Clackamas County Planning and Zoning Division
Department of Transportation and Development

Development Services Building
150 Beavercreek Road | Oregon City, OR 97045

503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

NOTICE OF LAND USE APPLICATION IN YOUR AREA

Date of Mailing of this Notice: 03/20/2024

Notice Mailed To: Property owners within 500 feet of the subject property
Community Planning Organizations (CPO)
Interested Agencies

File Number: Z0081-24

Application Type: Land Use Permit--Type II, Not Otherwise Listed

Proposal: A replacement dwelling within a mapped landslide hazard area. Development on mappaed landslide hazards is regulated persuant to ZDO Section 1003.02.

Applicable Zoning and Development Ordinance (ZDO) Criteria: In order to be approved, this proposal must comply with ZDO Sections 1003. The ZDO criteria for evaluating this application can be viewed at https://www.clackamas.us/planning/zdo.html

Applicant: DEBOIS, MIKE

Property Owner: DEBOIS CHESTER F TRUSTEE

Site Address: 21121 S REDLAND RD
OREGON CITY, OR 97045

Location: roughly 1/2 mile east of Ridge Road and Redland Rd intersection

Assessor's Map and Tax Lot: 33E15C 01900

Zoning: RRFF5 - RURAL RESIDENTIAL FARM FOREST 5-ACRE

Staff Contact: Benjamin Blessing 503 742 4521 **E-mail:** BBlessing@clackamas.us

File Number: Z0081-24

Community Planning Organization: The following recognized Community Planning Organization (CPO) has been notified of this application. This organization may develop a recommendation. You are welcome to contact the CPO and attend their meeting on this matter, if one is planned.

REDLAND-VIOLA-FISCHER'S CPO
WARD LANCE 503-631-2550
LANCECWARD@AOL.COM

If this CPO is currently inactive and you are interested in becoming involved in land use planning in your area, please contact Clackamas County Community Engagement at communityinvolvement@clackamas.us. In some cases where there is an inactive CPO, a nearby active CPO may review the application. To determine if that applies to this application, call or email the staff contact.

How to Review this Application: A copy of the application, all documents and evidence submitted by or on behalf of the applicant, and applicable criteria are available for inspection at no cost. Copies may be purchased at the rate of $2.00 per page for 8 1/2" x 11" or 11" x 14" documents, $2.50 per page for 11" x 17" documents, $3.50 per page for 18" x 24" documents and $0.75 per sq ft with a $5.00 minimum for large format documents. You may view or obtain these materials:

- Online at https://accela.clackamas.us/citizenaccess/. After selecting the Planning tab enter the file number to search. Select File Number and then select Attachments from the dropdown list, where you will find the submitted application; or
- By emailing or calling the staff contact.

Decision Process: Following the closing of the comment period, a written decision on this application will be made and a copy will be mailed to you. If you disagree with the decision, you may appeal to the Land Use Hearings Officer, who will conduct a public hearing. There is a $250 appeal fee.

How to Comment on this Application:
To ensure your comments are considered prior to issuance of the decision, they must be received within 20 days of the date of this notice. Comments may be submitted by email to the staff contact or by regular mail to the address at the top of this notice. Please include the file number on all correspondence, and focus your comments on the approval criteria identified above or other criteria that you believe apply to the decision.

Comments:

_____

_____

_____

_____ _____
Your Name/Organization Telephone Number

Clackamas County is committed to providing meaningful access and will make reasonable accommodations, modifications, or provide translation, interpretation or other services upon request. Please contact us at least three (3) business days before the meeting at 503 -742-4545 or DRenhard@clackamas.us.

¿Traducción e interpretación? | Требуется ли вам устный или письменный перевод? | 翻译或口译？| Cần Biên dịch hoặc Phiên dịch? | 번역 또는 통역?

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www.clackamas.us/planning

TYPE II OR III LAND USE APPLICATION

DEEMED COMPLETE

ORIGINAL DATE SUBMITTED: 3/4/24

FILE NUMBER: Z0081-24

APPLICATION TYPE: MASS MOVEMENT HAZARD AREA DEVELOPMENT

The Planning and Zoning Division staff deemed this application complete for the purposes of Oregon Revised Statutes (ORS) 215.427 on: 3/19/2024

Ben Blessing
Staff Name

Sr. Planner, CFM
Title

Comments:

Check one:

☐ The subject property is located inside an urban growth boundary. The 120-day deadline for final action on the application pursuant to ORS 215.427(1) is:

☑ The subject property is not located inside an urban growth boundary. The 150-day deadline for final action on the application pursuant to ORS 215.427(1) is: 8/16/2024

CLACKAMAS COUNTY

Planning and Zoning
Department of Transportation and Development
Development Services Building
150 Beavercreek Road | Oregon City, OR 97045
503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

STAFF USE ONLY

RECEIVED
Mar 4 2024
Clackamas County
Planning & Zoning Division

Staff Initials: | File Number: Z0081-24

Land use application for:

MASS MOVEMENT HAZARD AREA DEVELOPMENT

Application Fee: $1,065

APPLICANT INFORMATION

Applicant name: Mike DeBois	Applicant email: chet debois@gmail.com	Applicant phone: 503-936-9014	
Applicant mailing address: 42282 S.E. Marmot	City: Sandy	State: OR	ZIP: 970559744
Contact person name (if other than applicant): Mark Trunk	Contact person email: Mark@markTrunk.com	Contact person phone: 503-789-2511	
Contact person mailing address: 9200 SE Sunnybrook Blvd #100	City: Clackamas	State: OR	ZIP: 97115

PROPOSAL

Brief description of proposal: VACANT LAND

7.8 Acres, No Building Structures, No Utilities, No roadways.

SITE INFORMATION

Site address: 21121 S. Redland Rd Oregon City

Comprehensive Plan designation:

Zoning district:

Map and tax lot #:

Township: 3S Range: 3E Section: 15 Tax Lot: 01900

Township: _____ Range: _____ Section: _____ Tax Lot: _____

Township: _____ Range: _____ Section: _____ Tax Lot: _____

Land area:

Adjacent properties under same ownership:

Township: _____ Range: _____ Section: _____ Tax Lot: _____

Township: _____ Range: _____ Section: _____ Tax Lot: _____

Printed names of all property owners:	Signatures of all property owners:	Date(s):
Chester DeBois Trust		

I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge.

Applicant signature: Mike DeB | Date: 2/26/24

A. Review applicable land use rules:

This application is subject to the provisions of Subsection 1003.02, *Standards and Criteria for Mass Movement Hazard Area Development* of the Clackamas County Zoning and Development Ordinance (ZDO).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.

☐ **Application fee:** The cost of this application is **$1,065**. Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the *Credit Card Authorization Form* available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted Fee Schedule for refund policies.

☒ **Site plan:** Provide a site plan (also called a plot plan). A *Site Plan Sample* is available from the Planning and Zoning website. The site plan must be accurate and drawn to-scale on paper measuring no larger than 11 inches x 17 inches. The site plan must illustrate all of the following (when applicable):

- Lot lines, lot/parcel numbers, and acreage/square footage of lots;
- Contiguous properties under the same ownership;
- Areas of land movement, slump or earth flow, and mud or debris flow (*Note: The principal source of information for determining mass movement hazards is the State Department of Geology and Mineral Industries (DOGAMI) Bulletin 99 and accompanying maps. Approved site specific engineering geologic studies shall be used to identify the extent and severity of the hazardous conditions on the site, and to update the mass movement hazard area data base.*);
- Elevation contour lines, with identification of their source of the information (e.g., an engineer, surveyor);
- All existing and proposed structures, fences, retaining walls, roads, driveways, parking areas, other impervious surfaces, vegetation, and easements, each with identifying labels and dimensions;
- Setbacks of all structures from lot lines and easements;
- Areas of grading and vegetation stripping;
- Significant natural features (rivers, streams, wetlands, geologic hazards, drainage areas, etc.); and
- Location of utilities, wells, and all onsite wastewater treatment facilities (e.g., septic tanks, septic drainfield areas, replacement drainfield areas, drywells).

☐ **In certain cases, an engineering geologic study:** You must provide an engineering geologic study if development is proposed on slopes of 20 percent or greater in a mass movement hazard area (i.e., an area of land movement, slump or earth flow, and mud or debris flow). You must also provide an engineering geologic study for development in a mass movement hazard area, *regardless of the slope*, unless there is stabilization of the identified mass movement hazard condition based on established and proven engineering techniques which ensure protection of public and private property. When required, the engineering geologic study must establish that the site is stable for the proposed development, and must include the following:

- An index map;
- Project description, to include: location; topography; drainage; vegetation; discussion of previous work; and discussion of field exploration methods;

- Site geology, to include: site geologic map; description of bedrock and surficial materials including artificial fill; location of any faults, folds, etc.; and structural data including bedding, jointing, and shear zones;
- Discussion and analysis of any slope stability problems;
- Discussion of any offsite geologic conditions that may pose a potential hazard to the site or that may be affected by onsite development;
- Suitability of the site for proposed development from a geologic standpoint;
- Specific recommendations for cut slope stability, seepage, and drainage control, or other design criteria to mitigate geologic hazards;
- If deemed necessary by the engineering geologist to establish whether an area to be affected by the proposed development is stable, additional studies and supportive data shall include: cross sections showing subsurface structure; graphic logs of subsurface explorations; results of laboratory tests; and references;
- The signature and certification number of an engineer or engineering geologist registered in the State of Oregon; and
- Additional information analyses as necessary to evaluate the site.

