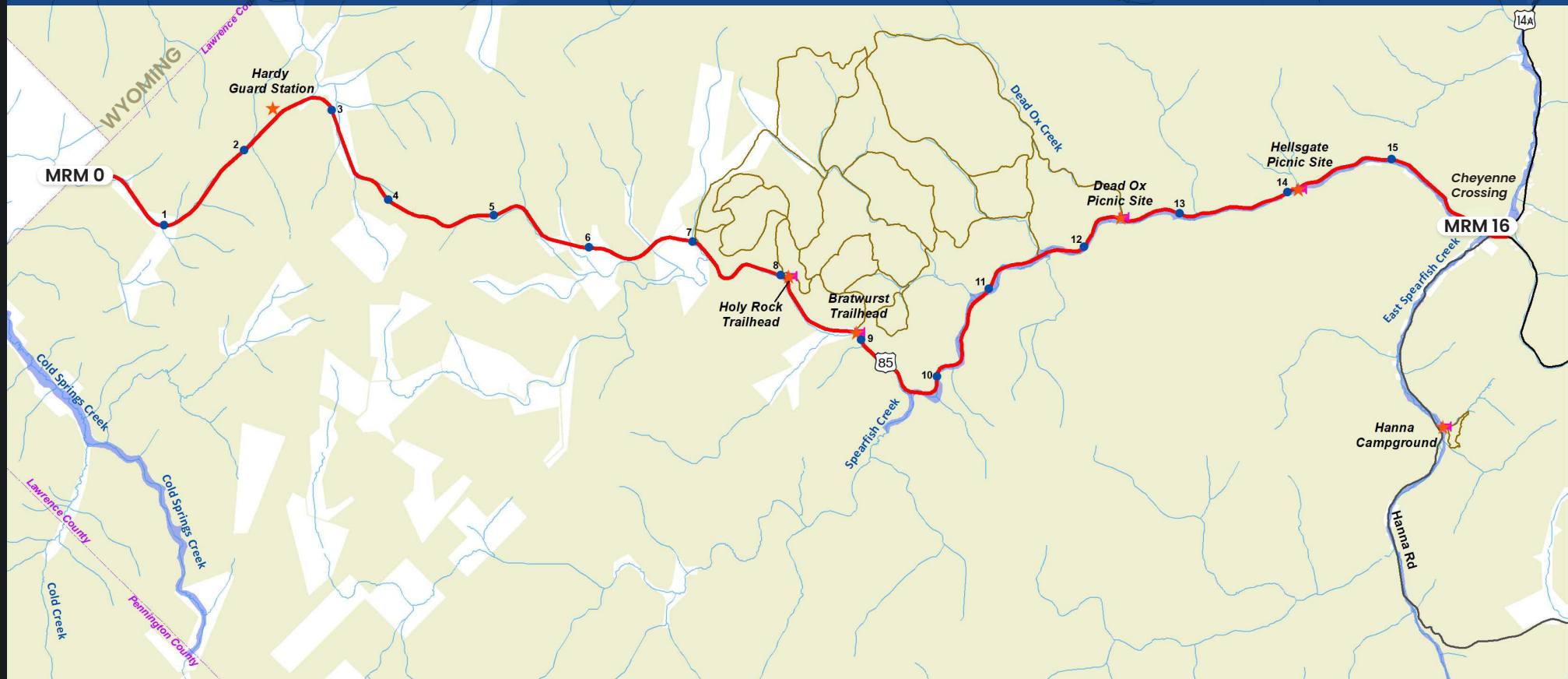
BLACK HILLS CONTEXT SENSITIVE CORRIDORS STUDY

PHASE 3 REPORT

CORRIDOR 3: US 85 - WYOMING TO US 14A



Black Hills
CONTEXT SENSITIVE CORRIDORS STUDY

PHASE 3 REPORT

CORRIDOR 3 – US HIGHWAY 85
WYOMING TO CHEYENNE CROSSING

Prepared for:

South Dakota Department of Transportation
700 E Broadway Ave
Becker Hansen Bldg
Pierre, SD 57501-2586

Prepared by:

FELSBURG HOLT & ULLEVIG

In cooperation with:

SRF Jacobs

FHU Reference No. 117385-01

February 2023

TABLE OF CONTENTS

Appendices

List of Figures

List of Tables

1. INTRODUCTION

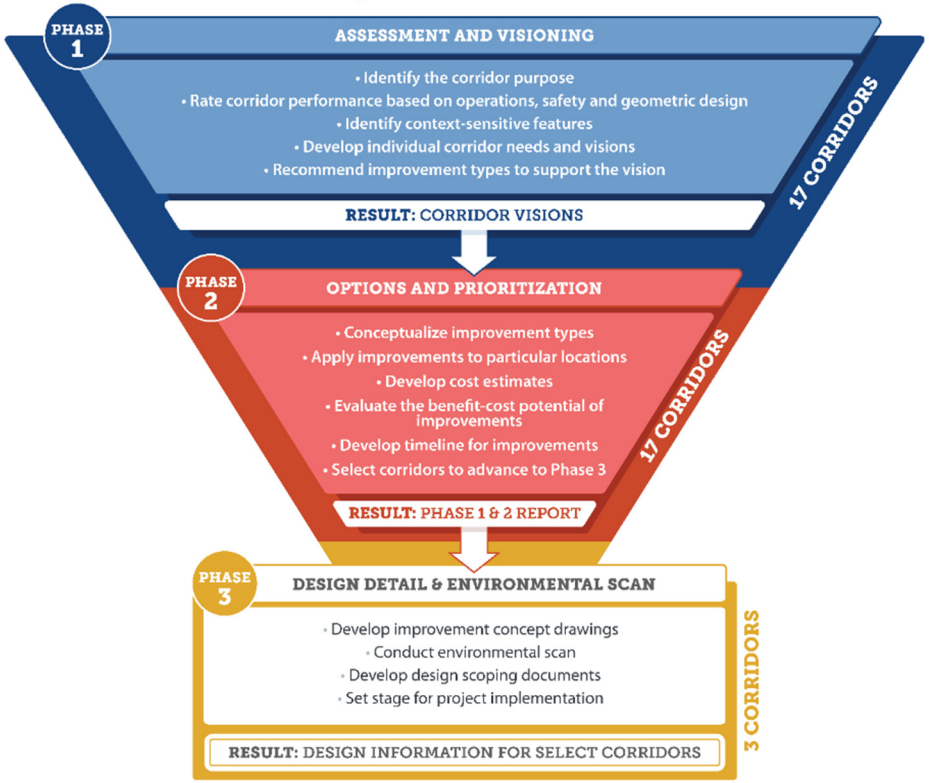
The Black Hills Context Sensitive Corridors Study team has crafted visions for improving 17 corridors in the scenic Black Hills of South Dakota. These corridors traverse topography substantially different from other areas in the state and serve functions that emphasize the drive/ride experience provided by the road along with the ability to convey traffic.

While the environment surrounding the study corridors and the reasons some travelers are present on the routes are different from South Dakota Department of Transportation (SDDOT) routes in other parts of the state, the SDDOT has the same responsibility to maintain safe routes in a good state of repair. Fulfilling this responsibility incorporates applying the SDDOT design guidelines to address lane width, curve radius, shoulder and clear zone. Even when these standards are adjusted to account for mountainous conditions, a standard design configuration may impact adjacent terrain, geologic features, and/or streams and may bring a perceived negative impact to corridor user experience. The study has addressed each impact perceived as a challenge by balancing engineering guidelines with the sensitive contextual conditions of the area.

The visions for improving these corridors were assembled through the application of Context Sensitive Solutions (CSS) principles. The visions recommend the types of transportation improvements to be applied to each corridor and provide preliminary locations and future prioritization of improvements.

The study has followed a program of three phases, as shown on **Figure 1**. Upon completion of corridor visioning through Phases 1 and 2, the study team identified a subset of corridors for further design detail and environmental evaluation in Phase 3. The vision for improving Corridor 3, US Highway 85 between the Wyoming state line and Cheyenne Crossing, was selected for further development in Phase 3 to provide information needed for the SDDOT to implement corridor projects.

Figure 1. Study Phases



1.1 Study Area

Corridor 3 is US Highway 85 from approximately the Wyoming state line to Cheyenne Crossing in Lawrence County. **Figure 2** displays the corridor limits. The current section of Corridor 3 is a combination of an urban section and a rural two-lane. **Appendix A** provides a map view of the corridor and current characteristics.

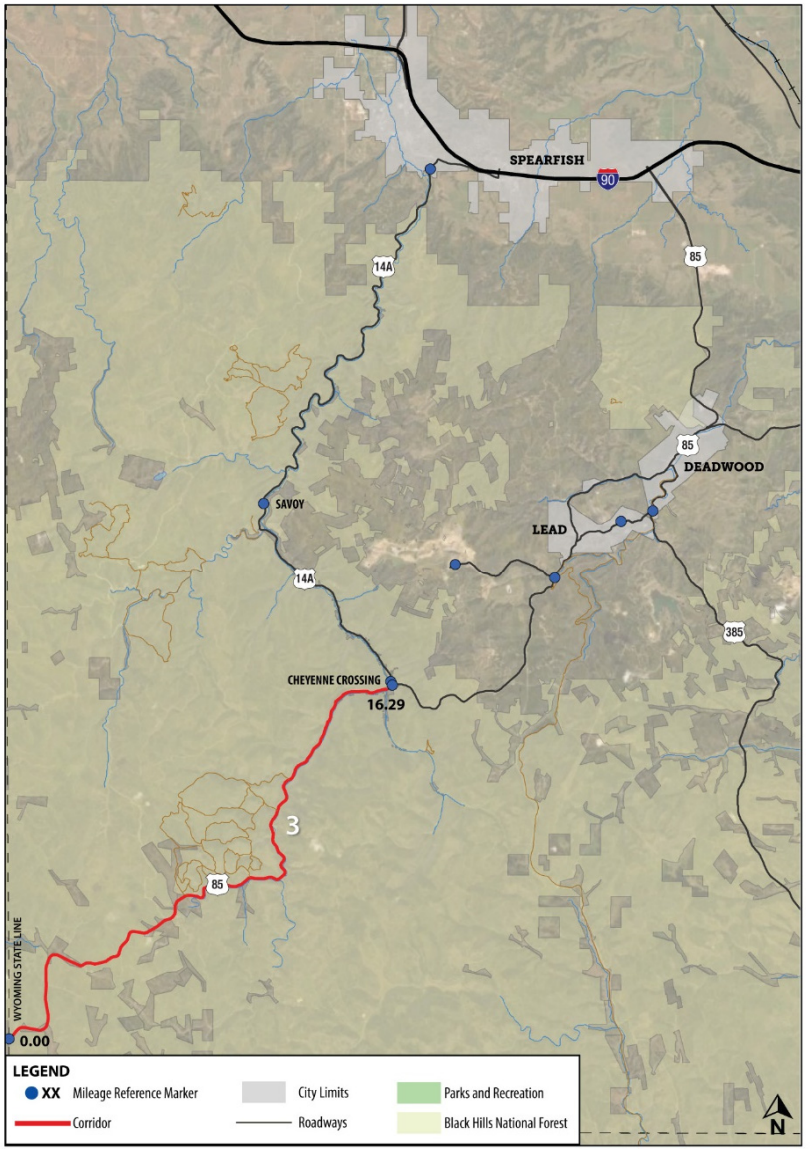
1.2 Phase 3 Report Content

The Phase 3 effort creates more detailed layouts, documents potential impacts, and provides review with project participants and the public. Phase 3 of the overall project is the focus of this document, including:

- Review the Context Sensitive Solutions (CSS) steps taken to develop, evaluate, screen, and recommend alternatives.
- Restate the corridor vision to support this document being standalone and separate from the Phase 1 and 2 document.
- Detail corridor enhancement design information to document the scope of potential improvement projects fitting within the defined corridor vision.
- Document corridor proposed concepts to be carried forward into conceptual and final design as improvements are advanced through project development when the need and funding are coordinated.

This report reviews the corridor vision developed in Phase 1, highlights the improvements recommended in Phase 2, and provides the additional design and environmental Phase 3 information for Corridor 3.

Figure 2. Study Corridor Location



2. CONTEXT-SENSITIVE PROCESS

CSS principles were used as a framework for developing the study. As applied in many transportation infrastructure projects, CSS provides a method for planning, designing, and constructing infrastructure improvements that are consistent with the purpose and role fulfilled by a corridor.

CSS operates with the following core principles (fhwa.dot/gov/planning/css):

- Strive toward a shared stakeholder vision to provide a basis for decisions
- Demonstrate a comprehensive understanding of contexts
- Foster continuing communication and collaboration to achieve consensus
- Exercise flexibility and creativity to shape effective transportation solutions, while preserving and enhancing community and natural environments

While the study represents a less formal implementation of CSS, these principles have guided the study team toward successful completion of Phases 1 and 2. Described as follows, stakeholder and public collaboration has supported the technical work, and the study team followed a series of steps to reach outcomes in line with CSS principles.

2.1 Study Oversight

Central to creating the context sensitive plan was discussion and information sharing with state/federal agency, county, and appropriate local jurisdictions throughout plan development. Before initiating the work, the SDDOT identified and invited representatives from the following agencies to participate on the Study Advisory Team (SAT):

- United States Forest Service, including representatives from each Ranger District in the region; with Hell Canyon, Northern Hills, Mystic, and Black Hills National Forest invited to participate
- United States National Park Service representatives from Jewel Cave and Mount Rushmore properties
- South Dakota Game Fish and Parks representatives from Custer State Park
- Spearfish Canyon Association
- Federal Highway Administration

SDDOT representatives from the following divisions participated on the SAT:

- Administration
- Bridge Design
- Custer Area Office
- Project Development
- Rapid City Area Office
- Rapid City Region Office
- Road Design
- Transportation Inventory Management

The SAT's role was to oversee the major project milestones, provide technical input, and monitor the progress of the planning process.

2.2 Stakeholder and Public Collaboration

In addition to ongoing guidance from the SAT, efforts were made to obtain feedback from other interested groups. The study team contacted a broad list of potential stakeholders and met with many representatives.

