GEOSCIENCE, PLLP
2728 Gregory Drive North
Billings, Montana 59102
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April 4, 2026

Winston and Connie Dorian
C/o Ms. Sonya Mcleod
4923 Valle Rio Trail NW
Albuquerque, NM 87120

RE: GEOTECHNICAL INVESTIGATION REPORT FOR PROPOSED DORIAN RESIDENCE; LOT 14, CALLEN WEST SUBDIVISION, CALLEN DRIVE, SOUTHWEST OF CODY, WYOMING

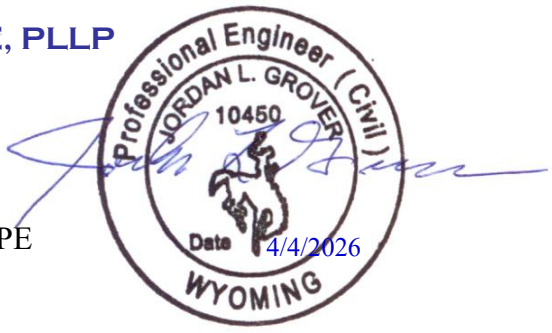
Dear Ms. Mcleod,

I am pleased to present this geotechnical site investigation report for the proposed Dorian Residence on Lot 14 of Callen West Subdivision, southwest of Cody, Montana. The report describes site conditions and presents conclusions and recommendations to support design and construction of foundation elements.

As building plans and design elevations are developed, we are available to discuss our recommendations and possible alternatives. If you have any questions about this report, or if we may provide other services, please contact us.

Best Regards,

GEOSCIENCE, PLLP



Jordan L. Grover, PE

Enc: Report

GEOTECHNICAL INVESTIGATION REPORT
DORIAN RESIDENCE
LOT 14, CALLEN WEST SUBDIVISION
SOUTHWEST OF CODY, WYOMING

Prepared for:

Winston & Connie Dorian
4923 Valle Rio Trail NW
Albuquerque, NM 87120

Prepared by:

GEOSCIENCE, PLLP
GEOTECHNICAL ENGINEERING & GEOLOGY
2728 GREGORY DRIVE NORTH
BILLINGS, MONTANA 59102

April 4, 2026

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1.0 SUMMARY

GEOSCIENCE conducted a geotechnical site investigation for the proposed Dorian Residence and detached shop on Lot 14 of Callen West Subdivision, southwest of Cody, Wyoming. The lot is located on the east side of Callen Drive and south of Southfork Road.

The scope of services included subsurface exploration, field observations, material property testing, engineering analyses, and furnishing this geotechnical report. The purposes were to investigate soil, rock and groundwater conditions, evaluate soil-engineering properties, and provide recommendations to support design and construction of foundation elements.

The site is underlain by loose/soft, low-density, fine-grained soils consisting of Sandy Lean Clay, Clayey Sand, and Silty Sand. Thin lenses of coarse-grained, Sandy Gravel with Cobble transect the fine-grained soils. Weak bedrock of the Cody Shale Formation likely underlies the site at depths of about 50 to 60 feet. The loose/soft, low-density, fine-grained soils have moderate consolidation potential under the anticipated foundation loads. If foundations are placed directly on unimproved native soil, the buildings will likely be susceptible to some differential settlement.

Provided the structures are lightly loaded and some soil consolidation and settlement of foundation elements is acceptable, foundation subgrade improvement consisting of over-excavation of 30 inches of native soil and then placement of compacted structural fill may be used to help reduce the potential for differential movement. A layer of woven geosynthetic such as Tencate Mirafi RS380i shall be placed at the interface of the structural fill and native soils. A second layer of Tencate Mirafi RS380i is suggested at the 1-foot structural fill height. Geosynthetics shall be installed according to the manufacturer's recommendations.

If tolerance for foundation movement is stringent, foundation loads are anticipated to be high, or the magnitude of the home is commensurate with a more elaborate foundation system, alternate foundation support methods may be considered. Based on deeper drilling and water well logs from the area, we anticipate deeper bearing stratum to be on the order of 50 to 60 feet. The owners may weigh foundation economics and reliability to help determine feasibility of these options.

Groundwater was not encountered to depths of about 15 feet during fieldwork on April 1, 2026. However, based on aerial photos, ditches and drainageways appear on multiple sides of the subdivision. Shallower groundwater shall be anticipated during the spring and summer irrigation season and once flow is returned to nearby ditches. Groundwater elevations will likely vary seasonally in response to flow in the adjacent irrigation ditches, precipitation, runoff, snowmelt, and crop and landscape irrigation.

