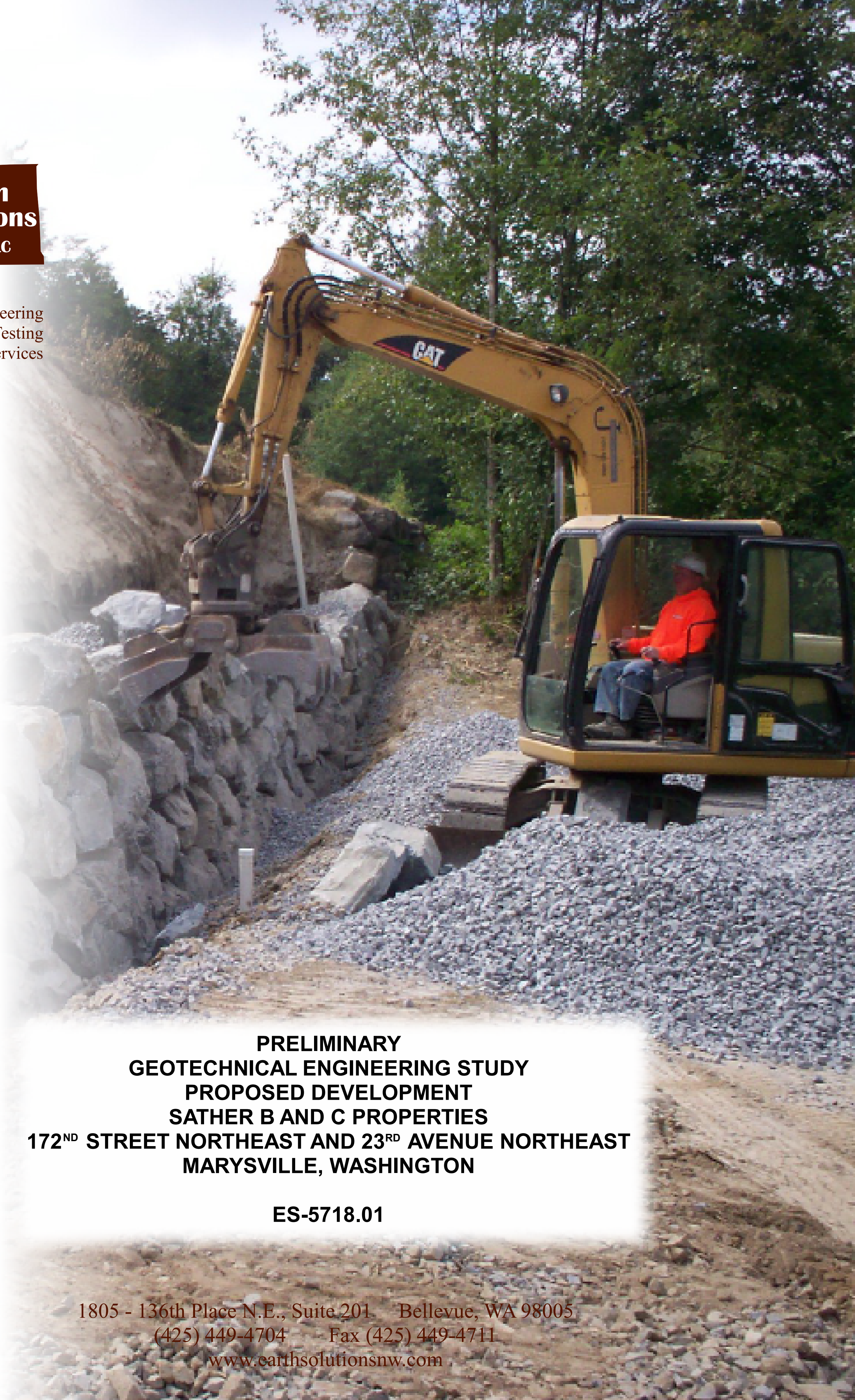
Earth Solutions NW LLC

Geotechnical Engineering
Construction Observation/Testing
Environmental Services



PRELIMINARY
GEOTECHNICAL ENGINEERING STUDY
PROPOSED DEVELOPMENT
SATHER B AND C PROPERTIES
172ND STREET NORTHEAST AND 23RD AVENUE NORTHEAST
MARYSVILLE, WASHINGTON

ES-5718.01

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PREPARED FOR

SATHER A, LLC
C/O LAND TECHNOLOGIES, INC.

August 13, 2018

Kyler T. Kelly
Staff Geologist

8/13/18

Henry T. Wright, P.E.
Senior Project Engineer

For: **Raymond A. Coglas, P.E.**
Principal Engineer

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Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

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

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of 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 engineering report without first conferring with the 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

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's 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 the geotechnical engineer who conducted the study specifically indicates 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.

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 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 structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your 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

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering 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 the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers 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 the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize 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, advise 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 the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid 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 to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

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

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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Earth Solutions NW LLC
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

August 13, 2018
ES-5718.01

Sather A, LLC
c/o Land Technologies, Inc.
18820 – 3rd Avenue Northeast
Arlington, Washington 98223

Attention: Mr. Merle Ash

Dear Mr. Ash:

Earth Solutions NW, LLC (ESNW) is pleased to present this report titled "Preliminary Geotechnical Engineering Study, Proposed Development, Sather B and C Properties, 172nd Street Northeast and 23rd Avenue Northeast, Marysville, Washington". The primary purpose of this preliminary report is to provide initial site preparation and earthwork recommendations for establishing future building sites.

Based on the conditions observed during our fieldwork, the subject site is underlain by medium dense silt, sand, and clay recessional outwash deposits. Based on the results of our study, development of the site is feasible from a geotechnical standpoint. We understand existing site grades will be raised several feet to establish design elevations throughout the proposed development area. Fill heights on the order of six or more feet above existing grades are currently proposed. Based on identified soil conditions and the anticipated construction type consisting of relatively lightly loaded wood frame buildings, the proposed structures can be supported on conventional spread and continuous foundations bearing on the newly placed structural fill; ESNW should further evaluate this recommendation when building plans are available.

Recommendations for site preparation and earthwork, drainage, preliminary foundation design and other pertinent recommendations are provided in this study.

The opportunity to be of service to you is appreciated. If you have any questions regarding the content of this geotechnical engineering study, please call.

Sincerely,

EARTH SOLUTIONS NW, LLC

Kyler T. Kelly
Staff Geologist

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Appendix B	**Laboratory Test Results**

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ES-5718.01

INTRODUCTION

General

This preliminary geotechnical engineering study was prepared for the proposed development to be constructed southwest of the intersection between 172nd Street Northeast and 23rd Avenue Northeast in Marysville, Washington. Our scope of services for completing this geotechnical engineering study included the following:

- Observing, logging, and sampling test pits for purposes of characterizing site soil and groundwater conditions;
- Laboratory testing of soil samples collected at the test pit locations;
- Engineering analyses and recommendations for the proposed development, and;
- Preparation of this report with primary emphasis on earthwork recommendations for establishing future building sites.

The following documents and resources were reviewed as part of our report preparation:

- Geologic Map of the Arlington West 7.5 Minute Quadrangle, Snohomish County, Washington, compiled by James P. Minard, dated 1985;
- Marysville Municipal Code;
- 2014 Stormwater Management Manual for Western Washington, Volume III, provided by Washington State Department of Ecology;
- Web Soil Survey, online resource maintained by the Natural Resources Conservation Service under the United States Department of Agriculture, and;
- Marysville Geologic Hazards Map (May 2014).