2.2.1 Phase 1 and 2 In-Person Public Meeting

In Phase 1, stakeholder input was received through the following efforts:

- Small group meetings with adjacent landowners/stakeholders with an interest in individual or a range of corridors.
- Municipal representative meetings in which current issues and future development traffic impacts on the corridors were discussed. Entities included the cities of Custer, Hermosa, Spearfish, Lead, and Deadwood.
- Meetings with the Black Hills Council of Governments and Chambers of Commerce associated with the cities of Spearfish, Lead, and Deadwood, along with the School District encompassing the Lead and Deadwood area.
- Individual agency meetings with staff responsible for specific properties along one or more of the corridors, including Custer State Park.

General public meetings in support of Phases 1 and 2 were held in both the north and south regions of the study area in August 2018. Each meeting was broadcast live via YouTube. Participants had the opportunity to comment on issues they experience within one or more corridors and their perception of corridor desired functions. In-person attendees and people participating remotely (live or delayed through watching the recorded meeting) were provided with the opportunity to send comments and/or questions via email.

A website was established to provide current information and serve as a tool for public feedback throughout Phases 1 and 2 of the study.

2.2.2 Phase 3 Virtual/Remote Public Meeting

Due to restrictions associated with COVID-19, the opportunity to communicate with the public and receive feedback was provided virtually through displays and recorded presentations available on the project website. Information provided through the website included:

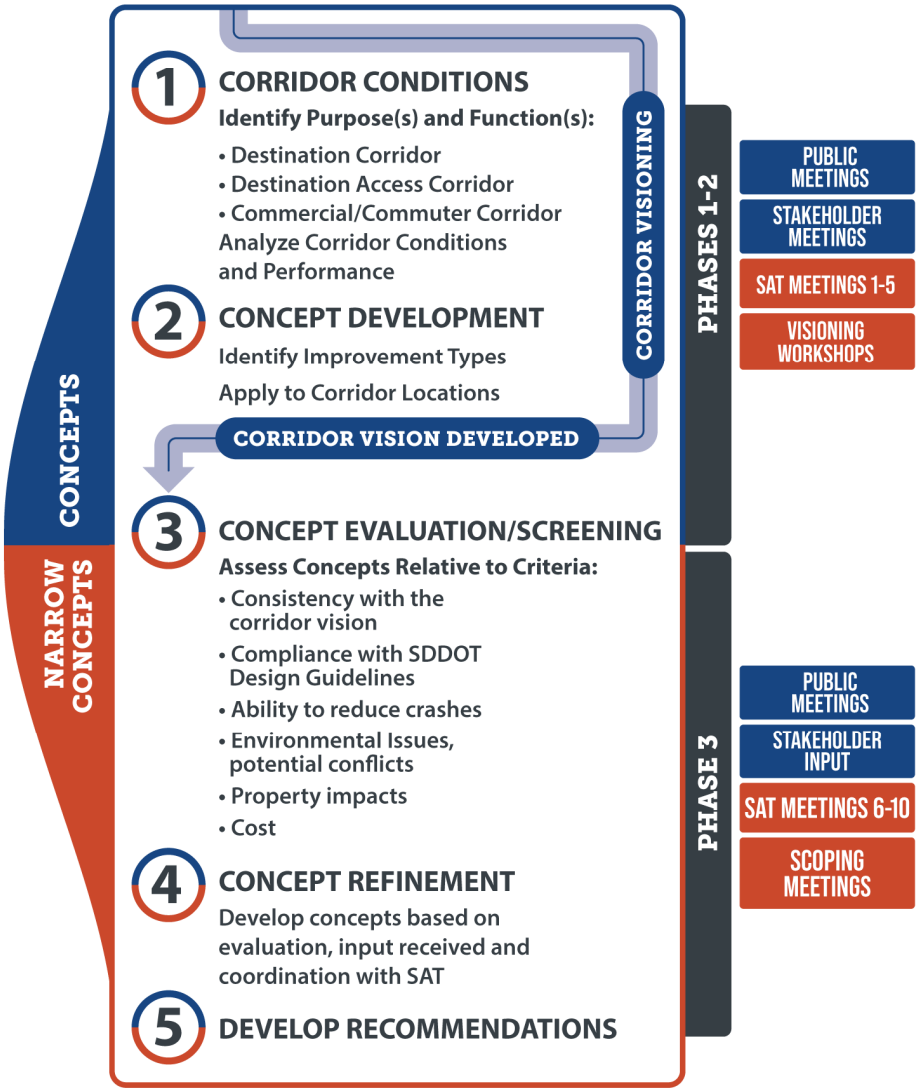
- Informational narrated recordings reintroducing the individual corridors, presenting alternatives to address needs/gaps, and summarizing results of alternative assessment relative to a consistent set of evaluation criteria.
- Detailed concept diagrams of the range of alternatives being considered to address needs within the definition of context sensitivity, including potential impact areas and types of impacts.
- Contact information for residents, business representatives, and other stakeholders to provide feedback and/or discuss with consultant team members their questions/concerns about the study process, alternatives, or findings.

2.3 Context Sensitive Visioning and Concepts

Figure 3 outlines the steps taken to reach a corridor vision and then develop, evaluate, screen, and recommend a design concept through the Context Sensitive Corridors Study. Phases 1 and 2 involved collecting pertinent information about each of the 17 corridors to understand their purpose and quantify their performance across a range of categories. Possessing this knowledge base, the study team identified improvement types that could be applied to further each corridor's purpose and meet the current and future needs. Improvement types include Design, Multimodal Operations, Safety, Intelligent Transportation Systems (ITS), and Aesthetics. The corridor vision includes locations for improvement types, assessments of costs and benefits, and timelines for implementing corridor improvements.

Criteria such as purpose/design inconsistency, safety benefit/cost, crash frequency and urgency of condition were used to advance a subset of corridors to Phase 3. In Phase 3 detail has been added to corridor improvements to better understand potential impacts associated with adding shoulder width, realigning segments, adding retaining walls and guardrail, and/or improving access into/out of the individual corridors to address safety and geometric deficiencies. The intent of Phase 3 is to narrow concepts and advance recommendations while increasing the detail provided. In addition to the concept layouts, a deliverable for Phase 3 is an environmental scan document.

Figure 3. Concept Development and Visioning Process



3. VISIONING

This section addresses the development of the context sensitive vision for US85 from the Wyoming state line to Cheyenne Crossing.

3.1 Purpose, Performance, and Needs

The study team developed a rating system to display key corridor conditions, including:

Purpose – The corridors are assigned ratings based on their tendency to serve as Destination, Destination-Access, or Commuter/Commercial roadways. The rating system allows recognition of multiple purposes served within the same corridor and serves as a background for identifying and selecting appropriate corridor improvements.

In a Destination Corridor, driver/passenger experience of the road is the reason for the trip. Curves, narrower lanes, and slower speeds are not considered deficiencies but rather desirable characteristics of the adventure provided by the trip.

A Destination-Access Corridor describes a hybrid corridor whose role is to carry travelers between their accommodation location (hotel/campground/ home) and the recreation venue to be visited. In addition, as the corridor provides direct access to a nature/park site, the environment next to the road traveled may also provide a complementary scenic view as part of the trip.

A Commuter/Commercial Corridor provides connectivity between residential and employment areas and/or is intended to carry goods from one point in the region to another or through the region. A Commuter/Commercial Corridor emphasizes vehicle throughput over access to adjacent property, reduced and reliable travel time, and lane and shoulder widths commensurate with commercial vehicles.

Corridor 3 is characterized primarily as a Commuter/ Commercial Corridor, recognizing its inclusion as a National Highway System (NHS) route, important to the nation's economy, defense, and mobility. It is secondarily characterized as a Destination-Access Corridor, traversing forested areas as it connects into the Black Hills from the west.

User Mix – Corridors were reviewed relative to the traffic volume and user type/vehicle mix observed in the corridor compared to the other 16 corridors in the study. Traffic volumes are relatively low along Corridor 3, reflecting its more rural nature. Within this overall volume, data indicate that the composition of user types tends toward higher percentages of heavy vehicles and motorcycles. Bicycle travel is rare, likely consisting of more expert cyclists.

Context – The nature and intensity of unique features "beyond the pavement" along the corridor are rated. Along Corridor 3, contextual features intensify within its eastern portion entering Spearfish Canyon, while the roadside surroundings are less contoured and more open on the west.

Traffic Operations – Traffic operations are rated based on Level of Service (LOS) findings for current and projected Year 2050 traffic levels compared with SDDOT LOS criteria. Classified as a Class I highway more focused on mobility than access, Corridor 3 shows substandard 2-lane highway LOS conditions for both current and projected future traffic volumes.

Safety –Safety is rated based on the relative magnitude of crash history compared with expected norms for roadways of similar type. Corridor 3 demonstrates higher than expected crash frequency.

Road Design – Geometric features of the roadway are rated relative to conforming to established standards. Along Corridor 3, design deficiencies exist with respect to shoulder and lane width, clear zone, limited-speed horizontal curves, and access spacing.

Table 1 summarizes the key characteristics.

Table 1. Corridor Characteristics Summary

Characteristic Category	Description
Purpose	Primary: Commuter/Commercial Secondary: Destination Access
User Mix	Lower traffic volumes, higher percentages of heavy vehicles and motorcycles. Prioritize auto and heavy commercial travel supporting commerce activities along the corridor.
Context	Black Hills National Forest. Contextual features intensify within its eastern portion entering Spearfish Canyon, while the roadside surroundings are less contoured and more open on the west.
Traffic/Safety Conditions	Deficient current and future 2-lane Level of Service. Safety conditions indicate high potential for total and severe crash reduction.
Road Design	Primary deficiencies are limited shoulder and lane width, limited-speed horizontal curves, and restricted clear zone.

The following summarize the assessment in support of visioning:

- Designated as part of the NHS, the route is of national importance.
- The route carries a higher percentage of heavy vehicles relative to some other corridors covered in the Context Sensitive Corridors Study.
- Elevated crash experience shows high potential for improvement through safety countermeasures.
- Design deficiencies with lane and shoulder width, curvature, and clear zone do not support higher travel speeds consistent with Class I highway.
- Canyon (eastern) portion may limit attainable design speeds and pavement width.

3.2 Visioning Results

The corridor vision consists of two elements: 1) a statement describing the envisioned future of the corridor and 2) a list of improvement types and locations that demonstrate the potential to support the vision.

Vision: US85, as a NHS route, serves high-speed Commuter/Commercial traffic. A corridor reconstruction effort increasing lane and shoulder widths and addressing horizontal curvature is needed to provide improved mobility and safety.

List of Improvements: The initial range of alternatives developed for Corridor 3 consisted of 48 improvement types categorized as follows:

- **Design**: Improvements or changes to the current physical roadway conditions that focus on lane width, shoulder width, vertical and horizontal curvature of the road, superelevation through a curve, ditch slopes, objects immediately outside the pavement area, and auxiliary lanes aiding entry or exit from the road
- **Multimodal Operations:** Improvements that reduce platooning behind slower moving vehicles, intersection control changes, better accommodating mixed traffic (bicycles, pedestrians and the range of motor vehicles) along and across a road
- **Safety:** Actions/improvements that affect visibility, speed, traction in wet/snow/ice conditions, and feedback if vehicles stray from travel lanes

- **ITS:** The range of vehicle detection and information feedback that influence driver behavior, such as speed management devices, advance warning devices, weather information systems, etc.
- **Aesthetics:** Improvements that may not have an effect on driver behavior but can be measured in crash reduction. However, such improvements are complementary to safety motivated actions and consistent with the context sensitive nature of routes covered in the study.

Improvement types demonstrating the ability to support the vision were identified from this initial list over the course of the two visioning workshops, which in the context sensitive approach played a critical role in balancing the application of improvement types with the preservation of the corridor's unique surroundings. In the workshops, possessing an understanding of corridor purpose and performance, the study team, SDDOT, and agency staff set initial road design expectations for the design speed and typical section, applying judgment regarding context-sensitive implementation. The workshop attendees selected improvements to deliver safety benefits, improve consistency with SDDOT design standards, and bring corridor configuration more in line with its designated purpose.

The current configuration of US85 between the Wyoming state line and Cheyenne Crossing is not effectively serving its primary purpose—it possesses a narrow paved section difficult for larger vehicles to navigate efficiently and safely. Horizontal curves are frequently signed with advisory speeds causing inconsistent travel speeds and adding to travel time. There are limited roadside refuge locations for vehicles to pause outside travel lanes. Crash records indicate high potential for crash reduction.

Effective improvement types would allow the corridor to better support the characterized purpose and function. A shortened list of improvement types was identified by evaluating the current conditions within the corridor relative to the vision; reviewing the findings from the operations, safety and design evaluations; and receiving input from the visioning workshops and the public meetings held in support of Phases 1 and 2. **Table 2** highlights the improvement types identified for US85.

Table 2. Summary of Improvement Types to Support Vision

Improvement Type	Supports Vision by
Additional pullouts alongside the roadway	Improving operations and safety
Widened roadway section including lane and shoulder width	Reducing crashes and improving heavy vehicle travel conditions
Horizontal curve treatments	Reducing crashes and creating more consistent travel speed
Speed management signage/devices	Helping to smoothly transition vehicles from the higher-speed western portion to the tighter, lower-speed western portion
Motorcycle safety treatments	Reducing motorcycle crash frequency
Roadside embankment slope stability/drainage improvements	Maximizing safety of roadside design while addressing infrastructure needs

4. CONCEPT EVALUATION

Understanding the desired corridor travel functions, current and future operations, and the need to better support the vision, the study team undertook a series of actions to craft unique actions for each corridor. Scoping meetings were also held to identify and discuss ideas about the appropriate improvements to the corridors. The concepts developed and discussed through the scoping represent the range of improvements reviewed through Phase 3.

Considerations informing the development of concepts include:

- **SDDOT road design standards:** The guidance for road design characteristics contained within the Road Design Manual was used as the initial basis for refining the roadway typical sections, design speed, and other parameters. In developing concepts, the study team implemented a context sensitive design approach balancing the meeting of standards with preservation of the unique context of the corridor.

With this approach, the following items were considered in addition to design standards:

- **Corridor purpose and function:** Pursue concepts that assist in aligning the physical layout of the roadway corridor with its purpose and function in the transportation system as a NHS route conveying longer distance travel for a mix of vehicle types.
- **Corridor characteristics:** Effective concepts will address corridor conditions identified during visioning; including locations where crash frequency and/or severity is higher than expected, locations of contextual features to preserve/protect/avoid, public and stakeholder input, and information from the SAT regarding known concerns and objectives.

