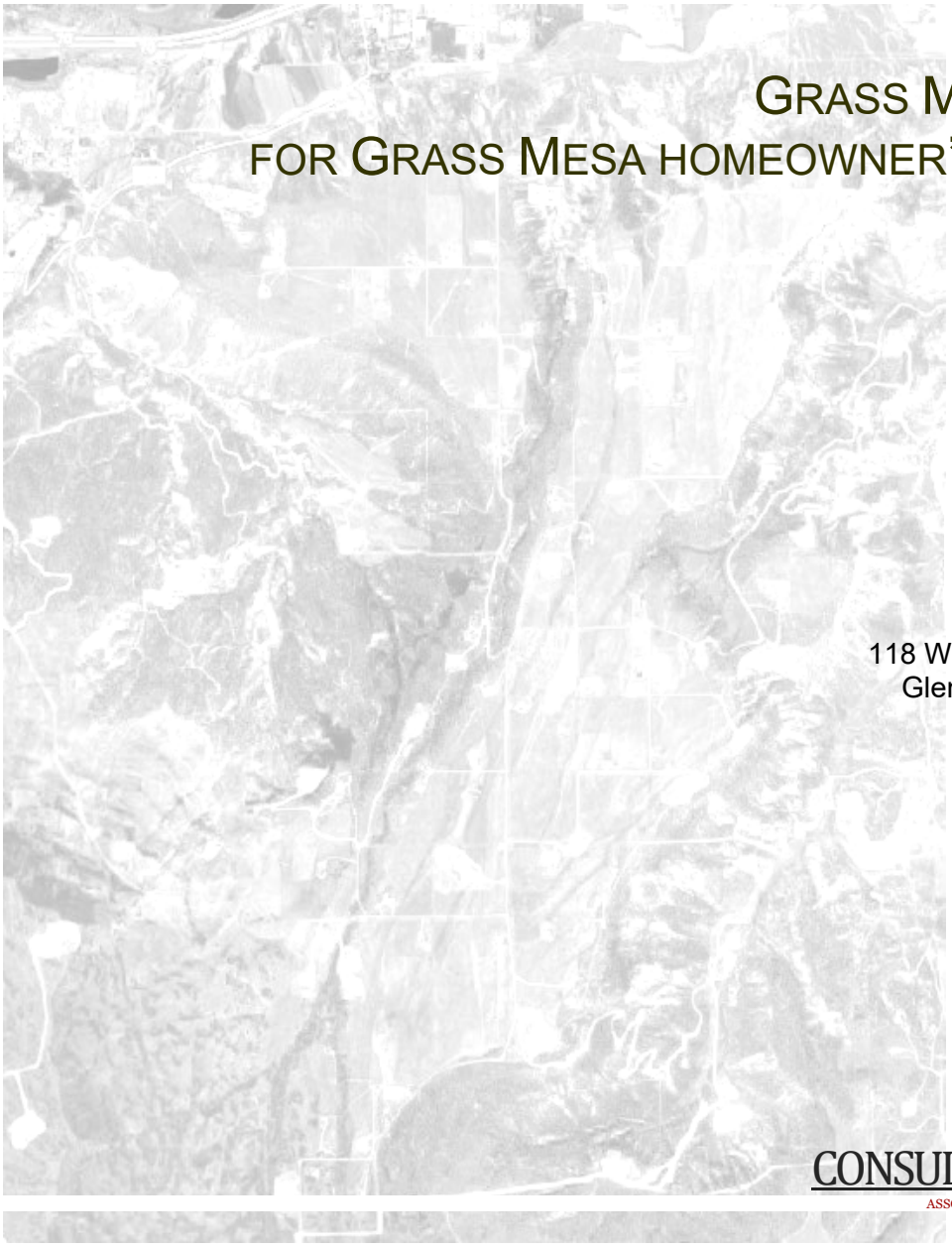
SHARED ROADWAY MASTERPLAN ASSESSMENT



GRASS MESA ROADWAY
FOR GRASS MESA HOMEOWNER'S ASSOCIATION

April 2019

Prepared by

SGM

118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004
970.945.5948 fax

PROVIDED VIA

ELK PEAKS
CONSULTING GROUP, LTD.
ASSOCIATION & PROPERTY MANAGEMENT SPECIALISTS

MASTERPLAN ASSESSMENT

GRASS MESA ROADWAY AND ACCESS ROADS

PREPARED BY

RICK BARTH, PE
CHIP FISHER, EI

REVIEWED BY

JEFF SIMONSON, PE

SGM Project # 2018-535

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

1.0 Executive Summary

This is to present our findings for the Grass Mesa Roadway master plan analysis. Our directive was to review the many issues on the roadway and provide recommendations and engineering details, but short of field survey, topographic information or plan and profiles.

Secondly, we provide estimated pricing for the various site-specific elements.

Thirdly, we looked at the various roads on the Mesa that would be inherited for maintenance by the HOA whenever the oil and gas companies fulfill their permits and “pull out” of the area. Included are also a list of questions to consider whenever that may occur.

Fourthly, we provide some general, “overall” possibilities for roadway improvement with pricing if, for no other reason, sound comparison of options.

Excluded from our approach is that a full, reworked roadway, with new alignment and grading was not undertaken. Reasons are the substantial expense such a project would require to construct as well as coordination with BLM or other property owners for potential access easement adjustments. For example, a rough estimate is $750,000 to $1,000,000 to re-construct new roadway in those areas where the steepness appears to well exceed 12% slope, which is a common, maximum slope for our region. Some segments may need to be lengthened by 300 feet or more, requiring more space, easement acquisition, construction through rock outcrops, and engineering associated with such an endeavor.

Our goal was to provide improvement guidelines that are priceable and an associated improvement plan so the HOA can budget and plan accordingly for elements within the current right of way and general roadway corridor. The finished product is a report describing the various investigations and general recommendations with mapping and a checklist so a contractor and the Board may review and “check” the items to be priced and worked upon.

This report contains the narrative in the following pages, some general thought considerations and commentary, and a reference table for spot maintenance and improvements. That table is duplicated on the reference drawing sheets.

Estimates are given with certain parameters discussed later. Prices are related to costs we have encountered for downvalley work in the last couple of years, but it is worth noting that prices have been steadily increasing with the more recent economic upturn.

2.0 Review Process and Field Investigation

We began with a thorough field investigation, documentation, and 100+ photographs to establish our mapping exercise.

We documented the more than 25 critical areas for some sort of improvement, listed on the table at the end of the report keeping in mind the details and reference material needed for a contractor to provide appropriate pricing and timeframes. The mapping notes and details should all reference each other. We also did an overview of the upper Mesa roads and saw very little of immediate concern.

For ease of future use, the table in the report that is referenced from the drawings is also on the drawing itself.

The elements to consider as you review and discuss this report is the order of urgency. You could take all the elements that we have rated as “poor”, and deal with them first. Or, conversely, you could take all the similar elements, say culvert installation or earthwork and boulder stacking, as a package of work. You will likely see greater cost efficiencies with the latter and we recommend your consideration for doing so as much as is reasonable. Our recommendations at the end of the report keep this in mind. While there are elements that are poor, it did not appear that anything was of an utmost critical nature that you would be remiss to put off a year.

.

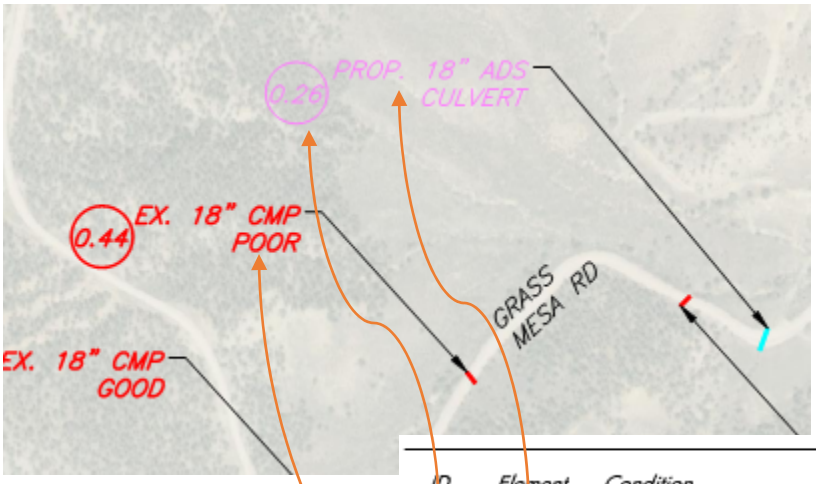
3.0 How to Read the Data

On the table we indicate the item by number, with that number referencing miles up from the CR 319 connection. Therefore item 0.07 would be 0.07 miles from the edge of paving of CR 319 according to the map. These areas are further identified on the provided mapping for location reference.

We then identify the primary issue at hand, a general condition comment, and potentially three improvements or improvement alternatives to be considered with a detail reference ID. We end with a brief description.

Finally we provide those details referenced above for contractor review. It is important to note that since we have not provided specfic engineering plans, there are no spot elevations or exact cross sections. The details should be easily appliable to the scenarios at hand, however, and the contractor should be able to provide a good estimate in combination with our report, details and descriptions, and a site visit to the locations for the work that is desired.

The plans you will notice our spot-maintenance references and some general drawing information associated with the reference table. A color-coded guide is also given. Red items note existing features that may need amendment or replacement. Pink are additional infrastructure such as culverts. Blue reflect proposed surface grading such as gravels or minor shoulder work. Gray is new asphalt or other hard surface. Green reflect more large scale grading such as road platform touch up cut/fill work. Below is a sample of how to read the data and link the various elements together. Yellow and orange refer to steep areas.



