



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: June 21, 2019	REQUESTS: The applicant is submitting a request for a Zoning Compliance Verification for a Minor Deviation at 140 Pine Glades Drive, specifically for a new avalanche fence that was originally not required based on incorrect avalanche study information. New information suggest an avalanche fence is required for 140 Pine Glades Drive. For questions, please call Tyler Valentine at 733-0440, x1305 or email to the address shown below. Thank you.
Item #: P19-157	
Planner: Tyler Valentine Phone: 733-0440 ext. 1305 Fax: 734-3563 Email: tvalentine@jacksonwy.gov	
Owner: Pine Canyon, LLC PO Box 4741 Jackson, WY 83001 Applicant: Sagebrush Architectural Services PO Box 642 Jackson, WY 83001 307-413-0056	
Please respond by: July 5, 2019 (Sufficiency) July 12, 2019 (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. | ph: (307) 733-0440
P.O. Box 1687 | www.townofjackson.com
Jackson, WY 83001

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: Pine Glades minor deviation

Physical Address: 140 Pine Glades Drive

Lot, Subdivision: Lots 14 and H, Pine Glades Townhomes

PIDN: 22-41-16-33-4-38-008

PROPERTY OWNER.

Name: Pine Canyon, LLC

Phone: 307-413-0056

Mailing Address: PO Box 4741; Jackson, WY

ZIP: 83001

E-mail: sagebrusharch@gmail.com

APPLICANT/AGENT.

Name: Sagebrush Architectural Services

Phone: 307-413-0056

Mailing Address: PO Box 642; Jackson, WY

ZIP: 83001

E-mail: sagebrusharch@gmail.com

DESIGNATED PRIMARY CONTACT.

____ Property Owner ☒ Applicant/Agent

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

Use Permit

____ Basic Use

____ 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

☒ other: minor deviation

____ 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 #: P18-250 Environmental Analysis #: n/a
Original Permit #: P07-126 & 127 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?

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

on file **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.

X **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

Carolyn Burke
Name Printed

June 20, 2019
Date
Owner's Rep
Title

LETTER OF AUTHORIZATION

Pine Canyon, LLC and John Tozzi

, "Owner" whose address is: P.O. Box 4741

Jackson, WY 83001

(NAME OF ALL INDIVIDUALS OR ENTITY OWNING THE PROPERTY)

, as the owner of property
more specifically legally described as: Pine Glades PUD, Phase 2 Lots A through E and
Phase 1 lots 13 & 14 and Lot H

(If too lengthy, attach description)

HEREBY AUTHORIZES Carolyn Burke and Sagebrush Architectural Services as
agent to represent and act for Owner in making application for and receiving and accepting
on Owners behalf, any permits or other action by the Town of Jackson, or the Town of
Jackson Planning, Building, Engineering and/or Environmental Health Departments
relating to the modification, development, planning or replatting, improvement, use or
occupancy of land in the Town of Jackson. Owner agrees that Owner is or shall be deemed
conclusively to be fully aware of and to have authorized and/or made any and all
representations or promises contained in said application or any Owner information in
support thereof, and shall be deemed to be aware of and to have authorized any subsequent
revisions, corrections or modifications to such materials. Owner acknowledges and agrees
that Owner shall be bound and shall abide by the written terms or conditions of issuance of
any such named representative, whether actually delivered to Owner or not. Owner agrees
that no modification, development, platting or replatting, improvement, occupancy or use of
any structure or land involved in the application shall take place until approved by the
appropriate official of the Town of Jackson, in accordance with applicable codes and
regulations. Owner agrees to pay any fines and be liable for any other penalties arising out
of the failure to comply with the terms of any permit or arising out of any violation of the
applicable laws, codes or regulations applicable to the action sought to be permitted by the
application authorized herein.

Under penalty of perjury, the undersigned swears that the foregoing is true and, if signing
on behalf of a corporation, partnership, limited liability company or other entity, the
undersigned swears that this authorization is given with the appropriate approval of such
entity, if required.

OWNER:

(SIGNATURE) (SIGNATURE OF CO-OWNER)

Title: President Pine Canyon LLC

(if signed by officer, partner or member of corporation, LLC (secretary or corporate owner) partnership or
other non-individual Owner)

STATE OF New York

COUNTY OF New York

The foregoing instrument was acknowledged before me by John Tozzi this 30th day of July, 2018.

WITNESS my hand and official seal.

(Notary Public)

My commission expires: 4/18/2020

(Seal) DUODUO LIN
Notary Public, State of New York
Registration #01LI6340377
Qualified In Queens County
Commission Expires April 18, 2020

PROPOSED MINOR DEVIATION TO THE PINE GLADES DEVELOPMENT PLAN

June 20, 2019

Project Name, Location

Pine Glades PUD
Pine Glades Townhomes, Phase 1, Lots 14, H
140 Pine Glades Drive

Approval Sought

Minor Deviation to Development Plan

PROPOSED DEVIATION

Minor deviations to a development plan may be approved when they become necessary in light of technical or engineering considerations that are first discovered during development that were not reasonably anticipated during the initial approval process. Three criteria are considered when reviewing requested minor deviations.

Below is a description of the requested deviation and responses to the review criteria.

Updated Report

The updated avalanche report is attached that illustrates the newly mapped avalanche path and provides technical data supporting this application.

Relationship to Other Applications

Earlier in 2019, the applicant proposed several changes to the duplex S – 1 that is being constructed on townhouse lots 13 and 14. Those changes included erecting a 65 – foot long by 13 – foot tall avalanche fence uphill of the S – 1 building. This avalanche fence is removed from the more extensive list of changes and is submitted as a minor deviation in hopes of expediting its construction.

The other amendments that were proposed in the earlier application will be withdrawn in a separate communication from the applicant, with the exception of a proposed materials change to the exterior building facade. Those proposed changes are not a part of this application.

History of Avalanche Report

Art Mears and Chris Wilbur prepared an avalanche report as part of the original Pine Glades proposal and they now have prepared a revised report as part of this proposal. During a site visit by Mr. Wilbur in April of 2018 it was discovered that the avalanche zone delineated in the 2008 Pine Glades proposal and approved on the original development plan was incorrect. The disbelief in this discovery launched six months of research to determine what happened when the original report was compiled.

It appears the initial Pine Glades plans did not reflect the updated 2005 topographic data by Mears and Wilbur which was again updated in 2009 when the affordable housing structure was constructed. Consequently, it was discovered that not only is a 30 foot long avalanche mitigation fence required uphill of the guest parking on the east end of the S – 1 building, where a new garage was earlier proposed, but additional avalanche mitigation fencing is required for the eastern 30 feet of the S -1 building which is under construction. Chris Wilbur has now designed and engineered a 13 foot tall by 65 foot long avalanche mitigation fence that will be installed between 30 and 50 feet uphill from the back deck of the S – 1 duplex. (See attached report and plan.) The mitigation fence will be visually screened by spruce trees that will be planted downhill of, and adjacent to the fence.

Wildlife Considerations

The applicant's team heard concerns expressed by one person about the impact on wildlife movement caused by the avalanche fences above the Teton Science Schools. The single fence proposed in this application differs from the Science Schools case in several key ways.

- This application proposes a single fence that will be 65 feet long. The combined fences at TSS are several hundred feet long.
- A single row of fence will be erected in Pine Glades where several rows exist at TSS.
- This proposed fence will overlap with the S – 1 building where the TSS fences are on an open hillside far removed from any buildings.
- The fence above S – 1 will be screened from the building by spruce trees and within 30 to 50 feet from the building. The TSS fences are in wide open space and much harder to see.

Review Criteria and Responses

1. Complies with the standards of the current LDRs.

The avalanche fence is necessary to comply with the LDR; if the avalanche mitigation is not installed, an LDR violation will be created. No additional development rights are sought in association with the avalanche mitigation.

2. Does not include reductions in the amount of open space set aside or required resource protection.

The common open space in the Pine Glades PUD will remain unchanged. The new avalanche fence will be uphill and between 30 and 50 feet of the two-unit S – 1 building that currently is under construction.

3. Does not include increases in the amount of building floor area.

The avalanche fence is not accompanied by any increased floor area or other development rights.



Justin Petersen, P.E.
Project Development Engineer
justin@gsi.us | 970.773.6790

June 22, 2018

Dave Meyers
dmeyers@wyoming.com
307.690.9547

Subject: Proposal for the Installation of an Avalanche Fence, Pine Glades Development

Dear Mr. Meyers:

GeoStabilization International® (GSI®) is pleased to offer this Proposal for the referenced project. This proposal is exclusively for Dave Meyers, herein known as the Contractor, to consider. The project site is located at 142 Pine Glades Drive, Jackson, WY (GPS 43°28'11.2"N 110°45'51.2"W). We thank you for the opportunity to provide pricing for this work.

Our opinions and statements regarding this project shall remain confidential and shall not be shared with other parties without the express written consent of GSI. All concepts and procedures outlined in this proposal shall be considered the intellectual property of GSI.

WORK DESCRIPTION AND PRICING

We understand that site requires an avalanche fence above and to the south of the existing structure. The design of the avalanche fence system is per Wilbur Engineering, Inc and Geobrugg. It is understood that Dave Meyers will be purchasing the fence materials directly from Geobrugg. GSI intends to install the fence according to the Geobrugg specifications. GSI will supply the equipment necessary to install the 19 anchors required. This price is based on a grout to soil bond ultimate strength of 20 psi and an allowable strength of 10 psi. The 10 psi grout to soil bond results in a 1500 lbs./ft allowable bond strength. 6 proof tests are included with this proposal to be completed by GSI.

- Upslope anchors (Geobrugg requires 70.8 kips) – 4" diameter hole will require 45-ft long anchors
- Lateral anchors (Geobrugg requires 64 kips) – 4" diameter hole will require 45-ft long anchors
- Post anchors (Geobrugg requires 34.8 kips) – 4" diameter hole will require 25-ft long anchors

We have based this proposal on the following:

- GSI 1151e 170504 RXE-2000 rope assembly
- L2 Anchor Forces RXE-2000 Ver. 20151110
- L2 RXE-2000 e Product Manual 08_161005

SCOPE OF WORK

GSI will provide crew, materials, and equipment necessary for the construction of the proposed avalanche fence. GSI limits its scope of work to:

- Drilling, installing and grouting threaded hollow-bar micropiles for the post anchors and drilling, installing and grouting of the hollow bar soil nails for the lateral anchors.
- Installation of 4m tall fence system according to Geobrugg's specifications.

PROJECT CONDITIONS

GSI's proposed scope of work includes labor, tools, equipment, and materials to install the avalanche fence system pursuant to the following conditions:

- The initial mobilization includes labor, equipment and material capable of installing the fence system. If GSI is required to leave the site and return outside of what was previously stated and planned for, the cost is \$5,500 for each demobilization/remobilization. Work shall be available to GSI prior to GSI mobilizing to the site.

PRICING

GSI proposes to perform the work described herein based on the prices listed below. The prices included herein are based on and assume continuous unobstructed work beginning the day we mobilize to the site. Should the work not proceed pursuant to the assumptions contained herein, the price to perform the work may likely increase.

Item	Description	Qty	UM	Unit Price	Total Price
1	Mobilization	1	EA	\$13,827.93	\$ 13,827.93
2	Avalanche Fence	69	LF	\$ 1,281.08	\$ 88,394.75
3	Proof Testing	6	EA	\$ 798.36	\$ 4,790.14
				Estimated	\$107,012.82

WORK HOURS/SCHEDULE

All work is based on a work schedule of Monday through Saturday, 10 hours per day as weather and daylight permits. GSI anticipates the fence construction to take 10-12 days.