4.1 Concept Development

Initial design concepts were developed to meet the following objectives:

- **Traffic Capacity:** The analysis of current and projected traffic volumes indicates that a two-lane highway can accommodate traffic volumes at LOS D into the future. While LOS D falls below the LOS C operational threshold, it is anticipated that improvements to the typical section (wider lanes and shoulders) can assist in improving the LOS rather than providing additional travel lanes.
- **Travel and Design Speed:** Given the NHS classification and importance of travel time and crash reduction to the Commuter/Commercial Corridor function, an objective to increase the design speed to 70 miles per hour (MPH) was set. This design speed would likely translate to a posted speed limit of 60 to 65 MPH, similar to the posted speed along US85 west of the Wyoming state line. This adjustment would require alterations to curvature and typical section.
- **Typical Section – Provide typical section and roadside design meeting SDDOT design standards:** Additional paved width to provide 12-foot travel lanes and 6-foot shoulders would reduce crashes and support higher travel speeds. A minimum clear zone of 30 feet was identified as the design objective.
- **Vision Improvements:** Implement pullouts, speed management strategies, and motorcycle safety treatments as appropriate.

Table 3 outlines design dimension objectives.

Table 3. Key Cross Section Components – Current and Objective

Design Element	Design Dimension	
	Current	Objective
Design Speed	30–80 MPH	70 MPH
Lane Width	11–12 ft	12 ft
Shoulder (Paved)	0–1 ft	6 ft
Clear Zone	varies	30

4.2 Roadway Alignment Concepts

Consistent with the design objectives, providing a consistent design speed of 70 MPH throughout the 16-mile length of the corridor was evaluated as a potential concept. This configuration would introduce roadway realignment of numerous horizontal curves and changes to the typical section. Upon evaluating these changes, it was determined that achieving a design speed of 70 MPH throughout the corridor is not feasible due to more significant contextual impacts within the eastern, more rugged, portion of the corridor. However, the design speed of 70 MPH was upheld as a feasible concept within the less hilly portion of the corridor, between approximately Mileage Reference Marker (MRM) 0 and MRM 6.7. **Figure 4** provides an example of a roadway realignment that would be needed to provide a 70 MPH design speed within the western portion of the corridor.

Figure 4. Example Horizontal Realignment at MRM 1

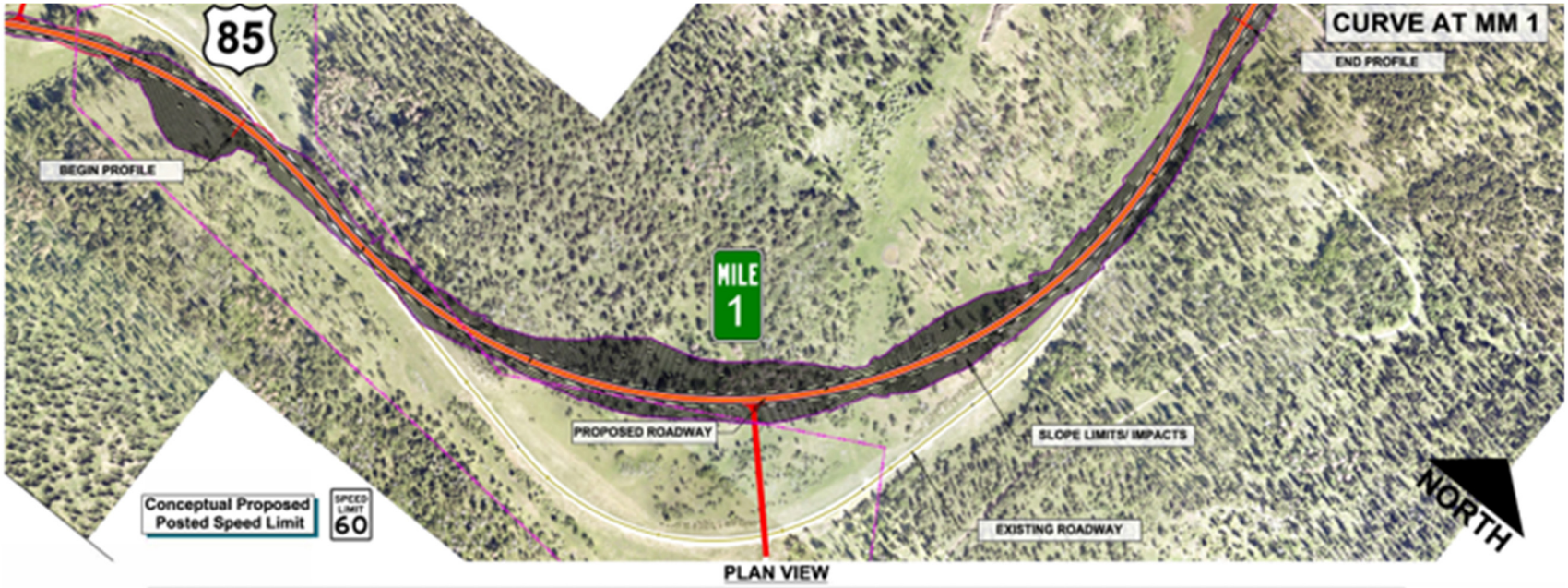
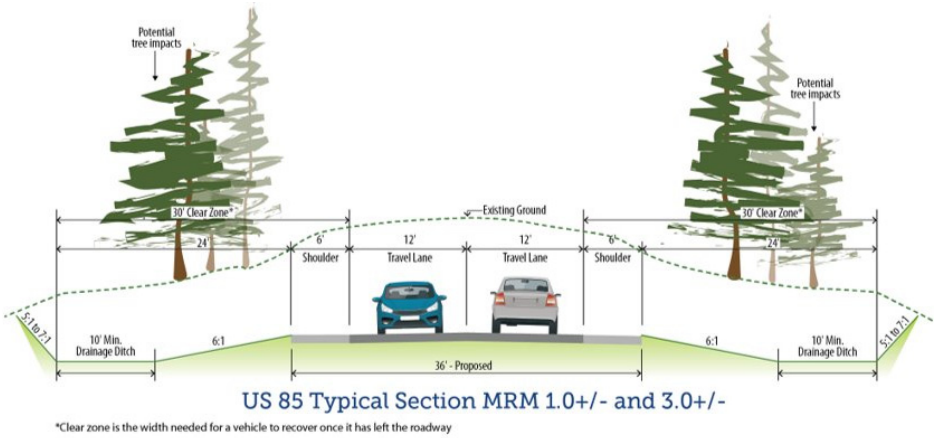


Figure 5 provides a cross-sectional view of a future realigned US85.

Figure 5. Realigned US85 Typical Section



Upon this conclusion, a concept was advanced to introduce mid-corridor design speed transitions to better serve the context and to limit the number of curves that would require reduced advisory speeds. From MRM 0 to approximately MRM 6.2, the concept would provide a design speed of 70 MPH. At MRM 6.2 a transition to a lower design speed would be introduced, culminating in a 40 MPH design speed section beginning at MRM 9 and continuing to approximately MRM 15.7, where a design speed of 60 MPH would be introduced, providing a transition to higher design speeds farther east along the corridor.

Figure 6 provides a layout of the recommended design speed/roadway alignment concept, depicting the adjustments to design speed along the corridor and the associated roadway alignment modifications.

4.3 Typical Section Concepts

Potential typical section concepts were developed and evaluated in similar fashion to the roadway alignment concepts; initially crafting a concept layout that would achieve the design objective and then considering appropriate adjustments in light of contextual features.

The design objectives shown in **Table 3** provided an initial framework for typical section elements, including lane width, shoulder width, and clear zone. Implementation of the design objective would result in a paved surface width of 36 to 40 feet, 8 to 18 feet wider than the existing paved surface throughout the corridor. Widening the roadway to provide this additional surface width would help to reduce crash frequency and severity and enhance travel time by providing roadside conditions consistent with higher design speeds.

A wider paved section would result in a range of impacts to the surrounding context. This extent of widening would be less impactful within the western portion of the corridor where terrain and roadside slopes are less severe. Impacts would increase moving east past MRM 8, where roadside conditions include steep slopes, rock formations, and Spearfish Creek.

Figure 7 provides several typical section examples outlining the application of a 6-foot shoulder typical section to various portions of the corridor. Within the eastern portion, the clear zone is reduced to a minimum of 10 feet, differing from the objective of 30 feet, while maintaining a widened 6-foot shoulder.

4.4 Other Improvements

Roadside pullout locations were identified to provide better refuge for vehicles needing to slow or stop while traveling along US85. Pullouts were identified at the following locations:

- Eastbound: MRMs 1.75, 3.5, 10.5
- Westbound: MRMs 1.75, 4.2

Speed management and motorcycle safety treatments may be identified at more advanced design stages.

Parking lots are improved/formalized along US85 at MRMs 8.1, 8.75 (Holey Rock), 9.5, 11.6, 12.5 (Dead Ox), 14.1 Hellsgate, and 15.1.

Figure 6. Alignment Concept and Design Speed Transitions

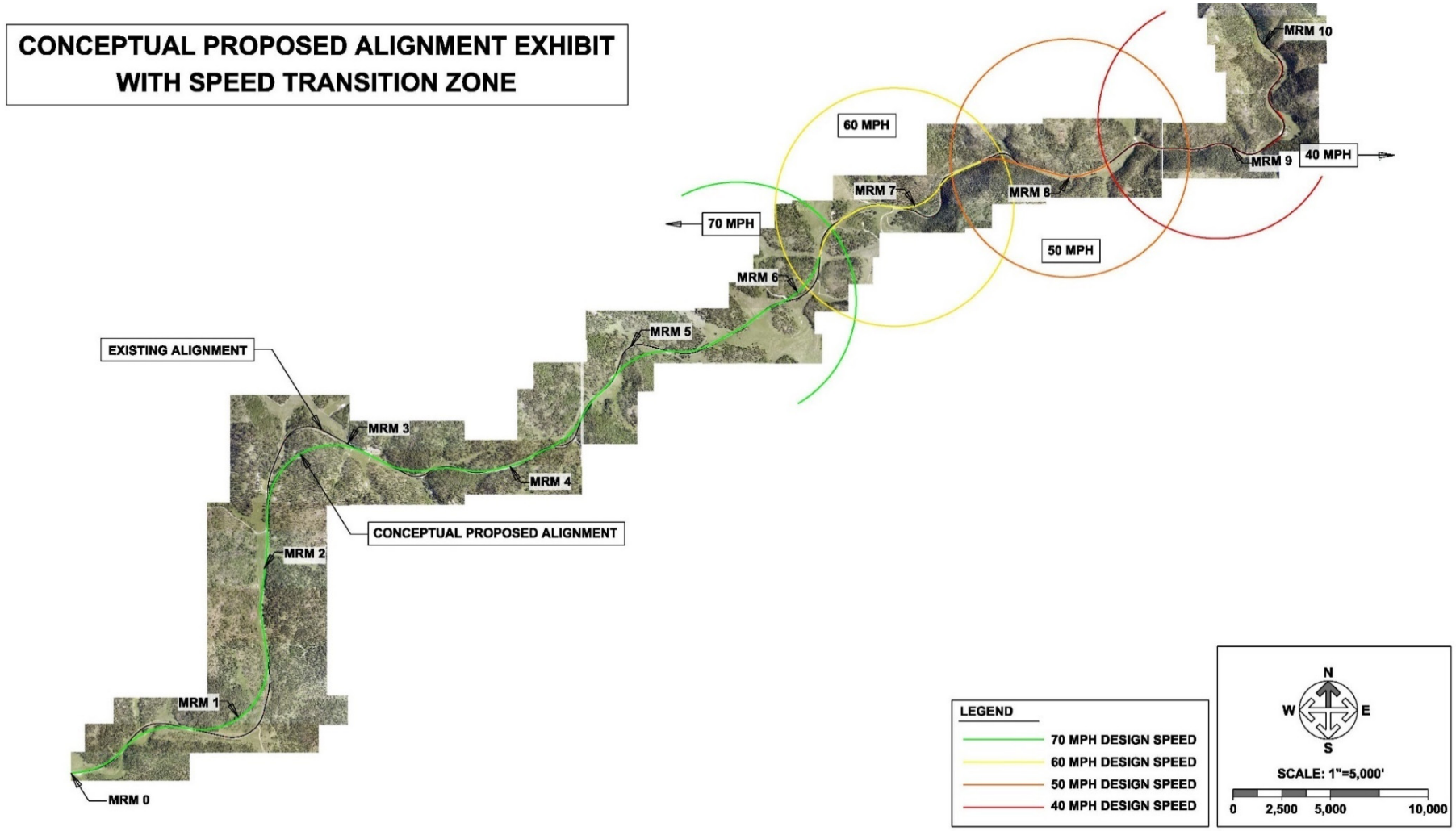
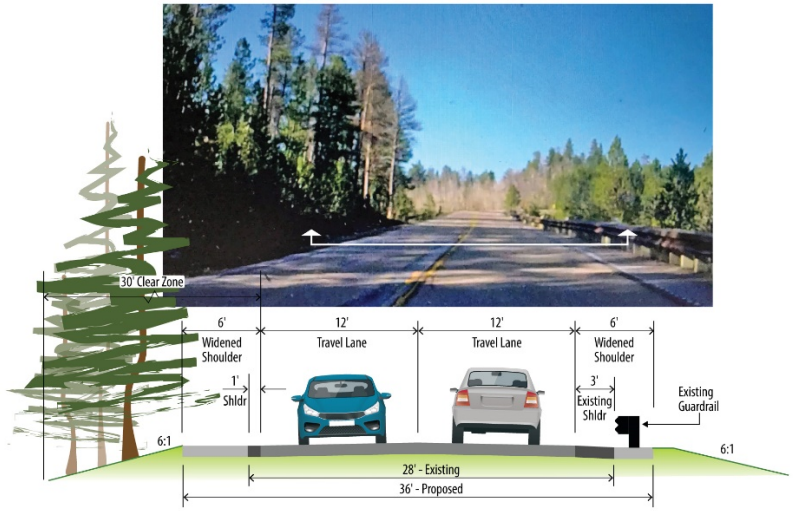
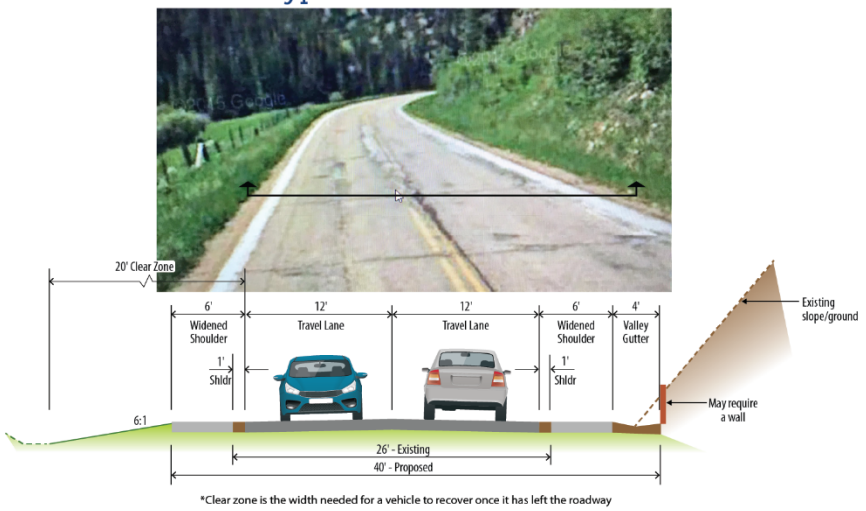