Project Description

Based on the information provided to ESNW, over six feet of structural fill will be placed across the subject site in preparation for a future development. Site improvements will also include construction of access roads, utility installations, and stormwater drainage facilities.

At the time this report was prepared, specific building types and load values were not available; however, we anticipate the proposed structures will consist of relatively lightly loaded wood framing supported on conventional foundations. Based on our experience with similar developments, we estimate wall loads on the order of 2 to 4 kips per linear foot, column loads of 40 to 60 kips, and slab-on-grade loading of 150 pounds per square foot (psf). ESNW should review building plans when they are available and update the recommendations in this report as necessary.

Although formal plans have not been prepared at this time, we expect stormwater will be managed through a combination of detention and (to the extent practicable) stormwater infiltration. Further geotechnical evaluation and testing (where applicable) will be needed with respect to infiltration system designs.

If the above design assumptions are incorrect or change, ESNW should be contacted to review the recommendations in this report. ESNW should review the final design to verify the geotechnical recommendations provided in this report have been incorporated into the plans.

SITE CONDITIONS

Surface

The subject site is located southwest of the intersection between 172nd Street Northeast and 23rd Avenue Northeast in Marysville, Washington, as illustrated on the Vicinity Map (Plate 1). The site consists of two tax parcels (Snohomish County parcel numbers 31055290020-1300 and -1401) comprising a combined total of approximately 36.98 acres of land. The subject site is currently undeveloped agricultural land with a remnant building foundation along the northeastern corner of the site. The site is relatively level with total elevation change on the order of four feet or less.

Subsurface

A representative of ENSW observed, logged, and sampled nine test pits, excavated at accessible locations within the proposed development area, on June 14, 2018, using a mini-trackhoe and operator retained by ESNW. The test pits were completed for purposes of assessing soil conditions, classifying site soils, and characterizing near-surface groundwater conditions within the proposed development area. The approximate locations of the test pits are depicted on Plate 2 (Test Pit Location Plan). Please refer to the test pit logs provided in Appendix A for a more detailed description of subsurface conditions. Representative soil samples collected at the test pit locations were evaluated in general accordance with Unified Soil Classification System (USCS) and United States Department of Agriculture (USDA) methods and procedures.

Topsoil and Fill

Topsoil was observed extending to depths of approximately 12 to 18 inches below existing ground surface (bgs). Abundant fine organics were encountered within the top 24 inches within test pit locations TP-1 and TP-6. The topsoil thickness is variable and vegetation roots extend below the topsoil zone into the underlying weathered native soil in some areas. The topsoil was characterized by dark brown color and fine organic material. Topsoil is not suitable for use as structural fill nor should it be mixed with material to be used as structural fill. Topsoil or otherwise unsuitable material can be used in landscape areas if desired.

Fill was not encountered within the test pits. If fill is encountered during construction, ESNW should be consulted to verify the suitability for support of the proposed structures and/or reuse as structural fill.

Native Soil

Underlying the topsoil, sand soils with varying amounts of silt (USCS: SP, SW-SM, and SM) were encountered, consistent with Marysville sand member recessional deposits. Underlying the sands, at test pit locations TP-6 and TP-7, sandy silt and lean clay deposits were encountered, consistent with the clay member associated with Marysville recessional outwash deposits. The native soils were observed to become wet to saturated at-depth. Moderate to severe caving was observed beginning at depths of approximately two feet bgs at all test pit locations with exception to TP-6.

Geologic Setting

The referenced geologic map identifies clay member recessional outwash deposits (Qvrc) and Marysville sand member recessional outwash (Qvrm) across the site and surrounding areas. As described on the geologic map resource, the clay member deposits are gray, olive gray, and mottled, massive clay and silt associated with the Marysville sand member. The Marysville sand member is typically well-drained, stratified to massive outwash sand, some fine gravel, and some areas of silt and clay. The referenced WSS resource identifies Custer fine sandy loam, Kitsap silt loam, and Terric Medisaprists (Map Unit Symbols: 13, 27, and 69 respectively) across the site and surrounding areas. Custer fine sandy loam was formed in outwash plains, Kitsap silt loam was formed in terraces, and Terric Medisaprists was formed in depressions, flood plains, and till plains. Based on our field observations, native soils on site are generally consistent with silt, sand, and clay recessional outwash deposits.

Groundwater

The groundwater table was encountered at relatively shallow depths at the test pit locations. Utility or vault excavations that extend into the groundwater table will likely require active dewatering during construction. Groundwater elevations fluctuate depending on many factors, including precipitation duration and intensity, the time of year, and soil conditions. In general, groundwater levels and flow rates are higher during the wetter, winter, spring, and early summer months. It should be noted that winter groundwater level monitoring will likely be necessary to establish the seasonal high level if an infiltration system design is proposed.

Geologically Hazardous Areas Assessment

We reviewed the geologically hazardous areas section of the Marysville Municipal Code, Chapter 22E.010, and the referenced map resource depicting geologically hazardous areas within Marysville. Based on the results of our review, no geologically hazardous areas are located within or immediately adjacent to the subject property.

DISCUSSION AND RECOMMENDATIONS

General

Based on identified soil conditions and the anticipated construction type consisting of relatively lightly loaded wood frame buildings, the proposed structures can be supported on conventional spread and continuous foundations bearing on the newly placed structural fill proposed for raising site grades. Existing vegetation should be cleared, surficial organic material should be mowed, and the prepared fill surface should be static-rolled with a large roller prior to placing new fill. Subsequent to the fill placement, additional footing subgrade preparation may be necessary at the time of building construction; ESNW should further evaluate building support recommendations when building plans are available and during construction. It should be noted that the primary purpose of this report is to provide initial site preparation and earthwork recommendations for establishing the future building sites.

This study has been prepared for the exclusive use Sather A, LLC and their representatives. No warranty, expressed or implied, is made. This study has been prepared in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area.

Site Preparation and Earthwork

Site preparation activities will consist of installing temporary erosion control measures and clearing and stripping the site. We understand grading activities will consist of placement of six feet or more of fill. Earthwork will be completed to establish approximate design elevations for the future development.

Temporary Erosion Control

Temporary construction entrances and drive lanes, consisting of at least six inches of quarry spalls, should be considered in order to minimize off-site soil tracking and to provide a temporary road surface; geotextile fabric may be necessary for additional stability. Temporary slopes and stockpiles should be covered when not in use. Silt fencing should be installed along the margins of the property. Erosion control measures should conform to the Washington State Department of Ecology and City of Marysville standards.

Site Stripping and Grading

Due to the granular nature of the topsoil and the expected placement of six or more feet of structural fill, minimal stripping will be required in proposed fill areas. The following recommendations pertaining to site stripping and grading can be considered for this project:

- Clear existing vegetation;
- In areas where fill placement will be greater than six feet, stripping can consist of mowing groundcover vegetation and removing cuttings. Thicker stripping may be necessary in areas where the organic horizon extends deeper into the subsurface;
- Static roll exposed soils with a large roller to a firm and unyielding state prior to placement of the new fill, and;
- All fill should be placed and graded for the support of the proposed development in accordance with the recommendations in this report.

A sheep-foot roller should be considered for use where silt and clay soils are encountered. Additional site preparation might be required once stripping and grading has started. ESNW should be contacted to evaluate the depth of any stripping deemed necessary prior to placement of fill.

