TOWN OF JACKSON
PLANNING & BUILDING DEPARTMENT

TRANSMITTAL MEMO

Town of Jackson
- ☒ Public Works/Engineering
- ☒ Building
- ☐ Title Company
- ☒ Town Attorney
- ☒ Police

Joint Town/County
- ☒ Parks and Recreation
- ☒ Pathways
- ☒ Housing Department

Teton County
- ☐ Planning Division
- ☐ Engineer
- ☐ Surveyor- *Nelson*
- ☐ Assessor
- ☐ Clerk and Recorder
- ☐ Road and Levee

State of Wyoming
- ☐ Teton Conservation
- ☒ WYDOT
- ☐ TC School District #1
- ☐ Game and Fish
- ☐ DEQ

Federal Agencies
- ☐ Army Corp of Engineers

Utility Providers
- ☐ Qwest
- ☐ Lower Valley Energy
- ☐ Bresnan Communications

Special Districts
- ☒ START
- ☒ Jackson Hole Fire/EMS
- ☐ Irrigation Company

Date: December 30, 2019

Item #: P19-291

Planner: Tyler Valentine

Phone: 733-0440 ext. 1305

Fax: 734-3563

Email: tvalentine@jacksonwy.gov

Owner:
Teton Gables
PO Box 991
Jackson, WY 83001

Applicant:
Cornelius Kinsey
PO Box 12258
Jackson, WY 83002

REQUESTS:

The applicant is submitting a request for a Hillside CUP for 1140 W. Highway 22 legally know as, PT SW1/4NE1/4, SEC.32, TWP.41, RNG 116.

For questions, please call Tyler Valentine at 733-0440, x1305, or email to the address shown below. Thank you.

Please respond by: **January 13, 2020 (Sufficiency)**
January 20, 2020 (with Comments)

RESPONSE: For Departments not using Trak-it, please send responses via email to:
tstolte@jacksonwy.gov

PLANNING PERMIT APPLICATION
Planning & Building Department

150 E Pearl Ave.
P.O. Box 1687
Jackson, WY 83001

ph: (307) 733-0440
www.townofjackson.com

For Office Use Only

Fees Paid_____ Date & Time Received _____

Application #s _____ _____ _____

Please note: *Applications received after 3 PM will be processed the next business day.*

PROJECT.

Name/Description: Gables Redevelopment

Physical Address: 1140 West Highway 22

Lot, Subdivision: PT SW1/4NE1/4, SEC. 32, TWP.41, RNG 116 PIDN: 22-41-16-32-1-00-031

PROPERTY OWNER.

Name: Teton Gables, LLC - Tyler Davis Phone: 407.952.1735

Mailing Address: P.O. Box 991, Jackson, WY ZIP: 83002

E-mail: tylerdavis34@yahoo.com

APPLICANT/AGENT.

Name: Cornelius Kinsey - Kinsey, LLC Phone: 413.2485

Mailing Address: P.O. Box 12258, Jackson, WY ZIP: 83002

E-mail: kinseycornelius@yahoo.com

DESIGNATED PRIMARY CONTACT.

_____Property Owner X_____Applicant/Agent

TYPE OF APPLICATION. *Please check all that apply; review the type of application at www.townofjackson/200/Planning*

Use Permit

_____Basic Use

X_____Conditional Use

_____Special Use

Relief from the LDRs

_____Administrative Adjustment

_____Variance

_____Beneficial Use Determination

_____Appeal of an Admin. Decision

Physical Development

_____Sketch Plan

_____Development Plan

_____Design Review

Subdivision/Development Option

_____ Subdivision Plat

_____Boundary Adjustment (replat)

_____Boundary Adjustment (no plat)

_____Development Option Plan

Interpretations

_____Formal Interpretation

_____Zoning Compliance Verification

Amendments to the LDRs

_____LDR Text Amendment

_____Map Amendment

Miscellaneous

X_____**Other:** Hillside

_____Environmental Analysis

PRE-SUBMITTAL STEPS. *To see if pre-submittal steps apply to you, go to www.townofjackson.com/200/Planning and select the relevant application type for requirements. Please submit all required pre-submittal steps with application.*

Pre-application Conference #: P18-344 Environmental Analysis #: Exempted by P19-239

Original Permit #: _____ Date of Neighborhood Meeting: _____

SUBMITTAL REQUIREMENTS. *Please ensure all submittal requirements are included. The Planning Department will not hold or process incomplete applications. Partial or incomplete applications will be returned to the applicant. Go to www.townofjackson.com/200/Planning and select the relevant application type for submittal requirements.*

Have you attached the following?

_____ **Application Fee.** Fees are cumulative. Go to www.townofjackson.com/200/Planning and select the relevant application type for the fees.

_____ **Notarized Letter of Authorization.** A notarized letter of consent from the landowner is required if the applicant is not the owner, or if an agent is applying on behalf of the landowner. Please see the Letter of Authorization template at www.townofjackson.com/DocumentCenter/View/102/Town-Fee-Schedule-PDF.

_____ **Response to Submittal Requirements**. The submittal requirements can be found on the TOJ website for the specific application. If a pre-application conference is required, the submittal requirements will be provided to applicant at the conference. The submittal requirements are at www.townofjackson.com/200/Planning under the relevant application type.

Note: Information provided by the applicant or other review agencies during the planning process may identify other requirements that were not evident at the time of application submittal or a Pre-Application Conference, if held. Staff may request additional materials during review as needed to determine compliance with the LDRs.

Under penalty of perjury, I hereby certify that I have read this application and associated checklists and state that, to the best of my knowledge, all information submitted in this request is true and correct. I agree to comply with all county and state laws relating to the subject matter of this application, and hereby authorize representatives of Teton County to enter upon the above-mentioned property during normal business hours, after making a reasonable effort to contact the owner/applicant prior to entering.

Signature of Property Owner or Authorized Applicant/Agent — Date: 12/27/19

Tyler Davis — Name Printed

Owner — Title

28 December 2019

Paul Anthony
Town of Jackson Planning and Development
150 East Pearl Avenue
Jackson, WY 83001

Mr. Anthony,

The applicant, Teton Gables, LLC (Tyler Davis - Owner), is requesting approval for Hillside Conditional Use Permit, for 1140 W. Highway 22.

BACKGROUND:
The applicant/owner is Teton Gables, LLC. The applicant owns the lot defined as PT SW1/4NE1/4, SEC 32, TWP. 41, RNG. 116, (commonly known as 1140 W. Highway 22 or the Cutty's). The lot is zoned CR-3 (Commercial Residential - 3). The lot currently has a restaurant and hotel, the restaurant constructed in approximately 1940's with the hotel built in the 1971. The site has been heavily disturbed over the years and no longer features native vegetation nor does it provide habitat to species of concern protected by Teton County. The lot is approximately 1.40 ac. The applicant proposes replacing the one of the existing hotel structures with one structure that will serve as an employee and local workforce housing also well as lodging units to replace the ones being torn down. On 4 December 2019, the town has determined the property is exempt from the Scenic Resource Overlay (SRO) and the Natural Resource Overlay (NRO) and the hillside slopes were naturally 21.7% so it will exempt from a Variance through Zoning Compliance Verification (ZCV) P19-239. The applicant is applying for a Hillside Conditional Use Permit

Conditional Use Permit (8.4.2.C) FINDINGS:

1. Is compatible with the desired future character of the area;
   The site is located in District 4.1, Midtown Highway Corridor of the Comprehensive Plan (Comp Plan) for Jackson and Teton County. The future as described by the Comp Plan is 2-3 stories buildings, pedestrian connectivity to the south side of the Highway and buildings with adequate setbacks and screening proportional to the highway, with the four stories buildings when they are built into and used to screen the adjacent hillsides. The proposed building is three stories, possibly four stories, built into the hillside, hence the reason the applicant is requesting the Hillside CUP to push the building back from the highway. The parking on the lower floor will be screened from the highway per 2.2.13.E.6 of the Town of Jackson LDR's and extend at least 20 feet down the side of the facades. The existing parking will remain as it has and the new parking will be screened from view. Though this building is not multi-use, the property already has a restaurant and offices, which is what the comp plan proposes for the district. The Comp Plan wants to connect the north and south sides since Highway 191 bifurcates the district, the light at the junction of Highway 191 and 22 is pedestrian friendly and specifically addresses pedestrians crossing the highway.

2. Complies with the use specific standards of Div 6.1;
   Per 6.1.1 Use Schedule, Residential apartment or Attached Single-Family Unit in CR-3 are a Basic Use Permit. There are seven conventional lodging units from the existing building to be

demolished that were grandfathered, built in 1971, that will be incorporated into the proposed project. Conventional lodging units in the CR-3 are a "Use not allowed."

3. Minimizes adverse visual impacts;
The reason for the Hillside CUP is to reduce the visual impact on the 191 Highway corridor by pushing the building into the hill. The Comp plan actually wants development built with adequate setbacks and built into the adjacent hillside. The third floor sets back at some locations to reduce the mass seen from the street. If a fourth floor is proposed then it will completely be stepped back from the face of the building, except for the stair and elevator tower. The first minimization is to hide the renter's storage units so that they could not be seen from the street. The storage units for this project are located in the rear of the building in the basement, which will be underground and cannot be seen from the street. The dumpster is hidden under the building in a closed fence with doors.

4. Minimizes adverse environmental impacts;
The indirect and direct natural environmental impacts caused by the proposed redevelopment have been assessed by Alder Environmental LLC professionals. For the purpose of their review, *environment* can be defined as natural resources such as air, soil, water, plants and wildlife. *Adverse environmental impacts* are defined as any harmful effects on the natural environment that reduce flora or fauna habitat, impair the function of components in the natural environment (e.g. wetlands), or make the local environment socially unacceptable. *Minimize* is defined as not increasing impacts beyond what already exists.

The proposed apartment and motel building with parking garage will be located on a property within the Town of Jackson that has a history of land disturbing activities and development pre-dating 1955 (Teton County GIS Mapserver). The property is currently surrounded by developed land including storage units, the busiest intersection in Wyoming and an old gas station. The current land use of the property and vicinity have adversely affected the natural environment and replaced any natural habitat, plants and soils with developed conditions. The property does not constitute meaningful wildlife habitat as presented in the December 20, 2019 Wildlife Review Letter prepared by Alder Environmental LLC. Since no industrial type exhaust or air pollutant activities are proposed, impacts to air quality should remain the same as existing conditions. Impervious surface will remain relatively the same and stormwater runoff will continue to connect into the WYDOT system.

Since the proposed development is similar in use and extent as the current developed property no additional adverse environmental impacts are expected.

5. Minimizes adverse impacts from nuisances;
The project minimizes adverse impacts from nuisances, for example is light pollution from the garage parking. The garage parking beneath the building is enclosed on both Hwy 191 and 22 sides except for the entrances to block the light emitted from the fixtures. The storage units for this project are located in the rear of the building in the basement or on the first floor, which will be underground and cannot be seen from the street. For this project, renters will be allowed to have one pet, either a dog or a cat to reduce the number of animals allowed on the property. The two existing dumpsters will be enclosed with a roof and doors to reduce the birds and other animals from trying to use the trash as a food source.

6. Minimizes adverse impacts on public facilities;
This project minimizes impacts to existing public facilities due to its location. The project site is located within 900 feet of the Buffalo Way START bus stop adjacent to Albertson's. Striping or other traffic guiding devices can be utilized at the property entrances to promote right turn movements onto the adjacent streets. The property is located adjacent to Wyoming Highway 22 and Broadway Avenue (S HWY 89). Due to the very high volumes observed during all times of years on these streets, it is highly unlikely that traffic generated by any developments on this property would influence traffic on adjacent streets in any way. Since the prospected residents of the planned development are expected to work in Jackson, it is not likely that trips generated from the development would contribute to the traffic density problems on Highway 22.

The project is adjacent to the pedestrian and bicycle corridor created by the Teton County and Town of Jackson pathways systems. This provides the development with more than adequate multi-modal transportation options. It would be anticipated that many residents of the development would choose to utilize pedestrian and bicycle facilities for a commute to the downtown area.

Water for the planned development will be provided from an existing 6" water main near the north corner of the property. Water flow modeling was performed during an off-site utilities investigation in the spring of 2019 found that a demand of 400 gallons per minute can be supplied to the property with a 35-psi residual pressure in the water system. Peak wastewater flows were calculated using fixture unit analysis. This analysis indicated an increase from 45 gallons per minute to 60 gallons per minute for the peak wastewater flow rates. Discussions with the Town of Jackson Engineering Department indicate that the existing sewer system in this area has capacity for increased flows.

The police, fire, and EMS stations are located less than 2 miles from the project. Due to the location on Broadway Avenue (S Highway 89), it can be assumed that no additional police patrols would be required. Broadway Avenue is already patrolled heavily by the town, county and state. Since the proposed building would be fire sprinklered, small fires would be extinguished by the fire sprinkler system. The location on Broadway Avenue would also see quick response times from EMS and fire crews in the event of a large fire or serious injury.

7. Complies with all other relevant standards of these LDR's and all other Town Ordinances: and
The two-story building, restaurant/office was built into the front setback in the 1940's before the county (at the time the property was in the county) had setback requirements. This building was grandfathered due to the length of time of existing and no work is proposed for this building. There are two parking places on the north side of the property next to the hotel office that are not in the parking setback that are grandfathered since no work is to be complete in that area. The remaining parking spots that are in the parking setback on the south side of the property will be removed from the proposed project. The proposed project will comply with all other relevant standards of the Town of Jackson LDR's and Town Ordinances.

8. Is in substantial conformance with all standards or conditions of any prior applicable permits or approvals.
The last building permits (B17-0712, B18-001, B18-0014, B18-0017 and B18-0019) were closed by Jim Green on 4 May 2018. The work inspected under the listed permits and associated trade permits were found to be in compliance with the applicable codes and ordinances of the Town

of Jackson and the construction documents at the time of inspection. The final inspections for the permits range from 26 January 2018 to 27 April 2018.

HILLSIDE CUP (5.4.1.C.5) FINDINGS:

5. The following finding shall be made before granting a Conditional Use Permit for hillside areas: that the mitigation measures identified will be effective in mitigating any adverse impacts identified, and associated with the proposed physical development, uses, development options, or subdivision.
The materials presented for the submittal requirements under 5.4.1.C.6 adequately illustrate the efficacy of constructing the proposed physical development. The Geotechnical Report discusses soil nail wall construction and associated slope stability for the excavations that facilitate building construction. In soil nail wall construction, soil is excavated incrementally from the top down as the wall is installed. This mitigates temporary slope instabilities associated with other types of wall or shoring installations. Steep slopes at the project site will be treated with erosion control measures and revegetated to prevent any localized slope instabilities.

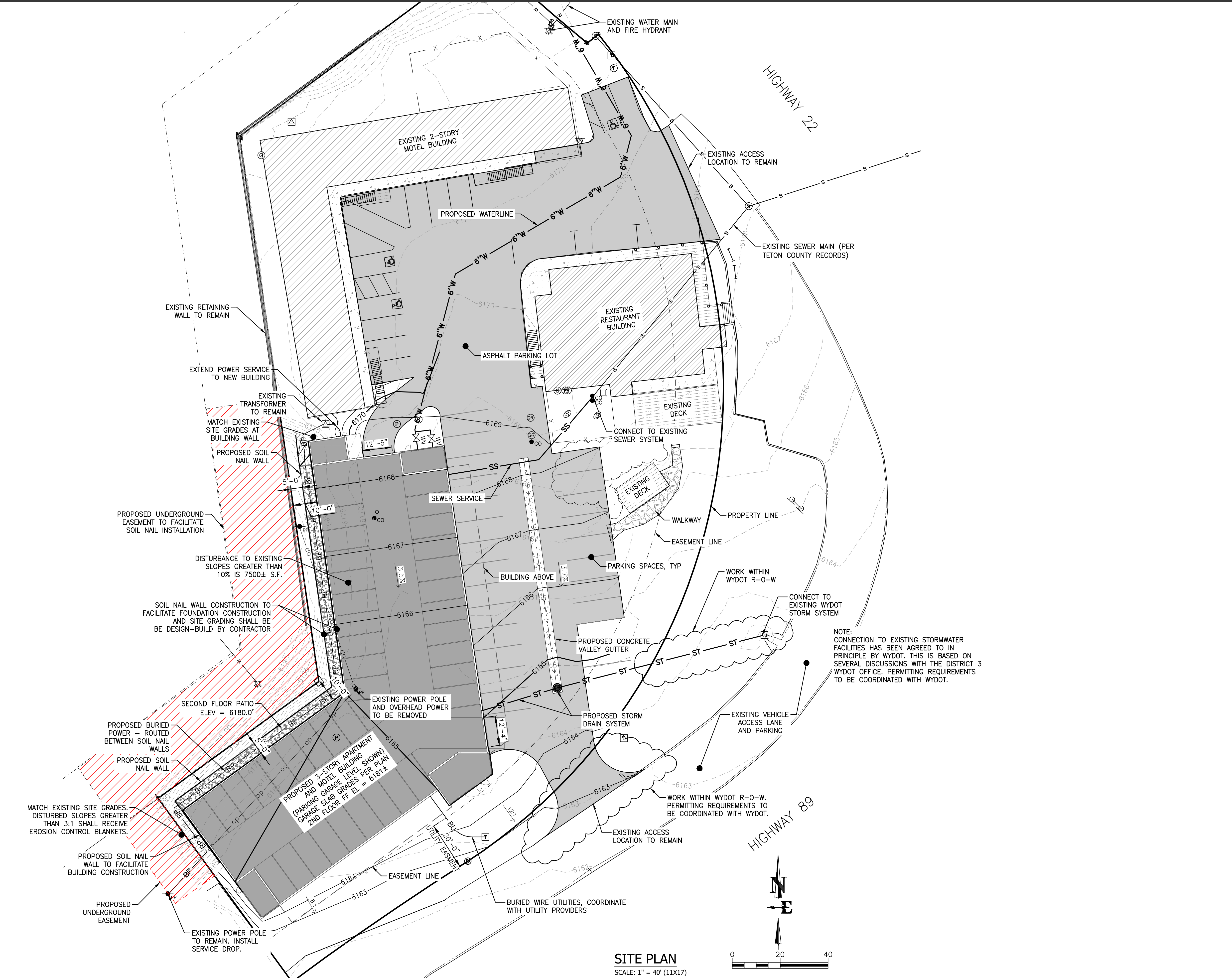
REQUEST:
The applicant respectfully requests based on the above findings that the planning department recommends the approval of this Hillside Conditional Use Permit for 1140 W. Highway 22.