We can mobilize to the site within approximately 4 weeks from GSI receiving an executed contract, approved submittals, and a written notice to proceed. Depending on material lead times we may require additional time. Additional charges will be assessed if we are scheduled and are required to work additional hours or shifts.

EXCLUSIONS

Contractor is responsible for and obligated to provide the following at no cost to GSI:

- Surveying – Layout survey, as-built survey, and wall tolerances as required.
- ~~Safety~~ – Design, installation, and maintenance of any fall protection systems at all grade separations including at the top of any earth retention system constructed by GSI.
- Traffic Control – All required pedestrian and vehicle traffic control.
- Sanitary Facilities – On-site facilities within reasonable proximity for the use of GSI employees.
- Site Security – Site security during nights, weekends, and holidays.
- Site Access – The pricing in this proposal is based on drilling production with larger excavator mounted drill. The drill is 10-ft wide and 11-ft tall. GSI assumes there will be access on the east side of the property for the drill. Contractor has agreed to provide access ramp material over existing parking wall.



Project Name: Pine Glades Avalanche Fence

ADDITIONAL TERMS AND CONDITIONS

- a) The cost of a bond premium is not included in the proposal price. If desired by and paid by the Owner, GSI will furnish a Payment and Performance Bond at a rate of 2% of the total bid price.
- b) Prevailing wages are not included in this proposal price.
- c) Buy America/American Material Requirements are not included in the proposal price.
- d) The attached Terms and Conditions are incorporated into this proposal as a contract document.

Sincerely,

GEOSTABILIZATION INTERNATIONAL

A handwritten signature in black ink, appearing to read 'Justin Petersen', is written over a faint, circular stamp that contains the word 'INTERNATIONAL'.

Accepted by: _____
(Printed name/title)

Date: _____

Justin Petersen, P.E. (WY)
justin@gsi.us | 970.773.6790

TERMS AND CONDITIONS

STANDBY TIME

Standby time of up to \$950/hour will be charged for delays beyond GSI's control. This includes requesting GSI mobilize to the site before the site is ready, or any delays/interruptions/interference/disruption to GSI's operation due to restricted access or lack of required easements, and other contingencies that may arise. Day rate is 10-hours and our crews will be allowed access to maintain our equipment during standby events.

OWNER'S OBLIGATIONS

Owner is responsible for and obligated to provide the following at no cost to GSI:

- a. Provide Construction Water – A clean (potable) supply of water for construction available on-site or in close proximity to work. GSI will provide and fill a water tank but the source of potable water is to be provided by Owner (~1,000 gallons per day).
- b. Drainage – Installation and maintenance of drainage measures to direct water away from the top and bottom of the system for the life of the system, which may be accomplished by grading, swales, sand bagging, etc.

ADDITIONAL TERMS AND CONDITIONS

- a) Retainage, if any, is to be released to GSI within 30-days after the completion of GSI's work.
- b) Any and all design work is excluded unless specifically included in this Proposal.
- c) Owner agrees that GSI shall not be responsible for liquidated damages, delay damages, or other time-related damages for any work that is outside GSI's control.
- d) Notwithstanding anything contained in any document to the contrary, in the event the project is delayed, disrupted, terminated and/or the project schedule is extended for any reason not caused by the acts or omissions of GSI (or as the proper designation may be for GSI), our subcontractor(s), or those for whom GSI, etc. is legally liable, GSI reserves and waives no rights to receive compensation to recover all costs including, but not limited to, price escalations and other damages.
- e) Any work not specifically included in this Proposal is excluded.
- f) GSI will employ open shop labor. In the event that union labor must be used the client will pay for any additional cost differential.
- g) The Parties agree that this Proposal is a "Contract Document" and is specifically incorporated into the Contract Documents for the Project. In the event of a conflict or ambiguity between this Proposal and any other Contract Document, the terms of this Proposal shall control and govern.
- h) All invoices are due, in their entirety, upon receipt from GSI. All payments received for GSI's work shall be held in trust for the benefit of GSI. Amounts due and unpaid over thirty days shall accrue interest at the rate of 1.5% per month. Owner shall be liable to GSI for all costs of collecting amounts due and unpaid, including, but not limited to, reasonable attorneys' fees and/or legal fees.
- i) This agreement/Proposal is subject to and governed by Colorado law under all circumstances and venue for any dispute shall be Mesa County, Colorado.
- j) The partial or complete invalidity of any provision of this Proposal shall not affect the validity or continuing force and effect of any other provision. The failure of either party hereto to

insist, in any one or more instances, upon the performance of any of the terms, covenants and conditions of this contract/Proposal, or to exercise any right herein, shall not be construed as a waiver or relinquishment of such term, covenant, condition or right as respects further performance.

- k) Each party has had the opportunity to review and negotiate this Proposal and no party shall be construed to be the drafter of this Proposal for any purpose including, but not limited to, interpretation of this document.
- l) Vibrations – GSI cannot accept any liability for disturbance to existing structures and their inhabitants on or near the site. GSI requires the Owner to indemnify GSI against any and all claims for such disturbance and also take precautions as necessary to avoid any such claims. This may include vibration monitoring, excavating trenches around the affected area, etc.
- m) Hazardous Materials -- GSI will immediately stop work per state and federal work and safety requirements if hazardous materials are encountered. Downtime or additional mobilization fees will be negotiated separately.
- n) It is possible that damage may occur as a result of heave, settlement, utility not correctly marked, or intrusion of grout and/or construction water and GSI cannot accept responsibility/liability for such damage. Owner agrees to waive any and all liability and damages against GSI in any related to the underground conditions and/or existing facilities described in the preceding sentence.
- o) Any work done pursuant to change order or otherwise is subject to the terms and conditions contained herein.
- p) The proposal pricing and scope is offered pursuant to the full and unmodified terms of this proposal. Should the owner not fully accept or modify this proposal, the pricing and/or the scope of work will likely be subject to modification by GSI.
- q) Should Owner provide GSI with verbal direction to begin to mobilize, the terms and conditions of this Proposal shall be deemed accepted and apply in full and without limitation.
- r) GSI's defense and indemnity obligations, if any, are limited to claims for damages to property or personal injury caused by the negligent acts or omissions of GSI. Contractor agrees to defend and indemnify GSI for claims or damages alleged to have been caused by its acts or omissions.
- s) GSI retains all ownership rights in its proprietary and/or patented information and no such rights are transferred in any way.
- t) Increased Costs. If, due to either (a) the introduction of or any change in or in the interpretation of any (i) law or regulation, or (ii) any tariff, tax, duty, toll, excise, levy or charge to be paid on a particular class of imports and/or exports, and/or (b) the compliance with any guideline or requirement from any governmental authority that is introduced or the interpretation of which is changed, in each such case after the date hereof, there is any increase in the cost to GeoStabilization International ("GSI") of providing the materials, goods and/or services under this Agreement, then Customer shall from time to time, upon demand by GSI, immediately pay to GSI additional amounts sufficient to compensate GSI for such increased cost. GSI shall submit to Customer a certificate as to the amount of such increased cost and detailing the calculation of such cost, which shall be conclusive and binding for all purposes, absent manifest error.
- u) This offer expires 30 days from the date transmitted.



Sent: Sonntag, 17. Juni 2018 22:32

To: Justin Petersen <justin@gsi.us>

Cc: dmeyers@wyoming.com; Kalejta John <John.Kalejta@geobrugg.com>; Art Mears <artmears@hotmail.com>

Subject: Re: Pine Glades Avalanche Fence

CAUTION: External email

Justin & Dave,

I've added John Kalejta and Art Mears to this email and attached my preliminary design criteria. The proposed mitigation is essentially a modified rockfall barrier. I am recommending a 20 meter length by 4.0 meters height. Based on a case study by Geobrugg and the SLF at Fieberbrunn, Austria, we should plan for 3000 kJ posts and ground plates/post foundations and 2000 kJ ring nets with a 5 cm wire mesh, and a 5 meter post spacing. Extra downhill ropes might also be needed. The Austrian barriers are 5 meters tall, but they are subject to multiple events each year, as well as higher loads (flow thickness and energy and a deeper snowpack). It might be possible to reduce the component strength and anchor loads after Geobrugg looks at the design avalanche criteria. There is no "factor of safety" in my criteria. Presumably, there is some geotech data for the house, but I have not seen it.

We need to get Art's input on the avalanche criteria, as well as barrier and anchor loads from Geobrugg. John, I hope that you can help us with this. Dave Meyers is the owner's rep. and he wants to move forward with this as expeditiously as possible.

Please let me know if anyone has questions, comments or concerns.

Thanks,

Chris

On Sun, Jun 17, 2018 at 1:33 PM, Justin Petersen <justin@gsi.us> wrote:

Chris and Dave,

I plan to drive up to Jackson tomorrow to visit this site and take a look at the access points and location of the proposed avalanche fence. I will be there around 3pm. Please let me know what information you have about the fence and location so I can accurately price the anchor drilling and fence install.

My cell is 970.773.6790.

Thanks,

Justin Petersen, P.E. Project Development Engineer, Mountain Region

Cell: 970.773.6790 Office: 855.579.0536 Fax: 970.245.7737 Email: justin@GSI.US

www.geostabilization.com



GEOHAZARD MITIGATION EXPERTS

GSi provides the most responsive and experienced geohazard mitigation services in North America and specializes in design/build warranty landslide repair, rockfall mitigation, excavation shoring, GRS-IBS abutment construction, settlement control, densification, grouting, and micropile underpinning.

6/18/2018

dmeyers@wyoming.com

From: "Kalejta John" <John.Kalejta@geobrugg.com>
Date: Monday, June 18, 2018 11:19 AM
To: "Chris Wilbur" <geowilbur@gmail.com>
Cc: "Justin Petersen" <justin@gsi.us>; <dmeyers@wyoming.com>; "Art Mears" <artmears@hotmail.com>
Subject: RE: Pine Glades Avalanche Fence

Chris,

Thanks for the clarification. I think the RXE-2000 barrier modified to 5m post spacing with stonger anchors / posts / foundations will do the trick. I have sent the info back to our barrier guru in Switzerland for his comments. Going with the RXE-2000 will also save the client a bit of money.

@ Dave – I will prepare a material proposal for you in the next day or so. As for schedule, when does your client want to begin the construction? Please advise.

Thanks and have a great day!

Regards
 John
 John Kalejta
 Regional Manager Rocky Mountains / Central USA

Upcoming events with Geobrugg!

Geobrugg North America, LLC
 3215 67th Avenue Place
 Greeley, Colorado 80634 USA
 Mobile: +1 505 220 1404
john.kalejta@geobrugg.com
www.geobrugg.com

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From: Chris Wilbur [mailto:geowilbur@gmail.com]
Sent: Montag, 18. Juni 2018 10:49
To: Kalejta John <John.Kalejta@geobrugg.com>
Cc: Justin Petersen <justin@gsi.us>; dmeyers@wyoming.com; Art Mears <artmears@hotmail.com>
Subject: Re: Pine Glades Avalanche Fence

CAUTION: External email

John,

Thanks for the quick response. Here is a little clarification:

1. The avalanche criteria have no factor of safety. Since the avalanche is smaller than the design avalanche at Fieberbrunn, the modified 2000/3000 kJ design barrier at Fieberbrunn would create a margin of safety/conservatism at our site.
2. The posts are the critical design element, so they need to be strong and spaced closely (5.0m).
3. The ring nets and rope assembly are intentionally lower strength at Fieberbrunn in order to allow greater deflection and reduce loads on posts. This is because the avalanche load is spread out

6/18/2018

much wider than a rockfall event.

