BLUE RIDGE PARKWAY TECHNICAL REPORT

BLUE RIDGE PARKWAY BRIDGE OVER INTERSTATE 26

Conceptual Alternatives
Impact Topics Considered
Environmental Consequences
VA/CBA Study Factors

July 30, 2018

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[1] The graphics provided for Alternative 4 were updated to reflect the most recent design (July 18, 2017)

Introduction

The North Carolina Department of Transportation (NCDOT), in cooperation with the Federal Highway Administration (FHWA) proposed to widen I-26 from US 25 in Henderson County to I-40 in Buncombe County (22.2 miles) to relieve congestion along the I-26 corridor. Because of the proximity of the existing high piers to the existing travel lanes, this widening requires the replacement of the Blue Ridge Parkway Bridge over I-26 in Buncombe County, NC. The Draft Environmental Impact Statement (DEIS), prepared by the NCDOT in coordination with the FHWA, was prepared to satisfy (in part) the requirements of the National Environmental Policy Act (NEPA) of 1969. The National Park Service (NPS) has been designated as a cooperating agency. Upon the completion of the EIS, the EIS should include information necessary for the NPS to adopt the EIS and issue their own decision document. In order for the NPS to issue an approval, an impact analysis and impairment analysis per Director's Order #12: Conservation Planning, Environmental Impacts Analysis and Decision-Making Handbook (National Park Service, 2015) must be completed. This technical report compiles the background information and analysis needed to support the NPS's adoption of the EIS.

This technical report discusses only the alternatives for the reconstruction or replacement of the Blue Ridge Parkway Bridge over I-26. In the Draft EIS, these alternatives are presented as options, since they are part of the larger corridor widening project, which has its own alternatives to avoid confusion.

1.0 Alternatives Development

This section summarizes the development and evolution of the alternatives proposed and evaluated for the reconstruction or replacement of the Blue Ridge Parkway Bridge over I-26. This section also discusses the evaluation factors and why certain alternatives were dismissed from further consideration.

1.1 Conceptual Alternatives

Several bridge replacement alignment alternatives are being analyzed for the replacement of the Blue Ridge Parkway Bridge. Ideally, the existing bridge would remain open to traffic during construction; however, one of the alternatives under consideration does require closure of the bridge during construction. Reconstruction of the existing bridge is also being considered. A new bridge could be either a concrete box girder or steel plate girder bridge. The bridge would most likely be constructed from the top down using segmental construction. The bridge would have two ten-foot travel ways, three-foot shoulders and a five-foot sidewalk on one side to accommodate the Mountains-to-Sea Trail. A description of the alternatives under consideration is listed below:

1. Under Alternative 1, the bridge would be realigned to the north. In order to tie into the existing motor road, approximately 2,300 feet of the road would be realigned as a single curve (1530-foot radius). Because of its single sweeping curve, it would also be longest bridge alternative. The bridge would be lengthened to 715[2] feet, and the entire bridge would be on a curve. Alternative 1 would also require a 2-foot widening of the bridge.

2. Under Alternative 2, the bridge would be realigned to the south and consists of a 3-curve realignment with a 1259-foot radius curve on the bridge. Approximately 4,150 feet of the motor

[2] Lengths provided are for a concrete box girder bridge. The use of steel plate girders would result in longer bridge lengths.

road would be realigned to flatten the curves at the approaches. The entire bridge would be on a curve and would be approximately 700 in length. Alternative 2 would require a 2-foot widening of the bridge. This Alternative would result in the most land disturbance, and so was considered but dismissed from further evaluation in the DEIS.

3. Alternative 3 would realign the bridge to the south and would consist of a 3-curve realignment. The bridge would have a 500-foot radius curve and would require a 10 percent superelevation on the bridge and a 3-foot widening of the bridge. Approximately 2,950 feet of the motor road would be realigned. The bridge would be approximately 660 feet in length.

4. Alternative 4 would realign the bridge to the south adjacent to the existing bridge and consists of a 3-curve alignment with a 1075-foot radius curve on the bridge. The bridge would be 605 feet long, and approximately 2,745 feet of the motor road would be realigned. Alternative 4 would also require an additional 2-foot of curve widening on the bridge.

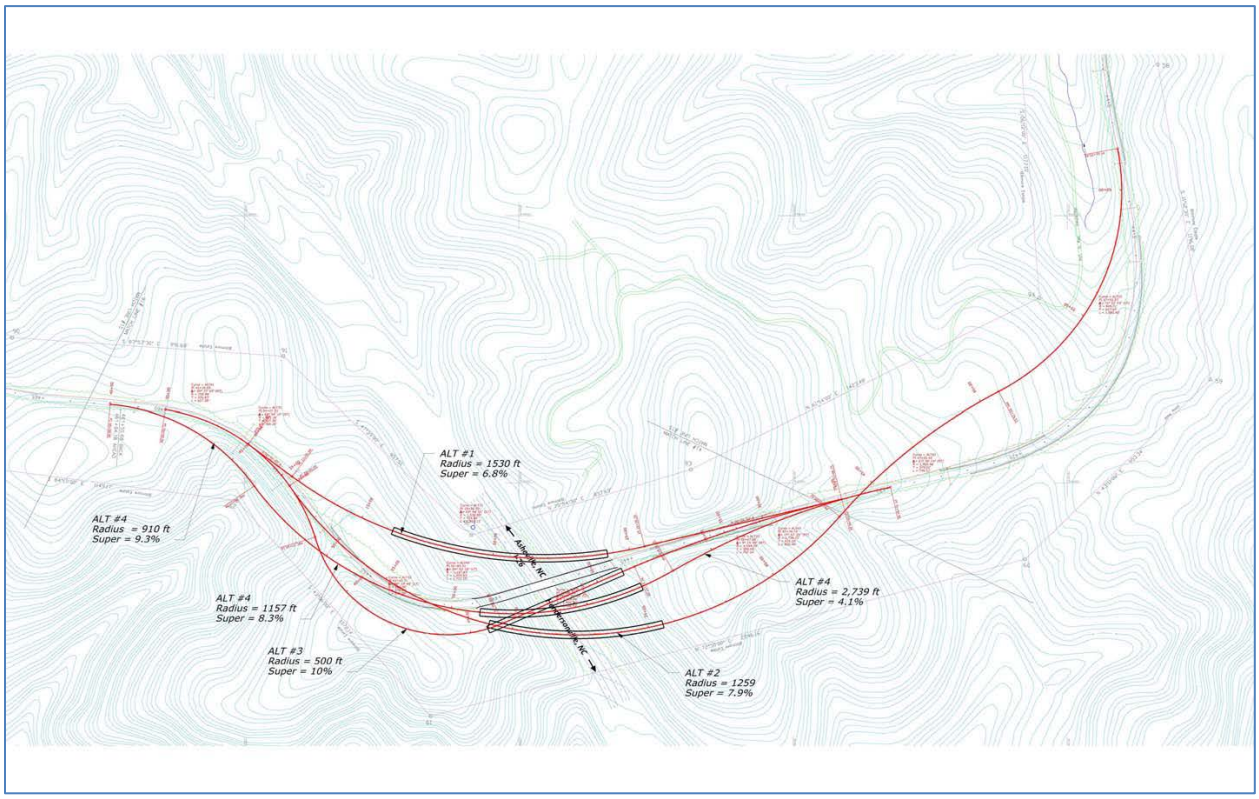

Figure 1. Plan View of Initial Four Alignments

1.2 Evaluation of Conceptual Alternatives and Evaluation Design Criteria

A multi-disciplinary team from the Blue Ridge Parkway NPS unit (BRP team) evaluated the above four proposed alignments for the replacement of the bridge carrying the Blue Ridge Parkway over I-26. The design criteria are listed in order of most importance and are considered criteria that were evaluated in the Value Analysis and Choosing by Advantage Studies (VA/CBA) studies. These proposals were preliminary and identified alignments that were carried forward into the DEIS and the VA/CBA. The BRP

team, comprised of Landscape Architects David Anderson, Andy Otten, and Larry Hultquist, met on April 1, 2015 to evaluate these alignments with consideration of the following design criteria.

1. Alignment impact to Natural and Cultural Resources along the Blue Ridge Parkway corridor.

   Alternatives 1, 3 and 4 were the most acceptable with the shortest realignment lengths required. Alternative 2 was unacceptable as it would impact a wetland area north of the bridge and was the longest realignment proposed.

2. Vertical alignment including superelevation along the bridge (existing bridge has -1.20% vertical alignment and 0% superelevation).

   a. Alternative 1 had a 1.89% rise south of bridge and a -0.56% downgrade north of the bridge, this grade was considered the most favorable with the flattest superelevation at 6.8 percent.
   b. Alternative 2 had a 2.52% grade south of bridge and a -9.61% downgrade north of the bridge, which was considered very steep. The superelevation of 7.2 % was considered steep but acceptable.
   c. Alternative 3 had a 2.64% southern vertical grade to the bridge and a -1.7% downgrade north of the bridge. This was considered a highly favorable vertical alignment but was considered an unacceptable superelevation because a superelevation of 10% was considered very steep.
   d. Alternative 4 had a 4.7% vertical grade on the southern approach and a -4.3 downgrade on the northern approach. These grades were considered steep but acceptable. The superelevation of 8.3% was steep but acceptable.

3. The most acceptable alignment providing the safest reroute of the Blue Ridge Parkway with reference to curve to layout of radius curves.

   Alternatives 1 and 4 were the most highly favored as they most effectively removed the sharp double reverse curves north of the bridge with long sweeping radius curves. Alternative 3 had the sharpest reverse curves and Alternative 2 had the longest most unnecessary long radius reverse curves.

4. Separation from the existing bridge and Blue Ridge Parkway alignment in reference to staging materials and equipment during its construction.

   Alternative 1 was the most favorable and Alternative 4 was considered acceptable. Alternatives 2 and 3 were the least acceptable.

5. Evaluation for balance of cut and fills, extent of vegetation clearing, and or special slope requirements.

   a. Alternative 1 would require a greater amount of cut slope over fill but was considered the most acceptable of all alternatives.
   b. Alternative 2 would require the most extensive cut slope grading and tree clearing and was considered unacceptable.
   c. Alternative 3 would require extensive cut slope and was not favored.
   d. Alternative 4 would best balance cut and fill slope construction. However, the alignment over the fill slope may require retaining walls or other slope reinforcement.

6. Alignment of the Mountains-to Sea-Trail across the Blue Ridge Parkway Bridge.

   All bridges would be designed with a minimal 5-foot wide walkway on the Blue Ridge Parkway. The main two factors evaluated were the sight distance along the curved alignment and the opportunity to provide trail head parking within the old Blue Ridge Parkway alignment. All alternatives would require that the trail be rerouted but some of the alternatives more than others. Alternatives 1 and 4 scored the most favorable with 2 being the most unacceptable and 3 being only acceptable.

7. Length of bridge in relation to estimated cost of the alternative (Is the alternative cost prohibitive?). The existing bridge is 512 feet long.

   a. Alternative 1: 715-foot span, which was the longest proposed bridge.
   b. Alternative 2: 615-foot span, which was within a range of acceptable bridge lengths.
   c. Alternative 3: 536-foot span, which was the shortest proposed bridge length.
   d. Alternative 4: 605-foot span, which was an acceptable second shortest bridge length.

Conclusions for Blue Ridge Parkway Alignments

Considering the above evaluation criteria, the NPS, in cooperation with Eastern Federal Lands Highway Division of the FHWA, has decided that Alternatives 1 and 4 would be the alignments considered for further design development and evaluation in the DEIS and the VA/CBA per the following scores.

1. Alternative 1: Scored highest in all design evaluation criteria. It scored lowest on evaluation design criterial 1, but might still be considered acceptable in meeting the purpose and need and economic constraints.
2. Alternative 2: Scored unacceptable on design criteria 3 through 7.
3. Alternative 3: Scored unfavorable in design criteria 4-6.
4. Alternative 4: Was considered favorable because it scored high in all evaluation design criteria.
5. In consideration of all seven evaluation design criteria the group decided to request that highway designers provide a fifth alternative that BRP team believes might also score high in all seven evaluation design criteria.
6. Alternatives 2 and 3 were considered but dismissed from further analysis.

1.3 Additional Conceptual Alternatives Proposed

After the initial review of the alternatives, additional alternatives were proposed, including the following:

1. Alternative 5 would realign the bridge to the south and consists of a 3-curve realignment with a 565-foot radius curve at the approach to the bridge. The curve at the approach of the bridge would require a 10 percent superelevation of the road and a 3-foot widening of the bridge. The bridge would be approximately 575 in length and approximately 3,255 feet of the Blue Ridge Parkway would be realigned.