C. Answer the following questions:

Accurately answer the following questions in the spaces provided. Attach additional pages, if necessary.

1. Is development or grading proposed on a slope of 20 percent or greater?

☐ YES, and an attached engineering geologic study establishes that the site is stable for the proposed use and development.

☒ NO, and even with the site's identified hazardous condition, an attached engineering geologic study establishes that the site is stable for the proposed use and development.

☐ NO, and the identified hazardous condition will be stabilized based on established and proven engineering techniques which ensure protection of public and private property, as explained in the box below:

2. Explain how vegetative cover will be maintained or established for stability and erosion control purposes:

3. Per ZDO Subsection 1003.02(D), diversion of storm water into areas of land movement, slump or earth flow, and mud or debris flow is *prohibited*. Does your proposal include diversion of storm water into these areas?

☐ YES

☒ NO, as demonstrated in the attached site plan.

Mark Trunk RE/MAX Equity Group 503-653-0607 mark@marktrunk.com

Tax Report
Tax ID: 00916030

4/20/2023 8:40AM

Clackamas County, OR:

Prop Addr: 21121 S REDLAND RD
OREGON CITY , OR 97045

Latest Listing ID:
County: Clackamas
Carrier Rt: R010

Owner Information:

Owner Name: DEBOIS CHESTER F (TRUSTEE)
Owner Addr: 3211 SE LAURA AVE
GRESHAM , OR 97080

Phone:
Carrier Rt:

Land Information:

Lot SqFt: 339768

Acreage: 7.8

Building Information:

Year Built: 1942
Stories: 1+B
Living SF: 852
Bldg SF Ind:
Bsmnt SF:
# of Bldgs: 0
Bldg Code:
Fireplace:

Bedrooms: 1
Bathrooms: 1
Parking SF:
Garage:
Mobile Home:
Foundation: Concrete
Heat Method: Other
Floor Cover:
Roof Cover: Composition Shingle
Exterior Finish: Other

Sales Information:

Title Co:
Loan Type:

Lender:
Loan Amt:

Current Deed Type:
Prior Deed Type:

Current Sale Date:
Prior Sale Date:

Current Sale Price:
Prior Sale Price:

Current Document No:
Prior Document No:

Tax Information:

Tax Year: 2022
Tax Period: 22-23
Market Land: $337,132
Market Impv: $52,890
Market Total: $390,022

Tax Amt: $1,884.17
Assessed Land: $0
Assessed Impv: $0
Assessed Total: $135,859

Legal Information:

Map Code: SEC 15 TWN 03S RNG 03E
Township: 03S
Range: 03E
Section: 15
Qtr Section:

16th Section:
Nbrhd Code: 12084
School Dist:
Prop Class: SINGLE FAMILY RES, CLASS 2

Land Use: Single Family Residential
Subdivision:

Census Tract: 410050231.002018
Census Block:
Lot: 1900
Zoning:
Tax Area Code: 062-004
Tax Rate:

Legal Desc: SECTION 15 TOWNSHIP 3S RANGE 3E QUARTER C TAX LOT 01900

Excavations can be accomplished with conventional excavating equipment. All excavations for footings and subgrades in the fine-grained silty-clay should be performed by an excavator or backhoe equipped with a smooth-faced bucket (no teeth).

Because of safety considerations and the nature of temporary excavations, the Contractor should be made responsible for maintaining safe temporary cut slopes and supports for utility trenches, etc. We recommend that the Contractor incorporate all pertinent safety codes during construction, including the latest OSHA revised excavation requirements, and based on soil conditions and groundwater evidenced in cuts made during construction.

6.6 Structural Fills

No structural fills are allowed on the lot. Remove all spoils from the house excavation except what is needed to backfill around the foundation.

6.7 Groundwater Management

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary to prevent standing water and/or erosion at the working surface.

The ground surface around the structure should be sloped to create a minimum gradient of 2% away from the building foundations for a distance of at least 5 feet. Surface water should be directed away from all buildings into drainage swales or into a storm drainage system. "Trapped" planting areas should not be created next to any buildings without providing means for drainage. Foundation house drains are required.

Storm water drainage shall be approved by RSS prior to construction.

6.8 Construction Observation

Prior to pouring any foundation the excavation shall be observed by the Geotechnical Engineer to ensure that the above items have been properly removed. ***Please allow 48-hour notice to call for subgrade inspections.*** Failure to do so can lead to foundation issues with the house. For placement of any backfilling RSS shall be called to provide compaction testing or probing of the fills

6.9 Conclusions

Geo - Tech

There are no issues with the construction of the house.

7.0 Limitations

This report has been prepared for the exclusive use of the addressee, and their architects and engineers for aiding in the design and construction of the proposed development. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials and contractors to ensure correct implementation of the recommendations.

RECORD OF SURVEY

A TRACT OF LAND SITUATED IN THE SOUTHWEST QUARTER OF SECTION 15, TOWNSHIP 3 SOUTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN, COUNTY OF CLACKAMAS, STATE OF OREGON.

CLACKAMAS COU

DATE RECEIVED: ___

DATE ACCEPTED/FILED:

SURVEY NUMBER: ___

TION PROJECTION (LDP), A SUBSET OF
REALIZED IN NAD83/2011(EPOCH
TANCES, UNITS IN INTERNATIONAL FEET.

SHOWN AT POINTS 'A' AND 'B', IS
EING S 89°52'04" E WITH A DISTANCE

DESCRIPTION
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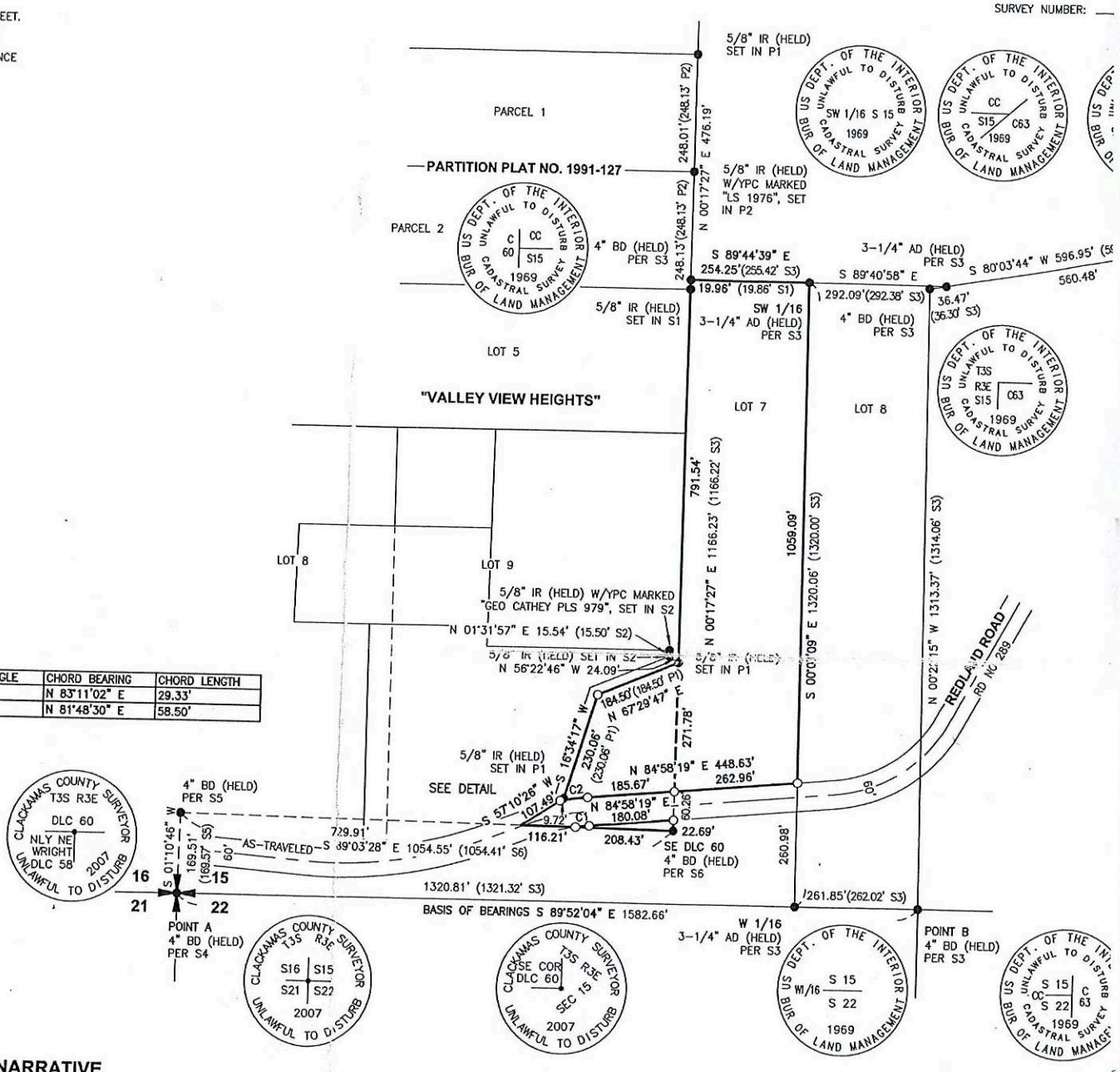
MARKED,