4. An additional downhill rope was used at Fieberbrunn to accommodate the widespread loading of the system.

In summary, if we match the barrier design at Fieberbrunn, we will have the factor of safety and performance that we need. If we use a newer product, it should be modified similarly to achieve the goal of reducing loads on posts.

I'm sure that Dave would like a quote for the materials and schedule.

I hope this helps.

Thanks,
Chris

On Mon, Jun 18, 2018 at 9:57 AM, Kalejta John <John.Kalejta@geobrugg.com> wrote:

Good morning all,

Here are a few thoughts I have after looking at Chris' design criteria:

- I would suggest using our new RXE rockfall barrier for this design, with the avalanche design modifications. Chris this is exactly what we did at Little Cloud in Aspen many years ago but with our RXI barrier line.
- In the RXE line, the post sizes are the same for 2,000 or 3,000 kJ. Since you say there is "no factor of safety" in the design, I would suggest using the RXE-3000 barrier. This will give the design stronger ROCCO ring nets as well as larger breaking devices. The cost difference between RXE-2000 to RXE-3000 is roughly 20%.

Chris, please let me know your thoughts and I will send the appropriate technical info, Product Manual(s), etc. If the owner would like a proposal showing both options please let me know and we can prepare that for him. I look forward to working with you all on this project. Have a good day!

Regards
John

John Kalejta
Regional Manager Rocky Mountains / Central USA

Upcoming events with Geobrugg!

Geobrugg North America, LLC
3215 67th Avenue Place
Greeley, Colorado 80634 USA
Mobile: +1 505 220 1404
john.kalejta@geobrugg.com
www.geobrugg.com

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From: Chris Wilbur [<mailto:geowilbur@gmail.com>]

6/18/2018

dmeyers@wyoming.com

From: "Chris Wilbur" <geowilbur@gmail.com>
Date: Sunday, June 17, 2018 10:31 PM
To: "Justin Petersen" <justin@gsi.us>
Cc: <dmeyers@wyoming.com>; "Kalejta John" <John.Kalejta@geobrugg.com>; "Art Mears" <artmears@hotmail.com>
Attach: 6-16-18 DRAFT design criteria Pine Glades Avalanche Barrier.pdf
Subject: Re: Pine Glades Avalanche Fence

Justin & Dave,

I've added John Kalejta and Art Mears to this email and attached my preliminary design criteria. The proposed mitigation is essentially a modified rockfall barrier. I am recommending a 20 meter length by 4.0 meters height. Based on a case study by Geobrugg and the SLF at Fieberbrunn, Austria, we should plan for 3000 kJ posts and ground plates/post foundations and 2000 kJ ring nets with a 5 cm wire mesh, and a 5 meter post spacing. Extra downhill ropes might also be needed. The Austrian barriers are 5 meters tall, but they are subject to multiple events each year, as well as higher loads (flow thickness and energy and a deeper snowpack). It might be possible to reduce the component strengths and anchor loads after Geobrugg looks at the design avalanche criteria. There is no "factor of safety" in my criteria. Presumably, there is some geotech data for the house, but I have not seen it.

We need to get Art's input on the avalanche criteria, as well as barrier and anchor loads from Geobrugg. John, I hope that you can help us with this. Dave Meyers is the owner's rep. and he wants to move forward with this as expeditiously as possible.Â

Please let me know if anyone has questions, comments or concerns.

Thanks,
 Chris

On Sun, Jun 17, 2018 at 1:33 PM, Justin Petersen <justin@gsi.us> wrote:

Chris and Dave,

Â

I plan to drive up to Jackson tomorrow to visit this site and take a look at the access points and location of the proposed avalanche fence. I will be there around 3pm. Please let me know what information you have about the fence and location so I can accurately price the anchor drilling and fence install.

Â

My cell is 970.773.6790.

Â

Thanks,

Justin Petersen, P.E. Â Project Development Engineer, Mountain Region

6/18/2018

Cell: 970.773.6790 Office: 855.579.0536 Fax: 970.245.7737 Email: justin@GSI.US

www.geostabilization.com



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Â

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--
Chris Wilbur, P.E.
Wilbur Engineering, Inc.
150 E 9th St. #201
Durango, CO 81301
(970) 247-1488
www.mearsandwilbur.com

6/18/2018

June 16, 2018

Dave Meyers
Via email

RE: Preliminary Design Criteria for Avalanche Barrier
Lots 13 and 14, Pine Glades
140 and 142 Pine Glades Drive, Jackson, Wyoming

Dave,

This letter describes design criteria for a flexible steel avalanche barrier intended to protect the residential duplex structure at the subject site. We have relied upon Sheet C1.1 of the Y2 Consultants Grading Plan to determine the structure location and elevation.

Limitations

1. The design criteria are for an approximate "100-year" (one-percent annual probability) size avalanche. Larger avalanches are possible and would likely result in damage to the barrier and possibly, the house. However, the proposed design would provide a very high level of protection for occupants, even for a larger avalanche.
2. The methods used to determine the design criteria meet the standard of care for avalanche science at this time and location. No warranty or guarantee of performance is made.
3. The design of the avalanche barrier system and its components is beyond the scope of this letter and must be provided by the supplier. We assume that Geobrugg will provide the barrier design and anchor and foundation loads.
4. The design of the post foundations and tension anchors is beyond the scope of this letter. We recommend that a qualified geotechnical engineer be retained by the owner or contractor for this task.

Avalanche Criteria

The following criteria are based on our site observations, avalanche dynamics analyses and experience with snow avalanches in this climate. The design criteria follow methods described in the following document:

Interaction of Flexible Rockfall Barriers with Avalanches and Snow Pressure, Geobrugg
Technical Documentation, S. Margreth and A. Roth, April 2008

Required retention capacity: 8 m³/m; assume k=10, very conservative

Impact Velocity: 4.7 m/s

Flow density: 300 kg/m³

Impact Pressure: 6.5 kPa

Impact height, d_{tot} = 0.6m (assume $\lambda = 1.8$)

Number of avalanches per design season: 1.0

Surface angle of avalanche deposit behind barrier: 20 degrees

Ground slope at barrier: 26 degrees

Storage capacity: 74 m³/m for a 4.0 meter tall barrier

Figure 1 and Figure 2 show the barrier location.

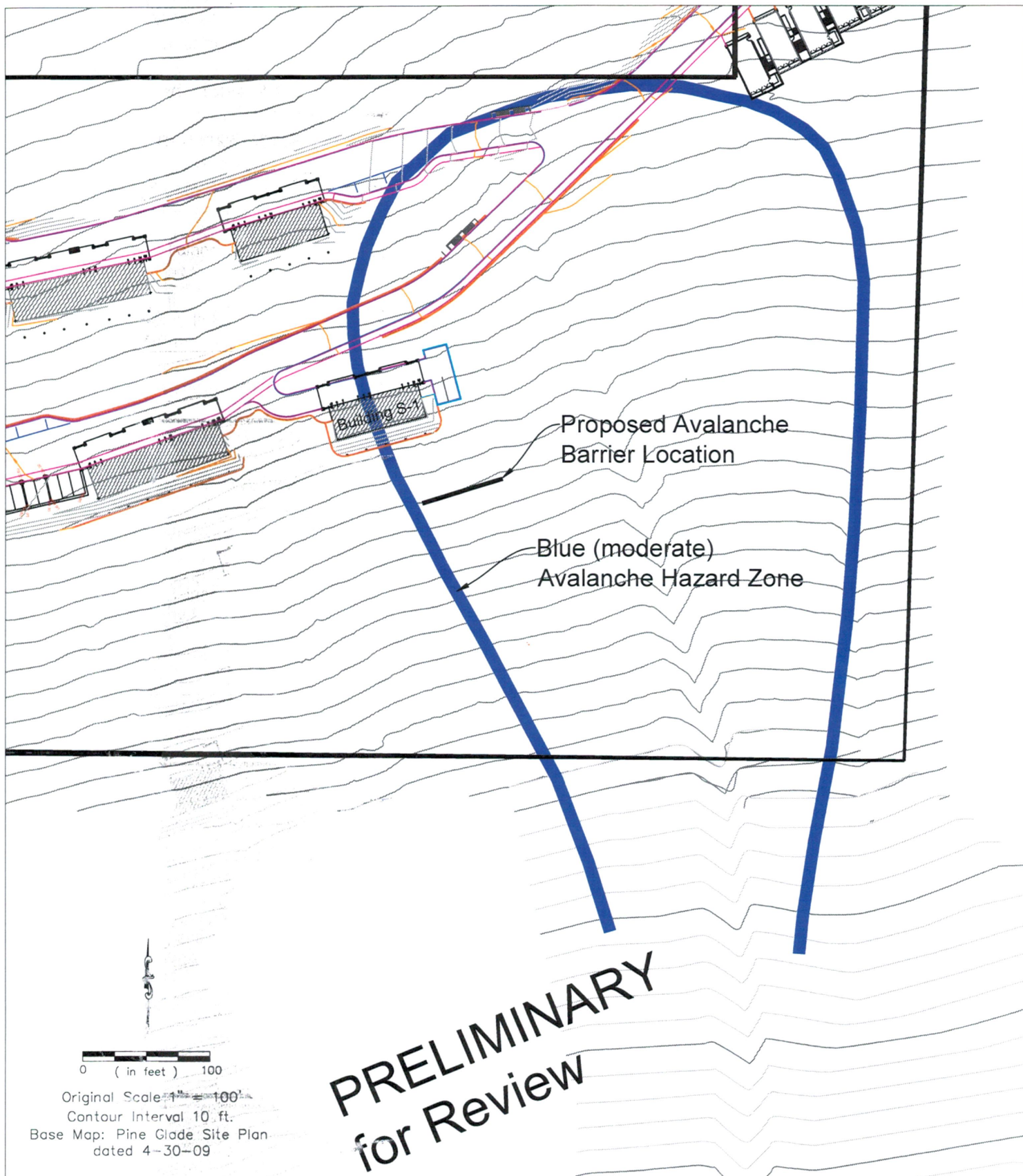
Please let me know if you have questions.

Sincerely,

Wilbur Engineering, Inc.



Chris Wilbur, P.E. (Colorado)



Wilbur Engineering, Inc.
Arthur I. Mears, P.E., Inc.
June 16, 2018

Avalanche Map with Proposed Barrier
Lots 13 & 14, Pine Glades
Jackson, Wyoming

Figure
1

Locations in Arizona, British Columbia, California, Colorado, Florida, Georgia, Idaho, Kentucky, North Carolina, Ohio, Ontario, Oregon, Pennsylvania, Tennessee, Texas and Virginia.

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--

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--

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dmeyers@wyoming.com

From: "Chris Wilbur" <geowilbur@gmail.com>
Date: Tuesday, April 24, 2018 7:18 AM
To: "Marian Meyers" <dmeyers@wyoming.com>
Attach: AVY_ex-base-Model-from Randy Schrouder.pdf; JMY Letter-2007.pdf; Mears Letter-2003.pdf; Mears Letter-2005.pdf; RDZ-DRAFT Exhibits-2000.pdf
Subject: Fwd: Hagen Glades-Pine Glades Avalanche Path

Dave,

The email below came yesterday. I'm available after noon, if you want to discuss it.

Chris

----- Forwarded message -----

From: **Jo Ann Hoff** <jhoff@rdzeng.com>
Date: Mon, Apr 23, 2018 at 5:17 PM
Subject: Hagen Glades-Pine Glades Avalanche Path
To: chris@mearsandwilbur.com
Cc: mostciek@rdzeng.com

Chris,

If you already received this email, I apologize for sending it twice, I had a computer email glitch and it is not showing up in my sent items, so I wanted to be sure you received it.