Reference Detail ID

ID	Element	Condition	Description	Details
0.26	Prop. ADS	N/A	Prop. 18" ADS culver & construct minor weir 6"-12" rock	1, 2
0.31	Ex. CMP	GOOD	Construct minor weir 6"-12" rock	2, 3
0.44	Ex. CMP	POOR	Clogged and damaged.Replace with 18" ADS & construct minor weir	1, 2, 3

4.0 SGM Assessment and General Description of Improvements

This portion of the report addresses the prescribed remedies as well as some overall improvements and their subsequent maintenance issues which should play a part in your consideration. In general, we will start with the smaller items and work our way up to the major elements.

Addressing **general vegetation (photo)** should be considered. There are many locations where the juniper and pinyon do notably block the view around bends. We recommend anything over 3 feet tall within 10 feet of the ditch be cut back or removed. Do note that much of this area coincided with steep slopes that we also recommend on cut/fill work, which would thereby already remove vegetation.

General **culvert cleaning** is warranted at several of the culverts. Shoveling and jetting is needed, along with some downstream ditch and channel cleanout (see below).

Culvert amendments include lengthening (as has already been done at location 0.77). Having no less than a three-foot overhang of the culvert from the slope, where such a grade drop is possible, should be targeted. Sufficient rock/splash block should be provided for at least 6 feet downstream of the culvert (4 times 18"). With the varying locations of culverts to consider you have associated with this varying drop to the splash zone. Field accommodation should be considered.

If a culvert extension is not feasible, installing larger rock and rip-rap around and, in particular under the drop zone of the pipe discharge point is critical to prevent under-curl erosion. The key is to establish a means of free flow of water from the outlet of the pipe mouth. When that is restricted, backup and deposition of mud and debris in the pipe occur. In short, it is a good practice to have at least a 6" drop from the mouth of a culvert to a native ditch with ample angular rock around that splash zone.

Upstream cleaning and weirs. Many of the locations had a recent ditch re-cut that was satisfactory but more permanent and intentional inlet controls are warranted for efficient flows into the pipe, thereby aiding in minimizing culvert clogging. This can be accomplished by ensuring a clear ditch section (V or trapezoidal), a vortex weir made with 6" – 12" angular rock, routing the flow with a bit of a "swing", and rip-rap at the mouth of the pipe itself. The latter elements of this recommendation were seen well at 0.31.

The weir helps re-concentrate flow to the pipe mouth, add a little energy and velocity to help flush the pipe more frequently, and protect the ditch upstream as the "V" shape acts as a level of trash collector, providing that easy to identify maintenance area which would hopefully concentrate future ditch maintenances points. The rip-rap in the "bowl" then protects the pipe mouth and helps to turn and energize the flow to aid in keeping the culverts flushed.

Regardless of noted culvert amendments above, every culvert should be sufficiently **rip-rapped** with 6"-12", angular material. It seems much of this could be sourced within the ROW for the roadway but it is worth HOA consideration (and priced below) to get a couple tandem loads of good, angular rock (roughly 20 CY).

Establishing a sound pattern of culvert rip-rap and ditch geometry makes for a good pattern for maintenance.

Downstream cleaning. Constructing an intentional flow path, with rip-rap will help significantly in allowing free flow from the culvert, hence not backing up and clogging the end. There were several culverts that seemed to just spill into native areas with very little, if any drop from mouth of pipe to free flowing area. This is a recipe for clogging the pipe.

Shoulder drainage **turnout**. Where a culvert is not applicable, some intentional drainage release points should be added. These are simple excavation efforts. There were a few locations where it seemed this either naturally or perhaps with some intentional amendment occurred. Yet these areas seemed to be fairly small and offered little flow control once leaving the roadway, hence undercutting the road platform. A detail is provided for a pattern of making sure flows get well away from the edge of road.

Adding a **new culvert** is warranted in a handful of locations. While we did not see any indications overloaded culverts, in general, good rules of thumb are to include a culvert where a notable change in ditch direction, horizontally or vertically, occurs. Even when flows are not significant, these locations are prime for removing whatever water can be pulled off and forced downstream.

All of your culverts were 18", most of which were CMP but there were at least 2 ADS (HDPE pipe) at the low end of the roadway. The soils in this region of the county are notable for corroding metal pipes, especially when frequently wet. Most of your culverts looked in fairly good shape, although we could not see the culverts that were partially full of mud and debris. HDPE pipe has no corrosion problems. While we recommend ADS for future changes, the plastic has a general weakness of the exposed ends are simply "softer" and can sometimes be more malleable to surface impacts. However, sufficient rock protection

around the ends offers a great deal of reinforcement and we account for this in the design and price.

5.0 Overall Amendment Commentary

Asphalt paving is a good option, but very pricey (see section 8). The more square-yardage you do the better the unit price, however it would still require preparation of the roadway surface. Too, any hard-paving surface will have maintenance issues in the steep slopes as it tends to tension crack (pull apart) from gravity, frost heave and slide down the grade, causing further cracks and continued wash-boarding. Our recommendation is asphalt may be worth considering on the low, flatter parking area, but not the best candidate for the roadway once you get above about a 5% slope.

Similar to asphalt **chip seal** is a good, hard surface option that may provide good winter traction. It is notably cheaper than asphalt but would likely take more frequent spot maintenance and attention, along with an occasional, likely once every 10-years re-coating on top of maintenance. Your first year would require a double coat, likely a ¾" chip with a 3/8" topping, followed by a 3/8" recoating as noted above. When doing properly, the chip gains strength with layers added.

One item to consider is with whichever of the two alternatives above you are likely then opening up to a 3rd party maintenance organization or paving company. It would be worth your consideration for such a maintenance program that should be budgeted for no less than once every 5-years to crack seal, patch potholes, etc. But that is additional, necessary expense to consider as you move forward and plan long term budget and reserve funds.

In the stretch at 1.81, you have the scenario of drainage from the road and from the sage field concentrating at the edge of road. We suggest pushing over the berm an additional 5 feet, compacting that new slope, then adding T-post reflectors for an extra wide drive lane. This would allow the drainage to get off the roadway, but then drain freely. Keeping the berm would likewise keep the sage field drainage off from this channel until they get to the beginning of the mild gulley toward the east. This is a simple solution, inexpensive, and then easy to maintain. Too, this can provide snow plowing area in front of and/or behind the reflectors with careful blade control.

For much of the roadway the general platform was generally in good condition with typical cross slopes in most areas. We understand the road was recently bladed with some fresh gravel in certain locations. Since no soil samples were taken we are not sure of the overall, average gravel thickness. A target minimum of 8" thick should be sought.

Steep slope alterations. Without topography or geotechnical information, it is difficult to get precise, but it appeared that the soils in the area did not stay together if they were steeper than 1:1 (stress / sloughing cracks can be seen in the photo at right). There are several areas where the cut slope above the roadway was sloughing off and then collecting in the ditch where steeper than this ratio. It would seem the best alternative is to lay those

slopes back to a maximum 1:1 or flatter. This will improve visibility and help reduce the negative impact these slopes have on ditch maintenance.

Those soils do not need to be wasted, however. There are several locations generally not far from a cut bank, where the spoil material can be re-utilized as **fill to widen** the road platform or help shallow a downhill fill slope. As a general guide only (geotechnical expertise would be needed) filling at 12" maximum lifts, with an edge boulder stack to that 1:1 would be desired, topping with no less than 6" of road base as your driving surface. You already have a few areas of a good downhill boulder stack that can be replicated, but a typical cross section detail is also provided on the plans. It is also likely to generate some level of rock for future rip-rap installation.

Along with this road re-grading, we do recommend reverting the slopes to a 2-4% cross slope toward the uphill slopes. Without specific topographic data, we cannot say exactly how many areas or how much square yardage this entails, but as part of this dirt work we certainly recommend contractors be aware of setting their blades to this cross slope. By visual observation only, it would seem in most locations a sliver of gravel on the inside of the turns and 6" of gravel added and compacted on the outside of turns would suffice.

For those areas where **large boulders** exist under the road surface, you will get a differential reaction on the roadway. These boulders are too large to remove and, in the end, can actually be a very stabilizing element of the roadway that you would like to keep. However, when the top of the boulder is close to the surface, one side of the road may move or washboard and the other may hump up. The best alternative, without further geotechnical consultation, would be to expose these very large boulders, drill, jackhammer, or excavate the tops off to a depth of 24", then re-compact with road-base back to the desired road grade. Most of the rock in this region of the county are breakable with such normal methods.

This exercise will better bring the road platform into a good uniformity of behavior for maintenance. In general, such an exercise is mostly labor cost and is therefore priced by day. We also recommend you keep that broken rock as it, too, could become helpful erosion control material or slope control surfacing with larger boulders (18" or greater) being reserved for soil retaining walls.

This list is not necessarily exhaustive but does cover the majority of issues you have already recognized.

The cost estimates associated with the above descriptions provided should be reviewed individually. By this we mean that if you do a collective group of tasks, for example all the culvert and rip-rap work, you would get a cheaper per-pipe price. We recommend such an approach but for the sake of budgeting, each is priced as a stand-alone exercise.

As for priority, it would seem the simple, low-hanging fruit is first worth your consideration. Vegetation removal, culvert and ditch amendments and a general culvert cleaning is certainly warranted. It could be prudent to tackle the boulder / slope reductions which would help generate some rocky material for the other tasks such as boulder stacks or ditch rip-rap, potentially saving the purchase of imported rock. If so doing, you will want to designate an area of deposition for any material not used immediately.

Too, the HOA would see long term budgetary benefit by pre-purchasing many of the materials. A whole flatbed of culvert, or a couple truckloads of angular rock stockpiled and at the ready could serve you for multiple projects or project phases. This master plan and the associated drawings afford you or a contractor to quantify all the hard elements and purchase them at once, even if you do not use all of them in one round of maintenance or improvements.

6.0 Inheriting Gas and Oil Roads

By and large the majority of the roads and culverts on the flat portions of Grass Mesa were in good condition. We assess that the principles noted on your road maintenance information, in partnership with the industry, seems to provide you a decent road network that is reasonably well maintained. In total, these roads account for 8.8 miles of two lane, gravel roads with many culverts and cross-drainages.