CE SURVEYS

LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
'	470.00'	3°34'34"	N 83°11'02" E	29.33'
'	530.00'	6°19'37"	N 81°48'30" E	58.50'

8'19" W 448.63'

.AND ROAD

.60' WIDE)

58'19" W
80.08'

NARRATIVE

THE PURPOSE OF THIS SURVEY IS TO MONUMENT A TRACT OF LAND SITUATED IN THE SOUTHWEST QUARTER OF SECTION 15, TOWNSHIP 3 SOUTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN, COUNTY OF CLACKAMAS, STATE OF OREGON, THAT CERTAIN TRACTS OF LAND DESCRIBED IN DOCUMENT NUMBER 2000-028110, CLACKAMAS COUNTY DEED RECORDS.

THE PROJECT BEGAN WITH A SEARCH FOR, AND SURVEY OF EXISTING MONUMENTS CONTROLLING THE SUBJECT PROPERTY AS SHOWN. UTILIZING SAID DEED AND EXISTING EVIDENCE FOUND ON THE GROUND, THE DEED LINES WERE DETERMINED AS FOLLOWS:

GOVERNMENT LOT 7

THIS TRACT OF LAND WAS DEFINED BY MONUMENTS EXCEPT THE NORTH RIGHT-OF-WAY LINE OF REDLAND ROAD, IT WAS ESTABLISHED BY TYING THE CENTERLINE OF ASPHALT ROAD AS TRAVELED, THEN OFF-SETTING THAT LINE 30.00' NORTHERLY.

THE FIRST TRACT OF LAND DESCRIBED IN SAID DEED

THE EAST LINE WAS DEFINED BY MONUMENTS AS SHOWN.

THE SOUTH LINE WAS DEFINE BY MONUMENTS AT THE SOUTHEAST CORNER OF DLC 60 AND THE NORTHERLY NORTHEAST CORNER OF DLC 58, HOLDING DEED DISTANCE OF 324.64'

THE NORTH AND WEST LINES WERE ESTABLISHED BY HOLDING PLAT, ANGLES AND DISTANCES PER "VALLEY VIEW HEIGHTS", THE LAST COURSE WAS FROM END POINT TO END POINT.

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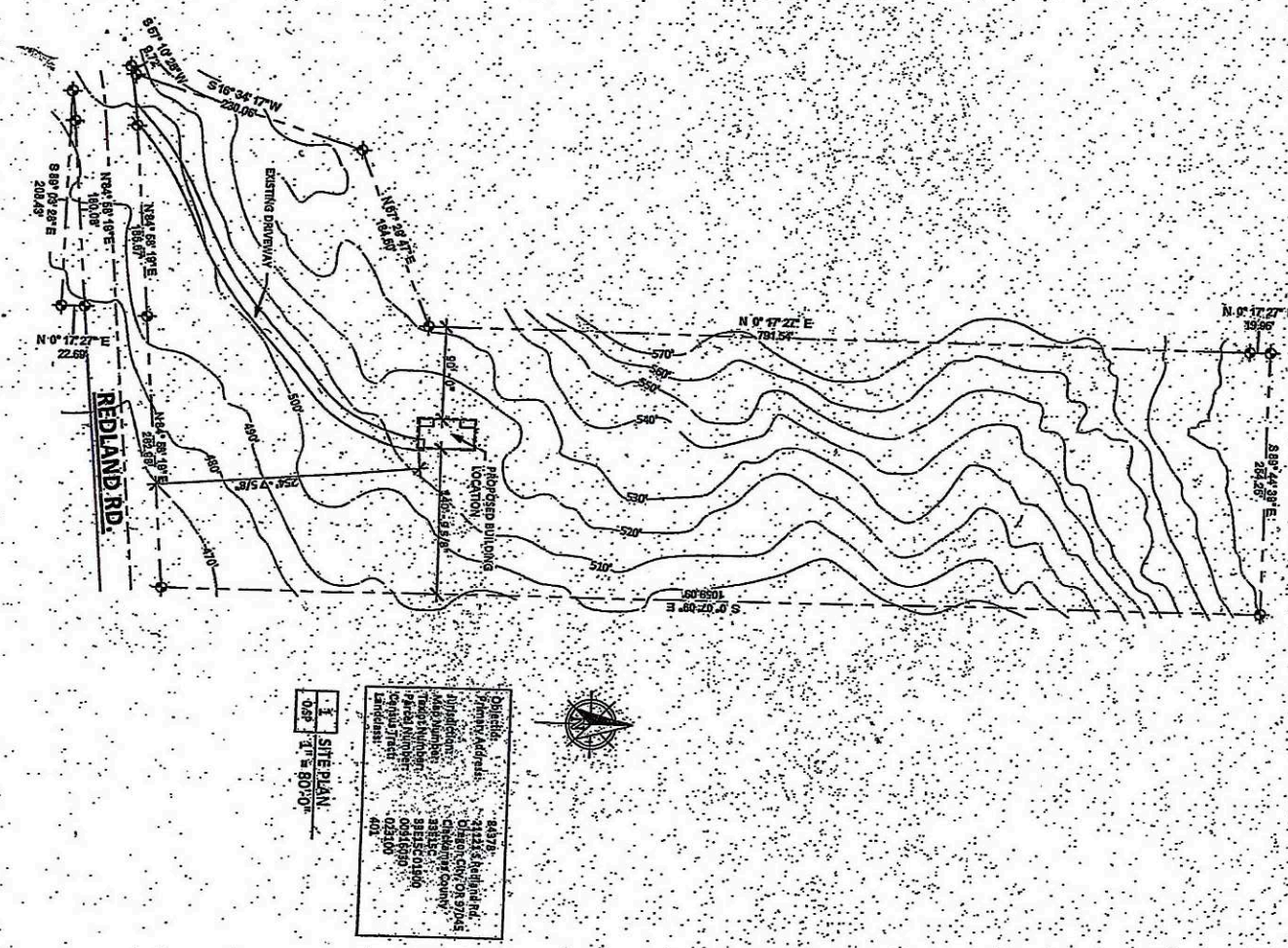
EXPIRES:



CHET DEBOIS HOMES

21121 S Redland Rd. Oregon City, OR 97045

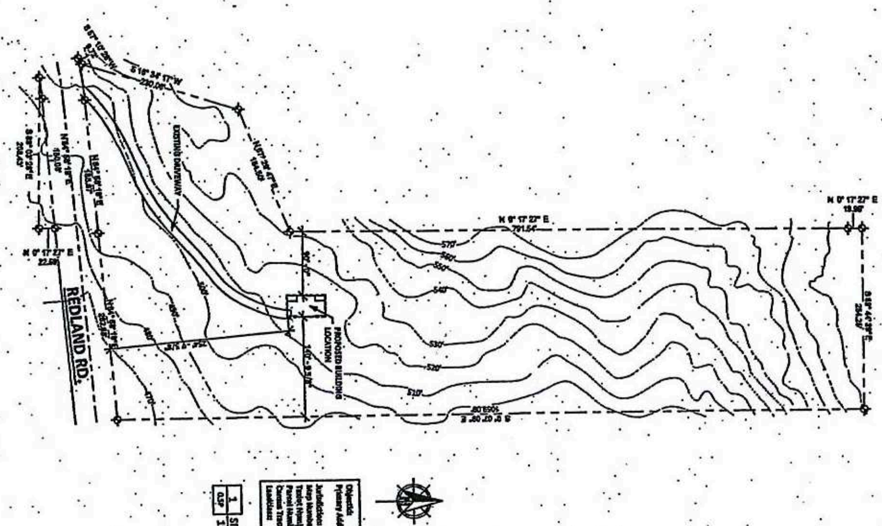
SITE PLAN

No.	Date	Issued by

Project number: 19460
Date: 4/18/2024 11:40:29 AM
Drawn by: KG
Area:
Scale: As indicated

0.SP

BUILDERS DESIGN INC
45NE 3rd St. GRESHAM, OR 97030 - (503) 351-3455
BUILDERSDESIGN@GMAIL.COM



CHET DEBOIS HOMES 21121 S Redland Rd. Oregon City, OR 97045	BUILDERS DESIGN INC.
SITE PLAN	BUILDERSDESIGN@GMAIL.COM

0.SP

GEOTECHNICAL REPORT

21121 S Redland Road
Oregon City, OR

For

Mark Trunk
30 January 2024

EXPIRES:
12/31/2024

Rapid Soil Solutions INC
3915 SW Plum Street
Portland, OR 97219
503-816-3689

1- INTRODUCTION

Rapid Soil Solutions Inc (RSS) has prepared this geotechnical report, as requested, for the proposed construction of a new single-family residence on the Clackamas County tax parcel currently assigned the street address of 21121 S Redland Rd (Oregon City, OR 97045). The 7.22-acre lot contains the derelict remains of a small residential structure and a small detached structure; the foundations of both structures remain on site, both foundations are obscured by the collapsed/demolished debris of the structures. RSS understands that the new development will utilize the existing disturbance area, possibly extending beyond the footprint currently impacted by historic grading and development. The majority of the property contains irregular slopes with a moderate to dense tree canopy.

