



Field Alternatives Review

Prepared for: Nevada Department of Transportation

Prepared by: Jacobs Engineering Group Inc.

May 3, 2012

USA Parkway
SR 439



1.0 ACKNOWLEDGEMENTS

The Field Alternatives Review for USA Parkway was conducted to allow numerous NDOT Divisions an opportunity to study the design alternatives developed to date, discuss the specific alignment challenges facing the project team, and observe the alternative features in the field. This report summarizes the comments and recommendations made from the participating project team members and outlines specific refinements that will be studied moving forward due to the input provided during the field review.

Support in the development of this report was provided by Jacobs. The collaboration and dedication of team members assigned to this field review effort is recognized and appreciated. Project team members participating in the Field Alternatives Review held on March 14, 2012 included the following individuals:

NDOT:

Pedro Rodriguez, NDOT Project Manager
 Brian D Wilson, NDOT Hydraulics
 Eric M Yount, NDOT Hydraulics
 Sabra Gilbert-Young, NDOT Environmental
 Jeffery A Palmer, NDOT Materials
 Will Young, NDOT Materials
 Jerry Claussen, NDOT Utilities
 Jeffery J Henkelman, NDOT Right-of-way
 Roger Ketterling, NDOT Right-of-way

Jacobs:

Bryan Gant, Project Manager
 Steve Hagel, Roadway Design Lead
 Steve Oxoby, Roadway Design
 Ben Taylor, Roadway Design
 Chris Martinovich, Roadway Design

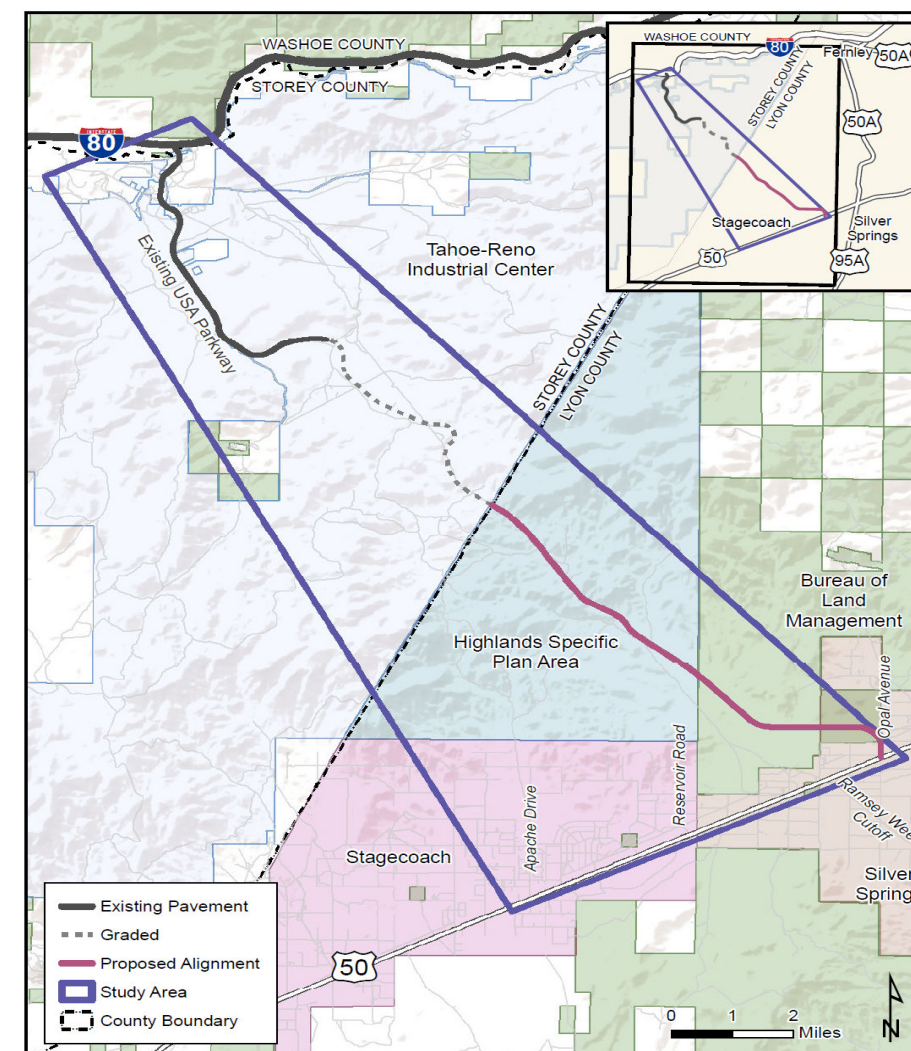
Wood Rodgers:

Mark Gookin, Hydraulics
 Cary Chisum, Survey and Mapping

2.0 INTRODUCTION AND PURPOSE

NDOT, with assistance from Jacobs, is currently exploring alternative alignments for the completion of USA Parkway in accordance with the National Environmental Policy Act (NEPA). Currently, USA Parkway begins 10 miles east of Reno at an interchange with Interstate 80 and proceeds south for approximately 5.4 miles to serve the Tahoe-Reno Industrial Center (TRIC). The continued southern extension of USA Parkway to US 50 has been envisioned for some time as a way to more directly link US 95 and US 50 to the Reno metro area and provides a means of access to future developments in the area.

As shown below, the proposed project extends the existing paved roadway 13 miles farther south through the Virginia Mountain Range from Storey County into Lyon County to connect to US 50 near Silver Springs. The first 4.4 miles of this extension have been rough graded as show by the dashed line, but no pavement or other improvements have been constructed. The remaining 8.6 miles represents brand new roadway alignment.



3.0 DESIGN ALTERNATIVES

PRELIMINARY ALIGNMENT ALTERNATIVES:

Preliminary horizontal and vertical geometry provided by NDOT, Reno Engineering, and other previously developed conceptual plans was used as a starting point for alternative alignment development. Refinements were made to the roadway geometrics by the Jacobs design team to develop a primary alignment for USA Parkway. The mountainous terrain, the topographic constraints, and the balancing of earthwork quantities have proven to be key design challenges in selection of a preferred alternative. Several isolated alternatives that modify sections of this primary alignment were identified and are discussed in detail below.

In general, the primary alignment follows the graded roadway 4.4 miles beyond the end of the existing pavement. The alignment portion continuing south from the graded section, extending for approximately 3 miles, (station 310 to 465) poses the greatest design challenges due to the mountainous topographic constraints. The final 5 miles of the alignment generally travels along an alluvial fan on the valley floor and is relatively straightforward with few geometric challenges.

Prior to the Field Alternatives Review Meeting, a preliminary site visit was held on February 22, 2012 with NDOT Roadway Design, NDOT Hydraulics, as well as representative from Jacobs and Wood Rodgers. The purpose of this preliminary field review was to highlight those areas where the alignment alternatives impact existing site features and discuss specific roadway and hydraulic design issues in advance of the Field Alternatives Review. Following this site visit, additional refinements were made to the primary alignment, mainly to minimize impacts to the existing drainage washes. The resulting design formed the basis for the plan and profile set utilized during the Field Alternatives Review Meeting and is included in Appendix B of this report.

The reader should be aware of the term ‘alternative’ as it relates to the roadway alignment in this report. The term alternative is used to describe refinements and options within the same general roadway concept. This general roadway concept will be identified in Chapter 2.0 “Alternatives” section of environmental document along with other concepts to achieve the project purpose and need. All discussions of alterations or eliminations of particular alignments in this report will be summarized within the NEPA document. The intent here is strictly a roadway design focused review.

FIELD REVIEW:

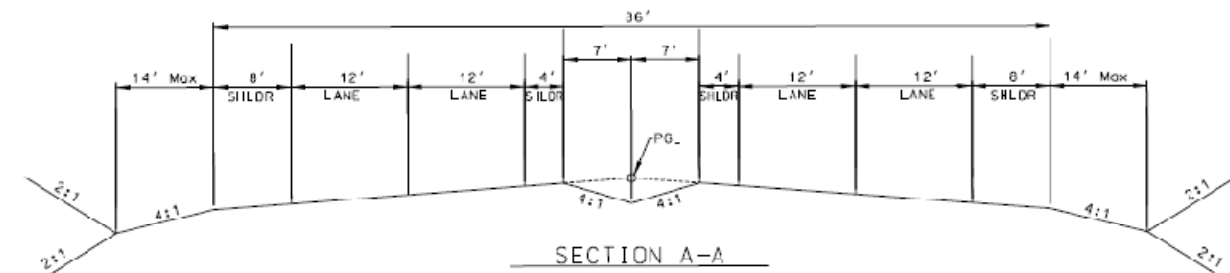
Following preliminary establishment of alignment alternatives, a Field Alternatives Review was conducted on March 14, 2012 to discuss both the existing graded portion as well as the new

portion of the alignment. The goal of the meeting was to evaluate the alternatives based on field observations and to gather comments and concerns from those who attended. Following this field review, alterations and refinements to the alternatives and the possible addition or elimination of alternatives could be made based on conditions encountered. The field review, attended by many NDOT and consultant staff, traveled the length of the proposed alignment from Interstate 80 to US 50 stopping many times along the route to discuss various aspects of the location of the alignment and possible refinements that could be made to mitigate potential impacts.

