BG

Brazos Geotech, Inc.
12636 N Red Eagle Dr
Tucson, Arizona 85755

(520) 237-0750
brazosgeo@yahoo.com

SOIL REPORT

DESHAZO RESIDENCE
4300 W POTVIN LN
PIMA COUNTY, ARIZONA

BRAZOS GEOTECH, INC. PROJECT NO. 21468

PREPARED BY:

Brazos Geotech, Inc.
12636 N Red Eagle Dr
Tucson, AZ 85755

PREPARED FOR:

Calisto Homes

May, 2021

Brazos Geotech, Inc.
12636 N Red Eagle Dr
Tucson, Arizona 85755

(520) 237-0750
brazosgeo@yahoo.com

May 27, 2021

TO: Brandon Mobley
Calisto Homes

RE: 4300 W Potvin Ln
Soil Report

Dear Mr. Mobley:

This letter transmits a soil report completed by Brazos Geotech, Inc. to assist the design and construction of a single-family residence at the above-referenced location in Pima County, Arizona.

Thank you for the opportunity to perform these services. Please contact the undersigned with any questions or concerns.

Yours truly,

BRAZOS GEOTECH, INC.

Gerald A. Tripp, P.E.
President

Soil Report

4300 W Potvin Ln
Pima County Assessor's Parcel 224-15-0190

Proposed Improvements & Location

The construction of a single-family residence is proposed at the above-referenced location. The floor slab/foundation system is anticipated to consist of a conventional slab on grade with a perimeter footing, a stem wall and slab system, or a post-tensioned slab on grade designed by a Structural Engineer.

The subject 3.64-acre site is located on the north side of West Potvin Lane, between North Paisano Avenue and North Oldfather Drive, in the northwest Tucson area of unincorporated Pima County, Arizona. It may also be described as being located within Section 7, Township 12S, Range 13E, Gila and Salt River Base and Meridian. The Location Map, Plate 1, shows the site location.

Surface Conditions

The property is currently undeveloped and it contains typical Sonoran Desert vegetation. The average site elevation at the proposed house location, assumed to be in the mid-south part of the lot is approximately 2,529 feet above mean sea level. According to Pima county GIS data, the property in that area slopes toward the west-southwest at roughly a two (2) percent gradient.

A review of Pima County GIS data suggests that the parcel is located within a FEMA flood plain area. There is also a regulatory wash with a 75-ft setback that crosses the north half of the lot.

It is therefore assumed that the pad will be created primarily by filling with imported soil, to increase its elevation to at least two (2) feet above the highest adjacent natural grade.

Soil Conditions

In April, 2021, soils were examined in a test pit that was excavated at the location indicated on the Site Plan, Plate 2. Soils were also observed in nearby test pits excavated for septic design purposes.

The soils were observed to consist of loose silty sand. Two (2) representative samples of soil were selected for classification purposes. The Test Pit log, Plate 5, is attached.

The soil samples were subjected to particle size analysis and Atterberg Limits testing to classify the soil types and determine plasticity characteristics. The following tables display summaries of the test results.

Sample #1 (TP-1, 0-10"):

Sieve No.	Cumulative Percent Passing	Liquid Limit (%)	Plasticity Index (%)
1"	100	NP	NP
3/8"	97		
4	95		
10	82		
40	43		
200	28		

Sample #2 (TP-1, 10"-6'):

Sieve No.	Cumulative Percent Passing	Liquid Limit (%)	Plasticity Index (%)
1"	100	NP	NP
3/8"	98		
4	97		
10	85		
40	30		
200	17		

NP = Non-Plastic

According to the Unified Soil Classification System (Plates 3 & 4), the samples were classified as SM (silty sand). The gradation curves are attached as Plate 6.

The soils are estimated to have a low shrink-swell potential. The on-site soil is considered to suitable for use as fill beneath the structure provided that it is topped by at least four (4) inches of compacted AB.