2. Alternative 6 would replace the existing bridge at its current location but would improve the curve radii/sight distance, requiring that the bridge be closed to traffic during construction. The new bridge would have a 1091-foot radius curve and 3-foot of curve widening on the bridge. The bridge would be approximately 605 feet in length and approximately 3,450 feet of the motor road would be realigned.

3. Alternative 7 would reconstruct the existing bridge. A steel or concrete arch could be constructed beneath the existing bridge deck. The insertion of an arch would allow for the piers closest to I-26 to be removed. Alternative 7 also includes an option to replace the bridge along the existing alignment. A new concrete bridge would be approximately 605 feet in length.

Dismissal of Alternative 6

Alternative 6 was dismissed from further consideration prior to the VA/CBA, since the alternative requires closure of the Blue Ridge Parkway in order to complete construction. It was determined that the prolonged closure of the Blue Ridge Parkway would have unacceptable impacts to visitor use and experience.

1.4 Evaluation Design Criteria for the Bridge Railing

The BRP all-steel triple railing system as was recently installed on the Blue Ridge Parkway's Goshen Creek Bridge is unacceptable. While this railing is considered a safe crash tested railing system, the railing does not meet the Blue Ridge Parkway cultural resource preservation needs and it is unlike any other railing that exists on the Blue Ridge Parkway. The railing is considered aesthetically unacceptable because it is too imposing in the landscape. With this rail the bridge no longer appears to lie lightly on the landscape blending with the surrounding landscape. The railing was a design failure as it required a costly removal and reset, only two years after the bridge construction was completed. The BRP team requested a bridge railing similar to the railing systems installed on the post-World War II era bridges, such as the bridges along the Grandfather Mountain section of the Blue Ridge Parkway. The photos below demonstrate that these railings are a blend of concrete parapet wall with steel or aluminum railing.

Figure 2. Railing Along the Grandfather Mountain Section of the Blue Ridge Parkway

These bridges have granite stone approach guard wall, with concrete parapet walls including a double tubular aluminum railing system. A system of railing most compatible with this design type would be more culturally acceptable and aesthetically pleasing. Two designs were proposed to meet crash tested standards and are also more acceptable in meeting cultural compliance criteria as well as being more compatible with the Blue Ridge Parkway's aesthetic requirements. In order to meet crash test standards, the railing must be 32 inches above the bridge deck and to be pedestrian safe, must be 42 inches high from the concrete walkway surface. To meet pedestrian safety standards the railing could not have an open space larger than 6 inches in height. Two railing designs that meet crash test standards are the Kansas 32 railing system and the Concrete Barrier Type 80 SW railing. Both are 32-inch high concrete railings that meet crash test standards. A handrail, single or double tubular aluminum or steel railing, or

a suicide preventative railing system, such as built at Battery Parkway, can be mounted on either the Kansas 32 or the Concrete Barrier 80 SW railing system.

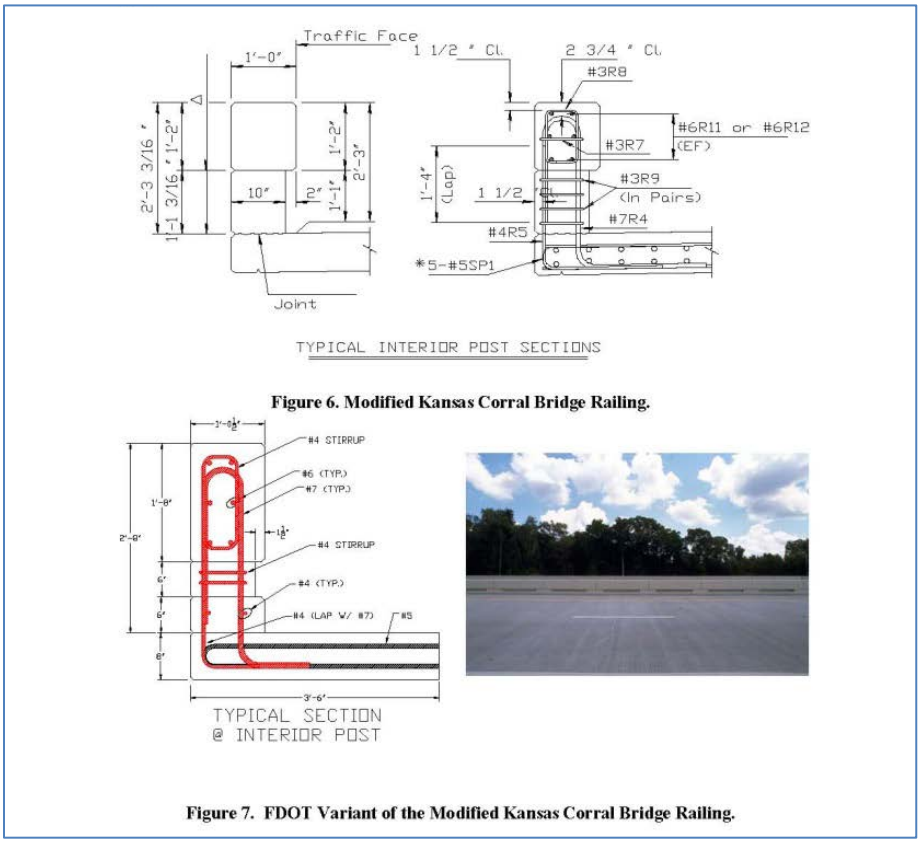

Figure 6. Modified Kansas Corral Bridge Railing.

Figure 7. FDOT Variant of the Modified Kansas Corral Bridge Railing.

Figure 3. Modified Kansas Corral Bridge Railing

This possible concrete rail system is 32 inches in height and must be mounted with either a single or double tubular aluminum railing, or a suicide preventative railing at top to provide the minimal 42 -inch pedestrian safe vertical height requirement.

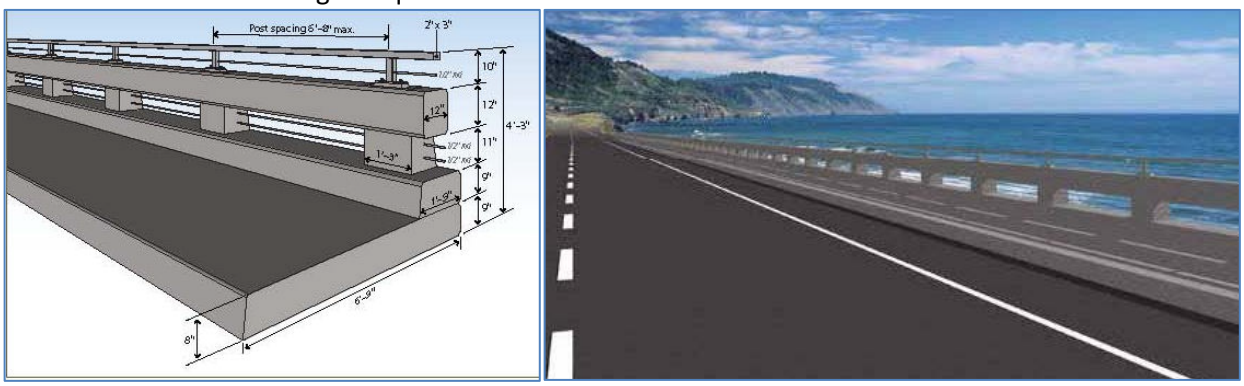

Figure 4. Concrete Barrier Type 80 SW Railing

This concrete railing is mounted with a square steel handrail system to give the railing system an overall height of 42 inches to make it pedestrian safe. Spaces within the railing and below the handrail are fitted with steel rods to limit vertical spaces to less than 6 inches in height. This railing system could also be

mounted with the single or double tubular railing system shown following, or the Battery Park suicide preventative railing system shown following.

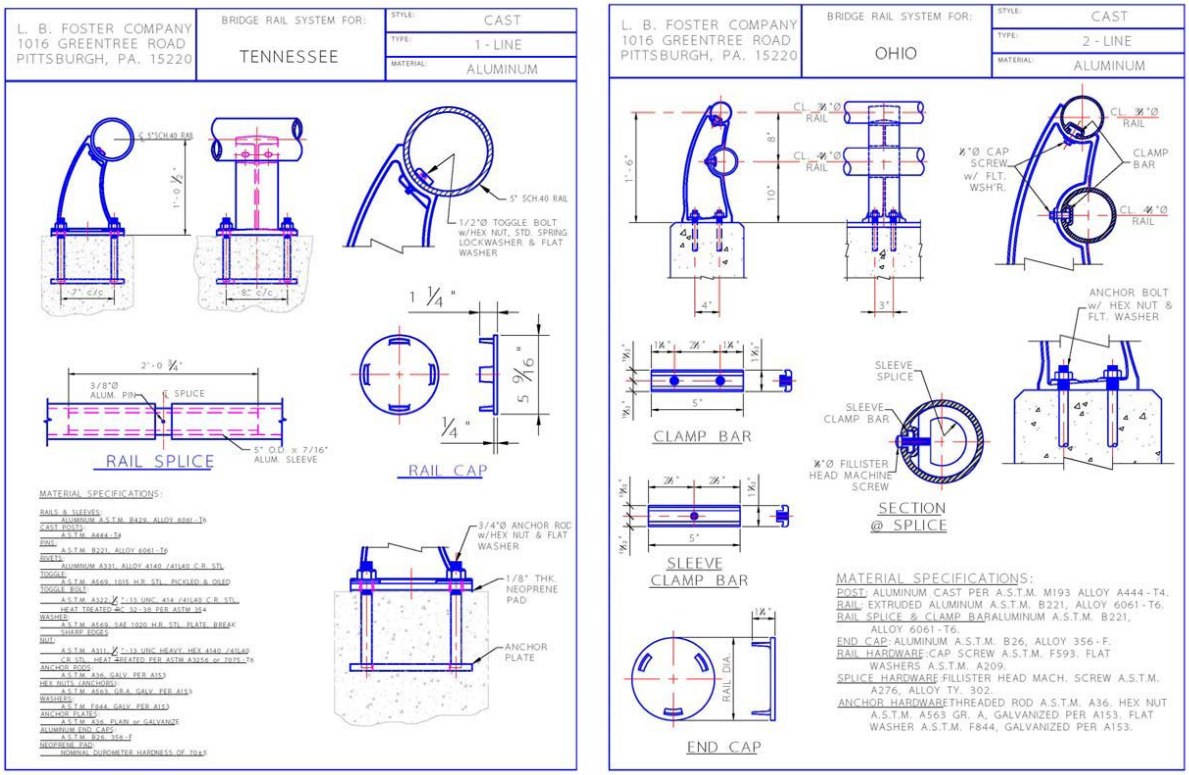

Figure 5. Tubular Railing Systems

Conclusions for Bridge Railing Design System

The BRP team has concluded that the Kansas 32 Railing system has a heavy concrete barrier like appearance. It does provide some advantages to screening views to I-26 from the Blue Ridge Parkway, but its massive appearance does not meet the aesthetic requirements of giving the bridge the appearance of lying lightly on the land. The BRP team concluded that the Concrete Barrier Type 80 SW should be the preferred railing design for the Blue Ridge Parkway over I-26 bridge. It is a crash tested railing while appearing less massive and less visually obtrusive. It has a top mounted handrail that is most compatible with the pedestrian walkway, and can additionally be mounted with the Battery Park Suicide Preventative Railing system if desired. The cross bars, handrail, and the suicide preventing rail can be coated in compatible colors such as grey. The most aesthetic, most compatible railing design would be to have the hand rail mounted on the Type 80 SW railing. The Battery Park railing would be visually massive and intrusive. The suicide railing safety feature would be considered during the design process.

1.5 Summary of Alternatives

Alternatives 1, 4, 5 and 7 were carried forward for further evaluation in the VA/CBA and DEIS. The evaluation of the impacts of each of these alternatives is presented in Section 2.0. As design of Alternative has proceeded since the DEIS was issued, modifications to the alignment were made to flatten the curve which will improve the sight-distance. Impacts of Alternative 4 have been updated where necessary in Section 3.0.

2.0 Impact Topics Considered

The following impact topics were considered for this project, specifically the reconstruction or replacement of the existing Blue Ridge Parkway Bridge over I-26. The DEIS prepared by NCDOT and FHWA considers a list of impact topics associated with the corridor I-26 widening project. The analysis completed by the NCDOT and FHWA was utilized for the overlapping impact topics.