This report is based on visual observations of the subject site, limited shallow subsurface exploration with hand-driven tools, and a review of available literature as referenced at the end of this report. Slopes and disturbance envelopes discussed in this report are approximate, primarily based on the visual assessment conducted by RSS staff. RSS conducted on site investigations on January 23rd, 2024. RSS conducted site investigations unaccompanied.

2- SITE DESCRIPTION

2.1 Location

The subject site is located in unincorporated Clackamas County about 2.3 miles west of the Clackamas River and 3.7 miles southeast of the unincorporated community of Redland. The site is situated on the northern side of S Redland Road roughly 0.42 miles east of its intersection with S Ridge Rd. Little Clear creek is located 0.12 miles east of the subject site, and the confluence of Little Clear Creek with Clear Creek is located about 0.4 miles northeast of the proposed disturbance envelope. The site is currently assigned the street address of 21121 S Redland Rd. Adjacent properties include 21010 S Redland Rd to the south, 21021 S Redland Rd to the west, and 21111 S Redland Rd to the northwest. The east-adjacent property is part of a 45-acre undeveloped site that is not assigned a street address.

The site can be found in the southwest quarter of Section 15, Township 3-South, Range 3-East (W.M.) in Clackamas County and can be distinguished by the lot number 1900 (TL 33E15C 01900). The tax map suggests the site was historically associated with the street address of 21125 S Redland Rd. The property is assigned the county parcel number of 00916030. The latitude and longitude of the site are 45.303692 and -122.430095 (45°18'13.3"N, 122°25'48.3"W). The site can be found in the southwestern quarter of the Redland 7.5-minute quadrangle.

The subject site is located in rural, unincorporated slopes east of Beavercreek and southeast of Reland. The site is situated within a forested strip that occupies the irregular slopes of the Clear Creek valley. Adjacent upland areas contain large agricultural fields and rural residential development. Morphologically, the site is positioned near the eastern flank of the informally named Oregon City Plateau. The local slopes contain abundant landslides of various ages, a common occurrence in geologically similar settings where streams have incised through the lithologically competent cap rock and exposed the underlaying sedimentary deposits that are more susceptible to erosion.

2.2 Slopes

The subject site is situated on east-descending slopes. Contours presented by Metro Map, as well as lidar imagery presented by DOGAMI, depict the irregular and hummocky slopes across the subject property. Contours indicate that the highest elevation on site is nearly 600 feet above sea level and can be found at the northern end of the parcel. The eastern flank of the site adjacent to the proposed disturbance area (southern half of the parcel) contains elevations of 530 feet above mean sea level to elevations of 580 feet above mean sea level. The lowest elevation on site is found in the southeastern corner of the tax lot at 466 feet above mean sea level. A lower-relief pocket within the hillside contains the remnants of the old structure, this area is around 510 to 514 feet above mean sea level.

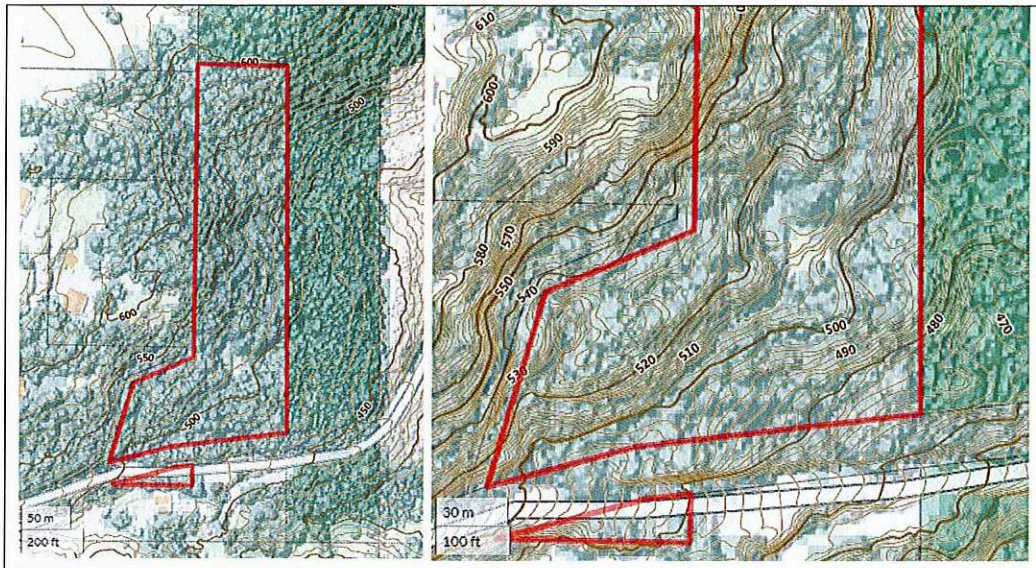


Figure 1: Metro Map contours of the subject property. Left depicts full property with 10-foot contours. Right depicts the proposed disturbance area (southern half of the site) with two-foot contours.

Lidar imagery of the subject site and surrounding slopes depicts an irregular and hummocky morphology. The slope appearance is consistent with deep-seated slope failures, a series of steep step-like slopes suggest multiple internal scarps within a large slide, though this morphology can also be the product of a composite landslide. The upper slope break of the uppermost scarp is located at an elevation of about 658 feet above mean sea level, a secondary and more prominent scarp is found between the elevations of 648 feet above mean sea level and 620 feet above mean se level. Additional internal scarps and disturbed subgrades produce a hummocky appearance in the east-descending hillside.

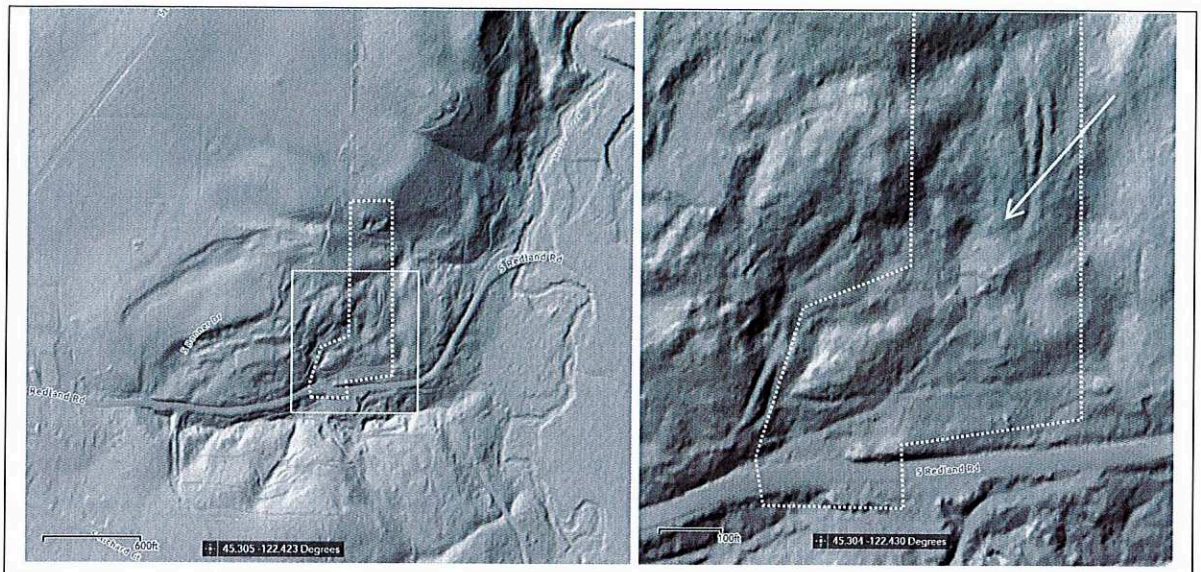


Figure 2: Lidar imagery of the subject site and two different scales.

2.3 Built/ Historical Conditions

The subject site is currently vacant. The demolished remains of two structures is present within the proposed disturbance envelope. County records suggest that the previous structure was constructed in 1942. The foundation remains on site, obscured by a pile of wooden debris.

Historic aerial imagery referenced as part of this investigation suggests that the site has remained predominantly wooded from 1952 through 2024. A roof within the proposed disturbance area is clearly visible in imagery from 1960 through the early 2010s. The roof is poorly visible in imagery from 2016 onwards; a thickening tree canopy appears to obscure the view.