Site Grading

The following recommendations are based on the assumption that the pad will be elevated at least 24 inches above the highest adjacent natural grade.

a) Strip and dispose of any remains of previous improvements discovered within the area to be graded. This shall include removal of all vegetation (including tree roots), debris, and other deleterious material. Any cobbles larger than six (6) inches in diameter should be removed and wasted in accordance with all applicable regulations.

b) Over-excavate and compact at least the top 12 inches of subgrade soil beneath the building footprint (including any cut areas) and extending five (5) feet out from the house in all directions. Place six (6) inch layers of native or imported fill soil compacted as described below in Part (g).

c) If stem wall footings extend below original grade, moisten and compact the subgrade. Place at least a four (4) inch thickness of compacted aggregate base course (AB) beneath the floor slab.

d) The area around the completed structure should be graded to insure positive drainage away from the foundation.

e) Visual examinations and laboratory tests indicate that the on-site soil is suitable to use as fill beneath the structure provided that it is topped by at least four (4) inches of compacted AB. In general, imported fill material should comply with the following minimum criteria. It should be a non-expansive soil with limited fines such as fine to medium-grained sand or slightly plastic clayey sand (SP, SW, SM, SC) which meets with the following minimum standards: 1) less than 25% passing the No. 200 sieve (<25% fines), 2) a plasticity index not more than 10 (PI<10), and 3) a liquid limit below 25 (LL<25).

f) Thoroughly and uniformly moisten the soil and maintain soil moisture prior to placement of all concrete.

g) Compact all soils, wherein the term "compact" and its derivatives mean a minimum of 95 percent of the maximum dry density within +2 and -4 percentage points of optimum moisture as determined by ASTM D698.

h) When fill is placed, it should be placed in layers not to exceed six (6) inches in compacted thickness, with treatment as described above.

i) Utility trenches are to be backfilled and compacted to a minimum of 95 percent of the maximum dry density under the slab or other improvements.

j) The site should be graded such that storm water is directed away from the foundation. No water, from either on or off-site sources should be allowed to pond contiguous to the foundation.

k) In all instances in which compaction is to be performed, the compaction should be verified by appropriate testing as the pad is being built up.

Slope Considerations

a) The structures should be set back from slopes at least a distance of one and one half times the slope height, with a minimum set back distance of five (5) feet.

b) Slopes less than 3:1 should be re-vegetated. Slopes in the range of 3:1 to 1.5:1 should be stabilized with minimum six (6) inch diameter rip-rap. Slopes greater than 1.5:1 must be retained.

c) To minimize erosion, slopes created with native sand fill should be protected with rip-rap or retained.

Foundation Considerations

Conventional Slab on Grade or Stem Wall and Slab

Provided that the above recommendations are adhered to, the recommended maximum soil contact pressure is 2,000 pounds per square foot for support of dead plus normal live loads. Anticipated total foundation settlements should be ½ inch or less with differential settlements of 3/8 inch or less.

The above recommendations are based upon the assumption that footing widths will be at least 12 inches and that the footings will be embedded at least 12 inches into undisturbed native soil or compacted material.

The allowable subgrade slab friction coefficient for native or imported sandy soils is estimated to be 0.55.

Post Tension Slab on Grade

This lot is considered to have 'stable', i.e. non-expansive or compressible soils.

Although this type of slab acts as its own load-bearing footing, the inclusion of a 6-inch depth perimeter footing is still recommended to inhibit moisture infiltration. The allowable bearing pressure at grade is 1,000 pounds per square foot with a minimum 6-inch wide footing. The soil modulus of subgrade reaction (k) is estimated to be 225 lb/cubic in.

The subgrade slab friction coefficient for native or imported sandy soils is estimated to by 0.55.

Seismic Design Site Class

According to the 2018 International Building Code Soil Criteria, the subject site is considered to be a Site Class 'D' (stiff soil profile).

LIMITATIONS & GENERAL CONDITIONS

1. It must be recognized by all parties concerned that the recommendations developed during this investigation are based upon many indeterminate factors and problems for which exact solutions are not available. Thus, Brazos Geotech, Inc. (BGI) has attempted to provide practical answers using the professional standards and techniques available at the time of the investigation. Of necessity, the recommendations developed on the Client's behalf must not be considered a warranty, direct or indirect, as to the final performance of the project. Since many of the subsurface conditions will remain unknown, it must be recognized that the Geotechnical Engineer should be given an opportunity to evaluate the subsurface conditions during construction and that some changes may be required during design and construction to achieve the maximum economy and safety for the project.

2. BGI warrants that all services are performed within time, monetary and technical limitations prescribed by our Clients and their consultants, with the usual thoroughness and competence of the Geotechnical Profession in this part of the country at the time of the investigation. No other warranty or presentation, either expressed or implied, is included or intended in our proposals, contracts, oral communications or written report.