Without knowing a timeframe for industry pull out, it is difficult to predict maintenance at this time. As noted on the HOA homepage, at some point these roads will become HOA responsibility in total. However, it is certainly worth considering the below elements as questions for a company if any sort of re-negotiation or finalization of agreements are considered. Pending your annual meetings with Caerus, some of these may be worth bringing up now rather than all at once.

-Culvert inspection and replacement, at a minimum, jet clean the culverts and ditches.
-Ditch improvements of a similar nature to the designs in this report
-Clearing of ditch/shoulder space of shrubs for visual clarity
-Hard surfacing any of the roadways or, at least, intersections
-Burying overhead utilities
-Final clarifications on any easements for access or pipelines
-Any Irrigation, whether well or surface
-Existing waterlines and wells. There is some level of water supply that apparently parallels much of the gas line work for the pads. What is to happen with that water supply and associated water rights?
-Any frac/reclaimed water tanks/basins to recognize, amend or secure
-Record of any spillage and subsequent cleanup
-Mapping and setbacks for any future development
-Precise clarification on any sort of continued access to oil/gas infrastructure
-Does the company have any stockpiles of rock or boulders they could donate or sell to the HOA?

With this in mind, on-going maintenance, presuming these roads do not change significantly, would likely be best and most cost effectively maintained with continued gravel and mag-chloride. The prices noted in section 8.0 can be utilized for such change in uses. With most of that region being flat, hard surfacing is more applicable and has long term benefits. But, again, remember you are introducing what would likely mean another layer of maintenance you cannot do in house. Further, I would recommend that until you know heavy oil/gas rigs will no longer be using the road surfaces, doing a hard topper that you have to maintain is not wise.

7.0 General Thoughts

Much of this work likely could be contracted for early spring or late fall which could benefit you in contractor pricing. Contractors often look for smaller, “easy” work such as this to start or finish off a year. Make sure to get pricing for the job done, not just hourly labor or time and materials.

Of course, we encourage you to make sure the contractor has appropriate insurance coverage and provides a traffic control plan for their work and, once on site, is responsible for all communication to neighbors, the oil/gas companies, governmental agencies and emergency services.

As for final budgetary and reserve concerns, we do recommend a HOA goal of keeping no less than $120,000 in your fund. A notable road damage event, for example a significant wash out on a steep slope, could easily run to a $60,000 repair. You would have the urgency of getting the road back open and likely not much time to negotiate pricing. All material would likely be imported. For example, 1,000 cubic yards of import soil and gravel, suitable for construction, could be in the range of $15,000 on material cost alone. Installation, drainage improvements, addressing the cause of the issue, would certainly chew up three times that amount.

The following is a more detailed example. Presuming a major roadway event, such as a noticeable hillslide that triggers a re-construction, we have made the following presumptions. A catastrophic event such as a 300-foot long slide, the full width of the road, with an average of 10 feet in depth of now unstable soils.

2,000 cubic yards of material to be re-set, recompacted - $15,000
1,000 cubic yards of imported material to be constructed - $20,000
150 lf of 4-foot high boulder stack - $12,000
Gravel import for topping - $13,500

Therefore, we estimate a $60,500 cost for a reconstruction of 300 foot of roadway. This just gives an idea of how quickly a large portion of your reserves could be spent.

Therefore, keeping a goal of no less than ~$120,000 allows for a significant event, then hopefully keep another ~$60,000 in reserve (in other words, targeting a minimum $180,000 fund at all times, with only an occasional dip below that to take care of an emergency event), allowing you time to build up the reserve kitty once again. With your approximate $60,000 in HOA revenue and $60,000 in usual expenses, this seems warranted and would hopefully only take a year to get back to normal reserves. During that time you would likely need to revert to taking care of the essentials only and not doing any significant improvements.

As an alternative, the Board could consider a funding vehicle for one-time, extra assessment incase a catastrophic event happens. The difficulty in budgeting for extra work when it appears you spend nearly all you take in always involves the risk of taking funds down too far.

With the notable list of potential improvements, and the steady but not rich budget flow, we do recommend planning and pacing your work. Looking at an improvement project (culvert replacement, for example) followed by a general maintenance project (vegetation removal or gravel import and mag) is a good pattern to get into. This affords you the opportunity to

pattern your spending and, if need be, flip the order. If you need to give a little more time for revenue generation, do two or three maintenance cycles in a row.

Too, it is a general pattern that can be easily modified. There is no best time for much of this work, other than not in winter. Asphalt materials tend to not be available until April and shut down by the end of October. The HOA may see a benefit in bidding work in the winter with a flexible "spring or fall" schedule, contractor option. Then they could simply switch the maintenance element to the other season.

Finally, remember to acquire the services of a geotechnical engineer for any significant soil work. Keep them under your contract and coordinate recommended practices for fill and compaction. Our details are standard issue and common for the western Garfield County region, but nothing beats site-specific criteria.

8.0 Estimate Review Commentary

Pricing of these various elements in the chart are general and include the contractor purchasing the materials. Recall the HOA could see some savings with pre-buying bulk materials such as rip-rap or culverts. While each culvert may be slightly different in length to replace, we presume a general, "per culvert" replacement cost as most will take two sticks (40 LF). For excavation and fill, we do estimate a yardage via observation and map only, and quantify a general length and height of fill and boulder wall. These would need field confirmation by the contractor for exact pricing. The other elements are estimated based on details shown (rip-rap, for example).

For some general pricing should you decide to do different proportions of road improvements such as asphalt, we have the following:

Asphalt	- $50 / SY w Preparation + Mobilization
Chip and Seal	- $ 6 / SY w Preparation + Mobilization
Large Boulder Excavation	- $60 / CY + Mobilization
Vegetation Removal	- $3000 per day

Note our pricing also includes some level of ancillary items such as import gravels, traffic control, etc. The larger the project scope, the more these costs would spread out. With this mind, you should note the more the quantity typically the lower the unit price.

As an item to note, any of these general scopes would also have a mobilization charge. We have presumed a $5,000 charge for that effort. So, for example, if you have the contractor replace 10 culverts at $2,000 per each, that is $20,000 + $5,000 mobilization.

Finally, it only makes sense to orient work regionally. By that I mean if you replace a culvert, you should likewise anticipate doing the up and downstream ditch work as well.

We recommend keeping roadways steeper than 5% in gravel. In our estimation going to a hard surface is an expense and introducing a long-term maintenance issue that will further tap your frequent repair expenses. Any hard surface will want to crack and creep down steeper slopes. It may be worth your consideration for more frequent mag-chloride or similar treatment. Keep in mind none of those tend to last more than a few months, but likewise they are not terribly expensive and you may see benefit from long term contract with providers.

Too, it is a steep gravel driveway. The reality is it will just take regular maintenance but these recommendations that follow should go a long way in minimizing those issues, improving the general driveway characteristics, and establishing a familiarity of routine within your regular maintenance.

The plan that follows gets you a few years down the road, more or less and would seem to be reasonably within your budget controls. Packaging these various areas by type and scope could see a cost savings from what is anticipated. It is an attempt to compile some similar items that would hopefully show immediate help in road conditions, but also conducting some notable exercise early to generate some of your own material for re-use. After these next few years, we submit you can focus on regular maintenance only, and continue building your reserve. The improved characteristics of these recommended steps through 2022 should help in maintenance costs and road longevity.

9.0 Recommended Course of Action

Below is our recommended priority of items and rationale. Pending price or preference, these items could be moved in schedule. I have packaged them with an approximate average of $60,000 expenses in mind, per year, but included what appears to be your ongoing, regular maintenance. Too, note that the provided list includes culvert and ditch cleaning at these targeted locations, which would be part of regular maintenance, so there is a bit of double counting here to be conservative.

Per our reviews, it would appear the below is within the range of careful budget management, allowing for expense and revenue balancing, and just general staying ahead of the maintenance program, tapping the reserves by an extra $30,000 or so.

2019 - $53,460 Collective Estimate

-First, clean culverts and improve entry / exits. This should just be part of a regular routine, likely no less than every other year and should be considered a maintenance effort. As part of cleaning or installs, presume ditch vortex weirs and splash block areas

RECOMMENDED PRIORITY AREAS

0.77, 0.95, 1.12, 1.19

-Second, add new culverts at select locations

RECOMMENDED PRIORITY AREAS

0.08, 0.44, 1.73, 2.12

-Third, fill 6" Road Base at bus stop area once culvert at **0.08** is installed

-Regular Maintenance, $30,000

2020 - $69,200 Collective Estimate

-First, inspect if the culvert cleaning and added culverts (2019) aided general road condition

RECOMMENDED PRIORITY AREAS

1.27, 1.98, 2.06

-Second, consider cut and fill excavations in key areas, utilizing the excavated material to fill and widen the road in those critical areas and scavenge rock for rip-rap and boulders. Most likely you will still need to import material, but not as much as new. As part of this would naturally be the vegetation cut backs. This is an improvement and likely more than one exercise (more than one year of work with your budget). Too, note that these areas are also where much of the vegetation removal would be as part of the work.

RECOMMENDED PRIORITY AREAS

1.01 (CUT) TO **0.77** (FILL). It would seem you may be able to generate enough material from the cut to fill both at 1.01 and 0.77 on the downhill side, widening the road 2-4 feet. Boulders and rock will be generated from the cut, but you should anticipate needing to acquire more.