This report summarizes comments, concerns and discussions from the field review that mainly focus on specific locations of the alternatives where refinements to the alignment warrant further analysis. A photo log is provided in Appendix A and specific photos are referenced in the report to depict alignment challenges.

FIELD REVIEW ALIGNMENT ALTERNATIVE:

The roadway alternatives presented during the field review utilize a design speed of 60 mph for the 13 mile extension of the roadway from the end of the existing paved section. It is anticipated that the posted speed limit will be less than the design speed once the roadway is completed. The roadway cross section utilized in alignment development features an 86 foot typical section width shown below. The number of travel lanes may be adjusted based on the findings of the traffic analysis currently being performed.



In some locations, this proposed typical section could be altered depending on topography and adjacent development constraints. In the mountainous terrain sections of the alignment, the use of barrier rail will allow for elimination of the median section as well as the need for recoverable side slopes, thus reducing the overall footprint width and earthwork requirements. The alternatives considered which modify the primary alignment include the following:

- From Station 375 to 520, an alternate alignment loops west of the primary alignment and travels near the abandoned historic Ramsey town site. This alignment is shown on plan sheets C2-1 to C2-6 in Appendix B.
- A portion of the existing graded roadway fails to meet horizontal curvature requirements for the proposed design speed of 60 mph. An alternate alignment was developed to meet the geometric standards for a 60 mph design speed. This alignment is shown on plan sheets C1-18 to C1-21 in Appendix B.
- Multiple locations for the connection to US 50 were considered during refinement of the primary alignment. Connections at Ramsey Weeks Cutoff, as well as Onyx Street are continuing to be considered; however, the alignment alternative tying into Opal Lane has garnered the greatest support with the project team, other stakeholders, and the public and for these reasons has been used for this Field Alternatives Review.

These alternatives along with other potential design refinements are considered in greater detail in the locations of interest section below.

4.0 SPECIFIC LOCATIONS OF INTEREST

During the February field visit, the project team identified six specific locations where additional design analysis was needed to further refine the alternatives and resolve specific issues. These six locations are listed below with a brief description of the issues encountered at each site. Exhibit 1 on the following page shows the locations of these sites in relation to the overall project with stations given corresponding to the plan set in Appendix B. Also, the photo log included in Appendix A depicts these areas and is helpful in clarifying the issues discussed below.

- **Location #1: The reversing curves along the graded portion of the roadway, at stations 510+00 to 620+00.**

The horizontal geometry of the existing graded section of roadway through this area meets a 55 mph design speed, but fails to meet the proposed 60 mph design speed. In order to achieve the 60 mph speed, longer radius curves were used to realign this section of roadway. The effect of this change creates a sizeable increase in earthwork as the new roadway would feature large cuts through the western hillside. A cost / benefit analysis will need to be performed to determine if the 5 mph increase in design speed is worth the additional cost of re-grading the roadway. In addition,

although the proposed design speed is 60 mph, it is anticipated that the roadway will be posted for 55 mph, which the current alignment presently meets.

- **Location #2: The western loop alternative versus the eastern direct alternative, stations 375+00 to 520+00.**

The choice of alignment through this location focuses on the pros and cons of the two separate alignment alternatives. Consensus from the project team has been in support of the eastern direct alternative, for the following reasons:

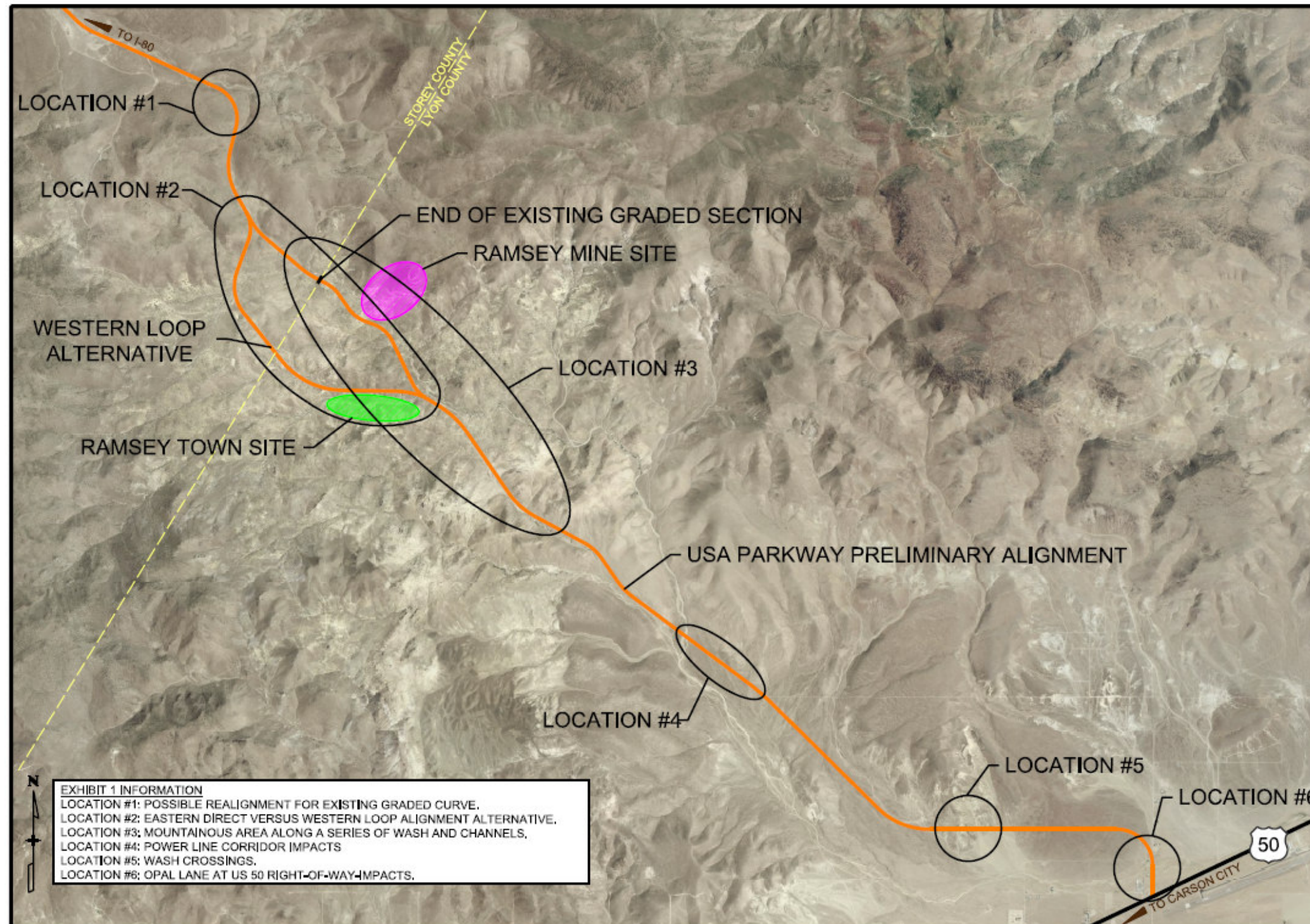
- The direct alternative is shorter and less topographically challenging
- Over one-third of the direct alternative has already been graded
- The western loop alternative passes close to the Ramsey town site, a culturally sensitive resource.
- The western loop alternative has potentially greater impact to the existing drainage washes

- **Location #3: The mountainous section from the Storey / Lyon County line to where the alignment meets the valley floor, stations 310+00 to 465+00.**

This three mile section represents the greatest design challenges on the USA Parkway alignment. A good deal of the discussion focusing on this area took place during the Field Alternatives Review. The numerous design challenges faced through this mountainous section include the following:

- Roadway fill slope embankments encroach onto the flow path of existing washes and drainage channels. This requires either relocation of portions of the channels (a maintenance concern), or shifting the alignment into yet more challenging topographic terrain.
- Existing power line poles in conflict with the proposed roadway location along this portion of the alignment. Numerous poles will be impacted and most likely require relocation. Suitable access to the pole locations will need to be maintained since the existing pole access road will be impacted by the USA roadway. All pole relocations and access roads will be included in the APE.
- Balancing the earthwork cut and fill such that the project as a whole balances while minimizing the haul distances required from the cut locations to the fill locations.