Figure 7. Initial Concept Typical Sections

US 85 Typical Section MRM 4.5+/-

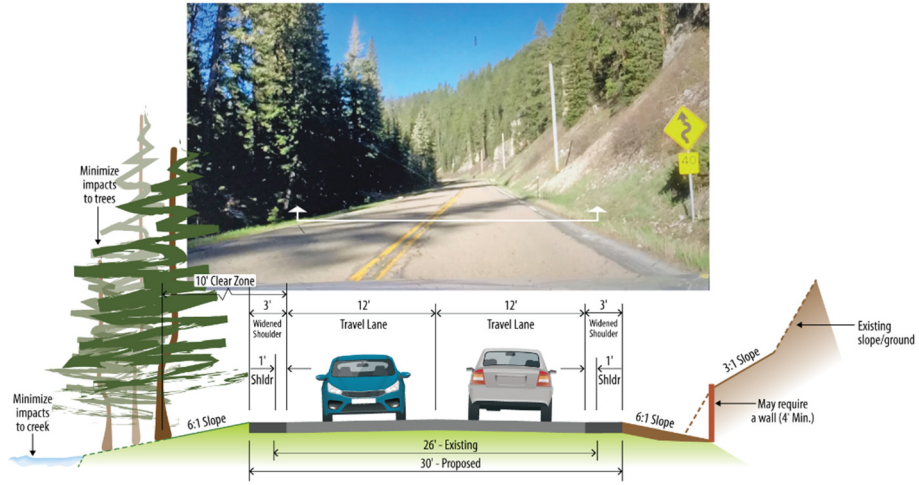


US 85 Typical Section MRM 8.0+/-



*Clear zone is the width needed for a vehicle to recover once it has left the roadway

US 85 Typical Section MRM 11.0+/-

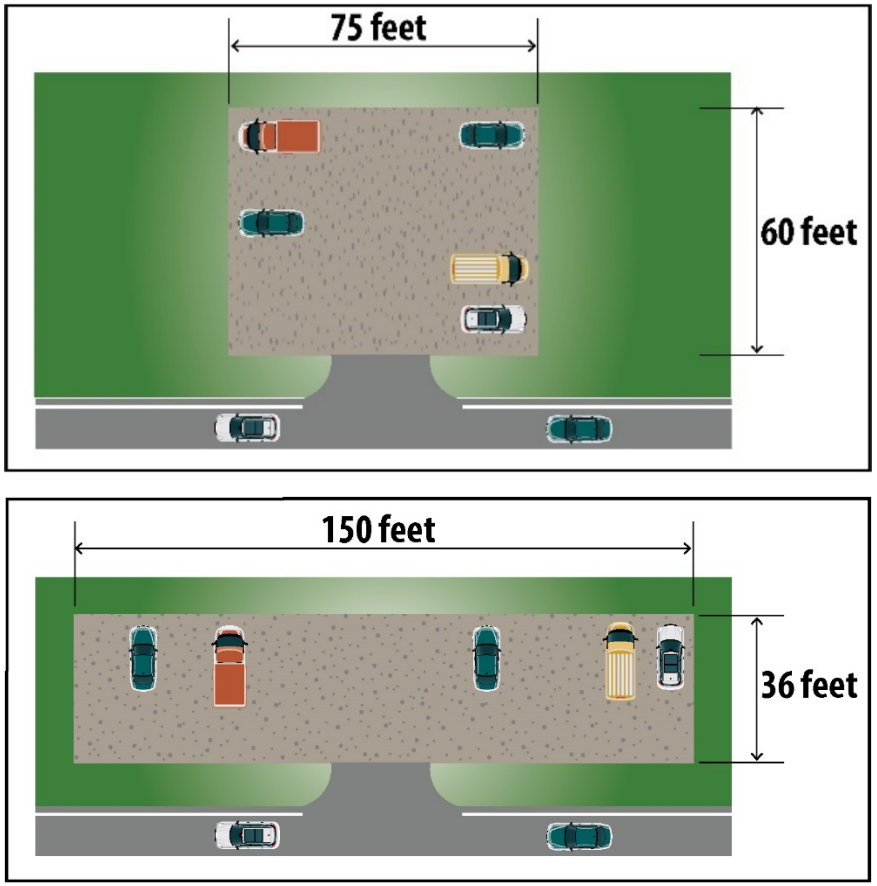


The study team conducted a parking demand evaluation to gauge current usage at key parking areas along the roadway and ensure that future modifications to parking provide an adequate number of spaces. **Table 4** outlines the results of the parking demand evaluation and provides concepts for parking lots. **Figure 8** provides typical parking layouts. These layouts would provide a single point of access to parking lots and formalize the space allocated to parking.

Table 4. Parking Demand Evaluation and Concept

Parking Location			Peak Parking Demand		Concept
MRM	Description	# of spaces	Wkdy	Wknd	
8.1	Informal roadside parking	8	1	1	Formalize parking and access (8 spaces)
8.75	Holey Rock Trailhead	6	2	2	Formalize parking and access (6 spaces)
11	Interpretive site, Spearfish Creek undercrossing	4	1	6	Maintain; future expansion potential limited by terrain (9 spaces needed)
12.5	Dead Ox picnic site-Loop drive along EB travel lane	6	6	1	Formalize parking and access (9 spaces)
15.1	Informal roadside parking/Creek crossing access	3	4	8	Formalize parking and access (12 spaces)

Figure 8. Typical Parking Concept Layouts



4.5 Concept Refinement

Concept refinement reemphasized the uniqueness of the context sensitive corridor purposes and functions and ensured these are reflected in study recommendations. Refinements were considered in light of:

- Emphasizing the corridor context. A higher level of deviation from the design objective may be permissible to retain corridor character. The eastern canyon portion of US85 shows high scenic quality for special consideration.
- Achieving consistency with the corridor vision as described in **Section 3**. Safety and travel time benefits are desired for this Commuter/Commercial Corridor. Additional incremental impacts to the context can be considered where concepts are able to provide safety benefits. The potential concepts for US85 show safety and travel time benefits.
- Incorporating public input. The potential concept outlined in **Section 4.3** was presented at the Phase 3 virtual public meeting for review and comment. Nearly 300 unique users visited the online meeting. Public feedback included comments received via the online comment form and via email.

  Most respondents expressed concerns about traffic safety in the area, sharing in the perception that straightening curve radii and widening shoulders could increase safety issues by encouraging higher speeds. Respondents agreed with making corridor travel more reliable and more accommodating and improving safety. There are also concerns with modifying the current route and affecting the context of the area, particularly the beautiful canyon areas. Improved parking in the area was appreciated by respondents.

Following completion of the virtual public meeting, the SAT held a meeting to determine refinements to the concept. Upon discussion, the following refined concept emerged:

- Maintain the design speed and roadway alignment concept. This concept shows the ability to improve traffic safety and travel time consistency for a significant portion of the corridor.
- Provide a 6-foot shoulder within the western portion of the corridor from MRM 0.0 to approximately MRM 10.5. This shoulder width meets the design objectives and shows potential to reduce crashes.
- East of MRM 10.5, introduce additional flexibility and variability to emphasize contextual features. Seek to provide a 3-foot shoulder width east of MRM 10.5, retaining a measure of safety benefits while managing impacts to the context.

5. RECOMMENDATIONS

It is recommended that the refined concept as described in **Section 4.3** be implemented along US85 between the Wyoming state line and Cheyenne Crossing. This concept is reasonable for addressing the corridor vision while balancing impacts to the surrounding context.

Appendix B provides a drawing of the concept. Overlaid on an aerial photo background, the drawing depicts the edge of pavement, cut and fill limit lines, and intersections. A preliminary profile is also provided. A preliminary view of replacing the US85 structure over Spearfish Creek is also depicted. At this preliminary level, the drawing has been developed using available contour information in lieu of survey information. More advanced levels of design are likely to reveal physical characteristics that would affect design outcomes. Also as design advances, locations where the layout is unable to meet design standards will require consideration and documentation.

5.1 Environmental Scan

Appendix C contains the Environmental Scan Report. This document provides a "bridge" between the three-phase corridor planning studies and the subsequent National Environmental Policy Act (NEPA) process. The sections within the Environmental Scan Report include the corridor context within the Black Hills, transportation system context, and a preliminary corridor-wide purpose and need statement to be refined during the NEPA process. The preliminary purpose and need statement was provided for public review during the Phase 3 virtual public meetings. The Environmental Resources sections within the Environmental Scan Report document known and potential environmental resources within the environmental study area for Corridor 3.

5.2 Cost Estimates

Detailed survey information is not currently available for the US85 corridor from the Wyoming state line to Cheyenne Crossing, and the severe terrain of the impact area creates an environment of uncertainty for preparing detailed cost estimates. The following key assumptions were used to develop an Opinion of Probable Cost:

- Unit cost by linear foot for roadway improvements/ replacement.
- Cut and fill limit estimates are based on USGS contour information for the rugged areas alongside the current alignment. This source will yield an order of magnitude estimate, which requires substantial refinement as project development continues.
- Costs associated with drainage, utilities, erosion control, traffic control, and similar elements are based on a typical percentage of items, including earthwork, highway surfacing, and installation of curb and gutter if applicable.

The study team developed planning level generalized cost estimates for the improvements envisioned for each corridor. The team reviewed the improvement types with respect to the limits and locations as presented to quantify the materials needed to implement these improvements. Unit costs were developed in collaboration with SDDOT staff, using the SDDOT pay items and representative unit costs. The costs of some improvements were estimated based on past projects.

Table 5 documents the opinion of probable cost, units required, and estimated construction costs for the recommended concept.

Table 5. Corridor 3 – Opinion of Probable Cost

ITEM	DESCRIPTION	UNIT	CONTINGENCY	UNIT COST	QUANTITY	COST
110	Earthwork and Removals (2' Depth)	SY		**$22**	338,620	$ 7,449,640
110	Earthwork (Significant Impacts)	CY		**$12**	3,229,680	$ 38,756,160
120	Rock Excavation	CY		**$50**	405,545	$ 20,277,250
380	Surfacing (Highway)	SY		**$145**	318,990	$ 46,253,550
380	Surfacing (Access Road)	SY		**$110**	19,630	$ 2,159,300
650	Curb and Gutter	LF		**$50**	-	$ -
651	Sidewalk & Median	SF		**$15**	-	$ -
	SUBTOTAL (A)					**$ 114,895,900**
530	Structures - Bridge	SF		**$ 210**	2,415	$ 507,150
530	Structures - Wall	SF		**$ 120**	123,220	$ 14,786,400
450	Drainage - New	% of (A)	**5%**			$ 5,744,800
451	Utility Relocations	% of (A)	**6%**			$ 6,893,760
632/633	Traffic - Signing/Striping	% of (A)	**6%**			$ 6,893,760
634	Traffic Control	% of (A)	**6%**			$ 6,893,760
734	Erosion Control/Environmental	% of (A)	**9%**			$ 10,340,640
	SUBTOTAL (B)					**$ 52,060,270**
635	Traffic - Signals (New)	EACH		**$ 280,000**	-	$ -
009	Mobilization	% of (A)+(B)	**9%**			$ 15,026,060
	Contingency	% of (A)+(B)	**30%**			$ 50,086,860
	SUBTOTAL (C)					**$ 65,112,920**