3- GEOLOGY

3.1 Regional Geology

The subject site is situated in a geologic transition, at the eastern edge of the informally named Oregon City Plateau. Structurally, the local region consists of a largely flat-lying sequence of volcanic and sedimentary rocks cut by two major and several minor N to NW trending faults. The Bolton Fault is the largest of these structural features, located west of the subject site. West of the site, a broad upland of rolling hills is underlain by broad sheet-like flows of basalt from the Boring Lava fields.

Boring Lavas were produced by dozens of young, extinct, volcanoes scattered across Portland Basin and the northern eastern edge of the Northern Willamette Valley. These eruptive events formed isolated hills and hill clusters that rise up to 200 meters above the surrounding landscape. Boring centers consist of cinder cones and associated lava flows, small shields and lava cones. In the Oregon City area, the flows form a thick platform with a rolling surface that is relatively resistant to erosion.

The plateau is cut by steep sided canyons; these drainages include the Willamette River, Clackamas River, Abernethy Creek, and their tributaries. Where rivers, creeks and streams have incised through the cap formed by the boring volcanic flow, the morphology typically displayed a sharp drop into the underlying sedimentary rock. These underlaying sedimentary rock are substantially more susceptible to erosion and landsliding. The sediments were emplaced as basin-fill deposits; as tectonic compressional stress produced a prolonged period of deformation in the form of bedrock down-warping, streams imported and deposited a thick accumulation of sediments. The local sedimentary bedrock is part of the Sandy River Mudstone.

3.2 Site Geology

The valley containing the subject site is floored by basin fill deposit, generally classified as the Troutdale Formation. Many workers have divided the Troutdale Formation from the underlying Sandy River mudstone deposits; where divided the subject site is mapped as underlain by Sandy River mudstone deposits.

The Troutdale formation underlies most of the Oregon City and Redland quadrangle. It is comprised of mudstone, claystone, sandstone and minor conglomerate and tuff. Madin (2009), mapping west of the subject site, does not divide the Troutdale as many workers have. The Troutdale formation, and its various facies, likely represent various environments of the same large-scale fluvial deposition system. Madin (2009) notes that in the Oregon City quadrangle the lithologies are complexly interbedded, making division for mapping impractical.

Wells et al (2020) distinguishes the Sandy River Mudstone from other lithologic units of the Troutdale Formation. The unit is described as a "soft arkosic, tuffaceous, and carbonaceous claystone, siltstone, sandstone, and minor pebble conglomerate." (Wells et al, 2020). Schlicker and Finlayson (1979) describe the local Sandy River Mudstone as "siltstone, claystone, very fine sandstone, and some lapilli tuff".

The subject site is additionally underlain by landslide deposits. The head scarp (elevation around 640-660 feet above mean sea level) and head of the slide debris (elevation around 640 feet above mean sea level) appear to cut into and transported basalt of the Boring Lava field. Boulders of igneous materials are present on site and may have been transported from the west-adjacent, upslope bedrock deposits via gravity.

3.3 Geologic Hazard Document Review

Oregon HazVu, Oregon SLDIO, and MetroMap were reviewed on January 29th, 2024 to investigate mapped geological hazards.

This review indicates that the site is outside the 100-year and 500-year floodplain as mapped by FEMA and presented by DOGAMI.

The expected earthquake-shaking hazard is classified as severe (VIII on the instrumental intensity map) with a 20-30% probably of damage from shaking. The site is classified as having no susceptibility to liquefaction. DOGAMI indicates that the local soils are assigned a D classification on the NEHRP Site Class Map.

Fine-scale, lidar-based, landslide mapping indicates that the subject site is located within a deep-seated landslide. This slide has moved in the past 150 years. It contains numerous internal scarps in addition to the head-scarp. The proposed disturbance area is located within the main body of the landslide, directly below the lowest set of mapped internal scarps.

Detailed landslide modeling includes a moderate to high susceptibly in regards to shallow seated landslides. The site is assigned a high susceptibility to deep-seated slope failures.

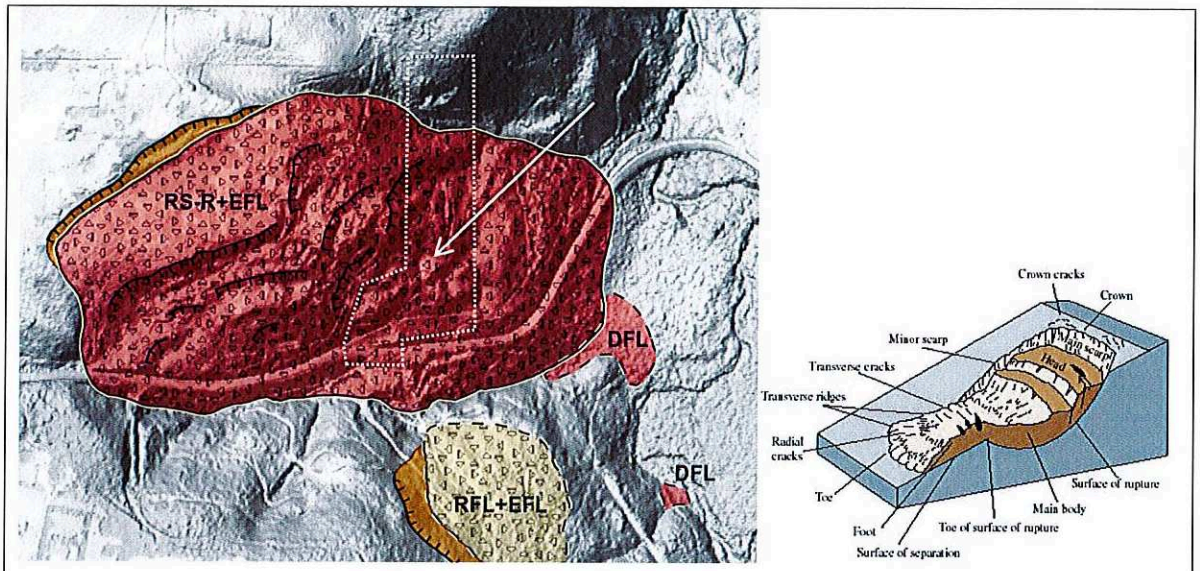


Figure 3: Landslide mapping at the subject site and a USGS line drawing of an idealized slump-earth flow with labeled nomenclature. Red: historic and/or active slides. Tan: Prehistoric or ancient slides.

4- GEOTECNIAL INVESTIGATION

A geotechnical investigation was conducted on 23 January 2024

4.1 Field Exploration Program

The field exploration program for the Site included three shallow hand auger borings, advanced to practical refusal or four feet. These borings provide the means to characterize subsurface soils and collected soil samples for laboratory analysis. Boring locations are depicted in the Appendix.

A Geologist in Training (GIT) observed the borings and logged the subsurface materials. The soil descriptions were reviewed by a professional engineer. The logs were created using the Unified Soil Classification and Visual Manual Procedure (ASTM-D 2488). Boring logs are included in the Appendix.

Results of the field explorations are discussed in the Section 5.2.

4.2 Laboratory Testing Program

Four soil samples were collected for laboratory analysis. All four samples were analyzed for soil moisture content. One sample was analyzed with an Atterberg limit test. Samples collected for laboratory analysis were transported to the lab in sealed plastic bags.

5- RESULTS OF INVESTIGATION

The following sections present the result of the geotechnical investigation of the Site. Presented conclusions are based on site observations, results of soil characterization, and laboratory analyses

5.1 Site Observations/ Conditions

RSS traversed the southern half of the subject site on foot.

The subject site contains irregular slopes with a hummocky appearance. The site consists of a series of steep, concave risers separated by hilly or low-relief benches. The tallest and steepest section of the site is directly above the existing concrete foundation.

Evergreen trees were observed to contain a mix of trunk curvature; many trees contained very little trunk curvature, some contains an irregular pattern of tilting and/or bending at the base, and one was observed to contain a substantial s-shaped bend.

The proposed disturbance area was historically impacted by grading. Fill appears to have been moved to the downslope portions of the benched area. On site investigations did not yield observations of steep and/or tall cuts in the subgrade.

A few septic test pits were observed on the subject site, these appear contain a sand-dominated sedimentary bedrock that is quickly breaking down. Pockets of fill adjacent to the driveway appear to contain high plasticity, grey colored clays. RSS observed basaltic boulders across the site, the largest boulders were observed on the upslope side of the existing driveway. The surficial soils appear to contain a mixture of soil types, suggesting some disturbances and irregular patterns from the landslide impacting the subject site.

No standing or flowing water was observed at the subject site.

5.2 Subsurface Conditions

A total of three (3) shallow hand auger borings were conducted at the subject site. The locations are shown in the Appendix. RSS encountered shallow refusal in two of the three hand auger borings. The shallow subgrade contained basalt gravels and cobbles in silt and/or clay, poorly consolidated siltstone and sandstone, as well as the high plasticity weathering product of a fine-grained sedimentary rock. The subsurface conditions appear consistent with the local sedimentary bedrock and overlaying basalts, which have been mix and moved by slope failures.