In-Situ Soils

The majority of the soils encountered during our subsurface exploration have a moderate to high sensitivity to moisture and were generally in a moist to saturated condition at the time of the exploration on June 14, 2018. Soils encountered during site excavations that are excessively over the optimum moisture content will require aeration or treatment prior to placement and compaction. Conversely, soils that are substantially below the optimum moisture content will require moisture conditioning through the addition of water prior to use as structural fill. Areas of upper loose and wet soil will not be compactible if grading is attempted during the wet season. An ESNW representative should determine the suitability of in-situ soils for use as structural fill at the time of construction.

Wet Season Grading

If grading takes place during the wetter, winter or spring months, a contingency in the project budget should be included to allow for export of native soil and/or existing fill and import of structural fill as described below.

Structural Fill

As described previously, up to roughly six feet of new fill will be placed to achieve design elevations. Structural fill is defined as compacted soil placed in foundation, slab-on-grade, and roadway areas as well as fills placed to construct permanent slopes and throughout retaining wall and utility trench backfill areas. Soils placed in structural areas should be placed in loose lifts of 12 inches or less and compacted to a relative compaction of at least 90 percent, based on the laboratory maximum dry density as determined by the Modified Proctor Method (ASTM D1557). It should be noted that the above compaction specification applies to the initial fill placement to establish rough grade elevations. More stringent compaction specifications will likely be required for utility trench backfill zones and finish subgrade areas.

Excavations and Slopes

The Federal Occupation Safety and Health Administration (OSHA) and the Washington Industrial Safety and Health Act (WISHA) provide soil classification in terms of temporary slope inclinations. Soils that exhibit a high compressive strength are allowed steeper temporary slope inclinations than are soils that exhibit lower strength characteristics.

Based on the soil conditions encountered at the test pit locations, site soils are classified as Type C by OSHA. New fill should also be considered Type C soil. Temporary slopes over four feet in height in Type C soils must be sloped no steeper than one-and-one-half horizontal to one vertical (1.5H:1V). Steeper temporary slopes may be feasible and should be evaluated by ESNW during construction. Where encountered, the presence of groundwater will cause caving of temporary slopes. ESNW should observe site excavations to confirm soil types and allowable slope inclinations. If the recommended temporary slope inclinations cannot be achieved, temporary shoring may be necessary to support excavations.

Permanent slopes should be planted with vegetation to enhance stability and to minimize erosion, and should maintain a gradient of 2H:1V or flatter. An ESNW representative should observe temporary and permanent slopes to confirm the slope inclinations are suitable for the exposed soil conditions. Supplementary recommendations with respect to excavations and slopes may be provided as conditions warrant.

Preliminary Foundations Recommendations

Based on our understanding of project plans and the anticipated lightly loaded wood frame structure type, the proposed structures can be supported on conventional spread and continuous footings bearing on the newly placed structural fill proposed for raising site grades. Additional footing subgrade preparation may be necessary at the time of building construction; ESNW should further evaluate building support and design recommendations when building plans are available and during construction.

Provided the structures will be supported as described above, the following parameters can be used for design of the new foundations:

- Allowable soil bearing capacity 2,500 psf
- Passive earth pressure 300 pcf (equivalent fluid)
- Coefficient of friction 0.40

A one-third increase in the allowable soil bearing capacity can be assumed for short-term wind and seismic loading conditions.

With structural loading as expected, total settlement in the range of one inch is anticipated, with differential settlement of about one-half inch. The majority of the settlements should occur during construction, as dead loads are applied.

Seismic Design Considerations

The 2015 International Building Code recognizes the American Society of Civil Engineers (ASCE) for seismic site class definitions. Based on the soil conditions observed at the test pit locations, in accordance with Table 20.3-1 of the ASCE Minimum Design Loads for Buildings and Other Structures manual, Site Class D should be used for design.

The referenced liquefaction susceptibility map indicates the site and surrounding areas maintain low to moderate liquefaction susceptibility. Liquefaction is a phenomenon where saturated and loose soils suddenly lose internal strength and behave as a fluid. This behavior is in response to increased pore water pressures resulting from an earthquake or other intense ground shaking. In our opinion, site susceptibility to liquefaction may be considered low to moderate. The proposed six foot structural fill placement and resulting elevated building pad area will help to substantially reduce the liquefaction susceptibility and will improve overall building support with respect to potential liquefaction impacts.

Slab-on-Grade Floors

Slab-on-grade floors for the proposed structures should be supported on a firm and unyielding subgrade. Unstable or yielding areas of the subgrade should be recompacted, or overexcavated and replaced with suitable structural fill, prior to construction of the slab.

A capillary break consisting of a minimum of four inches of free-draining crushed rock or gravel should be placed below the slab. The free-draining material should have a fines content of 5 percent or less (percent passing the Number 200 sieve, based on the minus three-quarter-inch fraction). In areas where slab moisture is undesirable, installation of a vapor barrier below the slab should be considered. If a vapor barrier is to be utilized, it should be a material specifically designed for use as a vapor barrier and should be installed in accordance with the specifications of the manufacturer.

Retaining Walls

Retaining walls must be designed to resist earth pressures and applicable surcharge loads. The following parameters can be used for retaining wall design:

- Active earth pressure (unrestrained condition) 35 pcf
- At-rest earth pressure (restrained condition) 55 pcf
- Traffic surcharge (passenger vehicles) 70 psf (rectangular distribution)
- Passive earth pressure 300 pcf
- Coefficient of friction 0.40
- Seismic surcharge 6H*

**Where H equals the retained height*

Additional surcharge loading from adjacent foundations, sloped backfill, retaining walls, or other loads should be included in the retaining wall design. Drainage should be provided behind retaining walls such that hydrostatic pressures do not develop. If drainage is not provided, hydrostatic pressures should be included in the wall design.

Retaining walls should be backfilled with at least 18 inches of free-draining material or suitable sheet drainage that extends along the height of the wall. The upper one foot of the wall backfill can consist of a less permeable soil, if desired. A perforated drain pipe should be placed along the base of the wall, and connected to an approved discharge location. A typical retaining wall drainage detail is provided on Plate 3.

Drainage

Based on our field observations, shallow groundwater is expected to be encountered in excavations that extend below existing site grades. If utility or vault excavations extend into the groundwater table, active dewatering during construction will likely be necessary. Groundwater (in general) should also be expected within shallower site excavations depending on the time of year grading operations take place. Temporary measures to control surface water runoff and groundwater seepage during construction would likely involve interceptor trenches and sumps and dewatering (where applicable).

Finish grades must be designed to direct surface drain water away from structures and slopes. Water must not be allowed to pond adjacent to structures or slopes, and should not be allowed to flow uncontrolled offsite. In our opinion, foundation drains should be installed along building perimeter footings. A typical foundation drain detail is provided on Plate 4.

Preliminary Infiltration Evaluation

As indicated in the *Subsurface* section of this study, native soils encountered during our fieldwork were characterized primarily as silt, sand, and clay outwash deposits. The following preliminary recommendations pertaining to infiltration feasibility can be considered for this project:

- The results of USDA textural analyses performed on representative soil samples indicate native sand soils consist of gravelly coarse sand, extremely gravelly coarse sand, and slightly gravelly sandy loam with fines contents ranging from 0.8 to 23.5 percent and native silt and clay soils consist of loam with fines contents ranging from 87.8 to 98.8 percent. Should infiltration be pursued, it should be targeted within areas where sand soils are present.

- Should infiltration be pursued, adequate separation between the seasonal high groundwater table and the infiltration system must be established to allow for infiltration feasibility. A winter monitoring program to establish the seasonal high groundwater level would be required.