-Regular Maintenance, $30,000

2021 - $62,000 Collective Estimate
-Cut / Fill with Boulder wall (similar to 1.01 / 0.77 area)
RECOMMENDED PRIORITY AREAS
1.62
-Road cross slope amendments
RECOMMENDED PRIORITY AREAS
1.81, 0.90 area
-Regular Maintenance, $30,000

2022 - $50,892 Collective Estimate

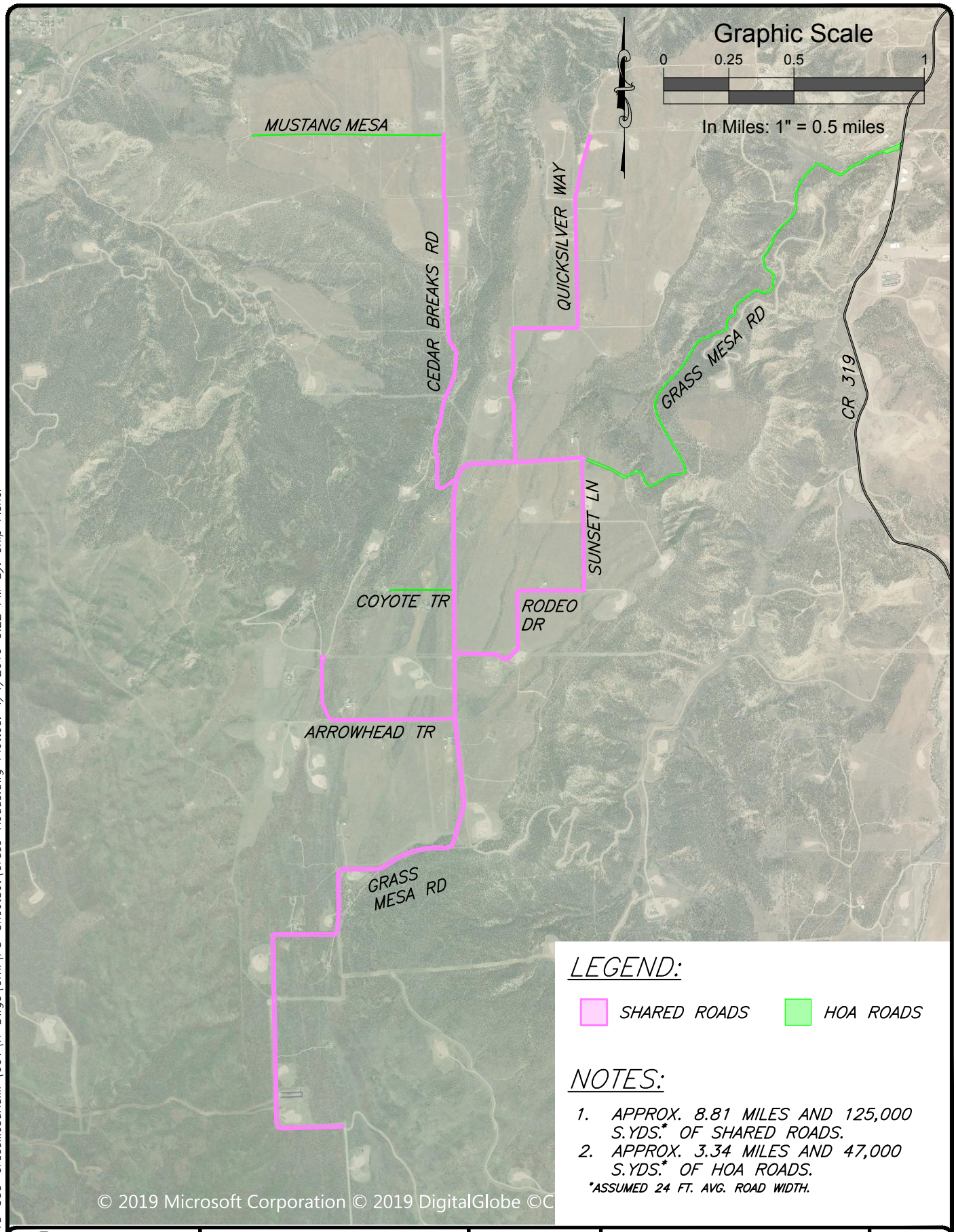
-Lower parking area surface improvements **($20,892)**. While a great improvement, in some ways it is a "nicety" that does not necessarily have a significant safety or longevity question. But proper grading and a good chip-seal coat does make that area much cleaner and maintainable. If you do so, we recommend a follow up crack and chip seal about five years after initial install. As these chip-seal surfaces build up thickness, they do get stronger and more durable.
-Regular Maintenance, $30,000

Table of Improvement Areas 1

Grass Mesa HOA - Driveway Cheat Sheet

Item ID	Element	Condition	Imprvmt 1	Imprvmt 2	Imprvmt 3	General Description	Est Individual Cost			Year	Contractor	Cost
0.00	Surface	Fair	Asphalt	Chip seal	Mag-Chloride	3 options, most to least expensive, but likewise best to worst longevity	$ 156,690	$ 20,892	$ 3,482			
0.05	Bus-stop	Poor	Asphalt	Fill w/ 6" CL6		Poorly graded, improve with pavement and regrading, or fill to regrade	$ 20,500	$ 2,460				
0.07	EX 60 CMP	Good	Ditch Weir (3)	Inlet/Outlet (2, 3, 6)		Monitor Inlet/Outlet for cleaning	$ 1,600	$ 800				
0.08	Ditch	Poor	New 18 ADS (1)	Re-grade ditch (3)	Fill gravels	Add cross culvert to north, re-grade swale in front of bus stop, fill 6" of CL 6 gravels, V-weir	$ 2,000	$ 800	$ 600			
0.10	Shoulder	Poor	Boulders (5)			Place 18"+ boulder stack for approx 20 LF of shoulder	$ 6,000					
0.14	Shoulder	Fair	Turnout (7)	Rip rap (5)		Intentional Turnout above driveway, rip-rap to ditch	$ 800	$ 800				
0.26	PROP 18 ADS	N/A	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Const minor weir, 6"-12" rock	$ 2,000	$ 800	$ 600			
0.31	EX 18 ADS	Good	Ditch Weir (3)	Rip rap		Const minor weir, 6"-12" rock	$ 600	$ 800				
0.44	EX 18 CMP	Poor	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Very clogged pipe with upper end damaged. Replace pipe and improve ditch flow	$ 2,000	$ 800	$ 600			
0.54	Bur Boulder	Fair	Rock Ex			Boulder excavation procedures (estimated location, unknown size)	$ 5,000					
0.56	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
0.62	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
0.68	EX 18 CMP	Fair	Ditch Weir (3)	Inlet/Outlet (2, 3, 6)	Outlet extension	Improve ditch flow, clean debris Inlet/Outlet, add extension CMP on outlet	$ 800	$ 800	$ 300			
0.75	Shoulder	Fair	Boulders (5)	Fill slope	Road slope	Place boulder stack for approximately 200 LF of shoulder, re-blade road to inside	$ 25,000		$ 3,000			
0.77	EX 18 CMP	Fair	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)		Clean debris from Inlet/Outlet, improve ditch flow	$ 800	$ 600				
0.90	Bur Boulder	Fair	Rock Ex			Boulder excavation procedures (estimated location, unknown size)	$ 5,000					
0.95	EX 18 CMP	Fair	Inlet/Outlet (2, 3, 6)	Outlet extension	Ditch Weir (3)	Clean debris from Inlet/Outlet, add extension CMP on outlet, improve ditch flow	$ 800	$ 300	$ 600			
1.01	Shoulder	Fair	Boulders (5)	Cut slope	Fill slope	Cut slope for visibility ~ 250 LF, place boulder stack for ~ 150 LF	$ 25,000	$ 4,000				
1.02	EX 18 CMP	Good	Rip rap	Cut slope		Rip rap on outlet, clean-up uphilll slope back for turn visibility	$ 800	$ 1,500				
1.07	EX 18 CMP	Good	Cut slope	Ditch Weir (3)		Clean-up uphill slope, improve ditch flow	$ 1,500	$ 600				
1.12	EX 18 CMP	Fair	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)		Clean debris from Inlet/Outlet, improve ditch flow	$ 800	$ 600				
1.17	Shoulder	Fair	Cut slope (5)			Cut slope for visibility ~ 100 LF	$ 4,000					
1.19	EX 18 CMP	Fair	Inlet/oulet	Cut slope	Ditch Weir (3)	Clean debris from Inlet/Outlet, clean-up uphill slope, improve ditch flow	$ 800	$ 1,500	$ 600			
1.19	Bur Boulder	Fair	Rock Ex x 2			Boulder excavation procedures (estimated location, unknown size)	$ 10,000					
1.27	EX 18 CMP	Poor	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Very clogged pipe with upper end damaged. Replace pipe and improve ditch flow	$ 2,000	$ 800	$ 600			
1.32	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
1.35	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
1.44	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
1.49	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
1.49	EX 18 CMP	Good	No work needed			Monitor Inlet/Outlet for cleaning	-					
1.62	Shoulder	Fair	Boulders (5)	Cut slope	Fill slope	Cut slope for visibility ~ 100 LF, place boulder stack for ~ 150 LF	$ 18,000	$ 4,000				
1.68	Bur Boulder	Fair	Rock Ex			Boulder excavation procedures (estimated location, unknown size)	$ 5,000					
1.73	EX 18 CMP	Poor	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Very clogged pipe with upper end damaged. Replace pipe and improve ditch flow	$ 2,000	$ 800	$ 600			
1.81	Shoulder	Fair	Road X-section (4)			Re-blade road, shift berm, compact	$ 5,000					
1.90	EX 18 CMP	Fair	Ditch Weir (3)	Inlet/Outlet (2, 3, 6)		Improve ditch flow, clean debris from Inlet/Outlet	$ 600	$ 800				
1.98	PROP 18 ADS	N/A	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Const minor weir, 6"-12" rock	$ 2,000	$ 800	$ 600			
2.06	PROP 18 ADS	N/A	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Const minor weir, 6"-12" rock	$ 2,000	$ 800	$ 600			
2.08	Shoulder	Fair	Boulders (5)	Cut slope	Fill slope	Cut slope for visibility ~ 150 LF, place boulder stack for ~ 200 LF	$ 20,000	$ 4,000				
2.12	PROP 18 ADS	N/A	New 18 ADS (1)	Inlet/Outlet (2, 3, 6)	Ditch Weir (3)	Const minor weir, 6"-12" rock	$ 2,000	$ 800	$ 600			

Appendix A – Plans and Details



LEGEND:

SHARED ROADS

HOA ROADS

NOTES:

1. APPROX. 8.81 MILES AND 125,000 S.YDS.* OF SHARED ROADS.
2. APPROX. 3.34 MILES AND 47,000 S.YDS.* OF HOA ROADS.

*ASSUMED 24 FT. AVG. ROAD WIDTH.