EXHIBIT 1: SPECIFIC LOCATIONS OF INTEREST



- Balancing the goal of a straight-forward geometric design without excessive horizontal and vertical curvature against the cost required to accomplish that goal.
- Development of a suitable roadway cross section such that all design standards are met while minimizing environmental impacts and overall costs. Considerations will include the use of barrier rail to minimize footprint width, the use of 'barn-roof' fill slopes, and the use of retaining walls in sliver cut / fill areas to minimize grading costs.

Numerous design alterations have already been incorporated through this area to reduce the impacts to the existing washes. Additional refinements will be made, especially to the profile, as drainage crossing sizing and more advance earthwork analysis is performed. Additional detailed discussion is provided in Section 6 of this report.

- **Location #4: The power line corridor, stations 210+00 to 280+00.**

The roadway alignment as proposed currently follows an existing power line and will impact this utility. Possible alignment shifts may avoid these impacts.

- **Location #5: A series of wash crossings, inaccessible by vehicle, stations 110+00 to 155+00.**

It is anticipated that minor alignment refinements can lessen the impacts to these existing washes.

- **Location #6: The connection with US 50 at Opal Lane, stations 10+00 to 30+00.**

The improvements at Opal Lane would have some right-of-way impacts to adjacent private properties. Possible alignment shifts to minimize or avoid impacts could be incorporated.

5.0 FIELD REVIEW COMMENTS

Discussions held and comments received from the Field Alternatives Review Meeting focused on a wide variety of project aspects including the overall alignment as well as issues identified within the six specific areas discussed above. Listed below is a summary of the comments

received from NDOT participating staff who participated in the field review with a response formulated by the review team. As appropriate, roadway alignment modifications will be made as a result of the review comments received.

5.1.1 General Project Comments

Comment:

The team should review the existing mining claims in the area.

Response:

The mining claims in the area will be investigated as part of the environmental assessment process.

Comment:

Wildlife crossings may be required. Discussion on whether increasing the box culvert sizes for horses would accomplish the crossing needs in the area.

Response:

Wildlife crossing locations are anticipated to be required. Locations will be evaluated based on input from the environmental team and local advocacy groups.

Comment:

Chain-up areas may be required due to the higher elevations and steep grades. The team should investigate the need and possible location for these areas.

Response:

District II has been contacted and provided the following direction: "Chain up areas are hard to determine based on elevations. Coming in from IR-80 onto USA Parkway there really is not a suitable location for a chain up area until you are out of the industrial area. Coming in from the US-50 side probably put one just prior to entering the foot hills". Ongoing coordination will occur when potential locations have been identified. Area for these will be included in the APE.

Comment:

Fencing will likely be required along the alignment.

Response:

Yes, fencing will likely be required due to the large presence of cattle and wild horses. Fencing will be determined during final design.

5.1.2 Environmental

Comment:

There is uncertainty and concern about if the alignment near the Ramsey town site would impact or have an adverse effect on any of the potentially historic features. Because the alignment near the mine does not appear to impact the site, nor is it anticipated that the mine is a historically significant feature, the eastern alignment would be preferred.

Response:

See discussion for Location #2 in Section 6 of this report.

5.1.3 Roadway Geometrics and Clear Zone

Comment:

Discussion on the graded alignment and the need to deviate from it. As much as the graded roadway should be used as possible to reduce the earthwork required.

Response:

It is anticipated that the majority of the existing graded portion of the roadway will be utilized. The width of the graded roadway, however, is approximately 80 ft, while the proposed section is 86 ft. Widening of the existing graded roadway, or re-evaluation of the proposed cross section will most likely be required.

Comment:

The realignment of the graded roadway curve to 60 mph looks like it will create a lot of earthwork. Will this earthwork be needed elsewhere on the project or will it be excess requiring disposal?

Response:

Preliminary earthwork estimates indicate that over 500,000 cubic yards of excess material would be produced with this realignment. While it is unknown as to the suitability of this material for use at other locations, current earthwork estimates for the new alignment portion of the roadway indicate a shortage of approximately the same amount. It is likely, however, that further profile refinements on the new alignment section will reduce cut/fill difference. There is also potential to develop a material site on the south portion of the new alignment, where a large portion of the embankment will be required. Refer to additional discussion in section 6 of this report.

Comment:

Roadside protection will need to be provided along roadside ditches present on the graded section of the roadway where required clear zone cannot be achieved. There was discussion on whether this should be guardrail or barrier rail.

Response:

If required clear zone distances cannot be met, roadside protection will be required. District II has indicated a preference to concrete barrier rail due to the high cost of maintaining guardrail. In the graded section of the roadway, widening of the roadway and re-grading of the ditches may be more cost effective and not introduce an additional hazard with the use of barrier rail.

Comment:

Because the high point of the alignment is at about 5669 ft of elevation, with the grade being 6% on either side, truck climbing lanes should be considered if a first phase of construction has only two lanes.

Response:

At this time, the team anticipates that 2 travel lanes per direction will be required based on conceptual traffic volumes. If this focus should change, truck lanes along the steeper sections can be evaluated.

Comment:

Consider lengthening the horizontal curve between stations 120+00 to 150+00 so that the alignment through the curve is moved to the north east of the current alignment and washes.

Response:

The alignment at this curve will be altered to minimize impacts to these washes.

Comment:

There are a few pinch points (such as at station 270+00, and along 300+00 to 350+00, etc) where the alignment is somewhat close to the wash. We might want to consider the future expandability such as going to 3 lanes each direction while still not impacting the wash.

Response:

Further analysis including cost would need to be completed to determine how critical these pinch points are and if retaining structures would be required at some future date..

Comment:

One of the main intents of the USA Parkway extension is to shorten travel distance and time for trucks. With grades along the new alignment reaching 6%, it is likely that trucks will be traveling at slower speeds reducing the time savings. Based on that, does this project make sense?

Response:

Steep grades will effect travel times for heavy vehicles and loaded trucks. It is anticipated that even with potential reductions in average speed due to climbing, sizeable travel time advantages will still be realized for most trips. The proposed facility provides a much more direct and shorter path to destinations south and avoids more congested areas around Fernley.

5.1.4 Drainage and Hydraulics

Comment:

If the graded section of the roadway were to be realigned to meet the 60 mph design speed, the drainage channels along the roadside may need to be realigned as well rather than providing crossings.

Response:

Drainage channel sizes and locations will be determined during a drainage analysis. Refer to discussions for site 1 included later in this review for additional information regarding this particular location.

Comment:

If concrete barrier rail is used, drop inlets and onsite drainage systems will be necessary to remove water from the roadway surface and to meet spread criteria.

Response:

Concur. If concrete barrier rail is used, drop inlets, culverts and other closed onsite drainage systems will be used to remove water from the roadway surface.

<u>Comment:</u> Wash crossings should be minimized to reduce the impacts to these features. Crossings closer to perpendicular are preferred.
<u>Response:</u> <i>To the extent possible, wash crossings will be minimized and where required, will be made to cross as close to perpendicular as possible given roadway geometric constraints.</i>
<u>Comment:</u> Straightening of the wash near the Ramsey mine site for the short distances discussed in the field is acceptable.
<u>Response:</u> <i>Straightening of the washes will be done only where required. Other options will be evaluated first.</i>
<u>Comment:</u> Propose a shift to the alignment to miss the wash near station 340+00. It was suggested to shift the alignment up the hill on the west side starting at about 370+00, cross the existing channel at 353+60, again at about 340+00, and then tie it back to the alignment at about station 335+00.
<u>Response:</u> <i>The team is evaluating different alignment refinements in this area and through the mountainous terrain. Refer to discussions about site 3 included in Section 6 of this report.</i>
<u>Comment:</u> The use of short toe walls on fill slopes to prevent impacts to washes is acceptable.
<u>Response:</u> <i>The use of retaining walls to avoid impact to significant drainage washes and to reduce grading requirements in sliver cut / fill locations will be evaluated.</i>

5.1.5 Geotechnical
<u>Comment:</u> Steep slopes may be an issue and will need to be investigated.
<u>Response:</u> <i>All slopes will be investigated as part of a geotechnical analysis and report.</i>
<u>Comment:</u> A geotechnical analysis will need to be completed to determine rippability of cuts.
<u>Response:</u> <i>A geotechnical investigation of the cut areas will be performed to determine if the material will be competent as fill and whether the cuts can be dozer ripped or will require drilling and blasting.</i>