Where infiltration facilities are incorporated into final designs, ESNW should provide design recommendations and related infiltration rates based on in-situ testing. The preliminary recommendations provided in this section should be confirmed during the appropriate phase of design and/or construction.

Utility Support and Trench Backfill

We understand that utility excavations will most likely occur within newly placed fill; however, where utility excavations extend into the groundwater table, remedial measures for proper support of the utilities may be needed. As previously stated, active dewatering of trench excavations would also likely be necessary for installations that extend below the groundwater table.

The native soils observed at the test pit locations may be suitable for use as structural backfill in the utility trench excavations provided the soil is at or near the optimum moisture content at the time of placement and compaction. Moisture conditioning of the soils may be necessary at some locations prior to use as structural fill. Utility trench backfill should be placed and compacted to the specifications of structural fill provided in this report, or to the applicable requirements of presiding jurisdiction.

Preliminary Pavement Sections

The performance of site pavements is largely related to the condition of the underlying subgrade. To ensure adequate pavement performance, the subgrade should be in a firm and unyielding condition when subjected to proofrolling with a loaded dump truck. Structural fill in pavement areas should be compacted to the specifications detailed in the *Site Preparation and Earthwork* section of this report. It is possible that soft, wet, or otherwise unsuitable subgrade areas may still exist after base grading activities. Areas of unsuitable or yielding subgrade conditions may require remedial measures such as overexcavation and replacement with structural fill or thicker crushed rock sections prior to pavement.

For relatively lightly loaded pavements subjected to automobiles and occasional truck traffic, the following sections can be considered for preliminary design:

- Two inches of hot mix asphalt (HMA) placed over four inches of crushed rock base (CRB), or;

- Two inches of HMA placed over three inches of asphalt treated base (ATB).

Heavier traffic areas generally require thicker pavement sections depending on site usage, pavement life expectancy, and site traffic. For preliminary design purposes, the following pavement sections for occasional truck traffic areas can be considered:

- Three inches of HMA placed over six inches of CRB, or;

- Three inches of HMA placed over four-and-one-half inches of ATB.

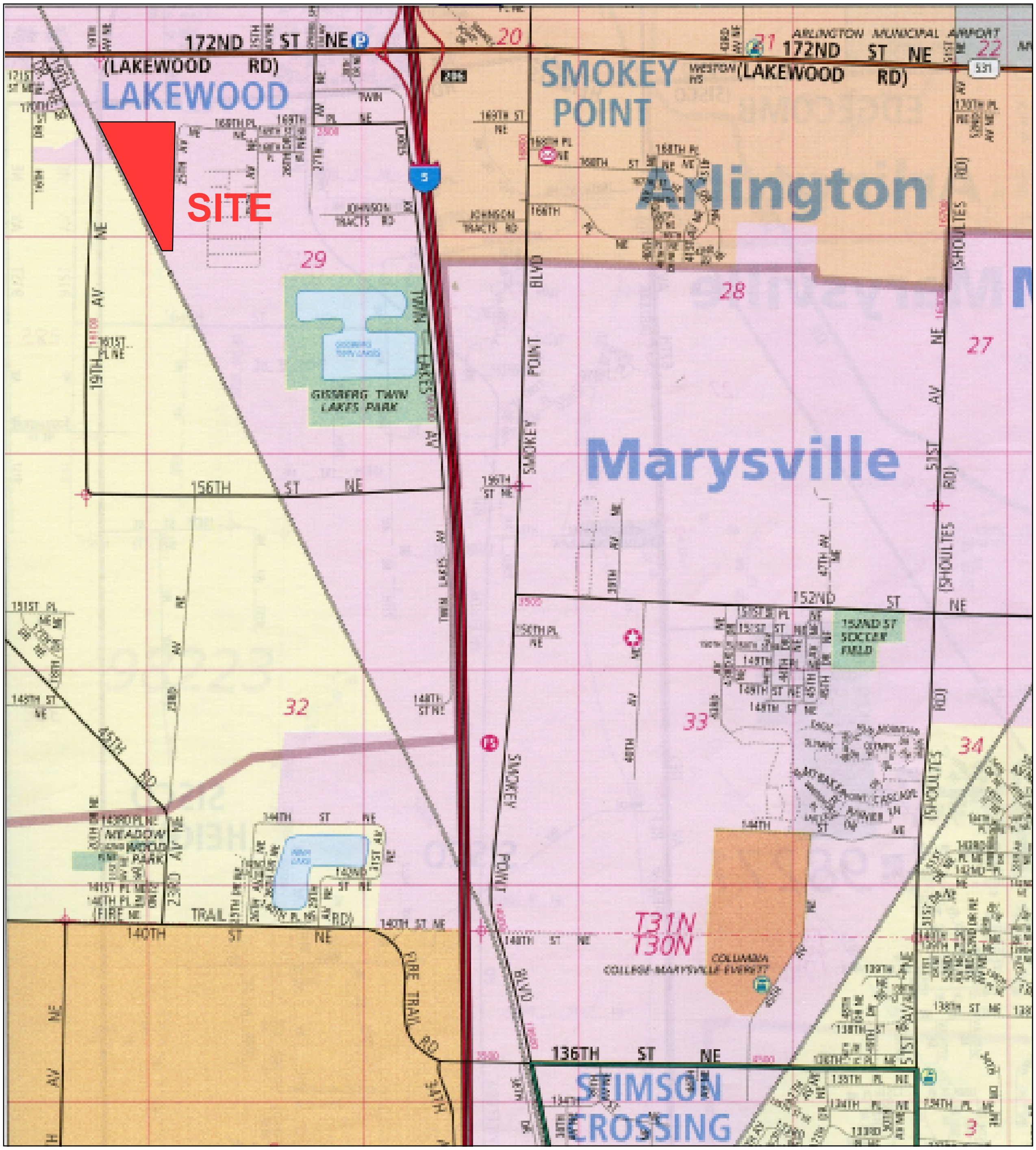
The HMA, CRB and ATB materials should conform to WSDOT specifications. Marysville minimum pavement requirements may supersede our recommendations and may require thicker pavement sections.

LIMITATIONS

The recommendations and conclusions provided in this preliminary geotechnical engineering study are professional opinions consistent with the level of care and skill that is typical of other members in the profession currently practicing under similar conditions in this area. A warranty is not expressed or implied. Variations in the soil and groundwater conditions observed at the test pit locations may exist and may not become evident until construction. ESNW should reevaluate the conclusions in this geotechnical engineering study if variations are encountered.

Additional Services

ESNW should have an opportunity to review the final design with respect to the geotechnical recommendations provided in this report. ESNW should also be retained to provide testing and consultation services during construction.