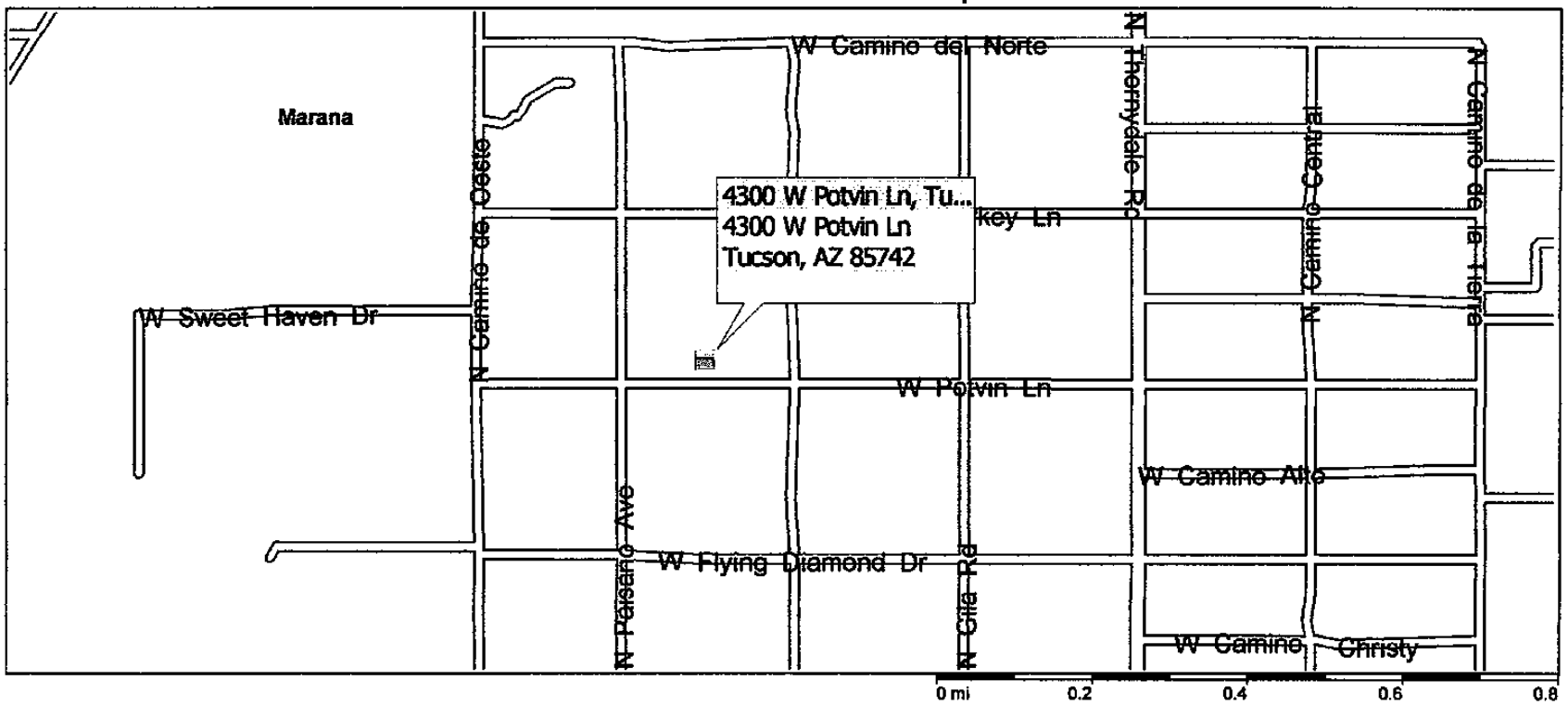
3. This report is to be used in the design of the proposed project and is not intended as a bidding document, and any contractors reviewing this report must draw their own conclusions regarding construction procedures and difficulties for the project at this site.

4. Generalized subsurface conditions were interpreted from soils sampling and apply only at the sampled location and the date sampled. They are not warranted to be representative of the subsurface conditions at other locations and other times.