Thank you for your assistance with this request. Please contact me should you have any questions or concerns regarding this request.

Best Regards,

Cornelius Kinsey, AIA NCARB

Enclosed:
Executed Hillside CUP application
Alder Environmental Report
Nelson Engineering Geotech Report
(3) 3-d Rendering of the proposed project
Nelson Hillside CUP Site Plan
Weaver Landscape Plan



EXISTING WATER MAIN AND FIRE HYDRANT
HIGHWAY 22
EXISTING 2-STORY MOTEL BUILDING
EXISTING ACCESS LOCATION TO REMAIN
PROPOSED WATERLINE
EXISTING SEWER MAIN (PER TETON COUNTY RECORDS)
EXISTING RESTAURANT BUILDING
EXISTING RETAINING WALL TO REMAIN
ASPHALT PARKING LOT
EXTEND POWER SERVICE TO NEW BUILDING
EXISTING TRANSFORMER TO REMAIN
EXISTING DECK
CONNECT TO EXISTING SEWER SYSTEM
MATCH EXISTING SITE GRADES AT BUILDING WALL
PROPOSED SOIL NAIL WALL
SEWER SERVICE
EXISTING DECK
WALKWAY
PROPERTY LINE
PROPOSED UNDERGROUND EASEMENT TO FACILITATE SOIL NAIL INSTALLATION
EASEMENT LINE
DISTURBANCE TO EXISTING SLOPES GREATER THAN 10% IS 7500± S.F.
BUILDING ABOVE
PARKING SPACES, TYP
WORK WITHIN WYDOT R-O-W
CONNECT TO EXISTING WYDOT STORM SYSTEM
SOIL NAIL WALL CONSTRUCTION TO FACILITATE FOUNDATION CONSTRUCTION AND SITE GRADING SHALL BE BE DESIGN-BUILD BY CONTRACTOR
PROPOSED CONCRETE VALLEY GUTTER
NOTE: CONNECTION TO EXISTING STORMWATER FACILITIES HAS BEEN AGREED TO IN PRINCIPLE BY WYDOT. THIS IS BASED ON SEVERAL DISCUSSIONS WITH THE DISTRICT 3 WYDOT OFFICE. PERMITTING REQUIREMENTS TO BE COORDINATED WITH WYDOT.
SECOND FLOOR PATIO ELEV = 6180.0'
EXISTING POWER POLE AND OVERHEAD POWER TO BE REMOVED
PROPOSED STORM DRAIN SYSTEM
EXISTING VEHICLE ACCESS LANE AND PARKING
PROPOSED BURIED POWER - ROUTED BETWEEN SOIL NAIL WALLS
PROPOSED SOIL NAIL WALL
PROPOSED 3-STORY APARTMENT AND MOTEL BUILDING (PARKING GARAGE LEVEL SHOWN) GARAGE SLAB GRADES PER PLAN 2ND FLOOR FF EL = 6181±
MATCH EXISTING SITE GRADES. DISTURBED SLOPES GREATER THAN 3:1 SHALL RECEIVE EROSION CONTROL BLANKETS.
WORK WITHIN WYDOT R-O-W. PERMITTING REQUIREMENTS TO BE COORDINATED WITH WYDOT.
EXISTING ACCESS LOCATION TO REMAIN
HIGHWAY 89
PROPOSED SOIL NAIL WALL TO FACILITATE BUILDING CONSTRUCTION
UTILITY EASEMENT
EASEMENT LINE
PROPOSED UNDERGROUND EASEMENT
BURIED WIRE UTILITIES, COORDINATE WITH UTILITY PROVIDERS
EXISTING POWER POLE TO REMAIN. INSTALL SERVICE DROP.
SITE PLAN
SCALE: 1" = 40' (11X17)
0 20 40

DATE	10/16/19
SURVEYED	NE
ENGINEERED	AL
DRAWN	AL
CHECKED	MB
APPROVED	MB
REV.	

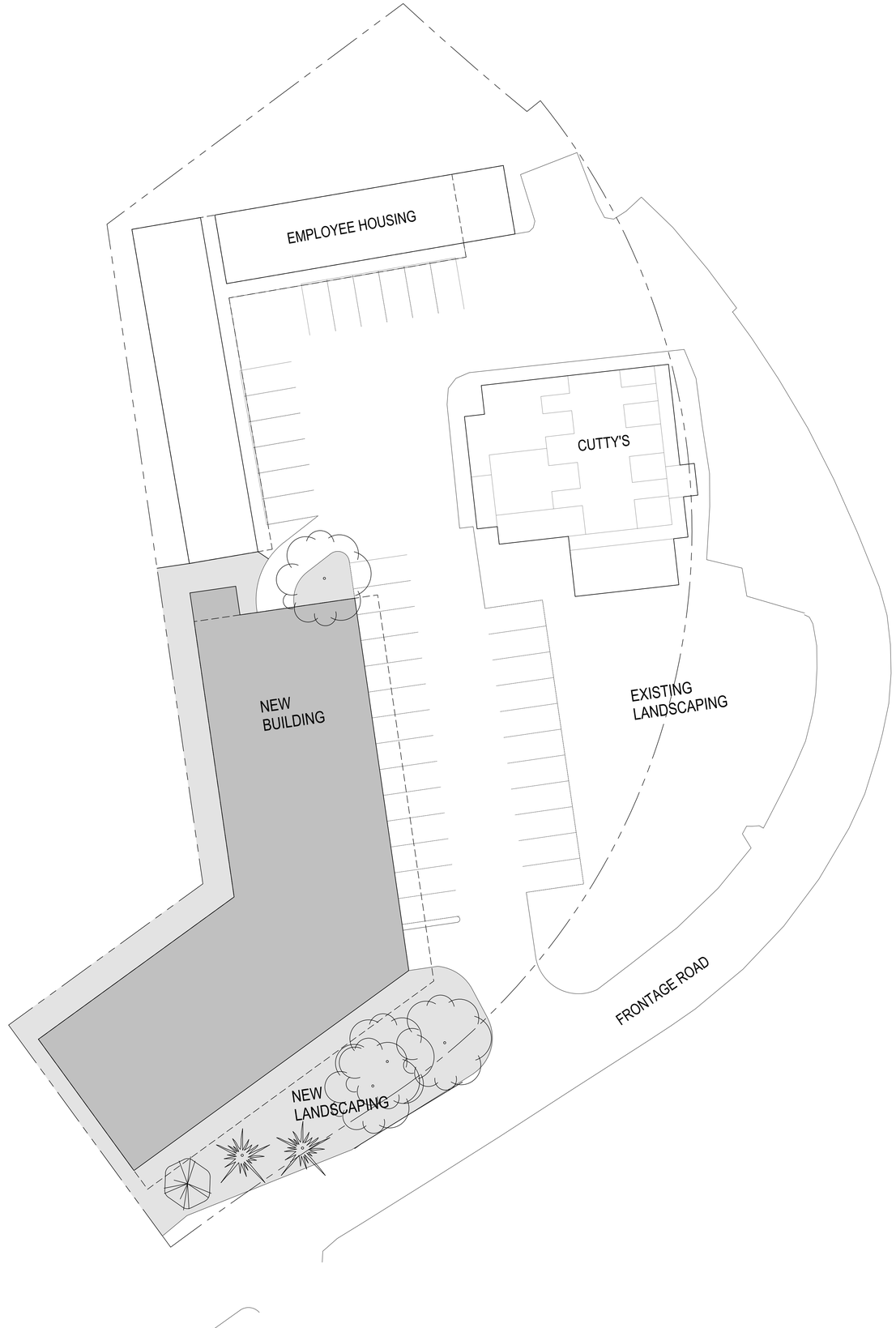
NELSON ENGINEERING
P.O. BOX 1599, JACKSON WYOMING (307) 733-2087

DRAWING TITLE
HILLSIDE CUP SITE PLAN

JOB TITLE
TYLER DAVIS
GABLES MOTEL
JACKSON, WY

DRAWING NO
CUP-1

JOB NO
18-262-04



PRELIMINARY

WEAVER & ASSOCIATES PA
LANDSCAPE ARCHITECTURE - LAND PLANNING
1605 SOUTH WOODRUFF AVENUE
IDAHO FALLS, IDAHO 83404
(208) 529-9504

GABLES PHASE II
TOWN OF JACKSON
TETON COUNTY, WYOMING

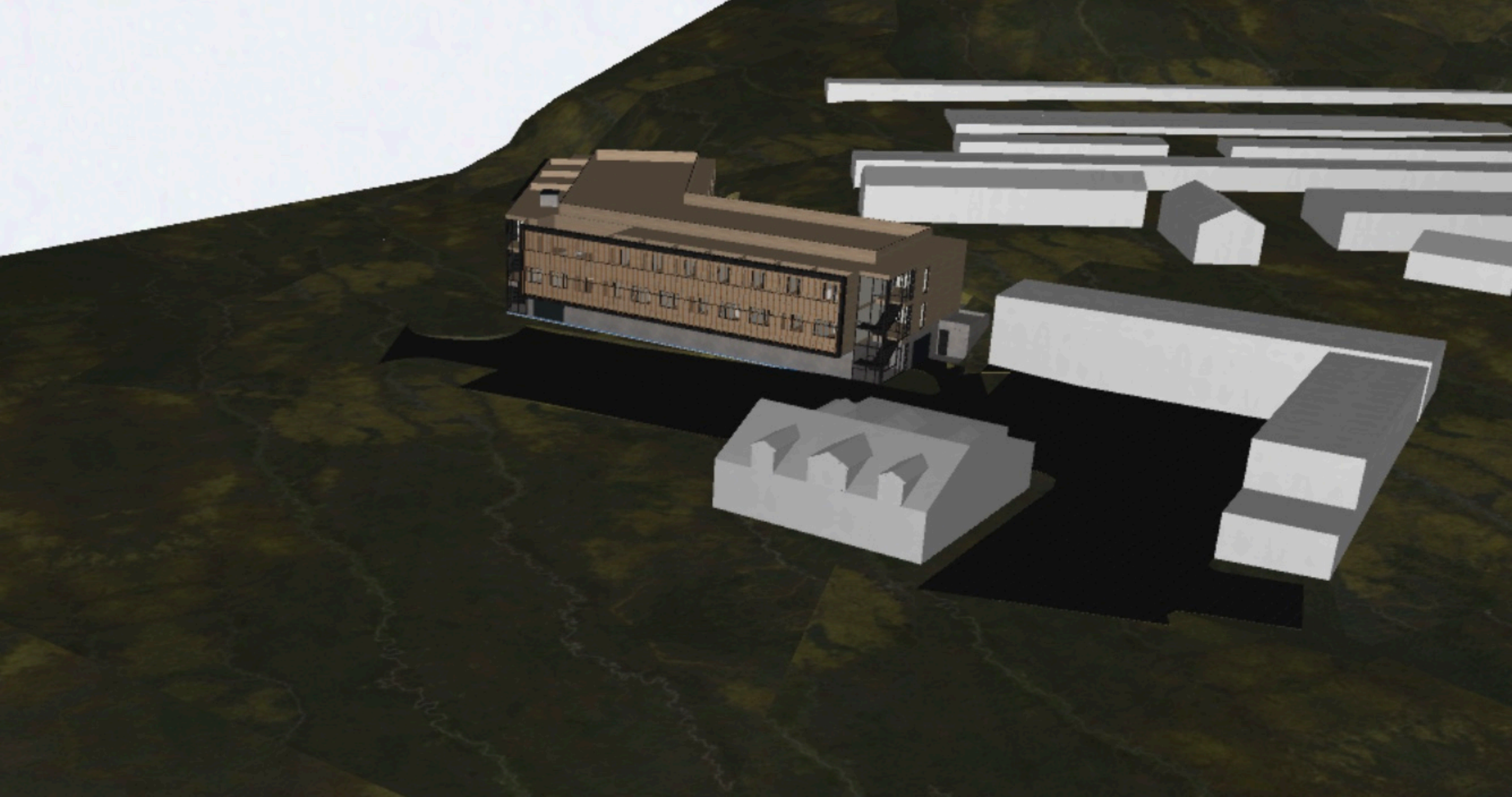
12-27-19

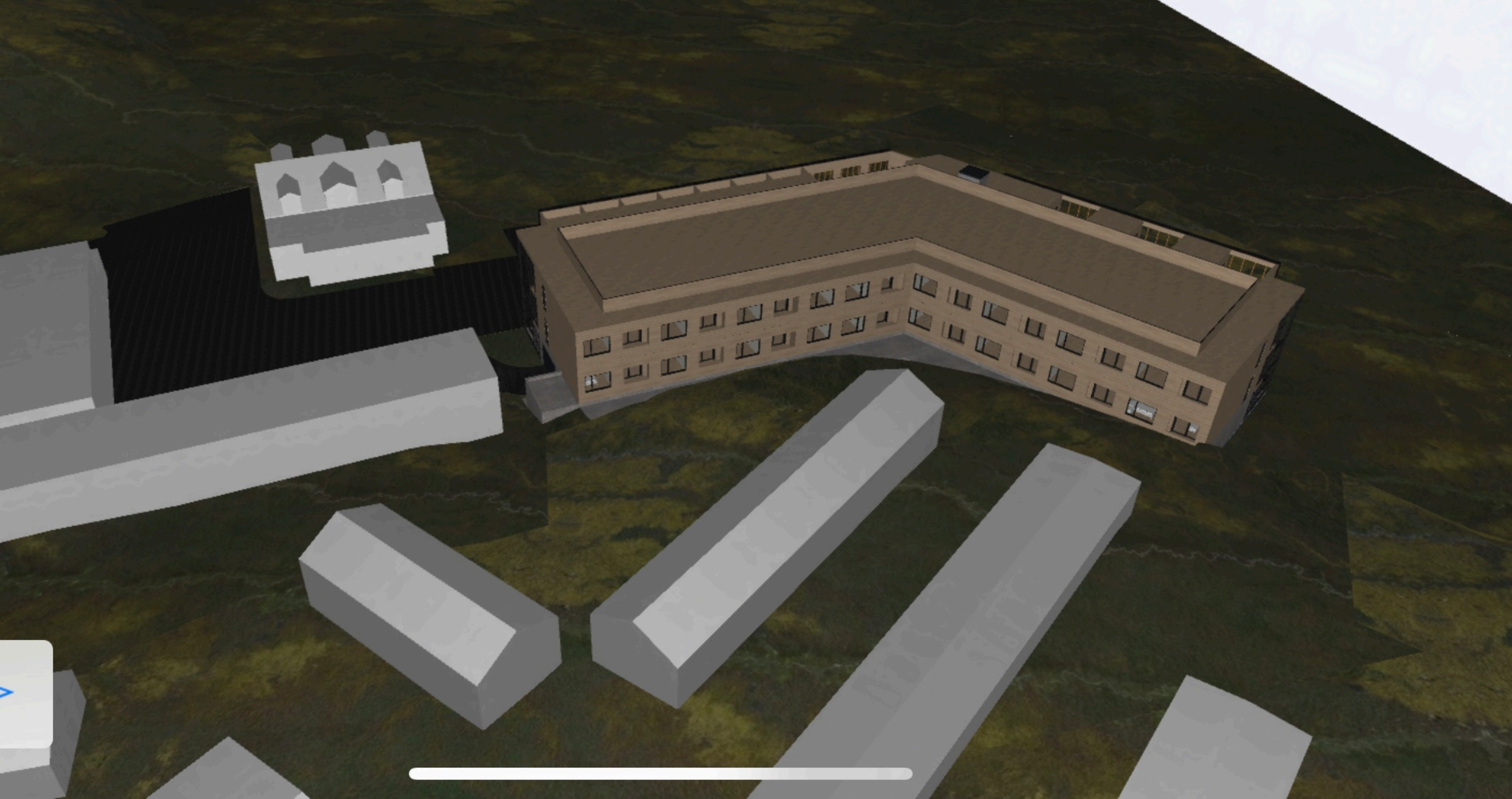
PRELIMINARY
LANDSCAPE PLANTING PLAN

N

20 10 0 20 40 60
1" = 20'-0" - 24"x36" SHEET SIZE

L1.1





GEOTECHNICAL INVESTIGATION

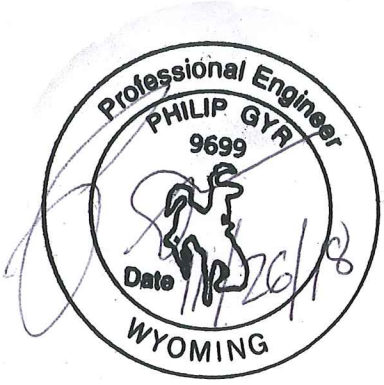
TETON GABLES MIXED USE STRUCTURE
SCHEMATIC DESIGN PHASE
JACKSON, WYOMING

PREPARED
FOR:

TYLER DAVIS
JACKSON, WYOMING

PREPARED
BY:

NELSON ENGINEERING
JACKSON, WYOMING



NOVEMBER 2018
Project No. 16-306-02

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GENERAL AND PROJECT DESCRIPTION

This report pertains to a geotechnical investigation performed for an approximately 74,000 square feet mixed use development referred to as the at 112 Center Street and 165 E Deloney Avenue in downtown Jackson, Wyoming. Recommendations for this report are specific to Schematic Design level plans as prepared Cornelius Kinsey (Architect). A three-story structure is planned. The ground level will be occupied by parking and the upper two levels will be residential. The structure will be inset into existing cut slopes along its western perimeter. Retaining walls will be required to accomplish the cuts.