Significant groundwater level changes on the order of 10 feet have been observed near flood-irrigated fields and adjacent to irrigation canals (Olsen and Reiten, 2002). Seasonal groundwater level variation has not been established by this office through long-term monitoring. We recommend placing footings no deeper than about 4 feet below existing grades.

Based on site observations and perceived surface topography, it appears a lower elevation swale runs through the lot near the proposed homesite. See approximate blue arrow on the attached Site Plan. Although unconfirmed with survey, designers and contractors shall be aware surface water flow may occur from higher elevations in the south during periods of heavy rain or snowmelt. Building elevations, finished floor heights, and site grading shall be planned to direct potential surface flow away from and around the building locations.

Control of water including landscape irrigation, rain-gutter downspouts, buried water lines, and surface runoff is critical. Based on our experience, the following critical points regarding foundation construction and water management are emphasized. This report should be passed on to design professionals, building contractors, and future property owners so that they will be alerted to potential hazards discussed herein.

- Exterior backfills must be compacted and sloped to drain away from structures. Runoff should be discharged away from the proposed and adjacent structures. Care shall be taken with building elevations and the apparent shallow swale across the site, as discussed above.
- If soil in the foundation excavations become wet or frozen during construction, the wet or frozen material must be removed.
- Excessive wetting or drying during construction is a common cause of foundation distress. Excavated soils should be placed around the excavation to prevent storm runoff or other surface water from flowing into the excavation during construction.
- Placing interior and exterior backfill to bring the site up to design grades for finished floors, driveways, or patios may cause excessive settlement under the fill prisms and adjacent foundation or retaining walls. Backfill material must be properly moisture conditioned, placed in thin lifts, and compacted to the specified density. GEOSCIENCE shall be notified if fill thickness greater than 2 to 3 feet are planned under slabs or driveways so we may re-evaluate our recommendations.
- Irrigation is strongly discouraged within 6 feet of the building. Over irrigation must be avoided. Underground irrigation systems should be pressure tested when installed and checked periodically for leaks.
- Buried rain gutter downspouts or buried extensions are not recommended unless the owner assures maintenance and performance of the buried pipes.
- Drain fields shall be placed downgradient or cross-gradient and as far as practical from foundation elements.
- Crawlspace or slab-on-grade construction appears feasible. Typically, slabs-on-grade are more prone to differential movement due to the thin section of the slab and due to the weight of fill placed below slabs to achieve design elevations. Placement of large quantities of fill to achieve base of slab elevations may consolidate deeper. See the 4th bullet item above.

This report, including engineering analyses, recommendations, figures, and design details are exclusive to the above referenced site. Under no circumstances shall the figures be separated from the text and used independently. Recommendations in this report are not applicable to other construction sites. This summary shall be considered an overview and does not constitute the entire report.

2.0 PROPOSED CONSTRUCTION

A new single-family residence and detached shop with frost-depth, shallow foundations are planned on Lot 14 of Callen West Subdivision. The buildings will likely be wood-frame construction with frost-depth foundation elements. Foundation loads of about 2 to 3 kips per lineal foot are assumed for the residence with column loads of 15 to 20 kips. It is assumed the proposed structures may be capable of withstanding differential movement on the order of L(length)/240 to L(length)/360 (inches) or about 1 to 1.5-inches in 30-feet.

If geometry, loading, or allowable displacements vary from that assumed above, this office should be notified so we may re-evaluate our recommendations. At the time of the investigation, excavation for foundations had not begun.

3.0 INVESTIGATION PROCEDURE

3.1 Field Investigation

Fieldwork consisted of site reconnaissance, and advancing and sampling four test holes. Additionally, subsurface data from test holes on nearby lots and nearby water well logs were reviewed. Approximate test hole locations are shown on Figure 1 in Appendix A. Subsurface logs are attached in Appendix B.

Soil type, thickness, consistency, and relative moisture content were observed and documented by a Professional Engineer. Site conditions may be variable and actual soil conditions encountered in the foundation excavations may differ from those represented on the test hole logs.

4.0 SITE CONDITIONS

4.1 Soils

Soil conditions generally consist of fine-grained alluvial soils classifying as Sandy Lean Clay, Clayey Sand, and Silty Sand to total depth. Lenses of sandy gravel with cobble on the order of 6-inches to 12-inches thick were encountered with the thickest lens about 4 feet. Based on deeper water well logs and regional geology, bedrock of the Cody Shale Formation is anticipated at depths of about 50 to 60 feet.