Table 1. Impacts Considered by the NPS and FHWA

NPS List of Impact Topics	I-26 Widening DEIS Impact Topics
Natural Resources	Community Characteristics
Vegetation	Environmental Justice
Wildlife	Farmland
Migratory Birds	Cultural Resources
Federal and State Listed Species	Section 4(f)
Geologic Resources & Soils	Visual Resources/Characteristics
Water-related Resources	Topography, Geology, and Soils
Wild & Scenic Rivers	Water Resources
Prime & Unique Farmlands	Biotic Resources
Air Quality	Jurisdictional Issues
Soundscape	Traffic Noise
Nightscapes	Air Quality
Carbon Footprint	Utilities
Cultural Resources	Hazardous Materials
Historic Structures	Floodplains
Cultural Landscapes	
Archeological Resources	
Ethnographic Resources	
Museum Collections	
Indian Trust Resources	
Environmental Justice	
Traffic & Transportation	
Regional Socioeconomics	
Visual Resources	
Visitor Use & Experience	
Parkway Operations	
Energy Resources	
Human Health and Safety	
Greenhouse Gases and Climate Change	

2.1 Impact Topics Considered But Dismissed

The following impact topics were considered but dismissed for further analysis because either the resource is not present in the study area or because the proposed action would have no or negligible impacts.

Natural Resources

Migratory Birds

The Migratory Bird Treaty Act, as amended (16 U.S.C. 703) and Executive Order (E.O. 13186, January 2001) directs each Federal agency taking actions having or likely to have a negative impact on migratory bird populations to work with the US Fish and Wildlife Service to develop an agreement to conserve those birds. In its current state, the existing bridge has resulted in some habitat fragmentation since its construction. This can adversely impact migratory birds and other species requiring large tracts of uninterrupted forest, while creating habitat for species that prefer open herbaceous and edge areas. The proposed site has only marginal suitable habitat based on its proximity to the Asheville urban area and the existing Blue Ridge Parkway motor road corridor. The proposed new bridge would be constructed to the extent practicable as close to the existing bridge alignment as possible. Thus, the proposed disturbance would be a maximum of 5.0 acres. This represents a minimal amount of potential nesting area for migratory birds. In order to minimize activities during the peak visitor season, the initial construction would be conducted in the fall/leaf-off season which is outside of the nesting period. NCDOT would coordinate this construction with Blue Ridge Parkway staff to ensure minimal impacts to resources (including migratory birds). The proposed construction activities summarized above are described in greater detail in the DEIS.

No significant effects on neotropical/migratory bird species would be expected from this project; therefore, migratory birds was dismissed from further analysis.

Wild and Scenic Rivers

No Wild and Scenic Rivers are present in the study area.

Prime & Unique Farmlands

In August 1980, the Council on Environmental Quality (CEQ) directed that Federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed. Unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to NRCS, none of the soils in the project area are classified as prime and unique farmlands.

Cultural Resources

Museum Collections

The NPS Director's Order #28, Cultural Resource Management Guideline (1997) and Museum Handbook (2004) require the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material). Because museum collections would be unaffected by the replacement of the bridge, this topic was dismissed from further analysis.

Ethnographic Resources

An ethnographic resource is defined as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system

of a group traditionally associated with it" (DO #28, 157). No ethnographic resources are located within the study area.

Indian Trust Resources
Secretarial Order 3175 requires that any anticipated impacts to Indian Trust resources from a proposed action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents. The Federal Indian Trust responsibility is a legally enforceable obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of Federal laws with respect to American Indian tribes. There are no Indian trust resources on the Blue Ridge Parkway.

Regional Socioeconomics
Land Use
Current land use within the Blue Ridge Parkway bridge corridor is recreational with federal lands being maintained as forestlands and ROW. This topic was dismissed from further analysis because land use in the vicinity of the proposed project would not change as a result of the proposed activity.

Environmental Justice
Presidential Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-income Populations", requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. There are no minority or low-income populations located adjacent to the Blue Ridge Parkway bridge, so the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities defined in the US EPA's "Draft Environmental Justice Guidance" (July 1996). Therefore, this topic was dismissed from further analysis.

Health and Human Safety
FHWA would conduct the proposed activities with safety at the forefront of the project. The project would include safety measures such as utilization of traffic control, signage and flag bearers. Because of the safety measures that would be utilized as a part of this project, this topic was dismissed from further analysis.

Greenhouse Gases and Climate Change
The project should not induce growth that might increase greenhouse gas emissions which lead to climate change. Construction equipment utilized for the project would emit greenhouse gases in the form of exhaust; however, construction equipment would meet current air quality and emission standards. Because impacts would be short-term and minor, this impact topic was dismissed from further analysis.

Energy Resources
The NPS's Guiding Principles of Sustainable Design (1993) provide a basis for achieving sustainability in facility planning, design and park operations, emphasizing the importance of bio-diversity, and encourages responsible decisions. The project as proposed does not include development of new park facilities or alteration to park operations; therefore, this topic was dismissed from further analysis.

Soundscapes
The NPS Management Policies 2006 state that the NPS will preserve, to the greatest extent possible, the natural soundscapes of parks. Park natural soundscape resources encompass all the natural sounds that occur in parks, including the physical capacity for transmitting those natural sounds and the

interrelationships among park natural sounds of different frequencies and volumes. This is the basis for determining the "affected environment" and impacts on a Park soundscape. Traffic capacity would not increase as a result of this project, but there would be short-term impacts to the soundscape from the presence of heavy equipment during construction. None of the build alternatives would result in a long-term change in soundscapes compared to current conditions.

Nightscapes

None of the build alternatives would result in a major change in the nightscapes compared to current conditions.

Carbon Footprint

For this study, the carbon footprint is defined as the sum of all emissions of carbon dioxide and other greenhouse gases that would result from implementation of the alternatives. Although a slight, temporary increase is anticipated during the construction of a build alternative due to the use of construction equipment, the increase would be negligible and temporary. The build alternatives would not result in an increase in vehicular traffic or increased emissions.

2.2 Impact Topics Carried Forward

In addition to the impact topics already carried forward for further analysis by NCDOT and FHWA for the corridor widening project, Cultural Landscapes, Visitor Use & Experience and Parkway Operations were carried forward for further analysis in the DEIS only for the reconstruction or replacement of the Blue Ridge Parkway Bridge.

3.0 Environmental Consequences

Impacts resulting from the implementation of the build alternatives were analyzed for each impact topic carried forward from Section 2.1. Build Alternatives 1, 4, 5 and 7 have been carried forward in the DEIS for further analysis. Analysis completed by NCDOT and FHWA for the corridor widening project was supplemented where necessary in order to discern the impacts of each of the alternatives for the reconstruction or replacement of the bridge carrying the Blue Ridge Parkway over I-26.

3.1 Natural Resources

Vegetation

Most of the Blue Ridge Parkway is covered with forests. The study area is comprised of Montane Oak-Hickory Forest. Montane oak-hickory forests contain a mixture of oak species (often white oak dominates). Hickories may be present, and the understory/ shrub layer vegetation is often quite diverse, supporting species such as flowering dogwood, flame azalea, and huckleberries. Red oak forests may dominate at medium to high elevations (most common community on high mountains) and on ridgetops where spruce-fir and northern hardwoods are absent or adjacent (North Carolina Wildlife Resources Commission).

Invasive Species: Exotic and/or invasive species of concern in the project area include Chinese privet, Japanese honeysuckle, Japanese stilt grass, multiflora rose, and Oriental bittersweet. The disturbance associated with the realignment increases the potential for the introduction of invasive species.

Table 2. Area of Vegetation Disturbance

Alternative	Clearing (acres)
1	2.8
4	4.4[3]
5	5.0
7	0.7

Wildlife

By virtue of the production of vast quantities of acorns, hickory nuts, and a wide variety of soft mast associates, the wildlife food production capacity of oak forests is immense. Coupled with the sheer amount of this habitat available, these factors make oak forests one of the most important habitats of the region to a significant variety wildlife species (North Carolina Wildlife Resources Commission).

The Blue Ridge Parkway supports a variety of wildlife species. Most commonly observed are whitetail deer, squirrels, rabbits, groundhogs, and birds. Dozens of less visible species are also found throughout Blue Ridge Parkway lands, including approximately 74 species of mammals, 44 species of amphibians, 35 species of reptiles, 57 species of fish, and more than 300 species of birds. Many of these bird species are migratory, and waves of birds can be seen and heard traveling along the Blue Ridge Parkway during the spring and fall. About 115 bird species nest in the various plant communities of the Blue Ridge Parkway during the summer. A rich diversity of insects, mollusks, and other invertebrate animals also inhabit Blue Ridge Parkway lands and waterways. (National Park Service, 2013)

[3] The disturbed area increased because of revisions made to Alternative 4 during the design process (July 30, 2018).

Federally-Listed Species

The following species are listed by the U.S. Fish and Wildlife Service as potentially occurring in Buncombe County:

Table 3. Potential Threatened and Endangered Species, Buncombe County

Common Name	Scientific Name	Status
Spruce-fir moss spider	*(Microhexura montivaga)*	Endangered
Spreading avens	*(Geum radiatum)*	Endangered
Rock gnome lichen	*(Gymnoderma lineare)*	Endangered
Gray bat	*(Myotis grisescens)*	Endangered
Carolina northern flying squirrel	*(Glaucomys sabrinus coloratus)*	Endangered
Northern long-eared bat	*(Myotis septentrionalis)*	Threatened
Bog turtle	*(Clemmys muhlenbergii)*	Threatened

The NPS has no records of federally-listed species being present in the study area, with the exception of the northern long-eared and gray bats. Both northern long-eared and gray bat surveys and consultation with U.S. Fish and Wildlife Service would be completed. Avoidance and minimization measures would be implemented to reduce impacts to the northern long-eared and gray bats. One of the measures would likely be that tree clearing would occur while the bats are dormant, between August 15 and May 15. In the event that any northern long-eared bat roost trees are documented within 0.25 mile of the project area, regardless of the time of year, the NPS will seek consultation with the U.S. Fish and Wildlife Service before work proceeds. In addition, to avoid adverse impacts to gray bats, emergence and/or acoustic surveys would be conducted prior to removal of trees if the work would be conducted between April 15 and August 15. Tree clearing in habitat within a 5-mile radius of hibernation sites when bats are emerging from or preparing for hibernation (April 1 to May 15 and August 15 to November 14, respectively) would require approval by an NPS biologist.

Geologic Resources and Soils

Soils in the project area are comprised primarily of Clifton sandy loam and Evard-Cowee complex of varying slopes. In order to realign the bridge approaches to construct a new bridge across the Blue Ridge Parkway, grading would be necessary given the hilly topography. Areas of cut and fill would be needed to flatten the roadway grades where necessary. Balancing of the required cut and fill would allow for the excavated material to be utilized as fill material. The would reduce the need for fill material to be imported from off-site or reduce the amount of excavated material to be disposed of off-site, depending on the volumes required.

Table 4. Volume of Soil Disturbance	
Alternative	**Volume of Cut/Fill (cubic yards)**
1	9,800
4	78,500[4]
5	38,000
7	negligible

[4] The cut/fill volume for Alternative 4 increased because of revisions made during the design process (July 30, 2018).

Water-related Resources

No water resources would be impacted by the build alternatives. Best Management Practices to reduce erosion and sedimentation would be implemented during construction, and would likely include silt fence, temporary seeding, and erosion control blankets. The stormwater treatment requirements generated through the redevelopment of the existing road and increase in impervious surface would be treated outside of the Blue Ridge Parkway but within the same watershed as part of the larger Interstate widening project.

3.2 Air Quality

The build alternatives would not increase the capacity of the Blue Ridge Parkway and are not anticipated to increase the traffic volume. Therefore, air quality would not be impacted as a result of the implementation of any of the build alternatives. However, construction activities and equipment would result in increased emissions during construction, adversely impacting air quality.

3.3 Cultural Resources

Historic Structures

The bridge carrying the Blue Ridge Parkway motor road is a contributing resource within the Blue Ridge Parkway, which is a resource previously determined eligible for the NRHP. The columns supporting the bridge deck of the Blue Ridge Parkway over I-26 are spaced in such a way that they would not accommodate any widening of the I-26 facility. As a result, replacement of the bridge would be required in order to construct any of the build alternatives.

Under all of the built alternatives, the bridge carrying Blue Ridge Parkway over I-26 would be demolished and replaced with a new structure developed in collaboration with FHWA-Eastern Federal Lands Highway Division, NPS-Blue Ridge Parkway, NCDOT, NC-SHPO, and FHWA-North Carolina Division Office, resulting in an adverse effect determination under Section 106 of the National Historic Preservation Act. A Memorandum of Agreement has been executed to resolve the adverse effect.

Archaeological Resources

An archeological survey of the Blue Ridge Parkway Bridge replacement APE was completed by the NPS. No known archaeological sites would be impacted. The area within the APE was previously disturbed during the initial construction and grading of the Blue Ridge Parkway motor road. The areas outside obvious cuts and fills are on slopes greater than 20% and would not be likely locations for prehistoric occupations. The build alternatives would have no impact on archeological resources.