Scope of Services

The scope of services for this investigation was to provide geotechnical recommendations based on subsurface investigations and soils laboratory testing for the proposed facility. The purpose of the subsurface investigation was to determine soils and groundwater characteristics. The results of the subsurface investigation and subsequent laboratory testing were utilized in an engineering analysis for foundation, paving and construction recommendations. Additional test pits/points of exploration are recommended in the south east area of the project.

Preliminary stability analysis of proposed shored cuts required for excavation was performed sufficient to ensure the feasibility of the proposed cut slopes. The Owner is responsible for obtaining final analysis and design of shoring and/or underpinning from a professional engineer when final plans for construction are prepared. Specific recommendations for drainage and surface water conveyance are not within the scope of work for this report.

The foundation analysis and resulting recommendations contained herein are based on typical loads for the type of structures assumed in this report. In the final design phase, it will be critical that structural loads be properly communicated to the Geotechnical Engineer to verify that the imposed loading conditions on the proposed foundation configuration do not cause excessive settlement, exceed the bearing capacity of the site soils, or exceed the seismic loading capacity of the foundation elements. Lateral earth pressure recommendations contained within this report are general in nature; it is critical that final retaining wall designs are reviewed by the Geotechnical Engineer for review and approval. For this report, it is assumed that foundation elements would not be subjected to unusual loading conditions such as eccentric loads or vibratory equipment. Unusual load conditions can induce settlement or reduce the bearing capacity of foundation elements.

SITE CONDITIONS

Description

The project is located on the northern lower slopes of High School Butte near Antelope Pass, Development of various commercial facilities at the site is evident in historic photos from the last century. Existing structures and improvements include: 1) a two-story restaurant and commercial office building constructed in 1949 2) a 7-room single story motel building constructed in 1949 which currently unused and in disrepair, and 3) a two-story 30-room motels constructed in 1971. Various underground utilities traverse the project.

Existing facilities are located on relatively flat topography that that gently slopes from north/northwest to south/southeast to northwest towards Flat Creek. The flat area was

created by excavation into the hillside and is bounded by steep cut slopes that rise 15 to 20 plus feet up to the west. Historic aerial photos show the cuts were accomplished in the middle part of the twentieth century. The neighboring property to the south and west is occupied by a storage facility.

West of the 7-room motel, the northeast facing slopes are about 1.5(H):1(V) and lead up to a concrete retaining wall that supports a roadway on the property to the south. The wall continues to the north and west of the 30-room building. Historic aerial photography shows the wall was constructed in a fill scenario above existing ground in the years between 1999 and 2001. To the south, the south east facing cut slopes are steeper, ranging from 1.5 to 1. 3H:1V with exposed loess at ground surface.

Geology and Soil Mapping

The area's surface geology is mapped on the USGS "Geologic Map of the Jackson Quadrangle, Teton County, Wyoming," J.D. Love and H.F. Albee, 2004. Surficial deposits within proposed developments are described as "Ql – Loess – Silt, light-gray, structureless, homogenous; deposited by wind."

The US Natural Resources Conservation Service's Soil Survey of Teton County has mapped the Tetonia-Lantonia silt loams within the area of development. The soils are loess deposits found on 6 to 10 percent slopes. This soil is described as very deep, well drained, and composed of silt loam.

Seismic Hazard

Jackson Hole and the project site are located within the Intermountain Seismic Belt, a zone extending from southern Utah through eastern Idaho and western Montana, and encompassing western Wyoming and the Teton Range as referenced by Smith, Robert B., and Walter J. Arabasz. "Seismicity of the Intermountain seismic belt. "Neotectonics of North America," 1991. The USGS Earthquake Hazards Program has mapped Quaternary faults and folds in the United States as displayed on Google Earth with the following active faults near the project site: the Teton Fault, the Phillips Valley Fault, and secondary faults within the Jackson Hole Valley. In particular, the Teton Fault is thought to be capable of producing major earthquakes of a magnitude of six or greater. The portion of the Teton Fault mapped as active in the Quaternary is approximately 6.3 miles northwest of the site. The USGS "Geologic Map of the Jackson Quadrangle, Teton County, Wyoming," J.D. Love and H.F. Albee, 2004, shows the postulate trace of the Cache Creek Thrust Fault a quarter mile south of the project site. The Cache Creek Thrust Fault is not classified by the USGS as an active fault. Multiple minor earthquakes with epicenters near the site have occurred in recent years (USGS Earthquake Database).

SITE INVESTIGATIONS

On October 9, 2018, five test pits, TP-1 through TP-5, were excavated within and near the proposed structure footprint as shown in the Appendix on the **Test Pit Location Map**. Test pits were located using a handheld Trimble GeoXT GPS unit. Test pit locations and depths were selected to determine subsurface conditions applicable to the proposed developments at the time of the investigation. Schematic design plans have since changed to enlarge the structure to the south and west. **ADDITIONAL** test pits in the south and west will be dug and a supplement to this report issued based on the updated plans. Test pits were backfilled with excavated material after logging was completed.

Fish Creek Excavation of Jackson, Wyoming, excavated the test pits with a John Deere 135 track hoe. Andy Pruett, a Professional Geologist at Nelson Engineering, logged the pits and directed sampling. Soil classifications, moisture conditions, and presence of organic or other notable features were recorded in the field logs. Bulk samples were sealed in plastic bags and transported to our laboratory for testing and further classification. Groundwater observations were made at the time of the excavation based on field observations of soil moisture conditions. Field observations and laboratory testing results are presented both on the test pit logs and in the test result presentation sheets in the Appendix.

The stratification lines shown on the test pit logs represent the approximate boundary between soil types. The actual in-situ transition may be either gradual or abrupt. Due to the nature and depositional characteristics of natural soils and fills, care should be taken in interpolating subsurface conditions beyond the location of the test pits. Soil conditions can change rapidly in both the lateral and vertical directions. Groundwater conditions shown on the logs are only for the dates indicated.

The subsurface conditions were interpreted from the described test pits. The soil properties inferred from the field and laboratory analyses supported by our experience formed the basis for developing our conclusions and recommendations.

Laboratory Investigations

Samples obtained during the field investigation were taken to the laboratory where they were visually classified in accordance with ASTM Test Method D-2487-93, which is based on the Unified Soils Classification System (USCS). Representative samples were selected for testing to determine the physical properties of the in-place soils and to estimate engineering properties. Engineering properties of concern at this location included bearing capacity, seismic response, shear strength, and site-specific construction recommendations that are influenced by soil type and condition.

Laboratory testing was conducted to provide additional information to determine the suitability of the soils for use as foundation and subgrade materials and to verify field observations and classification estimates. The finalized laboratory observations were used to estimate soil strength and compressibility characteristics for bearing capacity determinations, consolidation and settlement determinations, lateral and vertical pile load response analysis, and pavement designs. Specific tests included Atterberg Limits Tests - ASTM Designation D4318, Grain Size Analysis - ASTM Designation C117 & C136, Soil Moisture Content Determinations - ASTM Designation D2226, and Soil Classification - ASTM Designation D2487.

The soil samples stored in our laboratory will be discarded after 30 days from the date this report is submitted unless we receive a specific request to retain them.

SUBSURFACE CONDITIONS

Soil Profiles

WYDEQ Monitoring Wells

Wyoming DEQ drilled and logged several monitoring wells as part of a closed leaky underground storage tank investigation. Available records are attached in the Appendix and

wells are shown on the test pit location map. Soil profiles in the monitoring wells show loess of thickness varying from less than 5 feet to greater than 12 feet overlying dense cobble, gravel and sand alluvial deposits.

TP-1, 2, and 3, Loess Slopes

Trenches were cut into the slope west of the old motel structure to expose native soils within the slope. Soil profiles in the cut slope were very similar, surficial soils consisted of 1.5 feet of dry, brown/dark brown silt topsoil with minor grass roots. Topsoil was very stiff to hard with pocket penetrometer readings greater than 3.5 tons per square foot (TSF). Below topsoil and to the base of the slope, loess deposits along the entire length of the trenches. Loess was composed of dry, light brown/tan, silty clay with trace amounts of fine-grained sand. The loess contained minor to moderate amounts of pinhole voids and a very stiff to hard consistency corresponding to pocket penetrometer readings greater 3.5 TSF.

TP-4 and TP-5

Similar soil profiles were found consisting of fill overlying glacial gravels and cobbles. Surficial deposits in TP-4 to 5.5 feet were undocumented fills composed of dry, very stiff to hard, brown and light brown, silty clay loess, silt topsoil, and gravelly silt with cobbles and boulders up to 24-inches maximum dimension. Surficial deposits in TP-5 to 3.5 feet were a half foot of silt topsoil overlying fills composed of dense silty gravel with sand, cobbles, and boulders up to 18-inches maximum dimension, round to sub-round clasts. Below fills to the bottom of each test pit at 11 feet in TP-4 and 10 feet in TP-5, soils in both test pits were glacial fluvial deposits composed of dry, brown, gravel with silt, sand, cobbles, and boulders up to 24-inches maximum dimension. These soils were very dense and contained approximately 70-percent round to sub-round gravels, cobbles, and boulders and 30-percent sand with silt matrix. Hard digging in glacial gravels was noted and minor caving of test pit walls was observed.

Interpretation

Test trenches, test pits, and monitoring well logs indicate the native soil profile prior to grading consisted of loess overlying dense gravel and cobble alluvium. The former ground surface sloped down to the east, intersecting with the existing ground in the near vicinity of the edge of the WY22/189 roadway. Loess thickness at the west project pre-grading is estimated to be about 20 feet based on elevation of the cut slope and projecting pre-existing ground. Gravels form the subgrade at the base of the cut slope in the test pit where the loess has been removed in its entirety. Monitoring well profiles show top of gravel contact to the east at zero to 11 feet. Interpolation of depth to gravel along the eastern building edge results in depth to gravel of 3 to 8 feet.

Groundwater

Groundwater was not encountered in the test pits. Groundwater depths of greater than 10 feet are shown on the WYDEQ records.

GEOTECHNICAL ANALYSIS & RECOMMENDATIONS

General

A three-story residential structure with at grade parking on the lower level is proposed. The western walls of the building are located in the existing cut slope. An external retaining wall

is proposed to the west of the second story to create a walk out area. The building wall and external retaining wall combined height will be 10 to 20 feet. Soil nail and shotcrete permanent retaining walls are recommended for the building and external retaining wall. Permanent retaining walls shall be designed during the final design phase to the appropriate seismic and static Factors of Safety per the International Building Code and accepted standards. The remainder of the structure will be supported by columns supported by conventional spread footings bearing on underlying gravels. Recommendations herein emphasize concerns at depths at and below the anticipated bottom footing depth in soils influenced by foundation loading.

Loess

Loess is defined as a wind-deposited soil with a low-density structure. Loess at this site will exhibit undesirable characteristics including collapse and/or loss of strength when wetted. Schematic level plans show portions of retaining walls hardscapes may be supported on loess. Wetting of loess beneath hardscapes and retaining structures is likely to cause excessive settlement and damage.

Drainage and Moisture Infiltration Prevention

It is critical to prevent moisture from penetrating loess beneath hardscapes and retaining structures. Measures to prevent moisture migration include:

1. Subgrade Compaction: Where loess the forms subgrade under all structures, slabs, footings, and hardscape shall be compacted to a depth of 8 inches to greater than 95% of maximum density per Standard Proctor (ASTM-D698). A well-documented testing program shall be conducted to ensure compliance. Compaction of native loess subgrade creates a dense low permeability barrier that prevents moisture infiltration into underlying collapsible soils.

2. Drains: Retaining wall and hardscapes shall be properly drained. Subgrade drains shall be carefully designed and constructed. Drainage to daylight is recommended. Drainage design shall be submitted to and approved by this office prior to construction.

3. Irrigation Systems: Systems must be properly installed and well maintained. Irrigation waters SHALL NOT result in ponding in low areas with loess subgrades. Irrigation piping shall be placed a minimum of 10 feet from foundations and hardscapes.

4. Surface Drainage: Stormwater and snowmelt shall be directed away from structures and hardscape. Ponding near structures and hardscape shall be prevented.

Conventional Spread Footings

Structure foundations can be supported by conventional spread footings bearing on underlying alluvium composed of very dense gravel, cobble and boulders with sand and silt. A net allowable bearing capacity of **3500 PSF** is appropriate. Surficial topsoil and loess deposits will be found in eastern and southern portions of the building footprint. Depth to dense alluvium ranging from 3 to 9 feet is estimated. Loess and fine-grained soils shall be removed beneath footings down to competent gravel and cobbles. Structural fill shall be then be placed to achieve subgrade elevation beneath footings. Structural fill below footings shall extend horizontally beyond the perimeter of all footers a minimum of 2 feet or a distance equal to the total depth of structural fill, whichever is less.

Structural fill placed above the existing ground surface to achieve footing grade, beyond the 2-foot minimum level from the footings, shall have a maximum slope of 1.5(H):1(V).

All subgrades below footings and structural fills shall be compacted to a depth of 10 inches to 95% of maximum density per ASTM D 698 (Standard Proctor).

A typical foundation and backfill configuration are shown in **Foundation Backfill Typical** drawing in the Appendix**.** The minimum burial depth of footings shall be **36 inches** for frost protection.

The above analysis assumes **a maximum width of 3.0 feet** for continuous footings and a maximum dimension of **12.0 feet for isolated footings**. Construction of larger footing sizes can lead to increased settlement as the bearing pressure bulb can extend deeper into the soil profile resulting in settlement of greater than that specified. The net allowable soil pressure includes dead load plus maximum live load. These calculations assume a minimum depth of burial of the footing of 36 inches and that a maximum total settlement of **0.5 inches** can be tolerated on any one footing and the maximum differential settlement between footings that can be tolerated is **0.5 inches**. Bearing capacity values and settlement should be checked for each combination of load to determine whether settlement or bearing capacity will control the response of the footing. This office shall be consulted to verify specific footing loads and sizes. Isolated footings with bearing areas larger than 100 square feet or those foundation elements supporting large concentrated loads such as stone fireplaces shall be analyzed on an individual basis to determine settlement and bearing characteristics. Other foundation parameters are as noted below:

1. A **one-third** increase in allowable bearing capacity may be used for short duration loads such as wind or seismic.
2. Backfill against shallow foundations and stem walls shall conform to the **Foundation Backfill Typical** drawing in the Appendix. In no case shall material greater than 6 inches in diameter bear directly on or against foundation elements. Placing oversized material against rigid surfaces can damage the structure and interferes with proper compaction.
3. Lateral loads may be resisted by friction between the footing base and supporting soil and lateral bearing pressure against the sides of the footings. For design purposes, a **coefficient of friction of 0.45** at the footing base is appropriate. A lateral passive bearing pressure of **350 psf per foot of depth** is appropriate.

