoring

GeoTest recommends that we be involved in the project design review process. The purpose of the review is to verify that the recommendations presented in this report are understood and incorporated in the design and specifications.

We also recommend that geotechnical construction monitoring services be provided. These services should include observation by GeoTest personnel during (structural fill placement, compaction activities and subgrade preparation operations) to confirm that design subgrade conditions are obtained beneath the areas of improvement.

Periodic field density testing should be performed to verify that the appropriate degree of compaction is obtained. The purpose of these services is to observe compliance with the design concepts, specifications, and recommendations of this report. In the event that subsurface conditions differ from those anticipated before the start of construction, GeoTest Services would be pleased to provide revised recommendations appropriate to the conditions revealed during construction.

GeoTest is available to provide a full range of materials testing and special inspection during construction as required by the local building department and the International Building Code. This may include specific construction inspections on materials such as reinforced concrete, reinforced masonry, wood framing, structural steel, and energy code related services. These services are supported by our fully accredited materials testing laboratory.

USE OF THIS REPORT

GeoTest Services has prepared this report for the exclusive use of Corner 9 Properties, LLC, and their consultants for specific application to the design of the proposed Dynes Townhomes development to be located at the referenced parcels in Burlington, Washington. Use of this report by others is at the user's sole risk. This report is not applicable to other site locations. Our services are conducted in accordance with accepted practices of the geotechnical engineering profession; no other warranty, express or implied, is made as to the professional advice included in this report.

Our site explorations indicate subsurface conditions at the dates and locations indicated. It is not warranted that these conditions are representative of conditions at other locations and times. The analyses, conclusions, and recommendations contained in this report are based on site conditions to the limited depth and time of our explorations, a geological reconnaissance of the area, and a review of previously published geological information for the site. If variations in subsurface conditions are encountered during construction that differ from those contained within this report, GeoTest should be allowed to review the recommendations and, if necessary, make revisions. If there is a substantial lapse of time between submission of this report and the

start of construction, or if conditions change due to construction operations at or adjacent to the project site, we recommend that we review this report to determine the applicability of the conclusions and recommendations contained herein.

The earthwork contractor is responsible to perform all work in conformance with all applicable WISHA/OSHA regulations. GeoTest Services, Inc. is not responsible for job site safety on this project, and this responsibility is specifically disclaimed.

Attachments:

Figure 1	Vicinity Map
Figure 2	Site and Exploration Plan
Figure 3	Soil Classification System and Key
Figures 4 - 7	Test Pit Logs
Figures 8 - 10	Grain Size Test Data
	Northwest Agricultural Consultants Lab Test Results (1 Page)
	Report Limitations and Guidelines for Its Use (4 Pages)

REFERENCES

American Society for Testing and Materials (ASTM). *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).* ASTM D2487 – 17e1.

American Society for Testing and Materials (ASTM). *Standard Practice for Description and Identification of Soils (Visual-Manual Procedures).* ASTM D2488 – 17e1.

Bakeman, S., Dan, G., Howie, D., Killelea, J., Labib, F., & Ed, O. (n.d.) 2012. *Stormwater Management Manual for Western Washington*, as Amended in December 2014 (The 2014 SWMMWW) (pp. 1-1042) (United States, Washington State Department of Ecology).

City of Burlington Municipal Code – Surface Water Management, §§ 14.05 (December 9, 2021).

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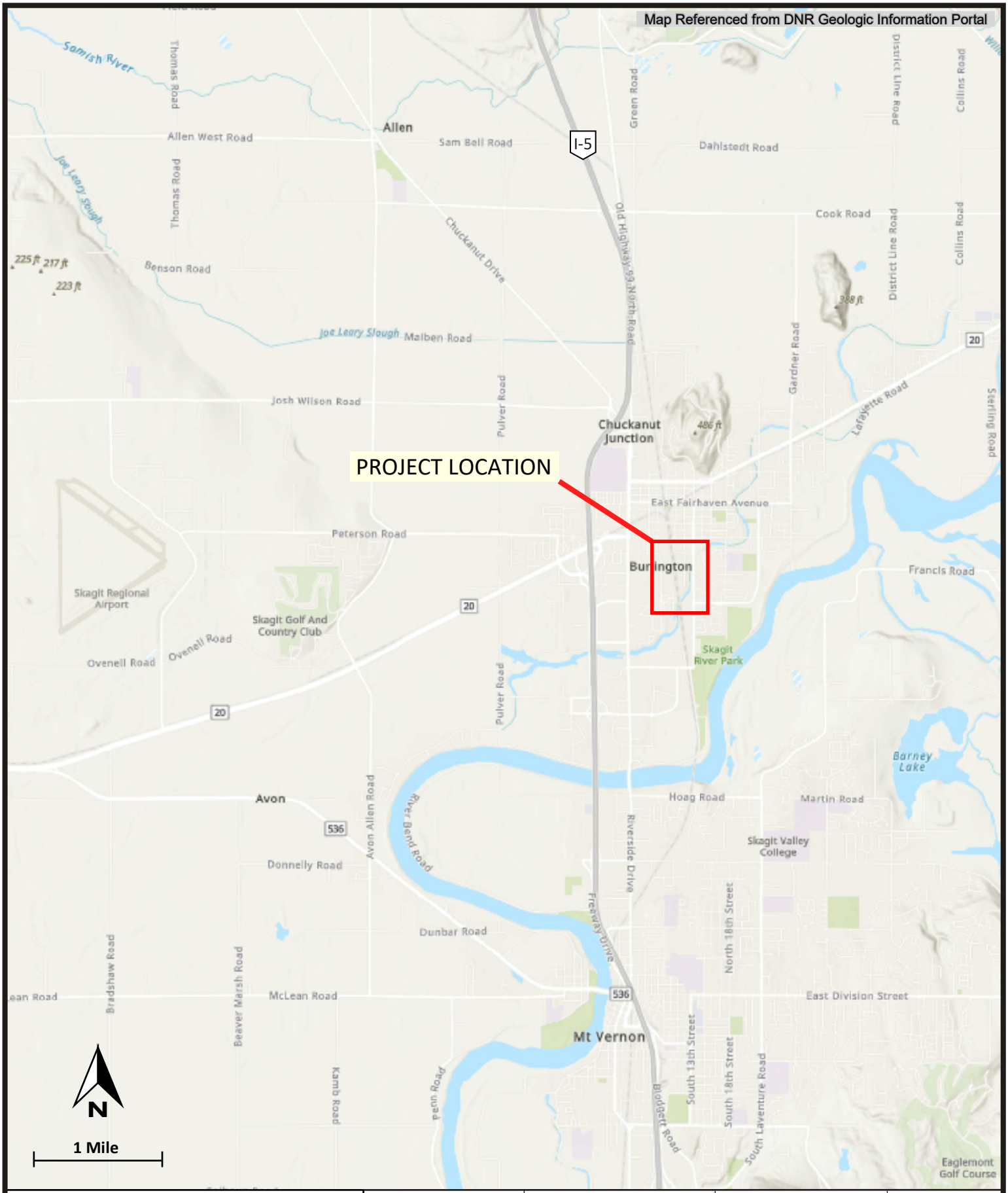