Cultural Landscapes

The Blue Ridge Parkway motor road corridor is the centerpiece of a 469-mile long designed historic cultural landscape that stretches from Virginia to North Carolina. The Blue Ridge Parkway is a nationally significant cultural resource, as it meets eligibility criteria for designation as a National Historic Landmark. Realignment of the motor road must be carefully considered to minimize impacts to the cultural landscape and the unique visual character of the designed landscape. The entire motor road is listed on the Cultural Landscape Inventory. No historic views or vistas are visible from vehicles being driven along this portion of the Blue Ridge Parkway motor road.

Realignment of the Blue Ridge Parkway motor road would alter the topography, vegetation, road alignment and circulation patterns, and land use patterns. This would be the first time the motor road has been realigned (beyond the limits of new bridge construction) since its completion. The length of the realignment of the motor road for the bridge replacement alternatives ranges from 2,300 feet (Alternative 1) to 3,255 feet (Alternative 7). All of the realignment alternatives would require cuts due to the topography north and south of the existing bridge. The deepest cut area for each alternative is approximately 25.25 feet high (Alternative 1), 59.59 feet[5] (Alternative 4), and 45.75 feet (Alternative 5). The area cleared in these areas would be more extensive as a result of the depth of the cut, resulting in a larger area that would be graded and revegetated. These areas would differ from the surrounding landscape of mature forest vegetation.

The design of the new bridge to replace the existing bridge must retain the landscape design characteristics of material use, aesthetics, workmanship, and alignment setting of the bridges built after the World War II Era. The types of bridges that would meet that criteria are steel girder or post tensioned precast box girder construction.

Table 5. Comparison of Alternatives

Alternatives	Approximate Length of Bridge (feet)	Length of Realignment (feet)	Depth of Deepest Cut (feet)	Superelevation (%)
1	715	2,300	25.25	6.8
4[6]	606	3,050	59.59	6.0
5	605	3,255	45.75	6.9
7	Reconstruction 512/ Replacement 605	Not Applicable/710	Not Applicable	Not Applicable

The above-listed bridge lengths are approximate. During the preliminary bridge design, the span lengths will be adjusted as needed to accommodate the I-26 widening and to balance the span lengths based on the proposed bridge type/construction method.

3.4 Visual Resources

The Blue Ridge Parkway motor road crosses over I-26 north of NC 146 (Long Shoals Road), but does not have direct access with I-26. At this crossing point, the Mountains-to-Sea Trail traverses the Blue Ridge Parkway Bridge. Outstanding scenery and recreational opportunities make the Blue Ridge Parkway one of the most visited sections of the National Park System.

The Blue Ridge Parkway Bridge over I-26 would need to be replaced in order to accommodate the proposed widening of STIP Project I-4400/I-4700. NCDOT, FHWA, and the NPS are currently coordinating the proposed bridge replacement in order to maintain the Blue Ridge Parkway's scenery along this section. This section of the Blue Ridge Parkway has an average daily visitation (ADT) during the visitation season (May 1 – November 1) of approximately 5,000 vehicles. The I-26 bridge is located in the middle of a very popular commuter route through the Asheville corridor.

[5] The depth of the deepest cut increased because of revisions made to Alternative 4 during the design process (July 18, 2017)

[6] The approximate length of bridge, length of realignment, depth of deepest cut, and superelevation are updated to reflect revisions made to Alternative 4 during the design process (July 18, 2017).

Visual impacts are being assessed in the following three ways:

1. Duration and extent of the view to the I-26 widening from the new bridge and along the bridge approaches. This impact has a direct correlation to the length of the new bridge, the extent of grading along bridge approaches that would open views to I-26 and the potential to reestablish view screening reforestation along the bridge approaches. Alternative 1 would have the greatest impact and all of the other alternatives less impact.

2. Visibility of the new bridge from the perspective of I-26. The bridge should be recognized as being appropriate and compatible and blend with the historic design of the Blue Ridge Parkway. To be considered appropriate and compatible the bridge type should be historically correct to the post World War II bridge construction types that have already been constructed on the Parkway.

3. Aesthetically pleasing and historically compatible from the perspective of visitors traveling on the Parkway, to and across the new I-26 bridge. The appearance of the bridge deck, railing design and the positioning of the bridge to lie lightly within the surrounding landscape are important impacting considerations.

3.5 Visitor Use & Experience

Today, the Blue Ridge Parkway corridor landscape is comprised of over 80,000 acres of land and features 24 separate visitor use and recreation areas. The Blue Ridge Parkway has received an annual average of 18,210,827 recreational visitors (based on 1986-2005 data). Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all national parks (2006 Management Policies). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in parks. The proposed action would have the potential to impact visitor experience by altering the driving experience of the Blue Ridge Parkway.

Visitors to the Blue Ridge Parkway enjoy many outdoor activities and sightseeing. Although no designated pull-out or overlook exists at the location of the bridge, the frequently used Mountains-to-Sea Trail is located within the assessment corridor.

Mountains-to-Sea Trail

The Mountains-to-Sea Trail stretches from Clingman's Dome in the Great Smoky Mountains National Park to Jockey's Ridge State Park by the Atlantic Ocean. The mainline distance is 935 miles. The segments of Mountains-to-Sea Trail along the Blue Ridge Parkway were designated as National Recreation Trail in 2005. Initial construction would occur during the dormant season (i.e. winter). The Parkway road is often closed to vehicular traffic in the winter months (November-March) depending on the weather, which should reduce the potential for hikers on the trail. The proposed project would require a short section of the trail to be realigned. The Parkway would provide signage and a detour to guide trail users out of the active construction area and into safe locations. Construction would have a direct, short-term minor adverse impact on use of the section of the trail through the assessment corridor. Adverse impacts are considered minor because initial clearing that could impact use of the trail would be of short duration and during a time of low probable usage (i.e. winter).

The BRP team is completing a comprehensive study of the Asheville commuter zone and Mountains-to-Sea Trail access. This study is an analysis of existing gravel pull-off areas heavily used by hikers and bicyclists as parking facilities along the Parkway. This includes a study for construction of asphalt paved

parking areas and restoration of existing gravel pull-off parking areas within the vicinity of the existing I-26 bridge.

- Milepost (MP) 390.9: Grade and construct an asphalt-paved parking area on the west side of Parkway. The location for parking area would provide safe sight distances for motorist to and from parking area. The parking area would provide space for up to 8 vehicles. Adjoining social trails would be improved for official trail connections.
- MP 391.1, 391.6 and 391.7 on Parkway east side: Remove the gravel, regrade the areas and restore the areas to a grassed shoulder. Two of the existing gravel pull-off areas currently cause sedimentation of a nearby stream. These parking areas would be replaced with the new parking area constructed at MP 390.9.
- MP 392.1: Grade and construct an asphalt-paved parking area on west side of Parkway. The location for parking area would provide safe sight distances for motorist to and from parking area. The parking area would provide space for up to 8 vehicles. The adjoining social trails would be improved to provide official trail connections.
- Construct a new paved asphalt parking area in the abandoned alignment of the existing I26 bridge and Parkway road alignment.

Blue Ridge Parkway Motor Road

Realignment of a portion of the motor road could be completed while the existing bridge and approaches remains open to traffic, with the exception of Alternative 7. Closure of the Parkway during the visitor season, May 1 through October 31, would not be permitted; however, temporary or nighttime closures of the Parkway with a signed detour may be allowed. Temporary or nighttime closures would only be permitted from November 1 until April 31, of any one year. After the new bridge and approaches are completed, traffic would be routed to the new section and the existing bridge and approaches would be demolished and restored to natural conditions. Under all of the alternatives, construction of the new bridge would be noticeable, and would detract from the natural setting of the Parkway. Although the area graded to construct the new roadway alignments would be revegetated with native species, the area would be noticeably different in appearance until the vegetation matures. The new bridge would be longer than the existing bridge and the bridge railing would be different in appearance. The railing would be higher to provide a safer railing for pedestrians crossing the bridge, but would be at the eye height of drivers obscuring a portion of their view.

Construction Detour

It is estimated that the build alternatives would have a construction duration of 2 years. If the bridge is reconstructed or replaced on the existing alignment (Alternative 7), a detour would be necessary. While the I-26 bridge is closed the detour will have to go from the intersection of Blue Ridge Parkway and Brevard Road (NC-191) to the intersection of Blue Ridge Parkway and NC-74. Currently, traveling at the posted speed limit of 45 miles per hour, the 4.8 mile trip along Blue Ridge Parkway from Brevard Road to Hendersonville Road takes approximately seven minutes.

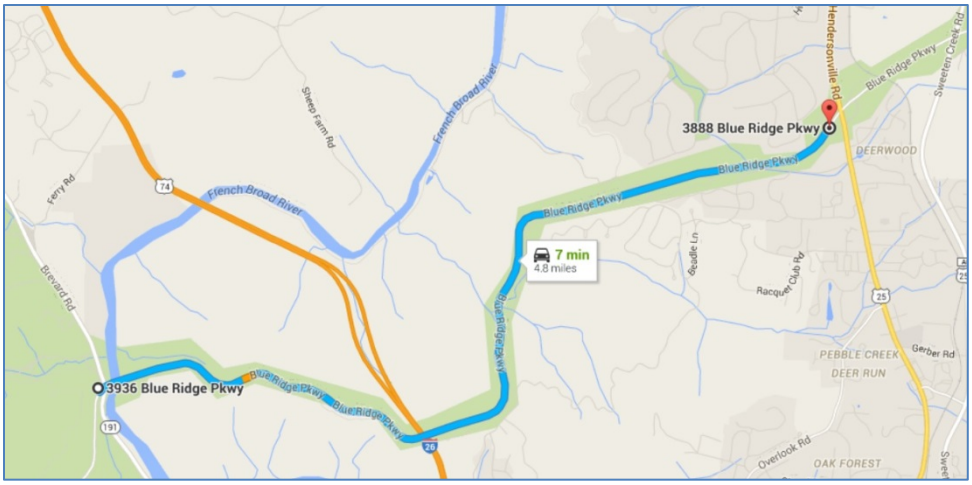

Figure 6. Blue Ridge Travel Time without Detour (Google Maps)

The detour route would be 15.3 miles and would take approximately 22 minutes. This route begins heading north on Brevard Road (NC-191) for 4.3 miles. Traffic would follow NC-191 past I-26, and take the I-40 East bound exit. Traffic would exit I-40 at exit 53 A, and proceed south to connect back with the Blue Ridge Parkway at MP 387. The Blue Ridge Parkway motor road would be closed with barricades or gates just south of NC-191 intersection and just north of the Blue Ridge Parkway motor road intersection with NC-25.

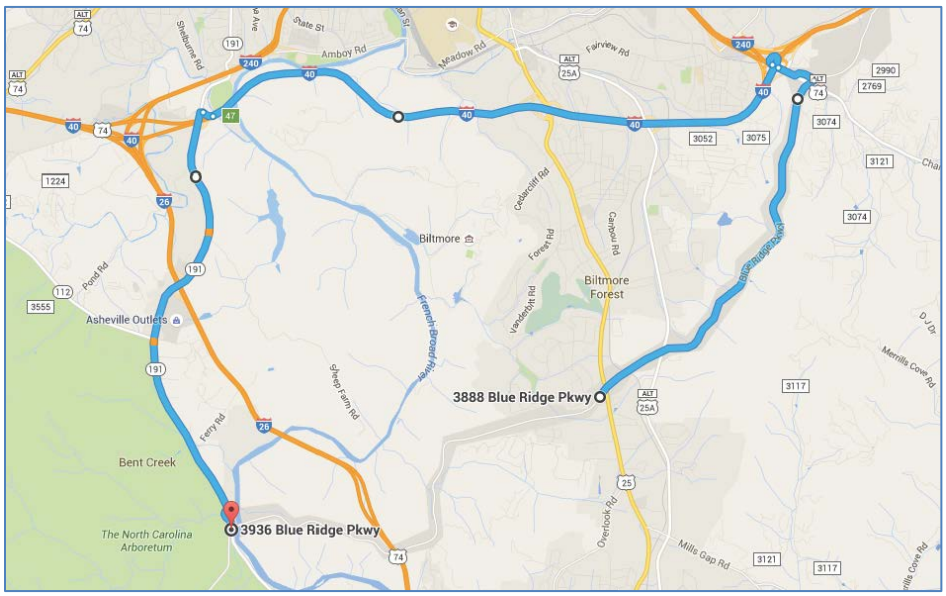

Figure 7. Detour Route (Google Maps)

3.6 Parkway Operations

Parkway operations include the maintenance cost, including time and equipment, for the upkeep of the motor road, bridges, and even mowing of the grassed shoulders of the roadway. Permanent and seasonal maintenance staff and the equipment that is used to perform the roadside and shoulder maintenance is a significant portion of the budget for the Blue Ridge Parkway. Bridges are also routinely

inspected, and bridges of different types and longer lengths may require more time and specialized equipment. Actions that change the Park's budget and/or personnel levels would impact Parkway operations.