The fine-grained soils are generally described as loose or soft, dry becoming moist with depth, brown, stratified and thinly bedded with sandy gravel with cobble lenses. Test results indicate that the silty to clayey soils contain about 40 to 60% low-plastic fines (finer than the #200 sieve) and about 40 to 60% fine-grained sand, and is non-plastic to low-plasticity, typically classifying as (CL) Sandy Lean Clay, (SC) Clayey Sand, or (SM) Silty Sand under the Unified Soil Classification System. The soils are typically low density, with measured dry density of about 90 to 95 pcf. Field observations and laboratory testing suggest the soil is moderately susceptible to consolidation upon loading.

4.2 Bedrock

Based on published geologic maps and water well logs, the project site is underlain by bedrock of the Cody Shale. Bedrock was not encountered in the test holes; however, depth to bedrock is anticipated to be about 50 to 60 feet below ground surface.

4.3 Groundwater

Groundwater was not encountered to depths of about 15 feet during fieldwork on April 1, 2026. However, based on aerial photos, ditches and drainageways appear on multiple sides of the subdivision. Shallower groundwater shall be anticipated during the spring and summer irrigation season and once flow is returned to nearby ditches. Groundwater elevations will likely vary seasonally in response to flow in the adjacent irrigation ditches, precipitation, runoff, snowmelt, and crop and landscape irrigation.

Significant groundwater level changes on the order of 10 feet have been observed near flood-irrigated fields and adjacent to irrigation canals (Olsen and Reiten, 2002). Seasonal groundwater level variation has not been established by this office through long-term monitoring. We recommend placing footings no deeper than about 4 feet below existing grades.

Based on site observations and perceived surface topography, it appears a lower elevation swale runs through the lot near the proposed homesite. See approximate blue arrow on the attached Site Plan. Although unconfirmed with survey, designers and contractors shall be aware surface water flow may occur from higher elevations in the south during periods of heavy rain or snowmelt. Building elevations, finished floor heights, and site grading shall be planned to direct potential surface flow away from and around the building locations.

4.4 Earthquakes and Seismicity

The area southwest of Cody and project site are considered moderate to high seismic activity. No active faults have been identified in the vicinity and historically no major earthquake epicenters have been located in the immediate area; however, Yellowstone Park is seismically active.

The project site is in Residential Seismic Design Category "C" as specified by the International Residential Code (IRC). Category "C" indicates areas could experience ground shaking of moderate to strong intensity. Earthquake damage is anticipated to be negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built structures.

5.0 ENGINEERING ANALYSES AND RECOMMENDATIONS

5.1 Foundations

The site is underlain by loose/soft, low-density, fine-grained soils consisting of Sandy Lean Clay, Clayey Sand, and Silty Sand. Thin lenses of coarse-grained, Sandy Gravel with Cobble transect the fine-grained soils. Weak bedrock of the Cody Shale Formation likely underlies the site at depths of about 50 to 60 feet. The loose/soft, low-density, fine-grained soils have moderate consolidation potential under the anticipated foundation loads. If foundations are placed directly on unimproved native soil, the buildings will likely be susceptible to some differential settlement.

Provided the structures are lightly loaded and some soil consolidation and settlement of foundation elements is acceptable, foundation subgrade improvement consisting of over-excavation of 30 inches of native soil and then placement of compacted structural fill may be used to help reduce the potential for differential movement. A layer of woven geosynthetic such as Tencate Mirafi RS380i shall be placed at the interface of the structural fill and native soils. A second layer of Tencate Mirafi RS380i is suggested at the 1-foot structural fill height. Geosynthetics shall be installed according to the manufacturer's recommendations.

If tolerance for foundation movement is stringent, foundation loads are anticipated to be high, or the magnitude of the home is commensurate with a more elaborate foundation system, alternate foundation support methods may be considered. Based on deeper drilling and water well logs from the area, we anticipate deeper bearing stratum to be on the order of 50 to 60 feet. The owners may weigh foundation economics and reliability to help determine feasibility of these options.

Over the life of the structure, minor cracks in the foundation walls, floors, and sheetrock are normal and should not be a cause for concern. Footings should be placed at or below the frost depth recommended by local codes (typically 42 inches). Also, wet or frozen material should be removed from beneath the footings and floor slabs prior to pouring concrete.

This office should observe the excavations and exposed subgrade prior to placement of footings or structural fill to verify our assumptions. If loose fill, organics, concrete, or other debris is encountered, they should be removed from the site and replaced with structural fill prior to foundation construction.

5.2 Over-Excavation and Engineered Fill

Subgrade soils should be over-excavated to a minimum depth of 30 inches below footings, and at least 30 inches on the inside and outside of the footings. A layer of woven geosynthetic such as Tencate Mirafi RS380i shall be placed at the interface of the structural fill and native soils. A second layer of Tencate Mirafi RS380i is suggested at the 1-foot structural fill height. Geosynthetics shall be installed according to the manufacturer's recommendations.