Date: 7-20-22	By: MY	Scale: As Shown	Project 22-0654

VICINITY MAP

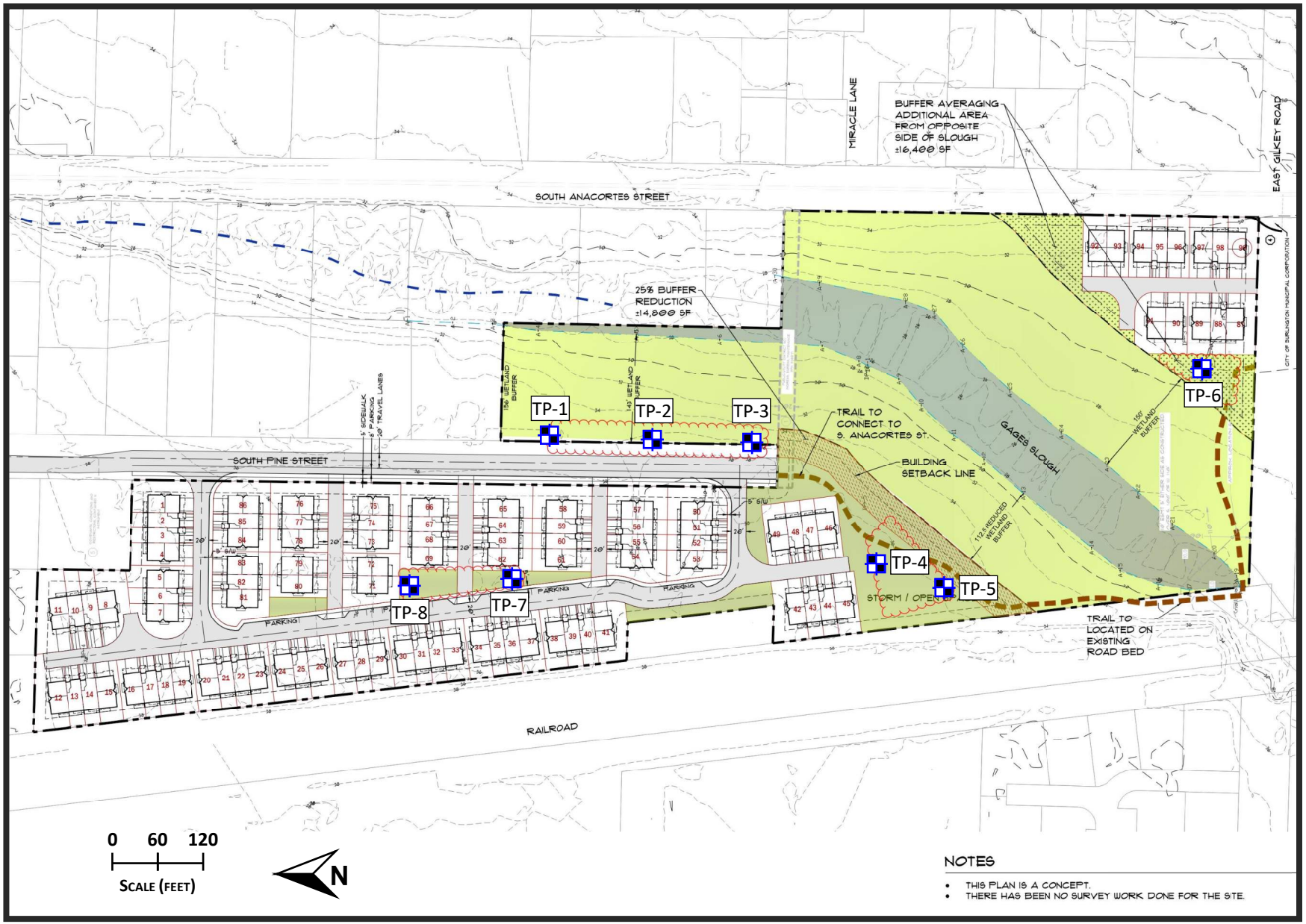
DYNES TOWNHOMES INFILTRATION FEASIBILITY

NW CORNER OF E GILKEY ROAD & S ANACORTES STREET

BURLINGTON, WASHINGTON

Figure 1

PRELIMINARY SITE MAP PROVIDED BY CORE DESIGN



TP-# = Approximate Test Pit Location

GEOTEST

Date: 7-20-22	By: MY	Scale: As Shown	Project 22-0654

SITE AND EXPLORATION PLAN

DYNES TOWNHOMES INFILTRATION FEASIBILITY

NW CORNER OF E GILKEY ROAD & S ANACORTES STREET

BURLINGTON, WASHINGTON

Figure 2

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL	TYPICAL DESCRIPTIONS[1][2]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

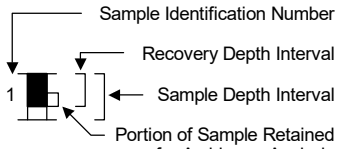
OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. Soil descriptions are based on the general approach presented in the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*, as outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the *Standard Test Method for Classification of Soils for Engineering Purposes*, as outlined in ASTM D 2487.
2. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent: > 50% - "GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents: > 30% and ≤ 50% - "very gravelly," "very sandy," "very silty," etc.
> 12% and ≤ 30% - "gravelly," "sandy," "silty," etc.
Additional Constituents: > 5% and ≤ 12% - "slightly gravelly," "slightly sandy," "slightly silty," etc.
≤ 5% - "trace gravel," "trace sand," "trace silt," etc., or not noted.

Drilling and Sampling Key

SAMPLE NUMBER & INTERVAL



SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Other - See text if applicable

Groundwater

▽ ATD — Approximate water elevation at time of drilling (ATD) or on date noted. Groundwater levels can fluctuate due to precipitation, seasonal conditions, and other factors.

Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Soil Classification System and Key

Figure 3

TP-1

SAMPLE DATA					SOIL PROFILE	GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol / USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 35 Excavated By: R&J / M.Yakavonis	
0	1	d	W = 11 GS	SM/OL	Loose to medium dense, brown, dry, very silty SAND, numerous rootlets (Topsoil)	Groundwater not encountered.
2	2	d		SM	Medium dense to dense, tan, dry, very silty SAND, scattered roots, trace charcoal and plastic fragments (Fill) - Moderately difficult to penetrate with #4 rebar driven by 5-lb hammer	