I spent a little time researching our files for both Hagen Glades/Jackson Hole Corp(JHC) and Pine Glades. I have attached everything that I found that is relevant. I cannot find the original map or later letter from Art Mears. My guess is that it may have been given to the Pine Glades Developer (Dave Taylor).

Given that the original work was completed in September of 2000, I would assume that the Mears map was digitized into our CAD drawing. We received a drawing from Randy Schrouder later (see attached pdf). It is impossible to tell where the blue zone shown in that drawing came from as it is a block 'AVYZONE'. When this drawing is overlaid on our Pine Glades DWG the blue zones are concurrent. However, the blue zone shown in Randy's drawing is also concurrent with our older base DWG for Hagen Glades. At this point, it is impossible to tell where the blue zone shown in the current drawings is a later CAD version, or (more likely) a digitized version from the original map. I have attached our original exhibits of the avalanche path which were also most likely from the original Mears drawing.

4/24/2018

Please give me a call if you have any questions. Thanks.

JoAnn

JoAnn Hoff, EIT

Rendezvous Engineering

25 S Gros Ventre

POB 4858

Jackson, WY 83001

P 307.733.5252

F 307.733.2334

C 307.690-5460

--

Chris Wilbur, P.E.

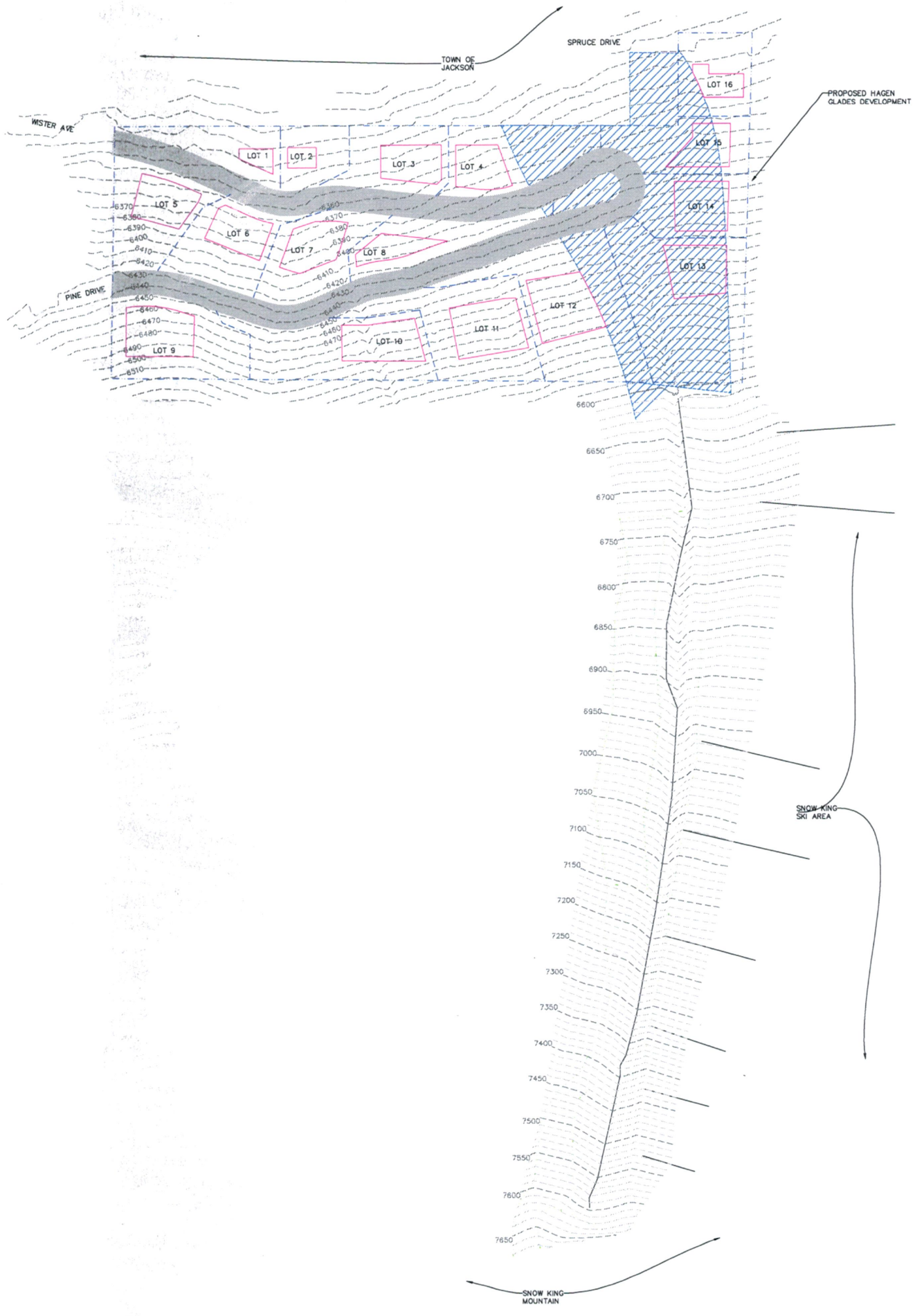
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JMY Environmental Contracting

Avalanche Consulting, Education, High Angle Construction, Weather Instrumentation
PO Box 6559, Jackson WY 83002 · 406-570-3688 · Jamie.yount@dot.state.wy.us

September 23, 2007

Grand Homes of Wyoming
PO Box 11870
Jackson WY, 83002

Re: Pine Glades Development Avalanche Hazard

Dear Grand Homes of Wyoming:

The terrain and climate at the proposed Pine Glades development is susceptible to the threat of avalanches during the winter months. The landscape above the development consists of a steep forested slope (greater than 25°) that is typical avalanche terrain. The slope is covered with numerous 12"-18" diameter trees that act as natural snow anchors but with ample space for avalanche debris to flow around and through. The Swiss guidelines are the industry standard for avalanche hazard mapping and define 3 main hazard zones. The red zone (high hazard), the blue zone (moderate hazard), and the white zone (no hazard). According to the Swiss guidelines, the development is in the blue zone of the avalanche zoning plan. Blue zone avalanches are typically small and infrequent and can be addressed through site specific design and planning. Private homes are permitted in the blue zone if they are designed to resist avalanche forces or are otherwise protected by avalanche defense.

The avalanche climate of the development is driven by the cold and shaded North face of Snow King Mountain. North facing aspects at low elevations typically lead to a weak sugary snow pack. This weak snow, referred to as depth hoar, is a persistent weak layer that can form early in the winter and remain intact until spring. Depth hoar can produce natural avalanches during significant snow loading from storm events and is also susceptible to failure from rapid and prolonged warming events.

The avalanche risks and hazards at the site can be addressed through several different methods. Avalanche forecasting and control uses weather and snow pack information to evaluate the avalanche risk. When the hazard reaches a critical state the risk is then mitigated with explosive control work. Forecasting and control is not practical when protecting occupied structures but could be an effective mitigation technique during onsite construction. Slope stabilization with snow supporting structures in the avalanche starting zone is a standard practice in the European Alps to protect highways and infrastructure, but impractical in this application as extreme costs and construction on National Forest land would require an involved NEPA process. Cost effective and practical avalanche defense for this site should consist of a site specific avalanche hazard analysis prior to construction to provide design guidelines for any structures built in the blue zone. Common solutions for structural defense include building reinforcement for avalanche loads, building shape and orientation, and terrain modification to provide avalanche debris deflection and storage. Please contact me with any questions or concerns.

Jamie Yount
Meteorologist and Avalanche Specialist

ARTHUR I. MEARS, P.E., INC.

Natural Hazards Consultants

555 County Road 16
Gunnison, Colorado 81230
Tel/Fax: 970-641-3236
artmears@rmii.com

January 18, 2003

Mr. Sean O'Malley, P.E.
Rendezvous Engineering
Jackson, WY 83001
Fax: (307) 733-2334

Dear Sean:

I'm sending this letter at your request to provide more detail about building procedures within "blue" or "moderate-hazard" avalanche zones.

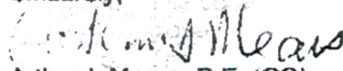
Blue zones are usually defined as intermediate-hazard avalanche areas between the more destructive or frequent avalanche of the "red zone" and the outer end of the design-magnitude avalanche areas¹. Therefore, within the blue zone avalanches have return periods between 30 and 100 (or 300) years and produce impact pressures of less than 600 lbs/ft² on flat surfaces normal to the avalanche flow². Residential construction is sometimes permitted within the blue zone if appropriate mitigation is used to protect property and persons. Mitigation will include the following steps which are taken through a cooperative by the avalanche engineering specialist, the structural engineer, architect, planner, and developer.

1. The dynamics (speeds, impact pressures, flow thickness) of the design-magnitude (100 or 300 year event) are computed using currently-accepted methods;
2. Building locations, sizes, shapes, and orientations are specified by the developer, land planner, architect or other interested party;
3. Loads on exposed building surfaces are computed by the avalanche specialist;
4. The computed loads are taken by a registered structural engineer, usually working closely with the architect, and the building is designed;
5. The final design must consider safety in the immediate area outside buildings.

The overall process is highly site-specific. It is never possible to provide "blanket" avalanche loads for an area, as these will vary considerably, depending on terrain and building details at each location. However, "blue-zone" areas are usually considered areas of "acceptable risk" because these areas have a) relatively infrequent avalanches (> 30-year return periods), thus persons outside do not have a high risk of encounter with avalanches, and b) produce avalanches where mitigation is technically feasible, from an engineering perspective. Overall planning of a subdivision should ensure that building avalanche mitigation on one lot does not increase the hazard on an adjacent lot.

Roads and subdivision streets are generally permitted where avalanches are not frequent, they typically avoid the "10-year" or shorter return period events because avalanche control is not usually done in subdivisions.

Sincerely,


Arthur I. Mears, P.E. (CO)
Avalanche-control engineer

¹ "Design-magnitude" avalanches usually have return periods of 100 to 300 years, depending on the particular jurisdiction.

² Uniform definitions for the blue zone do not exist in the United States, however several jurisdictions in the U.S. have defined avalanche red and blue zones in somewhat different ways.

Arthur I. Mears, P.E., Inc.
Natural Hazards Consultants
555 County Road 16
Gunnison, CO 81230
Tel/Fax: (970) 641-3236

March 20, 2005

Mr. Randy Schrouder
Summit Consulting
P.O. Box 6842
Jackson, WY 83002

RE: Avalanche exposure, Hagen Glades Subdivision

Dear Randy:

As requested and discussed during our site meeting on March 1, 2005, I have completed a site investigation and quantification of the design-avalanche dynamics at Hagen Glades Subdivision. I utilized the new topographic map prepared by you, personal knowledge of the local snow and avalanche climate, my field inspection of the avalanche path and building sites, and application of the Swiss avalanche-dynamics program, "AVAL-1D."

1. Terrain

The proposed building sites in the Subdivision are located on slopes of 15° to 20° below steep, forested slopes. Avalanches can begin within steep open areas near the top of the Snow King Ski Area, above 7,400 feet elevation and flow through the trees. Figure 1 is a March 1, 2005 photo of the relatively open,

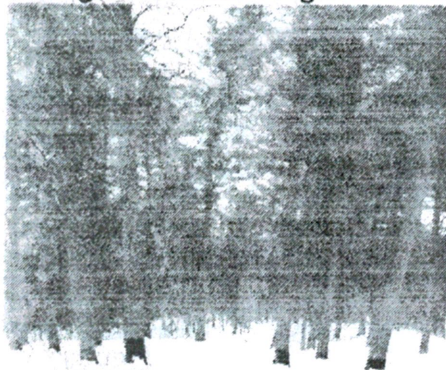


FIGURE. 1

gladed terrain at the 7,000-foot elevation level, approximately 500 to 650 vertical feet above various building sites on Lots 12 – 16. The view in Figure 1 shows the numerous 12" – 18" diameter trees on the slope, but clearly indicate that ample space exists between the trees to enable avalanches to flow through them. Large avalanches will tend to keep moving on this slope because it is relatively steep (generally $> 25^{\circ}$) and will be a relatively smooth surface. A gully as much as 15 feet deep and 30-40 feet wide is located on the eastern edge of the avalanche path. This gully will contain the majority of the flow above approximately 6,700 feet elevation. However, below approximately 6,700 feet the gully

becomes narrow and gradually turns to the southwest. It will not contain the remainder of the avalanche snow below 6,700 feet, where the buildings on Lots 12 - 16 will be located. Below the proposed subdivision, the gradient of the avalanche path gradually decreases to 10° or less.

