MEMORANDUM

TO: Board of Trustees

THROUGH: Indra Winquest
District General Manager

FROM: Nathan Chorey, P.E.
Engineering Manager

SUBJECT: Review, discuss and possibly approve a design services contract for the Mountain Golf Cart Path Replacement Project – Fund: Community Services; Division: Golf; CIP# 3241LI1903; Vendor: Lumos and Associates in the amount of $75,100

STRATEGIC PLAN: Long Range Principle #5 – Assets and Infrastructure

DATE: March 1, 2021

I. RECOMMENDATION

That the Board of Trustees makes a motion to:

1. Authorize a Design Services Contract for the Mountain Golf Cart Path Replacement Project – Fund: Community Services; Division: Golf; CIP# 3241LI1903; Vendor: Lumos and Associates in the amount of $75,100.

2. Authorize Staff to approve payment of permitting fees associated with the Mountain Golf Cart Path Replacement Project estimated to be $10,000.

3. Authorize Staff to execute the contract documents.

II. DISTRICT STRATEGIC PLAN

Long Range Principle #5 – Assets and Infrastructure – The District will practice perpetual asset renewal, replacement, and improvement to provide safe and superior long term utility services and recreation activities.

- The District will maintain, renew, expand, and enhance District infrastructure to meet the capacity needs and desires of the community for future generations.

- The District will maintain, procure, and construct District assets to ensure safe and accessible operations for the public and the District's workforce.

III. BACKGROUND

The Mountain Golf Course has approximately 14,440 linear feet of cart pathways which equates to ~110,000 square feet of pavement. In addition, there is approximately 5,000 linear feet of asphalt curb. The last major path project was over 15 years ago. The District has performed replacements at various points each year based on areas of greatest need and within the allotted budget. Due to issues of base material, overgrowth of sod, and intrusion by tree roots and other material, the current assessment of the condition of the paths suggests substantial remediation and reconstruction is needed.

At the December 11, 2019 Board of Trustees meeting, the Board of Trustees unanimously passed a motion to establish a new Capital Improvement Project #3241LI1903 Mountain Golf Cart Path Replacement for an amount not to exceed $166,395. More recently, at the January 13, 2021 Board of Trustees meeting, the Board of Trustees discussed Mountain Golf Cart Path Replacement Project as a Priority Project.

On August 21, 2020 IVGID contracted with Lumos and Associates to; evaluate the pathways and bridges, conduct a Geotechnical Investigation, and provide a Design Memorandum with preliminary cost estimate. The deliverables are attached to this memorandum for your review and reference.

The Pathway Evaluations and Maintenance Recommendations (Design Memorandum), prepared by Lumos and Associates presents two (2) alternatives for pathway reconstruction:

- Alternative #1, Spot Repair – Alternative #1 would take a triage approach to pavement maintenance. The most distressed areas would be treated first before moving to the less distressed areas. This treatment approach would allow IVGID to spread the construction cost over a longer period of time (10 years).

- Alternative #2, Full Cart Path Replacement – Alternative #2 considers full path reconstruction of 14,440 linear feet of cart path as well as miscellaneous BMPs and circulation improvements phased over a period of 2 or 3 years.

Based on Board conversation to date, IVGID Staff requested a proposal based on recommended improvement Alternative #2, Full Cart Path Replacement. The scope of work includes preparation of a base map and 50% construction drawings for the entire Mountain Golf Pathway system, final construction documents for the first year of improvements, Washoe County and Tahoe Regional Planning Agency

permitting, and support during the bid process. The full scope of work is attached to this memorandum.

Items to note:

1. Base map preparation and 50% construction drawings for the entire Mountain Golf Pathway system are included in this design contract as there is efficiency in preparing the entire base map and completing the initial design all at one time.

2. The exact cart paths sections included in the first year of improvements will be selected based on existing cart path condition, impact to golf operations, and permitting requirements.

The project's tentative schedule is attached to this memorandum for reference.

IV. BID RESULTS

This item is not subject to competitive bidding within the meaning of Nevada Revised Statute (NRS) 332.115 as described in subsection (b) Professional Services.

Additionally, per NRS 625.530, selection of a professional engineer or registered architect to perform work on public works projects (where the complete project costs exceed $35,000) is to be made solely on the basis of the competence and qualifications of the engineer or architect and not on the basis of competitive fees.

V. FINANCIAL IMPACT AND BUDGET

The 2020-2021 CIP budget includes $166,395 in carryover funds for the Mountain Golf Cart Path Replacement Project.

The table below presents the expenditures, encumbrances, and the final design contract through February 28, 2021 for the Mountain Golf Cart Path Replacement Project.

Task	Cost
Mtn Golf Course Pathway Evaluation – Consultant fees	$27,500
District Staff time during design and miscellaneous project expenses (Period 7/1/20 – 2/23/21)	$18,500
Preliminary Design Costs Sub-total	**$46,000**
Mtn Golf Course Pathway Final Design – Consultant fees	$75,100
Estimated Permit Fees	$10,000
District Staff time during design and miscellaneous project expenses	$30,000
Final Design Costs Sub-total	**$115,100**
Total	**$161,100**
Mountain Golf Cart Path Replacement Project, 4588BD1604	**$166,395**

VI. ALTERNATIVES

1. Request Staff solicit a final design proposal to execute improvement Alternative #1 and complete Mountain Golf Cart Path repairs over a period of 10-years.

2. Not authorize the final design contract for the Mountain Golf Cart Path Replacement Project and defer the pathway improvements to a future date.

VII. BUSINESS IMPACT

This item is not a "rule" within the meaning of Nevada Revised Statutes, Chapter 237, and does not require a Business Impact Statement.

Attachments:

- Excerpt from December 11, 2019 Meeting Minutes
- Lumos and Associates, Additional Services Addendum #52
- Incline Village Mountain Golf Course Pathway Bridges Structural Evaluation Report
- Geotechnical Investigation Report - Incline Village Mountain Golf Course Cart Path Evaluation
- Pathway Evaluations and Maintenance Recommendations - Incline Village Mountain Golf Course Cart Path Evaluation (Design Memorandum)
- Lumos and Associates Short Form Agreement and proposal
- Tentative Project Schedule

not be communicating this information to the State and that the objective is to create and build understanding.

Director of Finance Eick then moved onto agenda packet page 144 and said that Staff provided sample definitions and that there was a lot of thought given to these definitions and said that it is only completed or cancelled projects that are available for reallocation. Trustee Dent asked if it was reallocation for the cart paths that came in under budget or was it expand that reallocation if that is the Board's direction understanding that the Board can reallocate. Director of Finance Eick went over the cart path project. Trustee Dent asked about the Mountain Golf Course Clubhouse project. Director of Finance Eick said he does not call it complete. Trustee Dent said okay and that he appreciates knowing that; thank you. Chairwoman Wong said that she is okay with the definitions as they stand and asked if Staff needed anything else. Director of Finance Eick said that he trying to make sure that people have ways to communicate where we are at, trying to look ahead, and that the stress test was provided because not everything is done in one year. Chairwoman Wong said that it would be great to see this report when we look at capital projects for the budget.

H.3. Review, discuss, and possibly authorize a new Capital Improvement Project 3241LI1903 for the Mountain Golf Cart Path Replacement for 2019-2020 fiscal year, Pre-Design Phase for an amount not to exceed $161,500 by reallocation of $161,500 from CIP Project 3242LV1899 Mountain Course Cart Fleet (Requesting Staff Member: Director of Golf/Community Services Darren Howard)

Director of Finance Eick gave an overview of the submitted materials.

Trustee Morris asked if we were making this overly complicated because the Board agreed that the money that wasn't used would go to the cart path and that was slightly larger than $161,500. He doesn't understand why it is $161,500 and $163,000 because then we have around two thousand dollars that floats around so why not one project for cart paths that is $163,000. Director of Finance Eick said that he is aware of that conversation and he doesn't disagree if the Board wants to allocate $163,000 that is fine. He also thought he heard that the Board didn't want to look at one piece but rather have an understanding/look at the whole project without definition of the pieces or phases. Part of this effort is to communicate to the Board and the public of how we do our work and that there is sensitivity about moving

money from one project to another. This is more precise, is open to feedback, and so everyone understands the approach taken. Trustee Dent said that the one hundred and ten thousand square feet is the cart path in its entirety; has Staff gone through and done the assessment of what is really needed. Director of Finance Eick said that there is no conclusion and that this is the top of the funnel which is identifying what needs to be done. Trustee Dent said that his concern is about spending $161,500 on design or would we be better served to find the worst part of the carts and get something done because we aren't doing it now or in a couple of months. Interim District General Manager Winquest said on agenda packet page 174 it does speak to when our Engineering Team will start the process. He knows that $161,000 sounds like a lot of money but we need to allow our Engineering Team to do their work. They will go through and evaluate everything in order to put together a scope of work for the project. Staff can keep the Board updated and let you know the progress made as Staff would like to scope the entire project. We hope we don't spend that much and he doesn't think Staff will but Staff was asked to bring back the outer perimeters, by the Board, so we don't want to focus on the details as we have some time because everything is covered in snow. If the Board wants to put a limit on pre-design, Staff will comply. Our best interests will be served by allowing our Engineering Team to evaluate what we need to do and Staff is not going to spend $161,000 in Engineering time. Trustee Dent asked if you plan on doing this in this fiscal year or push until summer so you won't be doing this in the middle of the golf season or is this something that can push until next fall. Director of Public Works Pomroy said if we go into the design phase, Staff will go through holes one through eighteen and we won't do this until the snow melts off. We will do the assessment/analysis and most of it would occur during golf play. We would have to do some borings to assess the conditions and we would do a full evaluation like was done in 2003 at the Championship Golf Course. Trustee Dent asked how much time do you think it will take. Director of Public Works Pomroy said it depends on if we do it in house or bring in a paving consultant. Trustee Dent asked why can't we do it in house as you are qualified. Director of Public Works Pomroy said that Staff can't do the base mapping which is a decision point. Trustee Dent said that his concern is the cost of this and that the alternative is to create this project and not authorize the money because we don't see it happening this fiscal year rather it would be at the end of the year or the first project in June so let's just create a project so we have a budgeted project and then we can figure out how much to allocate next year and how much we want to authorize for design. Chairwoman Wong said that she would like to ask a clarifying question – the impetus of this was because we had the savings,

then the funds carryover to next year, so if we don't authorize the carryover then essentially do the funds go away. Trustee Dent said we are not doing a pre-design before the end of the fiscal year rather it is a cart path project and then we add to it. Chairwoman Wong said she is fine with it. Trustee Morris said that $161,000 sounds like a lot for pre-design and the end of the fiscal year is the end of June so he hopes to start some of this work this year and in this fiscal year which would mean late spring of 2020 and not waiting until September 2020 to start. Trustee Dent said that the cart paths are covered in snow until May, the Engineering Staff will go out there and mark it up with paint, categorize the areas and then it will go to survey at some point. It is not a priority project so we don't have to authorize this project or open up the checkbook to something we are not doing. Interim District General Manager Winquest said that the goal was to commit these funds to the Mountain Golf Course cart path project which will start in late May/early June and Staff can come back to you with a better analysis from our internal team and that when they are ready to start that effort, we have approved funds for their internal charges. The Board can make a motion tonight or reallocate the entire amount of $166,000 plus or we can bring it back later. We just don't want to hamstring our Engineering Team when they are ready to do the work. The goal is to do them as soon as we can and Staff will be bringing back some information at the January 15 meeting. We want to make sure the timing is right especially with us going to lithium battery operated carts; we want to make sure that Staff has the funds. Director of Public Works Pomroy said that there is a current contract with Lakeside Paving to do paving work to fix some of the worst areas. We are onboard with the Board to, within the next thirty six months, to get rehabilitated cart paths; a resolution within a three year time frame.

Trustee Dent made a motion to authorize establishing a new Capital Improvement Project 3241LI1903 Mountain Golf Cart Path Replacement for an amount not to exceed $166,395. by reallocation of $166,395 from CIP Project 3242LV1899 Mountain Course Cart Fleet. Trustee Morris seconded the motion. Chairwoman Wong asked for any further comments, hearing none, she called the question – the motion was passed unanimously.

At 7:38 p.m., Chairwoman Wong called for a break; the Board reconvened at 7:50 p.m.

H.4. Review, discuss and possibly approve 2020 Key Rates for the Championship Golf Course, Mountain Golf Course and Resident

LUMOS & ASSOCIATES

Carson City • Fallon • Lake Tahoe • Reno

www.LumosInc.com

Reno
9222 Prototype Drive
Reno, Nevada
775.827.6111

September 10, 2020
Job No. 10164.000

Mr. Mike Lefrancois, P.E.
Senior Engineer
INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT – PUBLIC WORKS
1220 Sweetwater Road
Incline Village, Nevada 89451

SUBJECT: INCLINE VILLAGE MOUNTAIN GOLF COURSE PATHWAY BRIDGES STRUCTURAL EVALUATION REPORT

Dear Mr. Lefrancois:

On September 1, 2020, a structural condition survey was conducted at the four golf cart pathway bridges. The purpose of the survey was to assess the condition of the bridges as part of the overall recommendations for maintenance and/or rehabilitation of the existing Mountain Golf Course pathway system.

The scope of the investigation consisted of a visual survey only of the bridge decks, the bridge superstructure components, and the bridge abutments.

Description of the Bridge Structures

The bridges observed were the four golf cart pathway bridges that span over Third Creek. All the bridges have the same construction but with span lengths varying from 36'-6" to 41'-4". They are each 10'-0" wide and consist of 4x12 flat planks that form the bridge deck. The planks span to glued-laminated beams on each side of the bridge. The planks then cantilever approximately 1'-8" over the beams to the bridge edges. The glued-laminated beams clear span the creek to cast-in-place concrete abutment walls which bear on cast-in-place concrete footings. On each side of the bridge abutment walls there are cast-in-place concrete retaining wing walls of varying lengths for grading transitions. The abutment walls and wing walls are typically 16" thick. There is a 24" wide concrete apron at the top of the abutment walls that forms a transition from the asphalt pathway to the bridge deck.

At the bridge deck sides there are continuous 4x6 curbs bolted to 4x6 blocks spaced at approximately five feet on center. 6x6 posts with varying spacing are attached to the planks and beams that support two continuous 2x12's to form a guardrail on each side of the bridges.

Summary of Structural Findings

Bridge at 2nd Hole:

Overall, the bridge superstructure components are in good condition, see Photos 1 and 2. The planks are experiencing only slight wear and the glued-laminated beams are moderately weathered.

At the west abutment there is scouring beneath the abutment wall footing where the soil beneath the footing has been washed away, see Photos 3 and 4. Also at the west abutment, there is some concrete spalling at the abutment wall at the footing transition, see Photo 5. No scouring was observed at the east abutment.

The steel plate beam bearing connections at each of the abutments are in good condition and are experiencing only minor corrosion. At the southwest beam bearing location there is a steel angle connection at the top of the beam to the abutment wall that is experiencing some concrete spalling, see Photo 6.

At the west abutment concrete apron there is some minor cracking and spalling of the concrete at the surface of this transition between the cart path and the bridge deck, see Photo 7. At the east abutment apron there is a crack occurring at the middle of the apron, see Photo 8.

Bridge at 4th Hole:

Overall, the bridge superstructure components are in good condition, see Photos 9 and 12. The planks are experiencing slight to moderate wear (Photo 10) and the glued-laminated beams are moderately weathered.

At the northeast abutment apron there is a post base connection that is experiencing slight corrosion. In addition, there is a missing anchor bolt and untightened nuts at this connection, see Photo 11.

No scouring was observed at either abutment.

The steel plate beam bearing connections at each of the abutments are in good condition and are experiencing only minor corrosion. At the south beam bearing location there is a steel angle connection at the top of the beam to the abutment wall that is experiencing some minor concrete spalling, see Photo 14.

Bridge at 16th Tee:

Overall, the bridge superstructure components are in good condition, see Photos 15-18. The planks are experiencing slight to moderate wear (Photo 19) and the glued-laminated beams are moderately weathered (Photo 17). The steel plate beam bearing connections at each abutment are in good condition and are experiencing only minor corrosion.

At two of the post base plate connections at the concrete apron locations there are missing lag bolts to connect the post to the base plate assembly, see Photos 20 and 21.

At the east abutment there is severe scouring beneath the abutment wall footing where approximately 3 feet of the soil beneath the footing has been washed away, see Photo 22. No scouring was observed at the west abutment.

Bridge at 17th Hole:

Overall, the bridge superstructure components are in good condition, see Photo 23. The planks are experiencing moderate wear (Photo 27) and the glued-laminated beams are moderately weathered (Photos 28 and 29).

At the northwest abutment wing wall there is a significant amount of concrete spalling that has occurred at the end of the wall. It appears that at some point in time there was a steel post at this location that was impacted causing the spalling to occur, see Photo 24.

No scouring was observed at either abutment.

Conclusions and Recommendations

In general, the bridges are all in good condition with most of the repairs being deferred maintenance repairs that can be done at the owner's discretion. We would recommend that the wood superstructure elements be provided with protective coatings. For the glued-laminated beams; a clear or colored penetrating epoxy sealer, and for the deck planks, posts, railing, and curb an exterior paint or stain can be used.

The cracks at the concrete aprons at the 2nd hole bridge should be sealed with an epoxy injection resin. The spalled concrete at the aprons and abutment walls should be patched.

The missing anchor bolt at the 4th Hole Bridge should be replaced with a new bolt drilled and epoxied into the concrete apron. In addition, the missing lag bolts at the 16th Tee post to base plate assemblies should be installed.

The scouring condition below the abutment footings at the west abutment wall at the 2nd Hole Bridge and at the east abutment wall at the 16th Tee bridge should be repaired as soon as possible. Typically, this is done by placing a low strength concrete flowable fill beneath the footings to replace the washed away soil. The flowable fill is capable of filling all voids in the hard to reach places beneath the footing at the washed out areas.

Repair Products

There are several manufactures of repair products for the concrete repairs listed. MAPEI® is a manufacturer of a variety of adhesives and sealants for repairing damaged concrete and protecting existing concrete. Following is a list of product recommendations that can be used for the distressed conditions at the concrete aprons and abutment walls:

- For the cracks at the concrete aprons: Epojet LV is a low-viscosity epoxy injection resin for hairline, structural crack repair. This is used along with Planibond AE a High-Modulus Epoxy Bonding Agent at the surface of the crack.

- Concrete Repair and Patching:
    - For spalling repair patching in abutment walls: Planitop X is a fast-setting, hand-applied repair mortar for vertical structural concrete elements.
    - For top of slab spalling repairs: Planitop 18 is a fast-setting, horizontal repair mortar that allows vehicular traffic within 1 hour.

- Optional Exterior Wall Coating: Elastocolor is a protective and decorative acrylic coating for walls. This is not required but can be applied at the owner's discretion at a cost of approximately $4.00/square foot of surface area. The advantages of this coating include:
    - Surface protection from fungus, moisture, and weathering
    - Low dirt retention minimizing the need for maintenance
    - Remains flexible to accommodate movement and minor cracking of surface.
    - Unlimited colors to choose from

- Concrete Flowable Fill at Scour Locations: A 150 psi minimum strength high slump, flowable concrete.

For the treatment of the glued-laminated beams: There are many suppliers of penetrating epoxy sealers to seal, preserve and protect hard and soft woods. These sealers bond with the wood to also provide waterproofing and will extend the life of the wood members. They are all readily available for contractors and can be purchased at any construction products store.

For treatment of the bridge deck planks, posts, railing, and curbs: There are a variety of paints and stains that can be used to provide a protective coating for these exterior elements.

Estimate of Probable Costs

The majority of the costs associated with these types of repairs are preparation and application labor costs. In addition, there are difficult logistical issues associated with accessing the bridge abutments and beams. The cost of the products used for the repairs (by any manufacturer) are very low relative to these labor costs. The following are anticipated installed pricing associated with the outlined repair tasks that can be used for planning and budgetary purposes.

Repairs that require immediate action:

- Concrete Flow-Fill below the 2nd Hole Bridge Abutment Footing: $5,000
- Concrete Flow-Fill below the 16th Tee Bridge Abutment Footing: $5,000

Deferred Maintenance Repairs to be performed at the owner's discretion:

- Crack Repair at 2nd Hole Bridge Concrete Aprons and Surface Repair of Spalled Concrete at West Abutment Wall, and Spalling at the Top Connections at the 2nd Hole and 4th Hole Bridge Abutment Walls: $2,500

- Penetrating Epoxy Sealing of Bridge Girders (2 beams per Bridge): $2,500 Per Bridge
- Protective Paint/Stain Coating for Deck Planks, Posts, Railing, and Curbs: $5,500 Per Bridge
- Installation of Missing Anchor Bolt at 4th Hole Bridge Post Connection and Installation of Missing Lag Bolts at 16th Tee Bridge Post Connections: $500

Please note that due to the current bidding climate, these costs are budgetary in nature and subject to market conditions at the time of bidding.

At this time, we would recommend contacting specialty contractors that are experienced in this type of work and that are familiar with these products to visit and assess the site, and along with this report, provide you with a more complete cost proposal.

Limitations

Please note that our findings are based on a visual inspection of exposed and readily accessible superstructure and foundation elements. Concealed or otherwise inaccessible elements were not uncovered for examination. While we have endeavored to provide a comprehensive assessment, it is possible that there are hidden conditions, which, if encountered, might affect our conclusions. As with any limited inspection, it is possible that there are structural deficiencies that cannot be known. In addition, we did not perform an analysis of the current design of the bridge structural components and foundations.

If you have any questions, please do not hesitate to contact me at 775.827.6111.

Sincerely,

Eric Hutchens P.E.
Senior Project Manager, Structural Engineering Division

cc: file

PHOTOS

BRIDGE AT 2nd HOLE PHOTOS

Photo 1 – Bridge Looking East

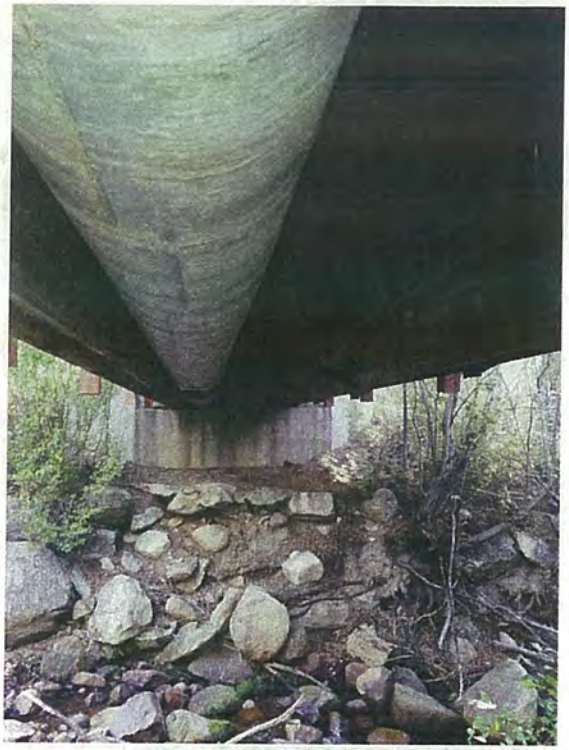

Photo 2 – View of East Abutment

Photo 3 – Scour at West Abutment Footing

Photo 4 – Scour at West Abutment Footing

Photo 5 – Spalling at West Abutment Wall

Photo 6 – Spalling at Top Connection Southwest Beam Bearing

Photo 7 – Cracking and Spalling at West Abutment Approach Apron

Photo 8 – Crack at East Abutment Approach Apron

BRIDGE AT 4th HOLE PHOTOS

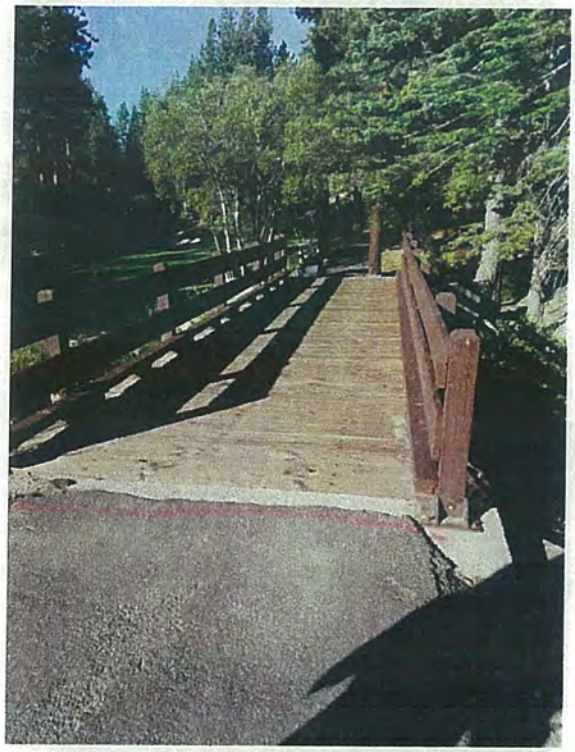

Photo 9 – View Looking Southwest

Photo 10 – Wearing at Deck Surface

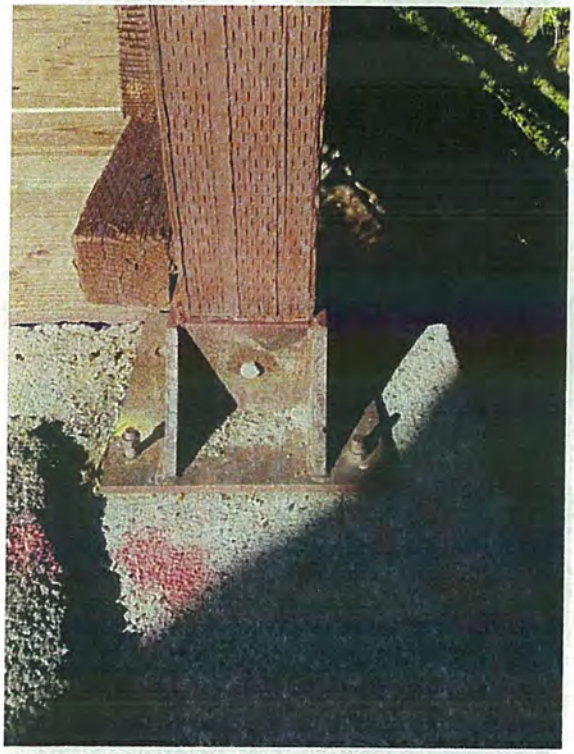

Photo 11 – Slight Corrosion/Missing Anchor Bolt

Photo 12 – View of Southwest Abutment

Photo 13 – View of Northeast Abutment

Photo 14 – Spalling at Top Connection at South End Beam Bearing

BRIDGE AT 16th TEE PHOTOS

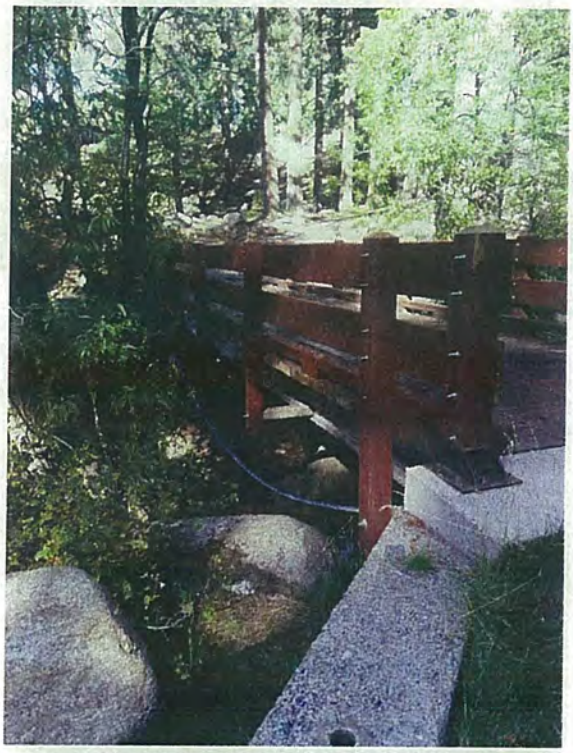

Photo 15 – View Looking West

Photo 16 – View of West Abutment

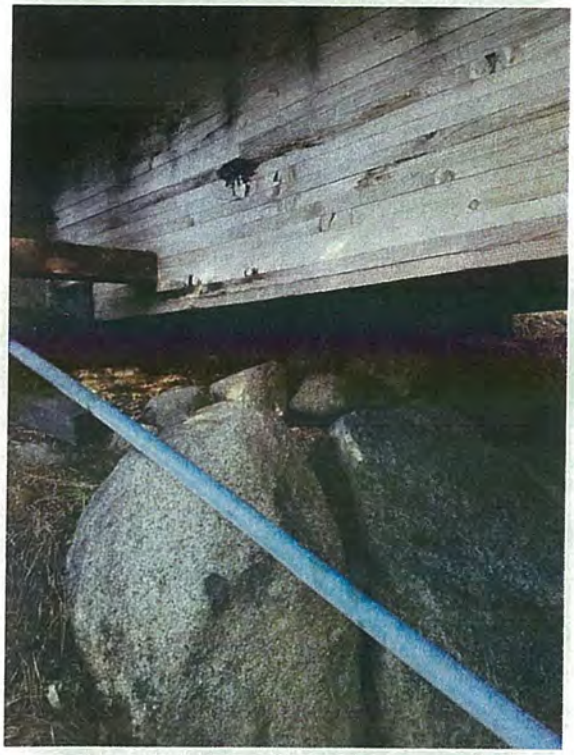

Photo 17 – View of West Abutment

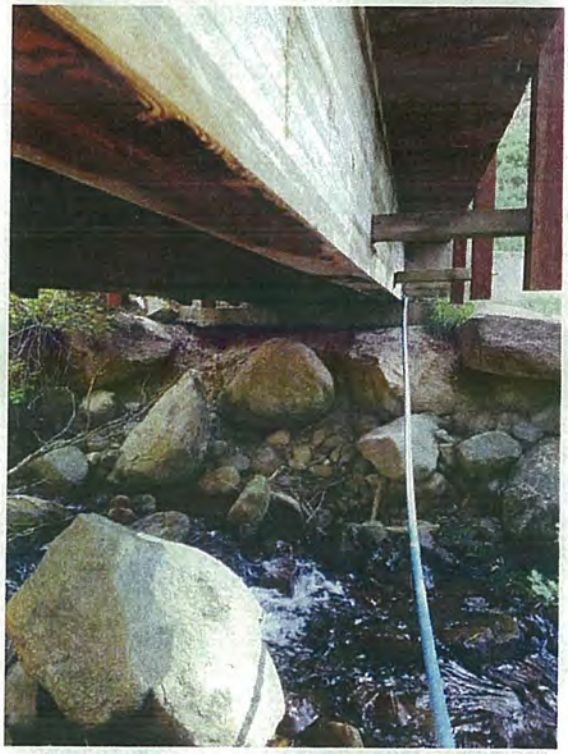

Photo 18 – View of East Abutment

Photo 19 – Wearing at Deck Surface

Photo 20 – Missing Bolt at End Post Connection

Photo 21 – Missing Bolt at End Post Connection

Photo 22 – Severe Scour at East Abutment

BRIDGE AT 17th HOLE PHOTOS

Photo 23 – View Looking South

Photo 24 – Spalling at Northwest Wing Wall

Photo 25 – View of North Abutment

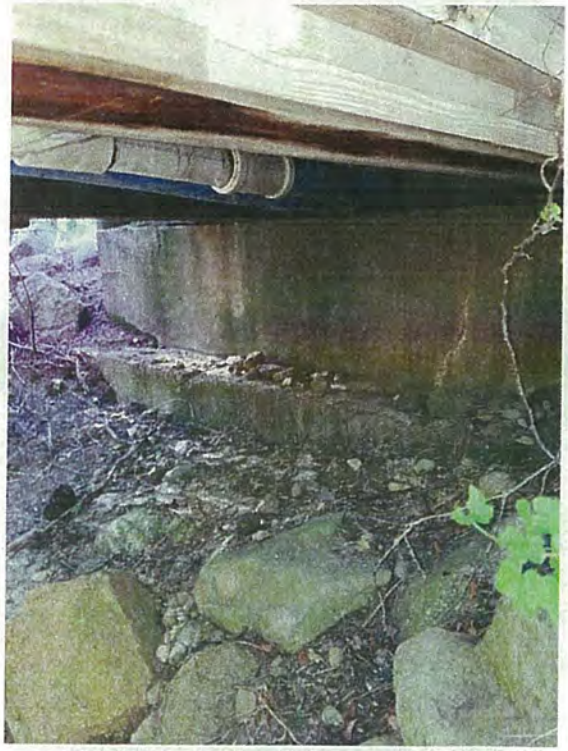

Photo 26 – View of South Abutment

Photo 27 – Moderate Wearing at Deck Surface

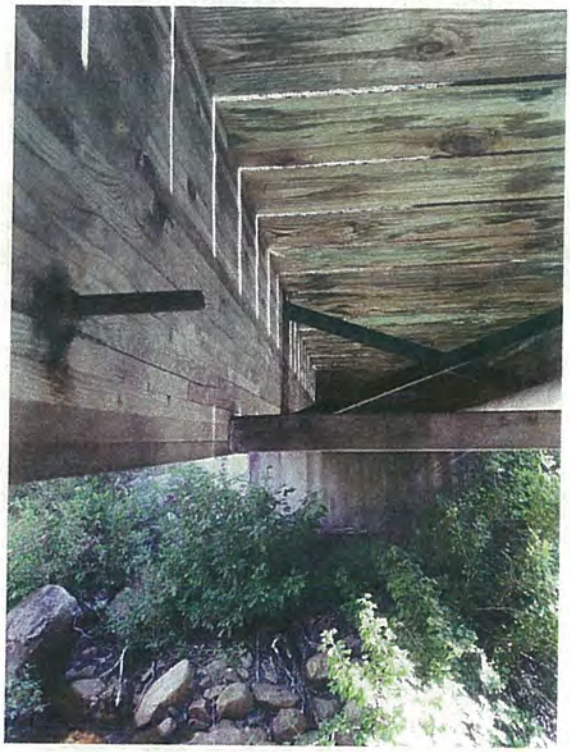

Photo 28 – Typical Weathering at Beams

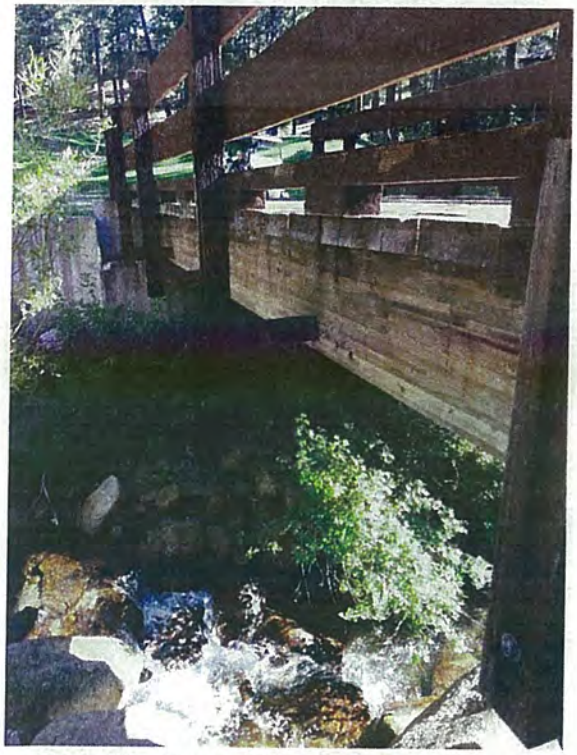

Photo 29 – Typical Weathering at Beams

GEOTECHNICAL INVESTIGATION REPORT

IVGID MOUNTAIN GOLF COURSE CART PATH EVALUATION

JN: 10164.000

INCLINE VILLAGE, NEVADA

SEPTEMBER, 2020

PREPARED FOR:
INCLINE VILLAGE G.I.D. PUBLIC WORKS
ATTN: MICHAEL LEFRANCOIS
893 SOUTHWOOD BLVD.
INCLINE VILLAGE, NV 89451-9425

PREPARED BY:
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CARSON CITY, NV 89706
775.883.7077

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IVGID MOUNTAIN GOLF COURSE CART PATH EVALUATION
Incline Village, Nevada

INTRODUCTION

Submitted here within are the results of Lumos and Associates, Inc. (Lumos) geotechnical investigation for the proposed IVGID Mountain Golf Course Cart Path Evaluation project located in Incline Village, Nevada. A vicinity map is included as Plate 1 and a site map is included as Plate 2.