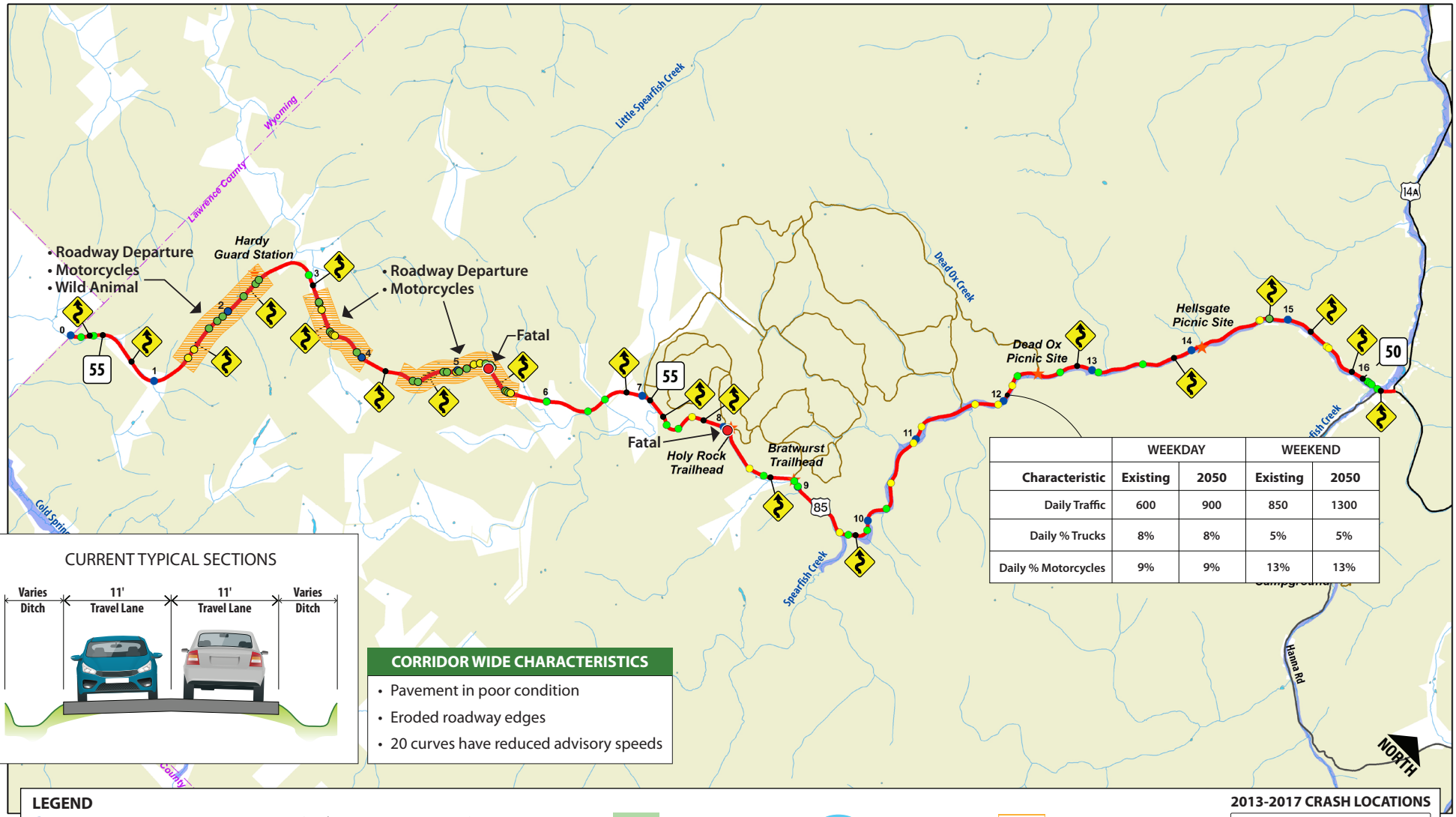
ITEM	DESCRIPTION	UNIT	CONTINGENCY	UNIT COST	QUANTITY	COST
	CONSTRUCTION TOTAL (D)	**(A)+(B)+(C)**				**$ 232,069,090**
18	Design Engineering	% of (D)	**4%**	**$ -**		$ 9,282,770
900	Construction Engineering	% of (D)	**10%**	**$ -**		$ 23,206,910
20	Commercial ROW**	SF		**$ -**	-	$ -
	Rural ROW**	SF		**$ -**	-	$ -
						$ 264,558,770
	PROJECT TOTAL (E)					**$ 264,559,000**
					Construction + ROW Cost**	**$ 232,100,000**
* Surfacing Unit Cost Includes Base Course						
** ROW Costs Not Included						

Note: In providing opinions of probable construction cost, the Client understands that Felsburg Holt & Ullevig has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing. The unit prices and percentages shown above were applied under the direction of the South Dakota Department of Transportation and FHU makes no warranty, expressed or implied, as to the accuracy of such opinions as compared to bid or actual costs.

APPENDIX A CORRIDOR CHARACTERISTICS

CORRIDOR 3
US 85: Wyoming to US 14A

Corridor Characteristics



	WEEKDAY		WEEKEND	
Characteristic	Existing	2050	Existing	2050
Daily Traffic	600	900	850	1300
Daily % Trucks	8%	8%	5%	5%
Daily % Motorcycles	9%	9%	13%	13%

CURRENT TYPICAL SECTIONS

CORRIDOR WIDE CHARACTERISTICS

- Pavement in poor condition
- Eroded roadway edges
- 20 curves have reduced advisory speeds

LEGEND

- XX Mileage Reference Marker
- Recreation Sites
- 6(f) Resource
- Corridor
- Roadways
- County Boundary
- Stream
- 303(d) Impaired Waters
- Trails
- Parks and Recreation
- Black Hills National Forest
- 100-Year Floodplain
- Wetlands
- XX Directional Regulatory Speed Limit Sign
- City Limits
- High Crash Location (Types Noted)
- Tight Curves or Curve Sections With Advisory Speeds

2013-2017 CRASH LOCATIONS

- Fatal (FAT)
- Injury (INJ)
- Property Damage Only (PDO)

SDDOT Black Hills CSC Study 17-385 2/3/20

APPENDIX B ENVIRONMENTAL SCAN DOCUMENT

Environmental Scan

Black Hills Context Sensitive Corridors Study – Corridor 3

US 85: Wyoming to US 14A

Environmental Review and Design

Lawrence County, South Dakota
NH 0085(106)0 N; PCN 06J8

View west towards US 85 approximately 2.5 miles west of US 85 and US 14A intersection.

Prepared for:
South Dakota Department of Transportation

Prepared by:
Felsburg Holt & Ullevig
6400 S Fiddlers Green Circle, Suite 1500
Greenwood Village, CO 80111
303.721.1440

December 2021

Table of Contents

Appendices

List of Figures

Page

List of Tables

List of Acronyms

ACS	American Community Survey
ADA	Americans with Disabilities Act
AEP	Area of Potential Effect
AMM	Avoidance and Minimization Measure
BGEPA	Bald and Golden Eagle Protection Act
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMR	Contaminated Materials Review
EDR	Environmental Data Resources
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
GLO	General Land Office
IPaC	Information, Planning and Conservation system
LEP	Limited English Proficiency
LOS	Level of Service
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
SDARC	South Dakota Archaeological Research Center
SDCL	South Dakota State Law
SDDENR	South Dakota Department of Environment and Natural Resources
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Department of Game Fish and Parks
SDSHPO	South Dakota State Historic Preservation Office

TMDL	total maximum daily load
USC	United States Code
USCB	U.S. Census Bureau
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOUS	Waters of the United States

1. INTRODUCTION

South Dakota Department of Transportation (SDDOT) is conducting a context sensitive analysis of highway corridors in the Black Hills through a three-phase program, in conjunction with the Federal Highway Administration, US Forest Service, South Dakota Game, Fish & Parks Department, and the National Park Service. The study is being conducted to identify existing conditions, anticipated challenge areas, safety, and operational needs along these corridors and to determine its short-term and long-term transportation priorities.

The first phase encompassed an overall traffic and safety needs analysis of 17 corridors, and the second phase involved an assessment of opportunities for transportation-related improvements for each corridor. These initial corridor planning investigations are documented in the *Black Hills Context Sensitive Corridors Study, Phase 1 & 2 Report* (Study), May 2020.

In the Phase 3 studies, these corridors were then prioritized for their ability to deliver safety benefits and address urgent infrastructure needs, based on current level of service, crash history, road purpose, and public review and comment. Five high priority corridors were selected for more detailed planning, conceptual design, and public review, including Corridors 2, 3, 4, 5, and 7 (see **Figure 1**).

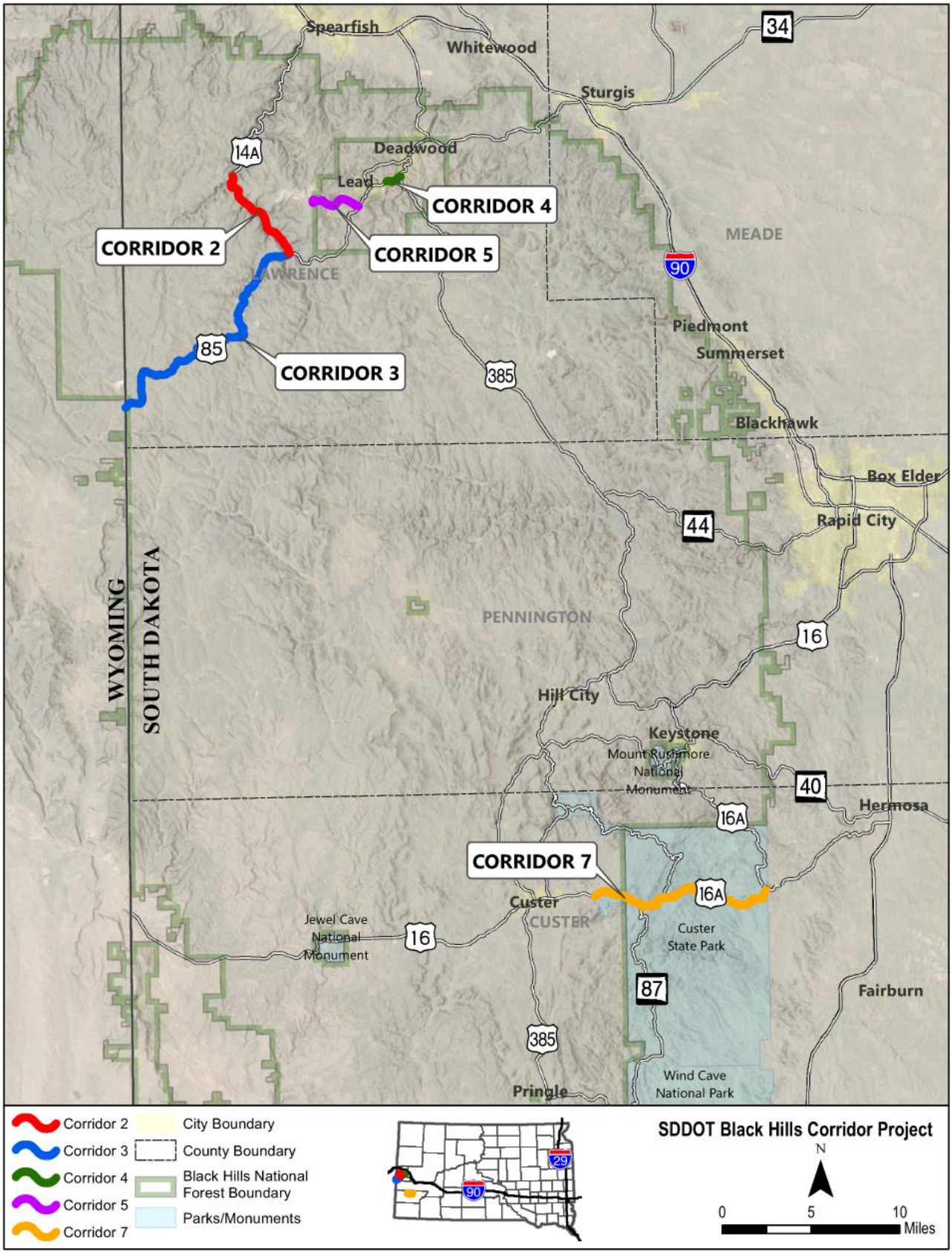
This study is establishing a corridor-wide preliminary purpose and need statement as well as goals and objectives that will be later developed and refined as project-specific purpose and needs for use in the National Environmental Policy Act (NEPA) process. The results of analyses from the previous transportation planning process are being used to shape the corridor-wide preliminary purpose and need statement, and, thereby, the range of alternative concepts. The corridor-wide preliminary purpose and need statement and the goals and objectives will be used to comparatively measure the effectiveness of alternatives. This comparison could occur in the Environmental Scan document but could also occur in the NEPA process. The corridor-wide purpose and need addresses the primary transportation issue in the corridor. Subsequent NEPA projects may address portions of the corridor needs but could have a project-specific purpose and need.

This Environmental Scan addresses the US 85 corridor from the Wyoming border to US 14A (Corridor 3) which is just over 16 miles long. The regional location of Corridor 3 within the Black Hills is shown on **Figure 1.**

The purpose for this Environmental Scan Report is to create a “bridge” between the 3-phase corridor planning studies, and a subsequent National Environmental Policy Act (NEPA) process.

The following sections include the *corridor context* within the Black Hills, *transportation system context,* purpose and need a preliminary corridor-wide *purpose and need statement* to be refined during the NEPA process. The *Environmental Resources* sections document known and potential environmental resources within the environmental study area for **Corridor 3**.

FIGURE 1. REGIONAL LOCATION MAP



1.1 Corridor Context

This corridor supports goods and personal travel movement between Wyoming and I-90 near Sturgis as its primary function.

The primary functions of Corridor 3 are to serve **Commuters and Commercial Goods Movement.**

The corridor provides connectivity between residential areas and employment areas or is intended to carry goods from one point in the region to another or through the region. Residential-to-work areas may be relatively close (within a community) or be separated by longer distances (from one community to another). Characteristics defining a commuter/commercial corridor are:

- Vehicle throughput is of greater importance than providing access to adjacent property.
- Reducing travel time through the corridor is of high importance.
- Providing or maintaining a reliable travel time is of high importance.
- Providing lane widths and shoulders to better accommodate commercial vehicles is important.

Curves, narrower lanes, and the associated slower speeds associated with Corridor 3 are considered deficiencies and are not desirable characteristics in fulfilling the commuter/commercial function.

Providing access to key recreational venues (**Destination Access**) in the region is a secondary function of Corridor 3.

This corridor lies within a hilly and forested area where the roadway traverses over a mountain pass and has a moderate presence of unique geological features, unique viewsheds, recreational resources, and user enjoyment.