<u>Comment:</u> Will cut slopes of 2:1 be stable?
<u>Response:</u> <i>The stability of cut slopes will be investigated as part of a geotechnical analysis and report.</i>

5.1.6 Right-of-way
<u>Comment:</u> It was suggested that our survey be tied to BLM corners and that our control should be given to geodesy.
<u>Response:</u> <i>Concur. Our survey will be tied to BLM corners and given to geodesy.</i>
<u>Comment:</u> NDOT requires that any private right-of-way acquisitions would have to follow the Uniform Act. Discussions occurred on whether TRIC is responsible to provide the right of way and easements needed for the entire project length.
<u>Response:</u> <i>It is unclear as to who will acquire the needed parcels near Opal Lane; however, if NDOT or TRIC should lead the acquisition process, the Uniform Act will be followed.</i>
<u>Comment:</u> Discussion on total property impacts. It may be better to impact fewer properties to a greater degree than more properties to a lesser degree.
<u>Response:</u> <i>The alignment has been refined to impact as few parcels as possible. Further refinements may reduce impacts.</i>
<u>Comment:</u> A buffer of 15 feet should be included within right-of-way, but outside of the roadway slopes to allow for maintenance throughout the project limits.
<u>Response:</u> <i>During establishment of the right-of-way, a buffer distance will be provided for maintenance. This distance will be included as part of the environmental footprint.</i>

5.1.7 Utilities
<p><u>Comment:</u> All utilities should be pushed out of the roadway onto the shoulders in a defined utility corridor where possible. Utilities such as water, gas, and sewer should be on one side while utilities such as electrical and telephone are on the other.</p>
<p><u>Response:</u> <i>The proposed typical section will accommodate additional width for utilities outside of the pavement surface.</i></p>
<p><u>Comment:</u> All utilities are to have RFIDs (Radio Density Identification) installed.</p>
<p><u>Response:</u> <i>Will be addressed in final design.</i></p>
<p><u>Comment:</u> Once power line relocations are determined, there will have to be an easement perfected, or the original easement modified for the new locations. There will have to be coordination with Nevada Energy on providing adequate access to their existing pole line access road. Possible approaches or pull out areas to service poles may be needed.</p>
<p><u>Response:</u> <i>Coordination with NV Energy will occur once the extent of the impacts to the power line are known. Approaches to pole access roads will be evaluated once the alignment has been set.</i></p>
<p><u>Comment:</u> In areas where the roadway alignment parallels the power line, it was suggested to move the alignment away from the poles so that each pole will not have to be relocated. Move the roadway enough so that the slope catches grade while still allowing an access road along the pole line.</p>
<p><u>Response:</u> <i>The roadway alignment in areas paralleling the power line will be realigned so that the offset distance will be enough as to not require significant power pole relocation. In areas where steep slopes occur or where the alignment crosses the power line, poles may still require relocation.</i></p>
<p><u>Comment:</u> An ITS conduit should be included along the length of the alignment.</p>
<p><u>Response:</u> <i>An ITS conduit will be included as part of the final design.</i></p>

6.0 CONCLUSIONS OF FIELD ALTERNATIVES REVIEW

The comments and discussions documented from the Field Alternatives Review provide direction for specific design refinements that will be investigated moving forward. This section expands on the six specific locations identified in Section 4 to make determinations regarding elimination of alternatives as well as additional refinements to analyze along the primary alignment. Several exhibits developed to clarify the proposed direction are provided in the pages following this narrative.

- **Location #1: The reversing curves along the graded portion of the roadway, at stations 510+00 to 620+00.**

As discussed in Section 5, the horizontal geometry of the existing graded section of roadway through this area meets a 55 mph design speed, but fails to meet the proposed 60 mph design speed. A proposed realignment of the roadway in this location to develop an alignment that meets the 60 mph design speed was developed and is depicted in blue line work on Exhibit #2 on page 11.

Preliminary earthwork estimates indicate the additional grading required to construct the alternate alignment in this location consists of roadway excavation of 549,000 cubic yards and embankment of 80,000 cubic yards, which generates excess cut in the amount of 469,000 cubic yards. The overall preliminary earthwork quantity for the project currently reflects the need for a significant amount of borrow material. The excess material from the subject realignment could be utilized to make up this difference. It is anticipated, however, that additional alignment refinements through the mountainous areas discussed in Location #3 below will reduce the amount of excess borrow required. In addition, NDOT is considering the use of a material source in close proximity to the southern section of USA Parkway alignment which could provide additional borrow material with a shorter haul distance.

Once earthwork quantities for the selected primary new alignment have been developed and the likelihood of a material source on the project has been assessed, a cost / benefit analysis will be performed to determine if the 5 mph increase in design speed is worth the additional cost of re-grading the roadway. If the excess material from the subject realignment is not necessary to balance the grading on the overall project, the disposal costs for removing the material from the project will be

significant. It will be NDOT's decision whether those costs are justified in providing a 5 mph increase in the design speed of the roadway.

As mentioned previously, if the existing graded alignment is not altered, the design speed of the curves would still match the proposed 55 mph posted speed currently proposed for the new alignment section of USA Parkway.

- **Location #2: The western loop alternative versus the eastern direct alternative, stations 375+00 to 520+00.**

Based on the design analysis as well as comments and discussions generated from the field review, the project team recommends that the western loop alternative be eliminated from consideration.

As shown in blue line work on Exhibit #3 on page 12, the direct alternative is approximately 0.6 miles shorter and approximately one-third of this alignment has already been graded. The western loop alternative, shown in yellow line work on Exhibit 3, produces approximately 1.4 million cubic yards of additional earthwork when compared to the eastern direct alternative.

In addition, the western loop alignment passes very close to the Ramsey town site and may impact some of the potentially historic aspects of this site. Even though the eastern alternative passes near the abandoned Ramsey mine, it is not anticipated to have the same impacts to existing features.

- **Location #3: The mountainous section from the Storey / Lyon County line to where the alignment meets the valley floor, stations 310+00 to 450+00.**

This area represents locations where the greatest design refinements to the primary alignment are being considered. As shown on Exhibit #4A and Exhibit #4B on pages 13 and 14, one significant refinement is under consideration in the area from station 400 to 450 and two refinements are under consideration in the area from station 310 to 390. The photos provided in Appendix A also help illustrate the design refinements under consideration.

Alignment Refinements Station 400+00 to 450+00

Modified Field Review Alignment -1 is shown in orange line work on Exhibit 4A. As shown in photos #4 through #9, the alignment through this location traverses a series of hillside peaks and valleys. Comments received during the field visit recommended a straightening of the primary alignment to more closely follow the existing power lines through this location. This allows for simpler geometry with a reduction in the amount of horizontal curvature. This refinement will also lessen any potential impacts to the drainage wash that runs parallel to the primary alignment through this area. In order to accurately analyze the earthwork quantities associated with this refinement, additional development of the digital terrain model will be required. Based on the impacts of the earthwork analysis, this refinement will be considered in lieu of the original field review alignment shown in blue on Exhibit #4A.

Alignment Refinements Station 310+00 to 390+00

Modified Field Review Alignment -1 (shown in orange line work) and Modified Field Review Alignment -2 (shown in magenta line work) are depicted along with the Original Field Review Alignment on Exhibit 4B. As shown in photos #11 through #18, the alignment heading north to south through this location traverses a hilltop and travels down a defined valley with a wash at the bottom.

Modified Field Review Alignment – 1 is being considered to lessen the impacts to the existing drainage wash at the bottom of the valley. The Original Field Alignment has issues with the toe of the embankment fill slope significantly impacting the existing wash. This proposed refinement pushes the alignment up the existing hillside to the east, away from the wash. Earthwork analysis, as well as consideration of retaining walls and realignment of the existing wash, will be considered in selection of the preferred alignment through this location.

Modified Field Review Alignment – 2 is being considered to reduce the large amount of cut required to construct the Original Field Review alignment through this location. Comments received during the field visit recommended a possible realignment on the west side of the existing wash to avoid the large excavation through an existing side slope the original alignment traverses. This refinement requires two additional crossings of the existing wash and initial review has

indicated that the reduction in excavation may not be significant. This refinement would also introduce additional curvature and geometric complexity. A similar analysis considering earthwork quantities, the use of retaining walls, as well as potential realignment of the existing wash will be considered in selection of the preferred alignment in this location.

- **Location #4: The power line corridor, stations 210+00 to 280+00.**

The roadway alignment as proposed currently follows an existing power line and will impact this utility.

The roadway alignment has been altered eastward to allow for the roadway prism to fall outside the power line corridor. In addition, a minimum 50ft buffer has been provided from edge of the roadway slope to allow NV Energy access to the poles. This realignment minimizes impacts to the power line. Refer to Exhibit #5 showing the original and refined alignments.