5.3 Laboratory Tests

The moisture content of the tested samples ranged from 33.1% to 44.6%. The Atterberg limit test identified a liquid limit of 67% and a plasticity index of 30% (MH).

6- GEOTECNIAL DESIGN AND RECOMMENDATIONS

6.1 Foundation Design

Since soft fill was found within the building footprint to a depth of 2ft RSS recommends 2ft of the soft fill be removed and replaced with 2ft of rock, either ¾" minus or 1.5" minus.
This depth may be locally variable and should be confirmed by a geotechnical engineer or their representative at the time of construction. ***Please allow 48hours notice to call for foundation inspections.***

Continuous wall and isolated spread footings should be at least 16 and 24 inches wide, respectively. The bottom of exterior footings should be at least 16 inches below the lowest adjacent exterior grade. The bottom of interior footings should be at least 12 inches below the base of the floor slab.

Footings placed on engineered fill or firm native sub-grade should be designed for an allowable bearing capacity of site 3000psf. The recommended allowable bearing pressure can be increased by 1/3 for short-term loads such as those resulting from wind or seismic forces.

Based on our analysis the total post-construction settlement is calculated to be less than 1 inch, with differential settlement of less than 0.5 inch over a 50-foot span for maximum column, perimeter footing loads of less than 100 kips and 6.0 kips per linear foot.

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction at the base of the footings. An allowable lateral bearing pressure of 150 *pounds per cubic foot* (**psf/f**) below grade may be used. Adjacent floor slabs, pavements or the upper 12-inch depth of adjacent, unpaved areas should not be considered when calculating passive resistance.

Engineering values summary

Bearing capacity rock	3000psf
Coefficient of friction rock:	0.35
Active pressure	35psf/ft
Passive pressure	300pcf

6.2 Retaining Walls and Embedded Walls

Default lateral soil load for the design of basement and retaining walls supporting level backfill shall be 35 psf/ft for laterally unrestrained retaining walls and 60 psf/ft for laterally restrained retaining walls.

For embedded building walls, a superimposed seismic lateral force should be calculated based on a dynamic force of $5H^2$ pounds per lineal foot of wall, where H is the height of the wall in feet and applied at 1/3 H from the base of the wall. The wall footings should be designed in accordance with the guidelines provided in the "Foundation Design" section of this report. These design parameters have been provided assuming that back-of-wall drains will be installed to

prevent buildup of hydrostatic pressures behind all walls.
The backfill material placed behind the walls and extending a horizontal distance equal to at least half of the height of the retaining wall should consist of granular retaining wall backfill as specified in the "Structural Fill" section of this report. The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D698. However, backfill located within a horizontal distance of 3 feet from the retaining walls should only be compacted to approximately 92 percent of the maximum dry density, as determined by ASTM D698. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (e.g., jumping jack or vibratory plate compactors). If flat work (e.g., sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D698.
A minimum 12-inch-wide zone of drain rock, extending from the base of the wall to within 6 inches of finished grade, should be placed against the back of all retaining walls. Perforated collector pipes should be embedded at the base of the drain rock. The drain rock should meet the requirements provided in the "Structural Fill" section of this report. The perforated collector pipes should discharge at an appropriate location away from the base of the wall. The discharge pipe(s) should not be tied directly into storm water drain systems, unless measures are taken to prevent backflow into the wall's drainage system. Settlements of up to 1 percent of the wall height commonly occur immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures.

6.3 Driveway pavement section

RSS recommends the private street have a section of 8in of total rock, with 6in being 1 ½" minus Please allow for 48hours' notice for site proof rolls of soils and rock layers. If site work takes place in wet weather, then geo-textile fabric is required.

6.4 Seismic Design Criteria

The seismic design criteria for this project found herein is based on the ASCE 7-16. A summary of IBC seismic design criterion is below it is generated from the USGS web site for earthquake hazards using a latitude of 45.303692 and a longitude -122.430095, soil site class D,
Null = see section 11.4.8

	Short Period	**1 Second**
Maximum Credible Earthquake Spectral Acceleration	S_S = 0.815 g	S_1 = 0.359 g
Adjusted Spectral Acceleration	S_{MS} = 0.957 g	S_{M1} =0.604
Design Spectral Response Acceleration Perimeters	S_{DS} = 0.638 g	S_{D1}= 0.402

6.5 Excavations

The initial site preparation will consist of topsoil stripping, and the removal of trees, where applicable. Removal of trees should include removal of the root ball, and any roots greater than ½-inch in diameter.

Excavations can be accomplished with conventional excavating equipment. All excavations for footings and subgrades in the fine-grained silty-clay should be performed by an excavator or backhoe equipped with a smooth-faced bucket (no teeth).

Because of safety considerations and the nature of temporary excavations, the Contractor should be made responsible for maintaining safe temporary cut slopes and supports for utility trenches, etc. We recommend that the Contractor incorporate all pertinent safety codes during construction, including the latest OSHA revised excavation requirements, and based on soil conditions and groundwater evidenced in cuts made during construction.

6.6 Structural Fills

No structural fills are allowed on the lot. Remove all spoils from the house excavation except what is needed to backfill around the foundation.

6.7 Groundwater Management

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary to prevent standing water and/or erosion at the working surface.

The ground surface around the structure should be sloped to create a minimum gradient of 2% away from the building foundations for a distance of at least 5 feet. Surface water should be directed away from all buildings into drainage swales or into a storm drainage system. "Trapped" planting areas should not be created next to any buildings without providing means for drainage. Foundation house drains are required.

Storm water drainage shall be approved by RSS prior to construction.

6.8 Construction Observation

Prior to pouring any foundation the excavation shall be observed by the Geotechnical Engineer to ensure that the above items have been properly removed. ***Please allow 48-hour notice to call for subgrade inspections.*** Failure to do so can lead to foundation issues with the house. For placement of any backfilling RSS shall be called to provide compaction testing or probing of the fills

6.9 Conclusions

There are no issues with the construction of the house.

7.0 Limitations

This report has been prepared for the exclusive use of the addressee, and their architects and engineers for aiding in the design and construction of the proposed development. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials and contractors to ensure correct implementation of the recommendations.

The opinions, comments and conclusions presented in this report were based upon information derived from our literature review, field investigation and laboratory testing. Conditions between, or beyond, my exploratory test pits may vary from those encountered. Unanticipated soil conditions and seasonal soil moisture variations are commonly encountered and cannot be fully determined by merely taking soil samples. Such variations may result in changes to our recommendations and may require that additional expenditures be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

If there is more than 2 years time between the submission of this report and the start of work at the site; if conditions have changed due to natural causes or construction operations at, or adjacent to, the site; or, if the basic project scheme is significantly modified from that assumed, it is recommended this report be reviewed to determine the applicability of the conclusions and recommendations. The work has been conducted in general conformance with the standard of care in the field of geotechnical engineering currently in practice in the Pacific Northwest for projects of this nature and magnitude. No warranty, express or implied, exists on the information presented in this report. By utilizing the design recommendations within this report, the addressee acknowledges and accepts the risks and limitations of development at the site, as outlined within the report.

8.0 References

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DOGAMI Lidar Viewer https://gis.dogami.oregon.gov/maps/lidarviewer/

DOGAMI Oregon State Wide Geohazard Viewer (HazVu) https://gis.dogami.oregon.gov/maps/hazvu/

DOGMAI Statewide Landslide Information Layer for Oregon https://gis.dogami.oregon.gov/maps/slido/

Google Earth

Google Maps https://www.google.com/maps

Metro Map https://gis.oregonmetro.gov/metromap/

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Portland Maps https://www.portlandmaps.com/