It is our understanding that the proposed project will consist of re-construction of the cart paths within the Mountain Golf Course. We have assumed that final grades at the site will be approximately the same as the existing grades.

The purpose of our investigation was to characterize the site geology and soil conditions, describe the native soil, determine their engineering properties as they relate to the proposed construction, and to identify any adverse geologic, soil/bedrock, or groundwater conditions. The current scope of work did not include any soil and/or groundwater contamination evaluations at the site.

The recommendations contained herein have been prepared based on our understanding of the proposed improvements and our findings of subsurface conditions at the site. Re-evaluation of the recommendations presented in this report should be conducted after the final site grading and construction plans are completed, if there are any variations from the assumptions described herein.

It is possible that discontinuities are concealed beneath earth materials between and beyond exploration points. Such discontinuities are beyond the evaluation of the Engineer at this time. No guarantee of the consistency of sub-surface conditions or site geology is implied or intended.

GEOLOGIC SETTING

Incline Village is located at the northern end of the Lake Tahoe Basin, a large fault-bounded valley within the eastern portion of the Sierra Nevada geomorphic province. Lake Tahoe is one of the world's largest and deepest alpine lakes, approximately 22 miles long and at least 1,600 feet deep. The Sierra Nevada is geographically characterized by a steep eastern slope that separates the Sierra Nevada and Great Basin geomorphic provinces and a gentle western slope that eases down into the Great Valley.

The surface geology of the project has been mapped by George J. Saucedo (2005). The mapping indicates that Tahoe glacial deposits from the Pleistocene Age underlie a majority of the site (Qta). The mapping also indicates the southern portion of the site is underlain by undivided glacial deposits from the Pleistocene and Holocene age (Qgo). Refer to Plate 3.

The geologic evolution of the Sierra Nevada province is extremely complex and involved a long sequence of events. First, subduction and abduction of oceanic plates below and across the continental plate began. This interaction between the two plates created different metamorphic rock complexes at the collision area known as a trench. Then, the deep continental crust began to melt into granite magma and volcanoes began to erupt above the granite batholiths. The basin and range to the east began to widen and open. Finally, the Sierra Nevada began to rise and tilt a few degrees to the west.

Glaciers have played an active roll in shaping the Sierra Nevada Mountains, particularly during the past two (2) million years. Alpine glaciers were present around Lake Tahoe during much of this period and extended below the current level of the Lake along the west shoreline (i.e., at Emerald Bay). The large U-shaped valleys surrounding the Lake were carved out by ice and display typical glacial features such as polished rock, lateral moraines and glacial lakes (tarns).

SITE CONDITIONS AND FIELD EXPLORATION

At the time of our investigation, the cart path asphalt had extensive cracking throughout (fatigue and transverse).

The current field investigation included a subsurface exploration. The location of the exploratory core drillings were determined by using existing features at the site and a map of the core locations. Therefore, the approximate location of the exploratory core drillings should be considered accurate only to the degree implied by the methods used.

Ten (10) exploratory core drillings were excavated with a Milwaukee core drill and a six (6) inch diameter bit, throughout the proposed project area, to a maximum depth of 24 inches below-existing-grade (b.e.g.). The locations of the exploratory core drillings within the site are shown on Plate 2. The subsurface soils were continuously logged and visually classified in the field by our Geotechnician in accordance with the Unified Soil Classification System (USCS). Representative soil samples were collected at each material change within the exploratory core drillings and subsequently transported to our Carson City geotechnical laboratory for testing and additional analysis.

The subsurface soils encountered consisted generally of silty sands with varying amounts of gravel to the total depths explored for this project. Groundwater was not encountered at the time of our investigation and is not expected to impact the development of this site. However, seasonal groundwater fluctuations should be anticipated at the site.

FIELD AND LABORATORY TEST DATA

Field and laboratory data was developed from samples taken and tests conducted during the field exploration and laboratory phases of this project. The core holes were initially started utilizing a core machine with a six-inch bit, then hand excavated to the depths explored. Representative bulk samples were collected at each lithological change. All samples were subsequently transported to our Carson City geotechnical laboratory for testing and analysis.

Laboratory tests performed on representative samples included sieve analysis, Atterberg Limits, and R-values. Much of this data is displayed on the "logs" of the exploratory core holes to facilitate correlation. Field descriptions presented on the logs have been modified, where appropriate, to reflect laboratory test results. The logs of the exploratory core holes are included in Appendix A of this report as Plates A-1 through A-10. Plate A-11 describes the various symbols and nomenclature shown on the logs.

Individual laboratory test results are presented in Appendix B as Plates B-1 through B-3. Laboratory testing was performed per ASTM standards, except when test procedures are briefly described and no ASTM standard is specifically referenced in the report. Atterberg limits were determined using the dry method of preparation (Plate B-2).

The soil samples obtained during this investigation will be held in our laboratory for 30 days from the date of this report. The samples may be retained longer at an additional cost to the client or obtained from this office upon request.

DISCUSSION AND RECOMMENDATIONS

GENERAL

The following recommendations are based upon the construction and our understanding of this project, as outlined in the introduction of this report. If changes in the construction are proposed, they should be presented to the Lumos Geotechnical Department, so that these recommendations can be reviewed and modified in writing, as necessary. As a minimum, final construction drawings should be submitted to the Lumos Geotechnical Department for review prior to actual construction and verification that our geotechnical design recommendations have been implemented.

GENERAL SITE GRADING

Prior to placement of fill and/or the proposed improvements, the areas to receive fill and/or improvements shall be cleared and grubbed. Clearing and grubbing is not anticipated under the existing cart path. Clearing and grubbing may be required if improvements will be placed outside of the existing cart path. Where required, clearing and grubbing is anticipated to be as much as six (6) inches, or more, where thicker vegetation/roots are present.

Root- or organic-laden soils encountered during excavations, should be stockpiled in a designated area on site for later use in landscaping, or removed off site as directed by the owner. Excavated soils free from any organics, debris or otherwise unsuitable material and with particles no larger than three (3) inches in maximum dimension may be stockpiled and moisture conditioned for later use as compacted structural fill provided it meets the criteria for structural fill soils.

All surfaces to receive fill and/or improvements should be observed and approved by a Lumos representative prior to placement of fill. The surfaces shall be scarified to a minimum depth of twelve (12) inches, oversize particles (+3") removed, moisture conditioned to within two percent (2%) of optimum, and re-compacted to at least ninety

percent (90%) of the ASTM D1557 standard. This requirement may be waived, at the discretion of the Geotechnical Engineer. Fill material should not be placed, spread or compacted while the ground is frozen or during unfavorable weather conditions. When site grading is interrupted by heavy rain or snow, grading or fill operations should not resume until a Lumos representative approves the moisture content and density conditions of the subgrade or previously placed fill.

Unstable conditions due to yielding and/or pumping soils are not anticipated to be encountered on site. However, native soils may yield or pump under heavy equipment loads or where vibratory equipment draws up water. If yielding or pumping conditions are encountered, the soils should be scarified in place, allowed to dry as necessary and re-compacted, where applicable. Alternatively, the unsuitable or saturated soil should be removed, the exposed surface leveled and compacted/tamped as much as practical without causing further pumping, and covered (including the sides) with geotextile stabilizing fabric (Mirafi HP370 or other equivalent). The fabric should then be covered with at least 12 inches of 3- to 6-inch **angular rock fill** with enough fines to fill the inter-rock pore spaces. Placement should be by end dumping. No traffic or other action should be allowed over the fabric, which may cause it to deflect/deform prior to cobble placement. Test sections should be used to determine the minimum thickness and/or number of layers required for stabilization.

Stabilization should be evaluated by proof-rolling standards commensurate with the equipment used, and approved by a Lumos representative. The placement of the stabilizing rock-fill may require additional over-excavation to maintain appropriate grading elevations. A filter fabric (Mirafi 180N or equal) should also be placed over the cobble rock fill to prevent piping of fines from covering soils into the stabilizing rock matrix.

Acceptable structural fill soils to be used for this project should consist of non-expansive material (LL less than 35 and/or a PI less than 12, and/or an Expansion Index less than 20), and should be free of contaminants, organics (less than two percent (2%)), rubble, or natural rock larger than three (3) inches in largest dimension. The R-Value shall be a

minimum of 30. Any import soils should be tested and approved prior to being placed or delivered on-site (seven (7) day advanced notice). Structural fill soils shall also meet the following gradation requirements:

TABLE 1
STRUCTURAL FILL GRADATION SPECIFICATIONS

SIEVE SIZE	% PASSING
3"	100
¾"	70 - 100
#40	15 - 65
#200	10 - 30

Soils not meeting all of the above requirements may be approved for use as structural fill at the discretion of the Geotechnical Engineer. It is anticipated the site silty sands will be suitable for reuse as structural fill, provided the oversize particles (+3") are removed. Compacted fill should be placed only on compacted sub-grade or on compacted fill in lifts not exceeding eight (8) inches in loose thickness, moisture conditioned to within two percent (2%) of optimum, and compacted to at least ninety percent (90%) relative compaction, as determined by the ASTM D1557 standard. Particle size, and lift thickness, may be increased by the Geotechnical Engineer, provided the contractor can demonstrate specified compaction requirements can be achieved.

If fill is to be placed on slopes steeper than 5:1, the existing slope shall be benched, in equipment wide swaths, that have a grade at least 20:1 into the slope. The bottom of the fill slope shall have a key a minimum of two (2) feet deep and ten (10) feet wide.

Fill material should not be placed, spread or compacted while the ground is frozen or during unfavorable weather conditions. When site grading is interrupted by heavy rain or snow, grading or filling operations should not resume until a Lumos representative approves the moisture content and density conditions of the subgrade or previously placed fill.

Landscape areas should be cleared of all objectionable material. In cut areas, no other work is necessary except grading to proper elevation. In fill areas, fill should be placed in loose lifts not exceeding twelve (12) inches and compacted to at least ninety percent (90%) relative compaction to prevent erosion.

Water should not be allowed to pond adjacent to structures, and measures should be taken to reduce surface water infiltration into the foundation soils.

A representative of Lumos should be present during site grading operations to ensure that any unforeseen or concealed conditions within the site are identified and properly mitigated, and to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction and is dependent upon compaction and stability of the subgrade soils. The soils engineer may reject any material that does not meet engineering characteristics, compaction, and stability requirements. Further, recommendations of this report are based upon the assumption that earthwork construction will conform to recommendations set forth in this section of the report.

PAVEMENT DESIGN

The pavement structural section was determined for the asphalt concrete utilizing an R-value of 51 for the native silty sands (laboratory test results) and an R-value of 70 for the aggregate base course, (Standard Specifications for Public Works Construction (SSPWC)). Refer to Table 2, "Recommended Asphalt Pavement Section". We recommend removing the upper seven (7) inches of asphalt and underlying soil to allow for the recommended asphalt and Type 2, Class B aggregate base to be placed. The area exposed should be scarified in place to a depth of at least 12 inches, particles larger than three (3) inches removed, moisture conditioned to within two percent (2%) of optimum, and compacted to at least ninety percent (90%) of ASTM D1557. Aggregate base should consist of Type 2, Class B material and meet the requirements of the SPPWC. The existing asphalt, base, and/or decomposed granite may be pulverized and reused as aggregate base, provided it meet the requirements of Type 1 Recycled Aggregate Base. Aggregate base material (Type 2, Class B or Type 1 Recycled) should be compacted to at least ninety-five percent (95%) of the laboratory maximum density as determined by the ASTM D1557 standard.

TABLE 2
RECOMMENDED ASPHALT PAVEMENT SECTION

	Minimum Asphalt Pavement Thickness	Minimum Aggregate Base Thickness	Properly Prepared Suitable Subgrade
Cart Path	3"	4"	12"

See Appendix C for Calculations

The recommendation for the three inches of asphalt is to help mitigate against the heavy freeze thaw cycles that happen in this area and the four inches of aggregate base is to help maintain a way in which water can move under the path and not pool up to help with the fatigue cracking.

The asphalt concrete shall contain PG64-28NV oil and Type 3 asphalt aggregate per the SSPWC. We recommend a 50-blow Marshall mix that targets three percent (3%) air voids. Asphalt concrete, placed in cart paths, should be compacted to between ninety-three percent (93%) and ninety-eight percent (98%) of the Rice theoretical maximum density.

All mix designs for asphalt concrete should be submitted to the Geotechnical Engineer for review and approval a minimum of seven (7) days prior to paving.

MOISTURE PROTECTION AND DRAINAGE

The finish surface around all structures including the cart path pavement should slope away from foundations and pavements and toward appropriate drop inlets or other surface drainage devices. It is recommended that within ten (10) feet of the cart path a minimum slope of two percent (2%) be used for soil sub-grades. These grades should be maintained for the life of the project.

CONSTRUCTION SPECIFICATIONS

All work shall be governed by the Standard Specification for Public Works Construction (SSPWC), as distributed by Washoe County except as modified herein.

LIMITATIONS

This report has been prepared in accordance with the currently accepted engineering practices in Northern Nevada. The analysis and recommendations in this report are based upon exploration performed at the locations shown on the site plan, the proposed improvements as described in the Introduction section of this report and upon the property in its condition as of the date of this report. Lumos makes no guarantee as to the continuity of conditions as subsurface variations may occur between or beyond exploration points and over time. Any subsurface variations encountered during construction should be immediately reported to Lumos so that, if necessary, Lumos' recommendations may be modified.

This report has been prepared for and provided directly to Incline Village G.I.D. Public Works ("The Client"), and any and all use of this report is expressly limited to the exclusive use of the Client. The Client is responsible for determining who, if anyone, shall be provided this report, including any designers and subcontractors whose work is related to this project. Should the Client decide to provide this report to any other individual or entity, Lumos shall not be held liable for any use by those individuals or entities to whom this report is provided. The Client agrees to indemnify, defend and hold harmless Lumos, its agents and employees from any claims resulting from unauthorized users.

If this report is utilized in the preparation of an Engineer's Estimate of Probable Construction Costs, then the preparer of the estimate acknowledges that the report recommendations are based on the subsurface conditions found at the specific locations investigated on site; that subsurface conditions may vary outside these locations; and that no guaranty or warranty, express or implied, is made that the conditions encountered are representative of the entire site. The preparer of the estimate agrees to indemnify, defend and hold harmless Lumos & Associates, its agents and employees from any and all claims, causes of action or liability arising from any claims resulting from the use of the report in the preparation of an Engineer's Cost Estimate.

This report is not intended for, nor should be utilized for, bidding purposes. If it is utilized for bidding purposes, Client acknowledges that the report recommendations are based on the subsurface conditions found at the specific locations investigated on site; that subsurface conditions may vary outside these locations; and that no guaranty or warranty, express or implied, is made that the conditions encountered are representative of the entire site. The Client agrees to indemnify, defend and hold harmless Lumos & Associates, its agents and employees from any and all claims, causes or action or liability arising from any claims resulting from the use of the report for bidding purposes.

As explained above, subsurface variations may exist and as such, beyond the express findings located in this report, no warranties express, or implied, are made by this report. No affirmation of fact, including but not limited to statements regarding suitability for use of performance shall be deemed to be a warranty or guaranty for any purpose.

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Lumos & Associates, Inc.

Mitch Burns, P.E., C.E.M.
Materials Engineering Manager
Lumos & Associates, Inc.

American Society for Testing and Materials (ASTM), 2020, Annual Book of ASTM Standards, West Conshohocken, PA

Naval Facilities Engineering Command, 1986, Design Manual 7.01

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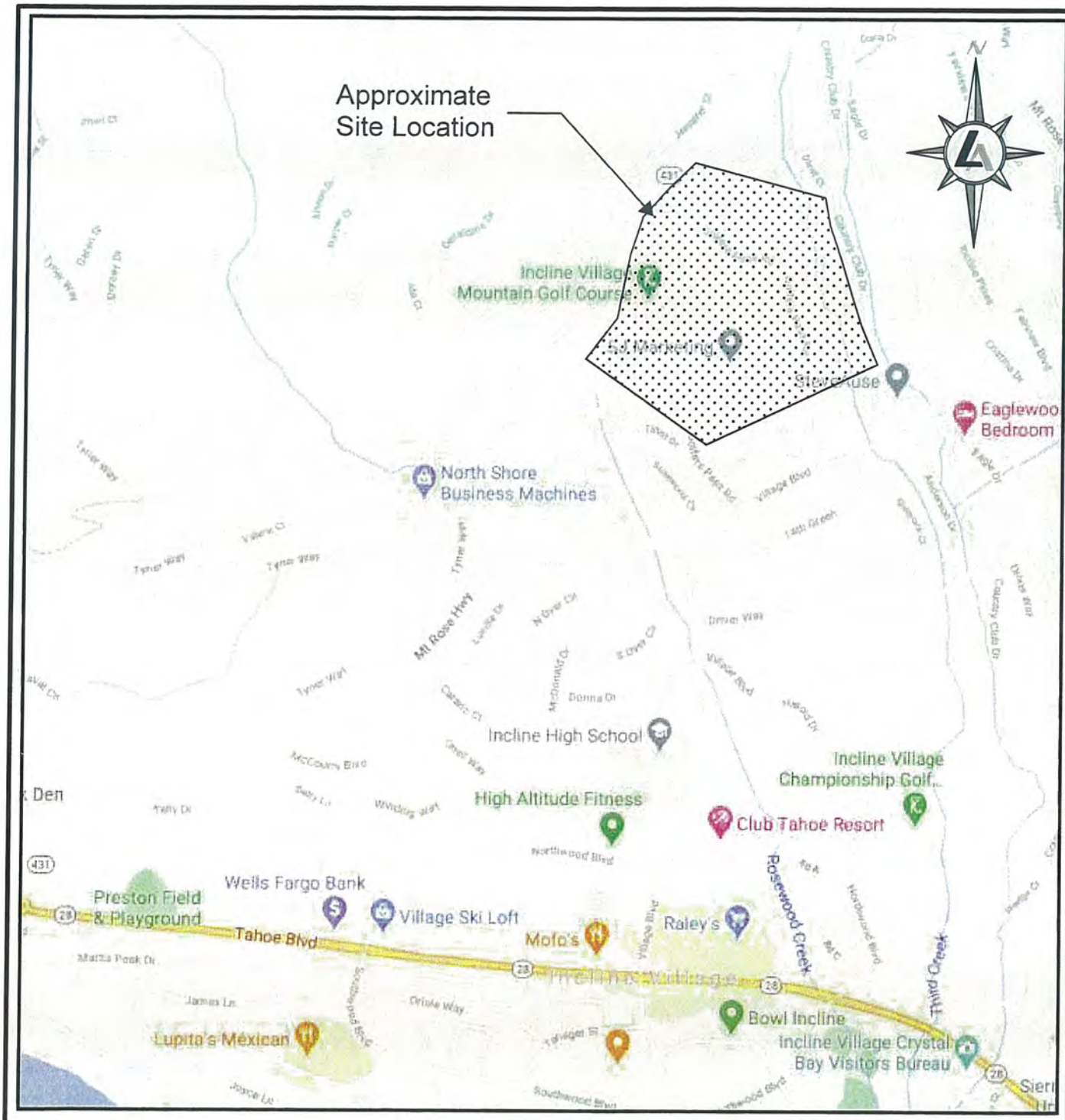

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IVGID Mountain Golf Course Evaluation

VICINITY MAP

Job Number: 10164.000

Date: Sept., 2020

PLATE

1

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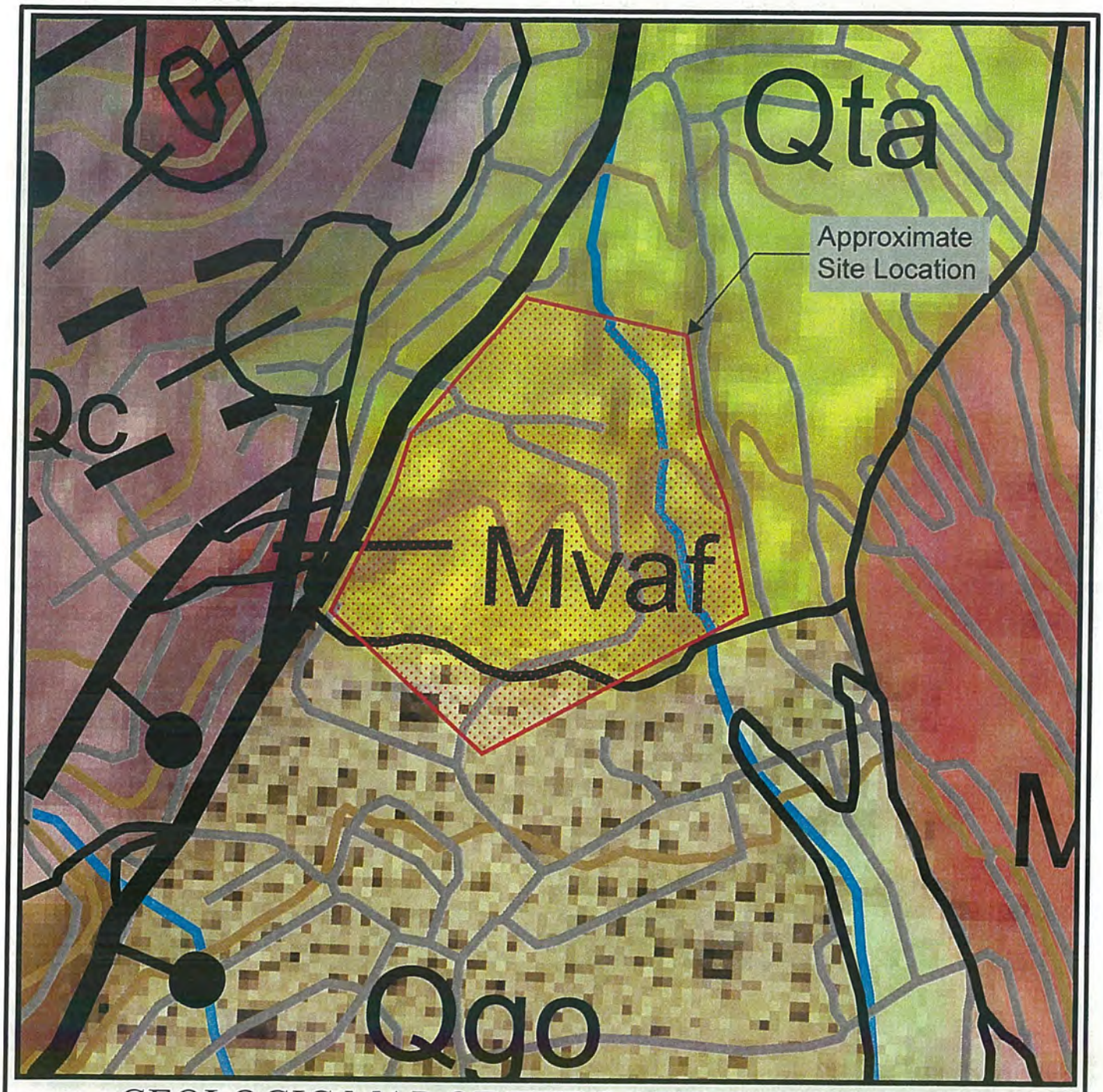
IVGID Mountain Golf Course Evaluation

SITE MAP

Job Number: 10164.000

Date: Sept., 2020

PLATE 2



GEOLOGIC MAP OF THE LAKE TAHOE BASIN CALIFORNIA AND NEVADA

George J. Saucedo 2005

Tahoe glacial deposits (Pleistocene)

Qta Till

Glacial deposits undivided (Pleistocene and Holocene?)

Qgo Outwash deposits

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IVGID Mountain Golf Course Evaluation

GEOLOGIC MAP

Job Number: 10164.000

Date: Sept., 2020

PLATE 3

APPENDIX A

LUMOS & ASSOCIATES

CORE HOLE No. C-01

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **2 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			2 1/2" Asphalt, Brittle and Porous										
			0.2										
		Z	1" of Material Similar to Decomposed Granite										
			0.3										
		Z	2 1/2" of a Fill Material. That Consists of a **Light Brown Silty SAND with Gravel (SM),** Moist and Medium Dense. Estimated to have 15% Medium to Fine Gravel, 60% Coarse to Fine Sand, and 25% Non-Plastic Silt.										
0.5			0.5										
			Brown Silty SAND (SM), Moist, Medium Dense, and with Roots. For Testing Purposes This Material was Combined with the Same Native Subgrade Layer from Cores 3 and 4.										
1.0													
		Z		5.4			NP	NP	14.2	68.0	17.9	51	
1.5													
2.0			2.0										

Core Hole terminated at 2 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000
Date: September 2020

PLATE A-1

CORE HOLE No. C-02

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **2 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			2" Asphalt, Brittle, and Fatigue Cracking. 0.2										
		Z	1" of Material Similar to Aggregate Base. 0.3										
		Z	3" of a Fill Material. That Consists of a **Light Brown Silty SAND with Gravel (SM),** Moist and Medium Dense. Estimated to have 15% Medium to Fine Gravel, 60% Coarse to Fine Sand, and 25% Non-Plastic Silt. 0.5										
0.5			**Brown Silty SAND (SM),** Moist, Medium Dense, and with Roots. Estimated 10% Medium to Fine Gravel, 70% Coarse to Fine Sand, and 20% Non-Plastic Silt.										
1.0													
		Z											
1.5													
2.0			2.0										

Core Hole terminated at 2 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000 Date: September 2020

PLATE A-2

CORE HOLE No. C-03

Logged By:	**B. Sexton**	Total Depth:	**2 feet**
Date Logged:	**9-9-2020**	Water Depth:	**No groundwater encountered**
Drill Type:	**Hand Excavation**	Ground Elev.:	**E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			2" Asphalt, Brittle, Porous, and Fatigue and Tranverse Cracking.										
			0.2										
		Z	5" of Material Similar to Aggregate Base.										
0.5			0.6										
		Z	**Brown Silty SAND (SM),** Moist, Medium Dense, and with Roots. Material Combined with Cores 1 and 4. See Core 1 for Test Results.										
1.0													
1.5													
2.0			2.0										

Core Hole terminated at 2 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000 Date: September 2020

PLATE A-3

CORE HOLE No. C-04

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **1 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			2" Asphalt, Brittle, Porous, and Fatigue and Tranverse Cracking.										
			0.2										
		Z	2" of Material Similar to Decomposed Granite.										
			0.3										
0.5		Z	**Brown Silty SAND (SM),** Moist, Medium Dense, and with Roots. Material Combined with Cores 1 and 4. See Core 1 for Test Results.										
			Refusal at 12" Due to a Rock That Couldn't be Excavated Out of the Core Hole.										
1.0			1.0										

Core Hole terminated at 1 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000
Date: September 2020

PLATE A-4

CORE HOLE No. C-05

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **1.33 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			3 1/2" Asphalt, Less Cracking Noted, Most Likely a Previously Patched Area. 0.3										
0.5		Z	6" of Material Similar to Aggregate Base. 0.8										
1.0		Z	**Medium Brown Silty SAND with Gravel (SM),** Moist, Medium Dense, and with Roots. Estimated 15% Medium to Fine Gravel, 65% Coarse to Fine Sand, and 20% Non-Plastic Silt. Refusal at 16" Due to a Rock That Couldn't be Excavated Out of the Core Hole. 1.3										

Core Hole terminated at 1.33 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000 Date: September 2020

PLATE A-5

CORE HOLE No. C-06

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **2 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			2 1/2" Asphalt, Brittle, Porous, and Fatigue and Tranverse Cracking.										
			0.2										
		Z	3 1/2" of Material Similar to Aggregate Base.										
0.5			0.5										
			Medium Brown Silty SAND with Gravel (SM). Moist, Medium Dense, and with Roots. Estimated 15% Medium to Fine Gravel, 65% Coarse to Fine Sand, and 20% Non-Plastic Silt.										
1.0		Z											
1.5													
2.0			2.0										

Core Hole terminated at 2 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000

Date: September 2020

PLATE A-6

CORE HOLE No. C-07

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **2 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			2 1/2" Asphalt, Brittle, Porous, and Fatigue and Tranverse Cracking.										
			0.2										
		Z	2" of Material Similar to Decomposed Granite.										
			0.4										
0.5			**Medium Brown Silty SAND (SM).** Moist, Medium Dense, and with Roots. For Testing Purposes This Material was Combined with the Same Native Subgrade Layer from Cores 8 and 10.										
1.0		Z		8.4			NP	NP	12.1	71.6	16.4	78	
1.5													
2.0			2.0										

Core Hole terminated at 2 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000
Date: September 2020

PLATE A-7

CORE HOLE No. C-08

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **1.25 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			1 3/4" Asphalt, Brittle, Porous, and Fatigue and Tranverse Cracking.										
			0.2										
		Z	2 3/4" of Material Similar to Aggregate Base.										
			0.4										
0.5		Z	**Medium Brown Silty SAND (SM).** Moist, Medium Dense, and with Roots. Material Combined with Cores 7 and 10. See Core 7 for Test Results.										
1.0			Refusal at 15" Due to a Rock That Couldn't be Excavated Out of the Core Hole.										
			1.3										
			Core Hole terminated at 1.25 feet. Core Holes Filled with Soil and Capped with Non-Shrink Grout.										