2. Avalanche-Release Conditions

The steep terrain comprising the avalanche path, including the starting zone above 7,400 feet, receives extensive skier compaction. This stabilizes the snowcover and prevents avalanche release during the vast majority of conditions. Furthermore, heavy, sustained snowfall over 3 - 5 days at the 7,000 to 7,600 foot elevation of the upper avalanche path is rare and substantial amounts of snow will be intercepted by the forest cover canopy below the starting zone. Nevertheless, over the long period time generally considered in land-use planning and engineering applications¹, it must be assumed that a substantial new snow layer will accumulate in the starting zone faster than it can be stabilized by artificial methods such as skier use or explosive control of the slopes.

In the avalanche-dynamics analysis a *new slab* depth (measured vertically) of 0.60m (2.0 feet) was assumed for the 30-year avalanche and a new slab depth of 0.80m (2.6 feet) was assumed for the 300-year avalanche. This new snow slab was assumed to be deposited over a starting zone total area of approximately 1 acre between 7,630 and 7,450 feet elevation covering. The slab can release over the entire area simultaneously during the right conditions.

3. Avalanche-dynamics analysis

Computations indicate that avalanches with return periods of 30 to 300 years will have lost most of the volume and impact energy by the time the upper building sites on Lots 12 and 13 are reached. However, energy will be sufficient to impact the back wall of the upper houses. Design pressures have not been computed because site-specific design details are required prior to calculations. However, rough calculations² based on simplified building geometries suggest pressures of 50 - 200 lbs/ft² which would act over a height of roughly 10 feet. This pressure is sufficient to rupture portions of unprotected walls and break windows and doors. The energy decreases as the lower building sites are reached, but the flow height of the avalanche increases as snow dams up when the snow decelerates.

It must be noted that the above calculations assume the terrain as it currently exists. However, substantial cuts into the slope will be required to build in the

¹ A return period between 30 and 300 years is assumed in land-use planning and engineering applications in numerous North American and European sites. The 30 and 300 year avalanches have been assumed in analysis at Hagen Glades. Computations are based on these events.

² Site-specific analysis is required to specify load magnitudes and heights of loads. These can only be completed after building shape, orientation and positions are known.

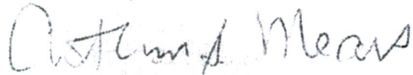
locations shown. These cuts would store compressed snow behind and against the upper sites on Lots 12 and 13. The lower building sites on Lots 14-16 would also be exposed to avalanche impact. However, because substantially less avalanche velocity and energy would be available lower on the slope, impact pressures will be reduced. Furthermore, the proposed subdivision road will also be cut into the slope west of Lots 14 and 15 and would certainly stop some avalanche debris and dissipate some of the energy.

4. Recommendations

The following recommendations are based on the site inspection and analysis of this study:

- a. Reinforcement for avalanche loads on buildings to be located on lots 12 and 13 should be incorporated in design.
- b. Proposed site contours of the access road and building sites must be provided as these will affect final avalanche loads.
- c. Building size, orientation and shape must also be provided as these will also affect loads.
- d. The storage of snow on the access road and behind buildings on Lots 12 and 13 may minimize or eliminate avalanche impact on buildings to be located on Lots 14 - 16.

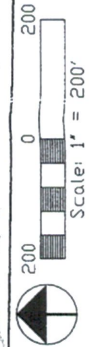
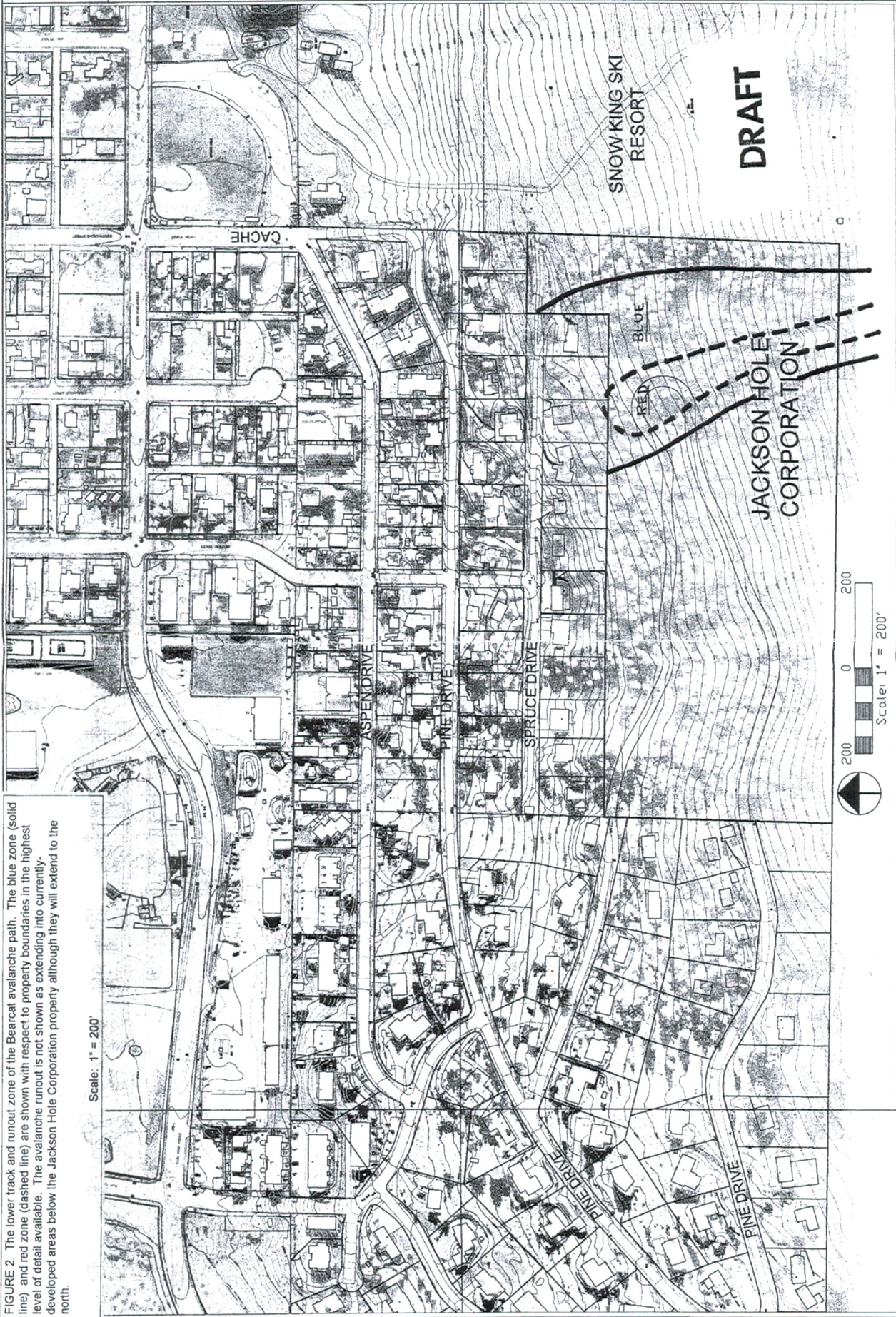
Sincerely,



Arthur I. Mears, P.E. (CO)
Avalanche-control engineer

FIGURE 2. The lower track and runoff zone of the Bearcat avalanche path. The blue zone (solid line) and red zone (dashed line) are shown with respect to property boundaries in the highest level of detail available. The avalanche runoff is not shown as extending into currently-developed areas below the Jackson Hole Corporation property although they will extend to the north.

Scale: 1" = 200'

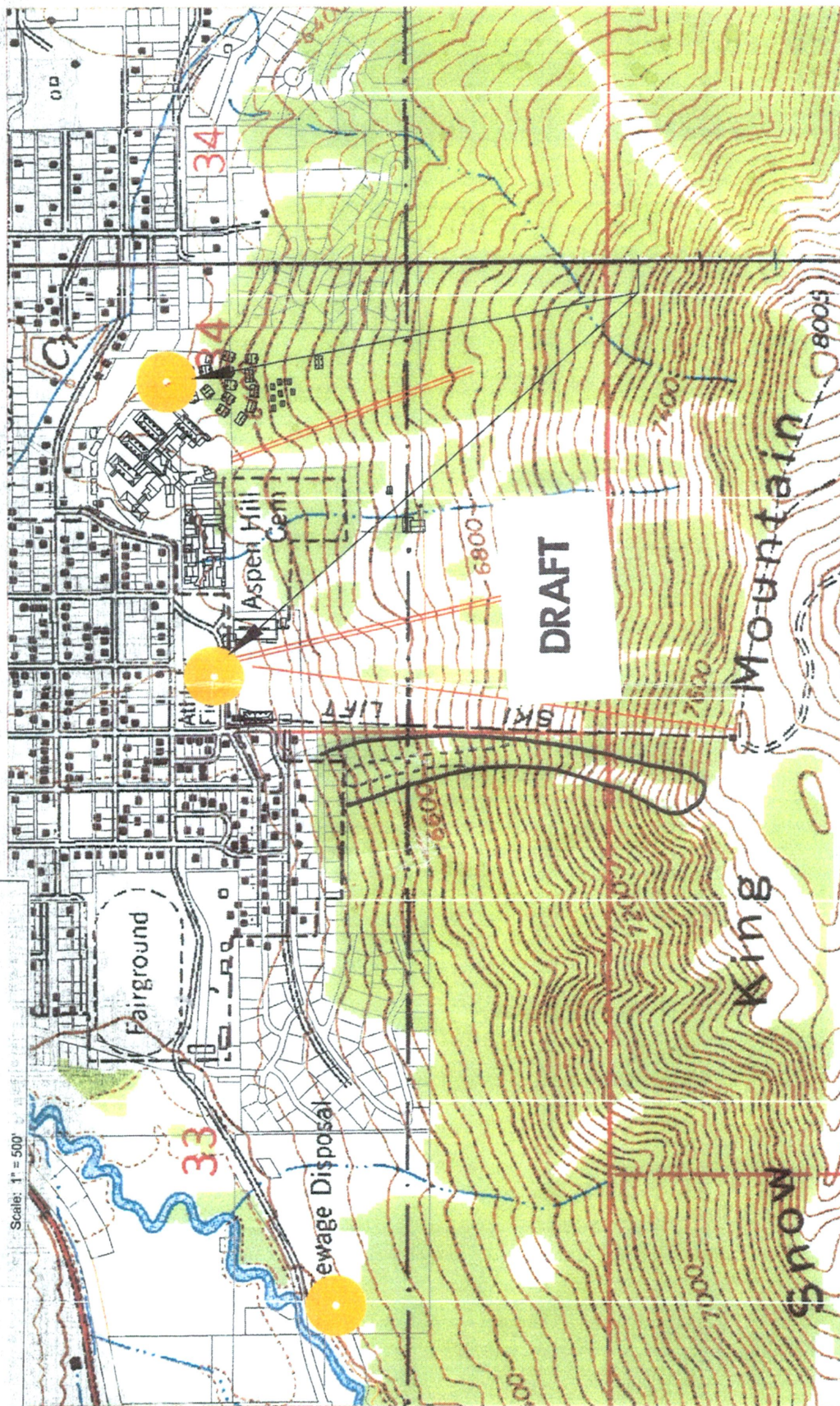


PROJECT TITLE:
JACKSON HOLE CORPORATION
PROJECT NUMBER:
2017.0
DRAWING NUMBER:
1

DRAWING TITLE:
VICINITY MAP

O'MALLEY ENGINEERING & MAPPING, P.C.
P.O. BOX 4888 JACKSON, WYOMING 83001
320 EAST OAKHURST AVENUE
PHONE: 307.733.0352 FAX: 307.733.2334
E-MAIL: info@omalleyeng.com
WWW.OMALLEYENG.COM
Prepared By: JED
Date: August 21, 2008

FIGURE 1. The Bearcat avalanche path south of downtown Jackson and near the west end of the Snow King Ski Area. This map provides an overview which shows the starting zone, track, and a portion of the runout zone. The approximate location of the blue (moderate-hazard) zone is shown as a solid line and the red (high-hazard) zone is shown as a dashed line. Avalanches are not mapped beyond the boundaries of the Jackson Hole Corporation land although numerous additional avalanches do exist on this map.