Any soil type encountered other than those described in the test pit logs or in this report shall be analyzed by Nelson Engineering. Isolated boulders at footing grade shall be excavated and removed, unless approved by Nelson Engineering, and the void backfilled with structural fill. Any excessively loose material or soft spots encountered in the footing subgrade will require over-excavation and backfilling with structural fill. All footings shall be suitably reinforced to make them as rigid as possible.

Surface Drainage

Moisture penetration into bearing soils of footings at frost depth should be avoided. Site grading plans should be carefully reviewed to ensure surface waters, snowmelt, and irrigation systems drain away from all structures and that pavements and slabs are well drained.

WESTERN SLOPE SOIL NAIL WALL FEASIBILITY LEVEL DESIGN

General

Slope stability was evaluated for construction of a permanent soil nail and shotcrete retaining wall cut into the western slope. The wall would permanently retain the slope adjacent to the planned structure. Test pit logs, WYDEQ monitoring well logs, laboratory testing, geologic mapping and geologic references were used to evaluate slope stability along the profiles shown on the test pit location map.

Interpolated, extrapolated, and interpreted subsurface conditions were used to formulate slope stability models in SLOPE/W™, a product of Geo-Slope International. The program calculates the Factor of Safety (FOS) of two-dimensional slope model using limit equilibrium theory. Analysis results delineate critical failure surfaces as well as the minimum FOS for the failure surfaces under static and earthquake loading with the soil nails as modeled.

Stability Analyses

Selection of Acceptable Factor of Safety and Seismic Coefficient

The results of a pseudostatic analyses are critically dependent on the selection of a seismic coefficient value. In recognition that actual slopes are not rigid and that the peak acceleration exists for short periods, the maximum peak bedrock acceleration is generally not applied to this type analysis. Hynes-Griffin and Franklin (1984) concluded that for large earthen dams, with pseudostatic Factors of Safety (FOS) of greater than 1.0, a seismic coefficient of 0.5 that of peak bedrock acceleration resulted in acceptable deformation. Seed (1979) concluded that a factor of safety of 1.15 was acceptable for seismic coefficients of 0.10g for Magnitude 6.5 earthquakes. For this analysis, a seismic coefficient of 0.19 was selected as appropriate and conservative, corresponding to half of the peak ground acceleration with a 7 percent probability of exceedance in 75 years.

In selecting a minimum FOS for the analyses, the following factors were evaluated:

1. The consequences of slope failure;
2. The adequacy of field and laboratory investigations;
3. The reliability of the assumptions included in the failure mode;
4. The ability to predict adverse conditions such as ground water conditions and maximum earthquake accelerations;
5. Judgment based on experience and the above discussion of Seismic Coefficient;

For this study, the chief considerations included in the selection of a minimum FOS were uncertainties associated with modeling the subsurface aquifer and soil/rock profiles in between borings, and the possibility of loss of life for a slope failure destroying occupied buildings.

For this preliminary feasibility level design for an inhabited structure, the minimum FOS selected for an inhabited structure for static stability was 2.5 and for seismic stability 2.0. Consideration of the reduction in FOS from existing to final conditions after construction is also important.

Stability Model Formulation

Cross-section topography was generated from site topographic surveys by Nelson Engineering. Subsurface profiles and assumptions were developed from our interpretation of the subsurface conditions. Slope stability sections are shown on the Test Pit location map and slope stability output drawings in the Appendix.

The models consist of two soil types, loess and dense gravel alluvium. Material properties were assigned conservatively using material properties based field cohesion tests, our experience with loess in Jackson Hole, and from generally accepted empirical correlations. Table 1 lists properties assigned. Additional testing of loess properties from additional field work is proposed.

Material	Material Model	Unit Weight (PCF)	Internal Friction Angel	Cohesion (psf)
Alluvium	Mohr-Coulomb	135	34	0
Loess	Mohr-Coulomb	100	28	500

Table 1: Material Model and Strength Properties

Preliminary soil nail wall layouts were modeled using grout to soil assumed bond strength of 1000 psf, a 6-inch diameter grout body and nails at 4 feet on center in the horizontal direction. Circular failure surfaces were analyzed for both static and seismic conditions. The failure surfaces were limited to entry and exit angles corresponding with active and passive wedge movements at the head and toe of the slopes with search criteria designated appropriately for local and global failure surfaces. The Morgenstern-Price (M-P) method of slices was used to search for and analyze failure surfaces. The Morgenstern-Price method satisfies moment and force equilibrium and is mathematically rigorous. Interslice forces in the M-P method were modeled using a half-sine function. Seismic acceleration of 0.19 g was transmitted through the slope models without attenuation or amplification. This acceleration is applied as a constant multiplied by the weight of the failure mass in a pseudostatic stability analysis. No attempt was made to assess strong ground motion transmission through underlying soils based on frequency spectra.

Conclusion

Satisfactory results were achieved in preliminary soil nail layouts analyzed. Seismic analysis results are shown in the Appendix. Based on these results, it is our opinion that properly designed soil nail walls can permanently retain site slopes for the proposed structures. conditions. Alternatively, soldier pile and wood lagged walls with anchors may also perform this function. It is anticipated that soil nails will extend beyond property boundaries, requiring subsurface easements.

Loess soils in the existing cut slope exhibit high cohesion per field tests. Loess in the Jackson Hole Valley typically exhibits cohesion of greater than 1000 psf and stable vertical cuts of 15 feet height or more are commonly performed. ADDITIONAL TESTING of cohesive strength of loess is in progress to eliminate unnecessary conservatism in final design. Slope stability analysis of two cross sections was conducted which confirms the feasibility of proposed construction using soil nail walls. Slope stability analysis discussion and results are given in the Appendix.

In final design, soil nail walls or other retaining structures should be designed by an experienced licensed engineer and installed by an experienced contractor.

Lateral Earth Pressures, Gravity Retaining Walls
These recommendations apply to gravity retaining walls backfilled with Structural Fill per the typical gravity stem wall drawing in the Appendix.

For walls restrained from movement such that active earth pressures are will not be allowed to develop, an at-rest equivalent fluid pressure of **60PCF** is appropriate.

The Mononobe-Okabe (M-O) equations are often used to estimate dynamic forces against retaining walls. The M-O analysis is theoretically derived using active earth pressure conditions. Although there is debate about the theoretical applicability of this methodology to restrained or rigid walls, the method has been used for many years for the seismic design of such walls. The performance record of underground walls during earthquakes has generally been good. Appropriate parameters for the M-O analysis are: 1) soil unit weight 130 pounds per cubic foot, and 2) Internal Friction Angle= 32°, and 3) K_h of 0.12g (half of the maximum horizontal seismic acceleration in rock with a 10% exceedance in 50years). The more limiting case, at-rest or active seismic pressure, shall be utilized in the structural design of restrained or rigid retaining walls.

Slabs-On-Grade
Slabs shall be founded upon the following section from top to bottom: **1)** 3 inches of crushed base composed of a ¾-inch minus free draining material (WYDOT Grade CR or equivalent) compacted to a minimum of 95% of maximum density as determined by ASTM D1557, **2)** 12-inches of Structural Fill, and **3)** the upper 8 inches of dense gravel alluvial deposits compacted to a minimum of 95% of maximum density as determined by ASTM D698. Where NE determines dense native gravels form the subgrade, structural fill may be omitted. Any excessively loose material or soft spots encountered in slab subgrade will require over-excavation and backfilling with structural fill. The recommended Modulus for Subgrade Reaction for use in Slab design per "The American Concrete Institute Design of Slabs on Grade, ACI 360R-92" is **300 lbs/in^3.**

Concrete slab-on-grade control joints should be saw-cut as early as possible. Nelson Engineering recommends the use of a soft cut system, which allows saw cutting as soon as the concrete can support foot traffic. Successful crack control is dependent upon proper joint spacing. Control joints should be placed in accordance with current Portland Cement Concrete Paving Association guidelines.

Sidewalks and Exterior Slabs
Sidewalks and exterior concrete slabs for foot traffic shall be placed upon a minimum of 3 inches of ¾-inch minus crushed gravel placed upon 8 inches of structural fill. Native subgrade must be compacted to a minimum of 95% of maximum dry density per ASTM D698 and inspected to 8-inch depth. Where NE determines dense native gravels form the subgrade, structural fill may be omitted. Any fill required to increase the elevation of the slab should meet the requirements for granular structural fill. (Refer to the section on structural fill for requirements). All fill material within one foot of the slabs must be compacted to a minimum 95% of the maximum density as determined by ASTM D698.

Roadway and Parking Lot Sections
The sections given below assume the existing asphalt, crushed base, and pit run section is removed and replaced. Proper drainage is essential for satisfactory road and parking area performance. The structural fill and geotextile requirements given below can be waived when acceptable subgrade conditions exist. **Nelson Engineering shall inspect and approve all pavement subgrades prior to waiving the structural fill requirement.**

Pavement Section Components	Newly Paved Areas
Asphaltic Concrete	3 inches
WYDOT Grade GR Crushed Aggregate	4 inches
Structural Fill subbase	12 inches
Compacted Subgrade	Surficial 8 inches of native soil compacted as much as moisture and subgrade conditions permit

*See Discussion above

CONSTRUCTION CONSIDERATIONS

Earthwork and Site Grading
Excavation work and heavy equipment access will be difficult when wet conditions exist. A protracted period of wet conditions can be expected during and after seasonal snowmelt and during periods of rainfall. **Placement of imported gravels supported by geotextiles and/or geogrid may be required to provide construction access and to provide platforms for equipment.** General recommendations for earthwork suitability, placement, and compaction procedures are provided below:

- Within the building footprints and areas to be paved, all organic material, deleterious undocumented fill, and debris shall be removed regardless of depth below the surface. Loose and disturbed native soils should be scarified, moisture-conditioned, and compacted. Finished surfaces shall be sloped away from foundations.

- Fill materials shall not be placed, spread, or compacted while the ground is frozen or during unfavorable weather conditions. Fill materials shall be at the proper moisture content prior to compaction and shall contain no frozen soil.

- Native subgrade shall be compacted with compaction equipment appropriate for the soil types described in this report. Where soft, loose or wet areas are encountered over-excavate and replace with structural fill or consult Nelson Engineering.

- Clays and silts with will be encountered throughout the excavations. These soils will exhibit undesirable engineering properties when wetted. **Every effort shall be made to ensure that moisture from rainfall and groundwater does not infiltrate clay and silt foundation bearing, slab, and roadway subgrade soils.** Measures to prevent moisture infiltration may include the placement of tarps or membranes; maintain grading during construction to drain storm water from exposed excavations during precipitation and snowmelt events, and others. When moisture has infiltrated

problem soils, Nelson Engineering shall be notified to inspect soils prior to resuming construction.

- **Structural Fill** shall consist of imported gravels (USCS classification GW or GP) with the following characteristics: 4-inch maximum rock size for geogrid reinforced fills, 6-inch maximum particle size for other uses, no more than 40% greater than ¾", and less than 8% fines passing the #200 sieve. Fines shall have a plasticity index of less than 15.

  Structural Fill shall be placed in layers of not more than 8 inches in thickness. Each layer of Structural Fill should be moisture conditioned to within 2% of optimum moisture content and compacted to a minimum density of 95% of the maximum dry density as determined by ASTM Designation D 698. The maximum density of material containing more than 30% oversize (greater than ¾" diameter) cannot be determined by use of the ASTM Designation D 698. In this case, a field maximum density may be determined by a test strip method. The material shall be compacted at or near optimum moisture content and a field density test shall be taken after each pass of the compaction equipment. This sequence shall continue until the maximum field density is achieved. This maximum field density shall be used for subsequent field compaction tests. Enough density tests should be taken to monitor proper compaction.

  Clean Rock Fill may be used in lieu of structural fill. Clean Rock fill shall be hard, durable crushed or screened rock of less than 6-inch maximum dimension with less than 1% passing the ¼ inch sieve. Nelson Engineering shall review and approve clean rock fill source and gradation prior to use.

- Safety of construction personnel including safe trenches and excavations are the responsibility of the contractor. Excavations for retaining walls and foundations shall conform to the applicable OSHA and Wyoming safety standards. Excavations and utility trenches shall be laid back to safe slopes or properly shored. Excavations and shoring operations shall be conducted in accordance with the most recent versions of the OSHA Construction Standards for Excavations, Part 1926, Subpart P and Wyoming Public Works Standard Specifications. Excavations for utilities shall be shored if the proper slope cannot be maintained.

- During earthwork phases of the project, a representative of Nelson Engineering shall be present to observe exposed native soils and fill materials for suitability and consistency. A documented testing program should be conducted to determine that soil compaction is in accordance with requirements.

- Backfill against structures (i.e., pipes and walls) shall be placed manner that will not damage the structure. In no case shall material greater than 6 inches in diameter bear directly on or against structures. Placing oversized material against rigid surfaces can damage the structure and interferes with proper compaction.

GENERAL COMMENTS

It is critical that the structural engineer and other project designers review this report. When project plans and specifications are complete, a consultation with this office should be arranged to ensure compliance with this report. Additional or supplementary recommendations concerning foundations and earthwork may be required at this time.

Monitoring and testing should be performed to verify that suitable materials are used for structural fills and backfills and that fills are properly placed and compacted. Concrete testing and special inspections should be performed prior to and during placement of all concrete to ensure concrete and reinforcing steel bar comply with project plans and specifications. Nelson Engineering can provide concrete testing and special inspections if requested.

WARRANTY AND LIMITING CONDITIONS

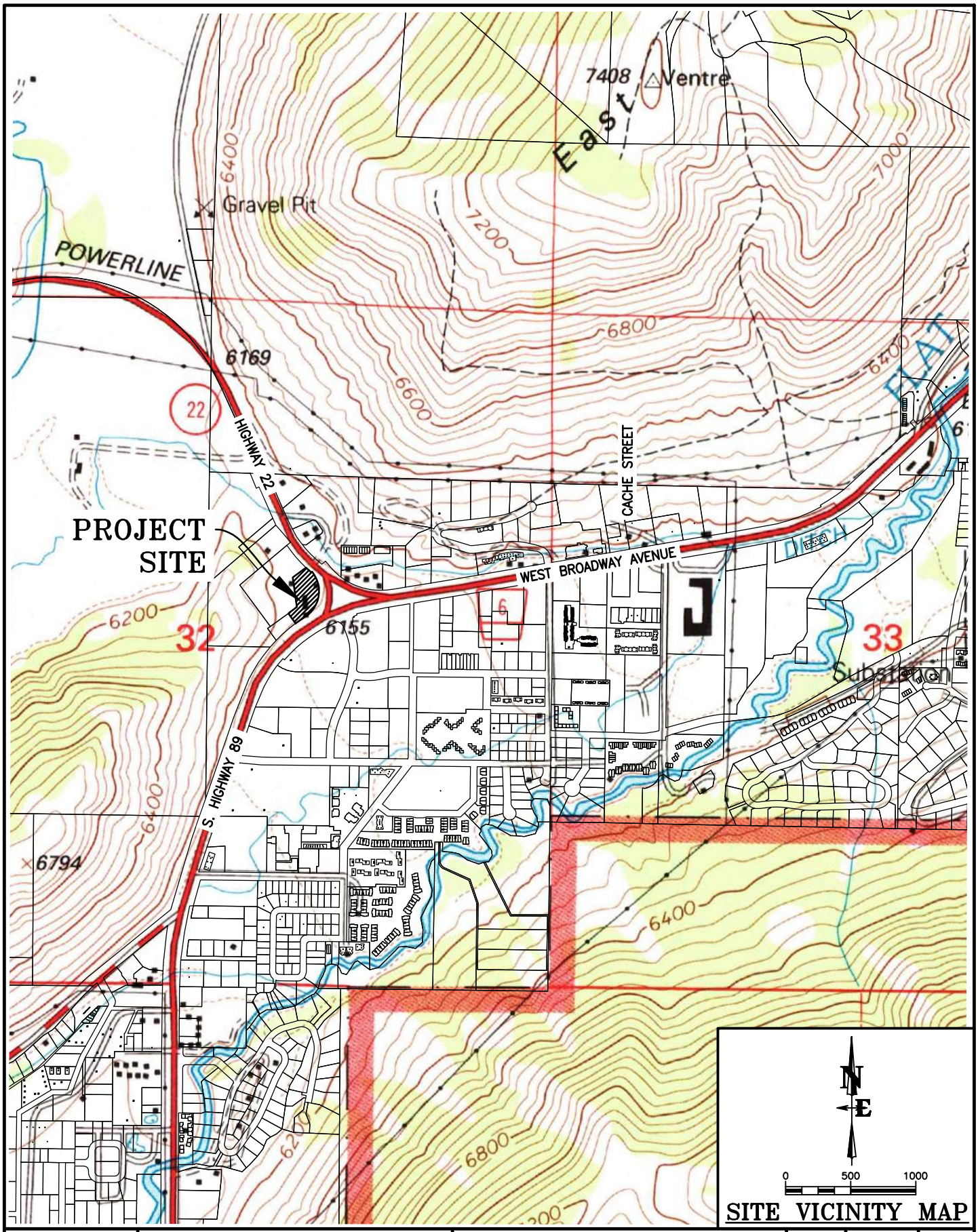
The field observations and research reported herein are considered sufficient in detail and scope to form a reasonable basis for the purposes cited above. Nelson Engineering warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology, only for the site described in this report. No other warranties are implied or expressed.