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000
Date: September 2020

PLATE A-8

CORE HOLE No. C-09

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **1.67 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample | California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			4" Asphalt with Tranverse Cracking.										
			0.3										
0.5			**Medium Brown Silty SAND with Gravel (SM).** Moist, Medium Dense, and with Roots. Estimated 15% Medium to Fine Gravel, 65% Coarse to Fine Sand, and 20% Non-Plastic Silt.										
1.0		Z											
1.5			Refusal at 20" Due to a Root That Couldn't be Excavated Out of the Core Hole.										
			1.7										

Core Hole terminated at 1.67 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000

Date: September 2020

PLATE A-9

CORE HOLE No. C-10

Logged By: **B. Sexton**
Date Logged: **9-9-2020**
Drill Type: **Hand Excavation**

Total Depth: **1.5 feet**
Water Depth: **No groundwater encountered**
Ground Elev.: **E.G.S. feet ±**

Percolation Test | Split Spoon | Ziplock Sample
California Sampler | Bulk Sample | Static Water Table

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	Natural Moisture Content, %	Moisture Content, %	Dry Density, pcf	Liquid Limit, %	Plasticity Index, %	Gravel, % (3" - #4 Sieve)	Sand, % (#4 - #200 Sieve)	Fines, % (< #200 Sieve)	R-Value	Expansion Index
			3" Asphalt with Tranverse Cracking.										
			0.3										
		Z	4" of Material Similar to Aggregate Base.										
0.5			0.6										
		Z	**Medium Brown Silty SAND (SM),** Moist, Medium Dense, and with Roots. Material Combined with Cores 7 and 8. See Core 7 for Test Results.										
1.0													
		Z	Refusal at 18" Due to a Rock That Couldn't be Excavated Out of the Core Hole.										
1.5			1.5										

Core Hole terminated at 1.5 feet.
Core Holes Filled with Soil and Capped with Non-Shrink Grout.

CORE HOLE LOG 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/17/20

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IVGID Mountain Golf Course Evaluation

LOG OF EXPLORATORY CORE HOLE

Job Number: 10164.000
Date: September 2020

PLATE
A-10

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Other Tests	
AN	ANALYTICAL TEST (pH, Soluble Sulfate, and Resistivity)
C	CONSOLIDATION TEST
DS	DIRECT SHEAR TEST
MD	MOISTURE DENSITY CURVE

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IVGID Mountain Golf Course Evaluation

LEGEND

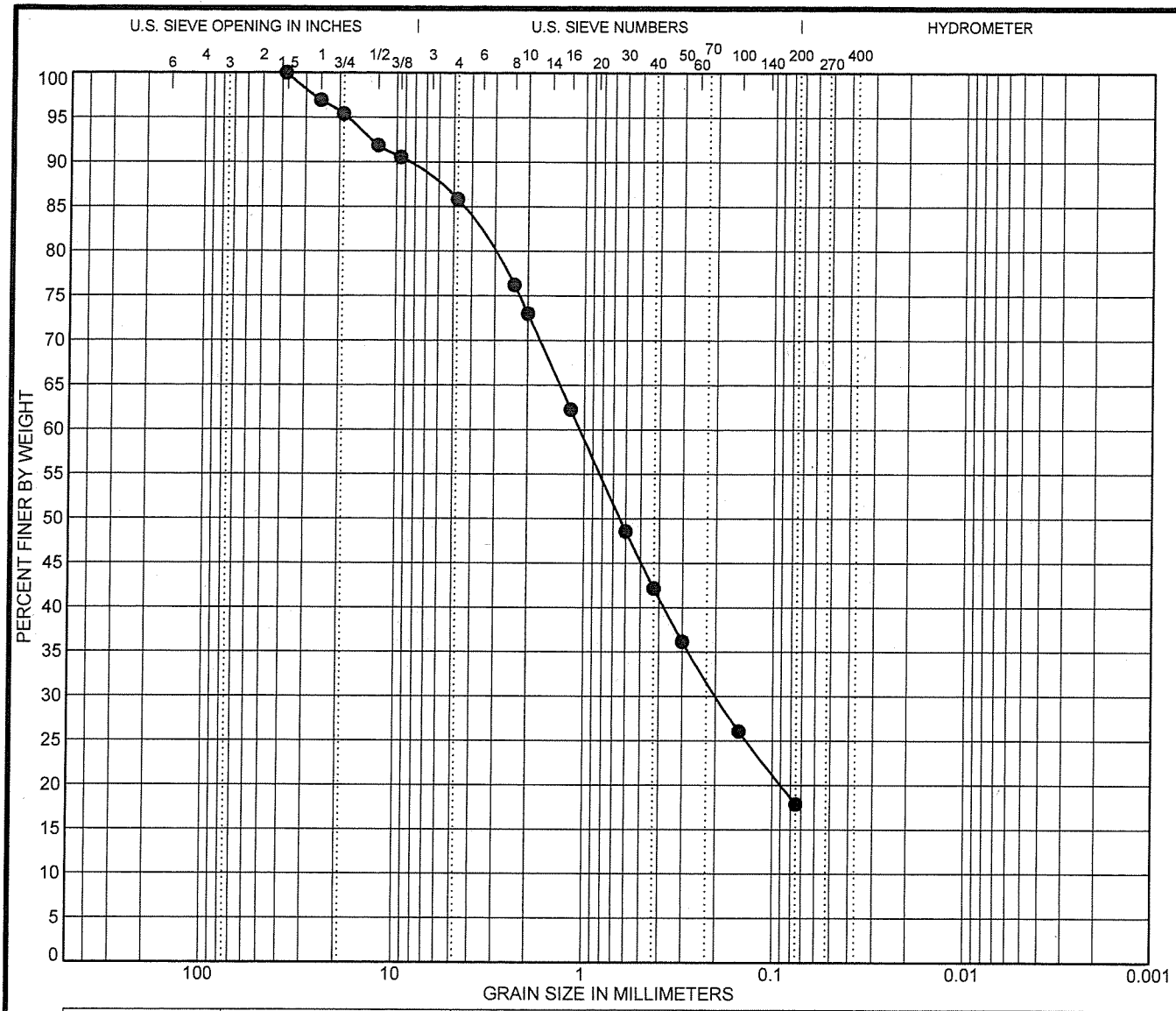
Job Number: 10164.000 Date: September 2020

PLATE A-11

LUMOS_LEGEND 10164.000 IVGID MTN GOLF.GPJ 10-23-06.GDT 9/15/20

APPENDIX B

LUMOS & ASSOCIATES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Date: 9-11-2020								
● **C-01**	Classification					LL	PL	PI	Cc	Cu
Depth: 0.5	Silty SAND (SM)					NP	NP	NP		
Sample Location	Combined Native Subgrade from Cores 1, 3, & 4									
USCS	SM									
AASHTO										

Specimen Identification								
● **C-01**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
Depth: 0.5	38.1	1.055	0.196		14.2	68.0	17.9	

Natural Moisture	5.4 %		**S.E.**		**Absorption %**	
R-Value	51		**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%		**Specific Gravity**		**Direct Shear**	

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IVGID Mountain Golf Course Evaluation

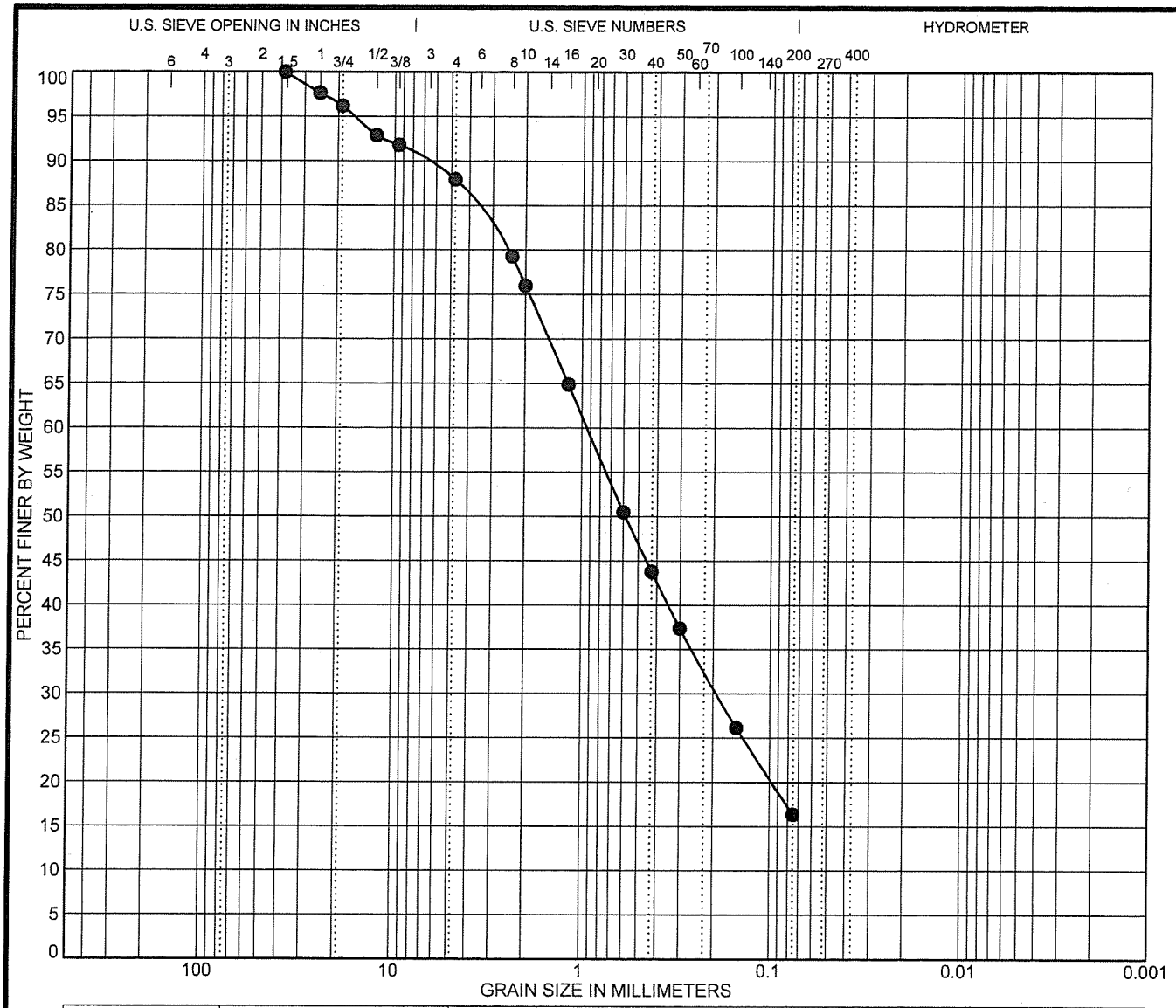
GRAIN SIZE DISTRIBUTION

Job Number: 10164.000 Date: September 2020

PLATE

B-1.1

LUMOS_GRAIN_SIZE 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/15/20



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Date: 9-11-2020							
●	**C-07**	Classification				LL	PL	PI	Cc	Cu
	Depth: 0.38	Silty SAND (SM)				NP	NP	NP		
	Sample Location	Combined Native Subgrade from Cores 7, 8, & 10								
	USCS	SM								
	AASHTO									

	Specimen Identification								
●	**C-07**	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
	Depth: 0.38	38.1	0.938	0.19		12.1	71.6	16.4	

Natural Moisture	8.4 %	**S.E.**		**Absorption %**	
R-Value	78	**Durability Index**		**Soundness**	
Perctage of Wear (500 rev)	%	**Specific Gravity**		**Direct Shear**	

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IVGID Mountain Golf Course Evaluation

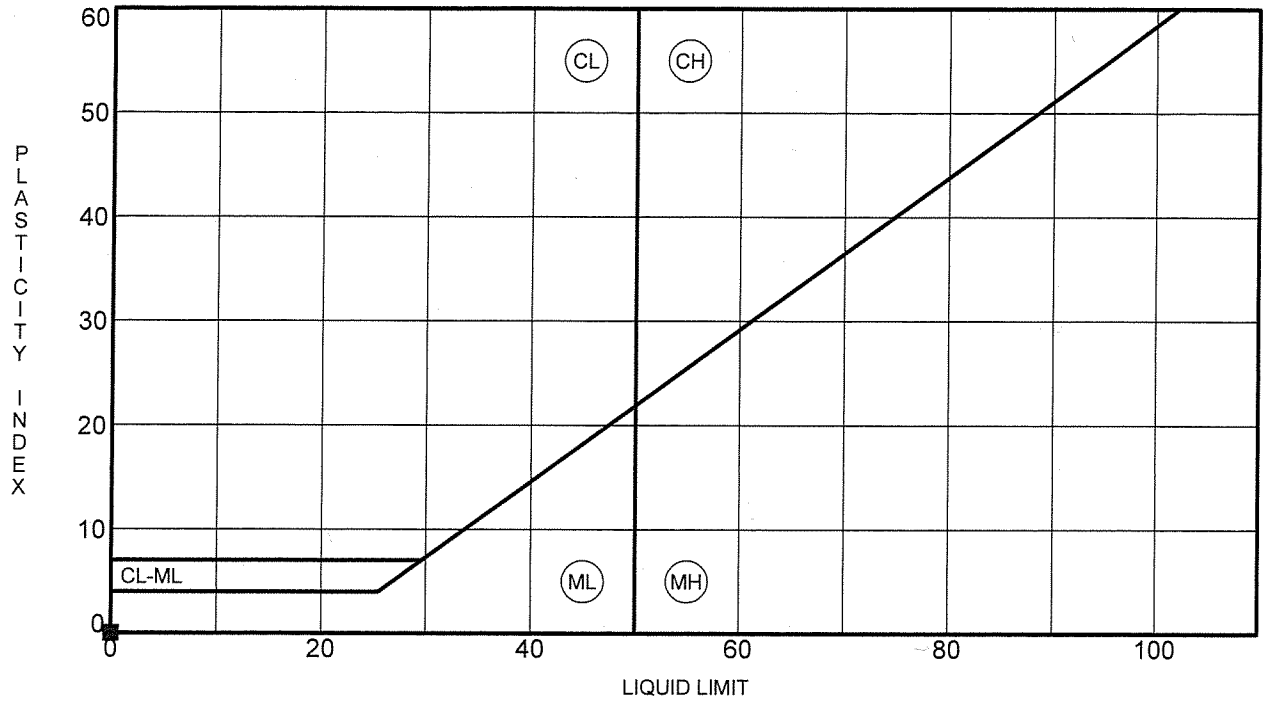
GRAIN SIZE DISTRIBUTION

Job Number: 10164.000 Date: September 2020

PLATE

B-1.2

LUMOS_GRAIN_SIZE_10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/15/20



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**C-01**	**0.5**	**NP**	**NP**	**NP**	**18**	Silty SAND (SM)
⊠	**C-07**	**0.4**	**NP**	**NP**	**NP**	**16**	Silty SAND (SM)

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IVGID Mountain Golf Course Evaluation

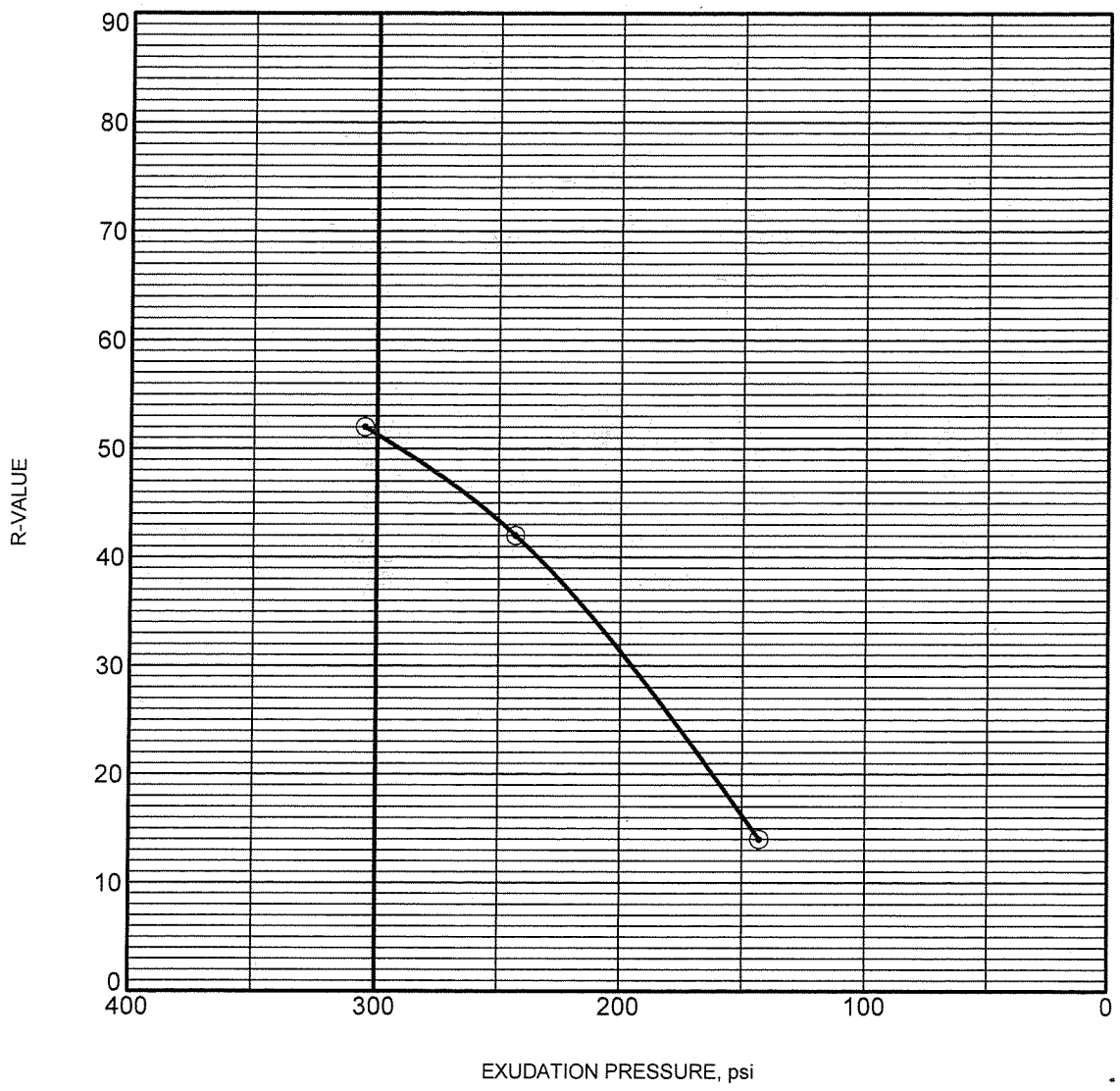
ATTERBERG LIMITS' RESULTS

Job Number: 10164.000 Date: September 2020

PLATE

B-2

LUMOS ATTERBERG LIMITS 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/15/20



Test Data

Specimen No.	Water Content (%)	Dry Density (pcf)	Expansion (psf)	Exudation (psi)	Test R-Value*
1	**13.7**	**120.0**	**0.0**	**143.0**	**14.0**
2	**12.2**	**126.0**	**0.0**	**243.0**	**42.0**
3	**11.7**	**120.1**	**0.0**	**305.0**	**52.0**

* Reported values have been corrected for sample height, where required.

Test Result

Specimen Identification		Classification	R-Value
C-01	**0.5**	**Silty SAND (SM)**	**51**

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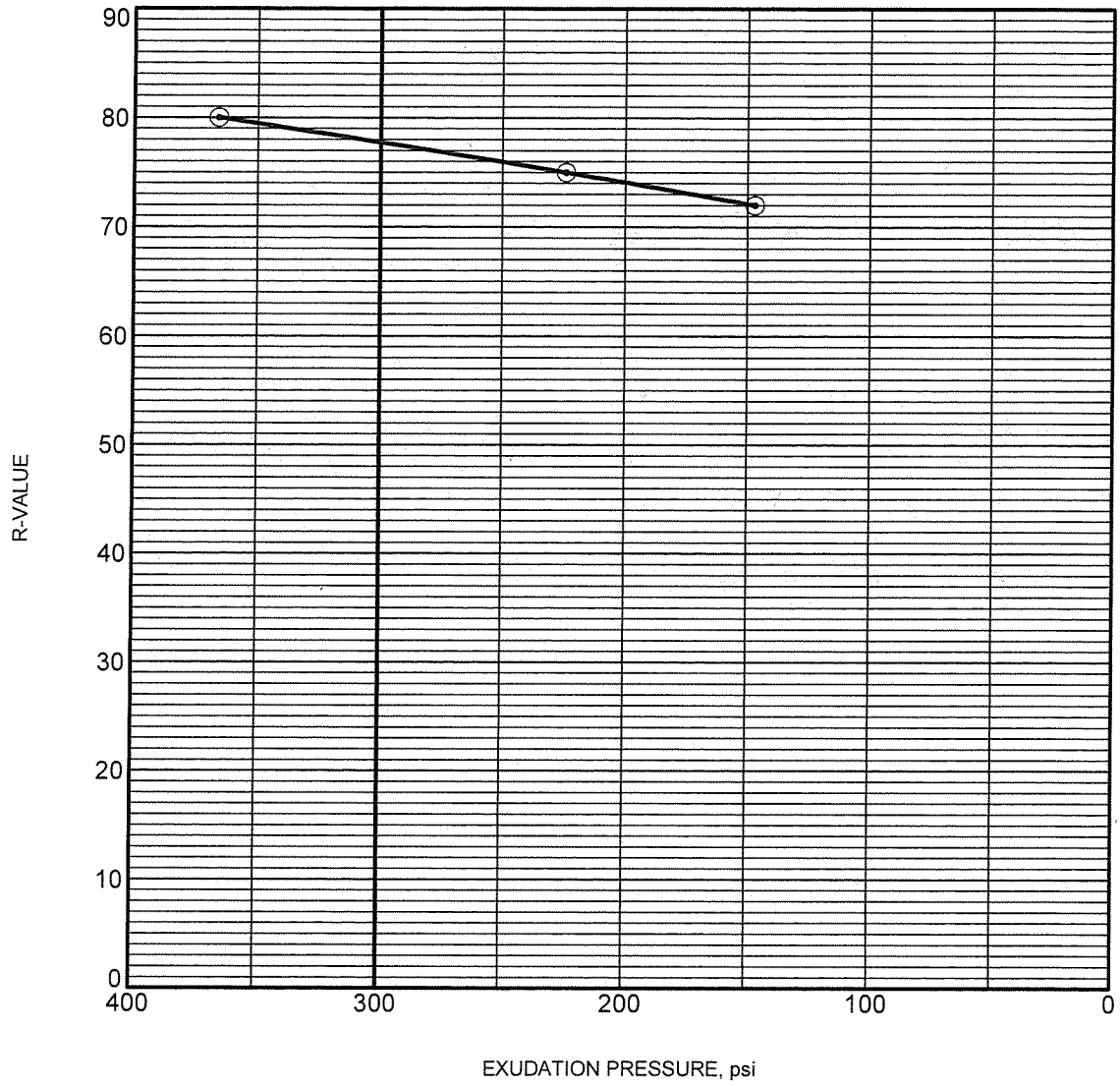
IVGID Mountain Golf Course Evaluation

RESISTANCE VALUE TEST

Job Number: 10164.000 Date: September 2020

PLATE B-3.1

R_VALUE 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/15/20



Test Data

Specimen No.	Water Content (%)	Dry Density (pcf)	Expansion (psf)	Exudation (psi)	Test R-Value*
1	**10.6**	**126.8**	**0.0**	**366.0**	**80.0**
2	**11.8**	**125.0**	**0.0**	**147.0**	**72.0**
3	**11.1**	**122.4**	**0.0**	**224.0**	**75.0**

* Reported values have been corrected for sample height, where required.

Test Result

Specimen Identification		Classification	R-Value
C-07	**0.4**	**Silty SAND (SM)**	**78**

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IVGID Mountain Golf Course Evaluation

RESISTANCE VALUE TEST

Job Number: 10164.000 Date: September 2020

PLATE

B-3.2

R_VALUE 10164.000 IVGID MTN GOLF.GPJ US_LAB.GDT 9/15/20

APPENDIX C

Job # 10164.000
Client: IVGID Mountain Golf Course Evaluation
Description: Pavement Calculations
By: B. Sexton

T.I. = 4.5 (light traffic)
Gf = 2.5
GE = 0.0032(TI)(100-R)
tlayer = GE/Gf

GE_{AC}= 0.0032(4.5)(100-70) = 0.43'
t_{AC}= 0.43/(2.5)*(12") = 2.1" => **use 3" Asphalt**
$t_{AC(actual)}$= (3)(2.5)/12" = 0.63'

GE_{AB}= 0.0032(4.5)(100-51) = .71'
t_{AB}= (0.71 – 0.63)(12")/1.1 = 0.9" => **use 4" Aggregate Base**

Therefore, use 3" of Asphalt Concrete underlain by a minimum of 4" of Type 2 Class B Aggregate Base. This is due to the freeze thaw cycles and water migration under the cart path.

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IVGID Mountain Golf Course Evaluation

PAVEMENT CALCULATIONS

Job Number: 10164.000 Date: Sept., 2020

PLATE C-1

PATHWAY EVALUATION & MAINTENANCE RECOMMENDATIONS

IVGID MOUNTAIN GOLF COURSE CART PATH EVALUATION

JN: 10164.000

INCLINE VILLAGE, NEVADA

FEBRUARY 26, 2021

PREPARED FOR:
INCLINE VILLAGE G.I.D. PUBLIC WORKS
ATTN: NATHAN CHOREY
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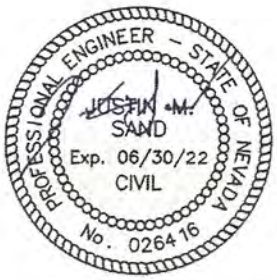

2/26/21

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Table of Contents

Appendices

Introduction

In September 2020, Lumos & Associates performed an evaluation of the Mountain Golf Course cart path. This evaluation serves to summarize the overall existing state of the Mountain Golf Course cart path, provide estimated quantities and costs for recommended repairs, and provide repair options to assist the Incline Village General Improvement District (IVGID) in budgeting and planning efforts for cart path pavement management. A geotechnical investigation and a structural evaluation of the four cart path bridges were also completed to supplement this pavement evaluation. Bridge evaluations and repair recommendations are included in a separate report titled "Incline Village Mountain Golf Course Pathway Bridges Structural Evaluation Report." Findings from the "Geotechnical Investigation Report," dated September 2020, were used to provide information on the underlying base and subgrade conditions necessary to identify the likely causes of distresses and recommend the appropriate repairs for each area.

Our evaluation of the cart path system under this report covers the following: existing asphalt pavement distresses, previous surface treatments, golf cart ride quality, drainage facilities, Best Management Practice (BMP) evaluation, impacts from tree roots, slope failure, irrigation issues, access restrictions, asphalt concrete curbing, and recommended repairs. The Cart Path Stationing Map, included as Appendix A, provides a layout of the cart path stationing referenced throughout this report for estimating quantities and delineating problem areas. Stationing is approximate based on GIS information provided from IVGID and should not be relied upon for actual construction quantities without prior verification. Photos of specific distress areas with stationing and estimated costs are provided for a quick reference in the Appendices as a way for IVGID to group repairs together or form its own phased rehabilitation plan if desired. This also provides a way to track these areas of concern over time.

The ASTM D6433 – Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys was referenced in effort to standardize asphalt distress categories and descriptions. General pavement information has been provided to give understanding of proper maintenance techniques and reference for recommendations offered later in this report. Each area of concern is accompanied by a recommended rehabilitation technique and cost estimate. Distresses are classified as either high, medium or low severity based on the immediacy recommended for the repairs.

The Lake Tahoe region is susceptible to extreme weathering events. Weathering of the cart path and surrounding slopes will continue to contribute to the severity of the issues outlined in this report. The timeframe associated with the distresses should be re-evaluated on a yearly basis. Engineering judgement was used to rank the severity of the cart path distresses, drainage, and erosion issues and to provide recommendations in terms of priority. Appendix B – Severity Map contains an overview of the severity level of the distresses found in the cart path.

Though there is not a standard width specified for cart paths, the Golf Course Superintendents Association of America (GCSAA) indicates the typical design width of asphalt or concrete cart paths is 7.5 to 8-feet wide. Using this as a guideline, width measurements were taken where the path appeared to be narrower than 7.5 feet based on visual inspection. Several areas of the cart path were found to be constricted to less than 7.5 feet. These areas are depicted in Appendix F. In some circumstances, this can be attributed to grass overgrowth and edge cracking. It is important to note that the total surface coverage should not be increased without permit approval from Tahoe Regional Planning Agency (TRPA) based on coverage requirements. It is our understanding that a land coverage assessment has already been completed by TRPA for this site. Additional proposed coverage will need to be within the allowable coverage form the respective land capability district. In the event that no additional coverage is allowed with in a particular district, coverage would need to be offset

by reducing the area of impervious coverage elsewhere as approved by TRPA. The original cart path design width and relevant coverage information should be verified prior to any pavement widening for coverage accounting purposes. BMPs have also been recommended in this report per the TRPA BMP Handbook.

Asphalt Pavement Background Information

Based on data compiled by the American Society of Golf Course Architects (ASGCA) the expected life cycle of asphalt concrete cart paths is 5-10 years (or longer) assuming on-going maintenance beginning 1-2 years after installation. Asphalt concrete (AC) roadways, on the other hand, generally have a design life of 25 years as they are typically constructed with more durable materials and subject to more stringent materials testing and installation requirements than recreational paths. The pavement's design life will be dependent on quality of construction materials, methods, and long-term maintenance. An aggregate base must be used under the AC to prolong the cart path's service life. If the network is properly maintained, an entity can extend the service life of the cart path well beyond the original design life. Conversely, if regular maintenance is ignored, the pavement is likely to fail prematurely and the costs to repair the cart path will increase significantly. The goal of pavement management is to continually maintain the cart path and delay the increased cost of complete cart path reconstruction once it has failed.

Figure 1 below illustrates a typical asphalt performance curve (red) and typical application of asphalt pavement Maintenance and Rehabilitation (M&R) phases. The figure illustrates that as pavement ages and/or deteriorates, the cost to reconstruct the cart path substantially increases.

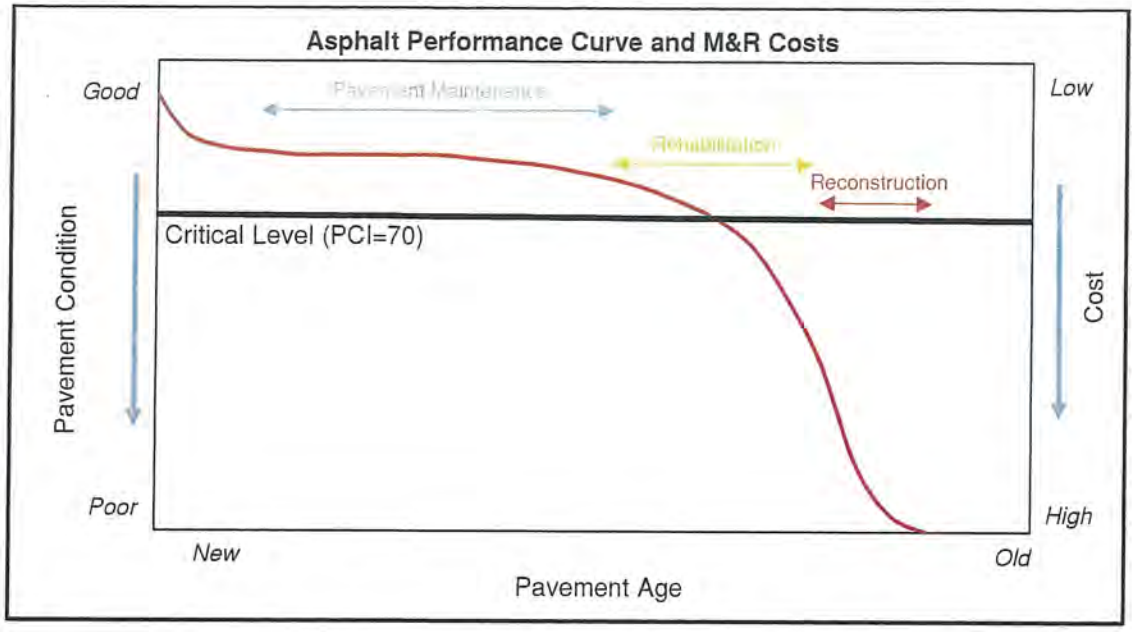


Figure 1: Asphalt Performance Curve and M&R Costs

Selecting the correct type of treatment and rehabilitation technique is imperative to increasing the service life of the cart path. The factors considered when determining these techniques includes types of pavement distress, age, condition, traffic levels, and available funding. Although the scope of this pavement evaluation does not involve an FHWA pavement condition index (PCI) evaluation, most of the recommended repair areas in this report appear to fall below the critical PCI level of 70. However, pavement age is a necessary component to determine pavement PCI level. The cart path has various pavement vintages which were not available for preparation of this report.