Suitable structural fill materials shall follow the recommendations in the Earthwork/Fill Materials Section of this report. Structural fill shall be placed in lifts and compacted to foundation elevation. Construction observation and field density testing are required to verify fill placement and compaction. Site preparation and placement and compaction of structural fill should conform to the recommendations in the Earthwork/Compaction Section of this report.

5.3 Bearing Capacity

Allowable bearing capacity on compacted structural fills is 2,000 psf. In addition to the bearing capacity requirements, continuous footings should not be less than 20-inches in width and isolated footing should not be less than 30-inches square. Allowable loads may include full dead load and 2/3 live load.

5.4 Lateral Loads on Basement Walls

Lateral pressures were calculated for active, passive, and at-rest conditions assuming level soil backfill adjacent to the foundation (Bowles, 1996).

Table 1 Lateral Loads γK (equivalent fluid pressure)	
Static Condition Level Backfill	At Rest - 60 pcf Active - 48 pcf Passive - 275 pcf

5.4.1 Soil Friction Factor

Terzaghi, et al (1996), suggest a maximum value of 30 degrees for the friction angle along a concrete base in granular soils. Accordingly, a friction value of 0.58, which is the tangent of 30 degrees, is suggested. A friction factor of 0.50 is suggested to calculate soil friction for design of retaining walls in contact with any fine-grained soils in the subgrade. The friction value may be combined with the passive pressure to resist horizontal loads.

5.5 Earthwork

5.5.1 Site Clearing and Subgrade Preparation

All exposed subgrade surfaces should be free of mounds and depressions which could prevent uniform compaction. If unexpected fills, organics, or obstructions are encountered during site clearing or excavation, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Subgrade surfaces beneath building foundations and floor slabs shall be scarified, moisture-conditioned to near optimum moisture content, and recompacted to at least 95% of maximum dry density as measured by ASTM D 698. If density tests indicate compaction is not being achieved, soil should be scarified or removed, moisture-conditioned to within ±2 percent of optimum moisture content, and re-compacted and re-tested. **Field density testing is required.**

Fill, footings or slabs shall not be placed on frozen or wet subgrade. Organics shall be removed and replaced with structural fill. All excavations shall be inspected prior to fill or concrete placement. This office is available to inspect excavations.

5.5.2 Excavation

Based on the soil conditions encountered, conventional earthmoving equipment should be capable of excavating site soils. All excavations should be approved by a representative of GEOSCIENCE prior to backfill placement.

All excavations must conform to OSHA *Standards for Excavations*, 29 CFR Part 1926.652 Appendix B to Subpart P. Based on field observations, the soils at the site are classified as Type C using OSHA classification system. Type C soils require excavation slope angles not to exceed 1½ H: 1 V (horizontal to vertical) for excavations exceeding 5 feet in depth.

5.5.3 Fill Materials

In general, materials including topsoil, organics, and random debris, <u>are not acceptable</u> as structural fill. Select site soils may be used for backfill against foundation walls and site grading. If structural fill from an offsite source is required, it should conform to the following requirements or be approved by the project Geotechnical Engineer.

Table 2 Granular Fill Recommendations	
Gradation	**Percent finer by weight**
3-inch	100
1 1/2	90-100
3/4	70-90
No. 4 Sieve	40-80
No. 40 Sieve	8-40
No. 200 Sieve	12 Maximum
Liquid Limit and Plastic Index = Non-plastic	

5.5.4 Fill Placement and Compaction

Structural fill shall be placed in maximum 6-inch loose lifts, moisture-conditioned to near optimum moisture content, and compacted to at least 98% of maximum dry density as measured by ASTM D 698. If density tests taken in the fill indicate compaction is not being achieved, fill should be scarified or removed, moisture-conditioned to within ±2 percent of optimum moisture content, and re-compacted and re-tested. No fill should be placed over frozen ground or in a frozen condition. **Structural fill density testing requirements are outlined in Table 3.**

Table 3 Minimum Compaction Requirements		
Location or Area	**Standard Proctor Density ASTM D 698**	**Testing Frequency 1 per lift per**
Exterior Slabs and Walkways	95%	5,000 sf.
Retaining Walls	95%	1,000 sf.
Trenches in Landscaped Areas	95%	150 sf.
Trenches Below Pavements or Structures	97%	150 sf.
Structural Fill	98%	1,000 sf.
Slab and Foundation Subgrade Surfaces	95%	2,000 sf.
Pavement Section (Scarified Subgrade and Entire Gravel Section)	95%	10,000 sf.