4	3	d		SP-SM	Medium dense, tan to gray, damp, slightly silty, poorly graded SAND (Alluvium) - Occasional thin interbedding of silty sand throughout unit - Moderately difficult to penetrate with #4 rebar driven by 5-lb hammer	
6	4	d				
8						
10					Test pit terminated - Excavator limitations	

Test Pit Completed 07/15/22
Total Depth of Test Pit = 9.5 ft.

TP-2

SAMPLE DATA					SOIL PROFILE	GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol / USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 36 Excavated By: R&J / M.Yakavonis	
0	5	d		SM/OL	Medium dense, brown, dry, very silty SAND, numerous rootlets (Topsoil)	Groundwater not encountered.
2	6	d	W = 5 GS	SP-SM	Medium dense, tan to gray, dry, slightly silty, poorly graded SAND, scattered roots (Overbank/Lahar Runout Deposit)	
	7	d	W = 22 GS	ML	- Moderately difficult to penetrate with #4 rebar driven by 5-lb hammer	
4				SP	Very stiff, tan, damp, sandy SILT (Overbank/Lahar Runout Deposit) - PP @ 3.0 ft = 2.0 tsf	
6	8	d	W = 4 GS		Medium dense, gray, damp, poorly graded SAND, trace silt (Alluvium) - Occasional thin interbedding of silty sand throughout unit	
8	9	d		SP	Medium dense, dark gray, damp, medium-grained, poorly graded SAND (Alluvium)	
					Test pit terminated - Excavator limitations	

Test Pit Completed 07/15/22
Total Depth of Test Pit = 8.3 ft.

Ground elevations are estimated from the provided Conceptual Site Plan, dated 5/24/22, for all test pit logs.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Log of Test Pits

Figure
4

TP-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 36 Excavated By: R&J / M.Yakavonis	
0	10	d			ML/ OL	Stiff, brown, dry to damp, very sandy SILT, numerous rootlets, occasional fragments of plastic and metal (Topsoil, Reworked)	Groundwater not encountered.
	11	d			ML	Very stiff, tan to light gray, damp, sandy SILT, slightly mottled, scattered rootlets, charcoal fragments (Overbank/Lahar Runout Deposit)	
2	12	d					
	13	d			SP-SM	PP @ 1.5 ft = 3.0 tsf Medium dense, gray, damp, slightly silty, fine- to medium-grained, poorly graded SAND, slightly mottled (Alluvium) - Occasional thin interbedding of silty sand throughout unit	
4							
6							
	14	d					
8	15	d			SM	Medium dense, tan, moist to wet, very silty, fine-grained SAND (Alluvium)	
						Test pit terminated - Excavator limitations	
10							

Test Pit Completed 07/15/22
Total Depth of Test Pit = 8.5 ft.