The existing bridge is a seven-span steel girder bridge. The bridge is 512 feet long and 35.2 feet wide (including railings). Structure types under consideration are a concrete box girder and a steel plate girder. Inspection methods and effort would differ. Due to the height of the bridge, it is likely that a snooper would be necessary to inspect a steel plate girder bridge, which would require a lane closure and traffic control. A concrete box girder could be accessed from the abutments. The steel plate girder also requires more effort to inspect because steel is more susceptible to fatigue. Inspection and maintenance of a steel plate girder bridge would have more of an adverse impact to Parkway operations as it would require more cost and effort.

Closure of the Parkway, particularly during the visitor season, would delay emergency response by Parkway rangers. Detouring bicycle traffic on to major highways would be dangerous and problematic.

4.0 Value Analysis (VA) and Choosing by Advantage (CBA) Study

The Value Analysis assists in the decision-making process. The VA/CBA identifies the alternative which best meets the function at the least cost.

4.1 Factors Carried Forward

The following is a list of factors required and others suggested for all VA/CBA in the NPS.

1). **Optimizes public health and safety, welfare of employees and the public.** This factor is related to public traffic safety of automobile, motor cycles, bicyclists, and pedestrians on the bridge and to bridge approaches. Railing design safety from attempted suicide might be analyzed. Safety of employees performing routine maintenance tasks across and around the bridge would be analyzed. This impact topic might be scored on how well it reduces driver error/recovery, sight line distances, and vertical and horizontal curve alignment.

2). **Maintains or improves cultural resources.** This factor is related to removing the existing bridge, which is considered an adverse effect to cultural resources. It is also related to the requirement of realigning the Blue Ridge Parkway motor road to construct a new bridge. This would be the first significant realignment of the motor road since its historic construction. This factor might be scored on impact to viewsheds, compatible bridge aesthetics and setting of the bridge relative to historic bridges on the Blue Ridge Parkway motor road.

3). **Maintains or improves natural resources**. This factor is related to minimizing construction disturbance or to altering site features due to grading requirements, area of clearing, any impact to Federally-listed threatened or endangered species, or spread of invasive seed.

4). **Maintains or improves visitor experience**. This factor is related to construction delays, duration of detour and ease of staging construction materials.

5). **Optimizes operations and maintenance efficiency.** Ensures long term serviceability of the bridge, amount of man hours required to maintain bridge and cost of materials to maintain bridge.

6). **Construction factors.** This factor would be related to how efficiently the new bridge can be constructed without impacting traffic on either the Blue Ride Parkway motor road or along the I-26 widening construction. It would be related to ease of construction, use of available materials, experience of local contractors, ease of material transportation and site staging. The factor would include meeting current design standards and structural loads.

7). **Design sustainability**. This factor is related to recycling steel/concrete/asphalt in the project or elsewhere. This factor might be scored on life cycle cost of using various materials to construct the bridge.

8). **Initial construction costs.** This factor would compare costs for all of the proposed bridge types to determine the cost/benefit ratio of all factors evaluated. Cost/benefit ratio would be graphed in bar chart format.

9**) Life Cycle Cost.** This factor would compare the cost of the bridge over time. If there is no difference, this factor might be included but not evaluated by CBA.

4.2 Result of VA/CBA

The VA/CBA Study was held December 15-17, 2015. Costs and advantages of the alternatives were evaluated by the study team comprised of representatives from NCDOT, FHWA, and the NPS. Alternatives 4 and 5 were considered first. They both provided considerable advantage over Alternative 7 and with an increased cost that is much less than Alternative 1. Alternative 4 provided greater total advantage than alternative 5, but would cost somewhat more. The VA team conducted an additional side-by-side evaluation of the two alternatives to further refine the evaluation. Alternative 4 had safety advantages compared with Alternative 5, as discussed in the initial evaluation. The two alternatives were further compared by 1) the ability to adjust alignment grades to tie into the bridge, 2) the degree of the new alignment's departure from the existing Parkway alignment, and 3) constructability based on topography. For all factors, Alternative 4 would be preferred. Based on this evaluation, Alternative 4 was the recommended alternative.

Bridge type - Following the selection of the preferred alignment, an evaluation and selection of the preferred bridge type was conducted. Four factors were considered, 1) Optimize operations and maintenance, 2) Construction duration, 3) Construction impacts to I-26, and 4) Sustainability. In all factors a concrete segmental bridge has greater advantage than a steel girder bridge and at a lower cost. The concrete segmental bridge is the preferred bridge type.

Bridge railing - The VA team evaluated the performance of two bridge railing options: Caltrans Type 80 and Kansas Corral rail. The evaluation was based on five evaluation factors: 1) Screening visibility of I-26, 2) Ability to divert drainage, 3) Aesthetics, 4) Ability to integrate stone guard walls, and 5) Ability to integrate hand rails. In all five factors, the Caltrans Type 80 rail was preferred and is recommended as the preferred railing type.

The Value Analysis Study report provides a detailed summary of the Value Analysis process, evaluation and findings (National Park Service and Federal Highway Administration, 2016).

5.0 References

Google Maps. (n.d.).

National Park Service. (2013). *Final General Management Plan/Environmental Impact Statement.* U.S. Department of Interior.

National Park Service and Federal Highway Administration. (2016). *Replacment of Blue Ridge Parkway Bridge over Interstate 26 Draft Value Analysis Study.*

North Carolina Wildlife Resources Commission. (n.d.). Retrieved November 5, 2015, from Oak Forest: http://www.ncwildlife.org/Portals/0/Conserving/documents/Mountains/SBR_Oak_forest_mixed_hardwoods_pine.pdf

6.0 Appendices

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5.1 Appendix A – Cross Sections Showing Maximum Excavation Depths

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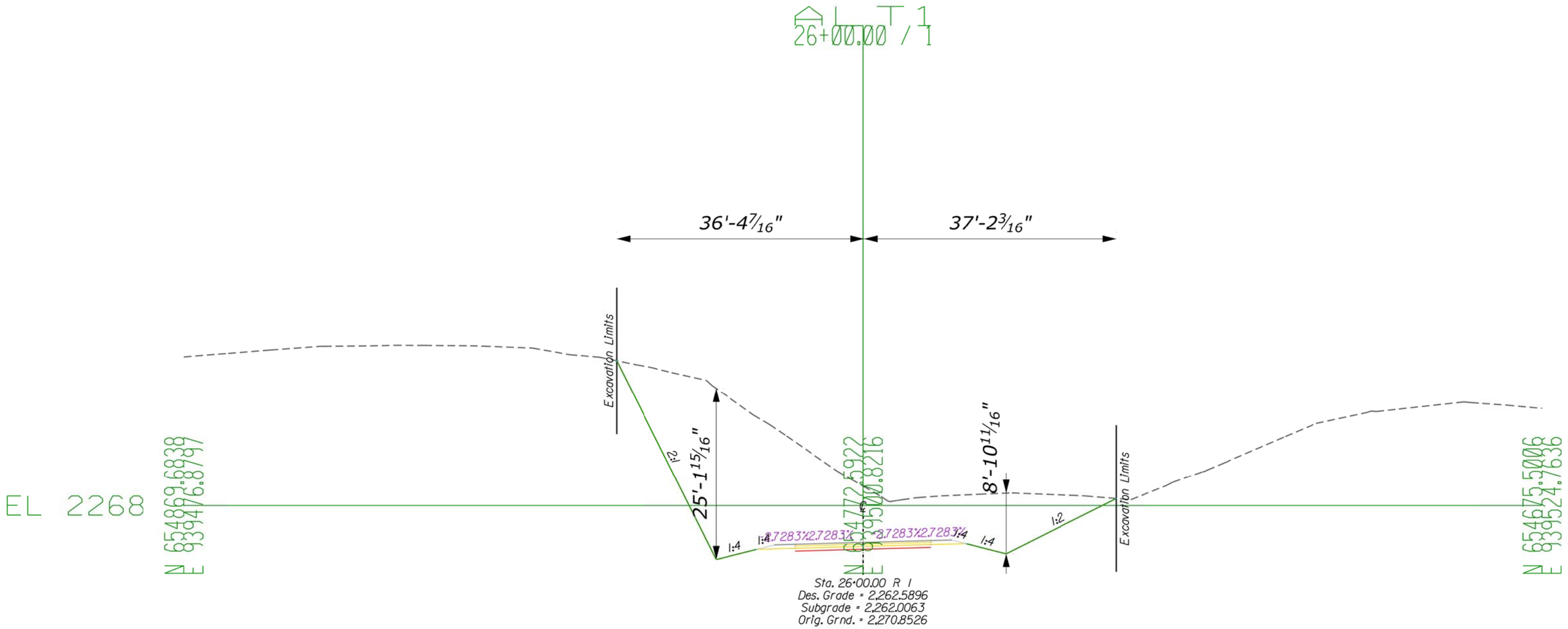
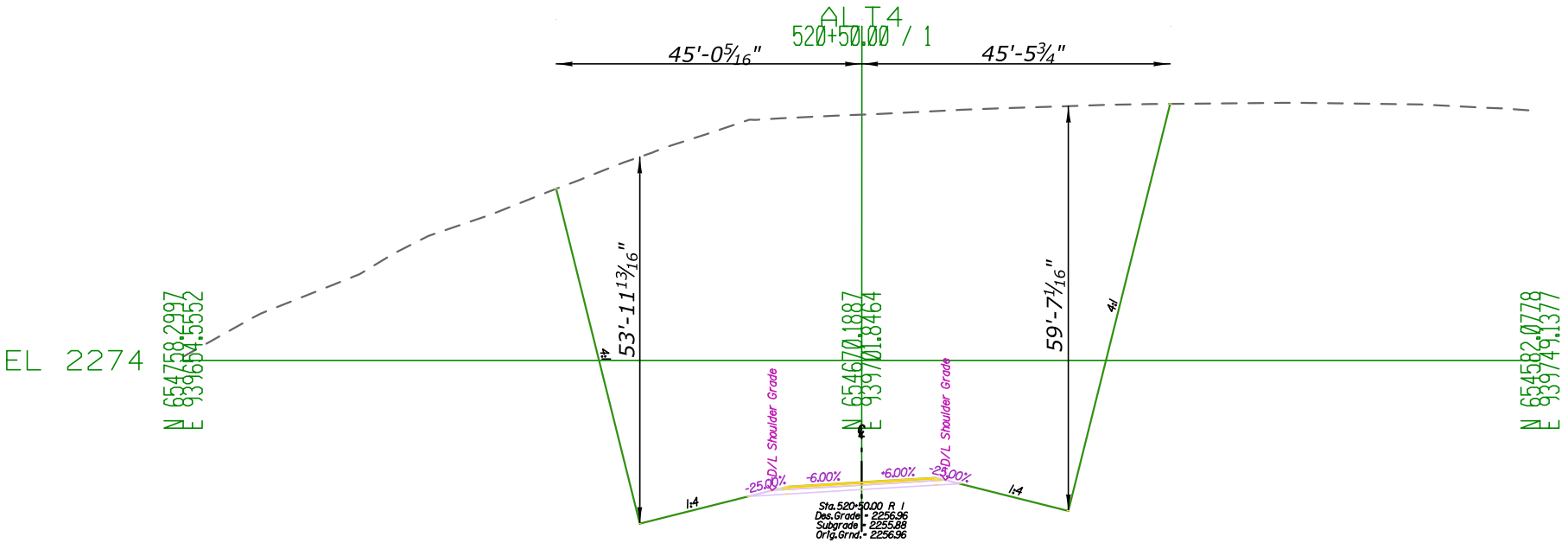

26+00.00 / 1
36'-4 7/16"
37'-2 3/16"
Excavation Limits
1:2
25'-1 15/16"
1:4
2.7283%
2.7283%
2.7283%
2.7283%
1:4
1:4
8'-10 11/16"
1:2
Excavation Limits
EL 2268
N 6548629.6838
E 839476.8787
N 6548772.5922
E 839500.8216
N 6548675.5006
E 839524.7636
Sta. 26+00.00 R 1
Des. Grade = 2,262.5896
Subgrade = 2,262.0063
Orig. Grnd. = 2,270.8526


ALT4
520+50.00 / 1
45'-0 5/16"
45'-5 3/4"
53'-11 13/16"
59'-7 1/16"
EL 2274
N 654758.2997
E 939654.5552
N 654670.1887
E 939701.8464
N 654582.0778
E 939749.1379
4:1
4:1
1:4
1:4
-25.00%
-6.00%
+6.00%
-25.00%
D/L Shoulder Grade
D/L Shoulder Grade
Sta.520+50.00 R 1
Des.Grade = 2256.96
Subgrade = 2255.88
Orig.Grnd. = 2256.96

62+50.00

46'-7⅛"