These engineering methods have been developed to provide the client with information regarding apparent or potential engineering conditions relating to the subject property within the scope cited above and are limited to the conditions observed at the time of the site visit and research. There is a distinct possibility that conditions may exist which could not be identified within the scope of the investigation or which were not apparent during the site investigation. The report is also limited to the information available at the time it was prepared. In the event additional information is provided to Nelson Engineering following this report, it will be forwarded to the client in the form received for evaluation by the client. This report was prepared for use by Tyler Davis in Jackson, Wyoming ("Client") and the conclusions and recommendations presented in this report are based on the agreed-upon scope of work outlined in the report and the contract for professional services between Client and Nelson Engineering ("Consultant"). Use or misuse of this report, or reliance upon the findings hereof by any parties other than the Client, is at their own risk. Neither the Client nor Consultant may make any representation of warranty to such other parties as to the accuracy or completeness of this report or the suitability of its use by such other parties for any purpose whatsoever, known or unknown, to the Client or Consultant. Neither Tyler Davis, nor Nelson Engineering shall have any liability to, or indemnifies or holds harmless third parties for any losses incurred, by the actual or purported use or misuse of this report. No other warranties are implied or expressed.

Prepared By:
Philip Gyr, PE
Geotechnical Engineer

APPENDIX

DRAWINGS



SITE VICINITY MAP

DRAWING NO 1	TITLE TETON GABLES 1140 W HIGHWAY 22 GEOTECHNICAL INVESTIGATION	NELSON ENGINEERING P.O. BOX 1599, JACKSON WYOMING (307) 733-2087	DATE	10/22/18	REV.
JOB NO 18-262-02			SURVEYED	-	
			DRAWN	BJG	
			CHECKED	AP	
			APPROVED	PG	

WYDEQ MONITORING WELL 124

WYDEQ MONITORING WELL 318

1140 HIGHWAY 22

SOUTH HIGHWAY 89

PROPOSED BUILDING FOOTPRINT

EXISTING HOTEL TO AND AUXILIARY SHED TO BE REMOVED

SLOPE STABILITY SECTION NORTH

SLOPE STABILITY SECTION SOUTH

CUT SLOPE: EXPOSED LOESS V.STIFF TO HARD

CONCRETE RETAINIING WALL

DRIVEWAY ABOVE

PROPOSED RETAINING WALL AT SECOND FLOOR ELEVATION

PROPERTY BOUNDARY

TP-1

TP-2

TP-3

TP-4

TP-5

1+00

0+00

+01

6162

6163

6164

6165

6166

6167

6168

6169

6170

6175

6180

6185

0 20 40

NOTES: SITE SURVEY BY NELSON ENGINEERING. SCHEMATIC DESIGN LEVEL BUILDING AND SITE FEATURES SHOWN. TEST PIT/TRENCH LOCATION AND SIZE ARE APPROXIMATE. TEST PITS AND WYDEQ MW LOCATED IN RELATION TO SITE FEATURES AND BY GPS TO 5'± ACCURACY.

REV.	DATE	SURVEYED	DRAWN	CHECKED	APPROVED
-	11/26/2018	-	AP	PG	PG

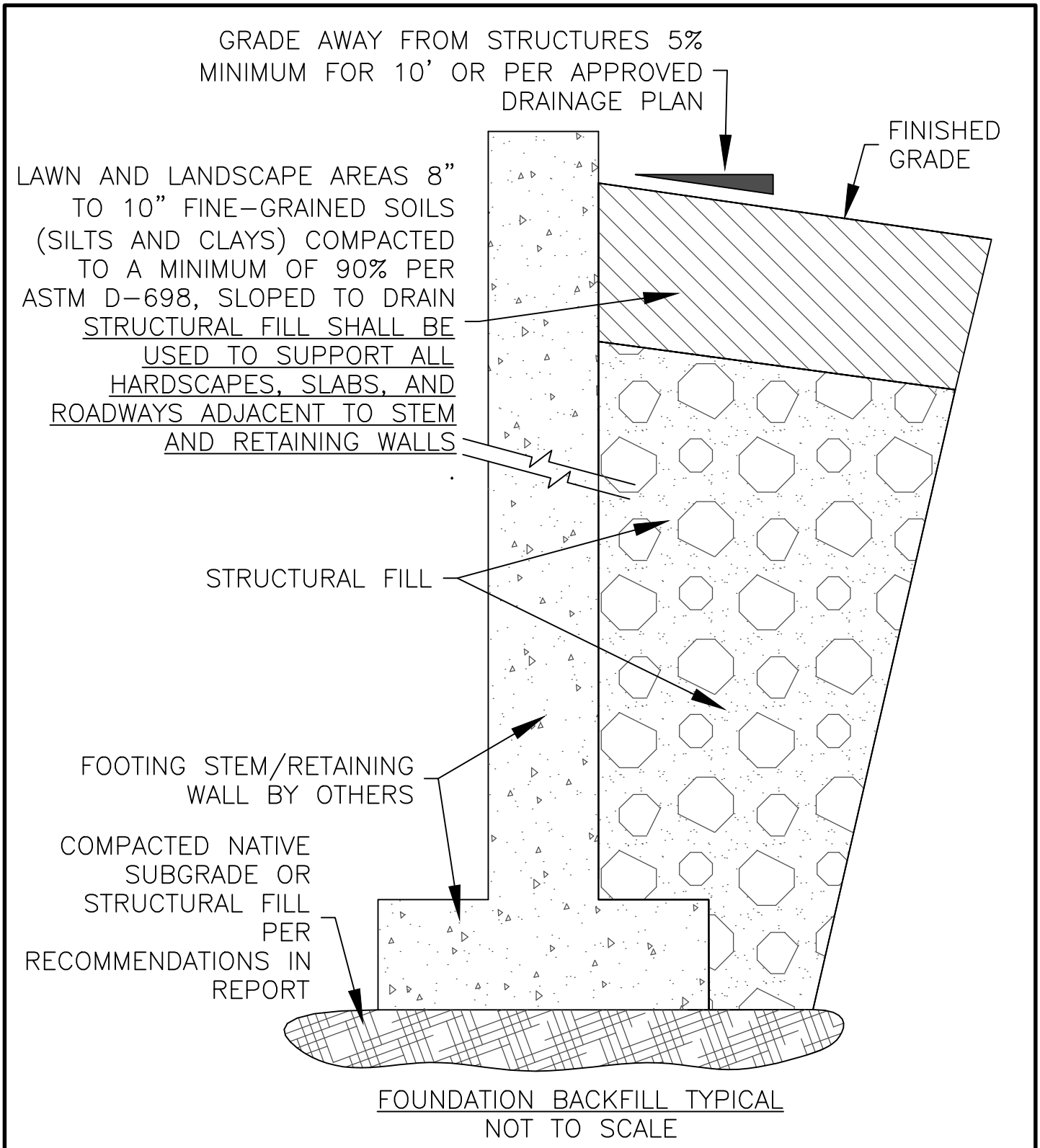
NELSON ENGINEERING
P.O. BOX 1599, JACKSON WYOMING (307) 733-2087

DRAWING TITLE
TEST PIT LOCATIONS AND SLOPE STABILITY SECTIONS

JOB TITLE
TETON GABLES
1140 W HIGHWAY 22
GEOTECHNICAL INVESTIGATION

DRAWING NO
EXHIBIT

JOB NO
18-262-02



FOUNDATION BACKFILL TYPICAL
NOT TO SCALE

DRAWING NO: 3	TITLE: TETON GABLES FOOTING AND GRAVITY WALL FOUNDATION BACKFILL TYPICAL	NELSON ENGINEERING P.O. BOX 1599, JACKSON WYOMING (307) 733-2087	DATE	11 26 18	REV.
JOB NO: 18-262-01			SURVEYED	N/A	
			DRAWN	PG	
			CHECKED	PG	
			APPROVED	PG	

TEST PIT LOGS

GEOTECHNICAL GENERAL NOTES

CORRECTED SPT: Standard Penetration Test values corrected to 60% of the theoretical free-fall hammer energy and for corrected for overburden pressure per AASHTO LRFD 6th ED Article 10.4.6.2.4.

DRILLING, SAMPLING, AND SOIL PROPERTIES ABBREVIATIONS AND SYMBOLS

N: Standard Penetration Test
U_c: Unconfined compressive strength, Pounds/ft^2 (PSF)
Pp: Pocket Penetrometer values, Ton/ft^2 (TSF)
FILGC: Fragments indicate gravels and cobbles larger than split spoon diameter.
w: Water content, %
LL: Liquid limit, %
PI: Plasticity index, %
gd: In-situ dry density, lbs/ft^3 (PCF)
: Ground water level
SS: Split-Spoon Sample
ST: Shelby Tube Sampler
CS: Cylindrical Brass Lined Sample


Monitoring Well, diagonal hatching indicates screen and sand packed interval

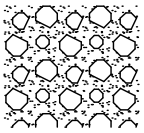
SOIL RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

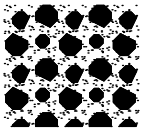
Non-Cohesive Soils	Standard Penetration Resistance	Cohesive Soils	Pp-(tons/ft^2)
Very Loose	0 - 4	Very Soft	0 - 0.25
Loose	4 - 10	Soft	0.25 - 0.50
Slightly Compact	8 - 15	Firm (Medium)	0.50 - 1.00
Medium Dense	10 - 30	Stiff	1.00 - 2.00
Dense	30 - 50	Very Stiff	2.00 - 4.00
Very Dense	50+	Hard	4.00+

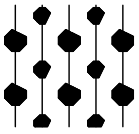
PARTICLE SIZE

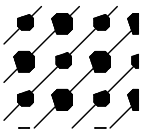
Boulders:	12 in.+	**Coarse Sand:**	5 mm(#4)-2 mm(#10)	**Silts and Clays: <#200**
Cobbles:	12 in.-3in.	**Medium Sand:**	2 mm(#10)-0.4mm(#40)	
Gravel:	3in.-5mm(#4)	**Fine Sand:**	0.4mm(#40)-0.075mm(#200)	

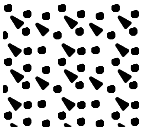
SOIL GRAPHICS

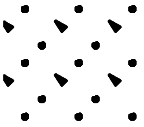
GW 

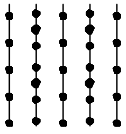
GP 

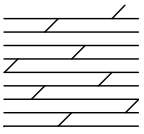
GM 

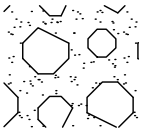
GC 

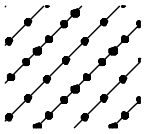
SW 

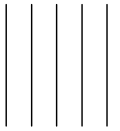
SP 

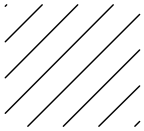
SM 

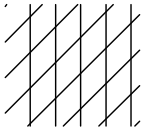
BEDROCK 

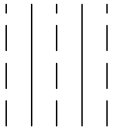
COBBLES/BOULDERS 

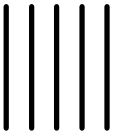
SC 

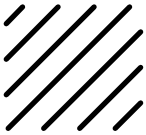
ML 

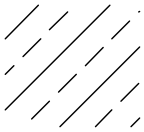
CL 

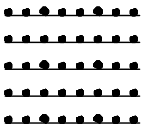
ML–CL 

OL 

MH 

CH 

OH 

PT 

NOTE: ANGLED DEMARCATIONS ON THE LOGS INDICATE APPROXIMATE OR POORLY DEFINED BOUNDARIES BETWEEN SOIL TYPES.

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P.O. BOX 1599, JACKSON WYOMING (307) 733-2087

PROJECT NAME: **TETON GABLES PARKING STRUCTURE**	**TEST PIT No.** 1 PAGE: 1
DATE STARTED / FINISHED: **10/09/2018**	OPERATOR: **FISH CREEK EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **JOHN DEERE 135 TRACK HOE**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	

This log is part of a report prepared by Nelson Engineering for this project and should be read with the report. This summary applies only at the location of the test pit and at the time of the excavation. Subsurface conditions may differ at other locations and may change at this location with passage of time. The data presented is a simplification of actual conditions encountered.

WELL LOG	GRAPHICS LOG	TRENCH LENGTH ON SLOPE FROM TOP (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15				*DUG TRENCH APPROX.1.5' DEPTH FROM TOP, 1.5' OF LOESS DERIVED TOPSOIL DRY BROWN/DARK BROWN, SILT TOPSOIL, MINOR GRASS ROOTS THROUGHOUT, PP>3.5 TSF, VERY STIFF TO HARD* *UNDERLYING SOIL, ENTIRE TRENCH, DRY, LIGHT BROWN/TAN, SILTY CLAY, LOESS, TRACE FINE SAND, HOMOGENOUS, MINOR TO MODERATE PINHOLE VOIDS, PP>3.5 TSF THROUGHOUT, VERY STIFF TO HARD*					*TEST TRENCH EXCAVATED ALONG CUT SLOPE. TRENCH DEPTH 1 TO 2 FEET BOTTOM OF TRENCH AT OR BELOW ADJACENT LEVEL GROUND ELEVATION. GRASS & MUSK THISTLE COVERED SLOPE* *EASY DIGGING THROUGHOUT* *NO CAVING*

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CLIENT: **TYLER DAVIS**
1140 HIGHWAY 22
JACKSON, WYOMING

JOB NO. 18-262-02

PROJECT NAME: **TETON GABLES PARKING STRUCTURE**	**TEST PIT No. 2** PAGE: 1
DATE STARTED / FINISHED: **10/09/2018**	OPERATOR: **FISH CREEK EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **JOHN DEERE 135 TRACK HOE**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	

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WELL LOG	GRAPHICS LOG	DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1				*DUG TRENCH APPROX.1.5' DEPTH FROM TOP, 1.5' OF LOESS DERIVED TOPSOIL DRY BROWN/DARK BROWN, SILT TOPSOIL, MINOR GRASS ROOTS THROUGHOUT, PP>3.5 TSF, VERY STIFF TO HARD*					*TEST TRENCH EXCAVATED ALONG CUT SLOPE. TRENCH DEPTH 1 TO 2 FEET BOTTOM OF TRENCH AT OR BELOW ADJACENT LEVEL GROUND ELEVATION. GRASS & MUSK THISTLE COVERED SLOPE*
		2				*UNDERLYING SOIL, ENTIRE TRENCH, DRY, LIGHT BROWN/TAN, SILTY CLAY, LOESS, TRACE FINE SAND, HOMOGENOUS, MINOR TO MODERATE PINHOLE VOIDS, PP>3.5 TSF THROUGHOUT, VERY STIFF TO HARD*					
		3									
		4									
		5									*EASY DIGGING THROUGHOUT*
		6		X	*TP2-1 6'-7'*	*USCS CLASSIFICATION – CL-ML, SILTY CLAY*	*25*	*21*		*10*	*NO CAVING*
		7									
		8									
		9									
		10									
		11									
		12									
		13									
		14									
		17									

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CLIENT: **TYLER DAVIS**
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JOB NO. 18-262-02

PROJECT NAME: **TETON GABLES PARKING STRUCTURE**	**TEST PIT No. 3** PAGE: 1
DATE STARTED / FINISHED: **10/09/2018**	OPERATOR: **FISH CREEK EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **JOHN DEERE 135 TRACK HOE**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	

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WELL LOG	GRAPHICS LOG	DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
		1				*DUG TRENCH APPROX.1.5' DEPTH FROM TOP, 1.5' OF LOESS DERIVED TOPSOIL DRY BROWN/DARK BROWN, SILT TOPSOIL, MINOR GRASS ROOTS THROUGHOUT, PP>3.5 TSF, VERY STIFF TO HARD*					*TEST TRENCH EXCAVATED ALONG CUT SLOPE. TRENCH DEPTH 1 TO 2 FEET BOTTOM OF TRENCH AT OR BELOW ADJACENT LEVEL GROUND ELEVATION. GRASS & MUSK THISTLE COVERED SLOPE*
		2				*UNDERLYING SOIL, ENTIRE TRENCH, DRY, LIGHT BROWN/TAN, SILTY CLAY, LOESS, TRACE FINE SAND, HOMOGENOUS, MINOR TO MODERATE PINHOLE VOIDS, PP>3.5 TSF THROUGHOUT, VERY STIFF TO HARD*					
		3									
		4									
		5									*EASY DIGGING THROUGHOUT*
		6									*NO CAVING*
		7									
		8									
		9									
		10									
		11									
		12				*MINOR ROOTS & DEBRIS (PLASTIC) AT BASE OF SLOPE IN LOESS AND SURFICIAL ROUND GRAVELS & COBBLES, INDICATING PORTION OF THIS AREA SLOPE HAS BEEN DISTURBED AND FILLED*					
		13									
		14									
		15									

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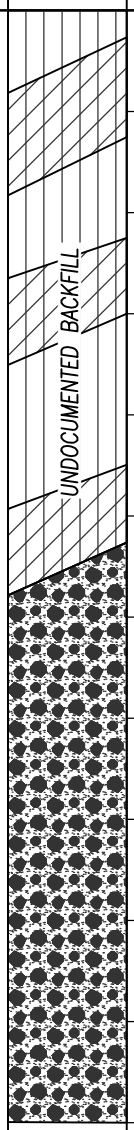
JOB NO. 18-262-02

PROJECT NAME: **TETON GABLES PARKING STRUCTURE**	**TEST PIT No. 4** PAGE: 1
DATE STARTED / FINISHED: **10/09/2018**	OPERATOR: **FISH CREEK EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **JOHN DEERE 135 TRACK HOE**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	

This log is part of a report prepared by Nelson Engineering for this project and should be read with the report. This summary applies only at the location of the test pit and at the time of the excavation. Subsurface conditions may differ at other locations and may change at this location with passage of time. The data presented is a simplification of actual conditions encountered.



DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
0				*0'–5.5' VARIABLE UNDOCUMENTED FILL INCLUDES DRY, BROWN & LIGHT BROWN, SILTY CLAY LOESS, SILT TOPSOIL, GRAVELLY SILT WITH COBBLES AND BOULDERS UP TO 24", PP>3.5 TSF, VERY STIFF TO HARD*					*FLAT GRASS & THISTLE AREA ADJACENT TO MOTEL STRUCTURE AND UTILITY SHED*
1									*EASY DIGGING TO 5.5'*
2									
3									
4									*4"ø DUCTILE IRON PIPE BURIED AT 5' PARALLELS BUILDING*
5									
6				*5.5'–BOP DRY BROWN GRAVEL WITH SILT, SAND, COBBLES & BOULDERS UP TO 24", POORLY GRADED, ~70% ROUND TO SUB–ROUND GRAVELS, COBBLES, AND BOULDERS, ~30% SAND WITH SILT MATRIX, ABUNDANT LARGE COBBLES/SMALL BOULDERS, VERY DENSE*					
7									*HARD DIGGING BELOW 5.5'*
8		X	*TP4–1 8'–9'*						
9									*MINOR CAVING IN GRAVELS*
10									
11				*BOP=11' NO GROUNDWATER ENCOUNTERED*					
12									
13									
14									
15									

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JOB NO. 18–262–02

PROJECT NAME: **TETON GABLES PARKING STRUCTURE**	**TEST PIT No. 5** PAGE: 1
DATE STARTED / FINISHED: **10/09/2018**	OPERATOR: **FISH CREEK EXCAVATION**
LOGGED BY: **ANDY PRUETT**	EXCAVATOR TYPE: **JOHN DEERE 135 TRACK HOE**
BOREHOLE LOCATION/ELEVATION: **SEE TEST PIT LOCATION MAP**	

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WELL LOG	GRAPHICS LOG	DEPTH (FT)	SAMPLES: UNDISTURBED	SAMPLES: BULK	SAMPLE ID	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	DRY DENSITY (PCF)	MOISTURE (%)	REMARKS
	NATIVE BACKFILL	0–10				0'–0.5' DRY, DARK BROWN SILT TOPSOIL WITH ABUNDANT GRASS ROOTS 0.5'–3.5' FILL: SILTY GRAVEL WITH SAND, COBBLES, AND BOULDERS UP TO 18", ROUND TO SUBROUND CLASTS, DENSE 3.5'–BOP DRY BROWN GRAVEL WITH SILT, SAND, COBBLES & BOULDERS UP TO 24", POORLY GRADED, ~70% ROUND TO SUB-ROUND GRAVELS, COBBLES, AND BOULDERS, ~30% SAND WITH SILT MATRIX, ABUNDANT LARGE COBBLES/SMALL BOULDERS, VERY DENSE BOP=10' NO GROUNDWATER ENCOUNTERED					FLAT GRASS & THISTLE AREA ADJACENT TO MOTEL STRUCTURE 4"ø TAR PAPER PIPE ENCOUNTERED AT 3' MODERATE DIGGING TO 3.5' HARD DIGGING BELOW 3.5' 1"ø GALVANIZED PIPE AT 6.5' MINOR CAVING OF GRAVELS POTHOLED TOE OF SLOPE ADJACENT TO TEST PIT TO VERIFY DEPTH TO GRAVELS, ENCOUNTER GRAVELS BELOW LOESS ~1' BELOW GROUND SURFACE ELEVATION OF TEST PIT 5

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JOB NO. 18-262-02

LABORATORY RESULTS

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USCS CLASSIFICATION

WWW.NELSONENGINEERING.NET

Sample ID: TP2-1 Depth (ft): 6-7 ft

Unified Soils Classification
Silty Clay (CL-ML)

Gravel	**0%**
Sand	**10%**
Fines	**90%**

Liquid Limit:	**25**
Plastic Limit:	**21**
Plasticity Index:	**4**

In-Situ Moisture Content	**9.8%**

Standard Sieve No.	Particle Size (mm)	Tare Weight (g)	Sample + Tare (g)	Sample Weight (g)	Cumulative % Retained	Percent Passing
1.5"	38	171.0	171.0	0.0	0%	100%
1"	25	171.0	171.0	0.0	0%	100%
3/4"	18.75	171.0	171.0	0.0	0%	100%
3/8"	9.5	171.0	171.0	0.0	0%	100%
#4	4.75	171.0	171.0	0.0	0%	100%
#10	2.00	171.0	171.4	0.4	0%	100%
#40	0.425	171.0	176.0	5.0	1%	99%
#100	0.15	171.0	220.2	49.2	6%	94%
#200	0.075	171.0	210.7	39.7	10%	90%
Pan	0	171.0	983.3	812.3	100%	0%
		Total Weight of Sample (g)		**906.7**		

Moisture Content	
Wet Wt + Tare (g)	1164.8
Dry Wt. + Tare (g)	1076.3
Wt of Water (g)	88.4
Tare Wt. (g)	169.7
Dry Wt. (g)	906.7
Moisture Content	9.8%
Wash	
Wet Wt. + Tare (g)	1164.8
Pre Wash Dry (g)	906.7
Post Wash Dry (g)	94.3
Tare Wt. (g)	0.0
Wt.Of Minus #200 =	812.3

Project:	Teton Gables Parking Structure
Job Number	18-262-02
Visual ID:	Light brown silt loess

Sampled By:	AP
Date:	10/9/2018
Tested By:	JM
Date:	10/22/2018

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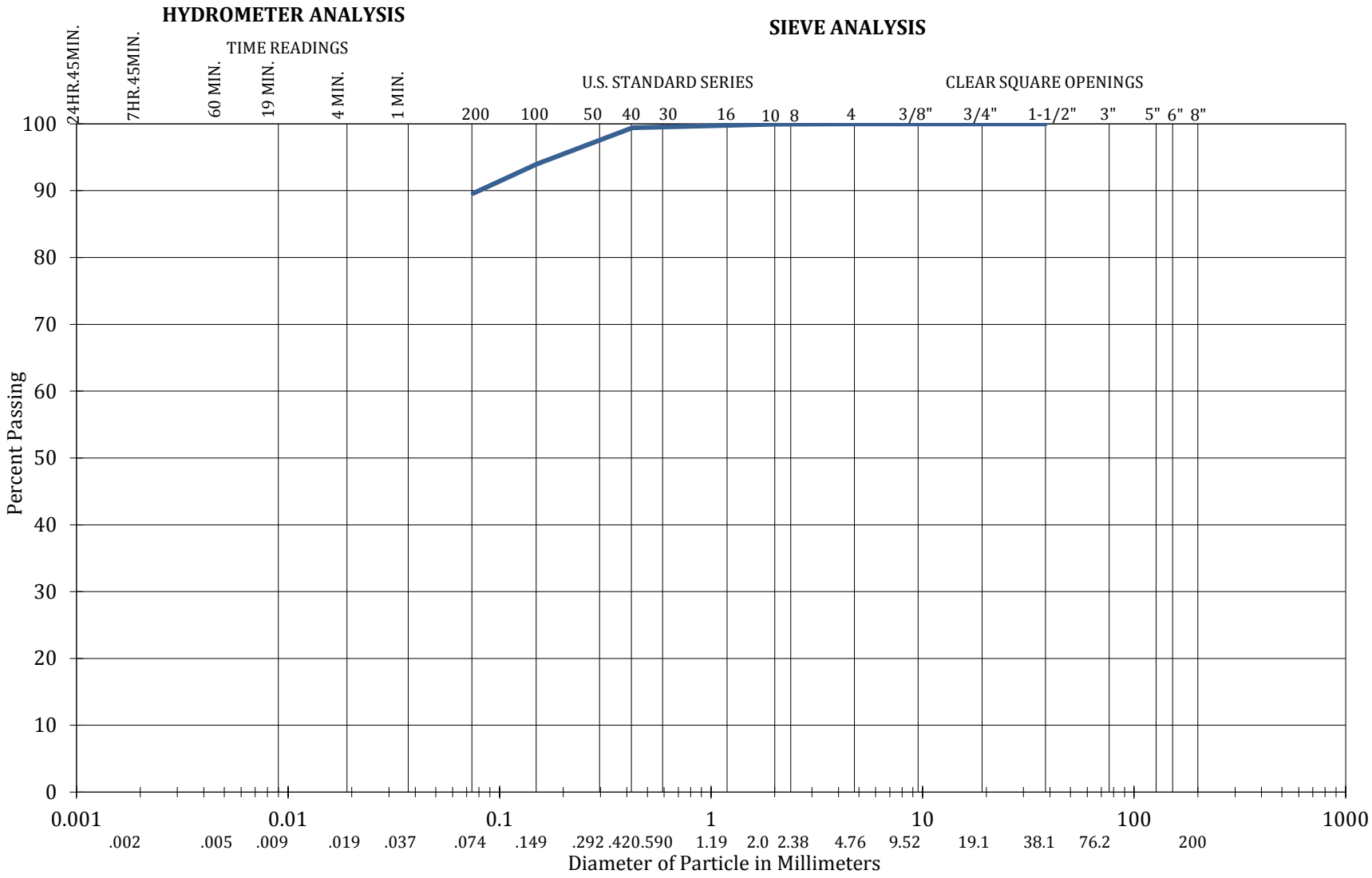
USCS CLASSIFICATION SIEVE CHART

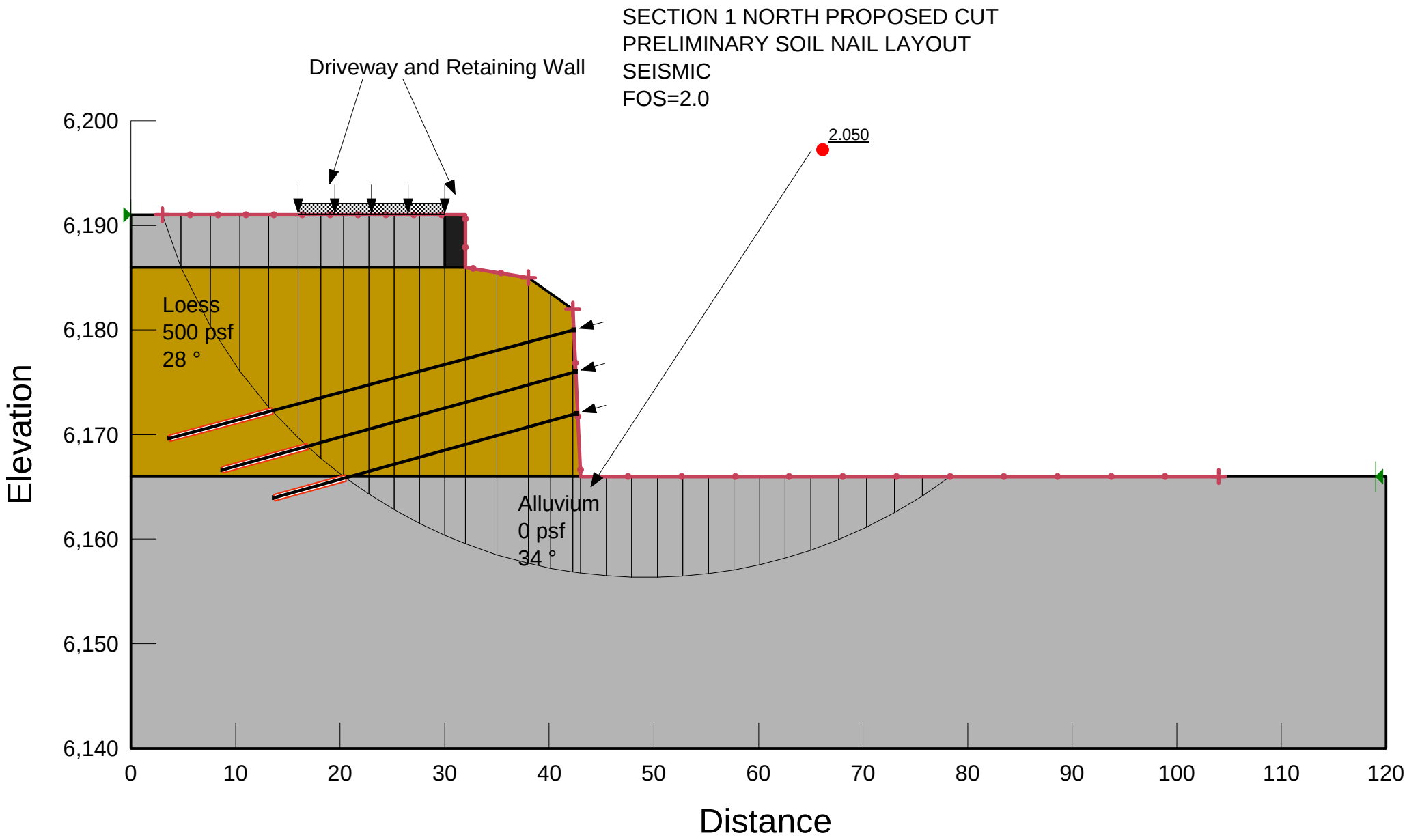


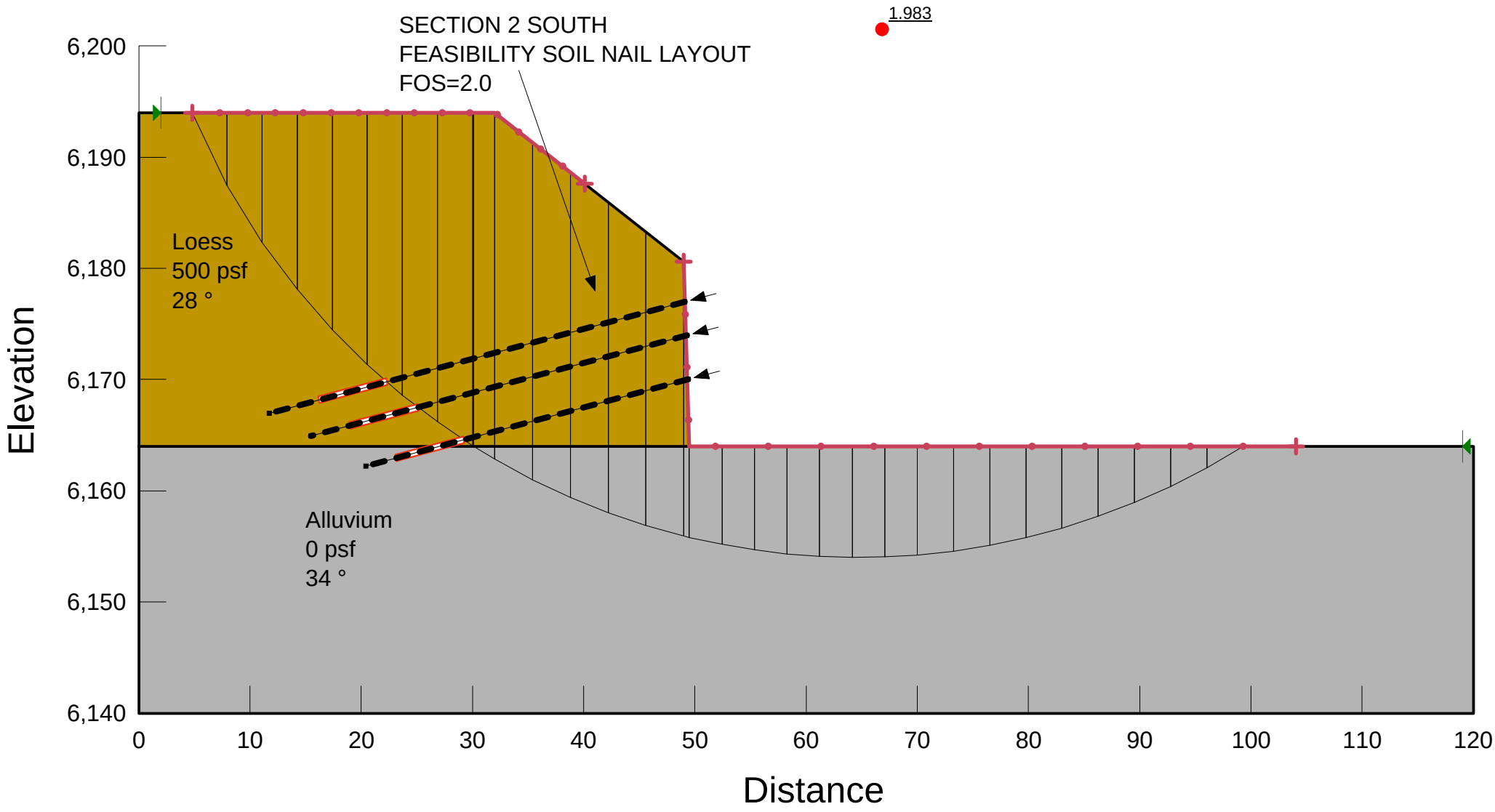
CLAY (plastic) TO SILT (non-plastic)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