TP-4

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 36 Excavated By: R&J / M.Yakavonis	
0	16	d	W = 28 GS		ML/ OL	Stiff, brown, dry to damp, sandy SILT, trace gravel, numerous rootlets (Topsoil)	Groundwater not encountered.
	17	d			ML	Very stiff, tan, damp, sandy SILT, moderately mottled orange, scattered roots, charcoal fragments (Overbank/Lahar Runout Deposit)	
2	18	d					
	19	d			SM	- PP @ 2.0 ft = 3.0 tsf Medium dense, tan to gray, damp, silty, fine-grained SAND (Alluvium)	
4							
6	20	d				- Occasional thin interbedding of poorly graded sand throughout unit	
8							
	21	d			SP	Medium dense, dark gray, damp, slightly gravelly, poorly graded SAND, trace silt (Alluvium)	
10						- Rounded gravel - Slight caving @ 8.5	

Test Pit Completed 07/15/22
Total Depth of Test Pit = 10.0 ft.

Ground elevations are estimated from the provided Conceptual Site Plan, dated 5/24/22, for all test pit logs.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Log of Test Pits

Figure 5

TP-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 36 Excavated By: R&J / M.Yakavonis	
0	22	d			SM/ OL	Medium dense, brown, damp, very silty SAND, numerous rootlets, occasional fragments of plastic and metal (Topsoil, Reworked)	Groundwater not encountered.
2	23	d			ML	- Easily to moderately difficult to penetrate with #4 rebar driven by 5-lb hammer	
4	24	d	W = 29 GS			Very stiff, tan, damp, slightly sandy SILT, scattered roots and charcoal fragments (Overbank/Lahar Runout Deposit) - PP @ 2.5 ft = 2.5 - 3.0 tsf	
6	25	d	W = 13 GS		SM	Medium dense, tan, damp, very silty, fine-grained SAND (Alluvium)	
8	26	d			SM	Medium dense to dense, gray, damp to moist, very silty SAND, moderate mottling (Alluvium)	
10						Test pit terminated - Excavator limitations	

Test Pit Completed 07/15/22
Total Depth of Test Pit = 9.0 ft.

TP-6

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 30 Excavated By: R&J / M.Yakavonis	
0	27	d			SM/ OL	Medium dense, brown, dry, very silty, fine-grained SAND, numerous rootlets (Topsoil)	
2	28	d	W = 6 GS		SM	Medium dense, gray, dry to damp, silty SAND (Overbank/Lahar Runout Deposit)	
4	29	d	W = 30 GS		ML	Very stiff, tan, moist, sandy SILT, moderate mottling and scattered rootlets (Overbank/Lahar Runout Deposit) - Severe caving from 3.0 ft	
6	30	d			SP	Medium dense, dark gray, moist to wet, slightly gravelly, poorly graded SAND, trace silt, rounded gravels, and moderate mottling (Alluvium)	▽ Rapid groundwater seepage encountered at 6.5 ft.
	31	d				- Gravel content increases with depth	
8						Test pit terminated due to caving and groundwater	

Test Pit Completed 07/15/22
Total Depth of Test Pit = 7.5 ft.

Ground elevations are estimated from the provided Conceptual Site Plan, dated 5/24/22, for all test pit logs.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Log of Test Pits

Figure
6

TP-7

SAMPLE DATA			SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 34 Excavated By: R&J / M.Yakavonis	
0	32	d	W = 11 GS		ML	Very stiff to hard, tan, dry, slightly gravelly, sandy to very sandy SILT, numerous grass rootlets (Fill)	Groundwater not encountered.
2	33	d					
	34	d	W = 20 GS		SP-SM	- Reduced gravel content with depth PP @ 1.75 ft = 4.0 - 4.5 tsf	
4	35	d			ML	Medium dense, tan, dry to damp, slightly silty, poorly graded SAND (Overbank/Lahar Runout Deposit)	
6	36	d			SP	Very stiff, brown, damp, sandy SILT, scattered charcoal fragments (Overbank/Lahar Runout Deposit)	
8	37	d			SP	Medium dense, gray, damp, fine- to medium-grained, poorly graded SAND, trace silt, and moderate mottling (Alluvium)	
10						Medium dense, dark gray, moist, medium- to coarse-grained, poorly graded SAND, trace silt (Alluvium) - Moderate caving from 7.0 ft - Increased moisture at 9.5 ft	
12						Test pit terminated - Excavator limitations	

Test Pit Completed 07/15/22
Total Depth of Test Pit = 9.8 ft.