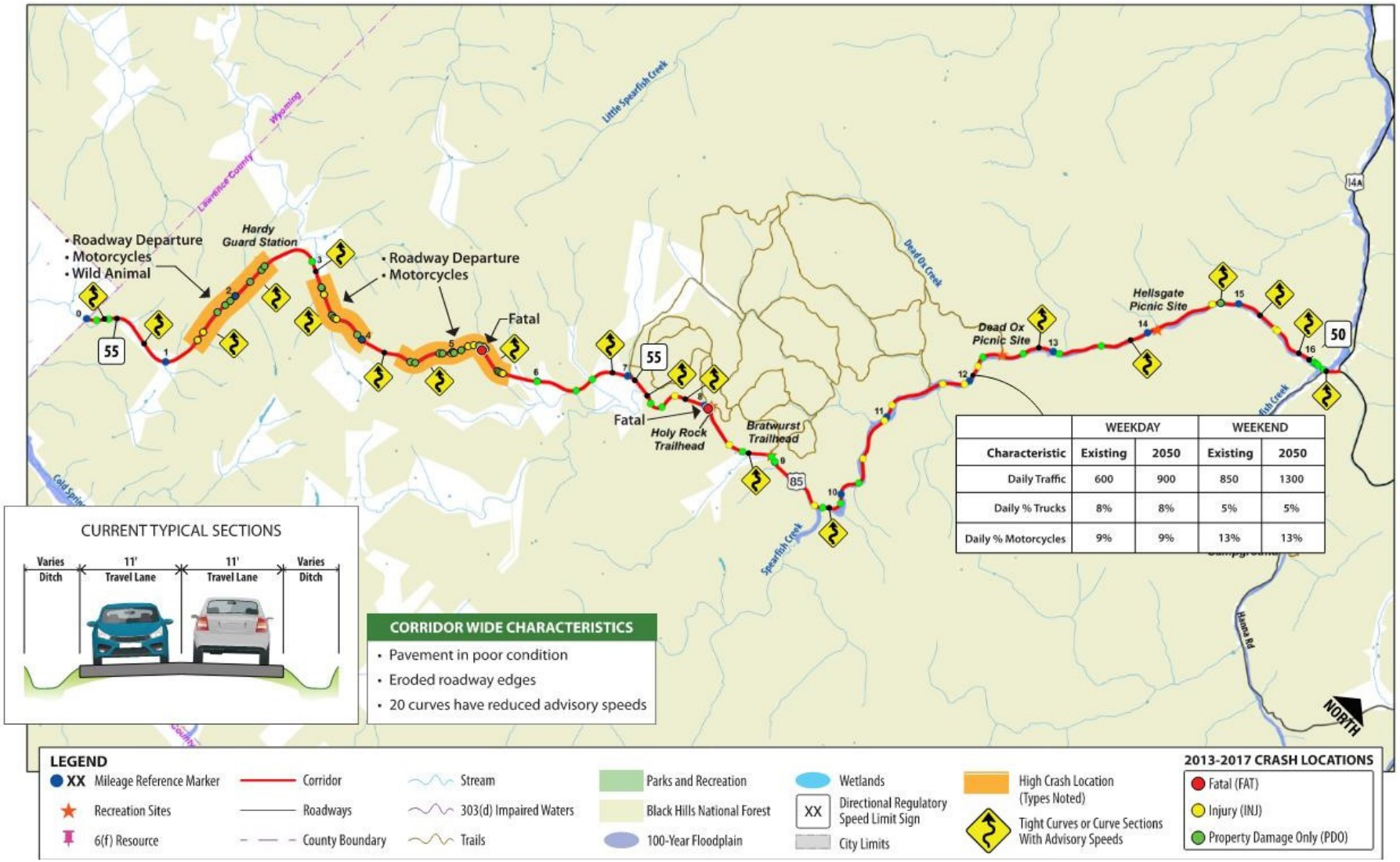
1.2 Transportation System Context

For corridor transportation system context, **Figure 2** illustrates the current typical roadway section, high crash locations, daily traffic data, tight curves, and an overview of corridor-wide characteristics.

The typical section of Corridor 3 is a 2-lane road with 11-foot lanes and drainage ditches on either side of the lanes. There is little to no shoulder along the entire stretch of the corridor. Overall, the pavement is in poor condition. Areas of the corridor have eroded roadway edges. Twenty curves in the corridor have reduced advisory speeds. The presence of these curves has contributed to the frequency and severity of crashes along the corridor.

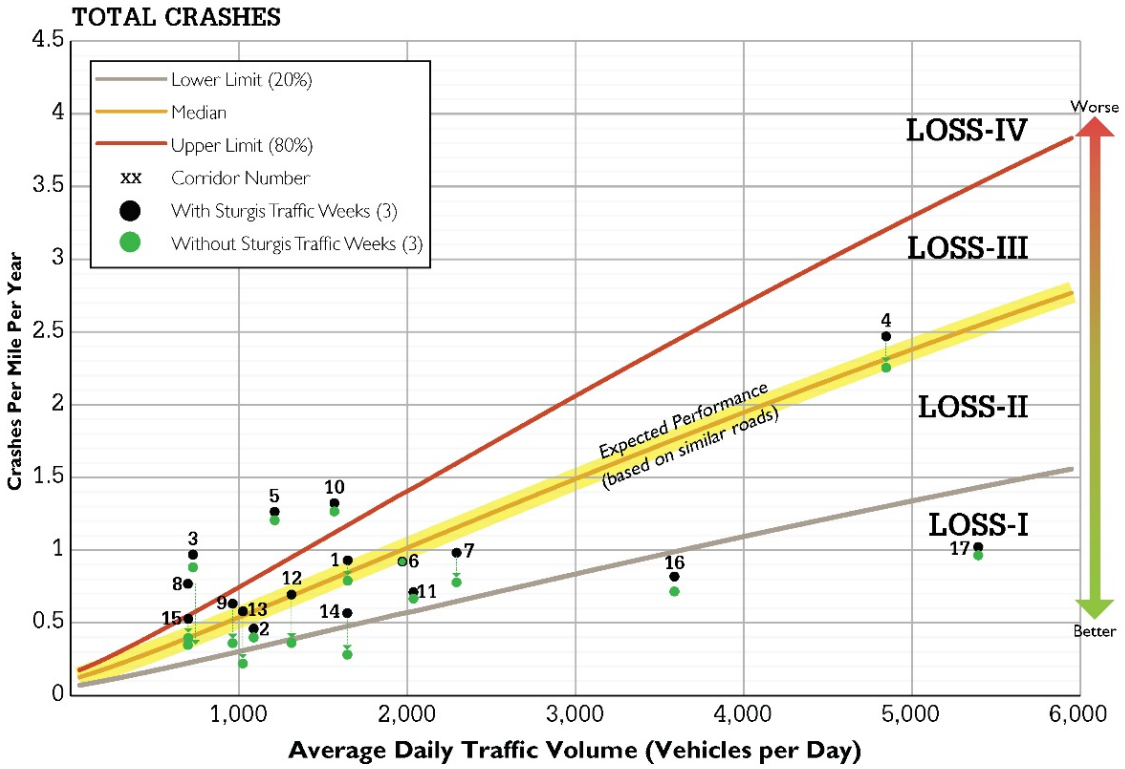
Figure 3 presents findings that compare the total and severe crashes reported along this corridor with what is expected for similar roadways, represented by the center line in the graph. Crash frequency and severity are concerns along the corridor with the primary areas of elevated crash frequency in the western end of the corridor.

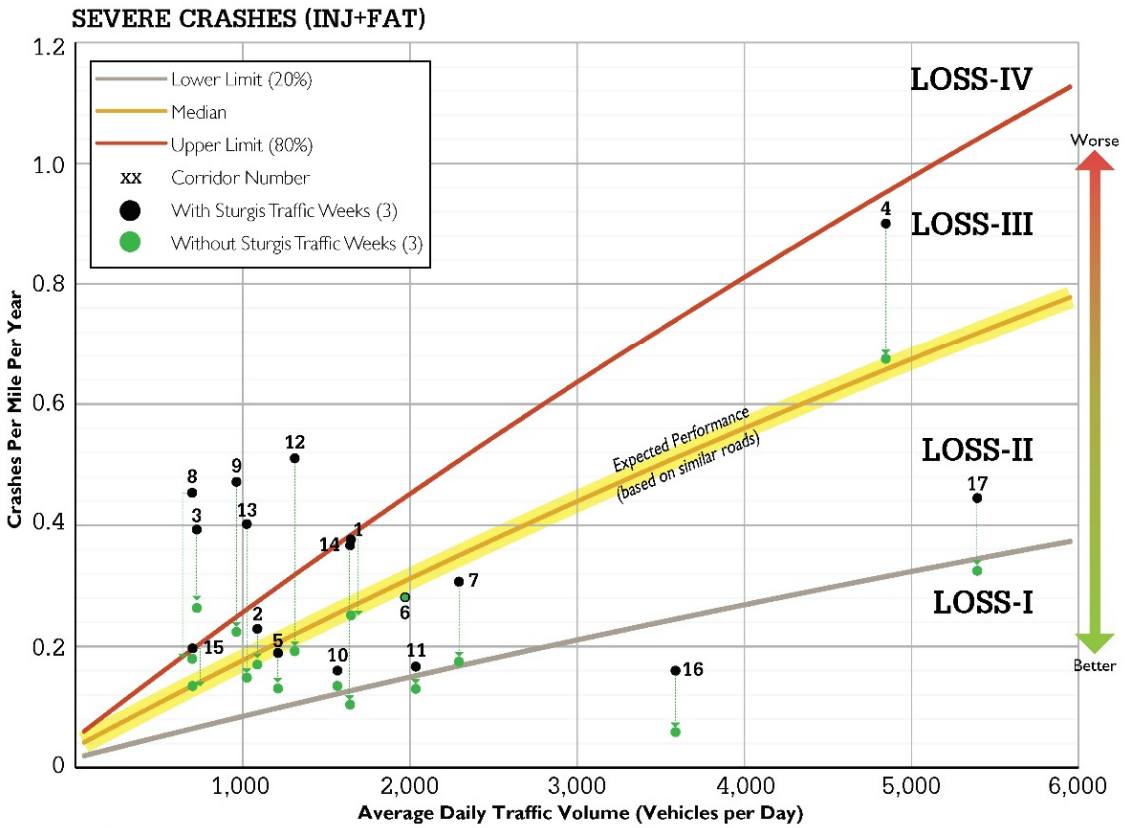
FIGURE 2. CORRIDOR 3 CHARACTERISTICS



	WEEKDAY		WEEKEND	
Characteristic	Existing	2050	Existing	2050
Daily Traffic	600	900	850	1300
Daily % Trucks	8%	8%	5%	5%
Daily % Motorcycles	9%	9%	13%	13%

FIGURE 3. CORRIDOR SAFETY PERFORMANCE, 2013-2017





Level of Service of Safety (LOSS) a qualitative description that characterizes safety of a roadway segment in reference to what its expected performance and severity might be.

LOSS-I - Indicates low potential for crash reduction
LOSS-II - Indicates low to moderate potential for crash reduction
LOSS-III - Indicates moderate to high potential for crash reduction
LOSS-IV - Indicates high potential for crash reduction

Three areas have crashes associated with roadway departure and motorcycles being the primary reason for crashes. The westernmost high crash area also has an elevated frequency of crashes associated with wild animals. This condition correlates to a Level of Service of Safety (LOSS) of IV both during and without the Sturgis Rally weeks included. This means that the corridor has more crashes than what is expected for a roadway of similar characteristics.

The current daily traffic ranges from 600 to 850 vehicles and in 2050 ranges from 900 to 1,300 vehicles. The heaviest transportation user group in this corridor is motorcycles (9 to 13 percent), followed by heavy vehicles and bicycle.

1.3 Purpose and Need

The following purpose and need sections include descriptions of the *preliminary corridor-wide purpose and need* for the proposed Action, and project goals, to be refined during the NEPA process.

1.3.1 Preliminary Corridor-wide Purpose for the Proposed Action

The US 85 corridor transportation improvements are needed to improve traffic safety by reducing crash frequency or severity within at least one major crash type; increase vehicular travel efficiency by addressing design deficiencies that limit travel speeds; and enhance the user experience along the corridor. The improvements should be resilient and support the underlying corridor context.

1.3.2 Preliminary Corridor-wide Need for the Proposed Action

This section summarizes the transportation needs for **Corridor 3**. The transportation improvements are needed to address:

- **Travel time**: The efficient movement of people, goods, and services along the corridor is critical and the roadway has several deficiencies that need to be addressed to improve the speed of vehicular travel through the corridor.
- **Inadequate shoulders:** There are currently little to no shoulders throughout the corridor. Maximizing shoulder width as much as physically practicable, when considering substantial physical constraints (up to 6 feet) would allow an appropriate accommodation of engineering standards and higher travel speeds.
- **Narrow drive lanes:** Portions of the corridor do not have 12-foot travel lanes and widening would provide necessary improvements. Creating sufficient travel lanes could have a positive effect on travel time.
- **Tight corners / sight distance:** Multiple curves in this corridor are tight and require advisory speed signage. Flattening these curves to increase design speeds would assist in the advisory speeds. Removing trees in select locations could increase sight distance for safer curves. Improvements should increase the curve radius for at least one limited-speed curve along the corridor.

1.3.3 Project Goals

This section addresses project goals of the project that each improvement type is intended to address. These goals are important to the character of the corridor, but do not rise to actual transportation needs for the corridor. These goals may result in the selection of alternatives when other needs are equal or one alternative addresses the goals better than other alternatives.

- **Safety:** As shown on **Figure 3**, the observed total crash frequency of 0.97 crashes per mile per year (expected value=0.41) and severe crash frequency of 0.39 severe crashes (expected value=0.14) demonstrate higher than expected crash frequency and severity and a high potential for crash reduction. To address this condition, improvements need to demonstrate the ability through predictive crash analyses to reduce crash frequency within any of the following crash types:
    - ***Off-road crashes***: 50 off-road crashes occurred along Corridor 3 in the five-year period (2013-2017), translating to 0.61 crashes per mile per year. The current narrow travel lanes and lack of roadway shoulders have contributed to the elevated occurrence of off-road crashes. Improvements should demonstrate the ability to reduce these crash types from the previous level.
    - ***Motorcycle crashes***: 25 crashes of this type were reported, or 0.31 per mile per year. A number of these crashes were also off-road type crashes. Limited roadway width and recovery space alongside the travel lanes and tight roadway curvature have contributed to this condition. Improvements should demonstrate the ability to reduce these crash types from the previous level.
    - ***Wildlife collisions***: 18 wildlife crashes were reported, or 0.22 per mile per year. Improvements should demonstrate the ability to reduce the frequency of these collisions.
- **User Experience**: The context of the corridor serving as a destination for travelers requires consideration of transportation improvements that further enhance this use. Users experience this corridor via passenger vehicles, heavy vehicles, motorcycles, bicycles, and as pedestrians. These uses should all be considered when infrastructure improvements are implemented.
    - Members of the public and project stakeholders have indicated that the inclusion of additional pullouts and enhanced parking areas would further enhance user experience of the corridor.
- **Clear Zone**: A design consideration advanced by project stakeholders is the provision of a 7- to 10-foot clear zone along the roadway, meeting the applicable minimum as documented in the AASHTO Roadside Design Guide. Some improvement locations may not be fully able to achieve this width through improvements. This is due to physical constraints such as

substantial steep grades, rock ridges, and the presence of waterbodies. Achieving standard clear zone widths may not be practical when balancing reasonableness and context sensitivity.

1.4 Proposed Project

1.4.1 Project Termini

The project termini are described as follows:

- **Western Terminus**: Mileage Reference Marker (MRM) 0.0, at the Wyoming/South Dakota border. This terminus is suggested due to the major change of jurisdiction. Also, the roadway west of the border shows a wider paved width consistent with the higher design speeds sought for Corridor 3.
- **Eastern Terminus**: MRM 16.29, at the US 85/US 14A junction. This intersection is a travelshed transition point at which drivers can turn to navigate Spearfish Canyon or continue eastward to Lead-Deadwood. The roadway typical section also becomes wider east of this intersection, with more open surroundings within which the roadway does not run parallel to a creek bed.