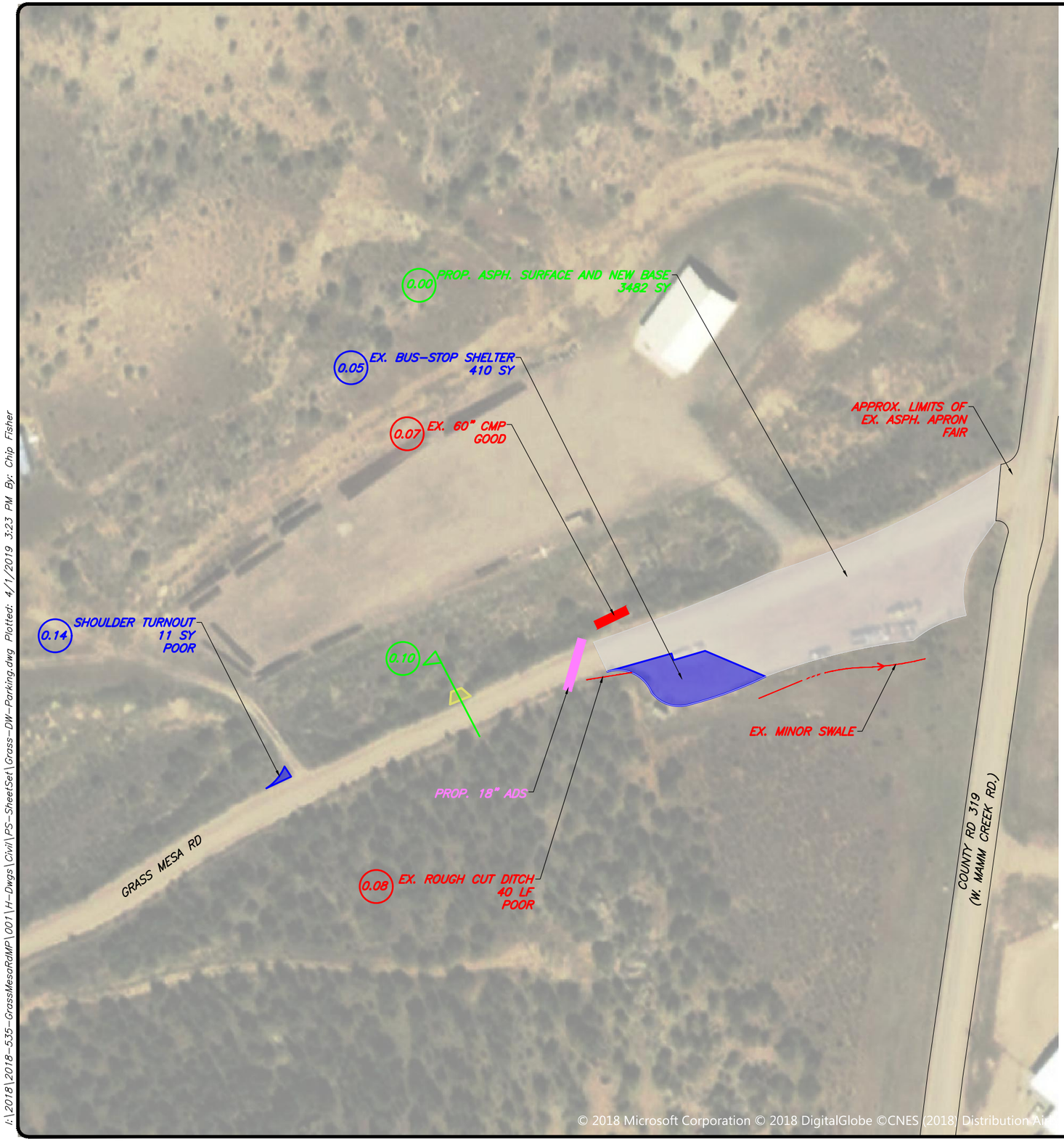
SGM
118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004 www.sgm-inc.com

Grass Mesa HOA
Rifle, CO

Job No.	2018-535.001
Drawn by:	RPF
Date:	01.11.2019
Approved: JS	PE: RB
File:	Grass-Roads

Grass Mesa HOA Road Map

Sht. 1 Of 5



Graphic Scale

0 50 100 200

In Feet: 1" = 100'

Road Improvements

ID	Element	Condition	Description	Details
0.00	Surface	FAIR	Pave parking area with asphalt	
0.05	Bus-stop	POOR	Improve poorly graded bus-stop	
0.07	Ex. 60" CMP	GOOD	Monitor inlet/outlet for cleaning	
0.08	Ditch	POOR	Install Prop. 18" ADS and re-grade	2
0.10	Section	POOR	Fill steep slope for turnout	5, 7
0.14	Shoulder	POOR	Build up turnout, rip-rap to ditch	6, 7

LEGEND

- EX. STEEP SLOPE
- EX. STEEP ROAD
- PROP. ASPHALT
- PROP. GRADING
- PROP. EARTHWORKS
- EX. FEATURES
- PROP. CULVERTS

SGM
118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004 www.sgm-inc.com

Grass Mesa HOA
Rifle, CO

#	Revision	Date	By:
1			

Project Milestone: Not For Construction

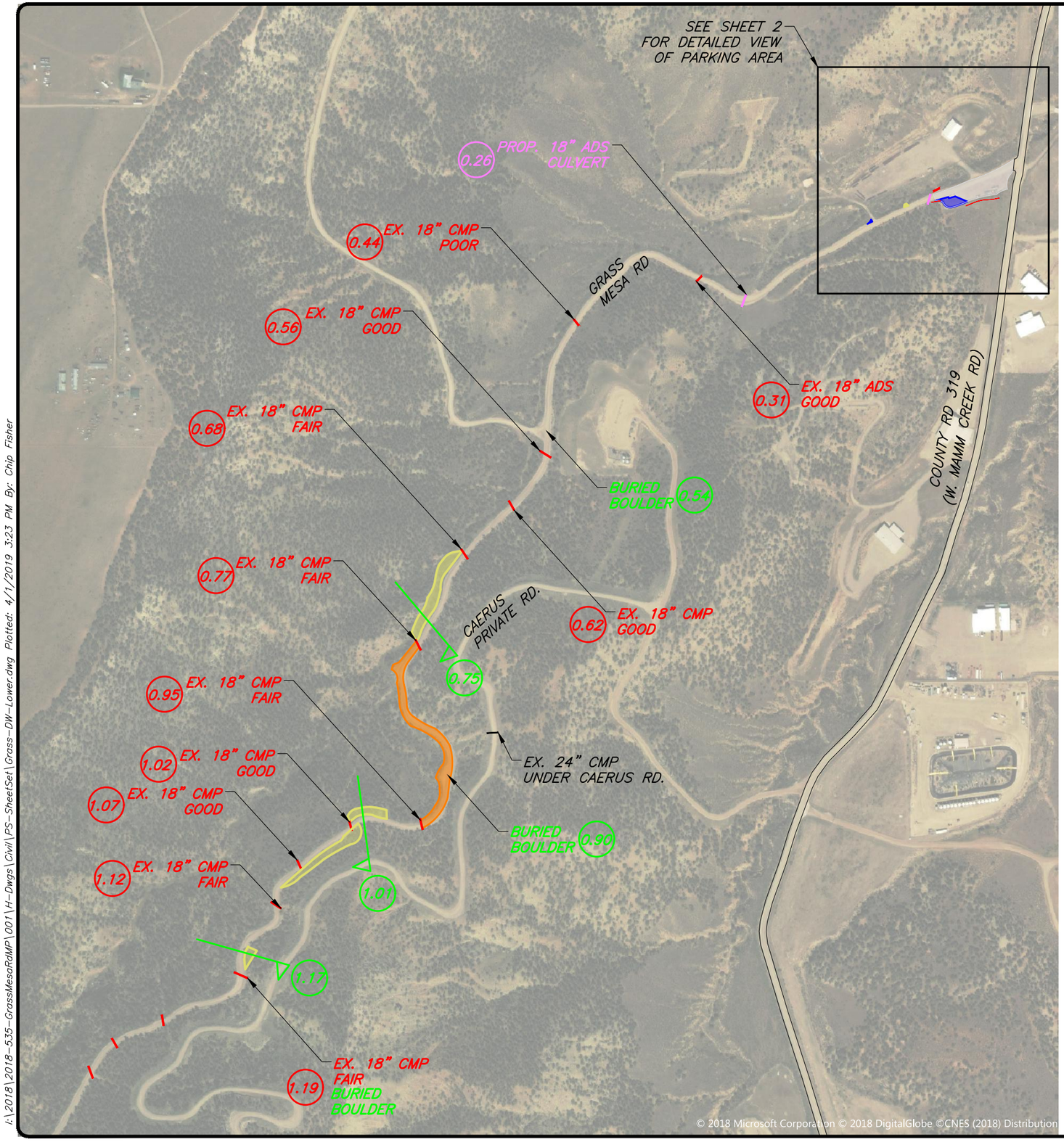
Job No.	2018-535.001
Drawn by:	RPF
Date:	01.11.2019
QC: JS	PE: RB
File:	Grass-DW-Parking

Title: Road Improvements - Parking Area

Dwg No. 2

Of : 5

I:\2018\2018-535-GrassMesaRdMP\001\H-Dwgs\Civil\PS-SheetSet\Grass-DW-Parking.dwg Plotted: 4/1/2019 3:23 PM By: Chip Fisher