Description of Asphalt Pavement Distresses & Repair Methods

Asphalt pavement distresses noted in this evaluation were evaluated with reference to distress descriptions found in ASTM D6433. However, considerations were taken into account for the intended use of the cart path and relative to the overall conditions of the site. The prevalent distresses found

throughout the asphalt cart path include fatigue cracking, edge cracking, longitudinal cracking, transverse cracking, and raveling. Descriptions of each of these distresses are provided below.

Pavement Distresses

Fatigue cracking occurs in areas subjected to repeated traffic loadings that appear as a series of interconnected cracks, with a characteristic alligator pattern or chicken wire appearance. Cracking begins at the bottom of the pavement section and propagates to the surface.

Edge cracking typically occurs to pavements with unpaved shoulders. Edge cracking can also occur adjacent to paved joints due to poor compaction or water infiltration. Cracks run parallel to the outer edge of the pavement and the asphalt pavement can break up.

Longitudinal cracks run parallel to the centerline of the path and are caused by poor construction of joints or shrinkage of the pavement surface as a result of low temperatures, asphalt hardening, and/or daily temperature cycling.

Transverse cracks are predominately perpendicular to the pavement centerline and are caused by shrinkage of pavement surface as a result of low temperatures, asphalt hardening, and/or daily temperature cycling.

Raveling is the wearing away of the pavement surface caused by dislodging of aggregate particles and the loss of asphalt binder. This can be caused by hardened binder, a poor-quality mix, or softened surface due to oil spillage.

Pavement Repair Methods

Repair methods commonly used for the above distress types include crack sealing, shouldering, full-depth pavement patching, pavement reconstruction, and tree root cutting with pavement reconstruction. Descriptions of each repair method are as follows.

Crack seal is a flexible, polymer-modified, rubberized asphalt blend that adheres to the edges of existing cracks and fills in the voids. When dried, crack seal provides a barrier that prevents water from intruding and impacting the subbase. Crack seal is a long-term, cost effective way to maintain and extend the life of the pavement. Sealing minor cracking may extend the useful pavement life for several years.

Shouldering adds crushed rock along the edges of the cart path in order to protect against edge cracking, erosion, and provides a higher level of safety to cart path users. Shouldering is typically done at a two-foot width. However, one-foot width of shouldering is recommended where two feet cannot be maintained. Shouldering is recommended for all new or replaced asphalt pavement. In order to maintain path aesthetics consistent with the rest of the golf course cart path, the aggregate should could be left at the same level as the aggregate base to allow for three to four inches of topsoil and grass to grow up to the edge of the cart path. This would minimize the potential for saturation of the subgrade and provide structural support for the edge of pavement. Note that vegetation along the edge of the path allows a potential for rutting and/or erosion from surface drainage along the path. NDOT Standard Specifications for Road and Bridge Construction provide a description and specification for shouldering materials under Section 704.03.09.

Pulverization-in-place is a pavement rehabilitation method that consists of pulverizing and grinding together the distressed layer of existing asphalt pavement and a portion of the underlying base. The pulverized material is mixed together, graded, and compacted, creating a strengthened base layer

for new asphalt pavement. Pulverizing and grinding the existing asphalt in place reduces the amount of haul by reusing the existing materials. One potential drawback of this method is that the finished surface of the pavement will be slightly higher than the existing pavement surface due to the increased amount of base material under the asphalt. The raised pavement edge could create difficultly for golf carts entering and exiting the cart path unless additional grading is performed along the sides of the path. Raising the cart path may also impact drainage patterns on the site and may create unintended concentrated flows or puddles along the sides of the path if not properly graded to drain.

Cold-in-place recycling (CIR) involves grinding off the asphalt layer, crushing and screening the material to a specific size, mixing it with an asphalt recycling agent, and re-paving a "new" asphalt surface using the recycled material. This entire operation occurs on site with a "train" of vehicles and large equipment, which would likely have difficulty accessing the site, following sharp turns along the path, and staying on the path in narrow areas. This method may not be feasible due to access restrictions and the equipment required. In our opinion, the required equipment (Water Truck, Milling Machine, Recycling Unit, and Emulsion Tanker) is too large to be utilized in this application without significant negative impacts to the surrounding improvements.

Pavement Reconstruction should be used when the existing pavement section needs to be replaced. The entire pavement section is typically removed by pulverizing the entire depth of pavement, base, and subgrade if compromised, unsuitable, or if additional pavement thickness is necessary. If the damage appears to be due to conditions of the underlying soils, the unsuitable soils are removed from the site and structural material is installed prior to placement of the base and new asphalt. This process may utilize either new or recycled material incorporated into the build materials, which are then used for the reconstruction of the complete pavement section.

Tree root cutting with pavement reconstruction is recommended in instances where pavement failure caused by tree roots can be remediated by cutting the tree roots and adding root barriers along the cart path, or by building up the grade of the path over the tree root at the pavement failure location. An arborist should be consulted prior to cutting tree roots to ensure tree health and stability are not compromised. Increasing the depth of soil and/or depth of the pavement base will require additional path grading and pavement reconstruction to accommodate the new pavement elevation above the tree roots. Costs associated with tree root cutting and tree preservation are estimated for budgetary purposes but may vary greatly on a case by case basis due to the amount of fill and grading required.

Existing Condition Evaluation

Approach and General Assessment

A visual inspection of the Mountain Golf Course cart path system was performed in early September 2020. A significant portion of this cart path system appears to be nearing, or has surpassed, its useful life. Several portions of the cart path have undergone maintenance in multiple phases over recent years. Maintenance efforts have included full depth pavement patching, surface paving, and crack-sealing. Some of these recently maintained areas are also failing due to tree root uplift or subgrade issues.

For the purpose of this evaluation and budgetary planning, distresses are categorized as either high, medium, or low severity. High severity distresses are those which have a significant impact on ride quality, safety, or erosion. We recommend that high severity distresses are repaired within one to two years. Medium severity distresses are not as critical and could be deferred 2-5 years if funds are not available to make the repairs. Low severity distresses are those areas where maintenance can be deferred longer without much impact on ride quality, safety, or erosion. Knowing that these distresses will worsen over time due to weather, age, and usage, we recommend monitoring these periodically and scheduling them for repairs over the next 5 to 10 years. Distresses are categorized based on the condition which they existed on the date of inspection in September 2020 and should be reevaluated annually.

Pavement Condition

The most prevalent distresses along the path are fatigue cracking and edge cracking. In several areas, it appears that golf course irrigation is resulting in ponding on the cart path and saturation of the path's base and subgrade in areas where the adjacent grade does not slope away from the path to allow for positive drainage. Subgrade saturation along the edges of the path is contributing to

increased edge cracking. As recommended in the September 2020 Geotechnical Investigation by Lumos & Associates, a Type 2 aggregate base course would improve this situation by allowing water to drain down into the soils, away from the paved surface. In areas where ponding occurs on the cart path, raising the pavement surface to promote positive drainage is recommended.

A lack of pavement base material also expedites fatigue cracking due to a lack of structural support underneath the flexible pavement surface. Surface pavement patching is not recommended for areas experiencing fatigue and edge cracking unless there is evidence of sufficient base material. Based on the geotechnical investigation, it was found that most of the cart path had insufficient or non-existent base. As a result, full-depth pavement reconstruction or pulverization-in-place has been recommended in most areas as a long-term solution. Recent pavement repairs on the path have included approximately 6 inches of aggregate base underneath the new asphalt pavement.

See Appendix C – Pavement Distress Evaluation for photo records of pavement distresses as described above. A ride quality rating has been included for each distress area in this appendix to further document the extent of the severity of the pavement distress and help prioritize recommendations for cart path improvements.

Slope Failure / Drainage Concerns

Slope failure and drainage problems were also discovered during this evaluation at multiple locations along the cart path as evidenced by sediment eroding down the cart path side slopes. In several cases, the adjacent slope appears to be too steep for the soil conditions or experiencing erosion due to heavy runoff. Retaining walls have been recommended along portions of the cart path that contain steep slopes adjacent to the cart path. Slope concerns and drainage issues have been photo documented in Appendix D – Slope Failure/Drainage Concerns.

There are existing rockery walls that require repair or replacement, as well as areas where new retaining walls are recommended. Adding retaining walls to these areas will help reduce the slope

beside the cart path to minimize risk of slope failure and erosion during storm events. Installation of drainage rock and edge drain behind retaining walls will reduce lateral pressure and earth swelling from saturation behind the wall, which often leads to failure of retaining walls. For estimating purposes, a stacked block wall was assumed for all recommended retaining walls and wall repairs.

Several sections of cart path are adjacent to tall, steep slopes with evidence of falling debris and boulders. Timber debris guards are recommended for these areas of concern.

Unsupported edges are a common cause of edge cracking that was identified throughout the cart path system. This is most prevalent in areas where there is a steep slope along the edge of the path with no shoulder. In these areas, aggregate shoulder is recommended.

Wood fencing is recommended as a vehicle barrier and safety measure in several areas to keep carts on the path and reduce rutting and slope erosion. These locations are catalogued in Appendix D.

Maintenance Vehicle Impacts

It is our understanding that small maintenance equipment and vehicles occasionally drive the cart path as necessary to perform work throughout the golf course. Most of the cart path consist of approximately three inches of asphalt on existing grade, with no engineered based for structural support. Portions of the path are also less than eight feet in width, which forces wheels from maintenance vehicles to ride on the unsupported pavement edge, or off the path in some areas.

Heavy loads over the cart path in areas without aggregate base will tend to expedite fatigue cracking and edge cracking in the cart path pavement, which is evidenced by many of the distresses documented in this report. When vehicles drive off the edge of pavement with no aggregate shoulder, rutting is caused along the path. This rutting further compromises the unsupported edge of pavement and can cause erosion issues along slopes.

The recommended pavement section consisting of three inches of asphalt over four inches of aggregate base would be sufficient for the occasional light maintenance vehicle. However, we

recommend ensuring that all maintenance vehicle routes have a minimum width of eight feet to reduce potential for edge cracking and rutting. If maintenance vehicles continually travel over the same segments of cart path, a 4-inch asphalt over 6-inch aggregate base pavement section is recommended to prolong the life of the cart path in these areas. Collateral damage to the existing pavement also applies to construction operations that take place during reparation or reconstruction of the cart path.

BMP Implementation

BMPs are required by TRPA on all developments in the Tahoe basin for the management and control of stormwater runoff and should be used wherever applicable. The Mountain Golf Course property is currently in BMP compliance per TRPA Certificate of Completion #18846. BMP maintenance recommendations for the site are provided by TRPA on this certificate. BMPs should be implemented for all proposed work on the site. General guidance for implementation of BMPs can be found in the TRPA BMP Handbook provided at www.trpa.org. In addition to the items listed on the Certificate of Completion for the site, the following BMPs are recommended as identified in this report and as needed during construction:

Soil and Vegetation Restoration should be used whenever soils are disturbed or compacted. The topsoil's organic matter is difficult to replace. Restoration provides disturbed areas with a stable soil structure, healthy vegetation, and protects against erosion.

Slope Stabilization is recommended in areas that are displaying soil erosion on slopes adjacent to the cart path. Vegetated slope stabilization, retaining walls, riprap, and slope shaping are effective methods for protecting steep slopes against erosion.

Infiltration Trenches can be used to promote storm water infiltration down into the soil where it leaves a paved surface. These are encouraged along parking lot areas where sheet runoff volumes are greatest.

Vehicle Barriers are an effective BMP to protect natural or vegetated areas from disturbance and erosion. An added benefit for vehicle barriers is that they can be used along the path where there are dangerously steep side slopes.

Rip Rap is recommended as a slope stabilization BMP where steep slopes are showing signs of erosion.

Improvement Alternatives

Fully reconstructed asphalt pavement with proper design, construction, and maintenance, can be expected to reach a 25-year design life. However, environmental factors, excessive loads, and improper drainage can shorten the expected design life. Pavement maintenance and repair activities requiring heavy equipment and vehicles are likely to exacerbate the existing pavement distresses since it was not designed or constructed for such loads. As such, impacts to the existing cart path system must be considered during project design and sequencing. Full reconstruction of the path system would minimize this concern by incorporating a pavement section that would support loads from trucks and heavy equipment. If complete reconstruction of the cart path system is desired, a phased approach is recommended in order to keep the golf course operational during construction.

Improvement Alternative #1 – Spot Repair

One phasing alternative would be to take a phased approach to pavement maintenance. The most distressed areas would be treated first before moving to the less distressed areas. This treatment approach would allow IVGID to spread the construction cost over a longer period of time.

A summary of pavement distresses and estimated construction costs to complete the spot repairs that have been identified under Improvement Alternative #1 are provided in the table below:

Recommendation	Severity Level		
	High	Medium	Low
Pavement Reconstruction	$290,370	$305,800	-
Block Retaining Wall	$54,750	-	-
Timber Barricade	-	-	$13,500
Rip rap	-	-	$60,000
Shouldering (1' width)	$900	$1,220	$610
Wood Fencing	-	-	$4,375
AC Curb Cuts	$750	-	-
Infiltration Trench	$360	$5,220	$4,680
Circulation Improvements	-	-	$141,060
Total	**$347,130**	**$312,240**	**$224,225**

Table 1: Total Estimated Costs

See Table 3 under the Conclusion section of this report for a breakdown of these costs over a 10-year period. Path circulation improvements, identified in this report would be in addition to these costs.

Improvement Alternative #2 – Full Cart Path Replacement

Improvement Alternative #2 alternative considers full path reconstruction of 14,440 linear feet of cart path as well as miscellaneous BMPs and circulation improvements phased over a period of 2 or

3 years. We anticipate that a pulverization-in-place and repave method would minimize haul-off of the existing pavement material and be a cost-effective option, which provides economy of scale benefits for construction quantities as opposed to performing spot repairs as identified under Alternative #1.

Under this alternative, the total estimated cost for complete pavement replacement, miscellaneous slope stabilization, BMPs, and drainage issues over the course of the project is estimated at approximately $877,600, including engineering and survey costs. See Table 4 under the Conclusions section of this report for a breakdown of these costs over a three year period. Path circulation improvements, as identified below, would be in addition to these costs.

Circulation Improvements

During initial coordination meetings, it was discussed that Mountain Golf Course staff would like to explore options for relocating the cart path in five locations to help improve circulation. The five areas for circulation improvements were analyzed and are depicted in Appendix E – Circulation Problem Areas and are summarized below.

Hole #2 – Realign path behind Green #2 to Tee-Box #3

The existing cart path currently cuts in front of Tee-Box #3, requiring two-way traffic for riders approaching and leaving the tee-box. This creates a congestion point on the one-lane path. Work involved to realign the cart bath behind Green #2 and behind Tee-Box #3 would require approximately 150 linear feet of pavement removal and 150 linear feet of new asphalt cart path. The estimated cost for this work is approximately $33,600.

Hole #9 – Widen path to 10 feet between Green #9 and Green #18 for reduced congestion

There is an existing congestion point where riders approach the greens for Hole #9 and Hole #18 park along both sides of the path, blocking the path for through traffic. Staff recommended widening the cart path in this area to 10 feet. Work involved to widen the cart path would require approximately 320 square feet of new asphalt cart path. The estimated cost for this work is approximately $5,760.

Hole #8-9 – Realign path to create one-way loop at #8 Green/#9 Tee

The existing layout of the cart path loop Tee-Box #9 creates a congestion area with two-way traffic. The proposed realignment of the path at this location would eliminate two-way traffic by creating a one-way loop as shown in Figure 6.0 of Appendix E. This would involve removal of approximately 1,630 square feet of existing asphalt and approximately 1,350 square feet of new asphalt pavement for a net decrease in impervious area of 280 square feet. The estimated cost for this work is approximately $54,775.

Hole #11 – Shift path to straighten road crossing to Hole #12

The road crossing from Hole #11 to Hole #12 is offset by approximately 85 feet, requiring riders to drive along the shoulder of the road to arrive at Tee-Box #12. This presents a safety concern for golf cart riders driving alongside traffic. In order to straighten this crossing perpendicular to the road, approximately 85 feet of cart path would need to be constructed, along with a significant cut into the bank and associated grading. Note that this work would require clearing and grubbing and may impact the integrity of nearby tree roots. The estimated cost for this path realignment is approximately $36,125.

Hole #15 – New turn-out w/ curb at green

A new turn-out at the green for Hole #15 would allow riders to keep their carts on the pavement, while providing enough space to maintain through traffic. Keeping carts on the cart path reduces potential for soil erosion and maintenance needs. This new turn-out would require approximately 200 square feet of new pavement, along with 20 feet of asphalt curbing, which is estimated at $4,000.

Hole #17 – Replace perpendicular turn-out with parallel turn-out

The existing perpendicular turnout at Green #17 requires riders to back out to continue on to the next tee. The layout would be more efficient as a parallel turn-out. Reconfiguration of this turn-out would require approximately 320 square feet of pavement removal and 200 square feet of new asphalt pavement. The estimated total for this work is $6,800.

Quantities for pavement removal and replacement are approximate and are based on a combination of field measurements and aerial imagery. A TRPA coverage analysis of these areas is recommended prior to moving forward with these circulation improvements. A summary of the costs for these improvements is provided in the table below.

Circulation Improvements				
Location	**Pavement Removal (SF)**	**New AC Pavement (SF)**	**Description**	**Estimated Cost**
Hole #2	1,200	1,200	Realign path behind Green #2 to Tee-Box #3	$33,600
Hole #9 (Green)	0	320	Widen path to 10 feet reduced congestion	$5,760
Hole #9 (Tee)	1,630	1,350	Create one-way loop	$54,775
Hole #11	335	1,150	Shift path to straighten road crossing to Hole #12	$36,125
Hole #15	0	200	New turn-out w/ curb at green	$4,000
Hole #17	320	200	Replace perpendicular turn-out with parallel turn-out	$6,800
			TOTAL:	**$141,060**

Table 2: Circulation Improvements Table

Conclusion

To address the deteriorating pavement Lumos and Associates has identified two improvement alternatives.

Improvement Alternative #1 would take a phased approach to treat the most distressed areas first before moving on to the less distressed areas. As documented in this report, roughly 22% of the 14,759 total feet of cart path has distresses categorized as high severity, 23% is categorized as medium level severity distresses, and 5% falls under the category of low severity. The remaining 50% of the cart path was either in fair condition or contained minor distresses that did not meet the threshold for documentation as a low severity distress. However, the remaining 50% of the cart path should continually be evaluated for distresses that may worsen or prevail over time. It is expected that the uncategorized 50% will approach the end of its service life and require repairs or replacement within 10 years.

The categorization used in this report can be used to prioritize repairs and assist in maintenance budget planning over several years, or as budget allows. We recommend that high severity distresses are addressed within 1 to 2 years, medium severity distresses should be addressed within 5 years, and low severity distresses can be deferred approximately 5-10 years based upon September 2020 investigations. All distress areas should be monitored periodically for accelerated deterioration and worsening.

Severity levels were determined based on safety concerns, environmental impacts, ride quality, and overall impact on serviceability of the path. Photos and descriptions are provided for individual distress areas with an evaluation of the level of distress, ride quality, and safety concern for each. These are provided so that IVGID can take a closer look and reprioritize repairs based on any of these characteristics if necessary.

Cost estimates are provided for several cart path circulation improvements as reviewed on site with IVGID and Mountain Golf Course staff. Circulation improvements can improve functionality and safety of the cart path. However, we recommend prioritizing structural and pavement surface items before addressing circulation improvements, as funding allows. The total estimated repair costs and recommended repair periods for Alternative #1 are provided in the summary table below:

Summary of Recommended Repair Costs				
Severity	**Recommended Repair Period**	**Estimated Construction Cost**	**Est. Engineering, Survey & Permit Fees**	**Total by Phase**
High	2021 to 2023	$347,130	$40,700	$387,830
Medium	2023 to 2027	$312,240	$37,200	$349,440
Low	2027 to 2031	$224,225	$29,400	$253,625
	Totals:	**$883,595**	**$107,300**	**$990,895**

Table 3: Summary of Improvement Alternative #1 Repair Costs

Alternatively, Improvement Alternative #2 – Full Reconstruction, proposes a full path system reconstruction approach could be taken to maximize the service life of the reconstructed pavement. With this approach, construction phasing can be implemented so that portions of the golf course remain operational during construction. Phasing will be dependent on the budget available. It is recommended that IVGID evaluates the budget available and appropriates annual funds toward cart path repairs at the Mountain Golf Courses. Based on the annual funds available, a repair or reconstruction approach and scope of work will need to be determined. If the repair strategy is selected, we recommend following the repair schedule provided in this report or a variation of this based on the available budget. If a full cart path reconstruction approach is selected, IVGID can use the estimated unit prices provided in this report to determine phasing limits that are within the

available budget. Costs will fluctuate depending on the selected method for reconstruction and the quantities assigned to each contract.

If there is a desire to keep the golf course open during construction activities, phasing can be designed to focus the work over defined areas that will allow for continuous golf play. For example, the first phase may focus on the "Back 9" and the second phase may focus on the "Front 9." Once a scope of work and schedule is identified, construction drawings, specifications, bid schedule, and contract documents will need to be prepared for contractors to bid the work and begin construction. For estimation purposes, we have assumed a unit price of $4.50 per square foot for pulverization in-place and re-paving of three inches of asphalt pavement. The total path length is roughly 14,440 lineal feet by approximately eight feet wide, totaling 115,520 square feet. Mobilization costs are assumed at 10% and 5% is assumed for miscellaneous related work, such as tree root trimming and grading.

Engineering and surveying costs under Phase 1 would include 60% design for the entire path reconstruction, along with 100% design plans, permitting, and bid assistance for roughly one-third of the cart path reconstruction. No TRPA permitting is assumed under Phase 1. Phases 2 and 3 would include 100% design plans for each respective Phase, making up the remaining two-thirds of the cart path reconstruction and site improvements. Phases 2 and 3 would not require additional surveying, but would require TRPA permitting.

Permit fees are estimated around $7,000 per phase. As shown in the table below, the estimated construction costs for full path reconstruction, assuming an in-place pulverization method, as well as other miscellaneous improvements, is approximately $770,000 with roughly $108,000 of engineering, surveying, and permit fees.

Potential Phased Full Path Reconstruction Costs				
Length of Path (LF)	**Recommended Repair Period**	**Estimated Construction Cost**	**Est. Engineering, Surveying & Permit Fees**	**Total by Phase**
4,813	2021	$256,500	$69,100	$325,600
4,813	2022	$256,500	$19,500	$276,000
4,814	2023	$256,500	$19,500	$276,000
N/A	Misc. Repairs (Retaining walls, timber barricades, rip rap, shouldering, wood fencing, infiltration trench)	(Included Above)	(Included Above)	(Included Above)
	Total:	**$769,500**	**$108,100**	**$877,600**

Table 4: Summary of Improvement Alternative #2 Costs

The estimated engineering and survey fees above include the design of full path reconstruction, BMPs, and site circulation improvements. Permit fees through Washoe County are expected to be minimal. However, the extent and cost for TRPA permitting and coordination has not been determined and will be in addition to these fees.

Next Steps

It is our understanding that a target construction start date is around September or October of 2021. Upon request from IVGID, Lumos and Associated would be pleased to prepare a proposal including a scope of services for completion of final design, bid assistance, and construction services for the proposed improvements under the selected alternative. If IVGID elects to proceed with Lumos' proposed scope of services, the following steps would occur.

1. Topographic Survey
2. Design Drawings and Specifications
3. Preparation of Bid Documents
4. Permitting through TRPA & Washoe County
5. Publicly Advertise for Construction Bids
6. Evaluate Bids
7. Award Bid and Contractor's Issue Notice to Proceed
8. Construction Staking
9. Construction Assistance and Contract Administration
10. Materials testing and inspection (if requested)

Appendix A: Cart Path Stationing Map

LUMOS & ASSOCIATES

LUMOS & ASSOCIATES
209 N. CURRY ST., STE. 309
CARSON CITY, NV 89703
TEL: 775.883.7077
WWW.LUMOSINC.COM
MOUNTAIN GOLF COURSE
CART PATH EVALUATION
STATIONING MAP
EX-1
DRAWN BY: RJH
CHECKED BY: RJH
APPROVED BY: JS
JOB NO: 10164.000
HOLE 1
HOLE 2
HOLE 3
HOLE 4
HOLE 5
HOLE 6
HOLE 7
HOLE 8
HOLE 9
HOLE 10
HOLE 11
HOLE 12
HOLE 13
HOLE 14
HOLE 15
HOLE 16
HOLE 17
HOLE 18

Appendix B: Severity Map

LUMOS & ASSOCIATES

LUMOS & ASSOCIATES
SEVERITY LEVEL
LOW
MEDIUM
HIGH
NOT CATEGORIZED
MOUNTAIN GOLF COURSE
CART PATH EVALUATION
SEVERITY MAP
EX-1
HOLE 1
HOLE 2
HOLE 3
HOLE 4
HOLE 5
HOLE 6
HOLE 7
HOLE 8
HOLE 9
HOLE 10
HOLE 11
HOLE 12
HOLE 13
HOLE 14
HOLE 15
HOLE 16
HOLE 17
HOLE 18

Appendix C: Pavement Distress Evaluation

LUMOS & ASSOCIATES

LUMOS & ASSOCIATES

Station 0+50 – Station 1+25

Location

- Behind clubhouse

Pavement Distress

- High severity raveling

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 75-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 75-ft L x 8-ft W
- $9,000

LUMOS & ASSOCIATES

Station 1+25 – Station 2+50

Location

- Behind clubhouse

Pavement Distress

- High severity AC heaving at channel drain
- Medium severity raveling
- Medium severity transverse cracking
- Medium severity longitudinal cracking

Ride Quality

- Very Poor

Safety Concern

- Medium

Length of Distress

- 125-ft

Recommended Repair

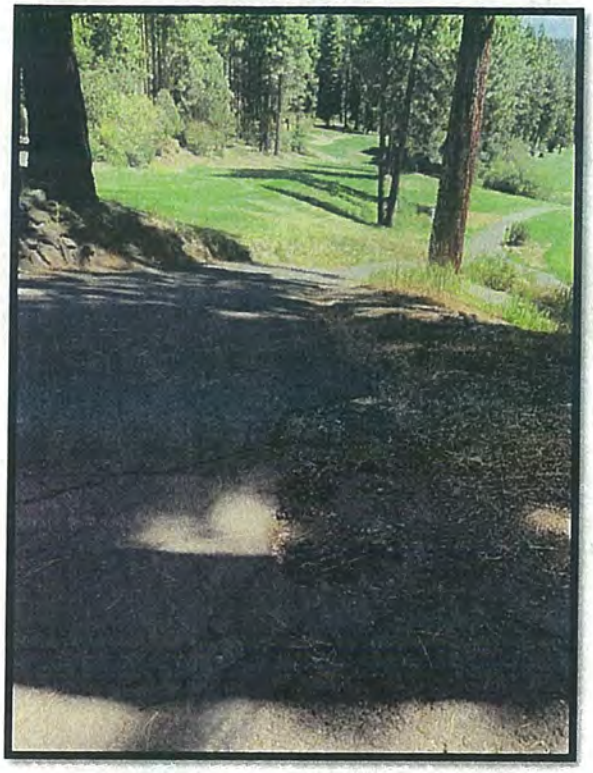
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 125-ft L x 8-ft W
- $15,000

LUMOS & ASSOCIATES

Station 1+25 – Station 2+50



Location

- Behind clubhouse

Pavement Distress

- High severity edge cracking

Ride Quality

- Poor

Safety Concern

- Medium

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 5+00 – Station 7+75

Location

- Hole 1

Pavement Distress

- High severity transverse cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 3-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 3-ft L x 8-ft W
- $360

Location

- Hole 1

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 10-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 10-ft L x 8-ft W
- $1,200

LUMOS & ASSOCIATES

Station 5+00 – Station 7+75

Location

- Hole 1

Pavement Distress

- High severity transverse cracking
- Low severity edge cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 3-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 3-ft L x 8-ft W
- $360

Location

- Hole 1

Pavement Distress

- High severity transverse cracking
- Medium severity depression

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 20-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 20-ft L x 8-ft W
- $2,400

LUMOS & ASSOCIATES

Station 5+00 – Station 7+75

Location

- Hole 1

Pavement Distress

- High severity transverse cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 5-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 8-ft W
- $600

LUMOS & ASSOCIATES

Station 8+50 – Station 9+50

Location

- Hole 1

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking
- Medium severity fatigue cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 100-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 100-ft L x 8-ft W
- $12,000

LUMOS & ASSOCIATES

Station 16+80 – Station 17+00

Location

- Intersection with Golfers Pass Rd (Hole 1 to Hole 2)

Pavement Distress

- High severity fatigue cracking
- High severity edge cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 20-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 20-ft L x 15-ft W
- $4,500

LUMOS & ASSOCIATES

Station 17+00 – Station 17+05

Location

- Intersection with Golfers Pass Rd (Hole 1 to Hole 2)

Pavement Distress

- High severity edge cracking
- High severity bump at road crossing

Ride Quality

- Very Poor

Safety Concern

- Medium

Length of Distress

- 5-ft

Recommended Repair

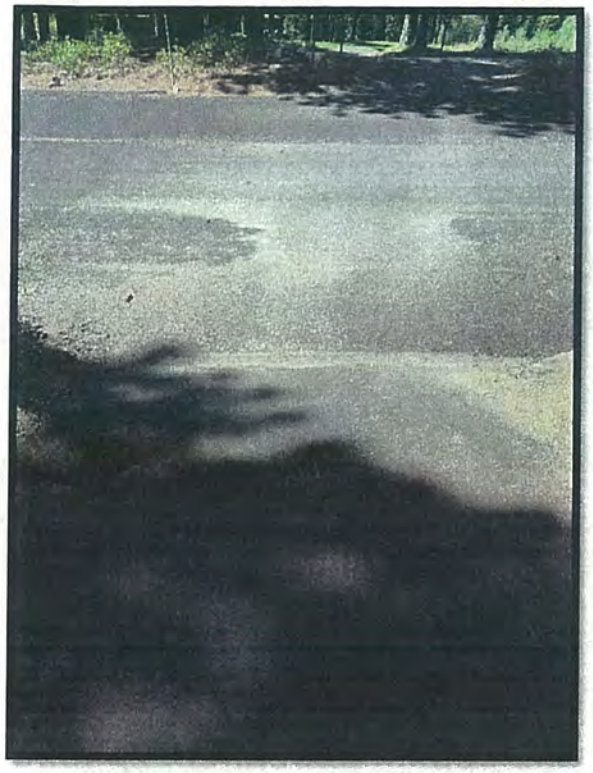
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 10-ft W
- $750

LUMOS & ASSOCIATES

Station 17+45 – Station 17+50



Location

- Intersection with Golfers Pass Rd (Hole 1 to Hole 2)

Pavement Distress

- High severity bump at road crossing

Ride Quality

- Very Poor

Safety Concern

- Medium

Length of Distress

- 5-ft

Recommended Repair

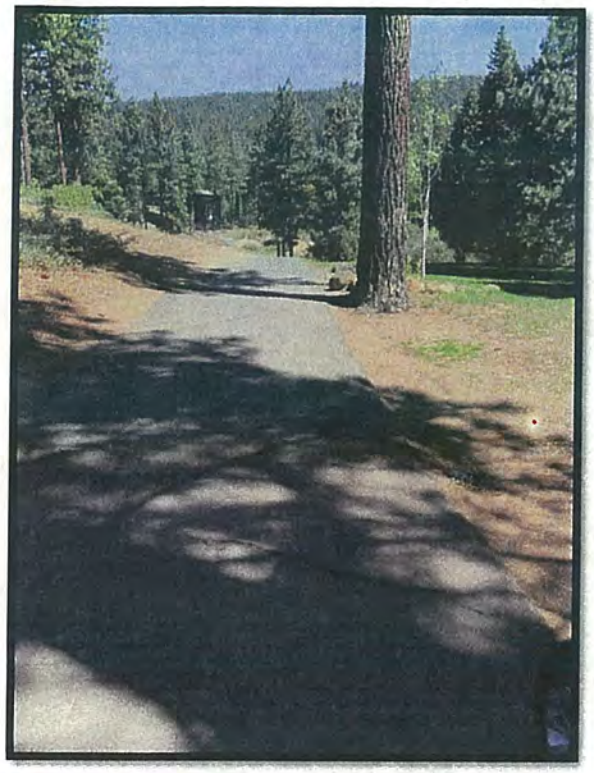
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 8-ft W
- $600

LUMOS & ASSOCIATES

Station 17+50 – Station 17+70



Location

- Hole 2 Tee

Pavement Distress

- Medium severity transverse cracking (caused by tree roots)