Care should be taken adjacent to “green” foundation concrete. Over compaction adjacent to “green” concrete may lead to foundation damage and cracking. Under no circumstances shall fill be placed using “hydro”-compaction methods. Excessive water may damage foundation elements.

Care should be taken adjacent to “green” foundation concrete. Over compaction adjacent to “green” concrete may lead to foundation damage and cracking. Under no circumstances shall fill be placed using “hydro”-compaction methods. Excessive water may damage foundation elements.

5.6 Site Grading and Surface Water Control

Surface water should not be allowed to accumulate and infiltrate the soil near foundations. It must be controlled and directed away from the structures.

Site grading is critical. A simple means of reducing moisture changes is to prevent surface water infiltration by sloping the ground away from the foundation. The recommended minimum slope within 10 feet of the building is 1 inch vertical for 1 foot horizontal. The sloped ground should be initially constructed at a greater slope to account for settlement/consolidation of exterior backfill. Within ten feet of the foundation, the upper 12 to 18 inches of backfill should consist of less permeable, compacted fine-grained soil (silts and clays). The area around the foundation should be inspected regularly by the property owner– particularly after a rainstorm – to determine if proper drainage away from the structure has been maintained.

Changes in site grading by landscapers or property owners have been a persistent and damaging problem. It is the property owner's responsibility to control water and maintain the site to prevent infiltration near foundations. Additionally, it is the property owner's responsibility to maintain rain gutter downspouts and buried sprinklers system conduits.

Roof drainage should include gutters, downspouts, extensions, and splash blocks. The downspouts should discharge at least 6 feet away from foundation walls and beyond any backfill zones. Sprinklers should not spray closer than 6 feet from foundations and beyond backfill zones. Plantings near foundations should not trap surface runoff. Additionally, sidewalks or low-water consumption groundcover are recommended to further reduce the risk of water infiltration near the foundation walls.

Buried rain gutter discharge pipes are not recommended because of persistent, often undetected, seepage problems caused by clogging, crushing, and adverse grading of the pipes. Buried rain gutter downspouts or buried extensions are not recommended unless the owner assures maintenance and performance of the buried pipes.

Similarly, infiltration basins or drainfield are not recommended adjacent to or upgradient of the structure or adjacent structures. If detention is required by statute, infiltration basins should be located down gradient and at least 30 feet from foundations.

5.7 Foundation and Retaining Wall Drains

If habitable space is constructed below grade, a perimeter drain system, day-lighted to a sump is recommended to help reduce the potential for seepage into lower elevations of the home.

Foundation drains should consist of minimum 4-inch diameter pipe. Thin walled or flexible pipe is not recommended due to crushing or inability to control pipe grades. Approved products include Hancor Sure-Lok ST perforated pipe. Perforations shall be factory slotted. Other products may be acceptable, pending approval by the geotechnical engineer. The drain pipe shall be installed a minimum of 1 foot below footing elevation and be buried in an envelope of free draining gravel. Foundation damp-proofing of foundation walls is recommended.

A critical element of foundation drain construction includes proper drain pipe grading. Uneven pipe grades or "bellies" are typical defects that may cause water redistribution to unwanted locations. Additionally, pipes should be placed low enough to collect water that may accumulate below basement slabs. The drainpipe should be sloped to daylight and fitted with wire mesh to keep out rodents or debris.

5.8 Interior Slabs-On-Grade

Light duty slabs are typically constructed as thin elements with little or no steel reinforcement. Slabs constructed in this fashion shall be considered walking surfaces, and not structural elements. Non-structural slabs shall be anticipated to crack, warp, and move as the result of many factors. If expectations of slab performance are high, then slabs shall be designed as structural elements.

A structural engineer should design interior slabs based on anticipated long-term and construction phase loading. Cracking of slabs-on-grade is difficult to control and should be expected to occur with time. Cracking may be the result of many factors such as concrete shrinkage and daily and seasonal variability in temperature and humidity and not necessarily the result of soil movement.

If floor coverings or coatings less permeable than the concrete slab will be used, or if moisture is a concern, we recommend a vapor retarder be placed beneath the slab. Some coverings, coatings or situations may require a vapor *barrier*, i.e., a membrane with a permeance less than 0.3 perms. Flooring installation should be consistent with the flooring manufacturer's recommendations for subsoil and slab construction and moisture testing prior to installation. A durable membrane such as *Stego Wrap* (Stego Industries, LLC) may be used. Such products should be installed according to the manufacture's recommendations. Installation of a vapor barrier/retarder may increase the tendency for slab curling.