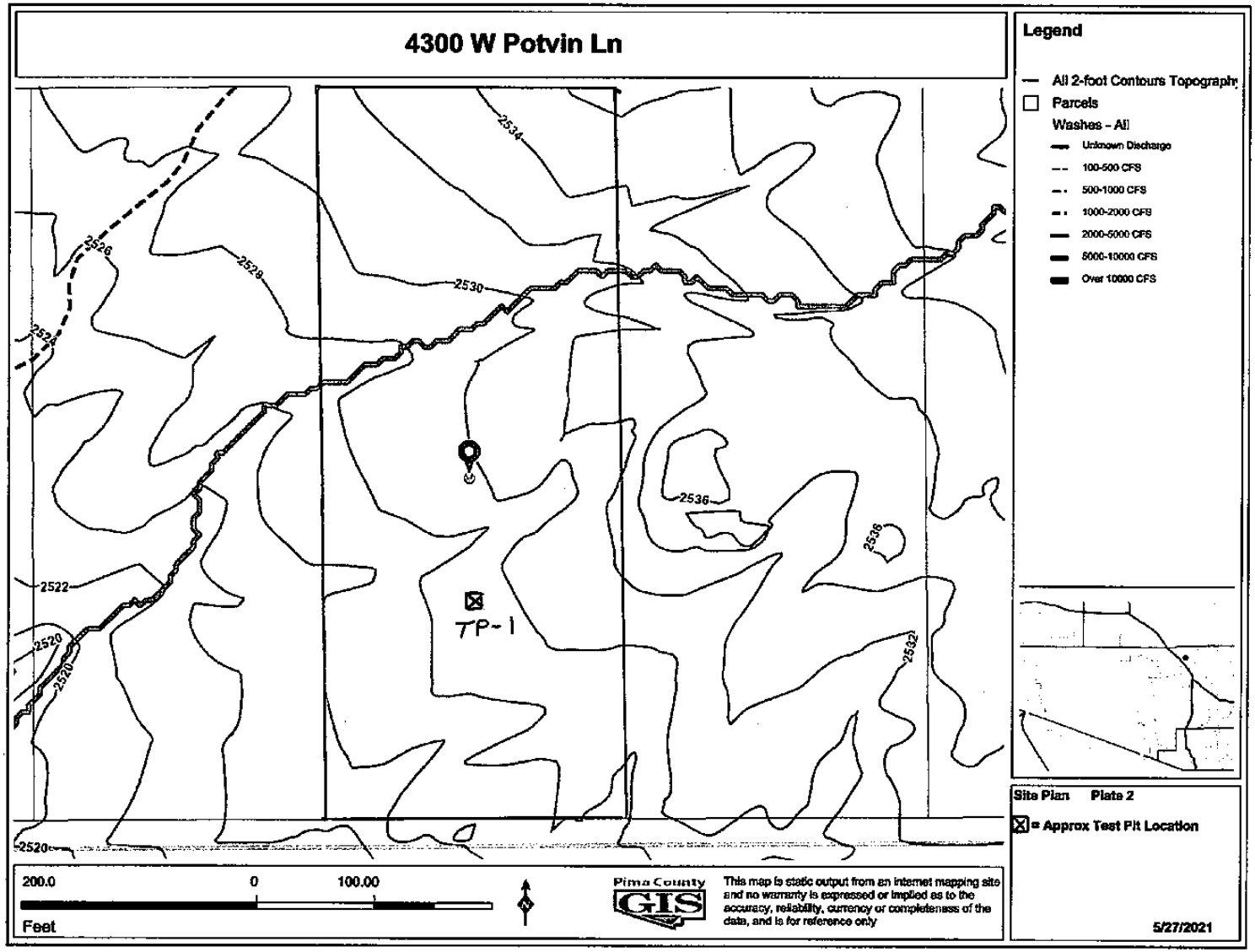
5. This report is prepared for the specific site location and specific proposed project. If the project location or the design considerations are changed, BGI should be consulted to review the conditions and issue applicable recommendations. This report should not be used for other types of structures at the same site location or similar structures at other locations.

6. If there is a substantial lapse of time (say, more than twelve months) between the submission of our report and the start of construction work on the site, or if conditions have changed due to natural causes, plan changes, or construction operations at or adjacent to the site, it is recommended that this report be reviewed by the Geotechnical Engineer to determine the continued applicability of the recommendations.

4300 W Potvin Ln Location Map Plate 1



Copyright © and (P) 1988–2012 Microsoft Corporation and/or its suppliers. All rights reserved. http://www.microsoft.com/streets/
Certain mapping and direction data © 2012 NAVTEQ. All rights reserved. The Data for areas of Canada includes information taken with permission from Canadian authorities, including: © Her Majesty the Queen in Right of Canada, © Queen's Printer for Ontario. NAVTEQ and NAVTEQ ON BOARD are trademarks of NAVTEQ. © 2012 Tele Atlas North America, Inc. All rights reserved. Tele Atlas and Tele Atlas North America are trademarks of Tele Atlas, Inc. © 2012 by Applied Geographic Solutions. All rights reserved. Portions © Copyright 2012 by Woodall Publications Corp. All rights reserved.