TP2-1

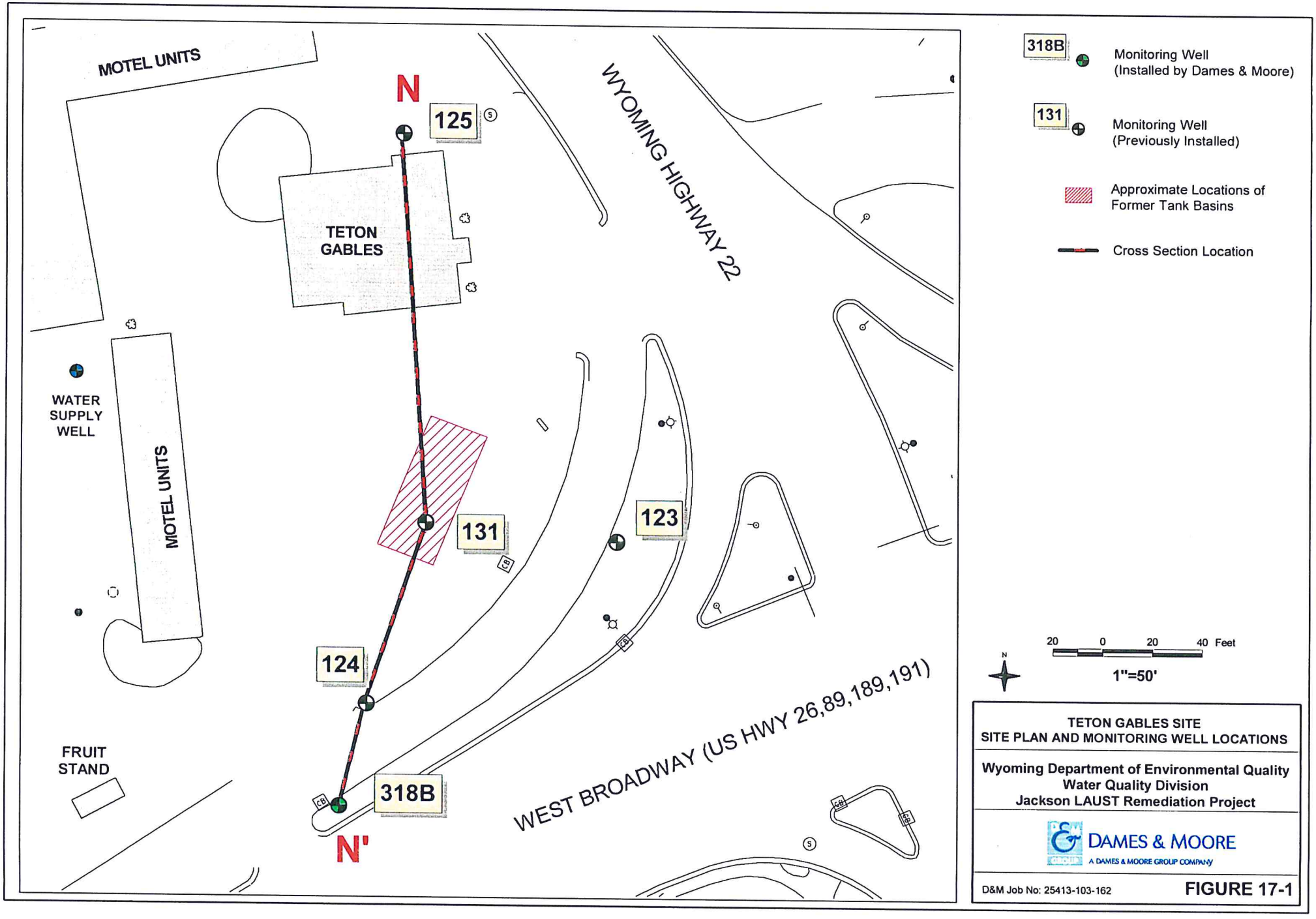
Teton Gables Parking Structure

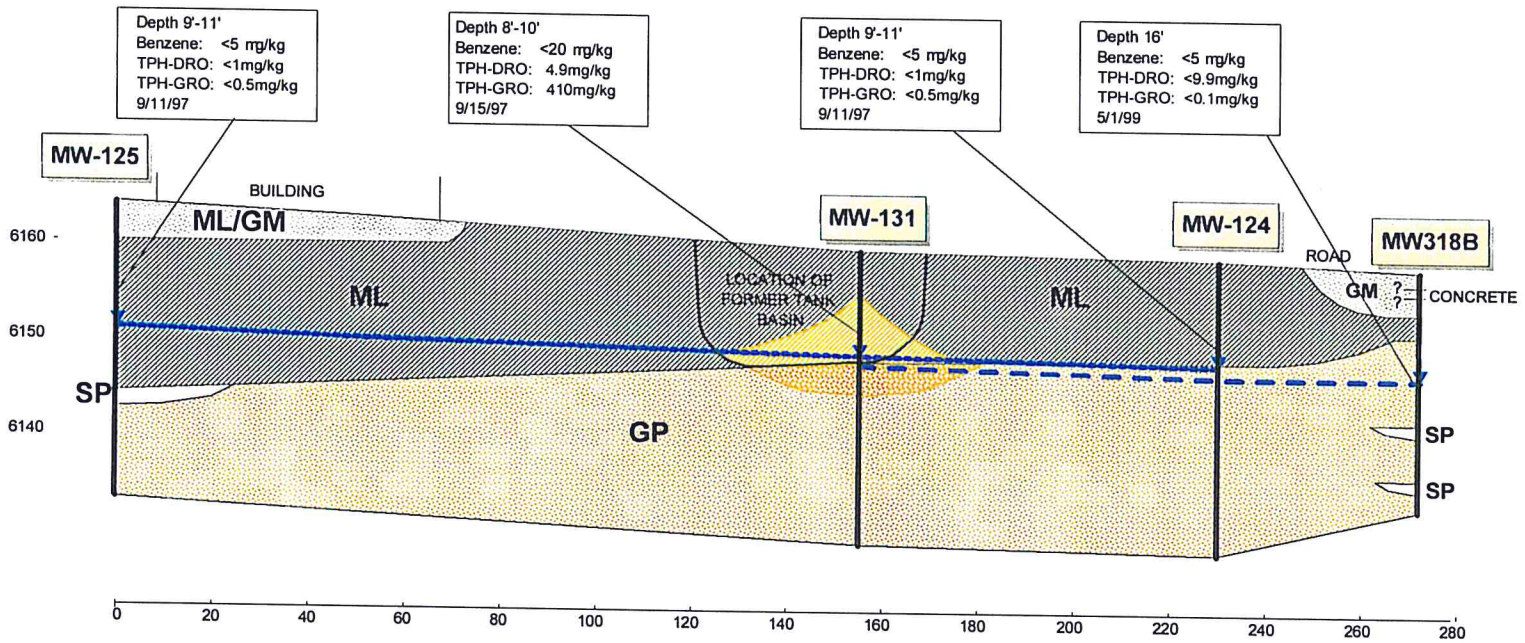
SLOPE STABILITY ANALYSES


SECTION 1 NORTH PROPOSED CUT
PRELIMINARY SOIL NAIL LAYOUT
SEISMIC
FOS=2.0
Driveway and Retaining Wall
2.050
Loess
500 psf
28 °
Alluvium
0 psf
34 °
Elevation
6,200
6,190
6,180
6,170
6,160
6,150
6,140
0
10
20
30
40
50
60
70
80
90
100
110
120
Distance


SECTION 2 SOUTH
FEASIBILITY SOIL NAIL LAYOUT
FOS=2.0
1.983
Loess
500 psf
28 °
Alluvium
0 psf
34 °
Elevation
6,200
6,190
6,180
6,170
6,160
6,150
6,140
0
10
20
30
40
50
60
70
80
90
100
110
120
Distance

WYDEQ MONITORING WELL RECORDS


MOTEL UNITS
N
125
WYOMING HIGHWAY 22
TETON GABLES
WATER SUPPLY WELL
MOTEL UNITS
131
123
124
FRUIT STAND
318B
N'
WEST BROADWAY (US HWY 26,89,189,191)
318B
Monitoring Well (Installed by Dames & Moore)
131
Monitoring Well (Previously Installed)
Approximate Locations of Former Tank Basins
Cross Section Location
20 0 20 40 Feet
1"=50'
TETON GABLES SITE
SITE PLAN AND MONITORING WELL LOCATIONS
Wyoming Department of Environmental Quality
Water Quality Division
Jackson LAUST Remediation Project
DAMES & MOORE
A DAMES & MOORE GROUP COMPANY
D&M Job No: 25413-103-162
FIGURE 17-1



Horizontal l Scale in Feet (1"=40'), Vertical Exaggeration: 2X

Description of Units

ML	Brown and Tan Silt, Brown Sandy Silt
ML/GM	Brown Sandy Silt with Gravel
SP	Fine to Medium Sand, Brown Sand, Gray Gravelly Sand
GM	Dark Brown Silty Sandy Gravel
GP	Brown Sand and Gravel with some Silt, Brown Sandy Gravel with Silt and Cobbles, Brown Coarse Sand and Gravel with Cobbles

Groundwater Level (Fall 97)

Groundwater Level (Summer 99)

Petroleum Staining/Odor with PID>100 Units

TETON GABLES SITE
GEOLOGIC CROSS SECTION N - N'

Wyoming Department of Environmental Quality
Water Quality Division
Jackson LAUST Remediation Project

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

D&M Job No: 25413-013-162

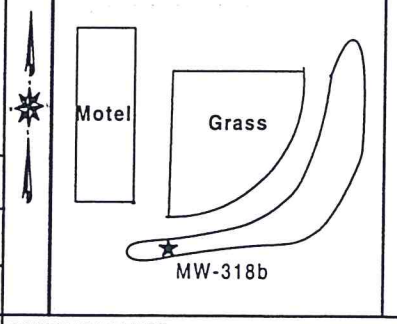
FIGURE 17-2

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

PAGE 1 of 1

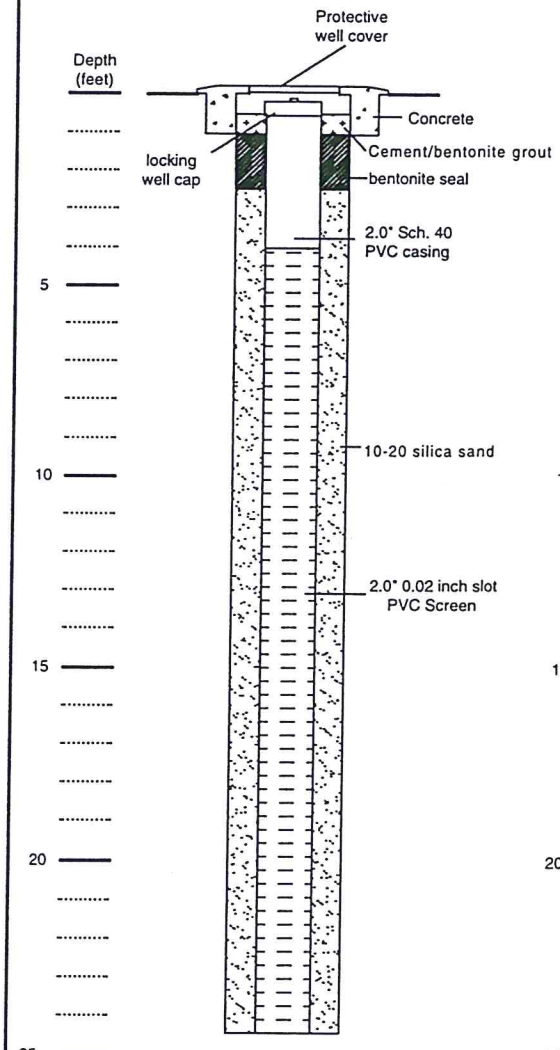
WELL CONSTRUCTION LOG

WELL LOCATION MAP



BORING/WELL NO. MW-318b	LOCATION Teton Gables Jackson, Wyoming	
PROJECT NAME Jackson LAUST	FIELD GEOLOGIST Jim Blankenau, Staff Geologist	
DRAWN BY Remmet deGroot, Env. Scientist	APPROVED BY Lori Robison, Senior Geologist	
DRILLING EQUIP./METHOD ODEX Air Rotary	SIZE/TYPE OF BIT	SAMPLING METHOD Grab Sample
CASING: 2.0" Sch. 40 PVC	SCREEN: 0.02 slotted, 2.0" Sch. 40 PVC	DATE STARTED/COMPLETED 5/25/99

WELL CONSTRUCTION



LITHOLOGY

GRAPHIC LOG	DESCRIPTION	PID (PPM)
GM Fill	Dark brown silty gravel (GM), fill, slightly moist, no odor	
	Concrete	
GM-GP	Brown silty sandy gravel (GM-GP), slightly moist to moist, well rounded,no odors	
SM	Silty sand (SM), trace clay brown, moist, low plasticity, no odor, some gravel	0.0
		0.0
	Sandy gravel (GP), brown, moist to slightly moist, well rounded, no odor	3.0
GP		3.0
	wet@14'	19.7
	Note: High background on PID	3.0
SP	Brown sand (SP), poorly graded, wet, no odor , med sand	
GP	Sandy gravel (GP), same as above	0.0
	Sandy Gravel (GP), well rounded gravel w/med sand	0.0
GP		0.0
SP	Gray gravelly sand (SP), med grained sand, wet, no odor	0.0

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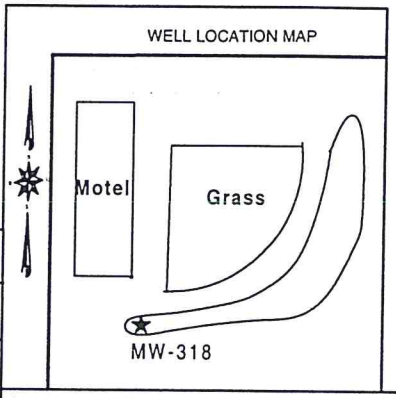
PAGE 1 of 1

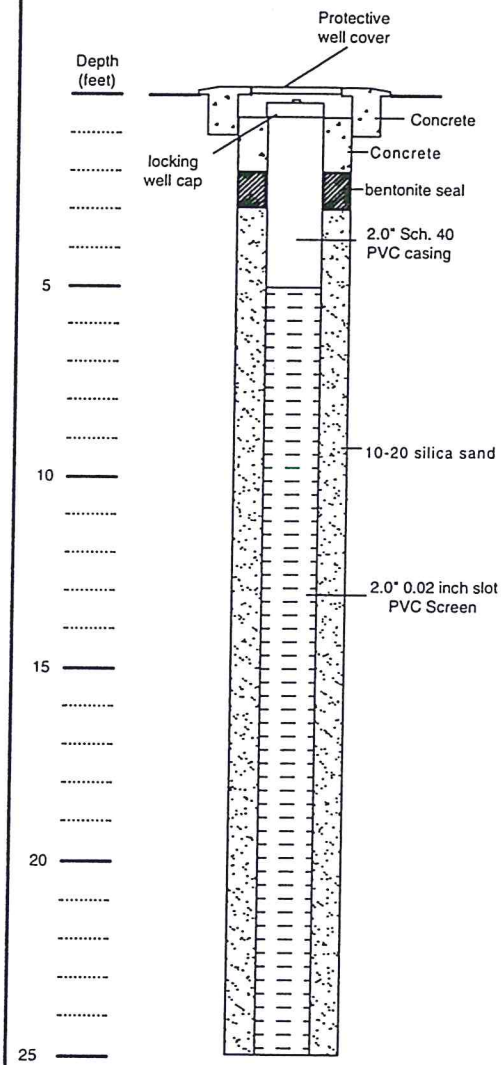
WELL CONSTRUCTION LOG

WELL LOCATION MAP



BORING/WELL NO. MW-318	LOCATION Teton Gables Jackson, Wyoming	
PROJECT NAME Jackson LAUST	FIELD GEOLOGIST Jim Blankenau, Staff Geologist	
DRAWN BY Remmet deGroot, Env. Scientist	APPROVED BY Lori Robison, Senior Geologist	
DRILLING EQUIP./METHOD Hollow Stem Auger	SIZE/TYPE OF BIT 7 7/8" / HSA	SAMPLING METHOD 2' Split Spoon
CASING: 2.0" Sch. 40 PVC	SCREEN: 0.02 slotted, 2.0" Sch. 40 PVC	DATE STARTED/COMPLETED 5/1/99