Graphic Scale

0 250 500 1000

In Feet: 1" = 500'

Road Improvements

ID	Element	Condition	Description	Details
0.26	Prop. ADS	N/A	Prop. 18" ADS culver & construct minor weir 6"-12" rock	1-3
0.31	Ex. CMP	GOOD	Construct minor weir 6 - 12" rock	2, 3
0.44	Ex. CMP	POOR	Clogged and damaged.Replace with 18" ADS & construct minor weir	1-3
0.54	Boulder	N/A	Buried boulder under road	
0.56	Ex. CMP	GOOD	Monitor inlet/outlet for cleaning	
0.62	Ex. CMP	GOOD	Monitor inlet/outlet for cleaning	
0.68	Ex. CMP	FAIR	Improve ditch flow, clean debris from inlet/outlet, extend CMP outlet	2, 3, 6
0.75	Section		Cut/fill steep slopes	5
0.77	Ex. CMP	FAIR	Clean debris from inlet/outlet, improve ditch flow	2, 3
0.90	Boulder	N/A	Buried boulder under road	
0.95	Ex. CMP	FAIR	Improve ditch flow, clean debris from inlet/outlet, extend CMP outlet	2, 3, 6
1.01	Section		Cut/fill steep slopes	5
1.02	Ex. CMP	GOOD	Rip-rap outlet, cut uphill slope back for visibility around turn	2, 3, 5
1.07	Ex. CMP	GOOD	Cut back uphill slope for visibility around turn, improve ditch flow	5
1.12	Ex. CMP	FAIR	Clean debris from inlet/outlet, improve ditch flow	5
1.17	Section		Cut back steep side slope for visibility	5

LEGEND

- EX. STEEP SLOPE
- EX. STEEP ROAD
- PROP. ASPHALT
- PROP. GRADING
- PROP. EARTHWORKS
- EX. FEATURES
- PROP. CULVERTS

SGM
118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004 www.sgm-inc.com

Grass Mesa HOA
Rifle, CO

#	Revision	Date	By:
1			

Project Milestone: Not For Construction

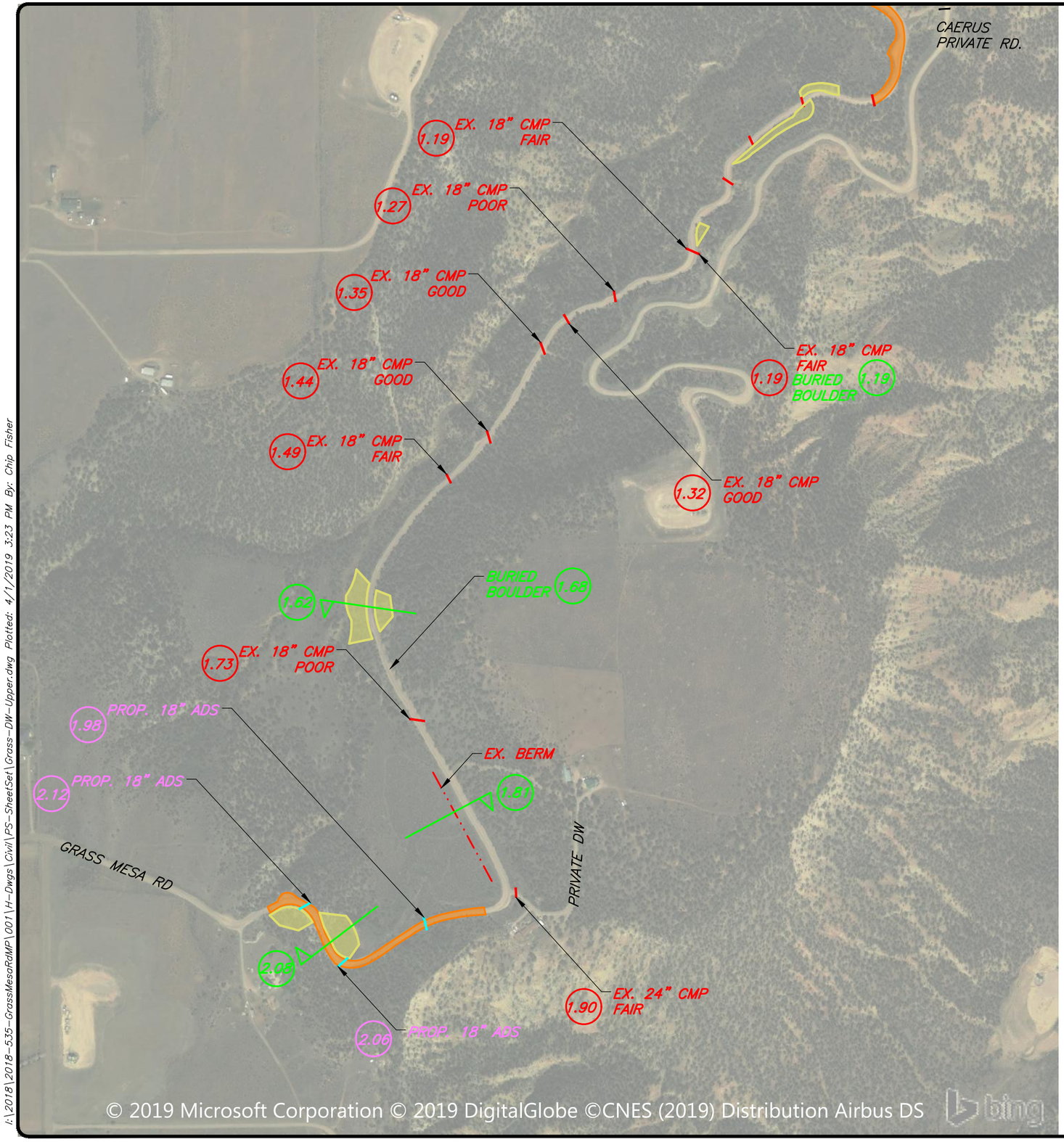
Job No.	2018-535.001
Drawn by:	RPF
Date:	01.11.2019
QC: JS	PE: RB
File:	Grass-DW-Lower

Title: Road Improvements - Lower Driveway

Dwg No. 3

Of : 5

I:\2018\2018-535-GrassMesaRdMP\001\H-Dwgs\Civil\PS-SheetSet\Grass-DW-Lower.dwg Plotted: 4/1/2019 3:23 PM By: Chip Fisher



Graphic Scale

0 250 500 1000

In Feet: 1" = 500'

Road Improvements

ID	Element	Condition	Description	Details
1.17	Section		Cut/fill steep slopes for visibility	5
1.19	Ex. CMP	FAIR	Clean debris in culvert, improve ditch flow	2,3
1.19	Boulder	N/A	Buried boulder under road	
1.27	Ex. CMP	POOR	Clogged and damaged. Replace with 18" ADS & const. minor weir	1-3
1.32	Ex. CMP	GOOD	Monitor inlet/outlet for cleaning	
1.35	Ex. CMP	GOOD	Monitor inlet/outlet for cleaning	
1.44	Ex. CMP	GOOD	Monitor inlet/outlet for cleaning	
1.49	Ex. CMP	GOOD	Monitor inlet/outlet for cleaning	
1.62	Section		Cut/fill steep slopes	5
1.68	Boulder	N/A	Buried boulder under road	
1.73	Ex. CMP	POOR	Clogged and damaged. Replace with 18" ADS & const. minor weir	1-3
1.81	Section		Move plow berm over roughly 5 feet	4
1.90	Ex. CMP	FAIR	Improve ditch flow, clean debris from inlet/outlet	2, 3
1.98	Prop. ADS	N/A	Prop. 18" ADS culver & construct minor weir 6"-12" rock	1-3
2.06	Prop. ADS	N/A	Prop. 18" ADS culver & construct minor weir 6"-12" rock	1-3
2.08	Section		Cut/fill steep slopes	5
2.12	Prop. ADS	N/A	Prop. 18" ADS culver & construct minor weir 6"-12" rock	1-3

LEGEND

- EX. STEEP SLOPE
- EX. STEEP ROAD
- PROP. ASPHALT
- PROP. DRAINAGE
- PROP. EARTHWORKS
- EX. FEATURES
- PROP. CULVERTS

SGM
118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004 www.sgm-inc.com

Grass Mesa HOA
Rifle, CO

#	Revision	Date	By:
1			

Project Milestone: Not For Construction

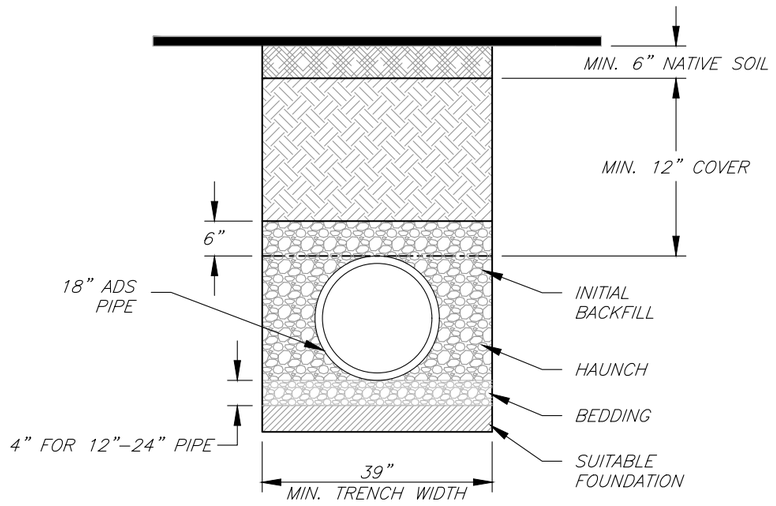
Job No.	2018-535.001
Drawn by:	RPF
Date:	01.11.2019
QC: JS	PE: RB
File:	Grass-DW-Upper