- **Location #5: A series of wash crossings, stations 110+00 to 155+00.**

Although this location was not visited during the field review due to vehicle inaccessibility, previous field reviews have indicated that minor revisions to the alignment could be made to reduce the impacts to several existing drainage washes. Due to relatively consistent topography, geometric revisions will be made to reduce the number of crossings and the potential need to relocate existing washes in this location.

- **Location #6: The connection with US 50 at Opal Lane, stations 10+00 to 30+00.**

Previous analysis has been performed regarding the tie-in location of USA Parkway to US 50. Due to issues with traffic, existing schools, the cemetery, and input from the public, the Opal Drive connection point was the only one considered from a design standpoint for the Field Alternatives Review. Consideration of other connection points at US 50 is being evaluated in the environmental analysis currently being performed and will be included as part of Chapter 2 of the environmental document.

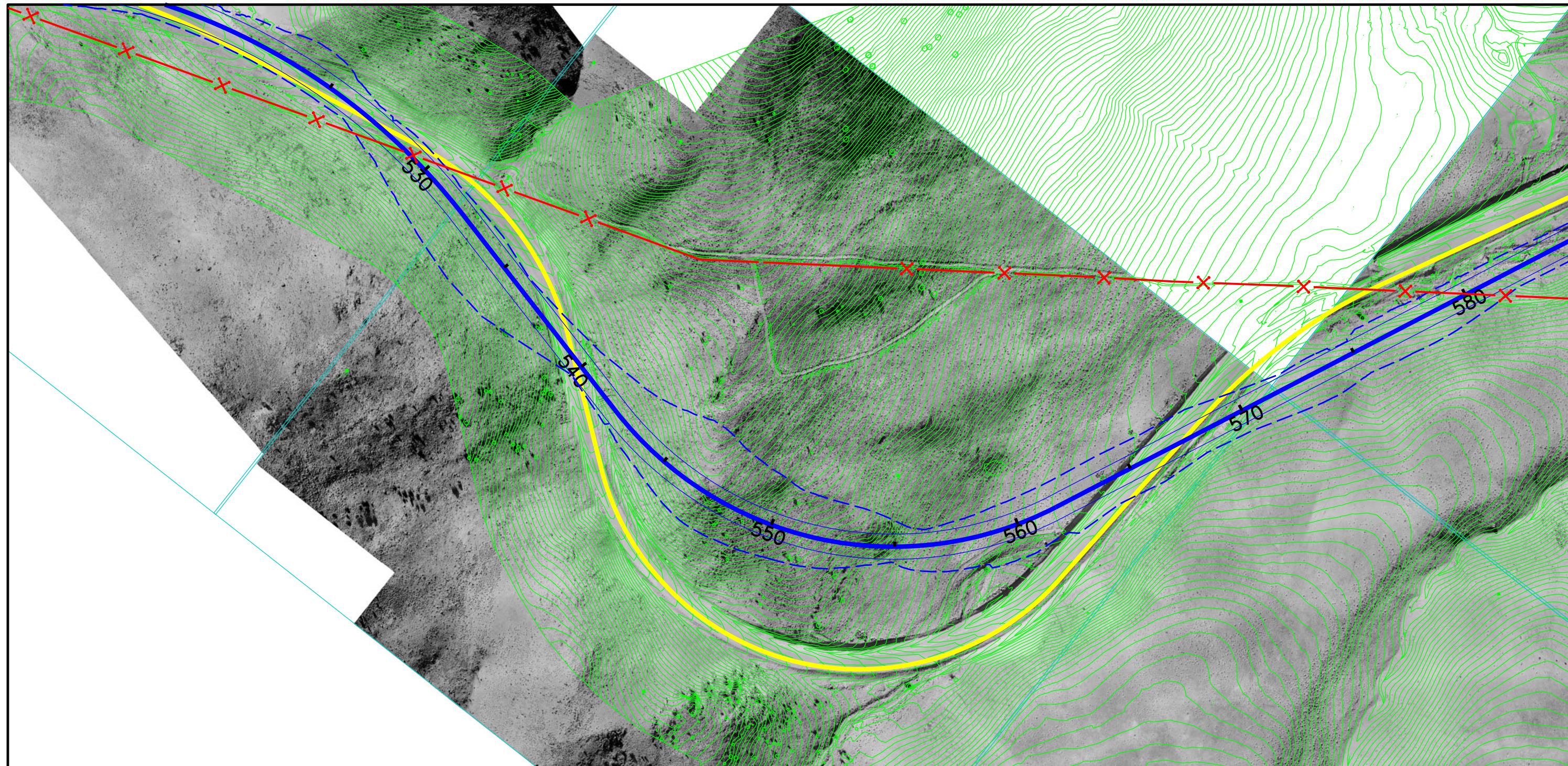
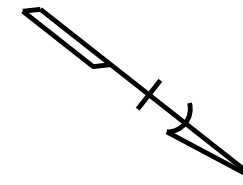
The alignment for USA Parkway as it nears US 50 directly impacts several properties along Opal Drive. It is unclear at this time if NDOT will be performing the right-of-way acquisition process, but whoever performs this work, the Uniform Act for Relocations and subsequent amendments shall be followed. Additional minor alignment refinements in this area may increase or decrease impacts to private properties. Following design refinements, the area required for USA Parkway from these adjacent properties will be determined. See exhibit sheet C1-1 of the attached plan set in Appendix B.

An additional challenge associated with the connection to US 50 is a future proposed grade separated interchange with USA Parkway. Due to the proximity of the proposed grade separation with the existing airport runway, severe restrictions to increasing the elevations of the roadway infrastructure exist. This restriction, combined with proposed drainage crossing requirements in close proximity to the US 50 connection will make this grade separated interchange a challenge to design. It should be noted that NDOT is preparing a preliminary design of the interchange as part of projects to improve US 50.

GENERAL CLOSING COMMENTS:

The design alternatives analysis leading up to the Field Alternatives Review, as well as the results of the field review have resulted in multiple revisions to the primary alignment from a design perspective. Other refinements will be considered after additional analysis based on recommendations of the project team outlined in this report. Additional geometry modifications will depend mainly on the results of more refined earthwork analysis, a study of the impacts to existing drainage features, reduction of geometric curvature where appropriate, refinement of the proposed roadway cross section through various locations on the alignment, and results following the environmental field review.

Following completion of additional analysis and final refinements to the primary alignment at the locations identified a preliminary USA Parkway preferred alignment will be established. This will allow the environmental team to continue field studies and analysis within the footprint of proposed roadway.