WELL CONSTRUCTION



LITHOLOGY

GRAPHIC LOG	DESCRIPTION	PID (PPM)	SOIL SAMPLE
GM	Dark brown silty gravel (GM), fill, slightly moist		
	Concrete		
	Cobbles & gravel		
GM-GP	Silty sandy gravel (GM-GP), brown, moist, no odor, coarse gravel, 2 in max clast size	0.8	
	Cobbles		
	(No sample- Crushed Rock)		
	Wet @ 14'		
SM	Brownish yellow silty sand (SM), wet, no odor, med to fine sand	0.0	
GM-GP	Silty sandy gravel (GM-GP), brownish yellow, wet, no odor, coarse gravel, rounded		15.5-16' bgs
	Cobbles & gravel		
SM	Silty sand (SM), brownish yellow, wet, no odor	0.0	
GM-GP	Silty sandy gravel (GM-GP), brownish yellow, wet, no odor, well rounded, coarse gravel, up to 2 inch diameter		
SP	Gray poorly graded sand (SP), no odor, subrounded, wet	0.0	
GP	Poorly graded gravel (GP), fine gravel, no odor, wet, well rounded to subrounded		

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To: Town of Jackson Planning & Building Department

Cc: Cornelius Kinsey, Kinsey LLC

From: Brian Remlinger, Principal, Alder Environmental, LLC
Julie Polasik, Wildlife Ecologist, Alder Environmental, LLC

Date: December 20, 2019

Re: **Proposed Teton Gables Motel Phase II, *Wildlife Use / Habitat Review***
PIDN: 22-41-16-32-1-00-031

The developers of the Teton Gables Motel Phase II are proposing a parking structure with housing and lodging above (Nelson Engineering Exhibit 10/16/19) on the property located at 1140 W Highway 22 within the Town of Jackson limits. Mr. Cornelius Kinsey, agent for the developers of the structure, requested the services of Alder Environmental, LLC to assist with submittal requirements related to the standards in the Town of Jackson Land Development Regulations (LDRs) Section 5.4.1. Steep Slopes. The submittal requirement for the proposed development includes a:

> *Report summarizing wildlife use of the subject property and any potential impacts from the proposed development.* (LDR *5.4.1.C.6.a*)

For the purposes of this review, *wildlife* shall be defined as those species and associated habitat protected in the in the current LDRs (Div. 5.2) and those species identified in the Teton County Focal Species Habitat Mapping Project (Alder 2017). *Impacts* shall be defined as development and/or uses that will detrimentally affect the food supply and/or cover provided by the habitat or detrimentally affect the potential for survival of the protected and focal wildlife species.

SITE INVENTORY & DATA REVIEW

A site visit was conducted on November 1, 2018 to evaluate existing wildlife habitat conditions and use. Photos 1 & 2 depict current site conditions consisting of developed impervious surfaces and disturbed lands with non-native and invasive plant species. The project site is entirely surrounded by development with active human use and activities. No signs of ungulate use (tracks, trails or scat) or bird nests (raptors specifically) were observed on the project location during the field inventory.

PHOTO 1 – Looking west at proposed parking structure.

PHOTO 2 – Looking northwest at slope behind existing motel.

Three sources of wildlife habitat data were reviewed: 1) Wyoming Game and Fish Department (WGFD) designated ungulate crucial winter ranges and migration routes and Bald Eagle Nests, 2) the 2013 WYDOT / Teton Science Schools mule deer movement and habitat use study (Riginos et. al, 2013) and 3) the Teton County

Focal Species Habitat Mapping Project (Alder 2017). The only protected or focal wildlife species potentially using the project site or impacted by the proposed development is mule deer.

The entire project site is mapped within WGFD designated mule deer crucial winter yearlong range (WGFD 2012, Figure 1). However, WGFD range maps were drawn at a very coarse scale and while the maps identify important areas, they are not useful for site specific analysis. The project site consists of disturbed and agricultural meadow cover types thus it does not contain the vegetative cover types that mule deer use for crucial winter range (xeric and mesic sagebrush-grasslands and mixed shrub types; *LDR Section 5.2.1.B.3.d*). Wyoming Game and Fish designated mule deer crucial winter range is also mapped northeast of the project site across Highway 22, and an elk migration corridor is mapped within 0.5 miles southwest of the project site. Although WGFD designated mule winter range is mapped within and near the project site, the high levels of human use and disturbed habitat types at the project site indicate that the site is of low-quality habitat for mule deer and is unlikely to be used as winter range.

The 2013 WYDOT/TSS Mule Deer Study designates the project site as a *low use movement area* for mule deer and *moderate probability of winter use* due to the project site's proximity to *high probability winter use* areas on High School Butte southwest of the project site and North Gros Ventre Butte to the north (Figure 2). Therefore, mule deer are more likely to use the higher quality habitat on High School Butte and North Gros Ventre Butte than the low-quality habitat at the project site. The site inventory, 2013 WYDOT/TSS Study and 2017 County Focal Species mapping also suggest that the crucial winter range that is mapped by WGFD does not exist at the project site (Riginos 2013, Alder 2017).

The nearest Bald Eagle nest to the project site is located 0.51 miles southwest of the site (WGFD 2019), and the site does not contain suitable habitat for nesting or wintering Bald Eagles. The project site also does not contain any crucial winter or nesting habitat for Trumpeter Swans, spawning habitat for Snake River cutthroat trout, or crucial moose winter habitat.

The Teton County Focal Species Habitat Map quantified the relative habitat values for the project site as ranging from 7 to 10 (low value) out of a possible 42 (highest value) (Alder 2017, Figure 2). This indicates that the project site is of low quality for wildlife habitat. The relative values habitat map was created by combining 20 weighted focal species habitat maps that are based on well documented species habitat data, expert knowledge and peer reviews, and environmental variables, providing a thorough assessment of relative wildlife habitat values in Teton County. The Countywide Habitat Value Map also designates the property and location of the proposed development as *Low Value Habitat* (EcoConnect 2018).

FINDINGS & OPINION

Wildlife use of the subject property is considered minimal and non-existent based on the site inventory and data reviews. Direct impacts from the proposed development to wildlife species and habitat protected by the Town of Jackson LDRs and those focal species identified in the Teton County Focal Species Habitat Mapping Project are negligible, if essentially non-existent.

REFERENCES

Alder 2017. Final Report: Focal Species Habitat Mapping for Teton County, WY. Alder Environmental LLC. Jackson, WY. April 2017.

EcoConnect 2018. Focal Species Habitat Mapping for Teton County, WY. Report Addendum. EcoConnect Consulting LLC. June 2018.

Riginos, C., Krasnow, K.D., Hall, E., Graham, M., Sundaresan, S., Brimeyer, D., Fralick, G., & Wachob, D. 2013. Mule Deer (*Odocoileus hemionus*) Movement and Habitat Use Patterns in Relation to Roadways in Northwest Wyoming. FHWA-WY-13/08F.

WGFD. 2012. Big Game Ranges Geographic Information Systems Layers. Cheyenne, WY.

WGFD. 2019. Bald Eagle Nest Flight Survey Data. Wyoming Game and Fish Department. Jackson, WY.

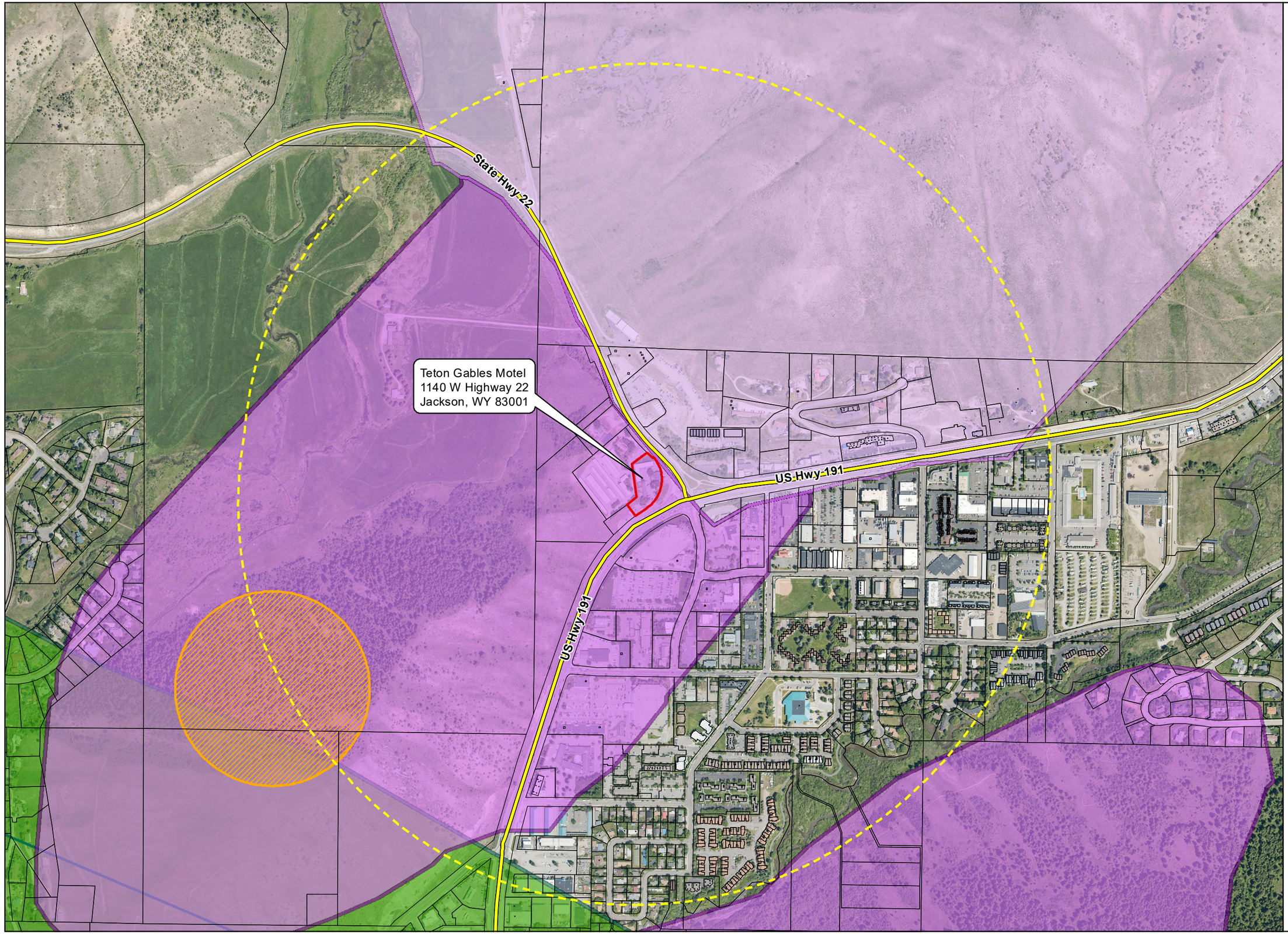

FIGURE 1

Mule Deer Crucial Winter Range and Elk Migration Corridor

Teton Gables LLC
TETON GABLES MOTEL PHASE II
1140 W Highway 22
Jackson, WY 83001

Legend

- Property Boundary
- 1/2 Mile Property Buffer
- Teton County Ownership
- State & County Roads
- Bald Eagle Nest Buffer
- Mule Deer Crucial Winter Range
- Mule Deer Crucial Winter/Yearlong Range
- Elk Migration Route 1/2 Mile Buffer

Sources

TETON COUNTY
- Aerial Imagery, June 2019
- Ownership Boundaries
- Roads
- Natural Resources Overlay (NRO)

WGFD
- Big Game Crucial Ranges and Migration Routes (2012)

1 in = 600 feet
0 150 300 600 Feet
N

December 20, 2019

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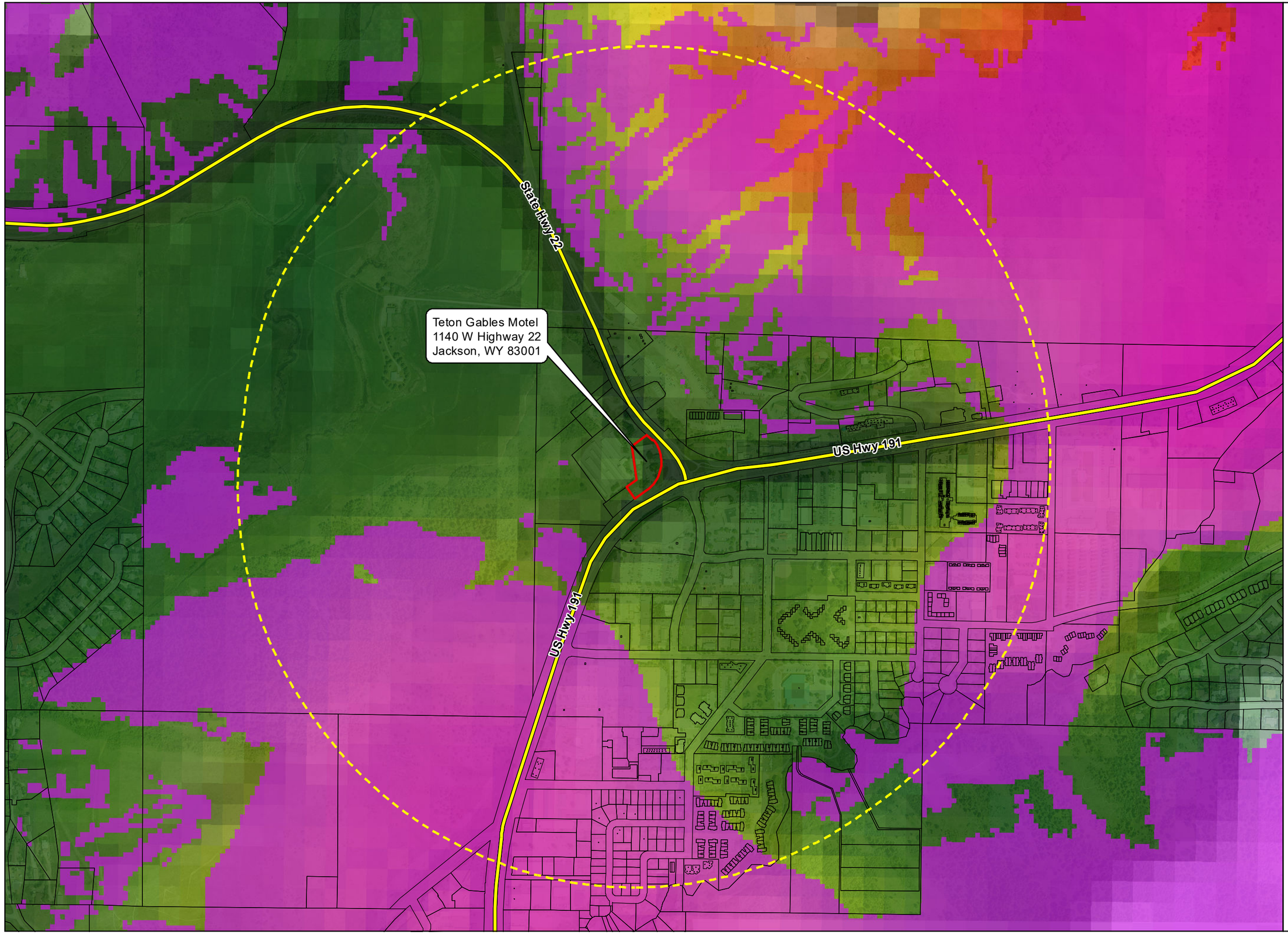

FIGURE 2

Focal Species Habitat & CRC/WYDOT Mule Deer Ranges

Teton Gables LLC
TETON GABLES MOTEL PHASE II
1140 W Highway 22
Jackson, WY 83001

Legend

- Property Boundary
- 1/2 Mile Property Buffer
- State & County Roads
- Teton County Ownership
- Mule Deer Winter Habitat (Alder 2017)

Mule Deer Use (TSS/WYDOT 2013)

Winter 2011 & 2012 Kernel Density / Utilization Distribution

HIGH PROBABILITY

MODERATE PROBABILITY

Sources

Teton County
- Aerial Imagery, June 2019
- Ownership Boundaries

Alder Environmental (2017)
- Focal Species Habitat Map - Mule Deer

Conservation Research Center of Teton Science Schools/WY Dept. of Transportation (2013)
- Mule Deer Kernal Density and Utilization Distribution

1 in = 600 feet

0 150 300 600 Feet

N

December 20, 2019

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