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Appendix

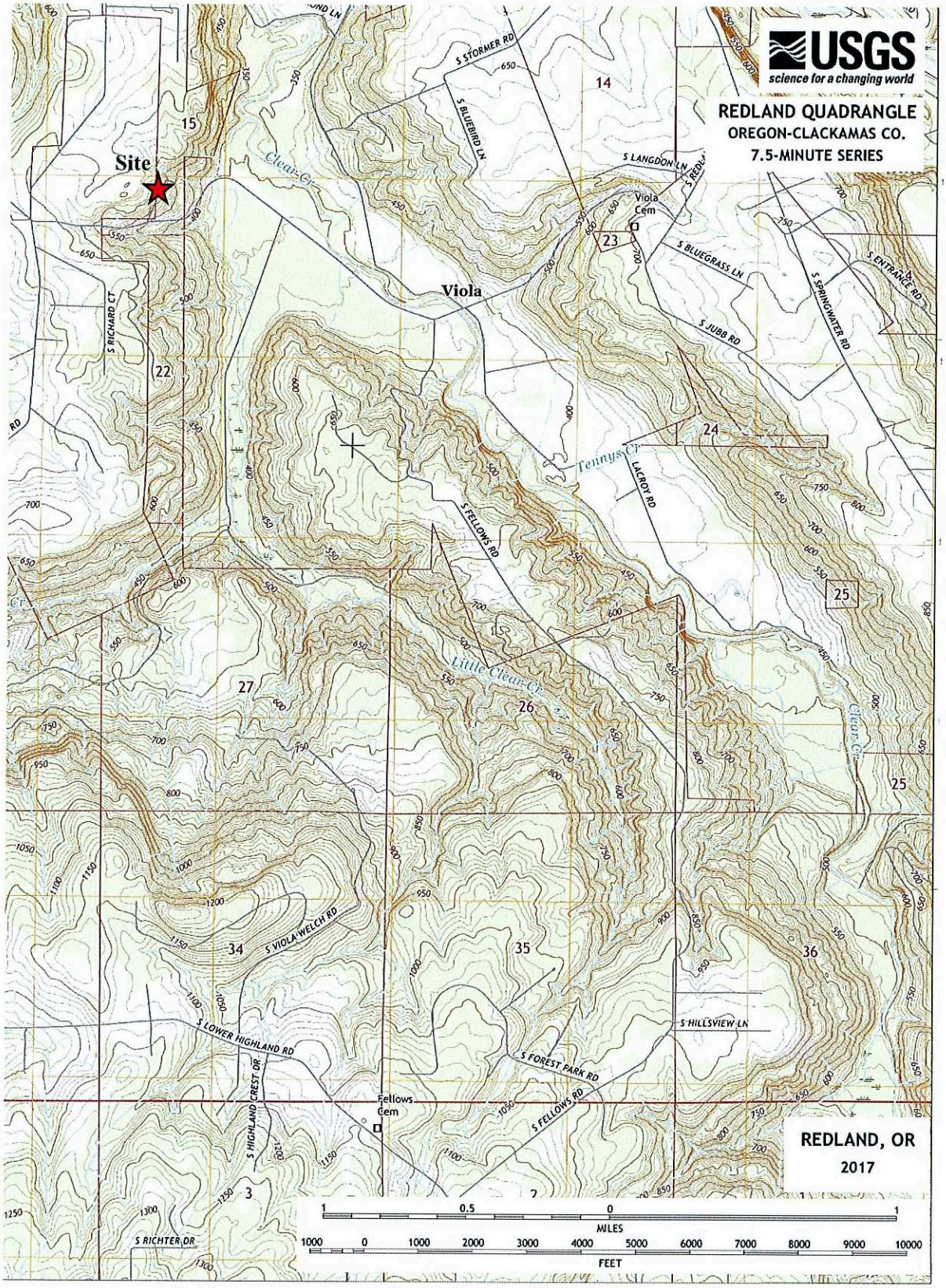


Figure 1: Subject site location on the SE quarter of the Redland 7.5-minute quadrangle

Figure 2: Subject site with 2022 aerial imagery from Cmaps and approximate boring locations

Lab Results

Project Name: 21121 S Redland Rd

Sample Date 1/23/2024

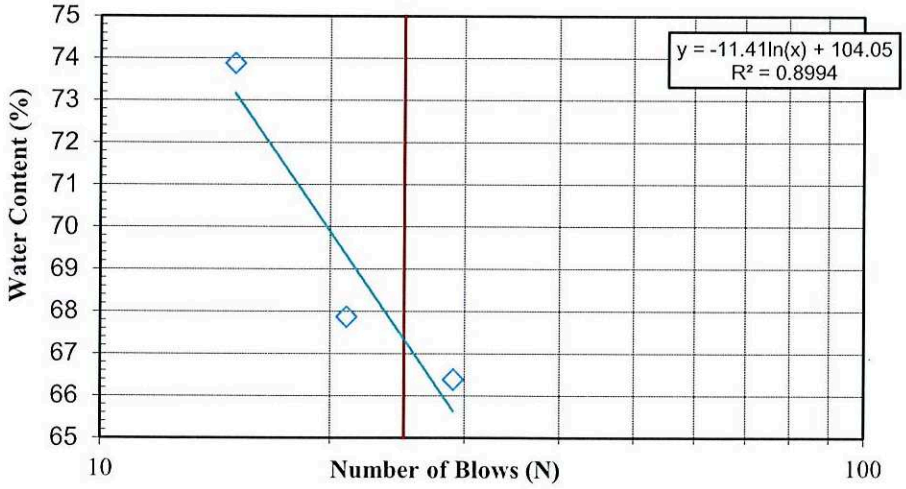
Moisture

	Sample number	HA#1-A	HA#1-B	HA#3-A	HA#3-B		
1	Date & time in oven	1/24/24 10:50 AM	1/24/24 10:50 AM	1/24/24 10:50 AM	1/24/24 10:50 AM		
2	Date & time out of oven	1/25/24 1:40 PM	1/25/24 1:40 PM	1/25/24 1:40 PM	1/25/24 1:40 PM		
3	Depth (ft)	2	3	2	4		
4	Tare No.	1	2	3	4		
5	Tare Mass	235	235	235	232		
6	Tare plus sample moist	1158	736	1087	906		
7	Tare plus sample dry	898	582	875	698		
8	Mass of water (g)	260	154	212	208		
9	Mass of soil (g)	663	347	640	466		
10	Water Content (%)	39.2	44.4	33.1	44.6		

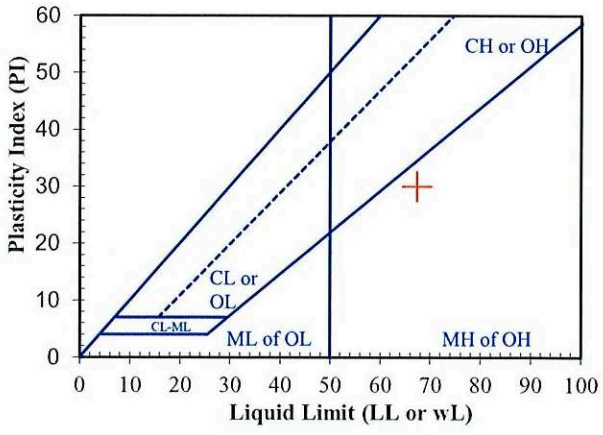
Atterberg Limit Test

Sample Number: HA#3-B Depth: 4'

		Liquid Limit			Plastic Limit	
1	Tare No.	D#1.1	D#1.2	D#1.3	R#1.1	R#1.2
2	Tare Mass (g)	39.56	39.89	40.55	39.45	40.24
3	Tare Plus Wet Soil (g)	71.42	69.36	72.56	51.97	52.73
4	Tare Plus Dry Soil (g)	58.54	56.84	59.79	48.55	49.35
5	Mass of Water (g)	12.88	12.52	12.77	3.42	3.38
6	Mass of Wet Soil (g)	18.98	16.95	19.24	9.10	9.11
7	Water Content (%)	67.86	73.86	66.37	37.58	37.10
8	No. Blows	21	15	29		



Liquid Limit (%) **67.3**
Plastic Limit (%) **37.3**
Plasticity Index (%) **30.0**
USCS Classification of fines: MH



Rapid Soil Solutions INC

HA#1

Surface Elevation:
Boring Date: 23 January 2024
Boring Location: Clackamas County, OR
Drilling Method: Hand Auger (3")