Reference:
Snohomish County, Washington
Map 336
By The Thomas Guide
Rand McNally
32nd Edition

NORTH

NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

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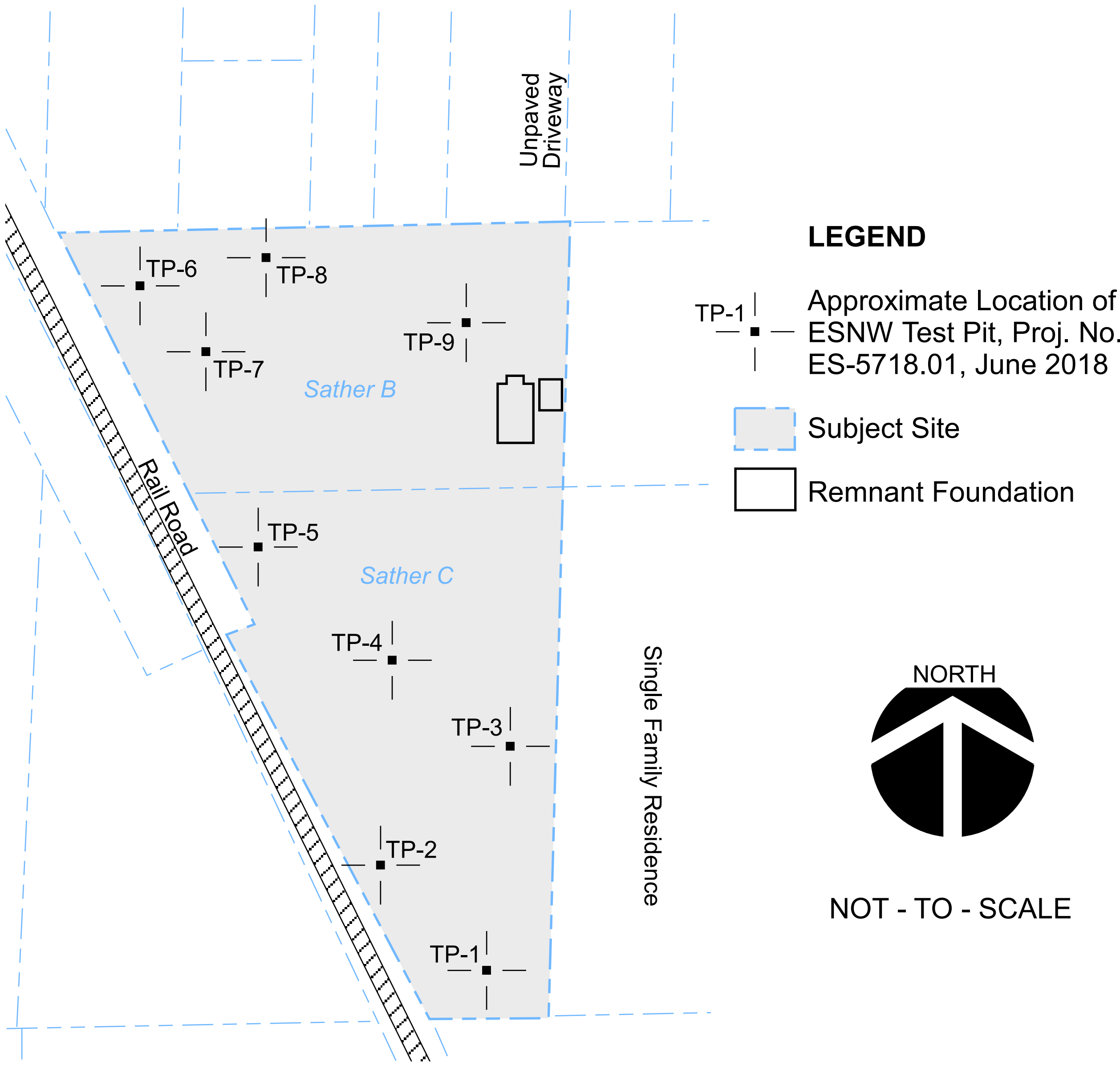
Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Vicinity Map
Sather B & C Properties
Marysville, Washington

Drwn. MRS	Date 06/21/2018	Proj. No. 5718.01
Checked KTK	Date June 2018	Plate 1



NOTE: The graphics shown on this plate are not intended for design purposes or precise scale measurements, but only to illustrate the approximate test locations relative to the approximate locations of existing and / or proposed site features. The information illustrated is largely based on data provided by the client at the time of our study. ESNW cannot be responsible for subsequent design changes or interpretation of the data by others.

NOTE: This plate may contain areas of color. ESNW cannot be responsible for any subsequent misinterpretation of the information resulting from black & white reproductions of this plate.

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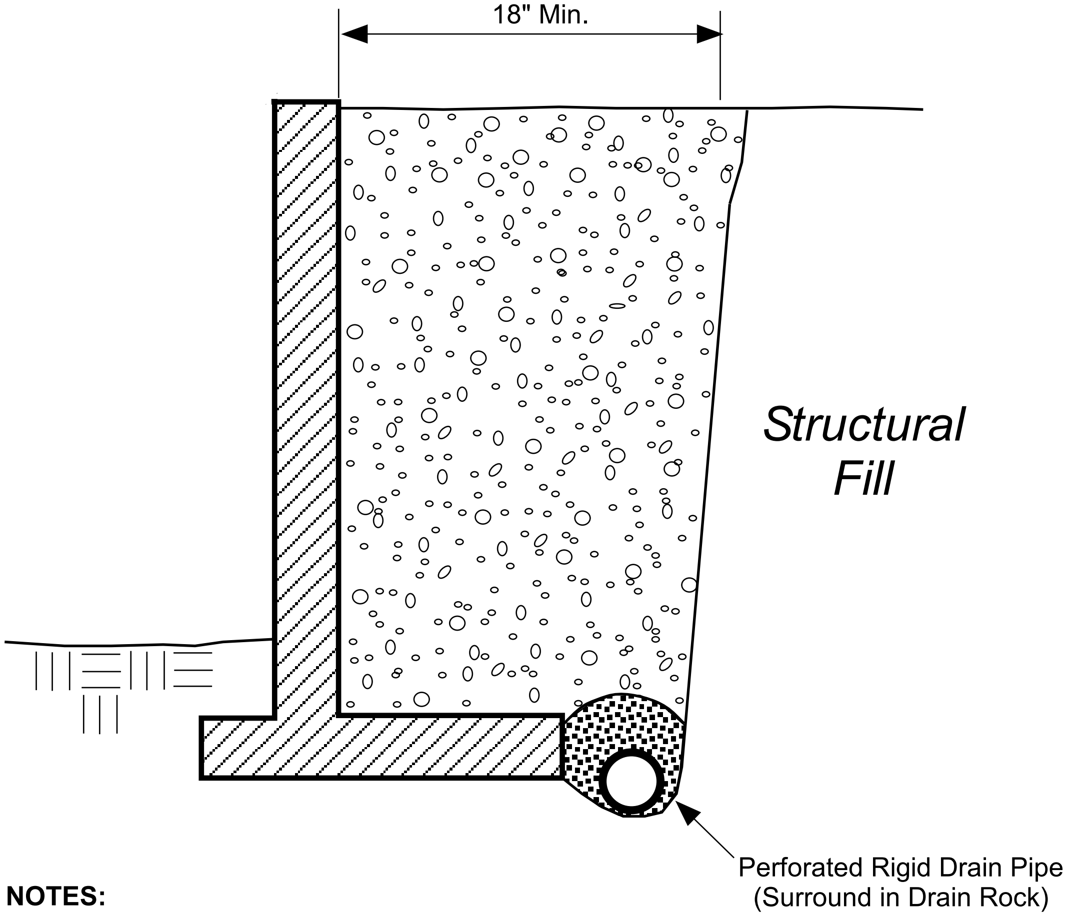
Earth Solutions NWLLC

Geotechnical Engineering, Construction Observation/Testing and Environmental Services

Test Pit Location Plan
Sather B & C Properties
Marysville, Washington

Drwn. MRS	Date 06/21/2018	Proj. No. 5718.01
Checked KTK	Date June 2018	Plate 2



NOTES:

- Free-draining Backfill should consist of soil having less than 5 percent fines. Percent passing No. 4 sieve should be 25 to 75 percent.
- Sheet Drain may be feasible in lieu of Free-draining Backfill, per ESNW recommendations.
- Drain Pipe should consist of perforated, rigid PVC Pipe surrounded with 1-inch Drain Rock.

SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

LEGEND:

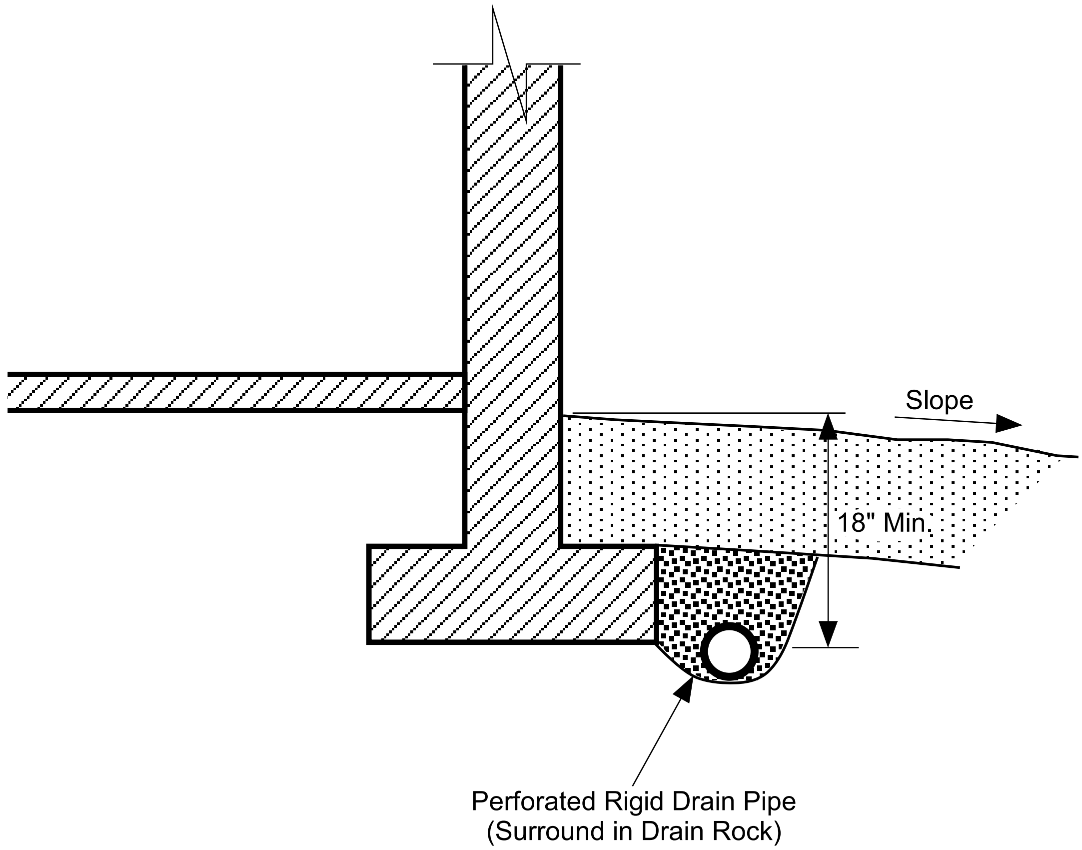
Free-draining Structural Backfill

1-inch Drain Rock

Earth Solutions NW LLC
Geotechnical Engineering Construction
Observation/Testing and Environmental Services

RETAINING WALL DRAINAGE DETAIL
Sather B & C Properties
Marysville, Washington

Drwn. MRS	Date 06/21/2018	Proj. No. 5718.01
Checked KTK	Date June 2018	Plate 3

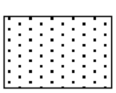


NOTES:

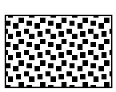
- Do NOT tie roof downspouts to Footing Drain.
- Surface Seal to consist of 12" of less permeable, suitable soil. Slope away from building.

SCHEMATIC ONLY - NOT TO SCALE
NOT A CONSTRUCTION DRAWING

LEGEND:



Surface Seal: native soil or other low-permeability material.



1-inch Drain Rock

Earth Solutions NW LLC
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FOOTING DRAIN DETAIL
Sather B & C Properties
Marysville, Washington

Drwn. MRS	Date 06/21/2018	Proj. No. 5718.01
Checked KTK	Date June 2018	Plate 4

Appendix A

Subsurface Exploration
Test Pit Logs

ES-5718.01

The subsurface conditions at the site were explored by excavating nine test pits at the approximate locations illustrated on Plate 2 of this report. The test pits were advanced to a maximum depth of 10 feet bgs. The test pit logs are provided in this Appendix. The subsurface exploration was completed on June 14, 2018.

Logs of the test pits excavated by ESNW are presented in Appendix A. The final logs represent the interpretations of the field logs and the results of laboratory analyses. The stratification lines on the logs represent the approximate boundaries between soil types. In actuality, the transitions may be more gradual.

Earth Solutions NW LLC

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

DUAL SYMBOLS are used to indicate borderline soil classifications.

The discussion in the text of this report is necessary for a proper understanding of the nature of the material presented in the attached logs.

Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-1

PROJECT NUMBER	ES-5718.01	**PROJECT NAME**	Sather B&C Properties
DATE STARTED	6/14/18 **COMPLETED** 6/14/18	**GROUND ELEVATION**	**TEST PIT SIZE**
EXCAVATION CONTRACTOR	NW Excavating	**GROUND WATER LEVELS:**	
EXCAVATION METHOD		∇ **AT TIME OF EXCAVATION**	4.5 ft
LOGGED BY	KTK **CHECKED BY** HTW	**AT END OF EXCAVATION**	---
NOTES	Depth of Topsoil & Soil 6": grass/exposed soil	**AFTER EXCAVATION**	---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
0			TPSL		0.5	Dark brown TOPSOIL
		MC = 146.50% Fines = 87.80% MC = 27.20%	ML		2.0	Brown sandy SILT, loose, wet -light iron oxide staining to 4', abundant fine organics [USDA Classification: LOAM]
			SM		3.5	Gray silty SAND, loose to medium dense, wet
5			SP		5.0	Gray poorly graded SAND with gravel, medium dense to dense, wet ∇ -groundwater table, increased gravel content
		MC = 6.70%				Test pit terminated at 5.5 feet below existing grade. Groundwater table encountered at 4.5 feet during excavation. Caving observed from 4.0 feet to BOH. Bottom of test pit at 5.5 feet.

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TEST PIT NUMBER TP-2

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18 **GROUND ELEVATION** **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD ∇ **AT TIME OF EXCAVATION** 4.5 ft

LOGGED BY KTK **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Soil 12": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL
				1.0	Gray poorly graded SAND, loose, moist to wet -light iron oxide staining to 4'
		MC = 14.60%			
		MC = 24.40%	SP		-becomes medium dense ∇ -becomes wet -groundwater table at 4.5', increased gravel content
5					
		MC = 8.60%		6.0	Test pit terminated at 6.0 feet below existing grade. Groundwater table encountered at 4.5 feet during excavation. Caving observed from 4.0 feet to BOH. Bottom of test pit at 6.0 feet.