TP-8

SAMPLE DATA			SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Test Data	Graphic Symbol	USCS Symbol	Excavation Method: Tracked Excavator Ground Elevation (ft): 35 Excavated By: R&J / M.Yakavonis	
0	38	d			SM/OL	Medium dense, brown, dry, very silty SAND, numerous rootlets (Topsoil)	Groundwater not encountered.
	39	d			SP-SM	Medium dense, tan, dry, slightly silty, poorly graded SAND, slightly mottled (Overbank/Lahar Runout Deposit)	
2	40	d			ML		
4	41	d	W = 11 GS		SM	Very stiff, tan, dry to damp, very sandy SILT (Overbank/Lahar Runout Deposit)	
					SP-SM	Medium dense, tan to gray, damp, very silty SAND (Alluvium)	
6	42	d	W = 5 GS			Medium dense, gray, damp, slightly silty, poorly graded SAND, slight mottling (Alluvium)	
8	43	d					
10						Test pit terminated - Excavator limitations	
12							

Test Pit Completed 07/15/22
Total Depth of Test Pit = 10.8 ft.

Ground elevations are estimated from the provided Conceptual Site Plan, dated 5/24/22, for all test pit logs.

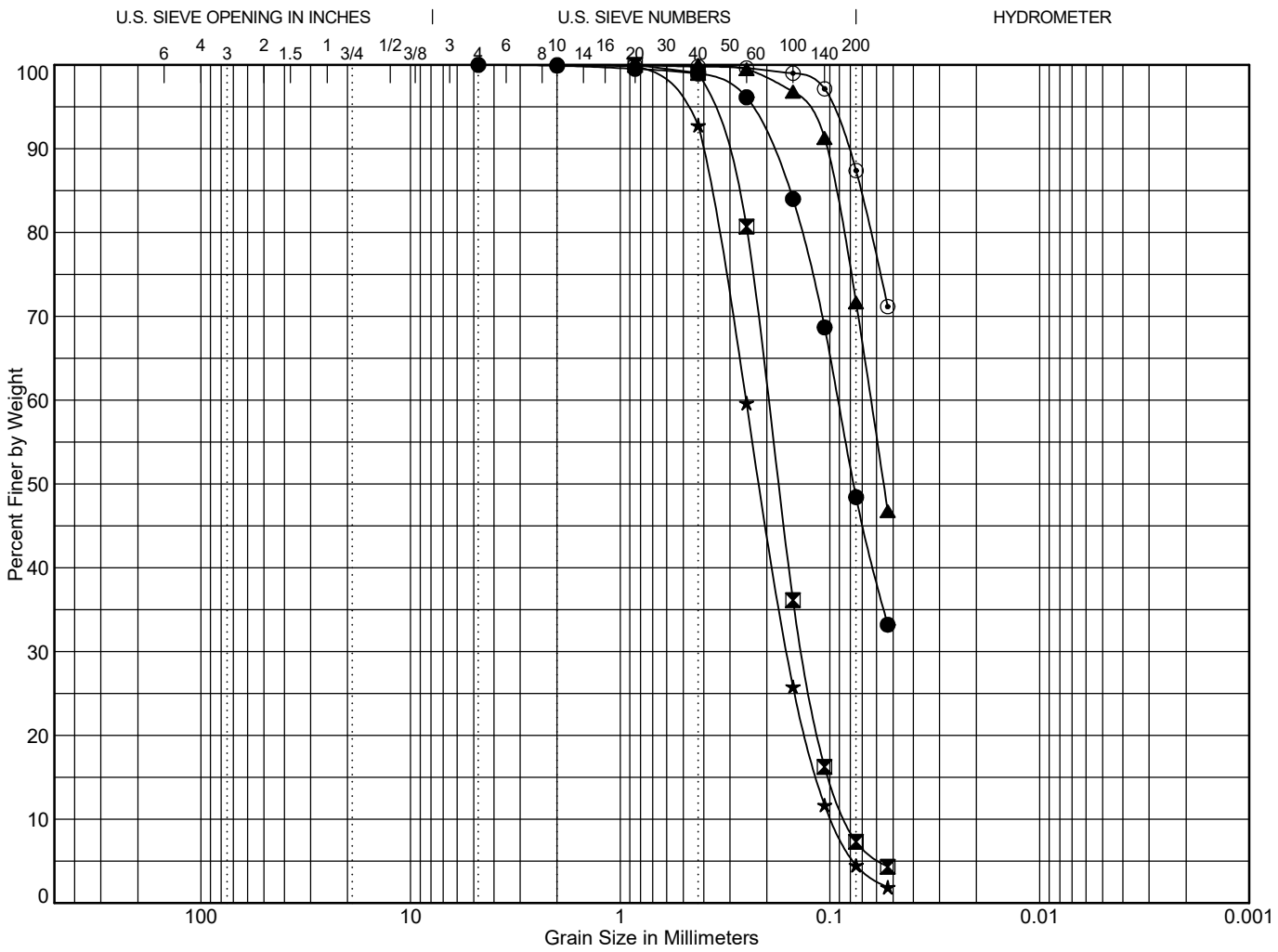
Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Log of Test Pits

Figure 7



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Point		Depth	Classification	LL	PL	PI	C_c	C_u
●	TP-1	1.3	Very silty SAND (SM)					
⊠	TP-2	1.8	Slightly silty, poorly graded SAND (SP-SM)				1.11	2.37
▲	TP-2	2.8	Sandy SILT (ML)					
★	TP-2	6.0	Poorly graded SAND, trace silt (SP)				1.04	2.57
⊙	TP-4	1.5	Sandy SILT (ML)					