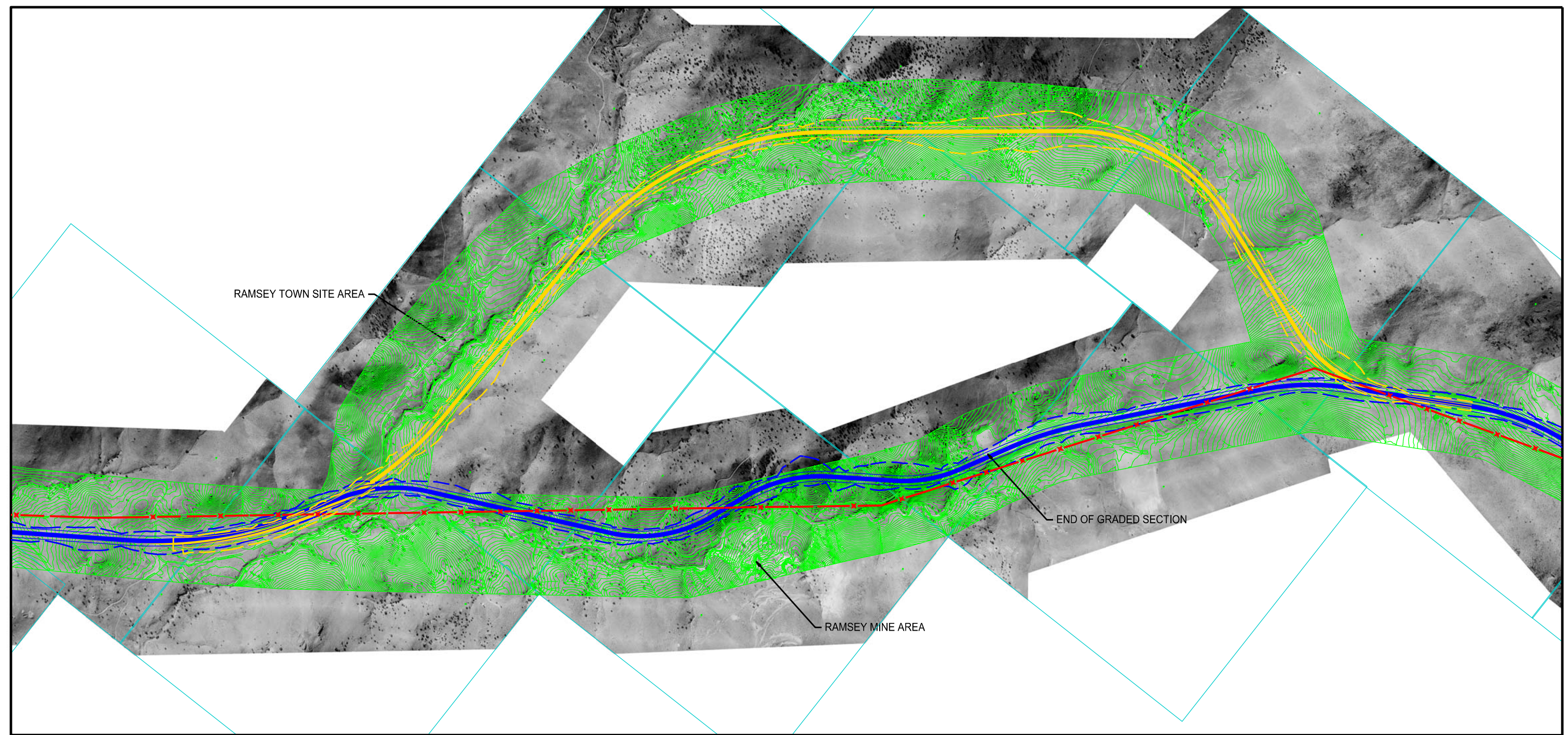
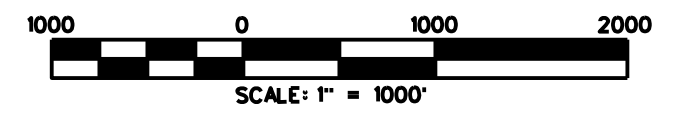
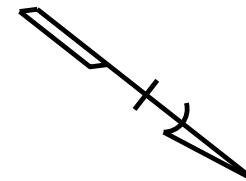


LEGEND:





- FIELD REVIEW ALIGNMENT: 60 MPH DESIGN SPEED
- EXISTING GRADED ALIGNMENT: 55 MPH DESIGN SPEED
- - - ALIGNMENT CUT / FILL LIMITS
- x - EXISTING POWER LINES

USA Parkway
SR 439
JACOBS
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RENO, NEVADA 89521
(775) 850-5100 Fax (775) 850-5115

EXHIBIT 2
LOCATION #1: REVERSING
CURVES
55 MPH VS 60 MPH ALIGNMENTS

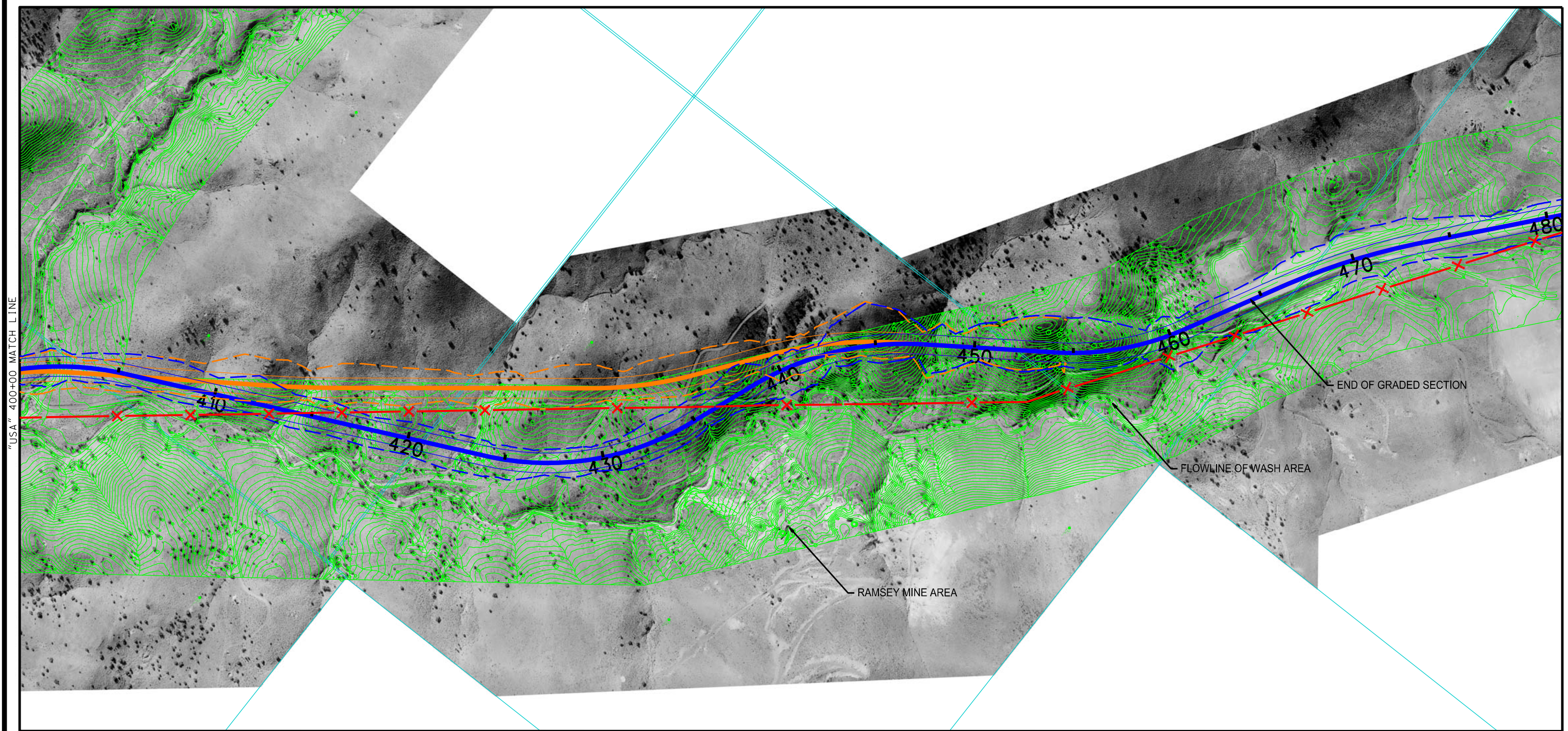
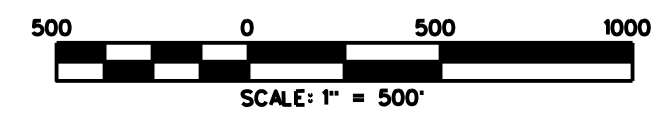
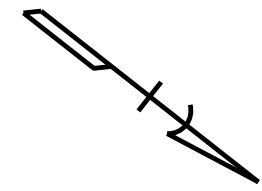


LEGEND:





-  EASTERN DIRECT ALIGNMENT ALTERNATIVE
-  WESTERN LOOP ALIGNMENT ALTERNATIVE (TO BE ELIMINATED)
-  ALIGNMENT CUT / FILL LIMITS
-  EXISTING POWER LINES

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EXHIBIT 3
LOCATION #2: EASTERN DIRECT
AND WESTERN LOOP ALIGNMENT
ALTERNATIVES