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Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-3

PROJECT NUMBER ES-5718.01
PROJECT NAME Sather B&C Properties
DATE STARTED 6/14/18 **COMPLETED** 6/14/18
GROUND ELEVATION **TEST PIT SIZE**
EXCAVATION CONTRACTOR NW Excavating
GROUND WATER LEVELS:
EXCAVATION METHOD
▽ **AT TIME OF EXCAVATION** 5.0 ft
LOGGED BY KTK **CHECKED BY** HTW
AT END OF EXCAVATION ---
NOTES Depth of Topsoil & Sod 18": grass
AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL
1.5		MC = 16.40%	SP		Brown poorly graded SAND, loose, moist to wet -light iron oxide staining to 5'
		MC = 24.50%			-becomes gray, becomes medium dense, wet
5					▽ -groundwater table, increased gravel content
6.0		MC = 26.20%			Test pit terminated at 6.0 feet below existing grade. Groundwater table encountered at 5.0 feet during excavation. Caving observed from 4.5 feet to BOH. Bottom of test pit at 6.0 feet.

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Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-4

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18 **GROUND ELEVATION** **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD ∇ **AT TIME OF EXCAVATION** 5.5 ft

LOGGED BY KTK **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 12": exposed soil **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	1.0	Dark brown TOPSOIL
		MC = 43.80% MC = 24.40%	SM	3.5	Brown silty SAND, loose, wet -light iron oxide staining to 5' -becomes gray, medium dense
5		MC = 10.10% MC = 14.20% Fines = 0.80%	SP	6.0	Gray poorly graded SAND with gravel, medium dense, moist to wet -becomes wet, dense ∇ -groundwater table [USDA Classification: extremely gravelly coarse SAND]

Test pit terminated at 6.0 feet below existing grade. Groundwater table encountered at 5.5 feet during excavation. Caving observed from 5.0 feet to BOH.

Bottom of test pit at 6.0 feet.

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Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-5

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18

GROUND ELEVATION **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating

GROUND WATER LEVELS:

EXCAVATION METHOD

∇ **AT TIME OF EXCAVATION** 5.0 ft

LOGGED BY KTK **CHECKED BY** HTW

AT END OF EXCAVATION ---

NOTES Depth of Topsoil & Sod 12": exposed soil

AFTER EXCAVATION ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	1.0	Dark brown TOPSOIL
		MC = 34.10%	SM		Tan silty SAND, loose, wet -light iron oxide staining to 5'
		MC = 21.90% Fines = 23.50%		4.0	-becomes medium dense [USDA Classification: slightly gravelly sandy LOAM]
5		MC = 8.40%	SP	5.5	Gray poorly graded SAND with gravel, medium dense to dense, wet ∇ -groundwater table

Test pit terminated at 5.5 feet below existing grade. Groundwater table encountered at 5.0 feet during excavation. Caving observed from 5.0 feet to BOH.

Bottom of test pit at 5.5 feet.

Earth Solutions NW
1805 - 136th Place N.E., Suite 201
Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-6

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18 **GROUND ELEVATION** ______ **TEST PIT SIZE** ______

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD ______ **AT TIME OF EXCAVATION** ---

LOGGED BY KTK **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 18": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	1.5	Dark brown TOPSOIL
		MC = 145.70%	ML	3.0	Tan sandy SILT, loose, moist -light iron oxide staining to 6', abundant fine organics
		MC = 19.20%	SM	4.0	Brown silty SAND, medium dense, wet -light groundwater seepage
5			CL	10.0	Gray lean CLAY, stiff, wet
10		MC = 44.30%			Test pit terminated at 10.0 feet below existing grade. Groundwater seepage encountered at 4.0 feet during excavation. No caving observed. Bottom of test pit at 10.0 feet.

Earth Solutions NW
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Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-7

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18 **GROUND ELEVATION** **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** ---

LOGGED BY KTK **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Soil 12": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	1.0	Dark brown TOPSOIL
		MC = 18.70% MC = 28.00%	SM	5.0	Tan silty SAND, loose to medium dense, moist to wet -light iron oxide staining to 4' -becomes gray -increased sand content -becomes wet -groundwater seepage
5		MC = 47.20% Fines = 98.80%	CL	7.0	Gray lean CLAY, stiff, wet [USDA Classification: lean CLAY]
					Test pit terminated at 7.0 feet below existing grade. Groundwater seepage encountered at 4.5 feet during excavation. Caving observed from 4.5 to 5.0 feet. Bottom of test pit at 7.0 feet.

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Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-8

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18 **GROUND ELEVATION** **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD ▽ **AT TIME OF EXCAVATION** 5.0 ft

LOGGED BY KTK **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 12": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL		Dark brown TOPSOIL
				1.0	
			SP		Brown poorly graded SAND, loose to medium dense, wet
		MC = 19.20%			-light iron oxide staining to 4'
					-becomes gray
		MC = 21.40%			
5					▽ -groundwater table
		MC = 25.80%		6.5	Test pit terminated at 6.5 feet below existing grade. Groundwater table encountered at 5.0 feet during excavation. Caving observed from 2.0 feet to BOH. Bottom of test pit at 6.5 feet.

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Bellevue, Washington 98005
Telephone: 425-449-4704
Fax: 425-449-4711

TEST PIT NUMBER TP-9

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B&C Properties

DATE STARTED 6/14/18 **COMPLETED** 6/14/18 **GROUND ELEVATION** **TEST PIT SIZE**

EXCAVATION CONTRACTOR NW Excavating **GROUND WATER LEVELS:**

EXCAVATION METHOD **AT TIME OF EXCAVATION** 4.0 ft

LOGGED BY KTK **CHECKED BY** HTW **AT END OF EXCAVATION** ---

NOTES Depth of Topsoil & Sod 12": grass **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0			TPSL	1.0	Dark brown TOPSOIL
		MC = 20.60%	SW-SM		Tan well-graded SAND with silt and gravel, loose to medium dense, wet -light iron oxide staining to 4'
		MC = 18.00% Fines = 7.60%			-becomes gray [USDA Classification: gravelly coarse SAND] -groundwater table
5		MC = 18.90%		5.5	-increased gravel content
					Test pit terminated at 5.5 feet below existing grade. Groundwater table encountered at 4.0 feet during excavation. Caving observed from 2.5 feet to BOH. Bottom of test pit at 5.5 feet.