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 20 ft

Recommended Repair

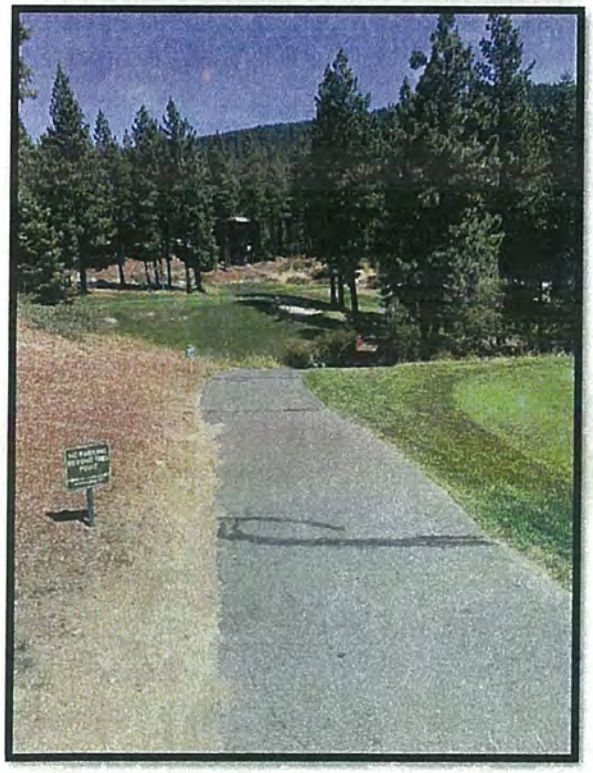
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 20-ft L x 8-ft W
- $2,400

LUMOS & ASSOCIATES

Station 18+00 – Station 19+00



Location

- Hole 2 Tee

Pavement Distress

- Medium severity transverse cracking
- Low severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 100-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 100-ft L x 8-ft W
- $12,000

LUMOS & ASSOCIATES

Station 22+00 – Station 22+25

Location

- Hole 2/3

Pavement Distress

- High severity transverse cracking

Ride Quality

- Very Poor

Safety Concern

- Low

Length of Distress

- 25-ft

Recommended Repair

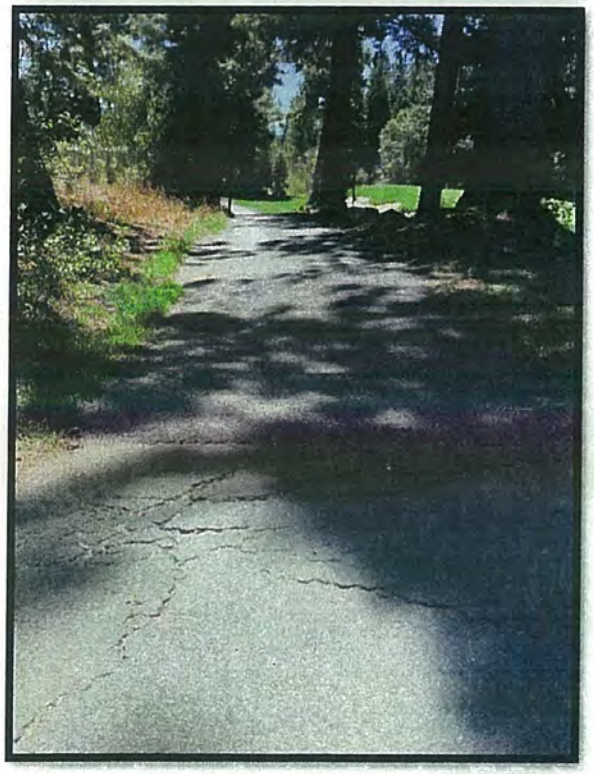
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 25-ft L x 8-ft W
- $3,000

LUMOS & ASSOCIATES

Station 24+15 – Station 24+55



Location

- Hole 3

Pavement Distress

- High severity transverse cracking
- High severity raveling

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 40-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 40-ft L x 8-ft W
- $4,800

LUMOS & ASSOCIATES

Station 24+60 – Station 25+10

Location

- Hole 3

Pavement Distress

- Medium severity fatigue cracking
- Medium severity transverse cracking
- Medium severity longitudinal cracking
- Medium severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 50 ft

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, downhill side)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 50-ft L x 8-ft W, 50-ft L x 1-ft W
- $6,000 + $50 = $6,050

LUMOS & ASSOCIATES

Station 25+50 – Station 27+10

Location

- Hole 3

Pavement Distress

- High severity transverse cracking
- Medium severity raveling

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 160-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 160-ft L x 8-ft W
- $19,200

Station 25+50 – Station 27+10

Location
- Hole 3

Pavement Distress
- High severity transverse cracking
- High severity edge cracking

Ride Quality
- Very poor

Safety Concern
- Low

Length of Distress
- See above

Recommended Repair
- Pavement Reconstruction

Estimated Cost
- See above

Location
- Hole 3/4

Pavement Distress
- Medium severity transverse cracking

Ride Quality
- Mediocre

Safety Concern
- Low

Length of Distress
- See above

Recommended Repair
- Pavement Reconstruction

Estimated Cost
- See above

LUMOS & ASSOCIATES

Station 27+10 – Station 27+90

Location
- Hole 3/4

Pavement Distress
- High severity raveling

Ride Quality
- Mediocre

Safety Concern
- Low

Length of Distress
- 80-ft

Recommended Repair
- Pavement Reconstruction

Estimated Cost
- Unit Price - $15 / SF
- 20-ft L x 20-ft W + 60-ft L x 8-ft W
- $13,200

Location
- Hole 4

Pavement Distress
- High severity transverse cracking (caused by tree roots)

Ride Quality
- Poor

Safety Concern
- Low

Length of Distress
- See above

Recommended Repair
- Pavement Reconstruction

Estimated Cost
- See above

LUMOS & ASSOCIATES

Station 28+75 – Station 33+00

Location

- Hole 4

Pavement Distress

- High severity edge cracking
- Medium severity transverse cracking

Ride Quality

- N/A

Safety Concern

- Medium

Length of Distress

- 425-ft

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, both sides)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 425-ft L x 8-ft W, 850-ft L x 1-ft W
- $51,000 + $850 = $51,850

Station 28+75 – Station 33+00

Location

- Hole 4

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Medium

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, both sides)

Estimated Cost

- See above

Station 28+75 – Station 33+00

Location

- Hole 4

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Medium

Length of Distress

- See above

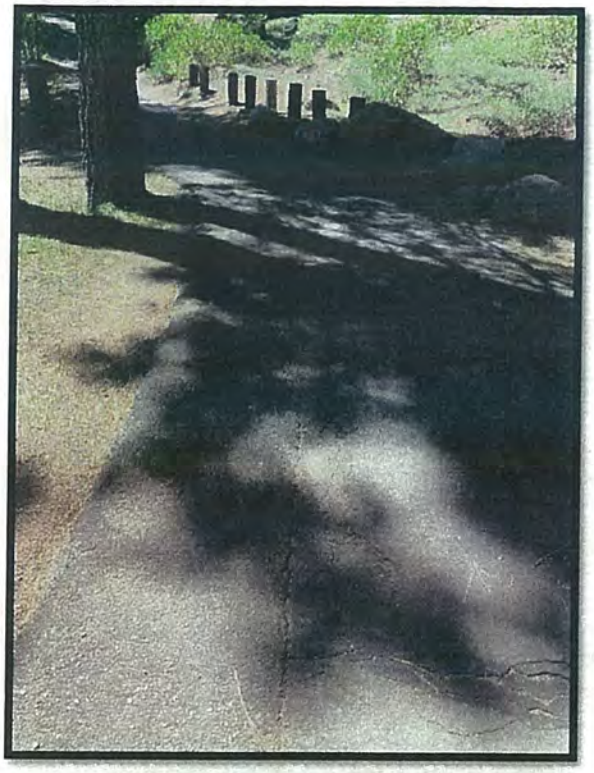
Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, both sides)

Estimated Cost

- See above

Station 28+75 – Station 33+00



Location

- Hole 4

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Medium

Length of Distress

- See above

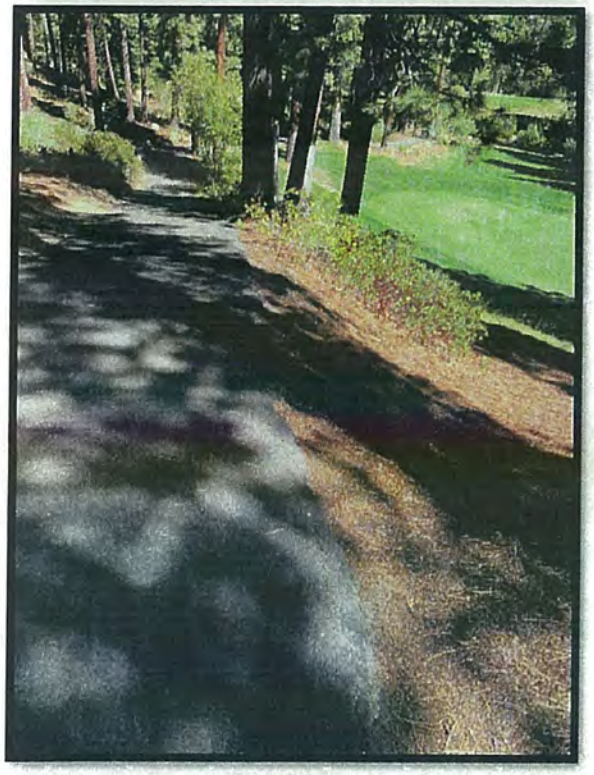
Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, both sides)

Estimated Cost

- See above

Station 28+75 – Station 33+00



Location

- Hole 4

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Medium

Length of Distress

- See above

Recommended Repair

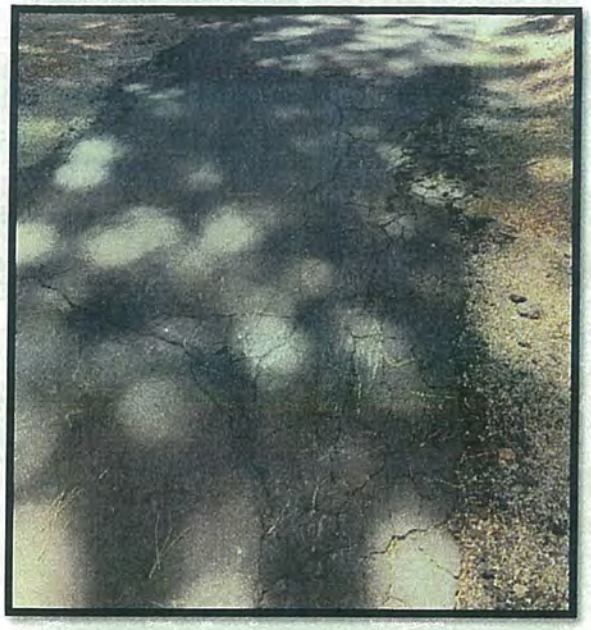
- Pavement Reconstruction
- Shouldering (1-ft width, both sides)

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 33+00 – Station 33+25



Location

- Hole 4/5

Pavement Distress

- High severity edge cracking
- High severity fatigue cracking
- Medium severity transverse cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 25-ft

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, both sides of path)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 25-ft L x 8-ft W, 50-ft L x 1-ft W
- $3,000 + $50 = $3,050

Station 33+25 – Station 35+00

Location

- Hole 5

Pavement Distress

- High severity edge cracking
- Medium severity transverse cracking (caused by tree roots)

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 175-ft

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, both sides of path)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 175-ft L x 8-ft W, 350-ft L x 1-ft W
- $21,000 + $350 = $21,350

LUMOS & ASSOCIATES

Station 37+00 – Station 37+25

Location

- Hole 5

Pavement Distress

- High severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 25-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 25-ft L x 8-ft W
- $3,000

LUMOS & ASSOCIATES

Station 46+40 – Station 46+90

Location

- Intersection with Golfers Pass Rd (Hole 5 to Hole 6)

Pavement Distress

- Bump at road crossing (each side)

Ride Quality

- Very poor

Safety Concern

- Medium

Length of Distress

- 5-ft x 2 (each side of road)

Recommended Repair

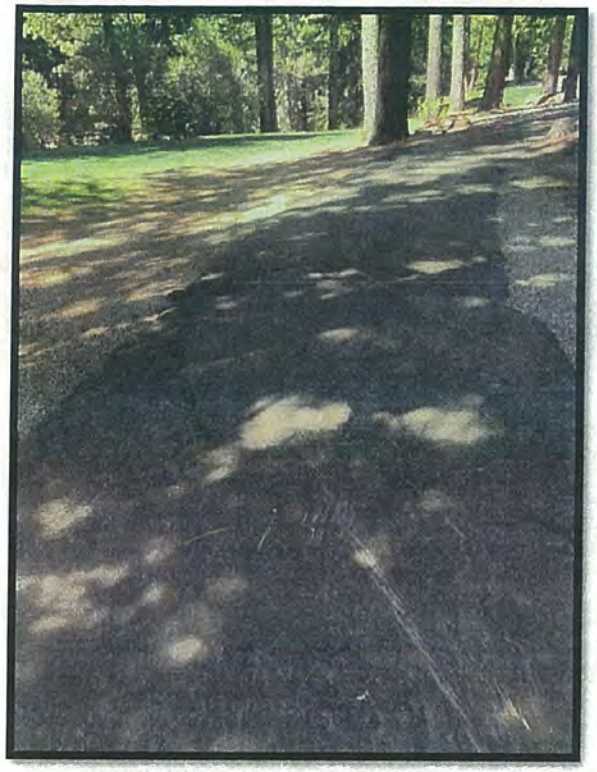
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 8-ft W (x2)
- $1,200

LUMOS & ASSOCIATES

Station 47+20 – Station 47+30



Location

- Hole 6 Tee

Pavement Distress

- High severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 10-ft

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width, one side)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 10-ft L x 8-ft W, 10-ft L x 1-ft W
- $1,200 + $10 = $1,210

LUMOS & ASSOCIATES

Station 50+25 – Station 50+50

Location

- Hole 6

Pavement Distress

- Medium severity transverse cracking
- Medium severity fatigue cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 25-ft

Recommended Repair

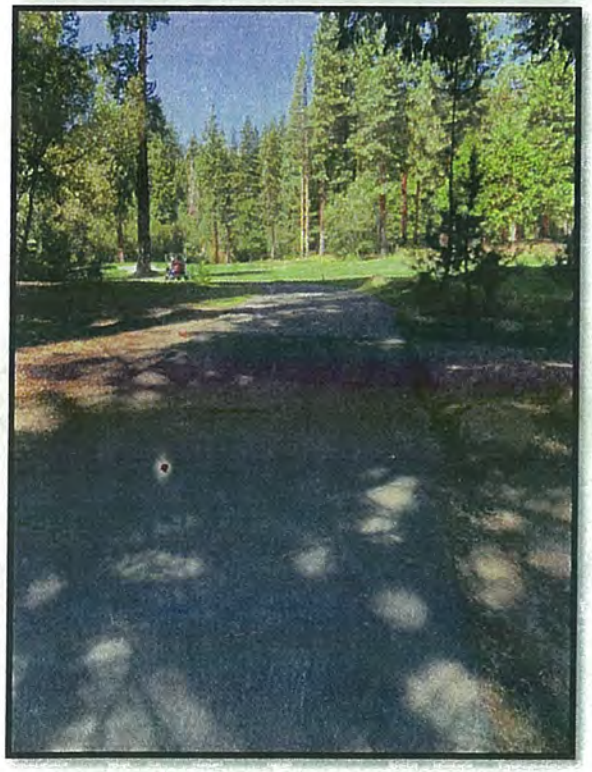
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 25-ft L x 8-ft W
- $3,000

LUMOS & ASSOCIATES

Station 52+00 – Station 52+60



Location

- Hole 7

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Low

Length of Distress

- 60-ft

Recommended Repair

- Shouldering (1-ft width, eastern side)

Estimated Cost

- Unit Price - $1 / LF
- 60-ft L x 1-ft W
- $60

LUMOS & ASSOCIATES

Station 52+60 – Station 53+10

Location

- Hole 7

Pavement Distress

- Medium severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 50-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 50-ft L x 8-ft W
- $6,000

Station 53+50 – Station 58+65

Location

- Hole 7

Pavement Distress

- High severity fatigue cracking
- Medium severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 515-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 515-ft L x 8-ft W
- $61,200

Station 53+50 – Station 58+65

Location

- Hole 7

Pavement Distress

- High severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 53+50 – Station 58+65

Location

- Hole 7

Pavement Distress

- Medium severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 53+50 – Station 58+65

Location

- Hole 7

Pavement Distress

- High severity transverse cracking (caused by tree roots)

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 59+00 – Station 66+30

Location

- Hole 8

Pavement Distress

- High severity transverse cracking
- Medium severity fatigue cracking
- Low severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 10-ft

Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- Unit Price - $15 / SF
- 730-ft L x 8-ft W
- $87,600

Station 59+00 – Station 66+30

Location

- Hole 8

Pavement Distress

- High severity transverse cracking
- High severity depression
- Medium severity raveling
- Low severity edge cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- See above

Station 59+00 – Station 66+30

Location

- Hole 8

Pavement Distress

- High severity raveling
- High severity transverse cracking
- High severity fatigue cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- See above

Station 59+00 – Station 66+30

Location

- Hole 8

Pavement Distress

- High severity transverse cracking
- Medium severity fatigue cracking
- High severity raveling

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- See above

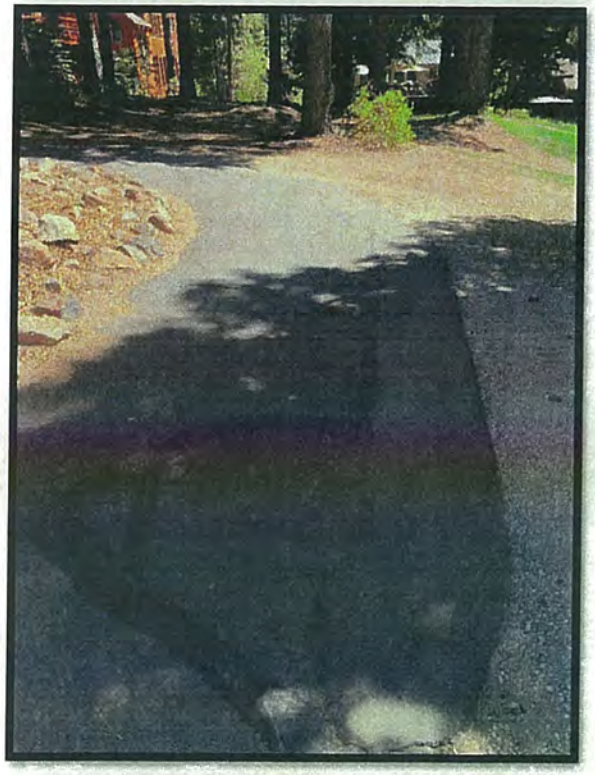
Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- See above

Station 59+00 – Station 66+30



Location

- Hole 8

Pavement Distress

- High severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- See above

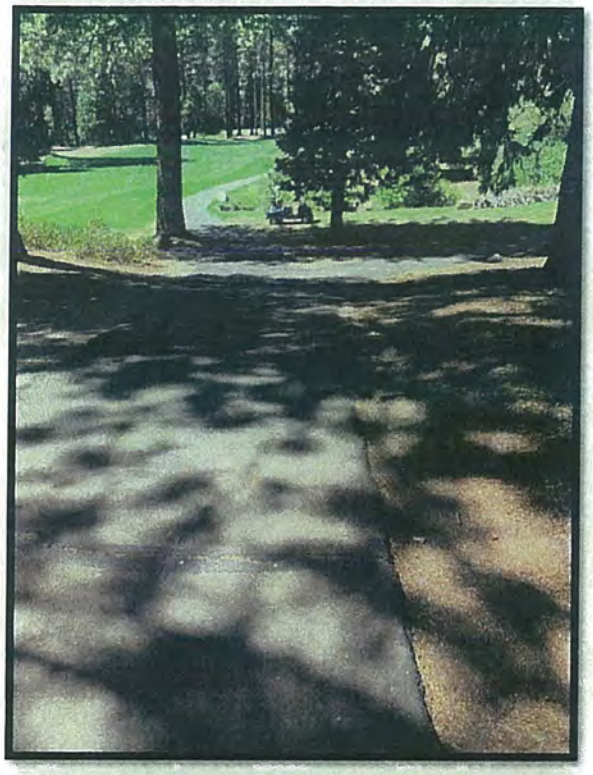
Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- See above

Station 59+00 – Station 66+30



Location

- Hole 8

Pavement Distress

- Medium severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- See above

Station 59+00 – Station 66+30

Location

- Hole 9

Pavement Distress

- High severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

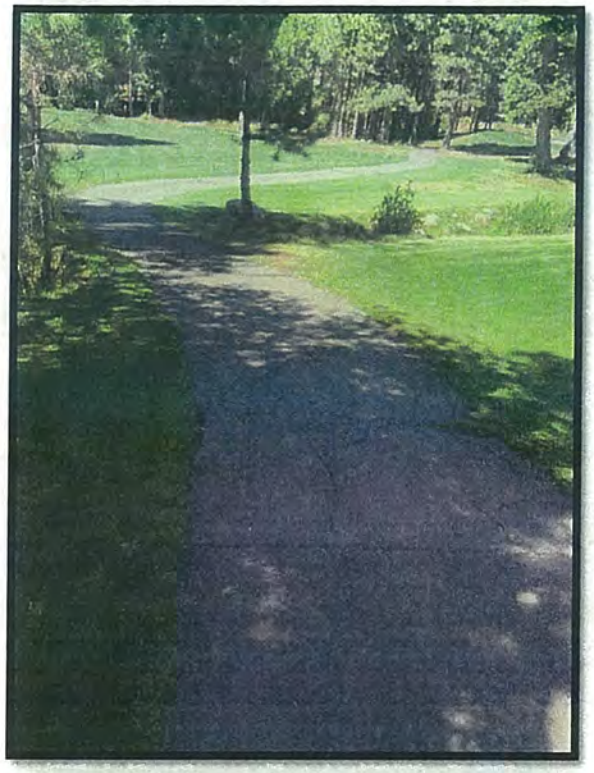
- Full Depth Pavement Rehabilitation

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 67+25 – Station 69+00



Location

- Hole 9

Pavement Distress

- Medium severity fatigue cracking
- Medium severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 175-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 175-ft L x 8-ft W
- $21,000

Station 67+25 – Station 69+00

Location

- Hole 9

Pavement Distress

- High severity transverse cracking
- Medium severity fatigue cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 67+25 – Station 69+00

Location

- Hole 9

Pavement Distress

- High severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

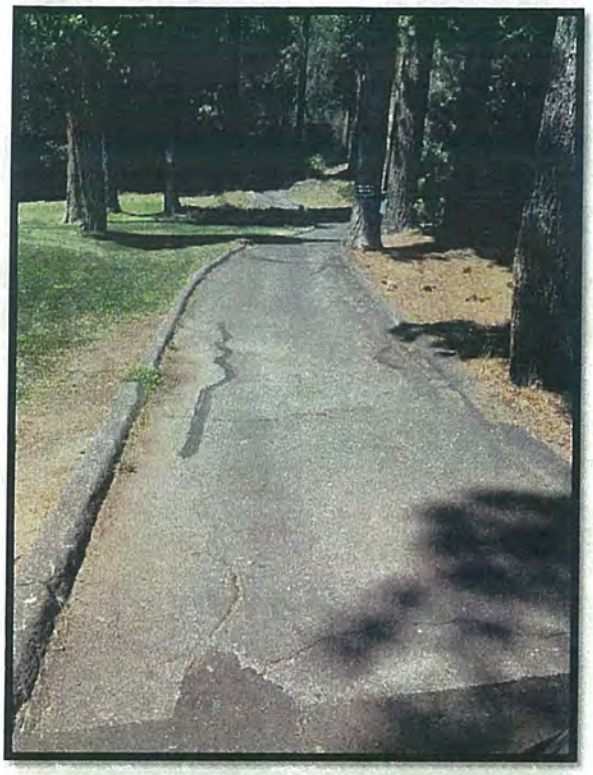
- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 69+40 – Station 72+00



Location

- Hole 9/18

Pavement Distress

- Medium severity transverse cracking (caused by tree roots)
- Low severity longitudinal cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 260-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 260-ft L x 8-ft W
- $31,200

Station 69+40 – Station 72+00

Location

- Hole 9/18

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Location

- Hole 9/18

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 69+40 – Station 72+00

Location

- Hole 9/18

Pavement Distress

- Medium severity edge cracking
- Low severity transverse cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 73+75 – Station 74+00

Location

- Hole 10

Pavement Distress

- Medium severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 25-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 25-ft L x 8-ft W
- $3,000

LUMOS & ASSOCIATES

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- High severity fatigue cracking
- High severity edge cracking

Ride Quality

- Very poor

Safety Concern

- High

Length of Distress

- 625-ft

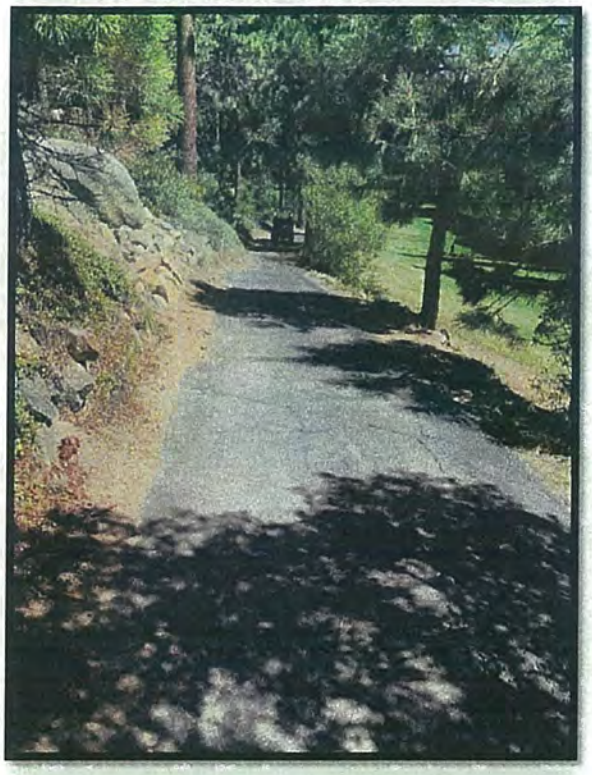
Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 625-ft L x 8-ft W
- $75,000

Station 74+25 – Station 80+50



Location

- Hole 10

Pavement Distress

- High severity fatigue cracking
- High severity edge cracking
- Medium severity transverse cracking

Ride Quality

- Very poor

Safety Concern

- High

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- High severity edge cracking
- High severity transverse cracking
- High severity longitudinal cracking

Ride Quality

- Very poor

Safety Concern

- High

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- High severity edge cracking
- Medium severity transverse cracking (caused by tree roots)

Ride Quality

- Very poor

Safety Concern

- Medium

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- High severity transverse cracking
- High severity edge cracking
- Medium severity raveling

Ride Quality

- Very poor

Safety Concern

- Medium

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- High severity edge cracking
- High severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- High severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 74+25 – Station 80+50

Location

- Hole 10

Pavement Distress

- Medium severity transverse cracking
- High severity raveling
- Medium severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 82+50 – Station 83+00

Location

- Hole 11

Pavement Distress

- High severity transverse cracking
- High severity fatigue cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 50-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 50-ft L x 8-ft W
- $6,000

LUMOS & ASSOCIATES

Station 83+00 – Station 85+50

Location

- Hole 11

Pavement Distress

- Medium severity transverse cracking
- Low severity fatigue cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 250-ft

Recommended Repair

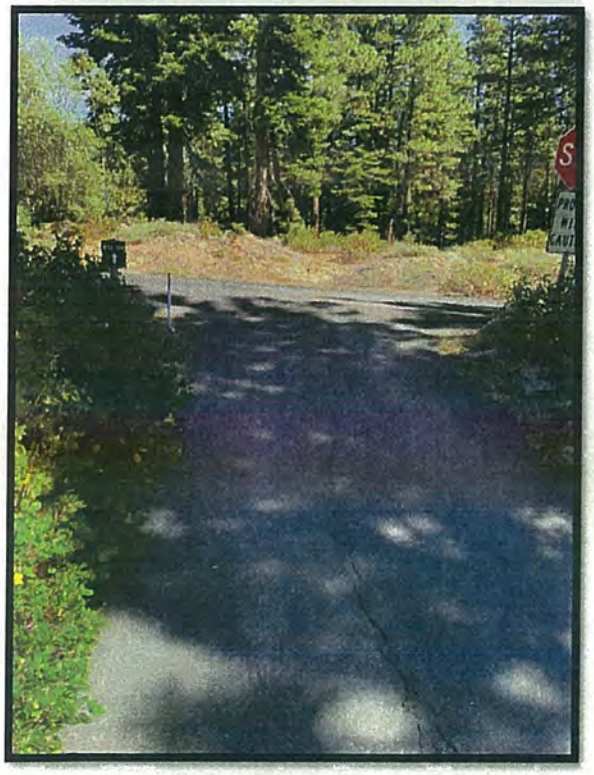
- Pavement Reconstruction
- Shouldering (1-ft width, uphill side of path)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 250-ft L x 8-ft W, 250-ft L x 1-ft W
- $30,000 + $250 = $30,250

LUMOS & ASSOCIATES

Station 86+00 – Station 86+50



Location

- Hole 11

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 50-ft

Recommended Repair

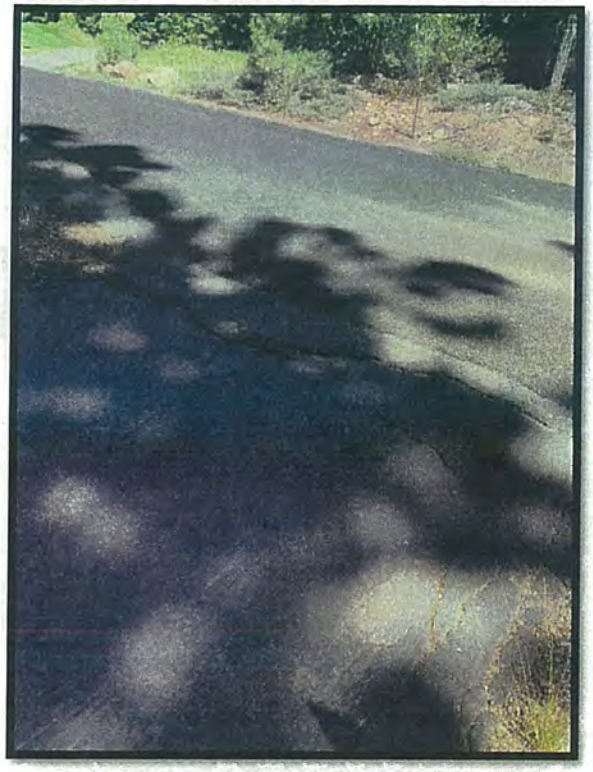
- Pavement Reconstruction
- Shouldering (1-ft width, both sides of path)

Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $1 / LF (Shouldering)
- 50-ft L x 8-ft W, 100-ft L x 1-ft W
- $6,000 + $100 = $6,100

LUMOS & ASSOCIATES

Station 87+00 – Station 87+05



Location

- Intersection with Golfers Pass Rd (Hole 11)

Pavement Distress

- High severity transverse cracking
- Bump at road

Ride Quality

- Very poor

Safety Concern

- Medium

Length of Distress

- 5-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 8-ft W
- $600

LUMOS & ASSOCIATES

Station 88+05 – Station 88+10

Location

- Intersection with Golfers Pass Rd (Hole 11)

Pavement Distress

- Bump at road crossing

Ride Quality

- Low

Safety Concern

- Medium

Length of Distress

- 5-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 8-ft W
- $600

LUMOS & ASSOCIATES

Station 93+70 – Station 94+50

Location

- Hole 12/13/15

Pavement Distress

- High severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 80-ft

Recommended Repair

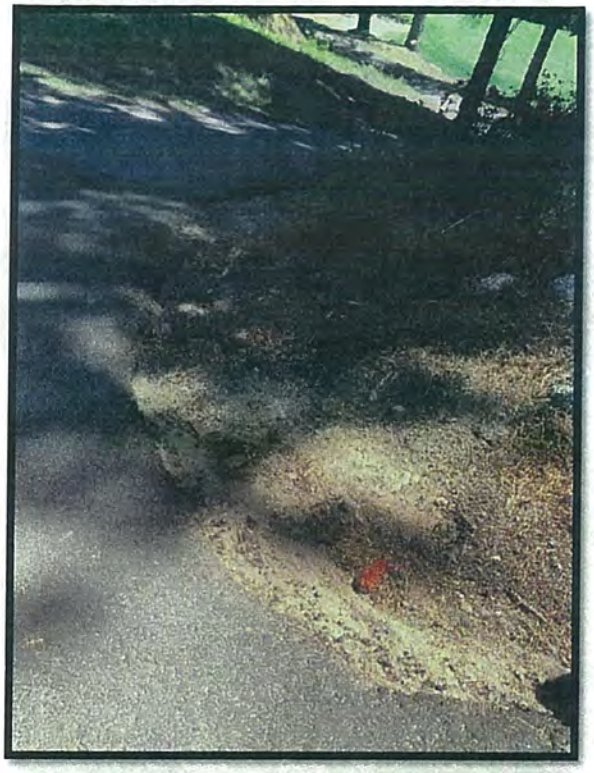
- Pavement Reconstruction
- 1-ft Wide Infiltration Trench, both sides of path (BMP)