Title: Road Improvements - Upper Driveway

Dwg No. 4

Of : 5

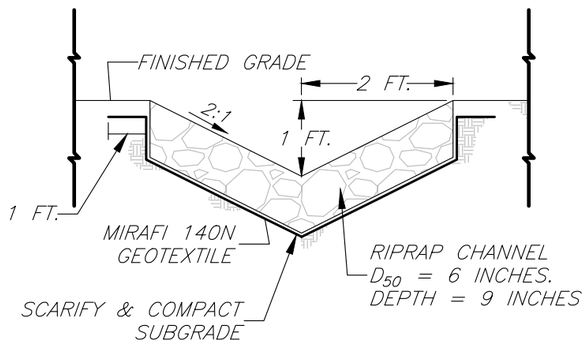
I:\2018\2018-535-GrassMesaRdMP\001\H-Dwgs\Civil\PS-SheetSet\Grass-DW-Upper.dwg Plotted: 4/1/2019 3:23 PM By: Chip Fisher



1 ADS INSTALLATION DETAIL
N.T.S.

NOTES:

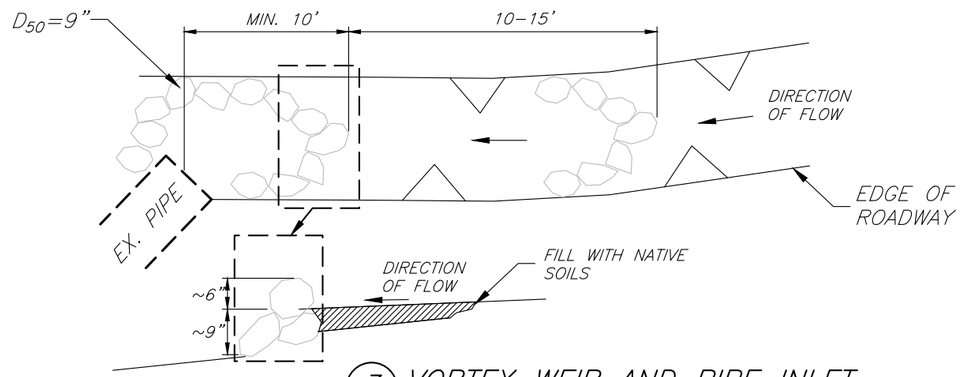
1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
2. BEDDING AND INITIAL FILL MATERIAL SHALL BE SUITABLE CLASS 6 OR ⅜" CHIP.
3. MIN. COVER IS 12" UP TO 48" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT.



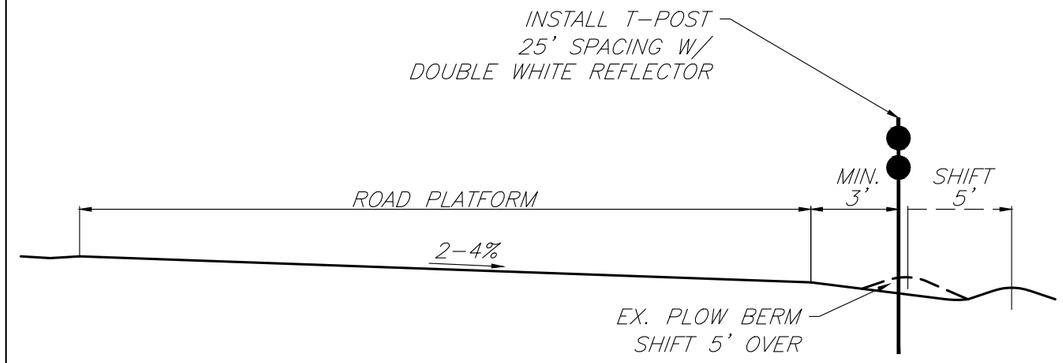
2 DITCH SECTION AT PIPE INLET
N.T.S.

NOTES:

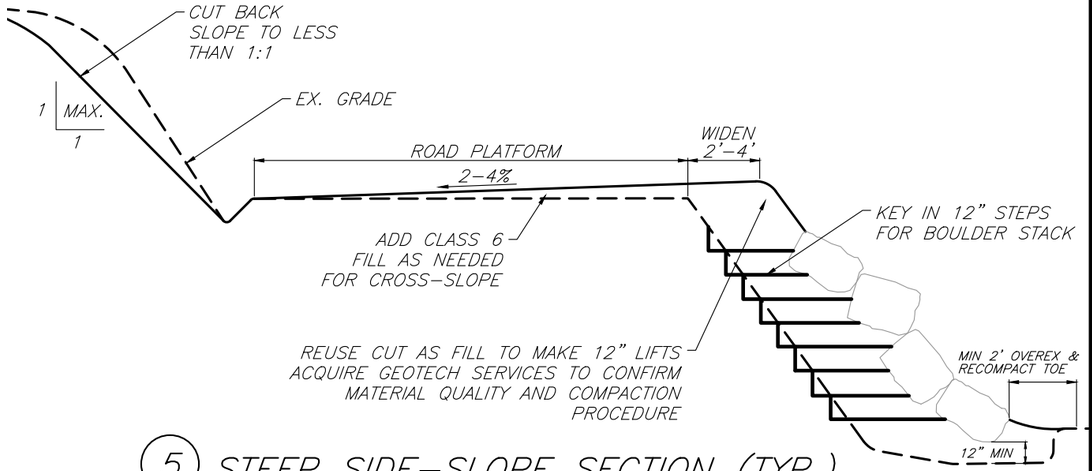
1. RIP RAP SHALL BE ANGULAR IN SHAPE.
2. GEOTEXTILE TO BE INSTALLED ACCORDANCE TO MANUFACTURER SPECIFICATIONS.



3 VORTEX WEIR AND PIPE INLET
N.T.S.



4 ROAD WITH BERM SECTION (TYP.)
N.T.S.



5 STEEP SIDE–SLOPE SECTION (TYP.)
N.T.S.

SGM
118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004 www.sgm-inc.com

Grass Mesa HOA
Rifle, CO

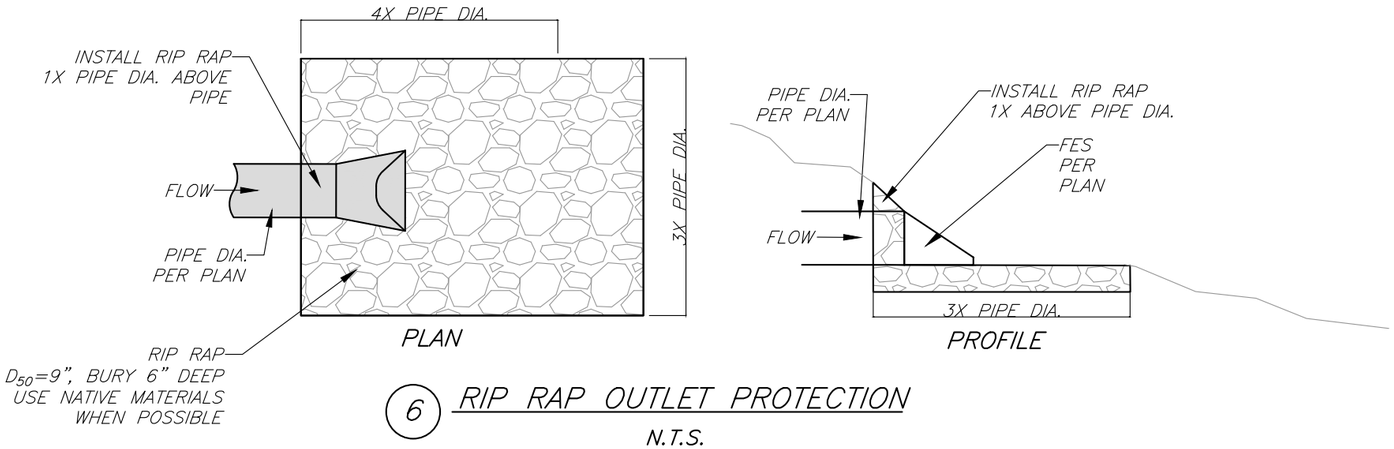
#	Revision	Date	By:
1	Project Milestone: Not For Construction		

Job No.	2018-535.001		
Drawn by:	RPF		
Date:	01.11.2019		
QC:	JS	PE:	RB
File:	Grass-DW-Detail		

Title: Road Improvements - Details (1)

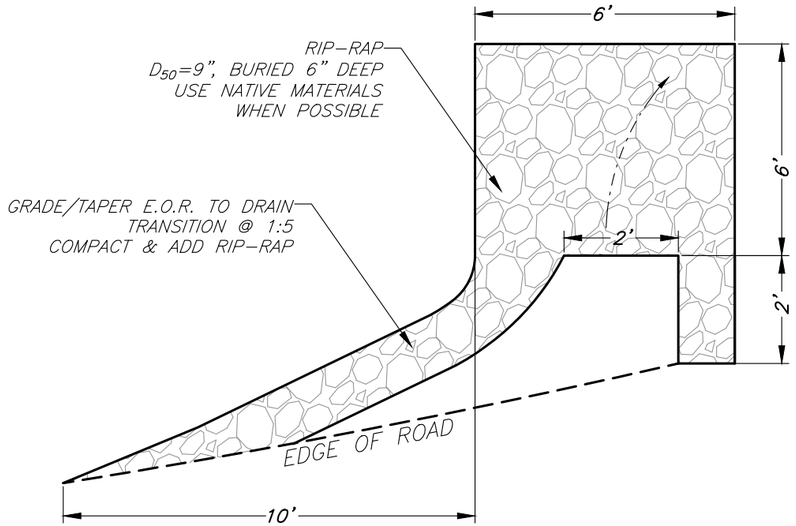
Dwg No. 5

Of : 5



6 RIP RAP OUTLET PROTECTION

N.T.S.



7 TURN-OUT DETAIL

N.T.S.