5.9 Exterior Slabs-On-Grade

Exterior concrete flatwork often moves in response to changes in temperature and soil moisture, or freeze/thaw cycles. Over-excavation and replacement of 9 inches of subgrade soil with granular fill may reduce the tendency of the slabs to move. Granular materials placed below slabs should be graded to drain. Steel reinforcement requirements shall be designed by the structural engineer based on anticipated long-term and construction phase loading as well as subgrade variability and curling tolerances.

Exterior columns should not bear on exterior slabs or un-compacted fill to help reduce slab movement being transferred to the structure. Sidewalks and non-critical slabs shall be designed and proportioned per local codes and standard of practice.

5.10 Other Considerations

Footings, slabs, and foundation and retaining walls should be reinforced to resist differential movement. A structural engineer should specify reinforcement.

Water, sewer, and sprinkler lines should be pressure tested before backfilling.

5.11 Environmental Services

Environmental services, including but not limited to a Phase I investigation, evaluation of soil and groundwater quality or contaminants, and radon testing are not included in this report and are beyond the scope of this geotechnical investigation.

5.12 Winter Construction

Subgrade soils and fill should be protected against frost and freezing ground conditions. No concrete or structural fill shall be placed against frozen ground or contain froze materials such as snow or ice. It is the contactor's responsibility to take adequate precautions to prevent damage from frost heave or frozen subgrade. Insulating or warming blankets are recommended to protect subgrade soils when temperatures are near or below freezing.

5.13 Construction Observations

A representative of this office should observe the foundation excavation, installation of foundation underpinning, and placement and compaction of structural fill. Recommendations in this report are contingent upon our involvement. If any unexpected soils or conditions are revealed during construction, this office should be notified immediately to survey the conditions and make necessary modifications.

6.0 LIMITATIONS

The conclusions and recommendations presented in this report assume that site conditions are not substantially different than those exposed by the test holes. If subsurface conditions different from those encountered in the test holes are observed or appear to be present during construction, GEOSCIENCE, PLLP should be advised so that we can review those conditions and reconsider our recommendations where necessary. In addition, we should review any foundation plans for the project to determine if the recommendations presented have been followed.

If there is a substantial lapse of time between submission of this report and the start of work at the site and conditions have changed due to natural causes or construction operations at or near the site, it is recommended that this report be reviewed to determine the applicability of the conclusions and recommendations.

This report was prepared for use by the client and their representatives. It should be made available to prospective contractors for information on factual data only and not as a warranty of subsurface conditions. This report should be passed on to design professionals, contractors, and future property owners to alert them to the risks associated with water and other hazards.

This report has been prepared for the exclusive use of our client, as referenced in the cover letter and cover page of this report. All information contained in this report as well as any future written documents, that may address comments or questions regarding this report, constitute the "entire report". GEOSCIENCE, PLLP's opinions, conclusions, and recommendations are based on the entire report. This report may be insufficient for other applications or other clients, other than those described herein. The entire report shall not be transferred to other clients or used for other purposes without the written consent and permission of GEOSCIENCE, PLLP.

It is customary for the consultant that provides design recommendations to be retained to provide observation and related services during construction. If GEOSCIENCE is not retained to provide continuing services, you agree to hold harmless from all claims, loses, and expenses arising out of any interpretation, clarifications, substitutions, or modifications of our work provided to you or others. If GEOSCIENCE is retained to provide observations and related services during construction, our services will not in any way have any right to control the work, stop the job, supervise or coordinate subcontractors, direct the contractor’s means, methods, techniques, sequences or procedures of construction, and safety precautions and programs.

Long term monitoring of groundwater levels was not included as part of this scope of services. We recommend the client continue to monitor groundwater elevations as the project proceeds. Groundwater levels may change due to seasonal precipitation, irrigations, changes in land use and other factors. Evaluation of these influences or prediction of future groundwater levels is outside of this scope of services.

These services have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar conditions. No warranty is made or implied.

This report, including engineering analyses, recommendations, figures, and design details are exclusive to the above referenced site. Under no circumstances shall the figures be separated from the text and used independently. Recommendations in this report are not applicable to other construction sites.