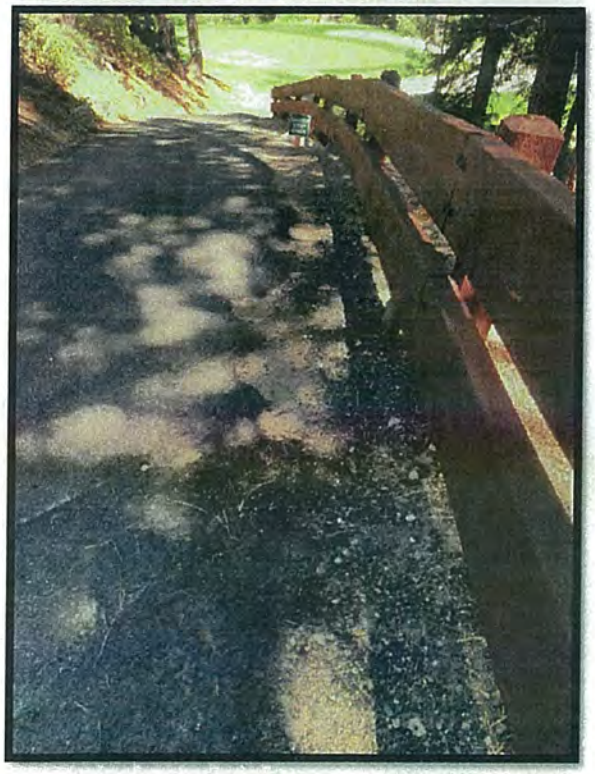
Estimated Cost

- Unit Price - $15 / SF (Reconstruction)
- Unit Price - $18 / LF (Infiltration Trench)
- 80-ft L x 8-ft W, 160-ft L x 1-ft W x 10" D
- $9,600 + $2,880 = $12,480

LUMOS & ASSOCIATES

Station 94+70 – Station 96+00





Location

- Hole 12/13/15

Pavement Distress

- Low severity edge cracking

Ride Quality

- N/A

Safety Concern

- Low

Length of Distress

- 100-ft

Recommended Repair

- Shouldering (1-ft width)

Estimated Cost

- Unit Price - $1 / LF
- 130-ft L x 1-ft W
- $130

LUMOS & ASSOCIATES

Station 101+00 – Station 101+05

Location

- Hole 13

Pavement Distress

- Medium severity raveling

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 5-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 5-ft L x 8-ft W
- $600

LUMOS & ASSOCIATES

Station 102+00 – Station 103+00

Location

- Hole 13

Pavement Distress

- High severity transverse cracking
- Low severity fatigue cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 100-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $10 / SF
- 100-ft L x 8-ft W
- $8,000

Station 102+00 – Station 103+00

Location

- Hole 13

Pavement Distress

- Medium severity edge cracking
- Medium severity raveling
- Low severity transverse cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Station 102+00 – Station 103+00

Location

- Hole 13

Pavement Distress

- Medium severity transverse cracking
- Low severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

Location

- Hole 13

Pavement Distress

- Medium severity transverse cracking
- Low severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 105+20 – Station 105+50

Location

- Hole 13

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 30-ft

Recommended Repair

- Pavement Reconstruction
- Shouldering (1-ft width) on side without AC curb

Estimated Cost

- Unit Price - $15 / SF
- Unit Price - $1 / LF
- 30-ft L x 8-ft W, 30-ft L x 1-ft W
- $3,600 + $30 = $3,630

LUMOS & ASSOCIATES

Station 118+00 – Station 118+40

Location

- Hole 16

Pavement Distress

- Medium severity transverse cracking
- Medium severity edge cracking
- Low severity fatigue cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 40-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 40-ft L x 8-ft W
- $4,800

LUMOS & ASSOCIATES

Station 120+50 – Station 120+70

Location

- Hole 16

Pavement Distress

- High severity transverse cracking
- Medium severity edge cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 20-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 20-ft L x 8-ft W
- $2,400

LUMOS & ASSOCIATES

Station 128+75– Station 129+00

Location

- Hole 17

Pavement Distress

- Medium severity transverse cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 25-ft

Recommended Repair

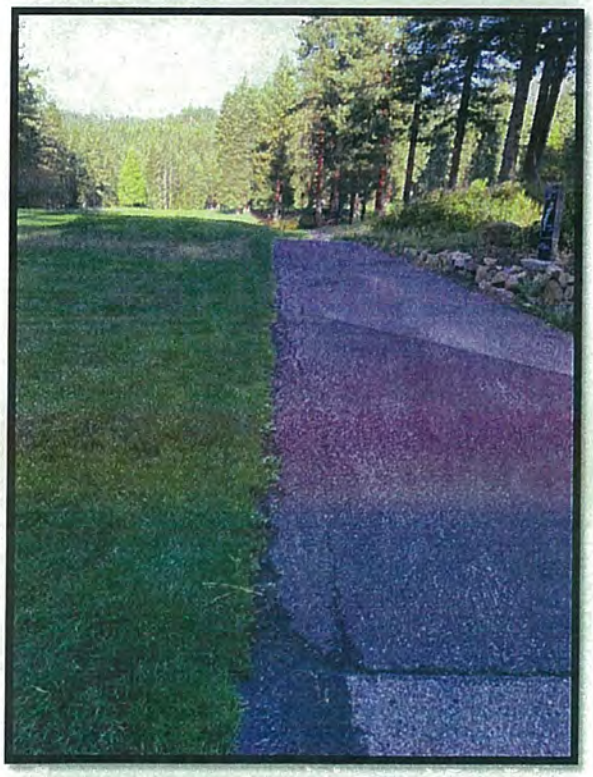
- Pavement Reconstruction

Estimated Cost

- Unit Price - $15 / SF
- 25-ft L x 8-ft W
- $3,000

LUMOS & ASSOCIATES

Station 130+60 – Station 132+90



Location

- Hole 18

Pavement Distress

- Medium severity edge cracking

Ride Quality

- Good

Safety Concern

- Low

Length of Distress

- 230-ft

Recommended Repair

- Full Depth Pavement Rehabilitation
- 1-ft Wide Infiltration Trench (BMP)

Estimated Cost

- Unit Price - $10 / SF (Rehabilitation)
- Unit Price - $18 / LF (Infiltration Trench)
- 230-ft L x 2-ft W, 230-ft L x 1-ft W x 10-in D
- $4,600 + $4,140 = $8,740

LUMOS & ASSOCIATES

Station 139+00 – Station 139+30

Location

- Hole 18

Pavement Distress

- Medium severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 30-ft

Recommended Repair

- Full Depth Pavement Rehabilitation
- 1-ft Wide Infiltration Trench (BMP)

Estimated Cost

- Unit Price - $10 / SF (Rehabilitation)
- Unit Price - $18 / LF (Infiltration Trench)
- 30-ft L x 4-ft W, 30-ft L x 1-ft W x 10-in D
- $1,200 + $540 = $1,740

LUMOS & ASSOCIATES

Station 139+50 – Station 139+80

Location

- Hole 18

Pavement Distress

- Medium severity edge cracking

Ride Quality

- Mediocre

Safety Concern

- Low

Length of Distress

- 30-ft

Recommended Repair

- Full Depth Pavement Rehabilitation
- 1-ft Wide Infiltration Trench (BMP)

Estimated Cost

- Unit Price - $10 / SF (Rehabilitation)
- Unit Price - $18 / LF (Infiltration Trench)
- 30-ft L x 4-ft W, 30-ft x 1-ft W x 10-in D
- $1,200 + $540 = $1,740

LUMOS & ASSOCIATES

Station 141+00 – Station 143+30

Location

- Hole 18

Pavement Distress

- High severity transverse cracking

Ride Quality

- Very poor

Safety Concern

- Low

Length of Distress

- 230-ft

Recommended Repair

- Full Depth Pavement Rehabilitation

Estimated Cost

- Unit Price - $10 / SF
- 230-ft L x 8-ft W
- $18,400

LUMOS & ASSOCIATES

Station 143+30– Station 143+50

Location

- Hole 18

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Low

Length of Distress

- 20-ft

Recommended Repair

- Shouldering (1-ft width), each side of path

Estimated Cost

- Unit Price - $1 / LF
- 40-ft L x 1-ft W
- $40

LUMOS & ASSOCIATES

Station 300+00 – Station 302+00

Location
- Hole 16/2/3

Pavement Distress
- High severity edge cracking

Ride Quality
- N/A

Safety Concern
- Low

Length of Distress
- 20-ft

Recommended Repair
- Shouldering (1-ft width, downhill side)

Estimated Cost
- Unit Price - $1 / LF
- 200-ft L x 1-ft W
- $200

Location
- Hole 16/2/3

Pavement Distress
- High severity edge cracking

Ride Quality
- Mediocre

Safety Concern
- Low

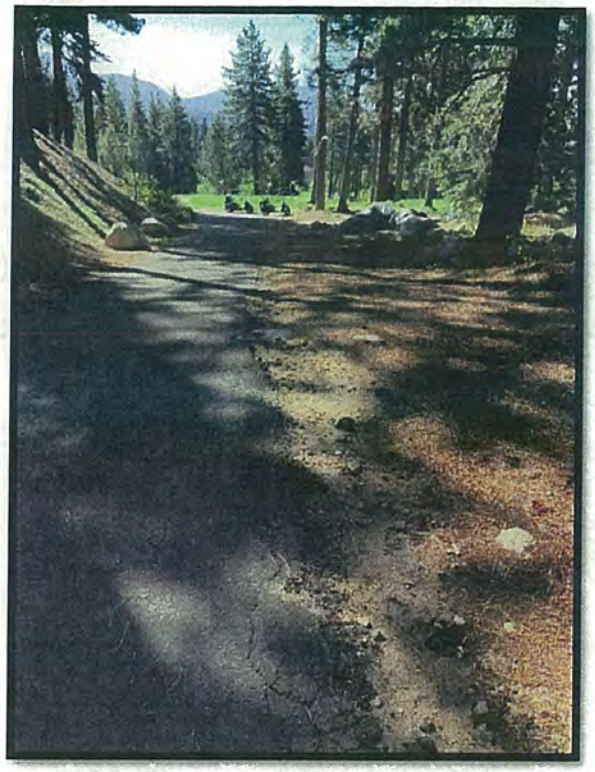
Length of Distress
- See above

Recommended Repair
- Shouldering (1-ft width, downhill side)

Estimated Cost
- See above

LUMOS & ASSOCIATES

Station 300+00 – Station 302+00



Location

- Hole 16/2/3

Pavement Distress

- Medium severity edge cracking

Ride Quality

- N/A

Safety Concern

- Low

Length of Distress

- See above

Recommended Repair

- Shouldering (1-ft width, downhill side)

Estimated Cost

- See above

LUMOS & ASSOCIATES

Station 302+00 – Station 303+25

Location

- Hole 2/3

Pavement Distress

- Medium severity transverse cracking
- Low severity longitudinal cracking

Ride Quality

- Poor

Safety Concern

- Low

Length of Distress

- 125-ft

Recommended Repair

- Pavement Reconstruction

Estimated Cost

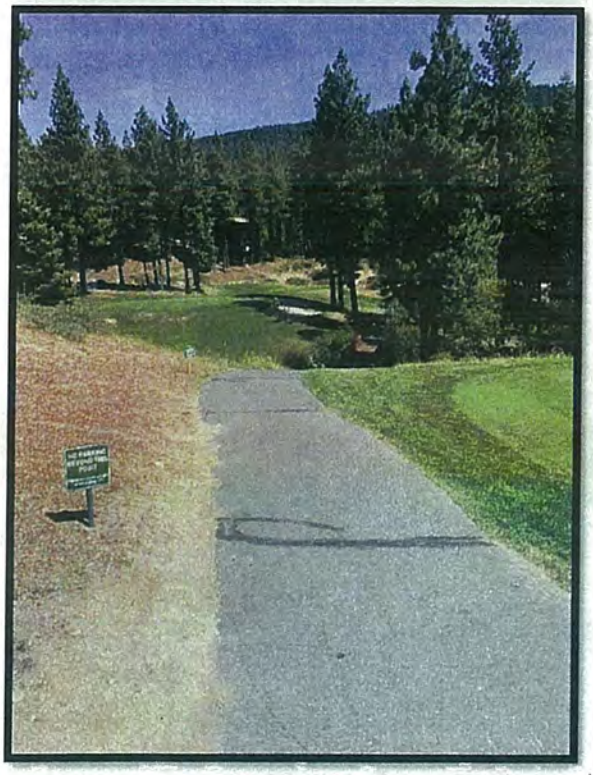
- Unit Price - $15 / SF
- 125-ft L x 8-ft W
- $15,000

LUMOS & ASSOCIATES

Appendix D: Adjacent Slope/Drainage Concerns

LUMOS & ASSOCIATES

Station 18+25 – Station 19+25



Location

- Hole 2

Slope Stability Issue

- N/A

Drainage Issue

- Sediment tracking onto cart path from uphill slope

Safety Concern

- Low

Recommendation

- 1-ft Wide Infiltration Trench (BMP)

Estimated Cost

- Unit Price - $18 / LF
- 100-ft L x 1-ft W x 10-in D
- $1,800

Slope Failure / Drainage Concerns

LUMOS & ASSOCIATES

Station 25+50 – Station 25+51

Location

- Hole 3

Slope Stability Issue

- N/A

Drainage Issue

- Runoff from storm events is ponding at curb on cart path, tracking sediment onto cart path

Safety Concern

- Low

Recommendation

- AC Curb Cut

Estimated Cost

- Unit Price - $250 LS
- 1-ft L
- $250

LUMOS & ASSOCIATES

Station 71+50 – Station 71+55

Location

- Hole 9/18

Slope Stability Issue

- No pavement edge stabilization

Drainage Issue

- N/A

Safety Concern

- Medium

Recommendation

- Shouldering (1-ft width)

Estimated Cost

- Unit Price - $1 / LF
- 5-ft L x 1-ft W
- $5

LUMOS & ASSOCIATES

Station 74+50 – Station 74+70

Location

- Hole 10

Slope Stability Issue

- No pavement edge stabilization next to culvert

Drainage Issue

- N/A

Safety Concern

- High

Recommendation

- Shouldering (1-ft width, downhill side)
- Fencing or Guard Rail (each side)

Estimated Cost

- Unit Price - $1 / LF (Shouldering)
- Unity Price - $25 / LF (Fencing)
- 20-ft L x 1-ft W, 20-ft L x 3-ft H + 5-ft L fence on other side of path
- $20 + $500 = $520

Slope Failure / Drainage Concerns

LUMOS & ASSOCIATES

Station 75+00 – Station 77+00

Location

- Hole 10

Slope Stability Issue

- High slopes on uphill side of cart path

Drainage Issue

- N/A

Safety Concern

- Medium

Recommendation

- Retaining wall with drainage rock

Estimated Cost

- Unit Price - $50 / SF
- 200-ft L x 3-ft H
- $30,000

Slope Failure / Drainage Concerns

Station 75+00 – Station 77+00

Location
- Hole 10

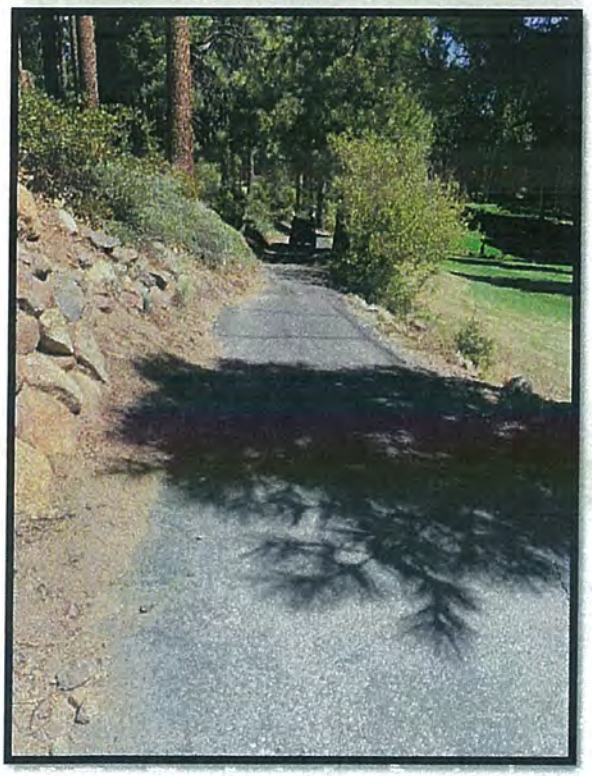
Slope Stability Issue
- High slopes on uphill side of cart path

Drainage Issue
- N/A

Safety Concern
- Medium

Recommendation
- Retaining wall with drainage rock

Estimated Cost
- See above



Location
- Hole 10

Slope Stability Issue
- High slopes on uphill side of cart path

Drainage Issue
- N/A

Safety Concern
- Medium

Recommendation
- Retaining wall with drainage rock

Estimated Cost
- See above

LUMOS & ASSOCIATES

Station 78+20 – Station 78+25

Location

- Hole 10

Slope Stability Issue

- Culvert is very close to cart path

Drainage Issue

- N/A

Safety Concern

- High

Recommendation

- Shouldering (1-ft width)
- Fencing or Guard Rail

Estimated Cost

- Unit Price - $1.00 / LF (Shouldering)
- Unit Price - $25.00 / LF (Fencing or Guard Rail)
- 5-ft L x 1-ft W, 5-ft L x 3-ft H
- $5 + $125 = $130

LUMOS & ASSOCIATES

Station 89+50 – Station 93+70

Location

- Hole 12

Slope Stability Issue

- High slopes on each side of cart path

Drainage Issue

- Gullies forming on downhill side of cart path

Safety Concern

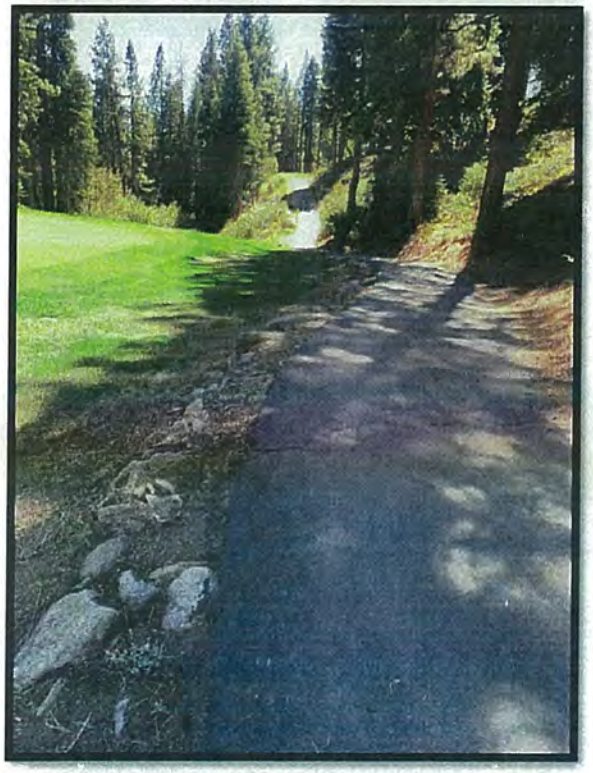
- High

Recommendation

- Shouldering (1-ft width, both sides)
- Fencing or Guard Rail
- Rip rap slope stabilization

Estimated Cost

- Unit Price - $1 / LF (Shoulder)
- Unit Price - $25 / LF (Fencing or Guard Rail)
- Unit Price - $100 / SY (Rip rap)
- 300-ft L x 1-ft W (Shouldering)
- 150-ft L x 3-ft H (Fencing or Guard Rail)
- 600 SY (Rip rap)
- $300 + $3,750 + $60,000 = $64,050



Location

- Hole 12

Slope Stability Issue

- No pavement edge stability

Drainage Issue

- N/A

Safety Concern

- Low

Recommendation

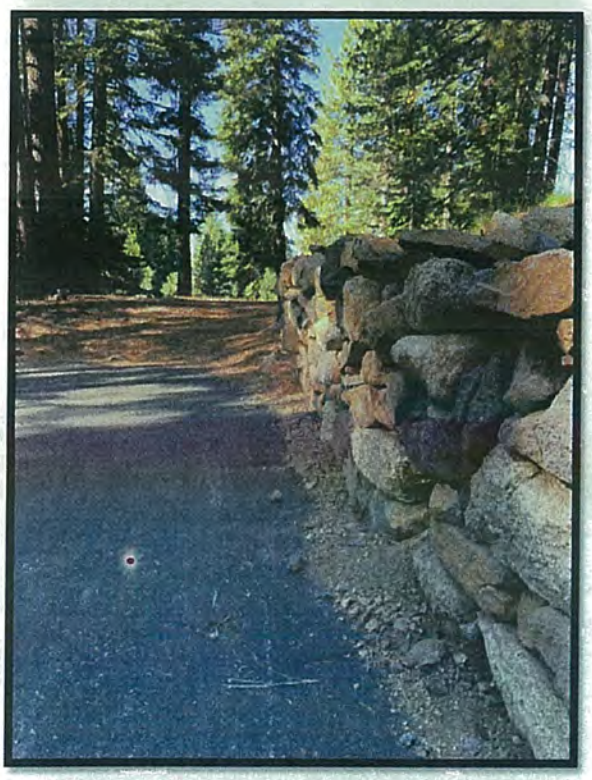
- Shouldering (1' width, one side)

Estimated Cost

- Unit Price - $1 / LF
- 270-ft L x 1-ft W
- $270

LUMOS & ASSOCIATES

Station 96+00 – Station 96+40



Location

- Hole 13

Slope Stability Issue

- Retaining wall is beginning to fail and is leaning toward the cart path.

Drainage Issue

- Drainage is causing retaining wall to lean and will eventually cause failure.

Safety Concern

- High

Recommendation

- Replace retaining wall with retaining wall + drainage rock

Estimated Cost

- Unit Price - $50 / SF
- 40-ft L x 3-ft H
- $6,000

Slope Failure / Drainage Concerns

LUMOS & ASSOCIATES

Station 106+50 – Station 106+60

Location

- Hole 13/14

Slope Stability Issue

- No pavement edge stability

Drainage Issue

- N/A

Safety Concern

- Medium

Recommendation

- Shouldering (1-ft width)

Estimated Cost

- Unit Price - $1 / LF
- 10-ft L x 1-ft W
- $10

LUMOS & ASSOCIATES

Station 111+00 – Station 112+00

Location

- Hole 14

Slope Stability Issue

- N/A

Drainage Issue

- Ponding occurring at AC curb on cart path

Safety Concern

- Low

Recommendation

- 4 AC Curb cuts spaced 25' apart to allow drainage to flow onto course

Estimated Cost

- Unit Price - LS
- 1-ft L x 4
- $500

LUMOS & ASSOCIATES

Station 118+75 – Station 121+00

Location

- Hole 16

Slope Stability Issue

- No pavement edge stability. Edge cracking is beginning to occur.
- High slopes on uphill side of cart path

Drainage Issue

- N/A

Safety Concern

- High

Recommendation

- Timber Barricade

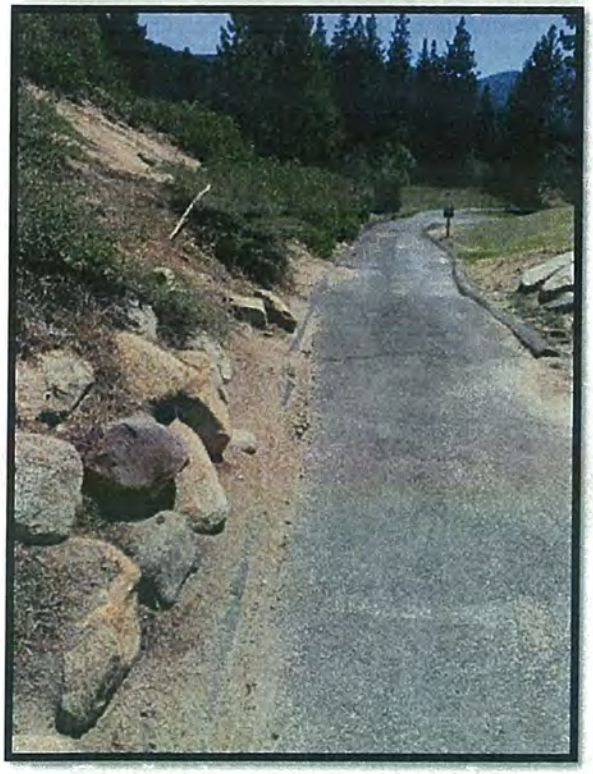
Estimated Cost

- Unit Price - $20 / SF
- 225-ft L x 3-ft H
- $13,500

Slope Failure / Drainage Concerns

LUMOS & ASSOCIATES

Station 302+00 – Station 303+25



Location

- Hole 2/3

Slope Stability Issue

- High slope. Soil is being carried over existing retaining wall.

Drainage Issue

- Runoff from storm event is carrying sediment onto cart path

Safety Concern

- Low

Recommendation

- Retaining wall with drainage rock

Estimated Cost

- Unit Price - $50 / SF
- 125-ft L x 3-ft H
- $18,750

Slope Failure / Drainage Concerns

LUMOS & ASSOCIATES

Station 302+00 – Station 303+25

Location

- Hole 2/3

Slope Stability Issue

- N/A

Drainage Issue

- Runoff from storm events is carrying sediment onto cart path and is ponding at curb cuts.

Safety Concern

- Low

Recommendation

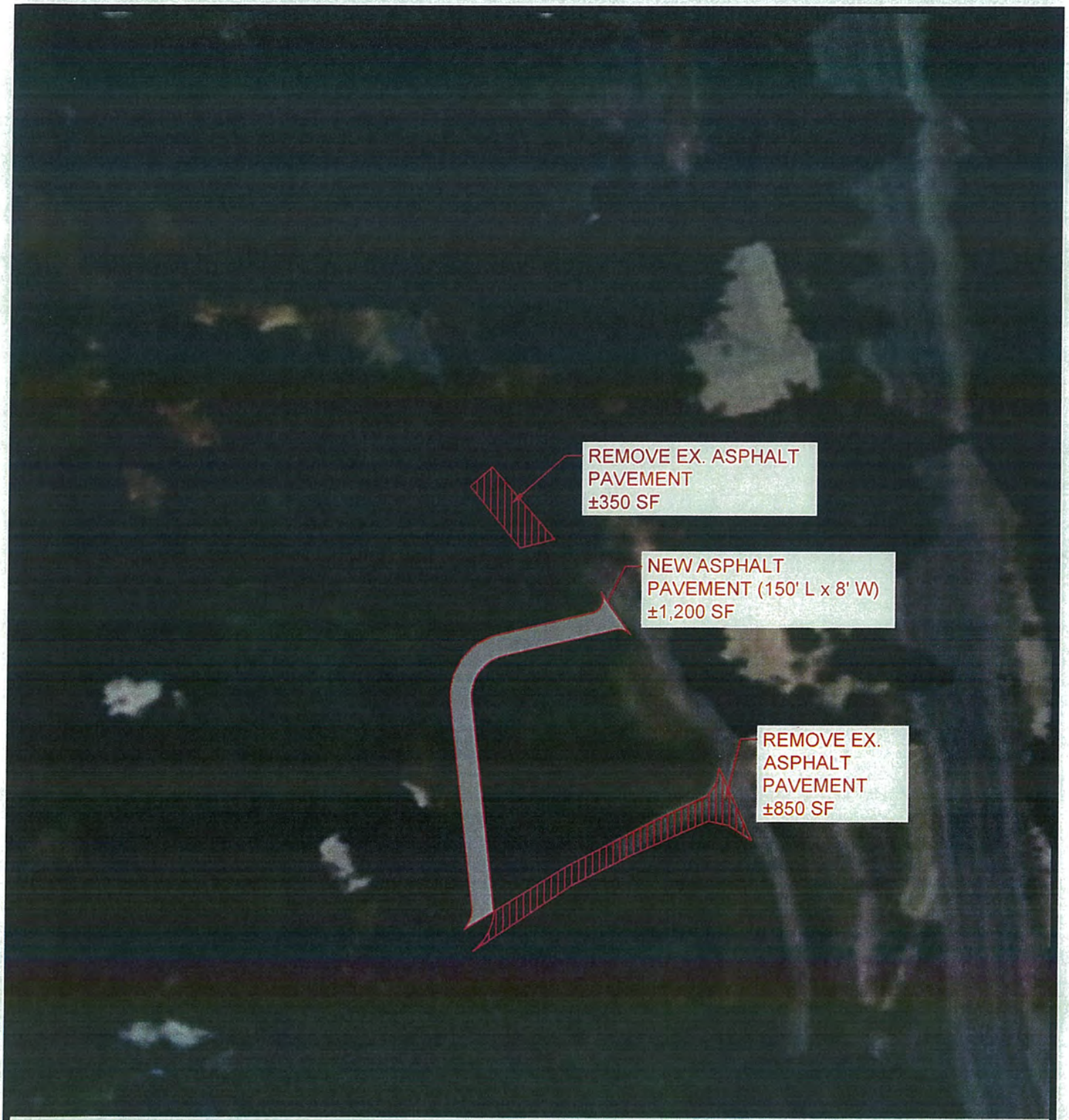
- 1-ft Wide Infiltration Trench (BMP)