Point		Depth	D_{90}	D_{60}	D_{50}	D_{30}	D_{10}	%Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
●	TP-1	1.3	0.193	0.091	0.077			0.0	0.0	0.1	0.9	50.5	48.4
⊠	TP-2	1.8	0.327	0.197	0.176	0.135	0.083	0.0	0.0	0.0	1.0	91.7	7.3
▲	TP-2	2.8	0.104	0.064	0.055			0.0	0.0	0.0	0.0	28.4	71.6
★	TP-2	6.0	0.407	0.251	0.216	0.16	0.098	0.0	0.0	0.0	7.2	88.3	4.5
⊙	TP-4	1.5	0.082					0.0	0.0	0.0	0.2	12.4	87.4

$C_c = D_{30}^2/(D_{60} * D_{10})$
$C_u = D_{60}/D_{10}$

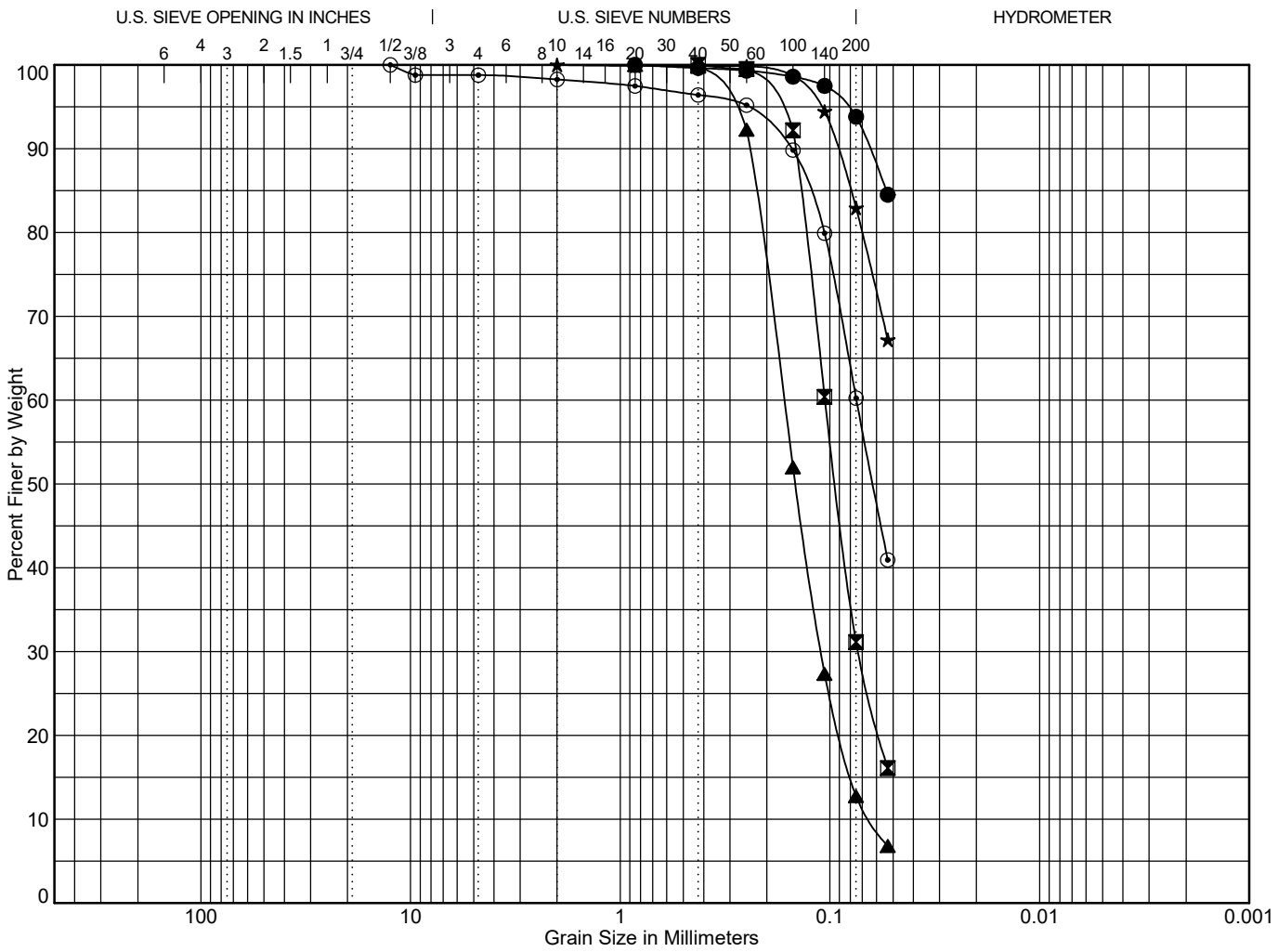
To be well graded: $1 < C_c < 3$ and $C_u > 4$ for GW or $C_u > 6$ for SW

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Grain Size Test Data

Figure
8



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Point	Depth	Classification	LL	PL	PI	C_c	C_u
●	TP-5 3.5	Slightly sandy SILT (ML)					
⊠	TP-5 6.0	Very silty SAND (SM)					
▲	TP-6 1.3	Silty SAND (SM)				1.14	2.60
★	TP-6 3.5	Sandy SILT (ML)					
⊙	TP-7 1.3	Very sandy SILT, trace gravel (ML)					