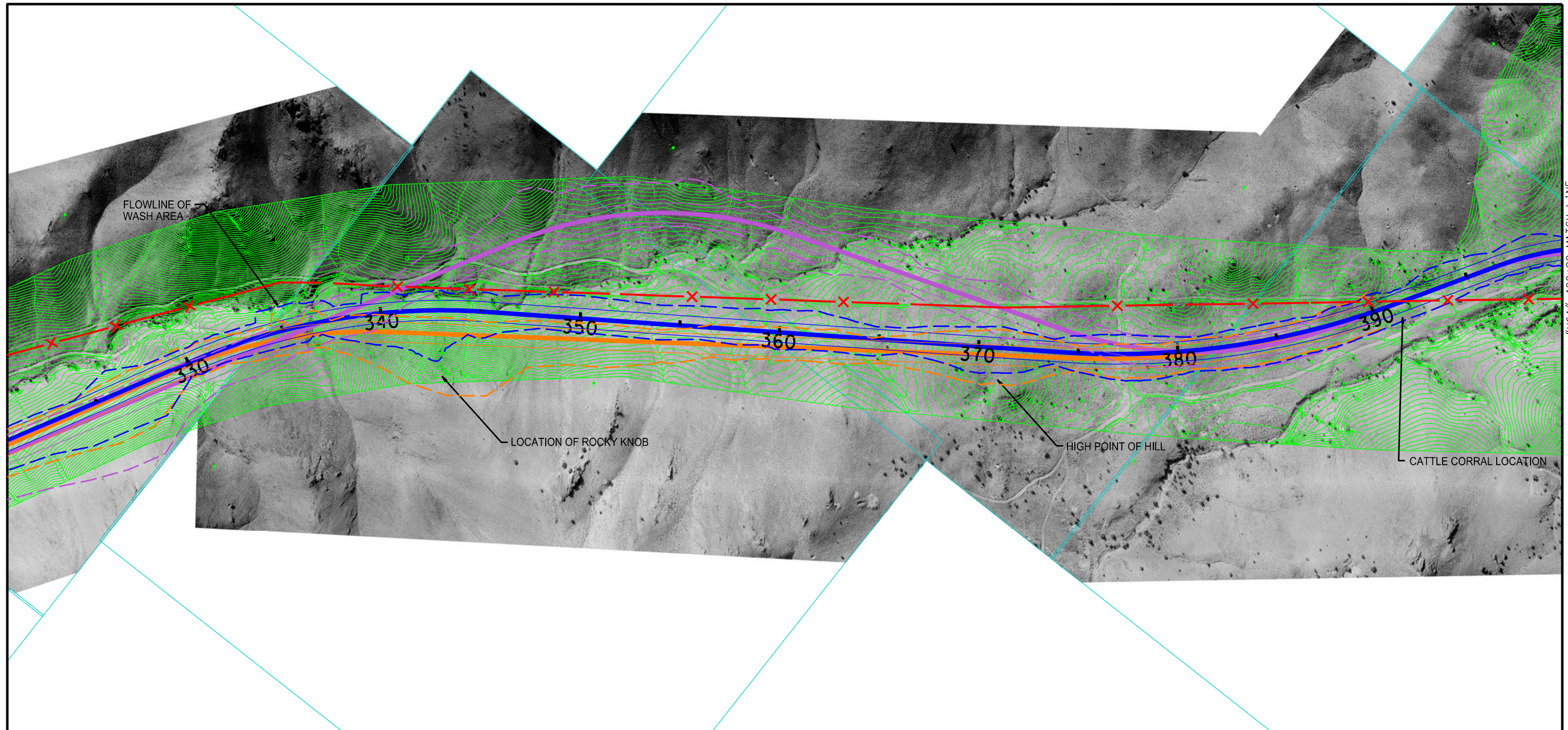
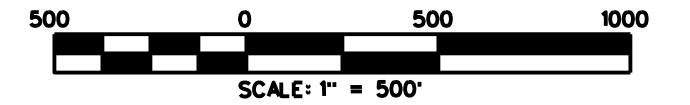
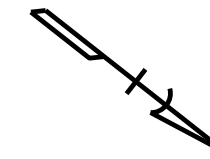


LEGEND:






-  ORIGINAL FIELD REVIEW ALIGNMENT
-  MODIFIED FIELD REVIEW ALIGNMENT-1
-  ALIGNMENT CUT / FILL LIMITS
-  EXISTING POWER LINES

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EXHIBIT 4A
LOCATION #3: ROADWAY PLAN
"USA" 400+00 TO 450+00

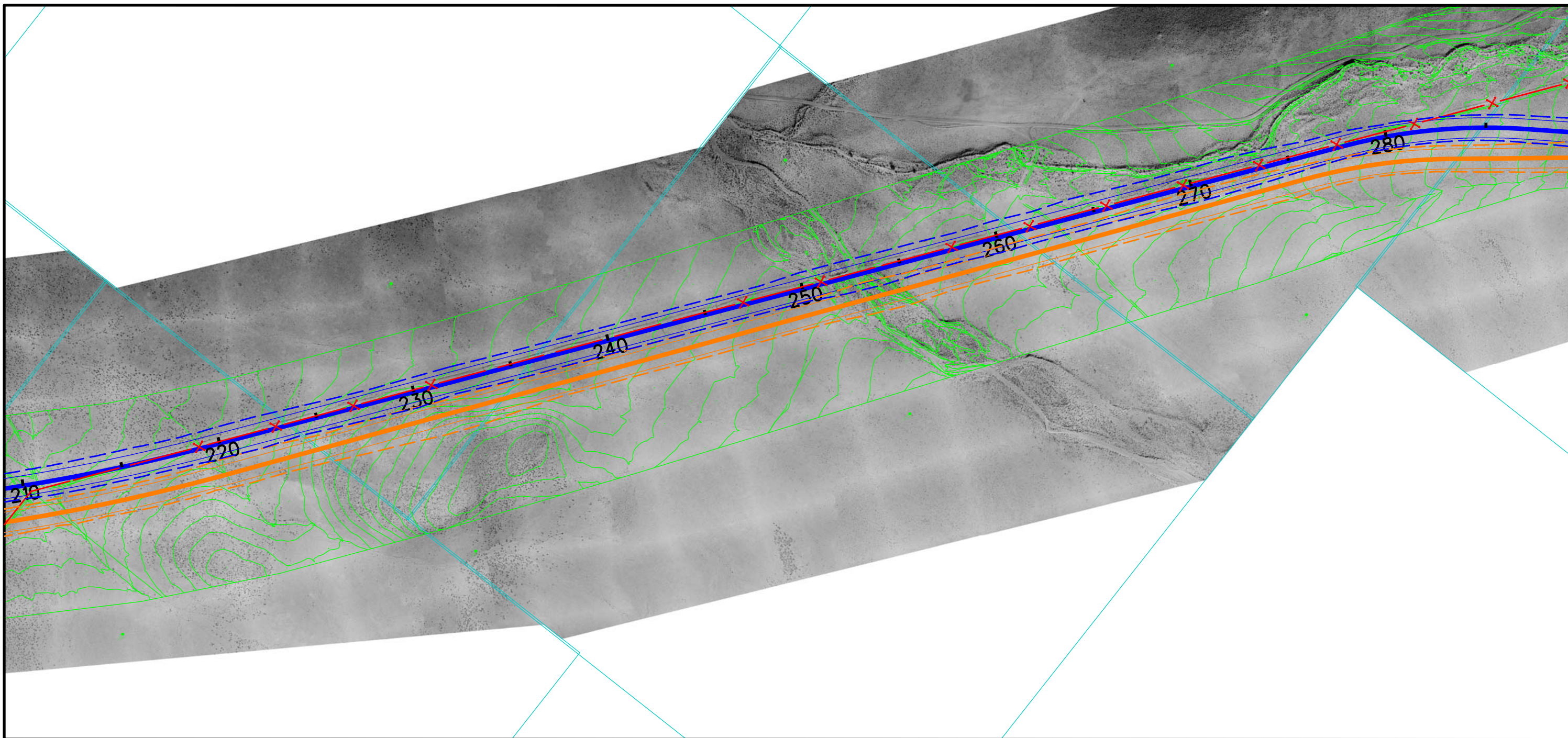
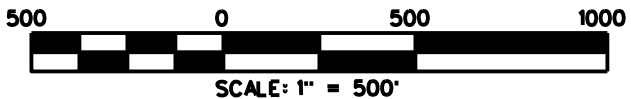
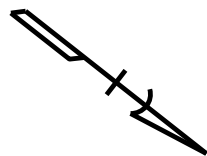


LEGEND





-  ORIGINAL FIELD REVIEW ALIGNMENT
-  MODIFIED FIELD REVIEW ALIGNMENT-1
-  MODIFIED FIELD REVIEW ALIGNMENT-2
-  ALIGNMENT CUT / FILL LIMITS
-  EXISTING POWER LINES

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EXHIBIT 4B
LOCATION #3: ROADWAY PLAN
"USA" 310+00 TO 390+00



LEGEND:

-  ORIGINAL FIELD REVIEW ALIGNMENT
-  MODIFIED FIELD REVIEW ALIGNMENT-1
-  ALIGNMENT CUT / FILL LIMITS
-  EXISTING POWER LINES

USA Parkway
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RENO, NEVADA 89521
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EXHIBIT 5
LOCATION #4: POWER
LINE CORRIDOR

APPENDIX A: PHOTO LOG

FIELD REVIEW PHOTOS

Photographs were taken in the southbound direction beginning at the end of the graded roadway at Station 470. Stationing is approximate, and direction of photos are southbound unless noted otherwise generally following the Field Alternative Review Alignment.