Estimated Cost

- Unit Price - $18 / LF
- 20-ft L x 1-ft W x 10-in D
- $360

Appendix E: Circulation Problem Areas

LUMOS & ASSOCIATES



REMOVE ASPHALT PAVEMENT:	±1,200 SF
NEW ASPHALT PAVEMENT:	±1,200 SF
NEW IMPERVIOUS SURFACE:	0 SF

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

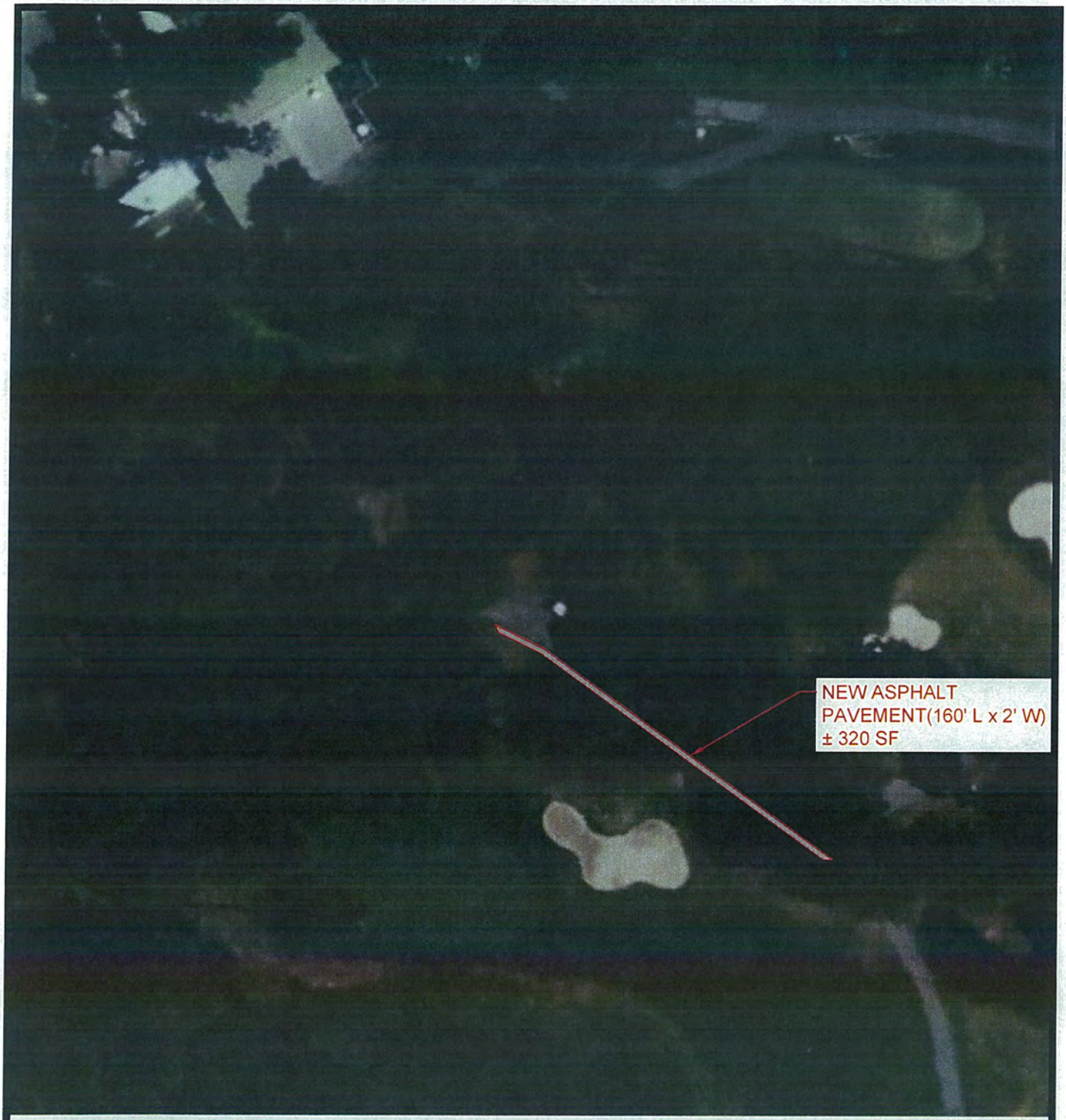
IVGID

MOUNTAIN GOLF COURSE CART PATH

HOLE #2 - REALIGN PATH BEHIND GREEN #2 TO TEE-BOX #3

WASHOE NEVADA

Date:	9/17/2020
Scale:	NTS
Job No:	10164.000
FIGURE	1.0



REMOVE ASPHALT PAVEMENT:	±0 SF
NEW ASPHALT PAVEMENT:	±320 SF
NEW IMPERVIOUS SURFACE:	±320 SF

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

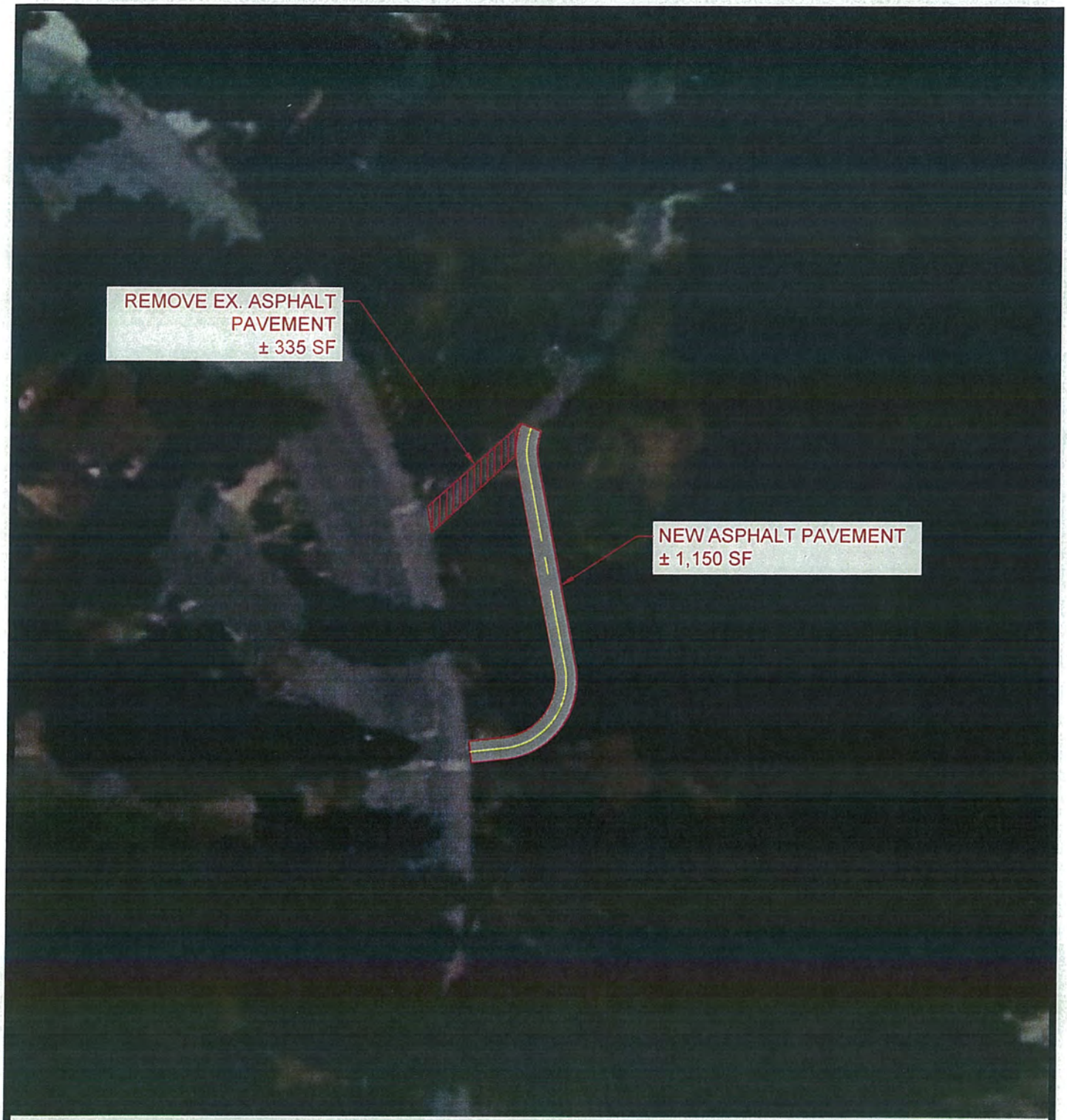
IVGID

MOUNTAIN GOLF COURSE CART PATH

HOLE #9 - WIDEN PATH TO 10 FEET FOR REDUCED CONGESTION

WASHOE NEVADA

Date:	9/17/2020
Scale:	1" = 50'
Job No:	10164.000
FIGURE	2.0



REMOVE ASPHALT PAVEMENT:	±335 SF
NEW ASPHALT PAVEMENT:	±1,150 SF
NEW IMPERVIOUS SURFACE:	±815 SF

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

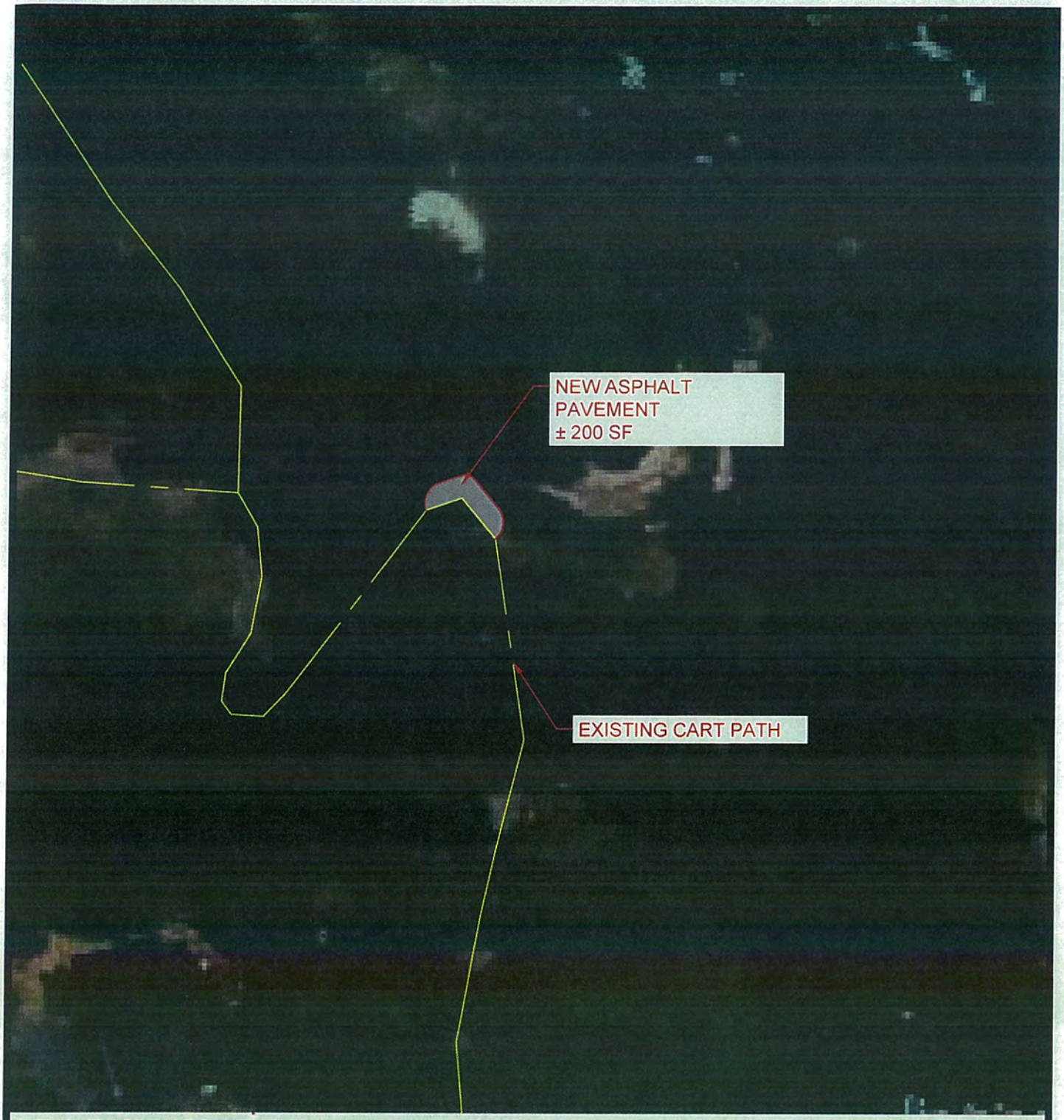
IVGID

MOUNTAIN GOLF COURSE CART PATH

HOLE #11 - SHIFT PATH TO STRAIGHTEN ROAD CROSSING TO HOLE #12

WASHOE NEVADA

Date:	01/22/2021
Scale:	1" = 50'
Job No:	10164.000
FIGURE	3.0



REMOVE ASPHALT PAVEMENT:	±0 SF
NEW ASPHALT PAVEMENT:	±200 SF
REDUCED IMPERVIOUS SURFACE:	±200 SF

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

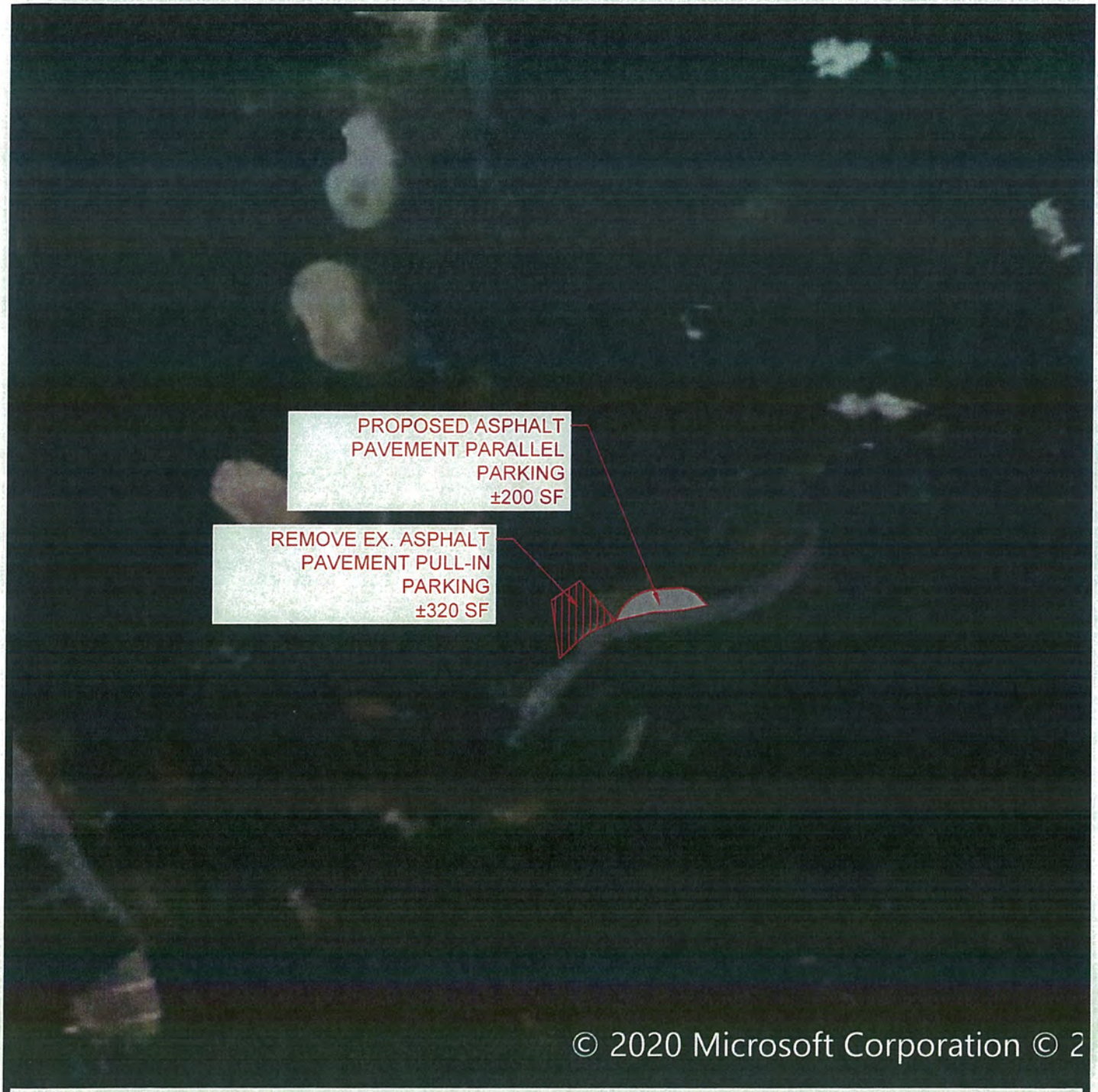
IVGID

MOUNTAIN GOLF COURSE CART PATH

HOLE #15 - NEW TURN-OUT W/ CURB AT GREEN

WASHOE NEVADA

Date:	9/17/2020
Scale:	1" = 50'
Job No:	10164.000
FIGURE	4.0



REMOVE ASPHALT PAVEMENT: ±320 SF
NEW ASPHALT PAVEMENT: ±200 SF
REDUCED IMPERVIOUS SURFACE: ±120 SF

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

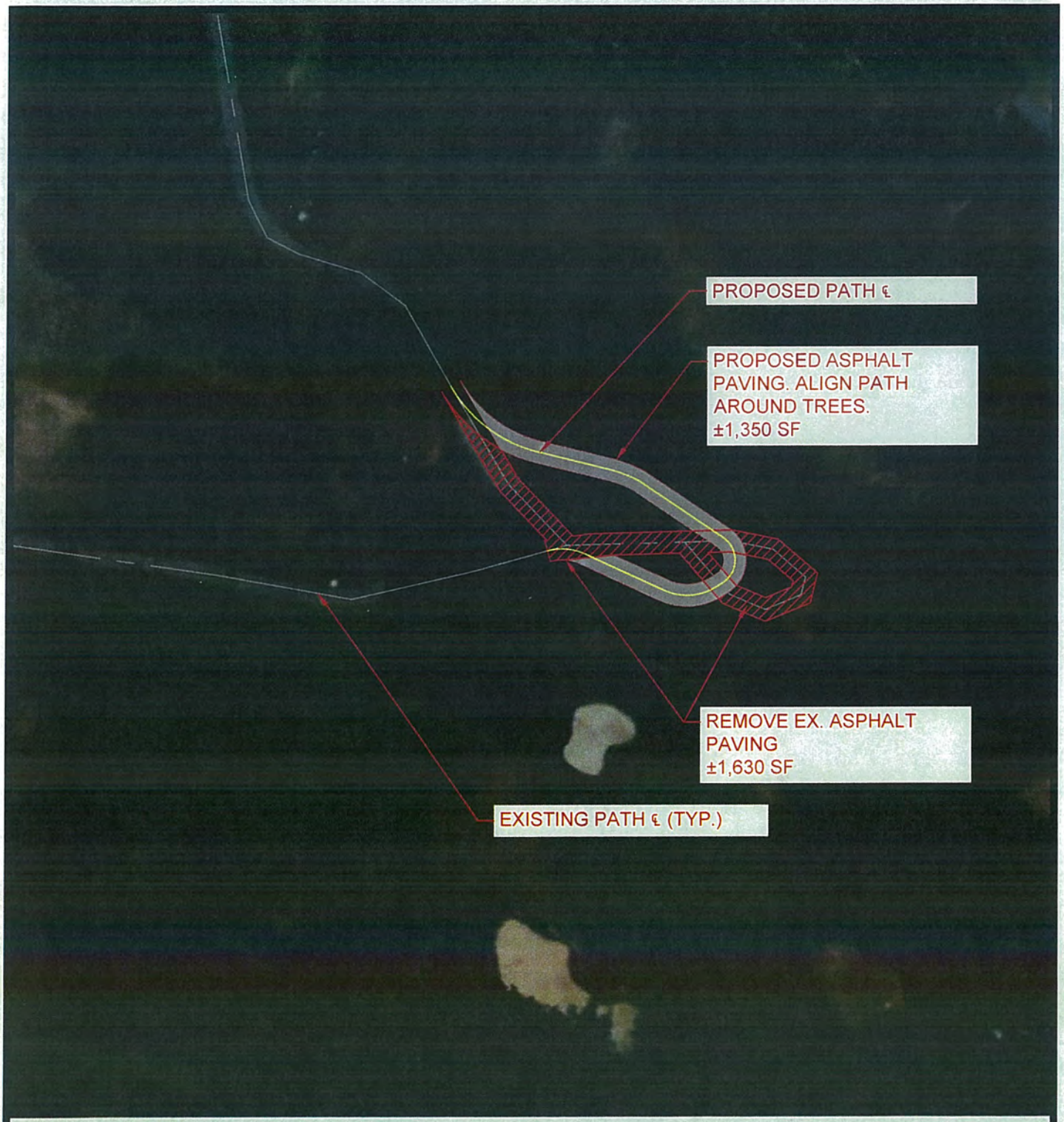
IVGID

MOUNTAIN GOLF COURSE CART PATH

HOLE #17 - REPLACE PERPENDICULAR TURN-OUT WITH PARALLEL TURN-OUT

WASHOE NEVADA

Date:	9/17/2020
Scale:	1" = 50'
Job No:	10164.000
FIGURE	5.0



REMOVE ASPHALT PAVEMENT:	±1,630 SF
NEW ASPHALT PAVEMENT:	±1,350 SF
REDUCED IMPERVIOUS SURFACE:	±280 SF

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

IVGID

MOUNTAIN GOLF COURSE CART PATH

HOLE #9 - REALIGNMENT AT TEE #9

WASHOE NEVADA

Date:	01/22/2021
Scale:	1" = 50'
Job No:	10164.000
FIGURE	6.0

Appendix F: Cart Path Width

LUMOS & ASSOCIATES

LUMOS & ASSOCIATES
PO BOX 3570
STATELINE, NEVADA 89449
PH. (775) 588-6490

IVGID

MOUNTAIN GOLF COURSE CART PATH APPENDIX F: CART PATH CONSTRICTIONS

WASHOE NEVADA

Date:	11/24/2020
Scale:	1"=5000'
Job No:	10164.000
FIGURE	1.0

Appendix G: Recommended Repair Logs

LUMOS & ASSOCIATES

High Severity Areas

The following repair log documents areas where repairs or maintenance items are recommended over the next 1 to 2 years:

High Severity - Repairs Recommended in 1-2 Years				
Station	**Quantity**	**Distress Type**	**Recommended Repair**	**Estimated Cost**
0+50 – 1+25	75 LF	Raveling	Pavement Reconstruction	$ 9,000.00
1+25 - 2+50	125 LF	Heaved AC at trench drain, raveling, transverse cracking, longitudinal cracking	Pavement Reconstruction	$ 15,000.00
5+00 - 7+75	41 LF	Transverse cracking, edge cracking, depression	Pavement Reconstruction	$ 4,920.00
16+80 - 17+00	20 LF	Fatigue cracking, edge cracking	Pavement Reconstruction	$ 4,500.00
17+00 - 17+05	5 LF	Edge cracking, bump at road crossing	Pavement Reconstruction	$ 750.00
17+45 - 17+50	5 LF	Bump at road crossing	Pavement Reconstruction	$ 600.00
22+00 - 22+25	25 LF	Transverse cracking	Pavement Reconstruction	$ 3,000.00
24+15 - 24+55	40 LF	Transverse cracking, raveling	Pavement Reconstruction	$ 4,800.00
28+75 - 33+00	850 LF (both sides)	Edge cracking, transverse cracking	Shouldering (1' width)	$ 850.00
33+00 - 33+25	25 LF	Edge cracking, fatigue cracking, transverse cracking	Pavement Reconstruction	$ 3,000.00
	50 LF (both sides)		Shouldering (1' width)	$ 50.00
46+40 - 46+90	10 LF (5 LF a side)	Bump at road crossing	Pavement Reconstruction	$ 1,200.00
52+60 - 53+10	50 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 6,000.00
53+50 - 58+65	515 LF	Fatigue cracking, edge cracking, transverse cracking	Pavement Reconstruction	$ 61,200.00
59+00 - 66+30	730 LF	Transverse cracking, fatigue cracking, edge cracking, raveling	Pavement Reconstruction	$ 87,600.00

74+25 - 80+50	625 LF	Fatigue cracking, edge cracking, transverse cracking, longitudinal cracking, raveling	Pavement Reconstruction	$ 75,000.00
82+50 - 83+00	50 LF	Transverse cracking, fatigue cracking	Pavement Reconstruction	$ 6,000.00
87+00 - 87+05	5 LF	Transverse cracking, bump at road crossing	Pavement Reconstruction	$ 600.00
120+50 - 120+70	20 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 2,400.00
Bridge Approaches	8 EA	Heaved AC at abutments	Pavement Reconstruction	$ 4,800.00
				$ -
25+50 - 25+51	1 LF	Ponding water	AC Curb Cut	$ 250.00
75+00 - 77+00	200 LF	Steep slope	Retaining Wall	$ 30,000.00
96+00 - 96+40	40 LF	Retaining wall failure	Retaining Wall	$ 6,000.00
111+00 - 112+00	4 LF	Ponding water	AC Curb Cuts	$ 500.00
302+00 - 303+25	125 LF	Eroding slope	Retaining Wall	$ 18,750.00
	20 LF	Eroding slope	Infiltration Trench	$ 360.00
			Total:	**$ 347,130.00**

Table 1: 1-2 Year Estimated Costs – High Severity Repairs

The table below provides a summary of the work items, quantities, and estimated costs under the high severity category to anticipate potential maintenance contract costs.

Recommended Repair	Est. Unit Cost	Estimated Quantity	Estimated Cost	Detail
Pavement Reconstruction	$15 / SF	22,278 SF	$334,170	3" AC Pavement, 4" aggregate base
Retaining Wall (Block)	$50 / SF	915 SF	$54,750	Block retaining wall with 1-ft of drainage rock behind wall
Shouldering (1' width)	$1 / LF	920 LF	$900	Shouldering Material Aggregate (NDOT 704.03.09)
Infiltration Trench	$18 / LF	20 LF	$360	1' width, 10" depth
AC Curb Cuts	LS	-	$750	1' AC curb cuts
Total			**$390,930**	

Table 2: 1-2 Year Estimated Unit Costs - High Severity Repairs

Medium Severity Areas

The following repair log documents areas where repairs or maintenance items are recommended over the next 2 to 5 years:

Medium Severity - Repairs Recommended in 2-5 Years				
Station	**Quantity**	**Distress Type**	**Recommended Repair**	**Estimated Cost**
8+50 - 9+50	100 LF	Transverse cracking, edge cracking, fatigue cracking	Pavement Reconstruction	$ 12,000.00
17+50 - 17+70	20 LF	Transverse cracking	Pavement Reconstruction	$ 2,400.00
18+00 - 19+00	100 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 12,000.00
24+60 - 25+10	50 LF	Fatigue cracking, transverse cracking, longitudinal cracking, edge cracking	Pavement Reconstruction	$ 6,000.00
	50 LF		Shouldering (1' width)	$ 50.00
25+50 - 27+10	160 LF	Raveling, transverse cracking, edge cracking	Pavement Reconstruction	$ 19,200.00
27+10 - 27+90	80 LF	Raveling, transverse cracking	Pavement Reconstruction	$ 13,200.00
28+75 - 33+00	425 LF	Edge cracking, transverse cracking	Pavement Reconstruction	$ 51,000.00
33+25 - 35+00	175 LF	Edge cracking, transverse cracking	Pavement Reconstruction	$ 21,000.00
	350 LF (both sides)		Shouldering (1' width)	$ 350.00
37+00 - 37+25	25 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 3,000.00
47+20 - 47+30	10 LF	Edge cracking, Transverse cracking	Pavement Reconstruction	$ 1,200.00
	10 LF		Shouldering (1' width)	$ 10.00
50+25 - 50+50	25 LF	Transverse cracking, fatigue cracking	Pavement Reconstruction	$ 3,000.00
52+00 - 52+60	60 LF	Edge cracking	Shouldering (1' width)	$ 60.00
67+25 - 69+00	175 LF	Fatigue cracking, transverse cracking	Pavement Reconstruction	$ 21,000.00
69+40 - 72+00	260 LF	Transverse cracking, longitudinal cracking, edge cracking	Pavement Reconstruction	$ 31,200.00
73+75 - 74+00	25 LF	Transverse cracking	Pavement Reconstruction	$ 3,000.00
83+00 - 85+50	250 LF	Transverse cracking, fatigue cracking	Pavement Reconstruction	$ 30,000.00
	250 LF		Shouldering (1' width)	$ 250.00

86+00 - 86+50	50 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 6,000.00
	100 LF (both sides)		Shouldering (1' width)	$ 100.00
88+05 - 88+10	5 LF	Bump at road crossing	Pavement Reconstruction	$ 600.00
93+70 - 94+50	80 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 9,600.00
94+70 - 96+00	130 LF	Edge cracking	Shouldering (1' width)	$ 130.00
101+00 - 101+05	5 LF	Raveling	Pavement Reconstruction	$ 600.00
102+00 - 103+00	100 LF	Transverse cracking, fatigue cracking	Pavement Reconstruction	$ 8,000.00
105+20 - 105+50	30 LF	Transverse cracking, edge cracking	Pavement Reconstruction	$ 3,600.00
	30 LF		Shouldering (1' width)	$ 30.00
118+00 - 118+40	40 LF	Transverse cracking, edge cracking, fatigue cracking	Pavement Reconstruction	$ 4,800.00
128+75 - 129+00	25 LF	Transverse cracking	Pavement Reconstruction	$ 3,000.00
130+60 - 132+90	230 LF	Edge cracking	Pavement Reconstruction	$ 4,600.00
	230 LF	Edge saturation	Infiltration Trench	$ 4,140.00
139+00 - 139+30	30 LF	Edge cracking	Pavement Reconstruction	$ 1,200.00
	30 LF	Edge saturation	Infiltration Trench	$ 540.00
139+50 - 139+80	30 LF	Edge cracking	Pavement Reconstruction	$ 1,200.00
	30 LF	Edge saturation	Infiltration Trench	$ 540.00
141+00 - 143+30	230 LF	Transverse cracking	Pavement Reconstruction	$ 18,400.00
143+30 - 143+50	40 LF (both sides)	Edge cracking	Shouldering (1' width)	$ 40.00
300+00 - 302+00	200 LF	Edge cracking	Shouldering (1' width)	$ 200.00
302+00 - 303+25	125 LF	Transverse cracking, longitudinal cracking	Pavement Reconstruction	$ 15,000.00
			Total:	**$ 312,240.00**

Table 3: 2-5 Year Estimated Costs – Medium Severity Repairs

The table below provides a summary of the work items, quantities, and estimated costs under the medium severity category to anticipate potential maintenance contract costs.

Recommended Repair		Est. Unit Cost	Estimated Quantity	Estimated Cost	Detail
Pavement Reconstruction		$15 / SF	21,235 SF	$318,525	3" AC Pavement, 4" aggregate base
Shouldering (1' width)		$1 / LF	1,230	$1,220	Shouldering Material Aggregate (NDOT 704.03.09)
Infiltration Trench		$18 / LF	20 LF	$5,220	1' width, 10" depth
Total				**$324,965**	

Table 4: 2-5 Year Estimated Unit Costs – Medium Severity Repairs

Low Severity Areas

The following repair log documents areas where repairs or maintenance items are recommended over the next 5 to 10 years:

Low Severity - Repairs Recommended in 5-10 Years				
Station/Area	**Quantity**	**Distress Type**	**Recommended Repair**	**Estimated Cost**
Circulation Area 1	2,400 SF	Circulation Problem	Realign Path	$ 33,600.00
Circulation Area 2	320 SF	Circulation Problem	Widen Path	$ 5,760.00
Circulation Area 3	2,980 SF	Circulation Problem	One-Way Loop	$ 54,775.00
Circulation Area 4	1,485 SF	Circulation Problem	New Road Crossing	$ 36,125.00
Circulation Area 5	200 SF	Circulation Problem	New Turn Out	$ 4,000.00
Circulation Area 6	520 SF	Circulation Problem	Replace Turn-Out	$ 6,800.00
18+25 – 19+25	100 LF	Eroding slope	Infiltration Trench	$ 1,800.00
71+50 - 71+55	5 LF	Eroding shoulder	Shouldering (1' width)	$ 5.00
74+50 - 74+70	25 LF (20' downslope side, 5' upslope side)	Rider safety concern	Install fence or guard rail	$ 500.00
	20 LF	Eroding shoulder/slope	Shouldering (1' width)	$ 20.00
78+20 - 78+25	5 LF	Rider safety concern	Install fence or guard rail	$ 125.00
	5 LF	Eroding shoulder	Shouldering (1' width)	$ 5.00
89+50 - 93+70	150 LF	Rider Safety Concern	Install fence or guard rail	$ 3,750.00
	300 LF (each side)	Eroding slope	Shouldering (1' width)	$ 300.00
	270 LF	Eroding slope	Shouldering (1' width)	$ 270.00
	600 SY	Gullying, eroding slope	Rip Rap	$ 60,000.00
93+70 – 94+50	160 LF	Edge saturation	Infiltration Trench	$ 2,880.00
106+50 - 106+60	10 LF	Eroding slope	Shouldering (1' width)	$ 10.00
118+75 - 121+00	225 LF	Rider Safety Concern	Timber Barricade	$ 13,500.00
			Total:	**$ 224,225**

Table 5: 5-10 Year Estimated Costs – Low Severity Repairs

The table below provides a summary of the work items, quantities, and estimated costs under the low severity category to anticipate potential maintenance contract costs.

Recommended Repair	Est. Unit Cost	Estimated Quantity	Estimated Cost	Detail
Remove AC Pavement	$10 / SF	3,485 SF	$34,850	Remove existing AC pavement, off-haul, revegetation, grading
New AC Pavement	$18 / SF	4,420 SF	$79,560	3" AC Pavement, 4" aggregate base, soil compaction, grading
Shouldering	$1 / LF	610	$610	Shouldering Material Aggregate (NDOT 704.03.09)
Wood Fencing or Guard Rail	$25 / LF	175 LF	$4,375	Fencing and posts or guard rail
Timber Barricade	$20 / SF	675 SF	$13,500	Timber barricade to block rock fall from adjacent steep slope
AC Curb	$20 / LF	20 LF	$400	AC curb
Infiltration Trench	$18 / LF	20 LF	$4,680	1' width, 10" depth
Rip Rap	$100 / SY	600 SY	$60,000	Heavy Rip Rap
Grading, Clearing, and Grubbing	$7 / SF	3,750 SF	$26,250	Grading, Clearing, Grubbing
Total			**$224,225**	

Table 6: 5-10 Year Estimated Unit Costs – Low Severity Repairs

SHORT FORM AGREEMENT
Between
INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT
and
LUMOS & ASSOCIATES
for
PROFESSIONAL SERVICES

This Agreement is made as of August 19, 2020 between **INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT (IVGID)**, hereinafter referred to as "OWNER," and **LUMOS & ASSOCIATES,** hereinafter referred to as "CONSULTANT." OWNER intends to complete the Project(s) as described in *Attachment A* and as amended from time to time, hereinafter referred to as the "Project."

1.0 BASIC SERVICES

The CONSULTANT shall perform the following tasks and additional services as may be included from time to time by Additional Services Addendums (ASAs) to this Agreement in accordance with Paragraph 4.2:

> Services as described in Attachment "A," correspondence from Consultant dated July 8, 2020, basically consisting of professional services for work related to the evaluation of golf course cart paths at the Owner's Mountain Golf Course.