Point	Depth	D_{90}	D_{60}	D_{50}	D_{30}	D_{10}	%Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
●	TP-5 3.5	0.065					0.0	0.0	0.0	0.4	5.8	93.8
⊠	TP-5 6.0	0.146	0.105	0.094	0.073		0.0	0.0	0.0	0.0	68.9	31.1
▲	TP-6 1.3	0.243	0.166	0.146	0.11	0.064	0.0	0.0	0.0	0.2	87.0	12.7
★	TP-6 3.5	0.093					0.0	0.0	0.0	0.1	16.9	82.9
⊙	TP-7 1.3	0.152	0.075	0.062			0.0	1.2	0.5	1.8	36.2	60.2

$C_c = D_{30}^2/(D_{60} * D_{10})$
$C_u = D_{60}/D_{10}$

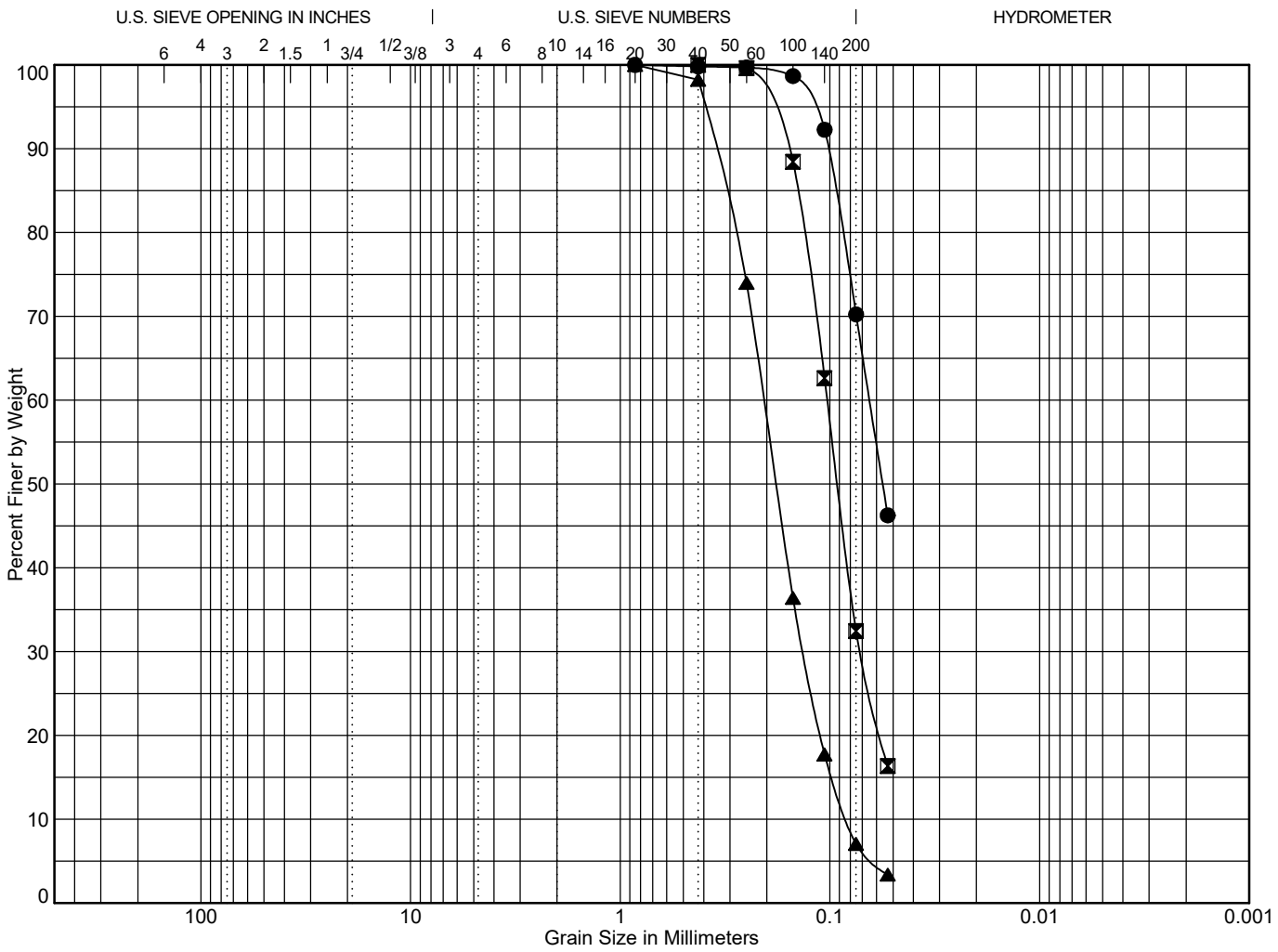
To be well graded: $1 < C_c < 3$ and $C_u > 4$ for GW or $C_u > 6$ for SW

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Grain Size Test Data

Figure
9



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Point		Depth	Classification	LL	PL	PI	C_c	C_u
●	TP-7	3.3	Sandy SILT (ML)					
⊠	TP-8	4.0	Very silty SAND (SM)					
▲	TP-8	6.0	Slightly silty, poorly graded SAND (SP-SM)				1.04	2.51