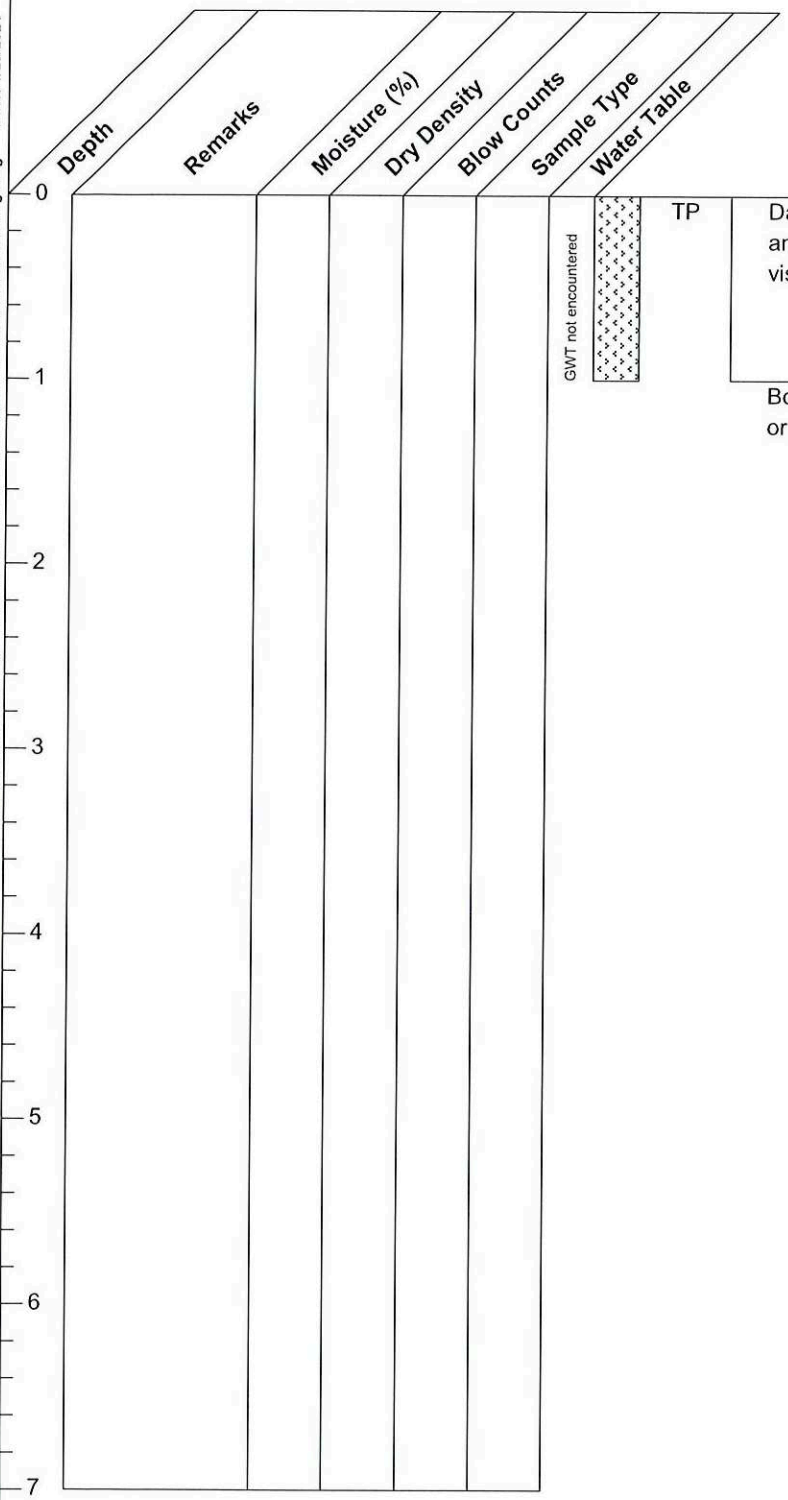
Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table		
0						GWT not encountered	TP	Damp, medium stiff, medium brown, clayey SILT with sand and gravels. Some to trace basalts (gravels, cobles, boulders) visible at surface. Abundant fine organics.
1							CL	Damp, medium stiff, red-brown, silty CLAY to CLAY with sand and gravels.
2		39.2					CL	Damp, stiff, red-brown, silty CLAY to CLAY with sand and gravels.
3		44.4						Boring completed at depth of 3 feet, refusal on basalt gravel.
4								
5								
6								
7								

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Owner\Documents\In Progress Reports\21121 S Redland Road Geotech 23Jan24\Redland Rd Logs.log Date: 1/29/2024

LOG OF BORING

RAPID SOIL SOLUTIONS	**21121 S Redland Road** **Mark Trunk**	**Plate 1**

HA#2



Surface Elevation:
Boring Date: 23 January 2024
Boring Location: Clackamas County, OR
Drilling Method: Hand Auger (3")

Damp, medium stiff, medium brown, clayey SILT with sand and gravels. Some to trace basalts (gravels, cobles, boulders) visible at surface. Abundant fine organics.

Boring completed at depth of 1 foot. Refusal on basalt gravel or cobble.

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Users\Owner\Documents\In Progress Reports\21121 S Redland Road Geotech 23Jan24\Redland Rd Logs.log Date: 1/29/2024

LOG OF BORING

RAPID SOIL SOLUTIONS	**21121 S Redland Road** **Mark Trunk**	**Plate 2**

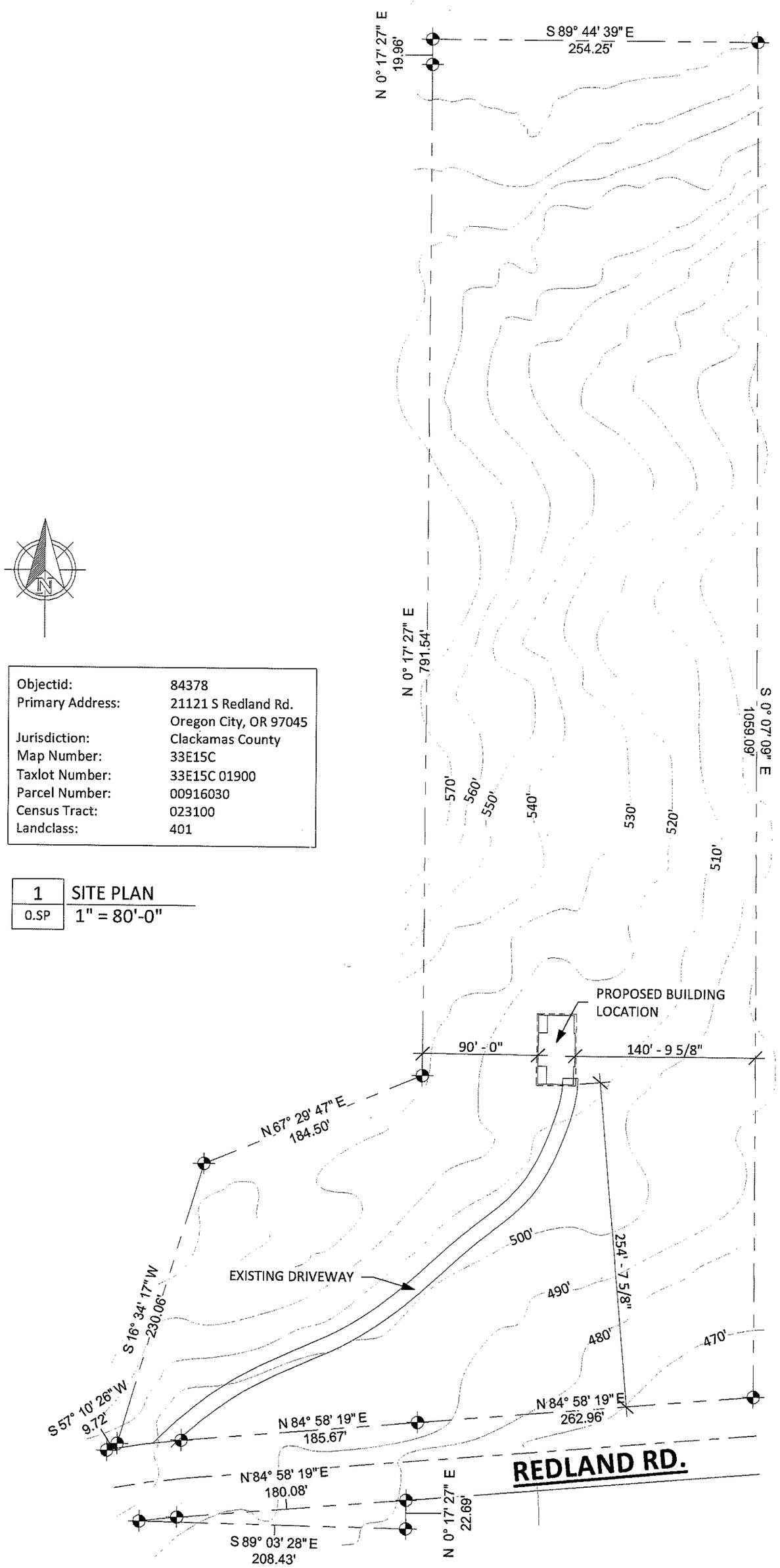
HA#3

Surface Elevation:
Boring Date: 23 January 2024
Boring Location: Clackamas County, OR
Drilling Method: Hand Auger (3")

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table		
0						GWT not encountered	TP	Damp, medium stiff, medium brown, clayey SILT with sand and gravels. Some to trace basalts (gravels, cobles, boulders) visible at surface. Abundant fine organics.
							CL	Damp, medium stiff, red-brown, silty CLAY to CLAY with sand and gravels. Increasing gravel abundance with depth.
1								
2		33.1					CL	Moist, medium stiff to stiff, red-brown, silty CLAY to CLAY with sand and gravels.
3								
4	LL=67, PI=30	44.6					MH	Damp, stiff, tan, high plasticity clayey SILT. Decaying sedimentary rock.
								Boring completed at depth of 4 feet.
5								
6								
7								

LOG OF BORING

RAPID SOIL SOLUTIONS	**21121 S Redland Road** **Mark Trunk**	**Plate 3**



Objectid:	84378
Primary Address:	21121 S Redland Rd. Oregon City, OR 97045
Jurisdiction:	Clackamas County
Map Number:	33E15C
Taxlot Number:	33E15C 01900
Parcel Number:	00916030
Census Tract:	023100
Landclass:	401

1 / 0.SP — SITE PLAN 1" = 80'-0"

Project	13460
Date:	
Drawn	KG
Area:	-
Scale	1" = 80'-0"

0.SP

SITE PLAN

CHET DEBOIS HOMES

BUILDERS DESIGN INC.
15 NE 3rd St. GRESHAM, OR 97030 - (503) 252-3453
BUILDERSDESIGN@GMAIL.COM