33'-3¹¹⁄₁₆"

Excavation Limits

24'-3¹⁵⁄₁₆"

1:1.5

1:4

-10.0000%

-10.0000%

10.0000%

10.0000%

1:4

45'-9¾"

4:1

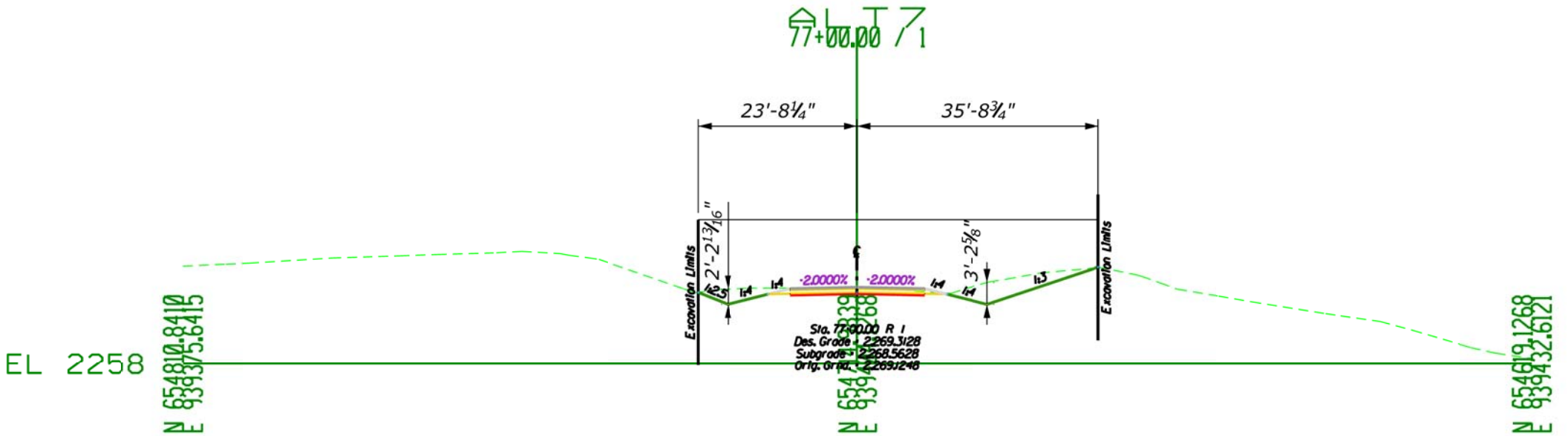
Excavation Limits

EL 2254

N 654643.5828
E 938523.7482

N 654479.6701
E 938408.9005

Sta. 62+50.00 R I
Des. Grade = 2,252.479I
Subgrade = 2,251.479I
Orig. Grnd. = 2,290.3232


77+00.00
23'-8¼"
35'-8¾"
2'-2 13/16"
3'-2⅝"
-2.0000%
-2.0000%
Excavation Limits
Excavation Limits
Sta. 77+00.00 R 1
Des. Grade = 2269.3128
Subgrade = 2268.5628
Orig. Grnd. = 2269.1248
EL 2258
N 654810.8410
E 939375.8415
N 654
E 939
N 654619.1268
E 939432.6121

5.2 Appendix B – Profiles

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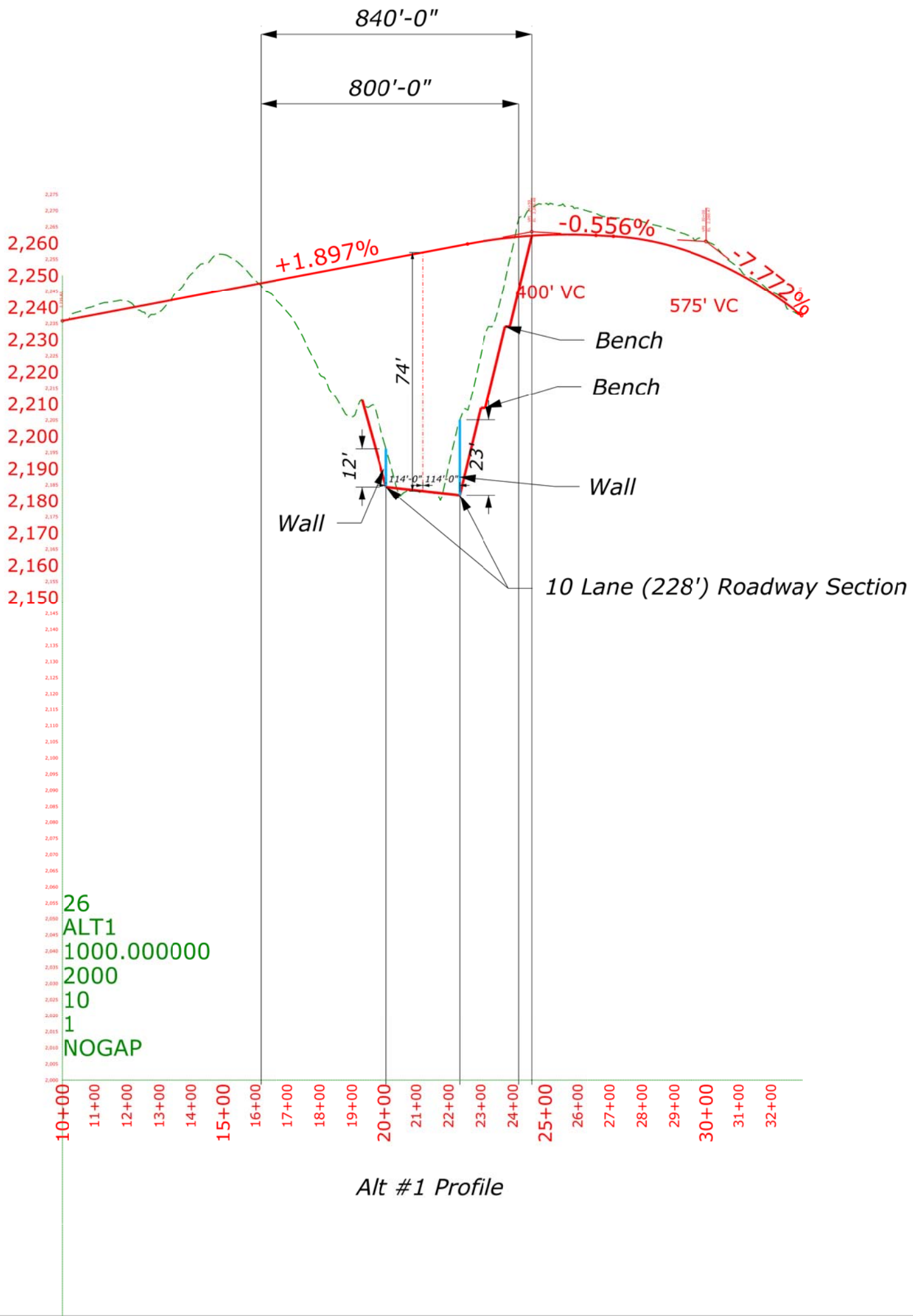
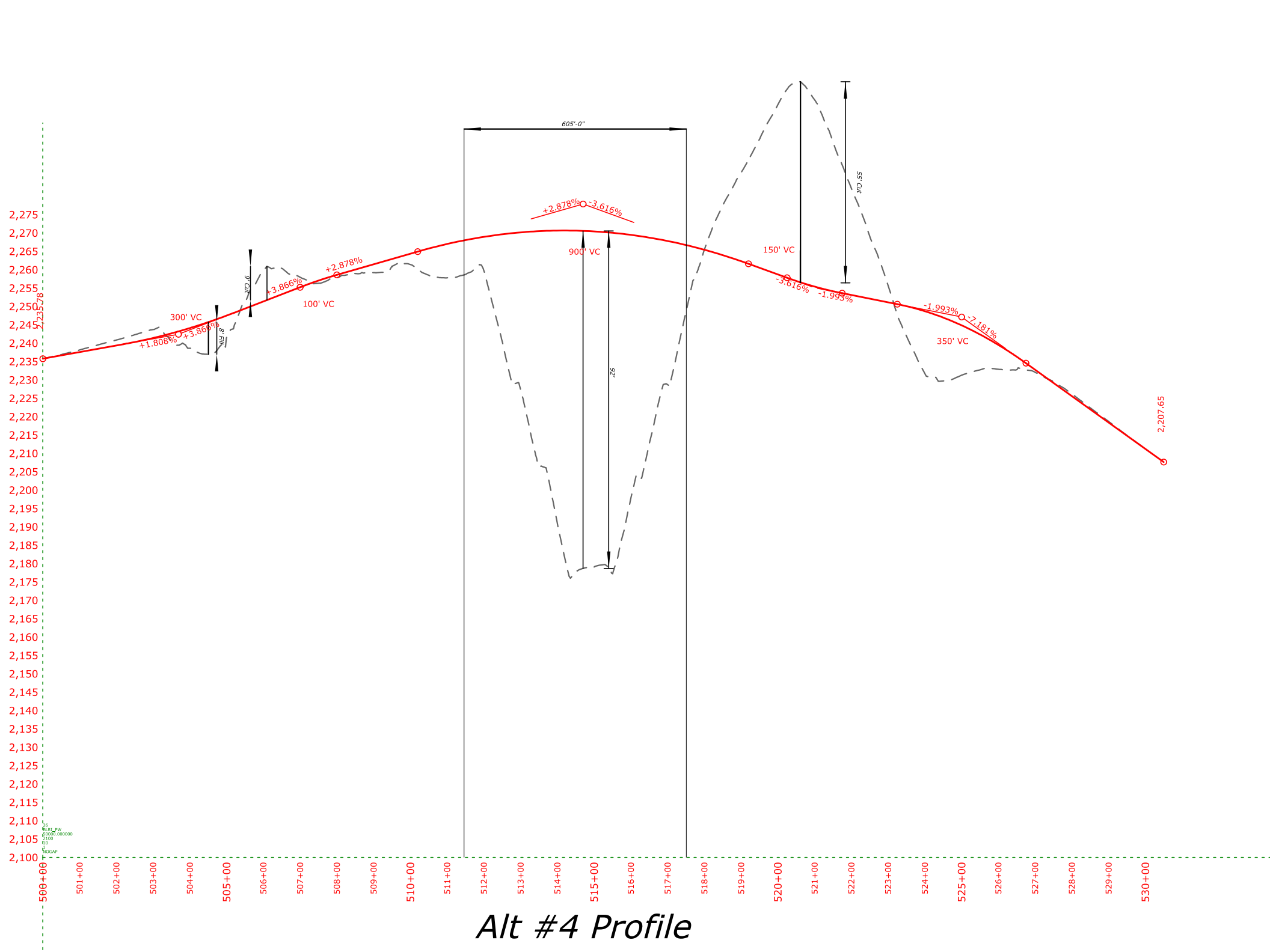
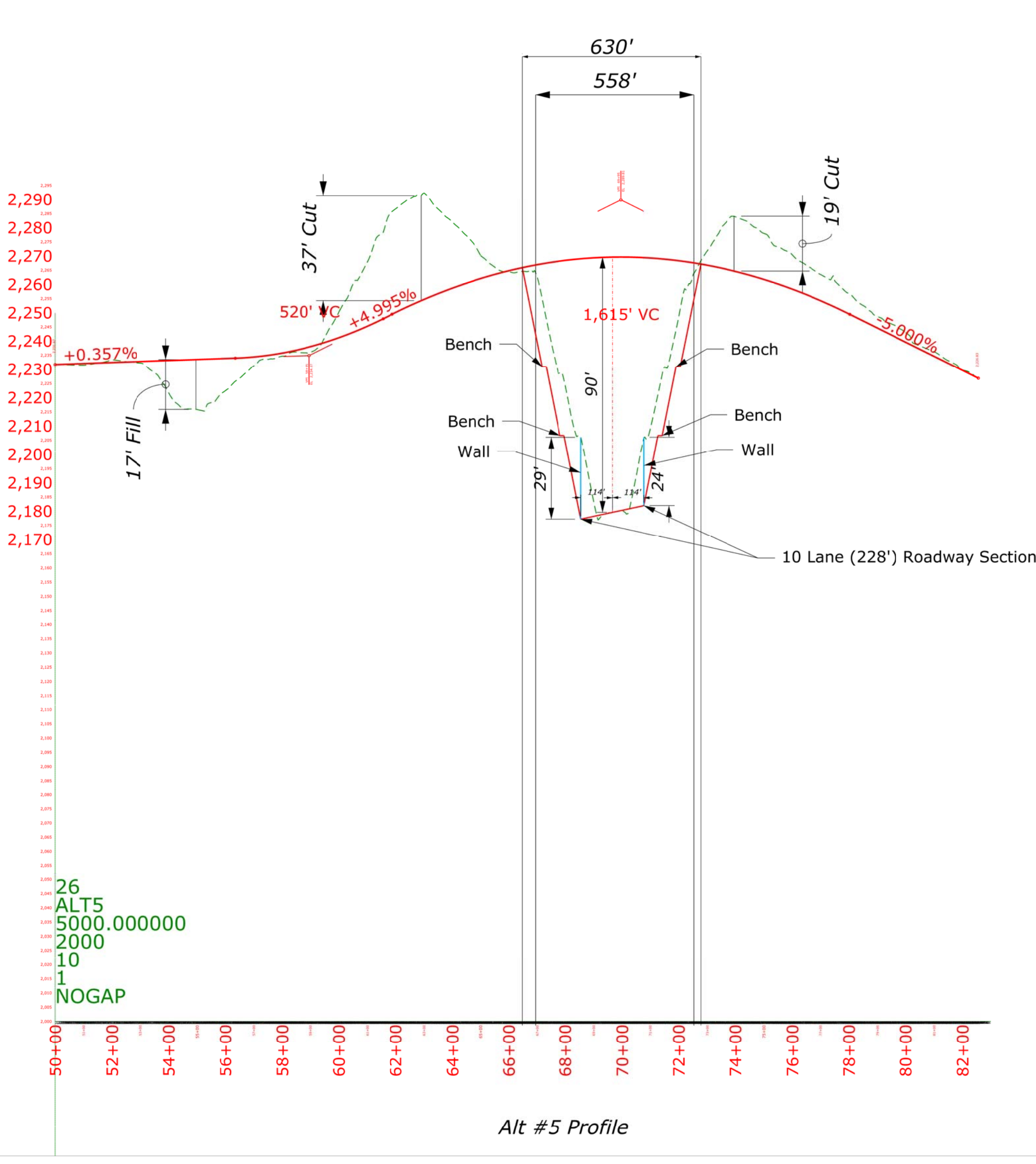