Point		Depth	D_{90}	D_{60}	D_{50}	D_{30}	D_{10}	%Coarse Gravel	% Fine Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
●	TP-7	3.3	0.102	0.065	0.056			0.0	0.0	0.0	0.2	29.6	70.2
⊠	TP-8	4.0	0.161	0.103	0.092	0.071		0.0	0.0	0.0	0.0	67.6	32.4
▲	TP-8	6.0	0.355	0.207	0.18	0.133	0.083	0.0	0.0	0.0	1.8	91.2	7.1

$C_c = D_{30}^2/(D_{60} * D_{10})$
$C_u = D_{60}/D_{10}$

To be well graded: $1 < C_c < 3$ and $C_u > 4$ for GW or $C_u > 6$ for SW

GEOTEST

Dynes Townhomes Infiltration Feasibility
NW Corner of E Gilkey Road and
S Anacortes Street
Burlington, Washington

Grain Size Test Data

Figure
10

Northwest Agricultural Consultants

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Kennewick, WA 99336
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lab@nwag.com

PAP-Accredited
NAPT

GeoTest Services Inc.
741 Marine Drive
Bellingham, WA 98225

Report: 59971-1-1
Date: July 20, 2022
Project No: 22-0654
Project Name: Dynes Townhomes

Sample ID	pH	Organic Matter	Cation Exchange Capacity
TP-3 @ 0.25’	6.2	4.51%	11.4 meq/100g
TP-3 @ 1.25’	6.6	3.78%	10.2 meq/100g
TP-4 @ 3.5’	6.7	1.58%	4.7 meq/100g
TP-8 @ 0.25’	6.7	4.94%	12.3 meq/100g
TP-8 @ 1.0’	7.0	1.59%	4.4 meq/100g
Method	**SM 4500-H^+ B**	**ASTM D2974**	**EPA 9081**

REPORT LIMITATIONS AND GUIDELINES FOR ITS USE[1]

Subsurface issues may cause construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help:

Geotechnical Services are Performed for Specific Purposes, Persons, and Projects

At GeoTest our geotechnical engineers and geologists structure their services to meet specific needs of our clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of an owner, a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineer who prepared it. And no one – not even you – should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report is Based on a Unique Set of Project-Specific Factors

GeoTest's geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the clients goals, objectives, and risk management preferences; the general nature of the structure involved its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless GeoTest, who conducted the study specifically states otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

1Information in this document is based upon material developed by ASFE, Professional Firms Practicing in the Geosciences(asfe.org)

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed, for example, from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed construction,
- alterations in drainage designs; or
- composition of the design team; the passage of time; man-made alterations and construction whether on or adjacent to the site; or by natural alterations and events, such as floods, earthquakes or groundwater fluctuations; or project ownership.

Always inform GeoTest's geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. Do not rely on the findings and conclusions of this report, whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact GeoTest before applying the report to determine if it is still relevant. A minor amount of additional testing or analysis will help determine if the report remains applicable.

Most Geotechnical and Geologic Findings are Professional Opinions

Our site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoTest's engineers and geologists review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in your report. Retaining GeoTest who developed this report to provide construction observation is the most effective method of managing the risks associated with anticipated or unanticipated conditions.

1Information in this document is based upon material developed by ASFE, Professional Firms Practicing in the Geosciences(asfe.org)

A Report's Recommendations are Not Final

Do not over-rely on the construction recommendations included in this report. Those recommendations are not final, because geotechnical engineers or geologists develop them principally from judgment and opinion. GeoTest's geotechnical engineers or geologists can finalize their recommendations only by observing actual subsurface conditions revealed during construction. GeoTest cannot assume responsibility or liability for the report's recommendations if our firm does not perform the construction observation.

A Geotechnical Engineering or Geologic Report may be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. Lower that risk by having GeoTest confer with appropriate members of the design team after submitting the report. Also, we suggest retaining GeoTest to review pertinent elements of the design teams plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having GeoTest participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do not Redraw the Exploration Logs

Our geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors of omissions, the logs included in this report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable; but recognizes that separating logs from the report can elevate risk.

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In that letter, consider advising the contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoTest and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might you be in a position to give contractors the best information available, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

1Information in this document is based upon material developed by ASFE, Professional Firms Practicing in the Geosciences(asfe.org)

In addition, it is recommended that a contingency for unanticipated conditions be included in your project budget and schedule.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering or geology is far less exact than other engineering disciplines. This lack of understanding can create unrealistic expectations that can lead to disappointments, claims, and disputes. To help reduce risk, GeoTest includes an explanatory limitations section in our reports. Read these provisions closely. Ask questions and we encourage our clients or their representative to contact our office if you are unclear as to how these provisions apply to your project.

Environmental Concerns Are Not Covered in this Geotechnical or Geologic Report

The equipment, techniques, and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated containments, etc. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. Do not rely on environmental report prepared for some one else.

Obtain Professional Assistance to Deal with Biological Pollutants

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts biological pollutants from growing on indoor surfaces. Biological pollutants includes but is not limited to molds, fungi, spores, bacteria and viruses. To be effective, all such strategies should be devised for the express purpose of prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional biological pollutant prevention consultant. Because just a small amount of water or moisture can lead to the development of severe biological infestations, a number of prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of this study, the geotechnical engineer or geologist in charge of this project is not a biological pollutant prevention consultant; none of the services preformed in connection with this geotechnical engineering or geological study were designed or conducted for the purpose of preventing biological infestations.

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