7.0 REFERENCES

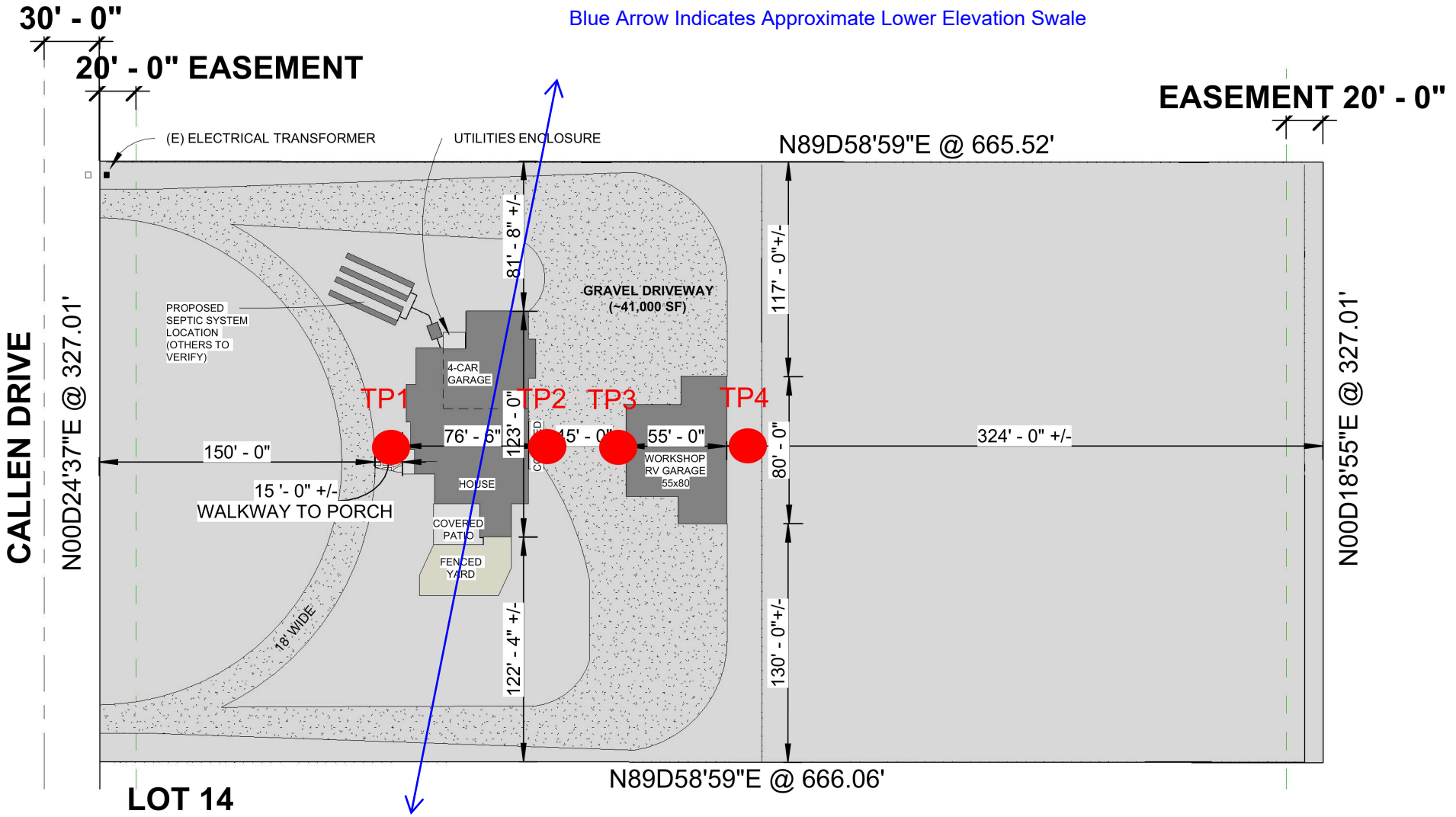
Bowles, J.E., 1996, Foundation Analysis and Design, 5th Ed.: McGraw-Hill.

Terzaghi, K., Peck, R.B., and Mesri, G., 1996, Soil Mechanics in Engineering Practice, 3rd Edition, John Wiley and Sons, Inc.

APPENDIX A

Figure

Living By Design, LLC
SONYA MCLEOD ~ 307.250.2836 ~ designwithsonya@gmail.com
Date: 03-26-26



LOT 14
4.77 NET ACRES
5 GROSS ACRES

Not to Scale
Test Hole Location Approximate

N

THE DORIANS
1" = 80'-0"

R1

APPENDIX B

Test Hole Logs

TEST PIT LOG

TEST PIT NO. TH1

File: Dorian Logs Date Printed: 4/2/2026

PROJECT: Lot 14, Callen West Subdivision **STRUCTURE.:** Residence
CLIENT: Winston & Connie Dorian **DATE:** 4/1/2026
LOCATION: West Side of Home **ELEVATION:** NM
CONTRACTOR: JLG **LOGGED BY:** JLG
EQUIPMENT: Excavator
DEPTH TO - WATER> INITIAL: ▽ NA **AFTER 24 HOURS:** ▽ _____ **CAVING>** C _____