Agrotech
Closet

Burton

Brude

690-4181

Deane

543-2810

dmeyers@wyoming.com

From: "Chris Wilbur" <geowilbur@gmail.com>
Date: Friday, April 27, 2018 8:59 AM
To: "Marian Meyers" <dmeyers@wyoming.com>
Subject: Re: Fwd: Hagen Glades-Pine Glades Avalanche Path

Dave,
Number 5 should refer to our 2009 report, not 2006. Sorry about the typo.
Chris

On Wed, Apr 25, 2018 at 9:18 AM, Chris Wilbur <geowilbur@gmail.com> wrote:

Dave,

Here is my understanding of the avalanche situation at Pine Glades. Art, please correct or clarify, if needed.

1. The info on avalanche zones and sources provided by Rendezvous is very limited and incomplete. I make the following observations and inferences.
2. It appears that the Avalanche Blue zone shown on Y2 plans for bldg. S-1 and on the plans for the 2006 Affordable Housing plans were based on mapping by Art Mears in 2000 using USGS 40-ft. contours prepared for Rendezvous Engineering. The 2000 map from Rendezvous is labeled "draft".
3. Revised mapping by Art Mears in 2005 was based on better topography (10-ft. contours) extending to the starting zone (top) of the avalanche path. This mapping was done for Summit Consulting for the Hagen Glades subdivision. The revised map indicated a shorter avalanche runout distance and more lateral spreading near the end of the runout.
4. I completed field work and analysis that was reviewed by Art Mears in 2009 for the Pine Glades affordable housing building. At that time, I discovered that the Blue zone on the site plan had not been updated to reflect the better topo data and mapping by Mears in 2005. This report was addressed to Andrew Miller, Pine Glades Development, LLC and our Service Agreement was signed by David Taylor, Grand Homes of Wyo. The report was intended for the Affordable Housing, but also described the mapping discrepancy for building S-1 and recommended avalanche mitigation for building S-1.
5. We assumed, incorrectly, that building S-1 had been moved out of the Blue zone when you contacted us to look at an addition that would encroach on the Blue Zone. If the location of building S-1 has not been moved since our 2009 report, then approximately 50% of the structure is subject to snow avalanche loading for a "design-magnitude" avalanche, which has an approximate annual probability of 1%. At this stage of construction for building S-1, the only practical mitigation is detached avalanche barriers as described in my April 13, 2018 memo to you.

Please let me know if you have question or want us to proceed in developing design criteria for a detached avalanche mitigation barrier.

Thanks,
Chris

On Tue, Apr 24, 2018 at 11:56 AM, <dmeyers@wyoming.com> wrote:

5/8/2018

Chris, Will call you at noon. Dave

From: [Chris Wilbur](#)

Sent: Tuesday, April 24, 2018 7:18 AM

To: [Marian Meyers](#)

Subject: Fwd: Hagen Glades-Pine Glades Avalanche Path

Dave,

The email below came yesterday. I'm available after noon, if you want to discuss it.

Chris

----- Forwarded message -----

From: JoAnn Hoff <jhoff@rdzeng.com>

Date: Mon, Apr 23, 2018 at 5:17 PM

Subject: Hagen Glades-Pine Glades Avalanche Path

To: chris@mearsandwilbur.com

Cc: mostdiek@rdzeng.com

Chris,

If you already received this email, I apologize for sending it twice, I had a computer email glitch and it is not showing up in my sent items, so I wanted to be sure you received it.

I spent a little time researching our files for both Hagen Glades/Jackson Hole Corp(JHC) and Pine Glades. I have attached everything that I found that is relevant. I cannot find the original map or later letter from Art Mears. My guess is that it may have been given to the Pine Glades Developer (Dave Taylor).

Given that the original work was completed in September of 2000, I would assume that the Mears map was digitized into our CAD drawing. We received a drawing from Randy Schrouder later (see attached pdf). It is impossible to tell where the blue zone shown in that drawing came from as it is a block 'AVYZONE'. When this drawing is overlaid on our Pine Glades DWG the blue zones are concurrent. However, the blue zone shown in Randy's drawing is also concurrent with our older base DWG for Hagen Glades. At this point, it is impossible to tell where the blue zone shown in the current drawings is a later CAD version, or (more likely) a digitized version from the original map. I have attached our original exhibits of the avalanche path which were also most likely from the original Mears drawing.

5/8/2018

Please give me a call if you have any questions. Thanks.

JoAnn

JoAnn Hoff, EIT

Rendezvous Engineering

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C 307.690-5460

--
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www.mearsandwilbur.com

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(970) 247-1488
www.mearsandwilbur.com

dmeyers@wyoming.com

From: "Chris Wilbur" <geowilbur@gmail.com>
Date: Friday, April 13, 2018 9:04 AM
To: "Marian Meyers" <dmeyers@wyoming.com>; "Art Mears" <artmears@hotmail.com>
Attach: 4-13-18 Pine Glades Preliminary Blue zone memo.pdf
Subject: Re: Lots 13 & 14, Pine Glade maps

Dave & Art,

Attached is a memo with the figures included.

Chris

On Fri, Apr 13, 2018 at 7:13 AM, <dmeyers@wyoming.com> wrote:

Chris, Y2 wasn't involved in 2005 or 2009. I think that should say Rendezvous Engineering. Also can you draw a preliminary conclusion in this memo. Thanks Dave.

From: [Chris Wilbur](#)
Sent: Thursday, April 12, 2018 8:36 PM
To: [Marian Meyers](#)
Cc: [Art Mears](#)
Subject: Lots 13 & 14, Pine Glade maps

Dave,

I've attached 4 figures that illustrate my current understanding of the avalanche situation and one option for mitigation.

Fig. 1 shows a Blue zone map that was prepared in March 2005 by Art Mears for the Hagen Glades subdivision. It was accompanied by a report addressed to Summit Consulting.

Fig 2 shows the Blue zone from Mears 2005 along with the Blue zone (black dashed line) that Y2 Consultants and the affordable housing architect provided to us. Y2 Attributed the second Blue zone to Rendezvous Engineering.

Fig 3 shows a conceptual layout for the avalanche barrier that we discussed yesterday.

Fig 4 shows a photo of such a barrier.

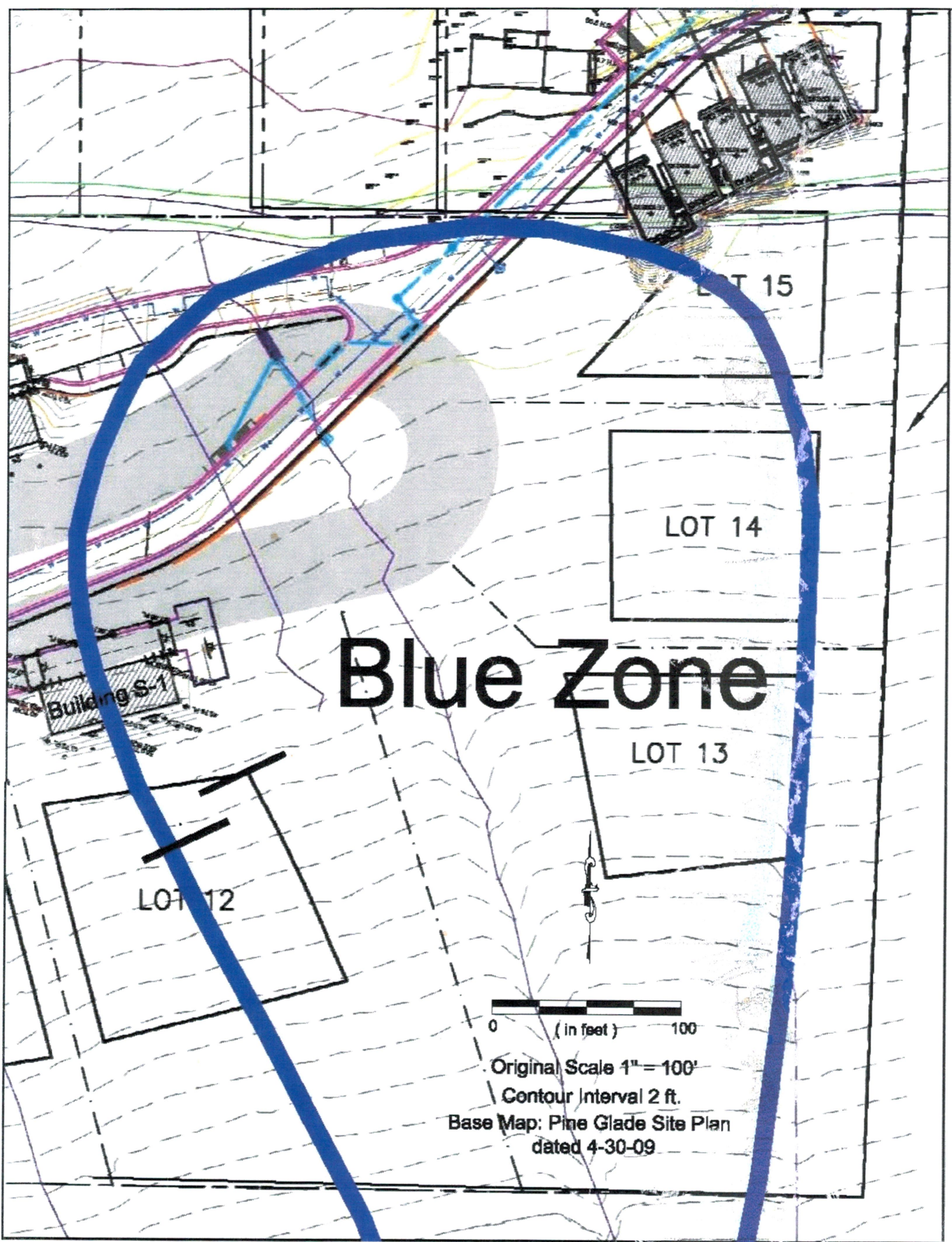
I spoke with JoAnn Hoff at Rendezvous Engineering today and she will look into their archived files to investigate the sources of their avalanche maps. I will let you know what she finds.

Thanks for meeting with me. - Chris

--

Chris Wilbur, P.E.

4/16/2018



Blue Zone

LOT 14

LOT 13

LOT 12

0 (in feet) 100

Original Scale 1" = 100'

Contour Interval 2 ft.