SGM
118 West Sixth Street, Suite 200
Glenwood Springs, CO 81601
970.945.1004 www.sgm-inc.com

Grass Mesa HOA
Rifle, CO

#	Revision	Date	By:
1			

Project Milestone: Not For Construction

Job No.			2018-535.001
Drawn by:			RPF
Date:			01.11.2019
QC:	JS	PE:	RB
File:			Grass-DW-Detail

Title: Road Improvements - Details (2)

Dwg No. 6

Of : 5

Appendix B – HOA Documents & Budget

Grass Mesa Homeowners Association
Budget Overview - 2018
January through December 2018

	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18	TOTAL Jan - D...
Ordinary Income/Expense													
Income													
Common Assessment	14,960	0	0	14,960	0	0	14,960	0	0	14,960	0	0	59,840
Encana Workover Rigs Revenue	1,500	0	0	2,000	0	0	2,000	0	0	2,000	0	0	7,500
Late Fees & Finance Charges	0	0	0	0	0	0	0	0	0	0	0	0	0
Legal & Collection Costs	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Transfer to Reserve Fund	-1,500	0	0	-1,500	0	0	-1,500	0	0	-1,500	0	0	-6,000
Total Income	15,160	200	200	15,660	200	200	15,660	200	200	15,660	200	200	63,740
Expense													
Audit & Tax Preparation	0	0	0	165	0	0	0	0	0	0	0	0	165
Copy/Postage/Office Supplies	50	50	50	50	50	50	50	50	50	50	50	50	600
Equipment Repairs	0	0	0	100	0	0	0	0	100	0	0	0	200
Income Tax	0	0	0	75	0	0	0	0	0	0	0	0	75
Insurance - General Liability	0	0	0	0	0	0	0	0	0	700	0	0	700
Legal Services													
Collection Expense	200	200	200	200	200	200	200	200	200	200	200	200	2,400
General Legal Matters	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Total Legal Services	300	300	300	300	300	300	300	300	300	300	300	300	3,600
Management & Accounting	955	955	955	955	955	955	955	955	955	955	955	955	11,460
Operating Contingency	235	0	0	0	0	0	0	0	0	0	0	0	235
Professional Fees	300	100	0	0	0	0	0	0	0	0	0	0	400
Road Improvements	0	0	0	3,500	0	0	0	0	0	0	0	0	3,500
Road Repairs/Maintenance	245	240	240	24,000	240	240	240	240	5,500	240	240	240	31,905
Sign Maintenance	0	0	200	0	0	0	0	0	200	0	0	0	400
Snow Plowing/Sanding	3,500	2,000	1,500	0	0	0	0	0	0	0	1,000	2,500	10,500
Total Expense	5,585	3,645	3,245	29,145	1,545	1,545	1,545	1,545	7,105	2,245	2,545	4,045	63,740
Net Ordinary Income	9,575	-3,445	-3,045	-13,485	-1,345	-1,345	14,115	-1,345	-6,905	13,415	-2,345	-3,845	0
Net Income	**9,575**	**-3,445**	**-3,045**	**-13,485**	**-1,345**	**-1,345**	**14,115**	**-1,345**	**-6,905**	**13,415**	**-2,345**	**-3,845**	**0**

SHARED ROAD MAINTENANCE AGREEMENT

All of the roads in the Grass Mesa Homeowners Association (HOA) are private roads belonging to the Grass Mesa HOA who is responsible for maintaining them.

ALL GRASS MESA ROADS ARE PRIVATE ROADS AND ARE NOT AVAILABLE FOR USE BY NON-GRASS MESA HOA HUNTERS.

All of the roads in Grass Mesa HOA are gravel roads constructed on dedicated easements either through private property owned by the Grass Mesa HOA Members or through the Bureau of Land Management (BLM) owned land.

There are two broad categories of roadway in the Grass Mesa HOA: Grass Mesa Road (lower section) and the rest of the roadways in the upper section of Grass Mesa HOA.

Grass Mesa Road, Lower Section

This section of road begins at the intersection of County Road 319 and Grass Mesa Road. There is a flat section of road at this intersection. All of the mail boxes for Grass Mesa residents are located on the southeast side of Grass Mesa Road at this intersection. In addition, there is a locked package delivery box for FedEx and UPS deliveries.

Shortly beyond the mail boxes and package delivery boxes Grass Mesa Road narrows and becomes a 2.2 mile section of approximately 12% grade, narrow mountain road with many blind curves and a steep slope off of one side of the road. This is the only legal access to the Grass Mesa HOA property and it is heavily traveled. Four wheel drive vehicles with good mud and snow tires are highly recommended.

The last .5 miles of the 2.2 mile section of Grass Mesa Road contains several S-Curves and blind turns and it is the steepest part of Grass Mesa Road.

The posted speed limit is fifteen miles per hour. Please observe the speed limit, and be courteous to other drivers. Passing is dangerous and is highly discouraged.

Grass Mesa Roads, Upper Section

Grass Mesa Road levels out and intersects with Sunset Lane at approximately 2.2 miles up Grass Mesa Road. All of the roadways beyond this section including Sunset Lane, Quicksilver Way, Cedar Breaks Road and Rodeo Drive, (Shared Roads), are currently maintained by Caerus Piceance LLC under a Settlement Agreement dated December 19, 2013. Caerus is the successor to this agreement that was originally negotiated to resolve certain issues between the Grass Mesa HOA and Encana Oil and Gas (USA), Inc. Mustang Mesa Trail and Coyote Trail are not defined as a Shared Roads and are not included in the December 19, 2013 Settlement Agreement, thus the Grass Mesa HOA is responsible for its maintenance.

Per the Settlement Agreement Encana, (now Caerus) is solely responsible for the following:

- ROAD BASE. THE ROAD BASE APPLIED BY ENCANA MUST BE ADEQUATE FOR FUNCTIONALITY OF DRAINAGE AND TRAFFIC LOADS. EACH SPRING, ENCANA SHALL, AT ITS SOLE EXPENSE, APPLY APPROPRIATE BASE MATERIAL, WHICH MAY INCLUDE 3/4-INCH ROAD BASE, TO ALL AREAS OF THE SHARED ROADS WHERE SUCH APPLICATION IS NECESSARY TO MAINTAIN THE SHARED ROADS FOR THE FUNCTIONALITY OF DRAINAGE AND TRAFFIC LOADS.

- CROWNING. EACH SPRING, AND AS OTHERWISE NECESSARY, ENCANA SHALL CAUSE ALL SHARED ROADS TO BE CROWNED FOR FUNCTIONALITY OF DRAINAGE.

- BLADING. EACH SPRING, AND AS OTHERWISE NECESSARY, THE SHARED ROADS SHALL BE BLADED WITH A FUNCTIONAL CROWN TO ALLOW FOR PROPER DRAINAGE OFF OF THE ROAD PLATFORM IN AN ATTEMPT TO PREVENT POOLING OF WATER ON THE SHARED ROADS.

- DUST SUPPRESSION MATERIAL. EACH SPRING, AND AS OTHER WISE NECESSARY, ENCANA SHALL APPLY APPROPRIATE DUST SUPPRESSION MATERIAL, WHICH MAY INCLUDE MAGNESIUM CHLORIDE, TO THE SHARED ROADS FOLLOWING, IF NECESSARY, THE APPLICATION OF ROAD BASE AND CROWNING AND ROLLING OF THE ROADS; PROVIDE, HOWEVER, THAT ENCANA SHALL NOT APPLY ANY MATERIAL TOT HE SHARED ROADS FOR PURPOSES OF DUST SUPPRESSION THAT IS PROHIBITED BY THE COLORADO OIL AND GAS CONSERVATION COMMISSION'S (COGCC) AND/OR COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT'S (CDPHE) REGULATIONS, INCLUDING PRODUCED WATER.

- DITCHES AND CULVERTS. EACH SPRING BY MAY 30 AND PRIOR TO BLADING, CROWNING, ROLLING AND APPLICATION OF APPROPRIATE DUST SUPPRESSION MATERIAL, ENCANA SHALL "PULL" THE DITCHES LOCATED

ALONG THE SHARED ROADS. NONE OF THE DEBRIS COLLECTED FROM THE PULLING OF THE DITCHES, SUCH AS TRASH, VEGETATION OR LARGE ROCKS, WILL BE INCORPORATED INTO THE SURFACE OF THE SHARED ROADS. FOLLOWING THE BLADING, CROWNING, ROLLING AND APPLICATION OF APPROPRIATE DUST SUPPRESSION MATERIAL, ENCANA SHALL INSPECT, CLEAN AND REPAIR THOSE CULVERTS OF THE SHARED ROADS AS REQUIRED BY ENCANA'S STORM WATER PERMITS TO ALLOW FOR FUNCTIONALITY OF DRAINAGE. NOTHING HEREIN SHALL REQUIRE ENCANA TO INSPECT, CLEAN OR REPAIR CULVERTS ON PRIVATE PROPERTY (COLLECTIVELY, (PRIVATE CULVERTS) UNLESS ENCANA'S OPERATIONS AFFECT OR DAMAGE PRIVATE CULVERTS.

- WEED CONTROL. EACH SPRING, ENCANA SHALL TAKE SUCH MEASURES AS NECESSARY TO CONTROL GARFIELD COUNT-LISTED, NOXIOUS WEEDS ALONG THE SHARED ROADS RIGH-OF-WAYS.

- SNOW REMOVAL. AS ENCANA DEEMS NECESSARY, IT AGREES TO PLOW THE SNOW ON THE TRAVELED SURFACE OF ALL SHARED ROADS IN A TIMELY MANNER.

Under the Settlement Agreement, Encana (Caerus) shall meet with designated Grass Mesa representative in the spring, prior to April 25th, and in the fall on or before October 25th in order to review, consider, discuss and address road conditions and maintenance needs for the Shared Roads.

Encana/Caerus' obligations, outlined above, per the Settlement Agreement, terminate when "Encana's, its affiliates, successors and assigns' oil and gas operations" cease within Grass Mesa HOA.

Shared Roads Map