Depth (feet)	Description	Soil Type	Elevation (feet)	Samplers	TEST RESULTS	Monitor Well Installation Details
0	Sandy Lean Clay, Clayey Sand, to Silty Sand (CL,SC, SM); loose/soft, dry becoming moist with depth, brown, stratifed and thinly bedded, Sandy Gravel (GP) lenses 6 to 12-inches thick, [Alluvium]				Plastic Limit ⊢——⊣ Liquid Limit Water Content - ● 10 20 30 40 50 Penetrometer (tsf)- ▨ 1 2 3 4	
2						
4						
6						
8						
10						
12						
14	14					

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

GEOSCIENCE, PLLP
BILLINGS, MONTANA

TEST PIT LOG

TEST PIT NO. TH2

File: Dorian Logs Date Printed: 4/2/2026

PROJECT: Lot 14, Callen West Subdivision **STRUCTURE.:** Residence
CLIENT: Winston & Connie Dorian **DATE:** 4/1/2026
LOCATION: East Side of Home **ELEVATION:** NM
CONTRACTOR: JLG **LOGGED BY:** JLG
EQUIPMENT: Excavator
DEPTH TO - WATER> INITIAL: NA **AFTER 24 HOURS:** **CAVING>** C

Depth (feet)	Description	Soil Type	Elevation (feet)	Samplers	TEST RESULTS	Monitor Well Installation Details
0	Sandy Lean Clay, Clayey Sand, to Silty Sand (CL,SC, SM); loose/soft, dry becoming moist with depth, brown, stratifed and thinly bedded [Alluvium]				Plastic Limit — Liquid Limit; Water Content - 10 20 30 40 50; Penetrometer (tsf)- 1 2 3 4	
4	Sandy Gravel with Cobble (GP); loose to medium dense, slighly moist, grayish brown, subangular to subrounded, stratified [Alluvium]					
8	Sandy Lean Clay, Clayey Sand, to Silty Sand (CL,SC, SM); loose/soft, dry becoming moist with depth, brown, stratifed and thinly bedded, Sandy Gravel (GP) lenses 6 to 12-inches thick, [Alluvium]					
14						

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

GEOSCIENCE, PLLP
Billings, Montana

TEST PIT LOG

TEST PIT NO. TH3

File: Dorian Logs Date Printed: 4/2/2026

PROJECT: Lot 14, Callen West Subdivision **STRUCTURE.:** Residence
CLIENT: Winston & Connie Dorian **DATE:** 4/1/2026
LOCATION: West Side of Shop **ELEVATION:** NM
CONTRACTOR: JLG **LOGGED BY:** JLG
EQUIPMENT: Excavator
DEPTH TO - WATER> INITIAL: ▽ NA **AFTER 24 HOURS:** ▽ _____ **CAVING>** C _____

Depth (feet)	Description	Soil Type	Elevation (feet)	Samplers	TEST RESULTS	Monitor Well Installation Details
0	Sandy Lean Clay, Clayey Sand, to Silty Sand (CL,SC, SM); loose/soft, dry becoming moist with depth, brown, stratifed and thinly bedded, Sandy Gravel (GP) lenses 6 to 12-inches thick, [Alluvium]				Plastic Limit ⊢——⊣ Liquid Limit Water Content - ● 10 20 30 40 50 Penetrometer (tsf)- ▨ 1 2 3 4	
2						
4						
6						
8						
10						
12						
14	14					

This information pertains only to this boring and should not be interpreted as being indicitive of the site.

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TEST PIT LOG

TEST PIT NO. TH4

File: Dorian Logs Date Printed: 4/2/2026

PROJECT: Lot 14, Callen West Subdivision **STRUCTURE.:** Residence
CLIENT: Winston & Connie Dorian **DATE:** 4/1/2026
LOCATION: East Side of Shop **ELEVATION:** NM
CONTRACTOR: JLG **LOGGED BY:** JLG
EQUIPMENT: Excavator
DEPTH TO - WATER> INITIAL: ▽ NA **AFTER 24 HOURS:** ▽ _____ **CAVING>** C _____

Depth (feet)	Description	Soil Type	Elevation (feet)	Samplers	TEST RESULTS	Monitor Well Installation Details
0	Sandy Lean Clay, Clayey Sand, to Silty Sand (CL,SC, SM); loose/soft, dry becoming moist with depth, brown, stratifed and thinly bedded, Sandy Gravel (GP) lenses 6 to 12-inches thick, [Alluvium]				Plastic Limit ⊢——⊣ Liquid Limit Water Content - ● 10 20 30 40 50 Penetrometer (tsf)- ▨ 1 2 3 4	
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