All documentation, drawings, reports and invoices submitted for this project will include IVGID Purchase Order Numper 21-0032.

2.0 OWNER'S RESPONSIBILITIES

OWNER shall do the following in a timely manner so as not to delay the services of CONSULTANT:

2.1 Designate in writing a person to act as OWNER's representative with respect to services to be rendered under this Agreement. Such person shall have complete authority to transmit instructions, receive information, and interpret and define OWNER's policies and decisions with respect to CONSULTANT's services for the PROJECT.

2.2 Assist CONSULTANT by placing at CONSULTANT's disposal existing data, plans, reports and other information known to, in possession of, or under control of OWNER which are relevant to the execution of CONSULTANT's duties on the PROJECT. Also, provide all criteria and full information as to OWNER's requirements for the Project, including design criteria, objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations.

2.3 Provide "Measured Drawings" for project.

3.0 PERIODS OF SERVICE

3.1 **General.** The provisions of Section 3 and the various rates of compensation for CONSULTANT's services provided for elsewhere in this Agreement have been agreed to in anticipation of the orderly and continuous progress of the Project through completion of the Services contained herein. CONSULTANT's obligation to render services hereunder will extend for a period which may reasonably be required for the performance of CONSULTANT's services and required extensions thereto. If specific periods of time for rendering services are set forth or specific dates by which services are to be completed are provided and if such dates are exceeded through no fault of CONSULTANT, all rates, measures, and amounts of compensation provided herein shall be subject to equitable adjustment.

3.2 It is agreed that time is of the essence and the Project shall be completed by no later than October 15, 2020.

4.0 PAYMENT TO CONSULTANT

4.1 Methods of Payment for Services and Expenses of CONSULTANT

4.1.1 Compensation Terms Defined

4.1.1.1 "Per Diem" shall mean an hourly rate(s) as indicated in Attachment "A" to be paid to CONSULTANT as total compensation for each hour(s) of each employee of CONSULTANT work(s) on the Project, plus Reimbursable Expenses.

4.1.1.2 "Reimbursable Expenses" shall mean the actual expenses incurred directly or indirectly in connection with the Project, including, but not limited to subconsultants or SubCONSULTANT costs, transportation and subsistence incidental thereto, obtaining bids or proposals from CONSULTANT(s), toll telephone calls, express mail and telegrams, reproduction of Reports, Drawings, Specifications, Bidding Documents, and similar Project-related items in addition to those required under Section 1. In addition, Reimbursable Expenses will also include expenses incurred for main frame computer time and other highly specialized equipment, including photographic production. Reimbursable Expenses will include a ten percent (10%) markup over CONSULTANT's cost.

4.1.2 **Basis and Amount of Compensation for Basic Services.** Compensation shall be as indicated in Attachment "A", with a Not to Exceed amount of **Twenty-Seven Thousand Five Hundred Dollars ($27,500.00).**

4.2 Basis and Amount of Compensation for Additional Services

Compensation for Additional Services shall be on the basis of Per Diem or Lump Sum, to be agreed upon at the time of request for Additional Services. The estimated amount of Additional Services will be determined at the time the Additional Services are requested.

4.3 Intervals of Payments

Payments to CONSULTANT for Basic and Additional Services rendered and Reimbursable Expenses incurred shall be made once every month by OWNER. CONSULTANT's invoices will be submitted once every month and will be based upon total services completed at the time of billing. OWNER shall make prompt payments in response to CONSULTANT's invoices.

4.4 Other Provisions Concerning Payments

4.4.1 If OWNER fails to make any payment due CONSULTANT for services and expenses within 30 days after receipt of CONSULTANT's statement, the amounts due CONSULTANT will be increased at the rate of one percent (1%) per month from date of OWNER's receipt of invoice.

4.4.2 If the Project is suspended or abandoned in whole or in part for more than 90 days, CONSULTANT shall be compensated for all services performed prior to receipt of written notice from the OWNER of such suspension or abandonment, together with Reimbursable Expenses then due.

4.4.3 If any items in any invoices submitted by CONSULTANT are disputed by OWNER for any reason, including the lack of supporting documentation, OWNER may temporarily delete the disputed item and pay the remaining amount of the invoice. OWNER shall promptly notify CONSULTANT of the dispute and request clarification and/or remedial action. After any dispute has been settled, CONSULTANT shall include the disputed item on a subsequent regularly scheduled invoice or on a special invoice.

5.0 GENERAL CONSIDERATIONS

5.1 Termination

5.1.1 This Agreement may be terminated in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this Agreement through no fault of the terminating party. However, no termination for default may be initiated unless the other party is given a ten (10) calendar day cure period after written notice (delivery by certified mail, return receipt requested) of intent to terminate.

5.1.2 This Agreement may be terminated in writing (delivered by certified mail, return receipt requested) by OWNER for its convenience.

5.1.3 Upon any termination, CONSULTANT shall (1) promptly discontinue all Services affected (unless a termination notice from OWNER directs otherwise); and (2) deliver or otherwise make available to OWNER upon full payment for services rendered to the date of termination, all documents, data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by CONSULTANT in performing this Agreement, whether such materials are completed or in process. All payments due CONSULTANT at termination shall be made by OWNER.

5.2 Ownership of Documents

The original documents, plans, electronic files, studies or reports prepared under this Agreement, for which the OWNER pays compensation to the CONSULTANT, except working notes and internal documents, shall become and remain the property of the OWNER, and upon payment of said compensation shall be surrendered to the OWNER upon the completion of the Work under this Agreement or on the completion of specific phases of the Work, if requested by the OWNER. The CONSULTANT may retain copies of said Work in their files, but such Work shall not be released to any other party or reused by the CONSULTANT without the express written consent of the OWNER. Reuse of any of these drawings, specifications or other work products of the CONSULTANT by the OWNER for other than the specific project covered in this Agreement without the written permission of the CONSULTANT shall be at the OWNER's risk; provided that the CONSULTANT shall not be liable for any claims or damages arising out of such unauthorized reuse by the OWNER or by other's actions through the OWNER.

5.3 Professional Liability Insurance

5.3.1 CONSULTANT shall maintain professional liability insurance for protection against claims arising out of performance of services under this Agreement caused by negligent acts, errors, or omissions for which "PROFESSIONAL SERVICES" is legally liable for a period of five (5) years thereafter, if available and reasonably affordable. The professional liability policy shall provide a minimum coverage of $1,000,000. CONSULTANT shall maintain the existing retroactive date on all future policies with the same insurance company and attempt to do so if CONSULTANT changes insurance companies. In the event that CONSULTANT goes out of business during the instant period, CONSULTANT shall purchase, at the request of OWNER, an extended reporting period.

5.3.2 Should CONSULTANT's normal professional liability coverage be less than the minimum required amount, CONSULTANT may purchase project insurance or obtain a rider on his normal policy in an amount sufficient to bring CONSULTANT's coverage up to minimum requirements.

5.4 Controlling Law

This Agreement is to be governed by and construed in accordance with the Laws of the State of Nevada.

5.5 Successors and Assigns

5.5.1 The parties hereby bind their respective partners, successors, executors, administrators, legal representatives, and, to the extent permitted by Paragraph 5.5.2, their assigns, to the terms, conditions, and covenants of this Agreement.

5.5.2 Neither OWNER nor CONSULTANT shall assign, sublet, or transfer any rights under or interest in this Agreement (including, but without limitation, monies that may become due or monies that are due) without the written consent of the other, except to the extent that any assignment, subletting or transfer is mandated by law or the effect of this limitation may be restricted by law.

Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement. Nothing contained in this paragraph shall prevent CONSULTANT from employing such independent professional associates, subCONSULTANTs, and consultants as CONSULTANT may deem appropriate to assist in the performance of Services.

5.5.3 Except as may be expressly stated otherwise in this Agreement, nothing under this Agreement shall be construed to give any rights or benefits in this Agreement to anyone other than OWNER and CONSULTANT, and all duties and responsibilities undertaken pursuant to this Agreement will be for the sole and exclusive benefit of OWNER and CONSULTANT and not for the benefit of any other party.

5.6 Dispute Resolution

This Agreement to engage in alternate dispute resolution ("ADR") pursuant to NRS 338.150 and any other Agreement or consent to engage in ADR entered into in accordance herewith as provided in this Section 5.6 will be specifically enforceable under the prevailing Nevada law in the Second Judicial District Court of the State of Nevada in and for the County of Washoe. Any dispute arising under this contract will be sent to mediation. Any mediation shall occur in Incline Village, Washoe County, Nevada. The mediation shall be conducted through the American Arbitration Association (AAA) and be governed by the AAA's Mediation Procedures.

The mediator is authorized to conduct separate or ex parte meetings and other communications with the parties and/or their representatives, before, during and after any scheduled mediation conference. Such communications may be conducted via telephone, in writing, via email, online, in person or otherwise.

OWNER and CONSULTANT are encouraged to exchange all documents pertinent to the relief requested. The mediator may request the exchange of memorandum on all pertinent issues. The mediator does not have the authority to impose a settlement on the parties but such mediator will attempt to help OWNER and CONSULTANT reach a satisfactory resolution of their dispute. Subject to the discretion of the mediator, the mediator may make oral or written recommendations for settlement to a party privately, or if the parties agree, to all parties jointly.

OWNER and CONSULTANT shall participate in the mediation process in good faith. The mediation process shall be concluded within sixty (60) days of a mediator being assigned.

In the event of a complete settlement of all or some issues in dispute is not achieved within the scheduled mediation session(s), the mediator may continue to communicate with the parties, for a period of time, in an ongoing effort to facilitate a complete settlement. Any settlement agreed upon during mediation shall become binding if within thirty (30) days after the date that any settlement agreement is signed, either the OWNER or CONSULTANT fails to object or withdraw from the agreement. If mediation shall be unsuccessful, either OWNER or CONSULTANT may then initiate judicial proceedings by filing suit. OWNER and CONSULTANT will share the cost of mediation equally unless agreed otherwise.

5.7 Equal Employment and Non-discrimination

In connection with the Services under this Agreement, CONSULTANT agrees to comply with the applicable provisions of State and Federal Equal Opportunity statutes and regulations.

5.8 Indemnification

Indemnification of OWNER by CONSULTANT: CONSULTANT agrees to indemnify and hold OWNER and each of its officers, employees, agents and representatives harmless from any claims, damage, liability or costs (including reasonable attorneys' fees and costs of defense) stemming from this project to the extent such claims, damage, liability or costs are caused by CONSULTANT's negligent acts, errors or omissions or by the negligent acts, errors or omissions of CONSULTANT's subconsultants, agents, or anyone acting on behalf of or at the direction of CONSULTANT.

CONSULTANT's obligation to hold harmless and indemnify OWNER shall include reimbursement to OWNER of the loss of personnel productivity, incurred as a result of that defense. Reimbursement for the time spent by OWNER's personnel shall be charged to CONSULTANT at the then-current rate charged for such services by the private sector.

Indemnification of CONSULTANT by OWNER: OWNER agrees to indemnify and hold CONSULTANT and each of its officers, employees, agents and representatives harmless from any claims, damage, liability or costs (including reasonable attorneys' fees and costs of defense) stemming from this project to the extent such claims, damage, liability or costs are caused by OWNER's acts, errors, or omissions or by the negligent acts, errors, or omissions of the OWNER's subconsultants, agents or anyone acting on behalf of, or at the direction of, the OWNER.

OWNER's obligation to hold harmless and indemnify CONSULTANT shall include reimbursement to CONSULTANT of the loss of personnel productivity, incurred as a result of that defense. Reimbursement for the time spent by CONSULTANT's personnel shall be charged to OWNER at the then-current rate charged for such services by the private sector.

Notwithstanding anything contained herein to the contrary, Nevada's comparative negligence doctrine shall apply to both OWNER and CONSULTANT. In addition, nothing herein shall prevent OWNER or CONSULTANT from relying upon any Nevada statute or case law that protects OWNER or CONSULTANT with respect to liability or damages. This Provision shall survive the termination, cancellation or expiration of the Agreement.

5.9 Changes and Modifications

The parties agree that no change or modification to this Agreement, or any attachments hereto, shall have any force or effect unless the change is reduced to writing, dated, and made a part of this Agreement. The execution of the change shall be authorized and signed in the same manner as this Agreement.

5.10 Licenses

CONSULTANT shall have a Washoe County business license, and all appropriate CONSULTANT's licenses and certifications for the services to be performed.

5.11 Severability

In the event any provision of this Agreement shall be held invalid and unenforceable, the remaining provisions shall be valid and binding upon the parties.

5.12 Waiver

One or more waivers by either party of any provision, term, condition, or covenant shall not be construed by the other party as a waiver of a subsequent breach of the same by the other party.

5.13 Extent of Agreement

This Agreement, including all Exhibits, and any and all amendments, modifications, and supplements duly executed by the parties in accordance with this Agreement, govern and supersede any and all inconsistent or contradictory terms, prior oral or written representations or understandings, conditions, or provisions set forth in any purchase orders, requisition, request for proposal, authorization of services, notice to proceed, or other form or document issued by OWNER with respect to the Project or CONSULTANT's services.

IN WITNESS WHEREOF, the parties hereto have set their hands the day and date of the year first set forth above.

OWNER:
INCLINE VILLAGE G. I. D.

Agreed to:

By: _____ 8/24/20
Indra Winquest
General Manager

Address for Giving Notice:
Incline Village GID
893 Southwood Boulevard
Incline Village, NV 89451

CONTRACTOR:

Agreed to:

By: _____ 08-20-2020
Sign AND Print or Type Name
Steven G. Moon
Construction Division Director

Attest:

_____
Sign AND Print or Type Name
Brian Harer
Project Manager - Construction Division

If CONTRACTOR is a Corporation, attach evidence of authority to sign.

Address for Giving Notice:
Lumos and Associates
9222 Prototype Drive
Reno, NV 89521

Washoe County
Business License No. W039803A-LIC

CORPORATE RESOLUTION
OF
LUMOS HOLDING INC.

We the undersigned, being of Lumos Holding Inc., organized and existing under the laws of Nevada, and having its principal place of business at 9222 Prototype Drive, Nevada 89521 (the "Corporation"), hereby certify that the following is a true and correct copy of a resolution adopted at a meeting of the Corporation duly held and convened on October 22, 2019, at which a quorum of the Board of Directors was present and voting throughout, and that such resolution has not been modified, rescinded or revoked, and is at present in full force and effect:

Therefore, it is resolved:

The Board of Directors authorizes the employees in the following positions to sign proposals, contracts, addendums, sub-consultant agreements, and purchase orders:

- CEO
- COO
- Principal
- Division Director

Individuals are authorized to sign proposals, contracts, addendums, and sub-consultant agreements, utilizing Corporation standard documents up to $100,000:

- Tim Russell
- Mitch Burns
- Dean Neubauer
- Michelle Gamble
- David Crook

Attest

Craig Wesner
President

11/15/20
Date

Certificate of Secretary

The Secretary of the Corporation hereby certifies that he is duly elected and qualified Secretary of Lumos Holding Inc. and certifies that the above is true and correct record of the resolution that was duly adopted by the Corporation on October 22, 2019.

Thomas Young
Secretary

10/22/19
Date

LUMOS & ASSOCIATES

Carson City • Fallon • Lake Tahoe • Reno

www.lumosinc.com

Reno
9222 Prototype Drive
Reno, Nevada 89521
775.827.6111

July 8, 2020

LA20.481

Mike Lefrancois, P.E., Senior Engineer
Incline Village General Improvement District – Public Works
1220 Sweetwater Road
Incline Village, Nevada 89451

Subject: **Incline Village General Improvement District – Mountain Golf Course Pathway Evaluation**

Dear Mike:

Lumos and Associates, Inc. (Lumos) is pleased to provide you with this proposal for professional services for the work related to the evaluation of the Mountain Golf Course pathway system maintained by the Incline Village General Improvement District (IVGID).

Project Understanding

The scope of services included in this proposal has been developed with the goal of compiling recommendations and a preliminary cost estimate for maintenance or rehabilitation of the existing Mountain Golf Course pathway system.

We propose the following tasks to assist you with your project.

Project Scope

Task 1 – Pathway Evaluations

Lumos will perform a pavement evaluation of the existing conditions. This assessment will include evaluation of existing asphalt pavement distresses, previous surface treatments, golf cart ride quality, drainage facilities, BMP evaluation, impacts from tree roots and groundwater springs, slope failure, irrigation issues, access restrictions, and asphalt concrete curbing. This task includes two (2) coordination meetings with IVGID and Mountain Golf Course staff.

Task 2 – Pathway Bridges Structural Evaluation

Lumos will perform a visual inspection to assess the condition of the three bridges, including the bridge decks, superstructure components, and abutments. A report summarizing the results of our inspection will be prepared and will include general recommendations for repair and/or replacement and an associated budgetary cost estimate.

Task 3 – Geotechnical Investigation

For the current scope of work, we propose a field investigation that will consist of approximately eight (8) to ten (10) core excavations within the area proposed for maintenance/reconstruction. Lumos will collect samples of each soil type encountered within the core excavation and document the existing pavement structural section. We understand Lumos will provide the coring services.

Lumos & Associates, Inc. herein proposes to provide laboratory testing on the samples collected. Additionally, we propose to perform engineering analyses and calculations and develop a report that will discuss the site conditions, field and laboratory test data, and our conclusions and recommendations from a geotechnical perspective. Our Geotechnical Investigation will be supervised by a Registered Professional Engineer in the State of Nevada and will specifically include the following services:

Field Investigation will include:

- Identification of All Corehole Locations
- Soil Sampling/Coring

Laboratory analysis may include:

- Atterberg Limits
- R-Value
- Grain Size Analysis (including fines and moisture content

Report, Recommendations, and Conclusions:

- Table of Contents
- Project Location, Background, and Purpose
- Exploration Logs and Maps
- Site Conditions
- Field Investigation
- Soil Types and Classifications
- Laboratory Test Results
- Site Preparation Recommendations
- Pavement Structural Design & Recommendations
- Construction Procedures
- Ground Water Depth, if Encountered
- Slope Stabilization Recommendations

Task 4 – Design Memorandum and Preliminary Cost Estimate

Lumos will prepare a design memo which will summarize the findings for the pathway system, including pavement condition, ride quality, pathway widths, adjacent slopes, tree impacts, irrigation issues, and drainage facilities. Utilizing guidance provided by USGA, GCSAA, ASGCA, and local design standards, Lumos will provide pavement maintenance improvement or reconstruction recommendations, anticipated design effort, and discussion on constructability of the proposed

improvements. Based on these findings, Lumos will also provide recommendations on project phasing and prepare a preliminary cost estimate.

Assumptions / Exceptions

Lumos has made the following assumptions in preparation of this proposal:

- IVGID will provide access to all facilities to be included in the assessment.
- This scope does not include any bid documents, design plans, survey, permitting or related work.
- This scope does not include preparation of structural repair documents.
- This scope does not include any soil and/or groundwater contamination evaluation at the site.
- This scope does not include an investigation of impacts to existing irrigation facilities.
- The work can be completed within 4-5 weeks once authorized to proceed.

Fees

The tasks described in the Scope of Work will be completed for the following fees:

Task	Description	Fee
Task 1	Pathway Evaluations	$ 7,800
Task 2	Pathway Bridges Structural Evaluation	$ 6,500
Task 3	Geotechnical Investigation	$ 7,200
Task 4	Design Memo & Preliminary Cost Estimate	$ 6,000
	Total:	$ 27,500

Tasks 1 through 4 are time and materials (T&M) not to exceed without prior authorization. Lumos will be happy to amend this proposal as necessary to include services not included or to amend the proposed services to better match the scope of services required by IVGID. Thank you again for allowing Lumos to provide you with this proposal. Please do not hesitate to contact myself or Steve Moon at 775.827.6111 if you have questions or concerns as we would happy to discuss them with you.

Sincerely,

Brian Harer
Project Manager, Construction Division

Steven G. Moon, P.E.
Director, Construction Division

ADDITIONAL SERVICES ADDENDUM (ASA) #1
to SHORT FORM AGREEMENT dated August 19, 2020
between
INCLINE VILLAGE GENERAL IMPROVEMENT DISTRICT
and
LUMOS & ASSOCIATES, INC.
for PROFESSIONAL SERVICES

This ASA, dated date, shall amend the referenced agreement to include the following project with relevant description, compensation, and schedule addressed herein.

PROJECT DESCRIPTION

Consultant shall provide engineering and related services for Phase 1 of the Mountain Golf Course Cart Path Reconstruction Project. Work is more fully described in the attached Exhibit A, Consultant's Proposal for Engineering Services, dated March 1, 2021.

PAYMENT TO CONSULTANT

Payment to be as follows:

1. Task 1 will be billed as a Lump Sum fee.
2. Tasks 2 and 3 will be billed on a Time and Materials basis, with total not to exceed amounts of $39,800 and $4,300, respectively.
3. Tasks 4 and 5 will be billed under the allowance amounts indicated on Consultant's Proposal, at $5,000 and $1,000, respectively.
4. All invoices and correspondence are to reference PO TBD.
5. Total Not to Exceed amount of this work will be $75,100.00.

PERIOD OF SERVICE

It is anticipated that services shall be begin on or about March 11, 2021 and be substantially completed by July 14, 2021.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first written above.

OWNER:
INCLINE VILLAGE G. I. D.
The undersigned has read, reviewed and approves this document

By: _____
Joshua Nelson
District General Counsel

_____
Date

Agreed to:

_____
Indra Winquest
IVGID General Manager

_____
Date

Owner's address for giving notice:
INCLINE VILLAGE G. I. D.
893 Southwood Boulevard
Incline Village, Nevada 89451
775-832-1267- Engineering Div. Phone

CONTRACTOR:
LUMOS & ASSOCIATES, INC.
Agreed to:

By: _____
Signature of Authorized Agent

_____
Print or Type Name and Title

_____
Date

If Contractor is a corporation, attach evidence of authority to sign.

Contractor's address for giving notice:
Lumos & Associates, Inc.
9222 Prototype Drive
Reno, Nevada 89521

LUMOS & ASSOCIATES

Carson City • Fallon • Lake Tahoe • Reno

www.LumosInc.com

Lake Tahoe
225 Kingsbury Grade, Suite A | P.O. Box 3570
Stateline, Nevada 89449
775.588.6490

March 1, 2021

Via email: npc@ivgid.org

Mr. Nathan Chorey, P.E.
Incline Village GID
1220 Sweetwater Road
Incline Village, NV 89451

Subject: ***Mountain Golf Course Cart Path Reconstruction – Phase 1***
Proposal for Engineering Services (LA21.138)

Dear Mr. Chorey:

Lumos and Associates, Inc. is pleased to provide you with this proposal for engineering and related services for Phase 1 of the Mountain Golf Course Cart Path Reconstruction Project (Project).

Project Understanding

The proposed project is located on an approximately 68.22 acre site (APNs: 128-351-01, 128-352-01, 128-220-02), located at 690 and 687 Wilson Way, Incline Village, NV 89451. It is our understanding that the scope of work for this project is to design a phased approach to a complete cart path reconstruction project, as recommended under Alternative #2 in the Pavement Evaluation & Recommendations report prepared by Lumos & Associates, dated February 2021. Full reconstruction of the cart path system would allow for better control of construction methods for a uniform pavement section, increasing the service life of the path, while providing an economy of scale with construction quantities as opposed to a spot repair approach. The project will also involve cart path circulation improvements in six locations in order to improve circulation of golf cart traffic and will also include implementation of best management practices (BMPs) for water quality.

Mountain Golf Course Cart Path Reconstruction – Phase 1 includes preparation of a base map and preliminary engineering drawings (50% Design) for the entire Mountain Golf Course cart path system. These drawings will then be submitted to Incline Village General Improvement District (IVGID) for review and utilized to identify a portion of the project than can be constructed in Fall 2021. Existing pavement condition, site access, permitting, IVGID budget, and impacts to the golf course will be studied to determine the exact limits of the Project. It is anticipated that improvements exceeding the thresholds defined in IVGID's Memorandum of Understanding (MOU) with TRPA will be constructed in future phases so that permitting requirements do not delay Phase 1 work.

We propose the following tasks to assist you with your project:

Project Scope

Task 1 – Topographic Mapping

Lumos will prepare a Topographic Survey Map at 1" = 20' scale with 1 foot contour interval accuracy in accordance to National Map Accuracy Standards for the area indicated on the attached exhibit. The total area to be surveyed consists of approximately 14,600 lineal feet of cart path corridor, covering the entire golf course cart path system. The survey will be conducted by conventional

ground based surveying methods. Contours and a surface model will be generated in the Civil3D format.

In addition, the entire 68-acre site will be flown and photographed by a fixed wing aircraft to create a digital orthophoto and to allow for mapping expansion beyond the cart path corridor as may be needed.

Control for the project will be referenced to the Nevada Coordinate System, West Zone, NAD83, modified to ground, and the vertical datum for the project will be referenced to NAVD88. Parcel boundaries and right-of-way lines will be shown from available GIS information. This scope of services does not include any boundary survey work or the placement of property corners. Deliverables for this project will be a portable document format file (.pdf) and an AutoCAD file of the survey map and the orthophoto image file.

The topographic mapping will be completed under this phase for the multi-phase cart path reconstruction project. It is anticipated that additional survey will not be needed to design future phases of the project.

Task 2 – Civil Improvement Plans

This task will include preparation of civil construction drawings in a phased approach. As requested, we will prepare 50% design plans for the reconstruction of the entire cart path system and all proposed realignments for circulation improvements, along with selected BMPs identified in the Pavement Evaluation & Recommendations report. We will submit these plans to IVGID for review and comment. We will address one round of IVGID review comments on the full plan set and consider these 60% design plans.

We will review the 50% design documents with IVGID in order to determine the limits for the initial phase of a two or three phase construction project. We will incorporate IVGID review comments and progress the first phase of improvements to 100% design for review by Washoe County and IVGID for permitting of the project improvements. 100% design for subsequent phases of construction will be provided under a separate scope of services. The drawings will be prepared on 24"x36" format sheets and at a standard engineering scale as required by Washoe County. Engineer's estimates of probable construction costs will be provided for the 50% design of the entire cart path system and for the 100% design of Phase 1 improvements.

Construction drawings will include the in-place cart path reconstruction areas, select BMP improvements, and proposed cart path realignments for circulation improvements. Dimensions and grading will be provided as required for construction. The design or relocation of any utilities, including irrigation lines is not included in this fee proposal.

Task 3 – Bid Assistance – Phase 1

Under this task, Lumos will prepare bid/contract documents for contractor bidding for the first phase of construction. Bid documents will include technical specifications and bid items descriptions as necessary for Phase 1 of construction. We will also provide assistance with public project advertisement, bid evaluation, recommendation for award. Lumos will also be available to answer bidder questions during the bid phase. Shop drawing review, plan revisions, field changes, and other

construction services are not included, but can be included in a separate construction services proposal.

Task 4 – TRPA Compliance & Permitting
Under this task, Lumos will provide all TRPA required submittals, coordination, mapping, checklists, and notifications required for the proposed project. Washoe County coordination and processing of requested revisions of the civil improvement plans will be completed under this task. This scope includes mapping of land classification, land capability, and coverage, BMP infiltration calculations (if necessary), permitting requirements, and submittals required for qualified exempt work.

Due to the uncertainty in earth disturbance quantities and permitting requirements, the efforts required under this task cannot be anticipated and will be performed on a time and materials (T&M) basis, with an initial allowance of $5,000. Services provided under this task are only to be performed at the direction of IVGID.

Task 5 – Reimbursables
Any fees or other associated project costs incurred by Lumos and Associates to obtain copies of previous plans or reports, additional mapping, permit fees paid by Lumos, or other unforeseen reimbursable expenses will be billed under this task at cost plus 15%. Additional production of plans and specifications as requested by the client will also be billed under this task on a time and materials basis in accordance with our current fee schedule.

Deliverables
The following are the deliverables identified for each respective task:

- Task 1 – Orthophoto and Base Map (PDF & .dwg)
- Task 2 – 50% Design Documents (drawings only) of entire cart path system (PDF & .dwg)
  – 100% Design Documents of Phase 1 Project (PDF, .dwg, and Word documents)
  – Written response to 50% Design comments (PDF)
- Task 3 – Final bid documents
- Task 4 – No deliverables
- Task 5 – Receipts for services rendered

Assumptions / Exceptions
Lumos has made the following assumptions in preparation of this proposal:

- Proposed improvements will be located entirely within APNs 128-351-01, 128-352-01, 128-220-02.
- Any proposed TRPA land coverage purchase, sale, or transfer is excluded.
- Submittals to agencies other than IVGID, Washoe County and TRPA are excluded.
- This scope does not include preparation of a drainage report.
- Utility extensions are not included in the scope of this proposal.
- Landscape, irrigation, lighting and electrical design are excluded from this proposal.
- Documents will include a performance specification to ensure Contractor is responsible for impacts cause by Project.
- Design of underground storm drain improvements, retention, or detention areas is not included in this proposal.
- IVGID will provide boiler plate general conditions and contract documents for bidding purposes.

- IVGID will award and manage the project during construction. Otherwise, Lumos can provide a separate proposal for these services.
- This proposal does not include scope for construction administration/assistance/management, construction staking, inspection, or materials testing.

Fees

The tasks described in the Scope of Work will be completed for the following fees:

Task	Description		Fee
Task 1	Topographic Mapping	Lump Sum	$25,000
Task 2	Civil Improvement Plans	T&M (NTE)	$39,800
Task 3	Bid Assistance - Phase 1	T&M (NTE)	$4,300
		Total:	**$69,100**
Task 4	TRPA Compliance & Permitting	Allowance	$5,000
Task 5	Reimbursables	Allowance	$1,000

Task 1 will be a Lump Sum fee, Tasks 2 and 3 will be billed on a T&M basis, with a not-to-exceed amount as indicated above. Tasks 4 and 5 will be performed as directed by IVGID and billed under the allowance amounts indicated. Receipts will provided for reimbursable expenses incurred under Task 5.

The Project is anticipated to proceed in accordance with the attached schedule. Please understand that this schedule may vary due to weather, extents of project limit defined under Phase 1, permitting requirements, or other unforeseen circumstances. If this proposal is acceptable, please execute the attached contract and provisions and return the same to our office. Any additional services requested but not covered by this Scope of Work can be provided by an amendment to this proposal. The attached Standard Provisions of Agreement are a part of this proposal.

Lumos and Associates, Inc. will send monthly progress billings on this project. The amount of these billings will be based upon the percentage of work completed. The terms are 'Due Upon Receipt' and accounts are past due after 30 days. Accounts over 30 days old will be subject to interest at the rate of 1 ½% per month and such collection action as may be necessary to collect the account. In addition, a "Stop Work Order" may be issued on past due accounts. In this case, no further work will be performed until the account is brought current.

Thank you again for allowing Lumos and Associates to provide you with this proposal. Please do not hesitate to call me if you have questions.

Sincerely,

Justiin Sand, P.E.
Project Manager

Tim Russell, P.E.
Director of Engineering

Mon 3/1/21

IVGID

Mtn Golf Course Cart Path Reconstruct - Phase 1, Tentative Schedule

ID	Task Name	Duration	Start	Finish
1	**Mtn Golf Course Cart Path Reconstruction**	**157 days**	**Thu 3/11/21**	**Fri 10/15/21**
2	**Design**	**60 days**	**Thu 3/11/21**	**Wed 6/2/21**
3	Notice to Proceed	0 days	Thu 3/11/21	Thu 3/11/21
4	Prepare Base Map	35 days	Thu 3/11/21	Wed 4/28/21
5	Prepare 50% Design Documents	15 days	Thu 4/15/21	Wed 5/5/21
6	IVGID Review	5 days	Thu 5/6/21	Wed 5/12/21
7	100% PS&E	10 days	Thu 5/13/21	Wed 5/26/21
8	IVGID Review	5 days	Thu 5/27/21	Wed 6/2/21
9	**Permitting**	**10 days**	**Thu 5/27/21**	**Wed 6/9/21**
10	Wahoe County Grading Permit	10 days	Thu 5/27/21	Wed 6/9/21
11	TRPA QE Permit (if necessary)	10 days	Thu 5/27/21	Wed 6/9/21
12	**Bidding/Construction**	**97 days**	**Thu 6/3/21**	**Fri 10/15/21**
13	Prepare Bid Documents	5 days	Thu 6/3/21	Wed 6/9/21
14	Bid Project	25 days	Thu 6/10/21	Wed 7/14/21
15	Addendum	0 days	Thu 7/8/21	Thu 7/8/21
16	IVGID Review	4 days	Thu 7/15/21	Tue 7/20/21
17	Board Documents Due	0 days	Tue 7/20/21	Tue 7/20/21
18	IVGID Board Meeting - Award	0 days	Wed 7/28/21	Wed 7/28/21
19	Construction	29 days	Tue 9/7/21	Fri 10/15/21