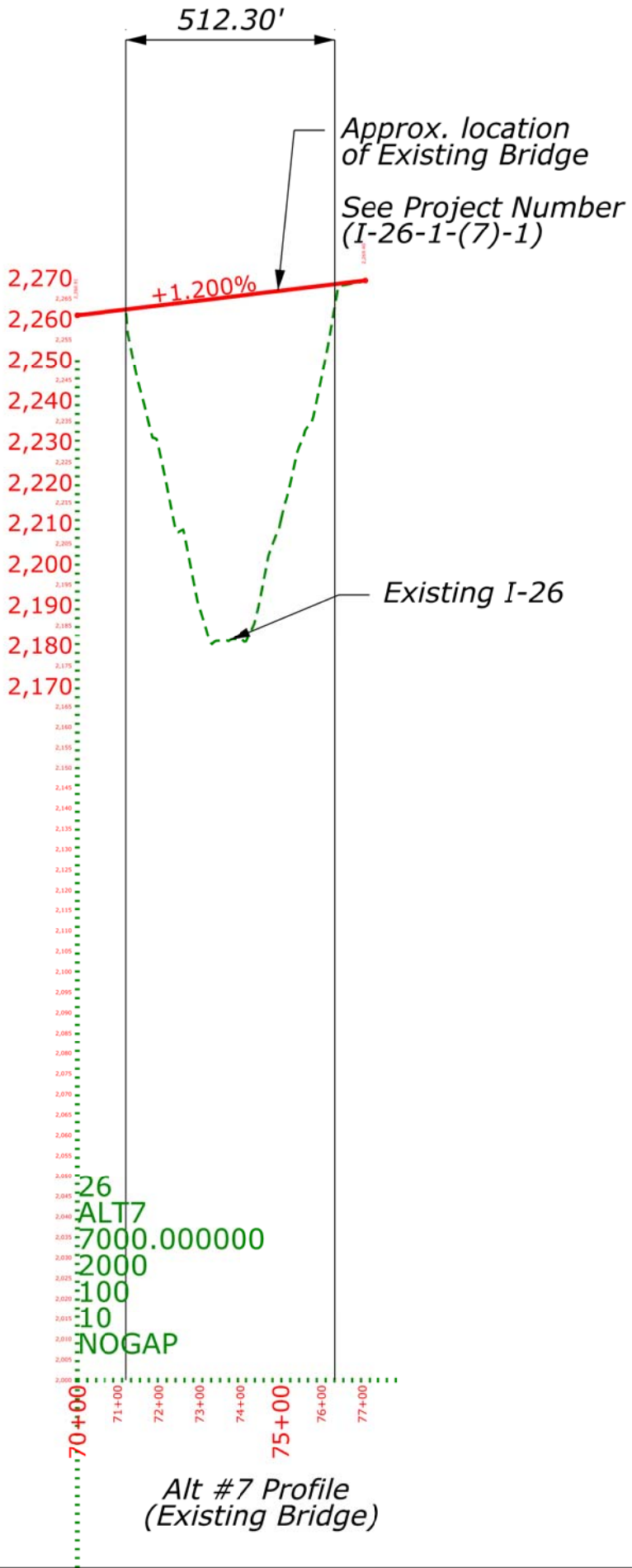
Alt #1 Profile



Alt #4 Profile



Alt #5 Profile


512.30'
Approx. location
of Existing Bridge
See Project Number
(I-26-1-(7)-1)
+1.200%
2,270
2,260
2,250
2,240
2,230
2,220
2,210
2,200
2,190
2,180
2,170
Existing I-26
26
ALT7
7000.000000
2000
100
10
NOGAP
70+00
71+00
72+00
73+00
74+00
75+00
76+00
77+00
Alt #7 Profile
(Existing Bridge)

5.3 Appendix C – Cut and Fill Limits

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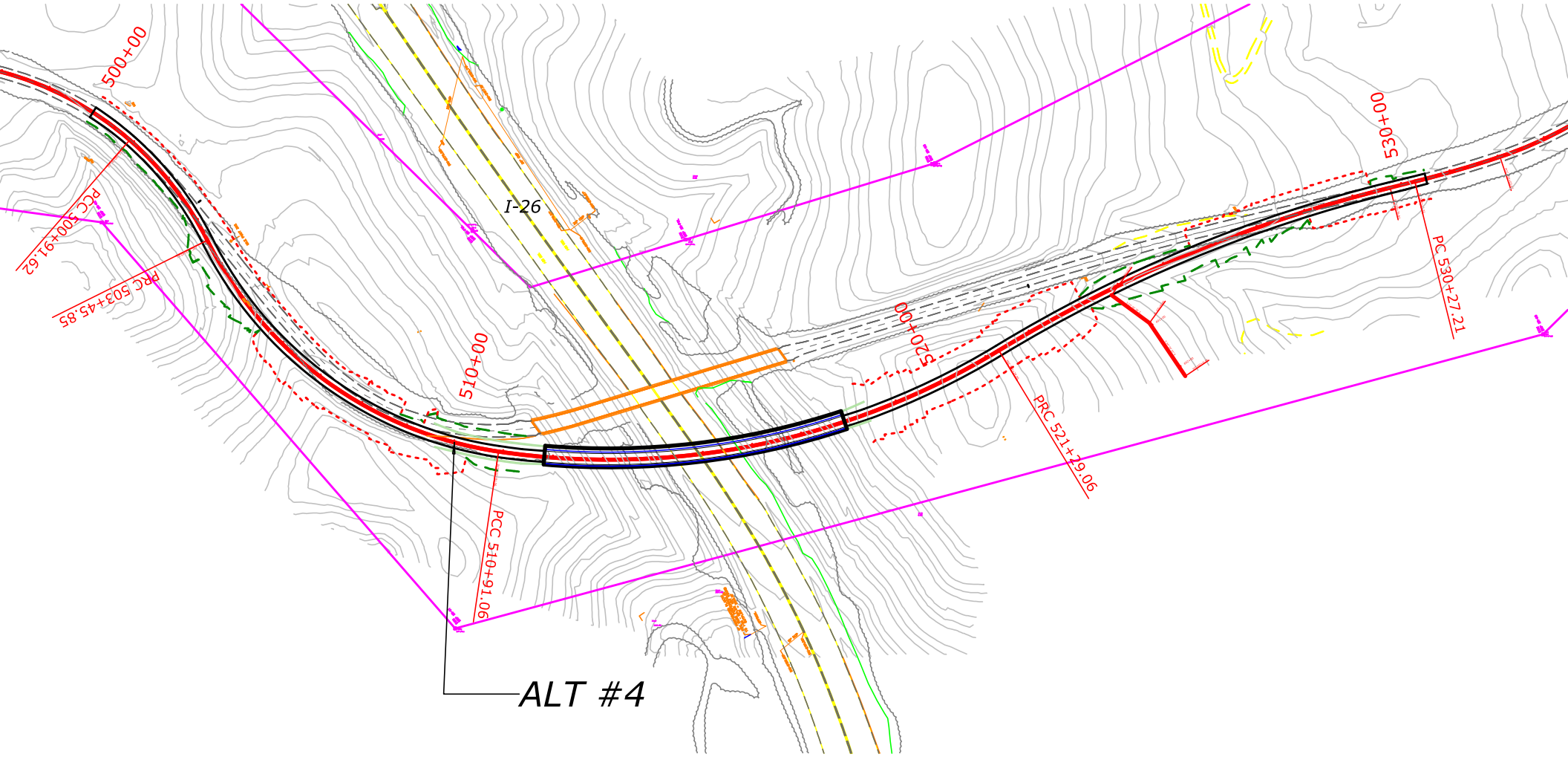
Alt #1
Asheville, NC
MATCH LINE #14
MATCH LINE #15
MATCH LINE #16
Biltmore Estate
N 70°54'30" E 937.69'
S 47°39'00" E 957.51'
N 61°14'00" E 142.48'
S 43°05'00" E 1072.14'
N 72°50'00" E 2246.16'
Henderso
91
92
93
76
62
61
+460
+455
+450
+445
+440
+435
+430


500+00
PCC 500+91.62
PRC 503+45.85
I-26
510+00
PCC 510+91.06
520+00
PRC 521+29.06
530+00
PC 530+27.21
ALT #4

MATCH LINE #16
MATCH LINE #15
S 87°57'30" E 991.68'
Biltmore Estate
91
461+55.68' BACK
461+94.18' AHEAD
S 47°39'00" E 957.51'
Asheville, NC
I-26
MATCH LINE #15
MATCH LINE #14
N 61°14'00" E 1423.48'
93
N 70°54'30" E 937.69'
92
62
1149.17'
S 43°05'00" E 1072.14'
61
Alt #5
N 72°50'00" E 2946.16'
Hende


Asheville, NC
I-26
Alt #7
MATCH LINE #14
MATCH LINE #15
Biltmore Estate
N 61°14'00" E 1423.48'
S 47°39'00" E 957.51'
N 70°54'30" E 837.69'
S 43°06'00" E 1072.14'
N 72°50'00" E 2246.16'
91
92
93
61
62
+460
+455
+450
+435
+430

5.4 Appendix D – Archeological Survey Report

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July 22, 2015

Memorandum:

To: Superintendent, Blue Ridge Parkway (BLRI)

From: BLRI Archeologist, R. Steven Kidd

Subject: Archeological survey of Area of Potential Effect (APE) associated with parkway reroute and I-26 bridge replacement.

INTRODUCTION

On July 21, 2015 BLRI archeologist Steven Kidd conducted a pedestrian survey of the proposed limits of disturbance associated with replacement of the Blue Ridge Parkway bridge over I-26 between Mileposts 391-392. Review of known archeological sites from the North Carolina Office of State Archaeology and the National Park Service's (NPS) Archeological Site Management Information System (ASMIS) resulted in the determination that no known sites would be impacted from the proposed bridge replacement and reroute of the parkway. The area included within the proposed APE was previously disturbed during initial construction and grading of the parkway. It is the determination of the BLRI archeologist hat no archeological sites would be affected by the proposed project.

PROJECT DESCRIPTION

The North Carolina Department of Transportation (NCDOT) and the Blue Ridge Parkway have agreed that the current grade separation structure over I-26 will need to be removed, the parkway rerouted, and a new bridge placed over the interstate as a result of the widening of I-26. As a result of the minor reroute and bridge replacement an archeological survey was undertaken to determine if archeological sites present within the APE would be affected (Figure 1). Previous research of known archeological sites in the area resulted in the determination that no known sites would be affected. An archeological survey conducted in 1988 for the construction of the Mountains to Sea Trail (MST) within the APE by the Southeast Archeological Center (SEAC Acc 0785) did not locate any archeological sites at the time the trail tested.