Base Map: Pine Glade Site Plan
dated 4-30-09

Spruce Drive

AFFORDABLE HOUSING BUILDING
LOCATION (SHADED)

APPROXIMATE SITE OF HAGEN
GLADES LOT 16 RESIDENCE, AS
REFERENCED IN MEARS' 2005
STUDY

Direction
of
flow

0 (in feet) 100

Original Scale 1" = 100'

Contour Interval 2 ft.

Base Map: Pine Glade Site Pl
dated 4-30-09

SHOW KING RESORT, INC.
P.O. BOX 584
JACKSON, WY 83001
10 E Snow King Avenue

dmeyers@wyoming.com

From: "Chris Wilbur" <geowilbur@gmail.com>
Date: Thursday, April 19, 2018 1:25 PM
To: "Marian Meyers" <dmeyers@wyoming.com>
Cc: "Art Mears" <artmears@hotmail.com>
Subject: Fwd: Pine Glades

Dave,

Still no word for Rendevous Engineering. Below is an email from Art Mears with his comments on the project history.

I spoke with John Kalejta, the Geobruigg rep., regarding costs and feasibility of a modified rockfall barrier to mitigate avalanches. He offered to provide a cost estimate for materials if we provide dimensions and avalanche loads. Let me know if I should pursue this. He also stated that rigid injection anchors would likely be acceptable for the tension anchors. These are less costly than double spiral cable anchors. Also, he has worked with GSI and says they are well qualified to install.

Please let me know if I should proceed on mitigation parameters or hold off until you have more info.

Thanks,
Chris

----- Forwarded message -----

From: Art Mears <artmears@hotmail.com>
Date: Thu Apr 19, 2018 at 1:00 PM
Subject: Pine Glades
To: Chris Wilbur <geowilbur@gmail.com>

Chris,

I reviewed old consulting documents relating to 2005 and 2009 consulting on the Pine Glades (previously named Hagen Glades) development west of the Snow King ski area in Jackson. My consulting work for Hagen Glades in March, 2005 is summarized in two letter reports to Randy Schrouder of Summit Consulting of Jackson. In 2009 we revisited the project now renamed "Pine Glades" and modified substantially from the previous Hagen Glades. You did the site work and most of the report preparation in 2009. I provided a review.

I have the following comments on our consulting work in 2005 and 2009:

1. The March 20, 2005 letter report to Randy Schrouder of Summit Consulting was based on site observations, the proposed Hagen Glades preliminary layout (with proposed topography not shown), and

4/19/2018

my avalanche-dynamics analysis. Topographic details are, of course, essential in assessing avalanche exposure and mitigation.

2. A follow-up letter dated March 29, 2005 to Randy Schrouder responded to a fax showing preliminary design concepts on Hagen Glades in and adjacent to the avalanche path. In this letter I stated that "My quantitative analysis will follow after I receive payment for previous work and you submit a more finalized design which will include the 20'-wide driveway to Lot 13 and a 90' diameter cul-de-sac with lot 13 "off the east side" which you mentioned in your fax yesterday." In other words my analysis of avalanche protection was not complete and required details about layout and landscaping details not yet available to me.

3. On August 31, 2009 we completed an updated study of the avalanche hazard and mitigation concepts for "Pine Glades" subdivision. This layout was substantially changed from the previous Hagen Glades layout studied in 2005. We provided a detailed map of the hazard area that showed clear exposure of building S-1 to the hazard. Structural mitigation and mitigation design parameters were provided in this report.

Art Mears



Virus-free. www.avast.com

--

Chris Wilbur, P.E.
 Wilbur Engineering, Inc.
 150 E 9th St. #201
 Durango, CO 81301
 (970) 247-1488 ✓
www.mearsandwilbur.com

dmeyers@wyoming.com

From: "Jeff Hobson" <Jeff@y2consultants.com>
Date: Wednesday, December 13, 2017 3:49 PM
To: <dmeyers@wyoming.com>; "Jennifer Walker" <jennileighpsi@ymail.com>; "Bill Collins" <collinsplanning@bresnan.net>
Cc: "Carolyn Coleman Burke" <sagebrusharch@gmail.com>; "John Kemp" <John@y2consultants.com>; "Vince Roux" <vince@y2consultants.com>
Subject: RE: S1 extra garage

Thank you Carolyn!

To all,

After looking at the avalanche zone in the original PUD, the new proposed garage is right in the avalanche path. I don't think that is going to pan out well for the structure. In order to design this structure we'll need a revised avalanche study which provides me with the necessary avalanche forces to the structure. The avalanche study needs to be updated per the new grading that has altered the avalanche areas/paths. Being we have a hole right behind the garage, those forces are going to be substantial. Additionally, depending on the severity of the avalanche zone, this structure type may not even be allowed. With certain zones, you have to allow the avalanche to travel over the structure, which this design does not meet those requirements.

I cannot seem to find the original avalanche report in the Dropbox folder, only the indicated hatching on the Rendezvous civil drawings. We don't even know who provided the avalanche report. We need to get this existing and revised information prior to any structural design occurring. Similarly, we believe it's putting the cart before the horse to provide a GEC amendment prior to getting this info as the structure may not even be feasible. I informed our civil department to hold on the GEC amendment due to these concerns as to not do things twice.

Sorry to be the bearer of bad news on this. There's a lot of unknown information popping up as we were not the original engineers for the development and none of this information has been provided to us.

Thank you,



Jeffrey Hobson, PE
Structural Engineering Manager
LEED Green Associate

p: (307) 733-2999 m: (307) 413-5519
a: PO Box 2870 | [180 S Willow St., Jackson, WY 83001](http://www.y2consultants.com/)
w: <http://www.y2consultants.com/>

Define. Design. Deliver.



From: Carolyn Coleman Burke [mailto:sagebrusharch@gmail.com]

Sent: Wednesday, December 13, 2017 2:58 PM

To: Jeff Hobson <Jeff@y2consultants.com>

Cc: <dmeyers@wyoming.com> <dmeyers@wyoming.com>; Jennifer Walker <jennileighpsi@ymail.com>; Bill Collins <collinsplanning@bresnan.net>

12/20/2017

Subject: Re: S1 extra garage

Drop Box, Geotech grading and piers **folder**, Pine Glades Grading @ piers.excerpt 01.11.14.pdf **file**. **Sheets** C2.1 & C2.2 Hatch shows avalanche zone. Rendezvous Engineering.

On Dec 13, 2017, at 2:08 PM, Jeff Hobson <Jeff@y2consultants.com> wrote:

Good afternoon,

Someone mentioned that there was an avalanche study done. I cannot seem to find a copy of that report in the dropbox. Can someone please point or send me that? I was originally told the avalanche area was very close if not at the eastern parking area. That can have major impacts to this new garage area. I need to see that study prior to providing structural drawings for the garage.

Thank you,

<image003.png>

Jeffrey Hobson, PE
Structural Engineering Manager
LEED Green Associate

p: (307) 733-2999 m: (307) 413-5519

a: PO Box 2870 | [180 S Willow St., Jackson, WY 83001](http://www.y2consultants.com/)

w: <http://www.y2consultants.com/>

Define. Design. Deliver.

<image004.png>

From: Carolyn Coleman Burke [<mailto:sagebrusharch@gmail.com>]

Sent: Wednesday, December 13, 2017 1:46 PM

To: Jeff Hobson <Jeff@y2consultants.com>; Dave Meyers <dmeayers@wyoming.com>; Jennifer Walker <jennileighps@gmail.com>; Bill Collins <collinsplanning@bresnan.net>

Subject: S1 extra garage

Hello everyone,

Dave has asked me to add a stair into the plans as well as changing the siding to stone in the gable end and fixed windows in the garage north wall. The walls on the outside of the courtyard were representing the original retaining walls and may have or be changed based on structural engineering. Please advise when available.

Attached are pdfs and a dwg for your use.

I'm am not aware of the allowable FAR or Site Development available to add this structure. Even though this is non habitable it counts towards both. The only area not counted toward FAR is basement which I do not believe this can be defined as a basement.

Thanks,

12/20/2017

Carolyn Coleman

Sagebrush Architectural Services
Carolyn Coleman Burke
P.O. Box 624, 3083 Rangeview
Jackson, Wyoming 83001
307-732-1553, 307-413-0056
sagebrusharch@gmail.com

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83001
307-732-1553,
307-413-0056

WILBUR ENGINEERING, INC.

150 East 9 St., Suite 201 • Durango CO 81301
(970) 247-1488 • chris@mearsandwilbur.com

February 20, 2018

John Tozzi
Pine Canyon, LLC
P.O. Box 4741
Jackson, Wyoming 83002
Via email
c/o David Meyer

RE: Proposal for Avalanche Hazard Assessment & Mitigation Design Criteria
140 Pine Glades Drive, Jackson, Wyoming

Dear Mr. Tozzi:

This proposal describes our proposed analysis and fees for avalanche hazard mapping and hazard assessment specific to the referenced project. Our understanding of the project is based on our telephone discussions and a Grading Plan (Rev. 2) for Lots 13 & 14 prepared by Y2 Consultants, dated, February 7, 2018. The proposal also includes scope and fees for avalanche mitigation design parameters, in case such mitigation is required. The work will be done by Chris Wilbur, P.E., and reviewed by Art Mears, P.E. of Arthur I. Mears, P.E., Inc. This proposal is based on our previous work, including a report by Art Mears on avalanche exposure for the Hagen Glades Subdivision dated March 20, 2005 and subsequent work by myself and Art Mears for a proposed affordable housing unit dated September 15, 2009.

Proposed Scope

We propose the following tasks:

1. Review of historical records and reports related to avalanche events at this site;
2. Review available local weather and snowpack records;
3. Make a site visit for the to observe terrain, vegetation and ground conditions;
4. Perform terrain analysis and aerial photo interpretation for the purpose of quantifying avalanche runout distance, frequency and energy for the design magnitude avalanche¹.
5. Create a digital elevation model (DEM) and apply the Swiss avalanche dynamics model RAMMS to quantify avalanche design parameters.
6. Prepare an avalanche hazard map showing the limits of the design avalanche¹ in the vicinity of the proposed structure.
7. If mitigation is deemed necessary, provide recommendations for mitigation, including design parameters for avalanche defenses. We anticipate that feasible avalanche

¹ The Design Avalanche for this proposal is defined to be approximately a "100-year" event or an event with an annual probability of 1 percent. Due to uncertainty, and the limited historical records and climate variability, the recurrence interval is more accurately defined by a range of 30 to 300 years or a 0.3 to 3 percent annual probability.

protection measures could include either direction protection where the building is designed to withstand impact, or detached energy dissipating avalanche barriers.

8. Prepare a letter report describing methods, findings and recommendations from the tasks described above.

Fees

The estimated total fees for the proposed scope of work is \$7525.00 itemized in the table below. We will not exceed this amount without your prior written approval. Invoices are due upon receipt and past due thirty (30) days from invoice date. Client agrees to pay a finance charge of one percent (1%) per month on past-due accounts, plus all time spent and expenses incurred (including attorney's fees) in connection with collection of any delinquent amount. Fees will be billed at these rates based on actual time and expenses.

ITEM	Rate		Quant.	TOTAL
Travel time shared w/ other job (CW)	\$175	hr.	8	\$1,400.00
Travel expenses shared (CW)				\$1,100.00
Site work (CW)	\$175	hr.	4	\$700.00
Records review (CW)	\$175	hr.	1	\$175.00
Terrain Analysis & Avalanche Modeling (CW)	\$175	hr.	6	\$1,050.00
Mitigation Analysis (CW)	\$175	hr.	4	\$700.00
Report preparation (CW)	\$175	hr.	8	\$1,400.00
Review (AM)	\$250	hr.	4	\$1,000.00
TOTAL				\$7,525.00

Schedule

The scope will be completed in a timely manner subject to receipt of information needed to complete the work and other factors beyond my company's control. We anticipate completion within 4 to 6 weeks of receipt of a signed agreement.