Photo #1: Station 470 – End of graded roadway



Photo #2: Station 463



Photo #3: Station 455



Photo #4: Station 445



Photo #5: Station 434 looking Northbound



Photo #6: Station 435



Photo #7: Station 425



Photo #8: Station 420



Photo #9: Station 410



Photo #10: Station 405



Photo #11: Station 405



Photo #12: Station 378 Looking Northbound



Photo #13: Station 376



Photo #14: Station 365

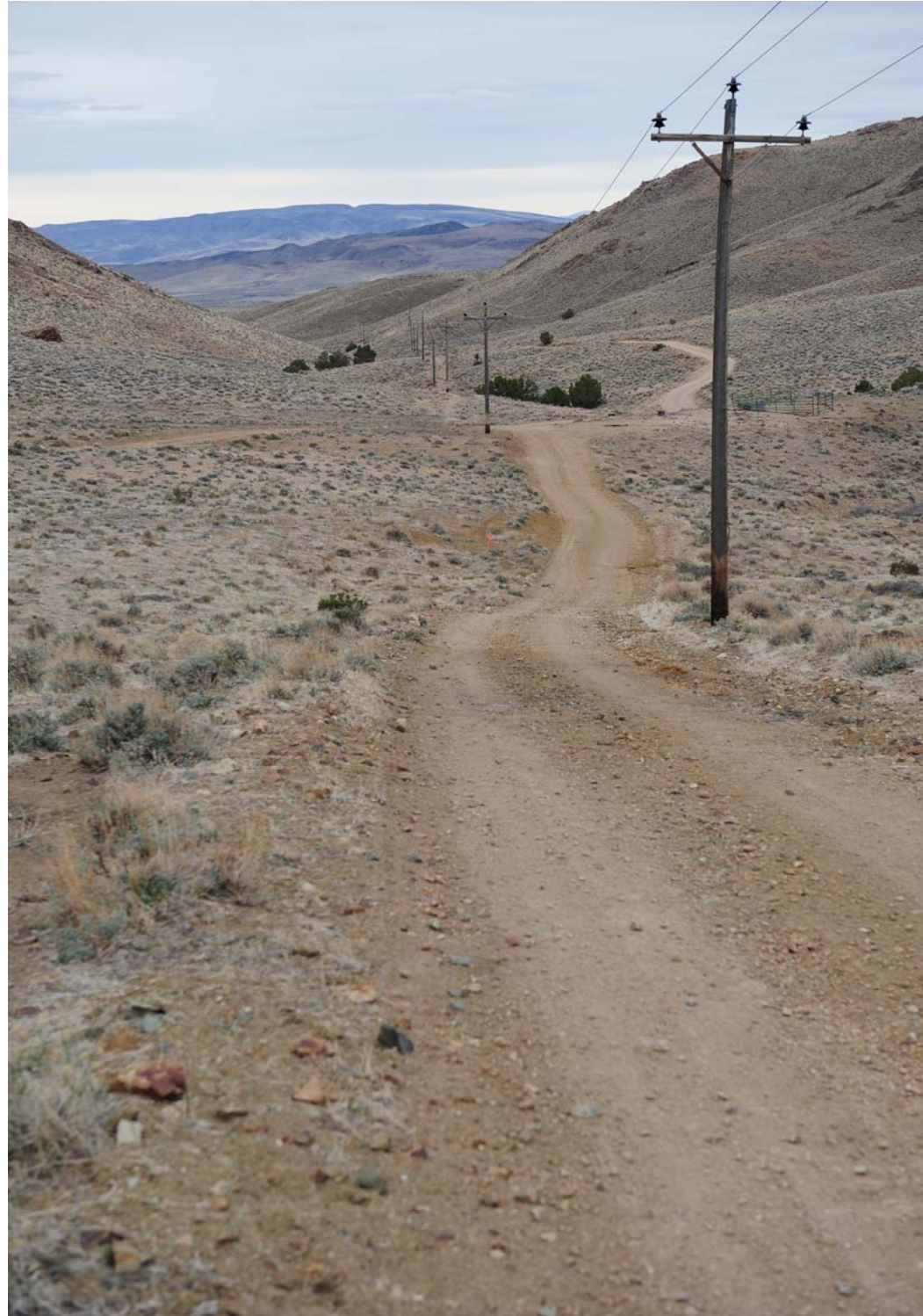


Photo #15: Station 360



Photo #16: Station 350



Photo #17: Station 347



Photo #18: Station 343



Photo #19: Station 335



Photo #20: Station 327



Photo #21: Station 320

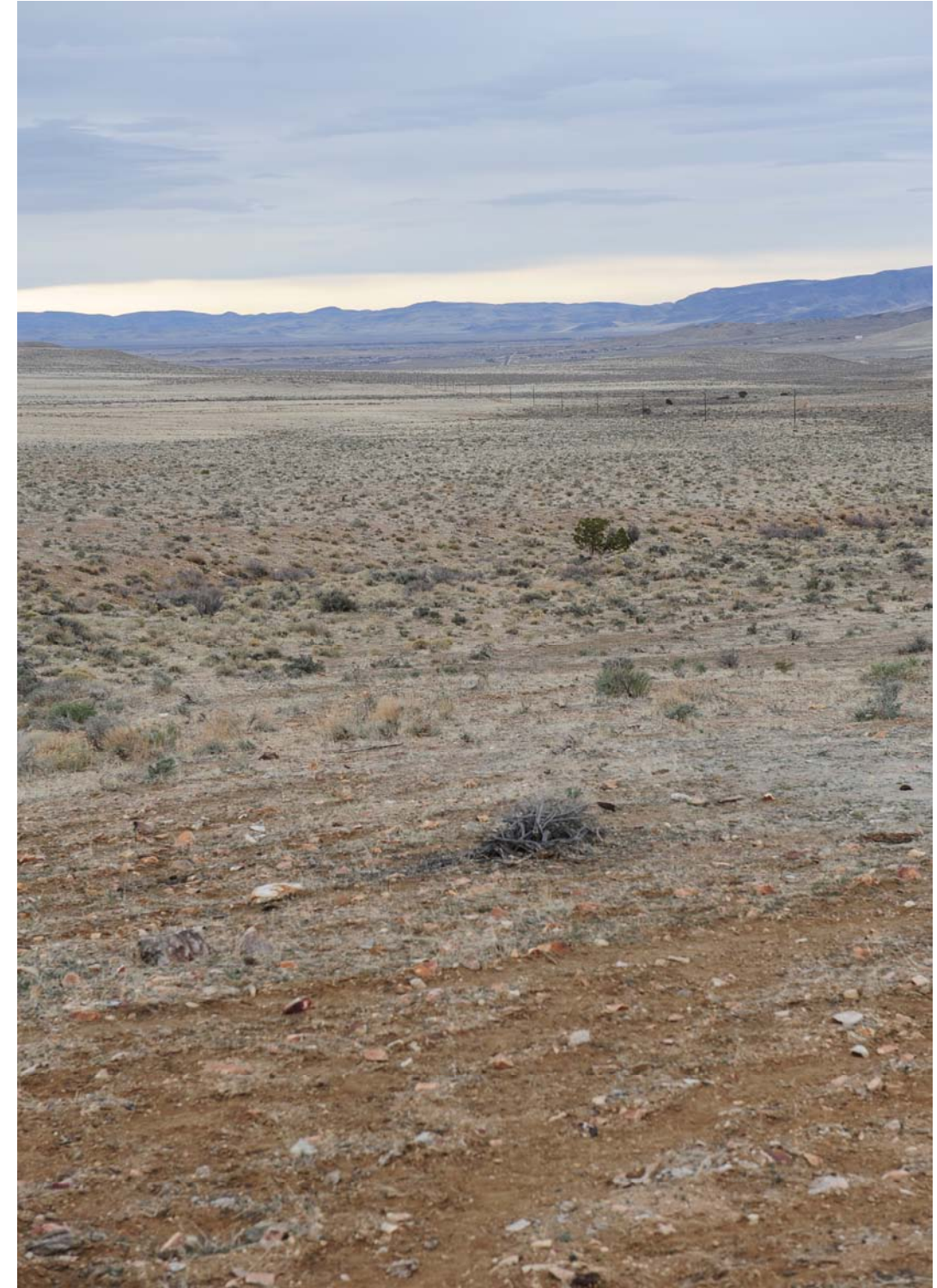


Photo #22: Station 300

The following photographs were taken from proposed tie-in location at Opal lane.



Photo #23: Looking North on Opal Lane



Photo #24: Looking Northwest along the alignment from Opal Lane



Photo #25: Looking South on Opal Lane

The following photographs were taken from proposed realignment of the graded section of roadway at station 525.



Photo #26: Looking northbound



Photo #28: Looking Southbound



Photo #27: Looking northbound



Photo #29: Looking northbound

APPENDIX B: PRELIMINARY PLAN AND PROFILE DRAWINGS