Research of parkway archival records resulted in the discovery of a grading plan that revealed that the area within the APE had been greatly altered during initial construction (Figure 2). Fieldwork in the area confirmed this to be the case. Pedestrian survey of the proposed realignment corridor revealed that most of the parkway east of Interstate 26 had been built up from cuts outside the road corridor. The section of parkway west of Interstate 26 was created from cuts into the southern bank and subsequent fill on the northern edge of the parkway. The area proposed for parkway realignment falls within the area originally disturbed from parkway construction

The areas directly outside obvious cuts and fills are on slopes greater than 20% and would not be likely locations for prehistoric occupations. No evidence of rockshelters were encountered during the survey and no evidence of historic use of the area was discovered other than a small section of Biltmore Forest's farmroad that was obliterated when the parkway was constructed (Figure 3).

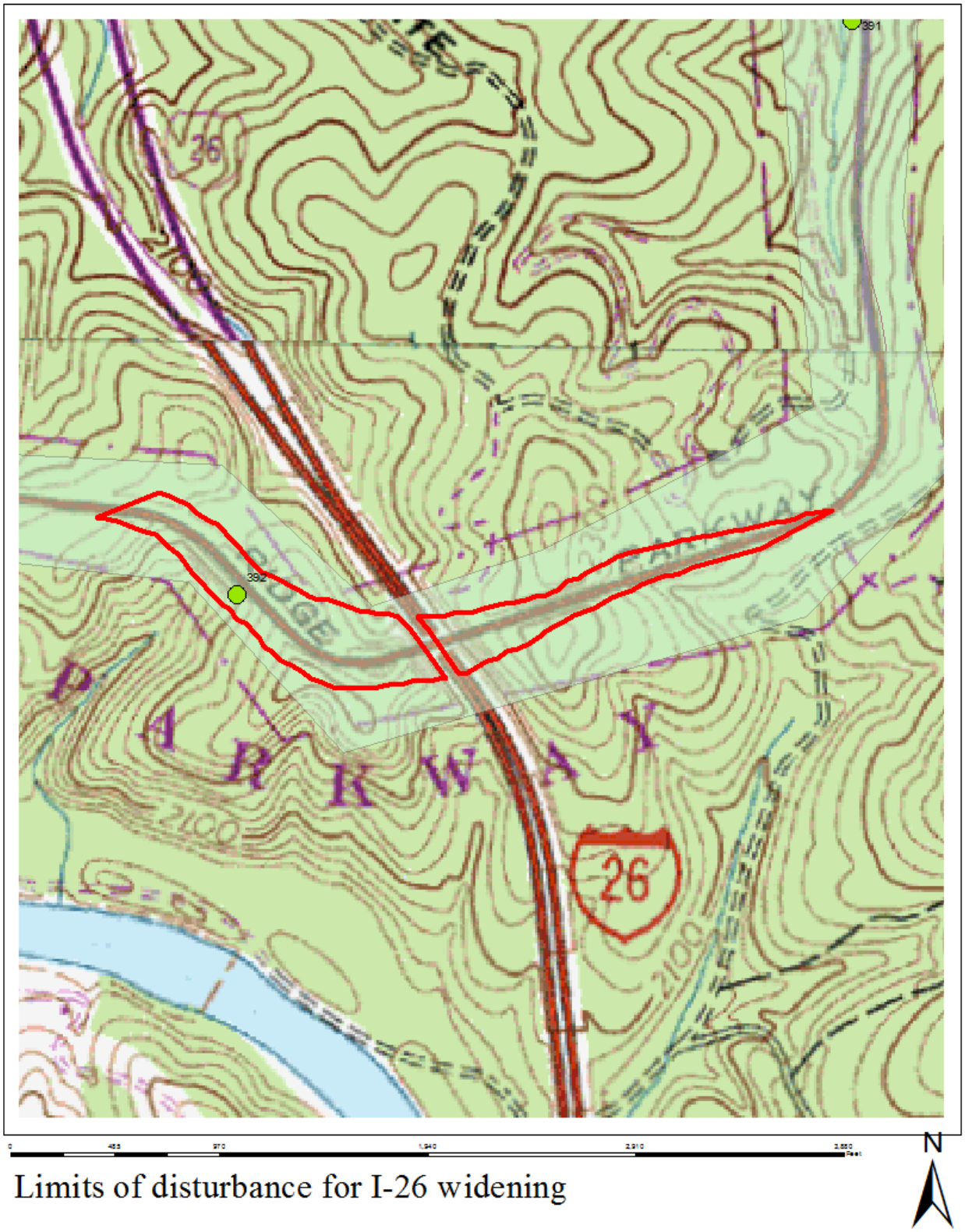

Figure 1. Location of proposed bridge replacement and parkway reroute. Area archeologically surveyed.

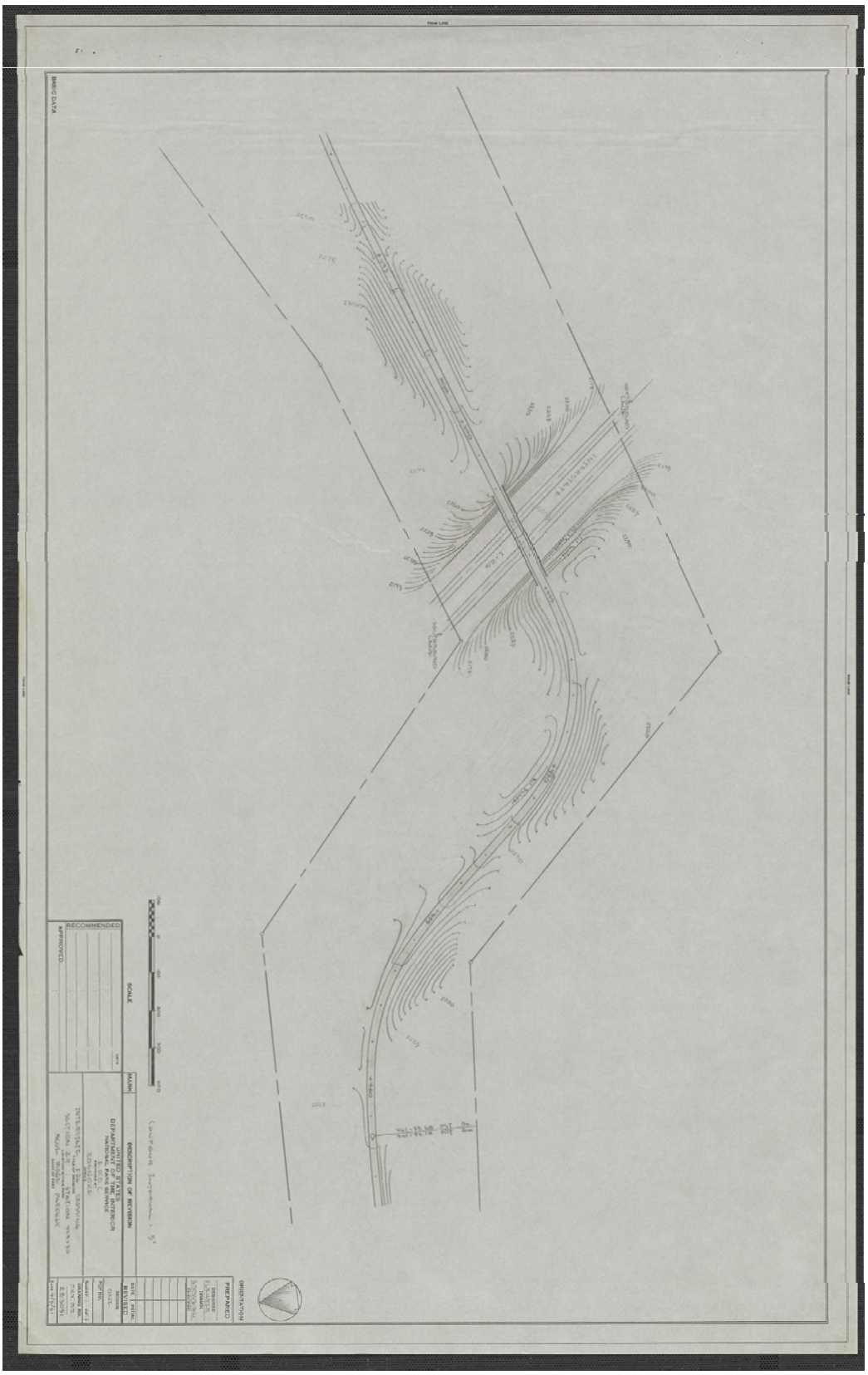

Figure 3. 1961 grading plan of proposed APE.

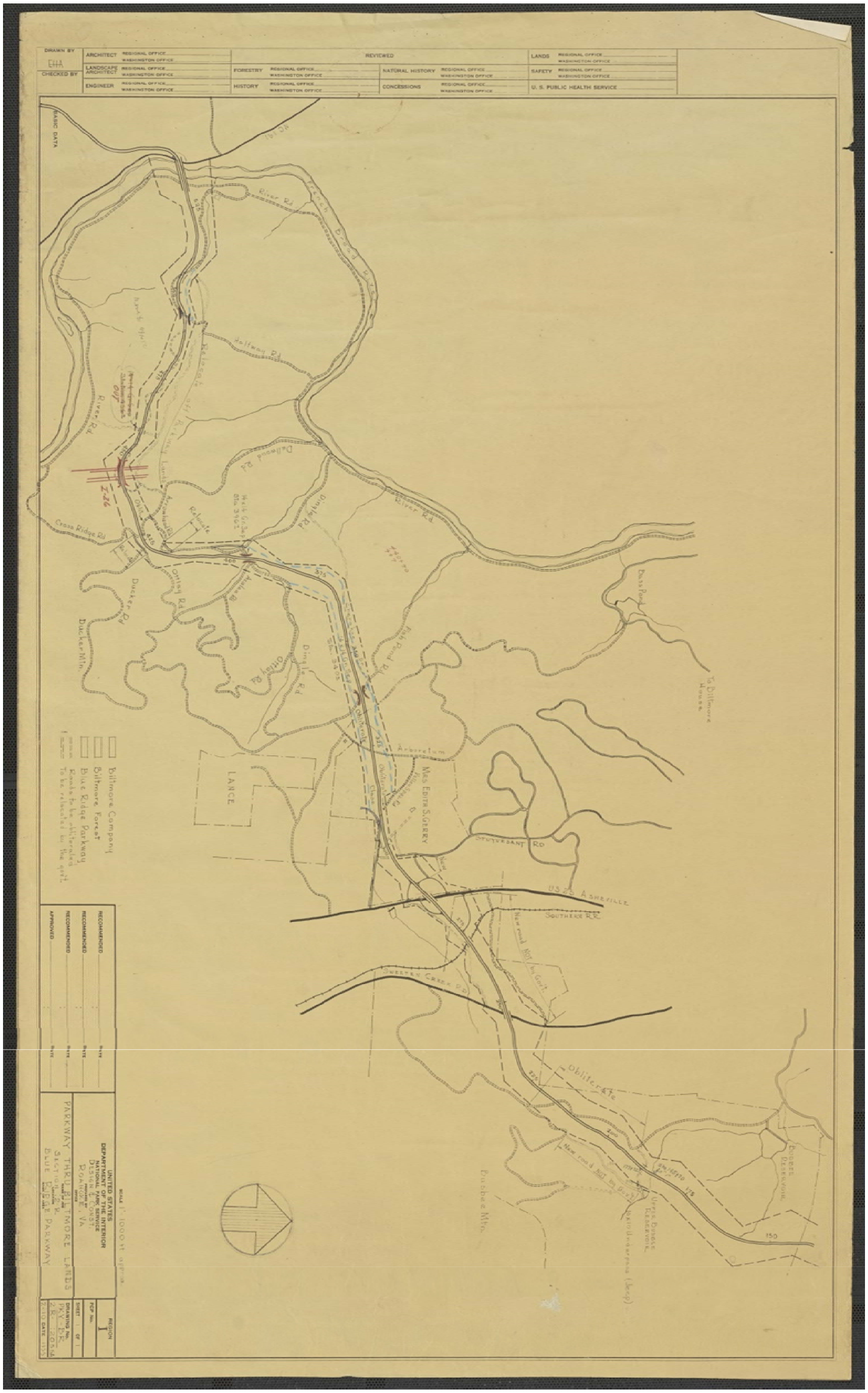

Figure 3. 1955 Map of parkway route within Biltmore property. Location of I-26 added later.

CONCLUSIONS AND RECOMMENDATIONS

Pedestrian testing of the area resulted in the finding that no significant archeological sites will be affected by the proposed actions at each location. Initial construction of the Parkway resulted in tremendous amount of soil disturbance in the form of cuts, fills, and grading that would have destroyed any sites that existed in the area prior to construction. Given the terrain in this area prior to Parkway construction it isn't likely that significant sites would have occurred in this location do to the relatively few areas that exhibit slopes of less than 20%. It is the BLRI archeologists recommendation that no further archeological testing is required at this location prior to bridge replacement or parkway reroute.