Limit of Liability

Client agrees to limit the liability of CONSULTANT, to the extent allowed by Colorado law, to either the total fees paid to consultant or \$10,000.00, whichever is greater.

Dispute Resolution

Client and consultant agree that all disputes between them arising out of or relating to this agreement or the project shall be submitted to nonbinding mediation unless the parties mutually agree otherwise.

Warranty

Consultant agrees in connection with services performed under this agreement that such services are performed with the care and skill ordinarily exercised by members of the profession practicing under similar conditions at the same time and in the same or a similar locality. No other warranty, expressed or implied, is made or intended by rendition of consulting services or by furnishing oral reports or documents.

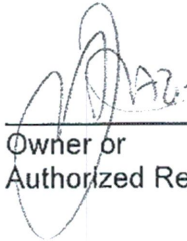
Please review this proposal and contact me if you have any questions.

Sincerely,
Wilbur Engineering, Inc.

Accepted by:



Chris Wilbur, P.E. (CO)
Principal



Owner or
Authorized Representative

3-26-18
date

dmeyers@wyoming.com

From: "Chris Wilbur" <geowilbur@gmail.com>
Date: Friday, March 16, 2018 8:53 AM
To: "Marian Meyers" <dmeyers@wyoming.com>
Cc: "Art Mears" <artmears@hotmail.com>
Subject: Re: Pine Glades

Dave,
 Please let me know if I should schedule field work for Lot 14.
 Thanks,
 Chris

On Tue, Feb 20, 2018 at 5:08 PM, Chris Wilbur <geowilbur@gmail.com> wrote:

Dave,
 Thanks for getting back to me quickly. Attached is our proposal. Let me know if you have any questions.
 Chris

On Tue, Feb 20, 2018 at 10:24 AM, <dmeyers@wyoming.com> wrote:

Chris, Yes it is Lot 14 which is [140 Pine Glades Drive](#). The new owner is John Tozzi and his company is Pine Canyon LLC whose address is P. O. Box 4741 Jackson, Wyoming 83001. John's phone number is [307-690-2834](tel:307-690-2834). John would prefer that you deal directly with us on this but is fine putting the contract in his company's name. Please email it to me and I will get it approved and signed by John. After we execute the contract it is fine to contact Y2 for the files. I look forward to receiving the contract. Best, Dave.

From: [Chris Wilbur](#)
Sent: Tuesday, February 20, 2018 7:13 AM
To: [Marian Meyers](#)
Cc: [Art Mears](#)
Subject: Re: Pine Glades

Dave,

Art and I have drafted a proposal and have a few questions.

1. Is it Lot 14, 140 Pine Glade Dr.?
2. We prefer to work for the owner. Please provide the owner name and contact info. We are fine communicating through you, if that is preferred.
3. Is it okay to contact Y2 for electronic files?

Thanks,
 Chris

On Mon, Jan 22, 2018 at 4:09 PM, <dmeyers@wyoming.com> wrote:

Durango, CO 81301
[\(970\) 247-1488](tel:(970)247-1488)
www.mearsandwilbur.com

--
Chris Wilbur, P.E.
Wilbur Engineering, Inc.
150 E 9th St. #201
Durango, CO 81301
(970) 247-1488
www.mearsandwilbur.com

Chris, Yes I did and I'll get you the exhibits in the next day or two. Best, Dave

From: [Chris Wilbur](#)

Sent: Monday, January 22, 2018 3:55 PM

To: [Marian Meyers](#)

Subject: Re: Pine Glades

Dave,

Did you get my email previously, and will you need avalanche design services at Pine Glades?

Thanks,

Chris

On Tue, Jan 9, 2018 at 4:12 PM, Chris Wilbur <geowilbur@gmail.com> wrote:

Dave,

I copied Art, so you have his email.

Chris

--
Chris Wilbur, P.E.

Wilbur Engineering, Inc.

[150 E 9th St. #201](#)

[Durango, CO 81301](#)

[\(970\) 247-1488](#)

www.mearsandwilbur.com

--
Chris Wilbur, P.E.

Wilbur Engineering, Inc.

[150 E 9th St. #201](#)

[Durango, CO 81301](#)

[\(970\) 247-1488](#)

www.mearsandwilbur.com

--
Chris Wilbur, P.E.

Wilbur Engineering, Inc.

150 E 9th St. #201

3/27/2018

Need to include Trees
69' x 13' tall



Proposal #: 10024 CO-RB

From: John Kalejta
john.kalejta@geobruigg.com
505-220-1404

We are pleased to provide our proposal for materials specified for this project. Geobruugg has designed and fabricated rockfall protection and slope stabilization systems for more than 60 years, with over 5,000 systems presently installed. This proposal does not include provisions for a "Buy America" requirement for steel materials.

	Item	Unit Price	Unit	
21	RXE-2000; height - 4 meters; post spacing - 7 meters	\$1'650.00	m	\$ 34'650.00
1	Freight	\$2'000.00	truckload	\$ 2'000.00
	Save Meye			
	ne Glades - L			
	ed to provide our pro			
	ection and have stor			
	sai does not includ			
	Total:	\$		36'650.00

- 1) These unit prices are based on barriers with approximate lengths as listed above. Variation in actual length of greater than 10% could result in higher pricing.
- 2) Changes to the barrier layout or design (post spacing, height, barrier alignment, etc.) may result in higher unit pricing.
- 3) The weight price above is based on all materials being shipped together. If some materials are shipped separately, the above unit prices for materials will apply plus the cost of freight. If the amount of materials ordered is larger than the plan quantities, the freight cost could be higher.

- Submittals
- Material Certifications
- Freight to the job site, via common carrier

Geobruigg North America, LLC
22 Centro Algodones
Algodones, NM 87001
www.geobruigg.com



version BA2.1

Date: June 21, 2018

Proposal #: 10024 CO-RB

C) Not Included

- Any materials not listed in Section A (Bicing) above.
- Any anchors (other than wire rope anchors), grout for anchors, nuts, washers, or any other anchoring materials (except as specifically noted in Section A).
- Any survey, stakeout, installation, or testing of installed materials.
- Cleaning, degreasing, colorization (except as specifically noted in Section A) or otherwise of materials.
- Any federal, state, or local taxes, and no sales tax.
- Stamping of drawings.

D) Schedule

- Lead times provided after receipt of order and release to fabricate. Estimates are as follows:
 - 3 to 4 weeks - Production of materials (after receipt of order and credit approval)
 - 4 days - Shipping
- Prior to commencement of fabrication and/or shipping:
 - Credit verification will be required. 100% prepayment will be required for projects without bonding or other payment security.
 - Down payment for a portion of the order is likely to be required
 - Orders less than \$7,500 will require 100% prepayment

E) Miscellaneous

The validity of this proposal is thirty (30) days from the above date. This proposal is contingent upon satisfactory arrangements for payment. Payment terms will be dependent upon credit approval and project details. This proposal takes precedence over any previous written or verbal communications. Our Standard Terms and Conditions of Sale and Patent Statement are herewith part of this proposal (available by calling 505-771-4080 or http://www.geobruigg.com/media/5680/geobruigg-north-america_terms-and-conditions_2015.pdf)

Please let me know if you have any further questions. I look forward to working with you on this project.

Regards,
Geobruigg North America, LLC

John Kalejta
Regional Manager, Rocky Mountains

Proposal Acceptance

Acceptance of this proposal must be in writing, either by company purchase order referencing our proposal number or by signed return of this proposal. Any changes to this proposal must be submitted in writing from Geobruigg North America, LLC and accepted with signed copy of revised proposal. Issuance of company purchase order or signature below indicates acceptance of this proposal in full, and acceptance of our Standard Terms and Conditions of Sale (www.geobruigg.com/brochures-usa). I am authorized to place orders for my company.

Authorized signature

Print Name

Company

Date:

Geobruigg North America, LLC
22 Centro Algodones
Algodones, NM 87001
www.geobruigg.com



version BA2.1

Date: June 21, 2018

Proposal #: 10024 CO-RB

Geobruigg North America billing address:

Accounts Receivable
Geobruigg North America, LLC
22 Centro Algodones
Algodones, NM 87001 USA
Phone: 505-771-4080; Fax: 505-771-4081

Notes on project design

- Design of the barrier system should be performed by a qualified designer.
- If needed, Geobruigg can provide assistance with the design process.

Note on material quantities

It will be the purchaser's responsibility to verify and order the appropriate quantity of materials

Note on elevation change

Please note that if there is elevation change between any two posts of the barrier exceeding 15%, surveyed x,y,z coordinates of the post locations will be required, to facilitate fabrication of special angled nets. The contractor will be responsible for the survey.

Design and lay-out

This proposal is based on the barrier systems, heights, lengths, and post spacings listed in Section A (Pricing). It will be the contractor's responsibility to confirm this lay-out in the field, and communicate any changes to Geobruigg. Changes to the barrier design, lay-out, or post spacing may result in different pricing.

Note on powder coating

This proposal may include powder coating of some materials. Please be advised that the powder coating is not a perfect finish. Due to the coating process there will be shadowed areas, small areas of incomplete coverage and small spots where the metal is touching upon metal during the process. It is intended to be a *colorization effect* for blending the materials into the background. The appearance is good with light mottling, and the imperfections are not visible at distance from the materials. Though imperfect in coverage, unlike paint it is resistant to wear and fading. It can be provided in nearly any conceivable color and several finishes, and is quite economical. Materials for touch-up of coating are not included in this proposal, and any touch-up will be the responsibility of the contractor. Any touch-up should be done by the contractor with paint at the job site after installation is complete. It is not possible to powder coat these types of materials and achieve any minimum thickness. The materials will have an average coating

Support and assistance

Technical assistance is available throughout the bidding and construction process by contacting Geobruigg. Data sheets, drawings, manuals, and other technical details are available upon request.

Geobrugg North America, LLC
22 Centro Algodones
Algodones, NM 87001
www.geobrugg.com



version BA2.1

Date: June 21, 2018

Proposal #: 10024 CO-RB

Anchoring requirements

These barriers will require the installation of a number of different anchors. Maximum forces for each individual anchor are as shown below. The number and location of anchors varies depending upon system type and topography. For more details see project plans or contact us for typical lay-out drawings. With the exception of post support anchorages, all anchors should consist of flexible wire rope anchors (included in this proposal). If the project plans or specs require different forces for any anchors, contact the project engineer.

Return Policy

All returns must be preauthorized by Geobrugg. Only stock items will be accepted subject to a 25% restocking fee and transportation costs prepaid by the customer. A full copy of the return policy will be included with the invoice and is available upon request.

NOTE:

Rockfall, landslides, debris flows or avalanches are sporadic and unpredictable. Causes can be e.g. human (construction, etc.) or environmental (weather, earthquakes, etc.). Due to the multiplicity of factors affecting such events it is not and cannot be an exact science that guarantees the protection of individuals and property. However, by the application of sound engineering principles to a predictable range of parameters and by the implementation of correctly designed protection measures in identified risk areas the exposure of injury and loss of property can be reduced substantially. Inspection and maintenance of such systems are an absolute requirement to ensure the desired protection level. The system protection can also be impaired by events such as natural disasters, inadequate dimensioning parameters or failure to use the prescribed standard components, systems and original parts; and/or corrosion (caused by pollution of the environment or other man made factors as well as other external influences).