4300 W Potvin Ln
Legend
All 2-foot Contours Topography
Parcels
Washes - All
Unknown Discharge
100-500 CFS
500-1000 CFS
1000-2000 CFS
2000-5000 CFS
5000-10000 CFS
Over 10000 CFS
2534
2526
2529
2530
2528
2536
2538
2522
2520
2520
2520
2532
TP-1
2520
Site Plan Plate 2
= Approx Test Pit Location
200.0
0
100.00
Feet
Pima County GIS
This map is static output from an internet mapping site and no warranty is expressed or implied as to the accuracy, reliability, currency or completeness of the data, and is for reference only
5/27/2021

Report Date: 5/27/2021	TEST PIT LOG	Pit No.: 1
Company Name: Brazos Geotech, Inc		Surface Elevation:
Site Name:		Total Depth: 6 feet
Location: 4300 W Potvin Ln		Start: 4/21/21
Logged By: G Velasco		Finish: 4/21/21
Contractor: Sonny Leon		Equipment Type: Excavator
Conditions:		Pit Dimensions:
Comments: Non-Plastic		Sampling Methods:

Graphical Log	Top Depth (feet)	Thick. (feet)	Bt.Elev. (feet)	Strata Code	Material Description	Sample No.	Sampling Method	Remarks
	0.0	0.9	-0.9	SM	Silty Sand: lt brown, loose.	1		NP
	0.9	5.1	-6.0	SM	Silty Sand: lt brown, loose.	2		NP

6.0 feet T.D.

PLATE 5

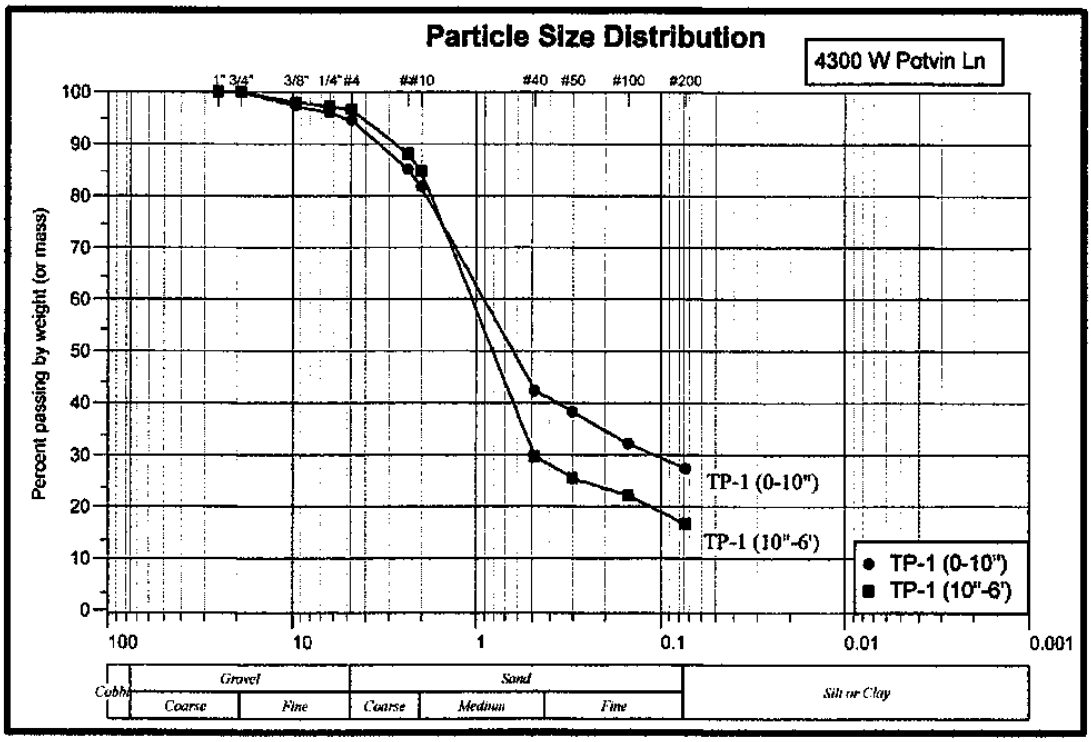

Particle Size Distribution
4300 W Potvin Ln
1" 3/4" 3/8" 1/4" #4 #10 #40 #50 #100 #200
Percent passing by weight (or mass)
100
90
80
70
60
50
40
30
20
10
0
TP-1 (0-10")
TP-1 (10"-6')
TP-1 (0-10")
TP-1 (10"-6')
100
10
1
0.1
0.01
0.001
Cobble
Gravel
Coarse
Fine
Sand
Coarse
Medium
Fine
Silt or Clay

PLATE 6