Appendix B

Laboratory Test Results

ES-5718.01

Earth Solutions NW, LLC
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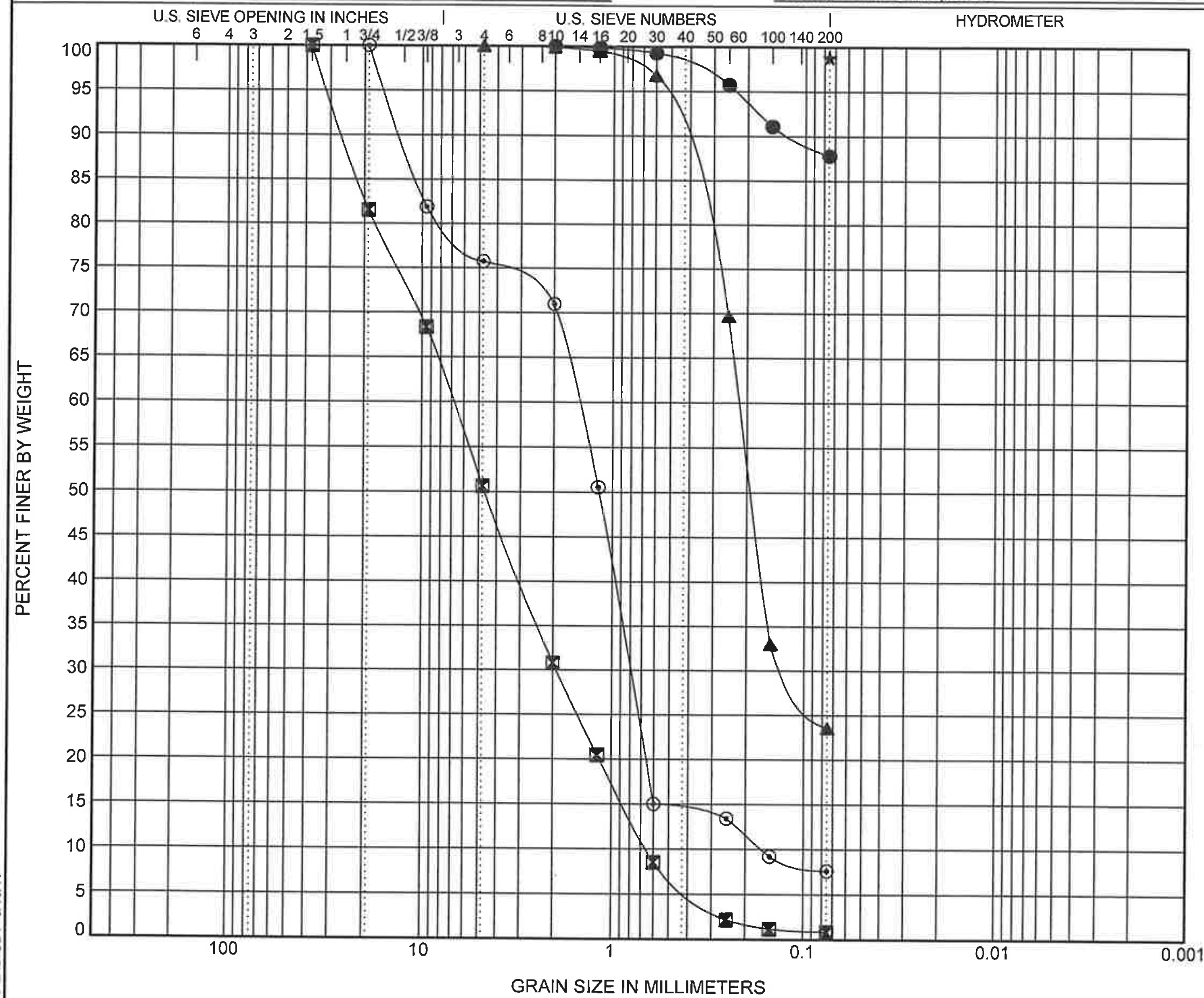
Bellevue, WA 98005
Telephone: 425-449-4704
Fax: 425-449-4711

GRAIN SIZE DISTRIBUTION

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B and C Properties



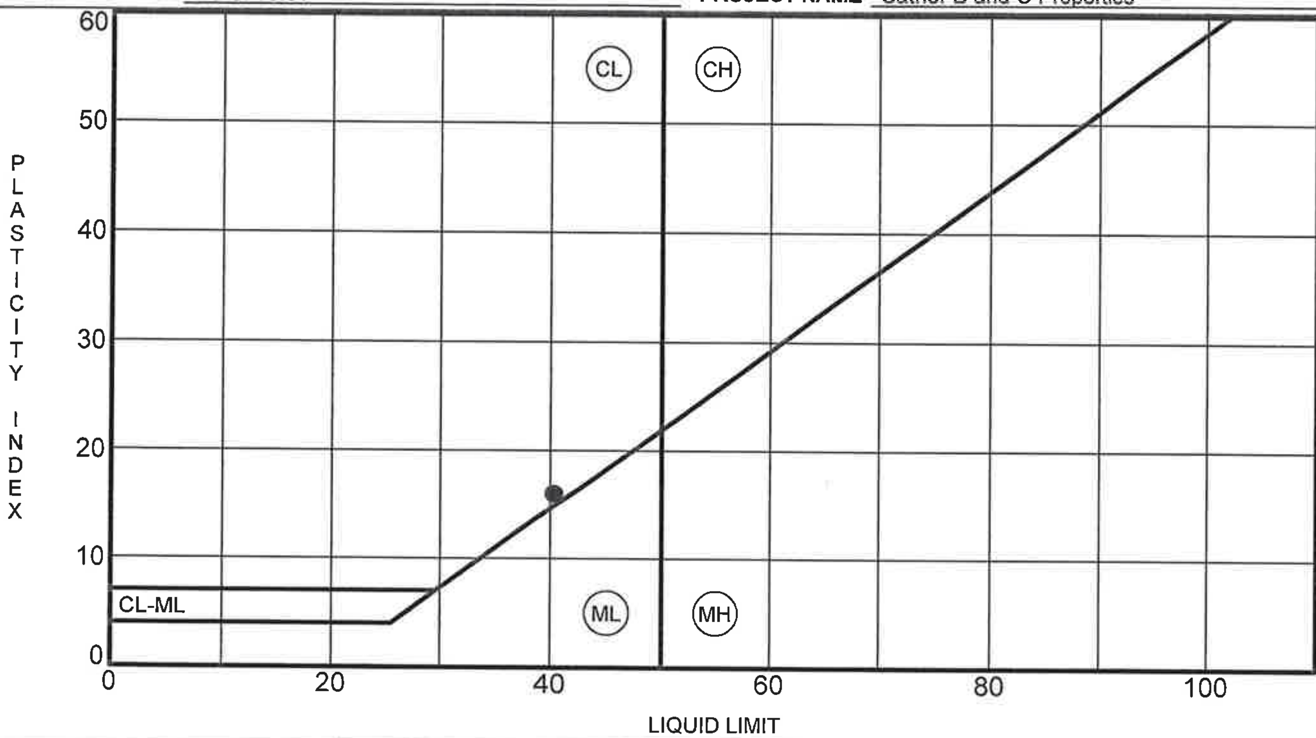
Specimen Identification			Classification	Cc	Cu
●	TP-1	1.50ft.	USDA: Brown Loam. USCS: ML.		
⊠	TP-4	6.00ft.	USDA: Gray Extremely Gravelly Coarse Sand. USCS: SP with Gravel..	0.83	10.51
▲	TP-5	3.50ft.	USDA: Gray Slightly Gravelly Sandy Loam. USCS: SM.		
★	TP-7	7.00ft.	Gray Lean Clay, CL		
⊙	TP-9	3.50ft.	USDA: Gray Gravelly Coarse Sand. USCS: SW with Silt and Gravel.	2.56	9.12

Specimen Identification			D100	D60	D30	D10	LL	PL	PI	%Silt	%Clay
●	TP-1	1.5ft.	2							87.8	
⊠	TP-4	6.0ft.	37.5	6.857	1.922	0.652				0.8	
▲	TP-5	3.5ft.	4.75	0.219	0.121					23.5	
★	TP-7	7.0ft.	0.075				40	24	16	98.8	
⊙	TP-9	3.5ft.	19	1.507	0.798	0.165				7.6	

Earth Solutions NW, LLC
1805 - 136th PL N.E., Suite 201
Bellevue, WA 98005
Telephone: 425-449-4704
Fax: 425-449-4711

ATTERBERG LIMITS' RESULTS

PROJECT NUMBER ES-5718.01 **PROJECT NAME** Sather B and C Properties



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**TP-7**	**7.0**	**40**	**24**	**16**	**98.8**	**Gray Lean Clay, CL**

Report Distribution

ES-5718.01

EMAIL ONLY

Sather A, LLC
c/o Land Technologies, Inc.
18820 – 3rd Avenue Northeast
Arlington, Washington 98223

Attention: Mr. Merle Ash