1.4.2 Proposed Improvements

A corridor visioning exercise was completed during the Black Hills Context Sensitive Corridors Study. The visioning exercise included technical analyses and intensive consultation with the SDDOT, partner agencies, stakeholders and the general public. The vision includes a list of appropriate improvement types to support the vision, summarized below:

Vision Statement: US 85 is a National Highway System (NHS) route serving high speed commuter/commercial traffic. A corridor reconstruction effort increasing lane and shoulder widths and addressing horizontal curvature is needed to provide improved mobility and safety.	
Improvement Type:	**Supports Vision by:**
Additional pullouts alongside the roadway	Improving operations and safety
Widened roadway section including lane and shoulder width	reducing crashes and improve heavy vehicle travel conditions
Horizontal curve treatments	reducing crashes and create more consistent travel speed
Speed management signage/devices	Helping to smoothly transition vehicles from higher-speed western portion to tighter, lower speed western portion
Motorcycle safety treatments	Reducing motorcycle crash frequency
Roadside embankment slope stability/drainage improvements	Maximizing safety of roadside design while addressing infrastructure needs

Upon reaching and confirming the vision, the study team compiled and evaluated concepts to improve the corridor. Concepts were developed to address SDDOT road design standards, advance

the corridor's purpose and function, and address corridor safety and operational needs. Design concepts were presented during public meetings to gather feedback and discussed with the Study Advisory Team to review impacts to the corridor context and adjust the concept to more effectively balance such impacts. A recommended concept emerged from the refinement, including the following components:

- Modify the roadway alignment to provide a 70 Mile Per Hour (mph) design speed between MRM 0.0 and MRM 6.2. At MRM 6.2 a transition to a lower design speed would be introduced, culminating in a 40 mph design speed section beginning at MRM 9 and continuing to approximately MRM 15.7 where a design speed of 60 mph would be introduced. These changes would increase curve radii between MRM 0.0 and MRM 8.1.
- Widen shoulders to 6 ft. between MRM 0.0 and MRM 10.5. East of MRM 10.5, introduce additional flexibility and variability with the goal of providing a 3 ft. shoulder width east of MRM 10.5 to MRM 16.29.
- Provide 30 ft roadside clear zone through the western portion of the corridor, reducing to 10 ft clear zones within the eastern portion.

A conceptual engineering drawing of the recommended concept is provided as Appendix C in the Phase 3 report. This environmental scan data and mapping covers this concept.

1.5 Stakeholder and Public Involvement

General public meetings in support of Phases 1 and 2 were held in August of 2018 and both meetings were broadcast live via YouTube. Participants had the opportunity to provide comments on issues they have experienced within one or more of the corridors and their perception of corridor desired functions. A website was established to provide information and serve as a tool for public feedback throughout Phases 1 and 2. Meetings with various stakeholders were also held, which included:

- Small group meetings with adjacent landowners/stakeholders.
- Municipal representative meetings with the cities of Custer, Hermosa, Spearfish, Lead, and Deadwood.
- Black Hills Council of Governments and Chambers of Commerce associated with the cities of Spearfish, Lead, and Deadwood, along with the School District encompassing the Lead and Deadwood area.
- Individual agency meetings, including Custer State Park.

Two Visioning Workshops were held in Phases 1 and 2. These workshops helped to facilitate proper identification of corridor purposes, needs and improvement types.

Public engagement tasks for Phase 3 included presenting previous findings of the corridor studies, improvement options, and engagement tools for receiving public input. A project website was created, and it served as the primary portal of information for members of the public wanting to learn more about the study and to provide feedback.

A virtual public meeting was hosted instead of an in-person meeting due to the recommendations by the Centers for Disease Control. Information about participating in the public meeting was posted on the project website, as well as through different channels of communication. The project website included general project information, access to the interactive public meeting platform, and information on how to subscribe and access documentation form previous public meetings.

The meeting website and public comment period was launched on June 23, 2021, and closed at noon on August 20, 2021. Press releases, flyers, and mailing lists were all used to notify the public of the start of the comment period. Agency stakeholders included in the notifications included:

- City of Custer
- Black Hills Council of Governments
- Town of Hermosa
- Custer County
- Lawrence County
- City of Keystone
- City of Lead
- City of Deadwood
- City of Spearfish

Social Pinpoint, a community engagement platform, was used for the virtual public meeting. The virtual public meeting had almost two thousand visits to all corridors from 420 unique users. Corridor 3 had a total of two responses and three emails. Most respondents had concerns about safety in the area. There is the perception that straightening the curve radius and widening the shoulders could cause more safety issues, as it could lead to higher speeds. In general, as stated in the corridor purpose, respondents do agree with making the corridor more reliable, safer, and more accommodating. There are also environmental concerns with modifying the current route, affecting the landscapes of the area. Better parking in the area is greatly appreciated as respondents stated that is needed.

Agency involvement included coordination and correspondence with agencies for identifying issues and understanding needs and concerns in the corridors. The Study Advisory Team (SAT) was comprised of the following members:

- U.S. Forest Service (USFS)
- U.S. National Park Service (USNPS)
- South Dakota Game, Fish, and Parks
- Spearfish Canyon Association
- Federal Highway Administration
- SDDOT

The SAT's role was to oversee the major project milestones, provide technical input, and to monitor the progress of the planning process. A total of nine SAT meetings have been held to date, four of which has been during Phase 3 of the study.

2. Environmental Resources

This chapter provides a review of known and potential environmental resources within the environmental study area that may be important considerations for construction of the potential improvements. The environmental study area consists of a 500-ft buffer of the existing US 85 roadway between MRM 0.0, at the Wyoming/South Dakota border and MRM 16.29, at the US 85/US 14A junction. **Figure 4** provides an overview of the study area.

Included are sections documenting *regulatory requirements*, study *methodology*, descriptions of *existing conditions*, and *next steps* in the NEPA evaluation process for implementing improvements identified for Corridor 3. Evaluated resources are as follows:

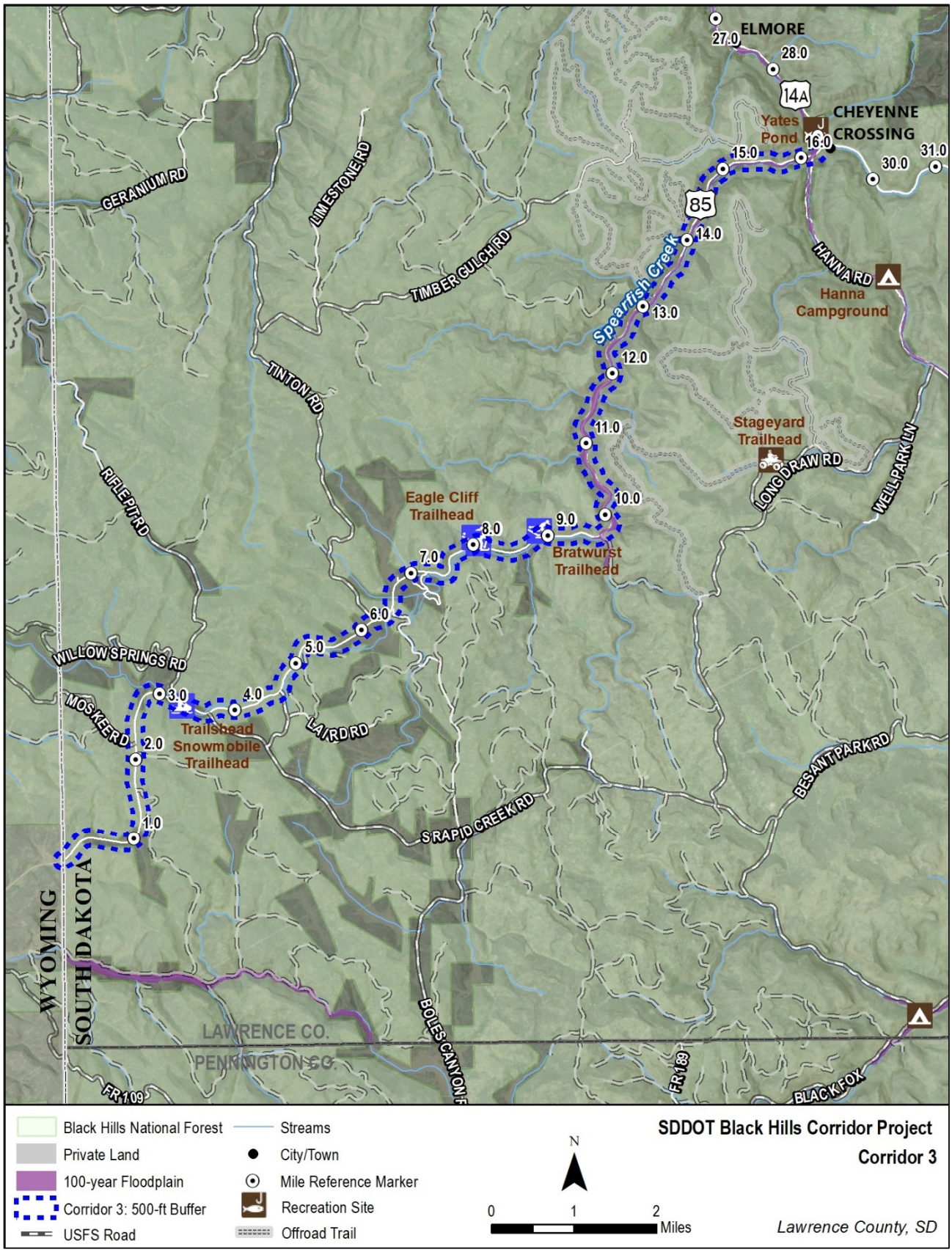
- Soils/Geology
- Air Quality
- Water Quality
- Floodplains
- Wetlands and Waterways
- Vegetation and Wildlife
- Threatened and Endangered Species
- Environmental Justice
- Historic and Cultural Resources
- Federal and Tribal Lands
- Traffic Noise
- Section 4(f) and 6(f)
- Visual Resources
- Hazardous Materials

Several environmental resources with regulatory drivers but without applicability to the environmental study area for Corridor 3 were excluded from further review, including contaminated materials, farmlands, invasive species, wild and scenic rivers, socioeconomic resources. The following subsections provide an overview of the environmental resources, findings of this evaluation and, where appropriate, additional considerations for the proposed project.

2.1 Soils/Geology

This section highlights the soil and rock outcrop constraints associated with the Black Hills adjacent to US 85. Soil constraints associated with roadway widening or realignments into the moderate to very steep side slopes include erosion, instability, rock outcrops, and revegetation challenges. The focus of this section is on selected soils on steep to very steep slopes with rock outcrops. The primary source of information is from the Soil Survey of Lawrence County, South Dakota (USDA, 1976).

FIGURE 4. ENVIRONMENTAL STUDY AREA



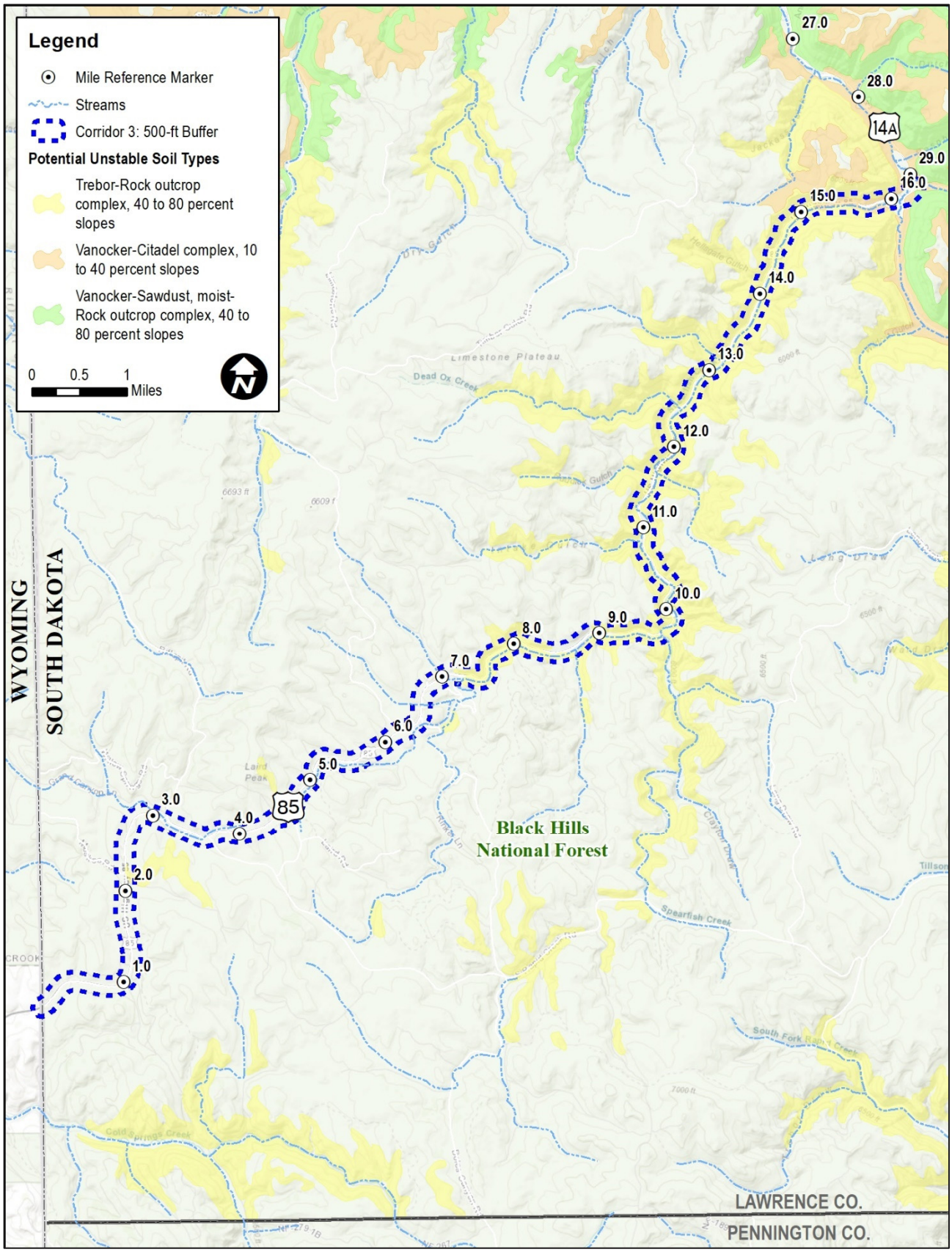
2.1.1 Existing Conditions

There are tall shear rock faces and extensive rock side slopes adjacent to the Corridor to be avoided. The following is a profile of constraints associated with selected soil types adjacent to Corridor 3 side slopes that could contain potentially unstable slopes:

- **Q0420G: Trebor-Rock outcrop complex (40% - 80% slopes)**
  - **General Characteristics**: Moderately deep, well drained, very steep Trebor soil intermingled with areas of rock outcrop. It is on mountains at the higher elevations on the Limestone Plateau. The Trebor soils is formed in material weathered from limestone. The areas of Rock outcrop occur as rimrock ledges or peaks on ridges ranging.
  - **Revegetation**: Dominantly Ponderosa Pine, but there is some Black Hill spruce, quaking aspen, and paper birch. Bearded wheatgrass, sedges, brome, common juniper, Oreogongrape, snowberry, and bearberry are also found.
  - **Hazards**: Steep slopes. This soil type is severly limited as a site for dwellings, and hard-surfaced roads and streets because of the steep slopes and rock outcrops.
  - **Erosion**: 0.28 K; 4T; wind erosion group 8 = Very Severe
- **Q0584E-Vanocker-Citadel Complex (10 – 40% slopes)**
  - **General Characteristics:** Deep, well drained, steep and very steep soils in the Black Hills. It is on breaks along the edge of ridges and on the sides of mountain valleys. In some places bedrock is less than 40 inches deep.
  - **Revegetation**: Low fertility. Dominantly Ponderosa Pine forest with some native grasses and shrubs.
  - **Hazards**: Generally, too steep for building sites, local roads and streets.
  - **Erosion**: 0.24-0.37K; 5T; wind erosion group 6 = moderate
- **Q0589G-Vanocker-Sawdust, Moist-Rock Outcrop Complex (40-80% slopes)**
  - **General Characteristics**: Deep, well drained, very steep soils in the Black Hills. It is on the sides of mountains and canyons. In some places, bedrock is 20-40 inches deep.
  - **Revegetation**: Low fertility. Dominantly Ponderosa Pine forest with some native grasses and shrubs like bluestem, sedges, sideoats grama, common juniper, snowberry, Saskatoon, and yucca.
  - **Hazards**: Generally, too steep for building sites, local roads, and streets. Water erosion in disturbed areas.
  - **Erosion**: 0.17-0.24K; 5T; wind erosion group 8 = Severe

Figure 5 provides an overview of the corridor and areas of potential unstable soil types.

FIGURE 5. POTENTIAL UNSTABLE SOIL TYPES



2.1.2 Next Steps

Certain soil types along the corridor could pose a risk to the roadway. These soils will need to be further evaluated during the preliminary design phase and NEPA process.

2.2 Air Quality

Air quality is primarily regulated under the federal 1970 Clean Air Act (CAA) and amendments from 1977 and 1990. The purpose of the CAA is to protect and enhance air quality to promote public health, welfare, and the productive capacity of the nation.

2.2.1 Regulatory

Through the CAA, National Ambient Air Quality Standards (NAAQS) were established for six criteria air pollutants: carbon monoxide, particulate matter, lead, sulfur dioxide, nitrogen dioxide and ozone. Each of the states have evaluated their air quality with respect to the NAAQS. Any areas that exceeded the NAAQS were designated as nonattainment areas and are subject to more rigorous air pollution control measures. Over time and with air quality improvements, nonattainment areas may transition into NAAQS maintenance areas or NAAQS attainment areas. Transportation sources are most closely associated with carbon monoxide, particulate matter, nitrogen dioxide and chemical precursors of ozone.

A group of hazardous air pollutants are regulated under the CAA; a subset of which are called mobile source air toxics (MSAT). Greenhouse gases (GHG) are also covered by the CAA.

The CAA established mandatory Class I federal areas, which receive extra protection and consideration from impairment from man-made air pollution. This primarily focuses on visibility/haze and aerosols from large industrial sources and includes prevention of significant deterioration to the air quality.

For reasons described in the following section, the CAA transportation conformity regulations do not apply in South Dakota. However, the SDDOT Environmental Procedures Manual (2019) states:

> "Air quality is an environmental concern within the broad purview of NEPA and the thresholds/screening criteria included in the transportation conformity regulations and guidance can be helpful in deciding whether an air quality analysis of a proposed transportation project is warranted for NEPA purposes."

SDDOT has the option to consider transportation conformity concepts voluntarily. Such voluntary analyses are determined case by case.

Construction may temporarily affect air quality (e.g., fugitive dust). Permits are likely to be needed when construction begins.

2.2.2 Existing Conditions

South Dakota currently has no air quality nonattainment or maintenance areas designated by the U.S. Environmental Protection Agency for NAAQS pollutants under the CAA. This is indicative of good overall air quality across the state, including the Black Hills. Consequently, the federal CAA transportation conformity regulations do not apply in South Dakota and transportation projects, in general, would be expected not to be concerns regarding the NAAQS.

There are two Class I areas in South Dakota and both are in the vicinity of the corridor. Wind Cave National Park is approximately 50 miles south of the corridor. Badlands National Park (Badlands/Sage Creek Wilderness Area) is approximately 80 miles southeast of the corridor. Road improvement projects typically would not be a concern for Class I areas, particularly at these distances.

2.2.3 Next Steps

If a NEPA clearance is required for the corridor improvements, an appropriate air quality analysis will be scoped and completed. Transportation conformity analysis under the CAA will not be required, but SDDOT has the option to choose voluntary conformity-based analyses—that decision will be made at that time in response to the circumstances and concerns in place.

The need for and extent of MSAT or GHG analyses generally depends on the NEPA class of action. These analyses may be either qualitative or quantitative. An EA or EIS generally requires progressively greater consideration of MSAT and GHG. The level of analysis needed for these will be determined when the NEPA decision for the corridor is made.

The corridor improvements are unlikely to be a concern for either of the two Class I areas nearby and no associated air quality analysis is expected, but the two areas should be acknowledged.

Analysis of construction emissions is not needed for most projects. Permits are likely to be needed for construction and typical best practices should be required to minimize construction emissions and address air quality issues.

2.3 Water Quality

2.3.1 Regulatory

Water Quality is regulated under the Federal Water Pollution Control Act Amendments of 1972 (CWA). The objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and non-point pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. Each state has jurisdiction for managing water quality in its respective state.
Section 303(d) of the CWA requires each state to evaluate water quality conditions in designated waterbodies and list as impaired any waterbodies not meeting water quality standards; this is to be reported every other year.

2.3.2 Methodology

The 2020 South Dakota Integrated Report lists five categories to present information on the Section 303(d) finding in a descriptive and comprehensive manner (SDDANR, 2020). Category 5 waterbodies where one or more beneficial uses are determined to be impaired by one or more pollutants and a total maximum daily load (TMDL) has not been developed. States must develop and implement TMDLs (i.e., pollutant management plans) for waterbodies identified as having a Category 5 impairment.

2.3.3 Existing Conditions

The *2020 South Dakota Integrated Report for Surface Water Quality Assessment* (SDDANR, 2020) does not list any waterbody within or near the study area as impaired.

2.3.4 Next Steps

During the NEPA process, mitigation measures to reduce impacts to water quality would be incorporated and includes developing a Storm Water Pollution Prevention Plan (SWPPP) and a National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit would be required from the South Dakota Department of Agriculture and Natural Resources (SDDANR). Furthermore, best management practices (BMPs) from the South Dakota DOT Erosion Control Guide would be implemented to minimize pollutants entering waterbodies.

2.4 Floodplains

2.4.1 Regulatory

Floodplains are the lands on either side of a waterway that are inundated when a channel exceeds its capacity. The following regulatory requirements apply to floodplains:

- **Executive Order (EO) 11988, Floodplain Management (1977)**, directs federal agencies to "provide leadership and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This EO assists in furthering the NEPA, the National Flood Insurance Act of 1968 (amended), and the Flood Disaster Protection Act of 1973.
- **Code of Federal Regulations (CFR), Title 23 – Highways**, prescribes the policies and procedures that FHWA is directed to implement in the location and hydraulic design of highway encroachments on floodplains.
- **CFR, Title 44 – Emergency Management and Assistance**, contains the basic Federal Emergency Management Agency (FEMA) policies and procedures to regulate floodplain management and to analyze, identify, and map floodplains for flood insurance purposes.

2.4.2 Methodology

The 100-year floodplains and floodways were identified using FEMA digital GIS data. For projects within the floodplains, local jurisdictions typically require floodplain development permits.

2.4.3 Existing Conditions

The main floodways and floodplains within the study area are those associated with Spearfish Creek and its tributaries. All floodplains within the environmental study area have been classified as "Flood Zone A," the area covered by a 100-year flood (see **Figure 6**) on Flood Insurance Rate Map (FIRM) Panel 4600940025B and FIRM Panel 4600940125B.

2.4.4 Next Steps

This project requires that a floodplain analysis be completed to determine whether potential floodway impacts are associated with the project elements. If impacts are found, the level of these impacts will be identified, as well as measures to mitigate or eliminate these impacts. The floodplain analysis uses modeling to assess significant changes. These areas would require a Conditional Letter of Map Revision (CLOMR) from FEMA. For projects within the floodplains, local jurisdictions typically require floodplain development permits.

2.5 Wetlands and Waterways

2.5.1 Regulatory

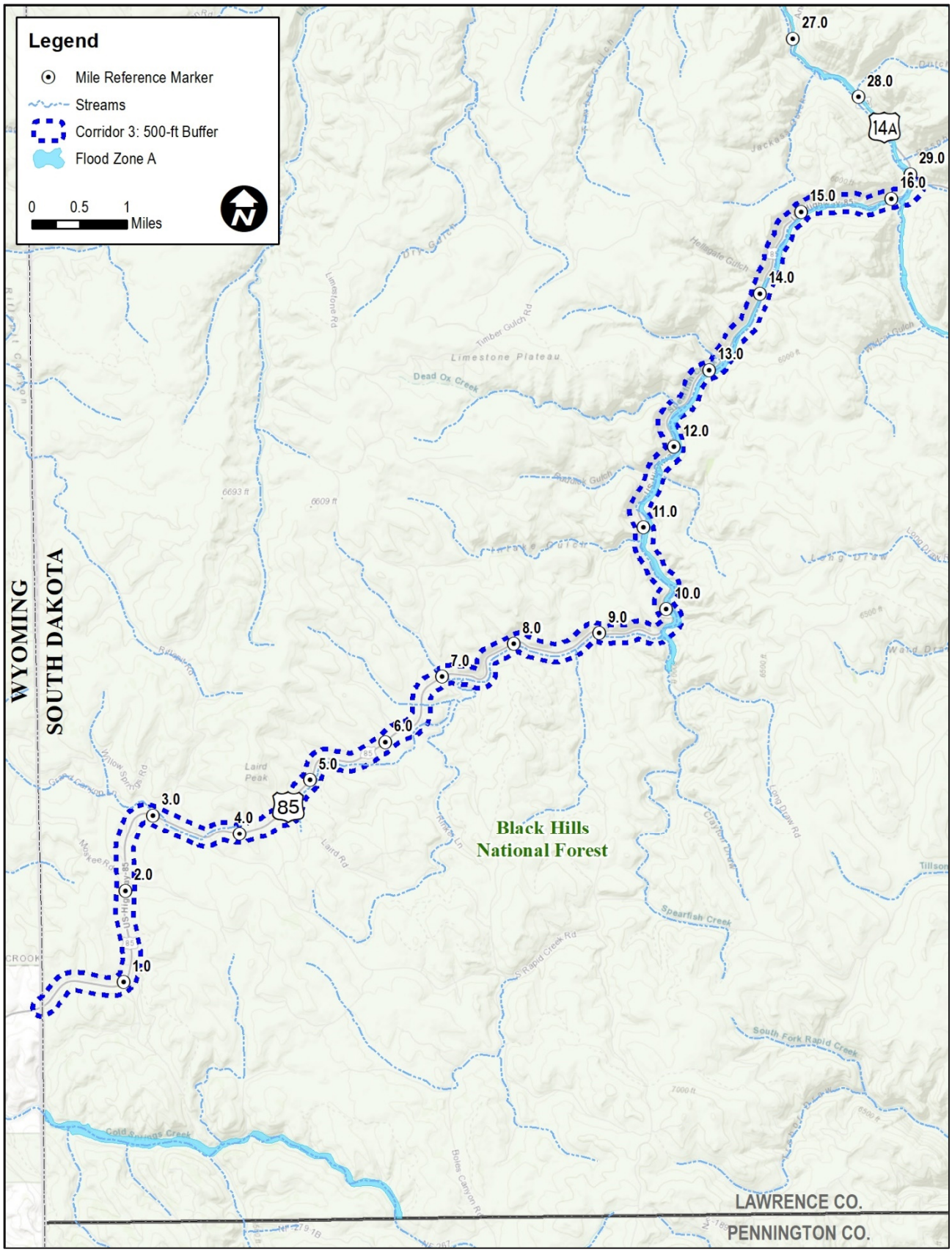
Wetlands and Waters of the United States (WOUS) are protected under Section 404 of the CWA, as amended (33 USC 1344), and EO 11990 of 1977 (Protection of Wetlands). Discharge of fill into wetlands and WOUS requires a Section 404 permit from the United States Army Corps of Engineers (USACE). Additionally, SDDANR reviews and issues certification for Section 401 of the CWA, which requires states to review federal projects for water quality certification.

2.5.2 Methodology

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328). Wetlands and riparian areas are important because they provide habitat for various plant, fish, and wildlife species; serve as groundwater recharge areas; provide storage areas for storm and flood waters; serve as natural water filtration areas; and provide protection from wave action, erosion, and storm damage.

Potential wetlands were mapped within the study area, based on field observations and aerial photography.

FIGURE 6. FLOODPLAINS



2.5.3 Existing Conditions

Initial inventories of streams and wetlands adjacent to or crossing US 85 within Corridor 3 are summarized by MRM in **Table 1**, and shown on **Figure 7** and on the Environmental Resources Map Book in **Appendix B**.

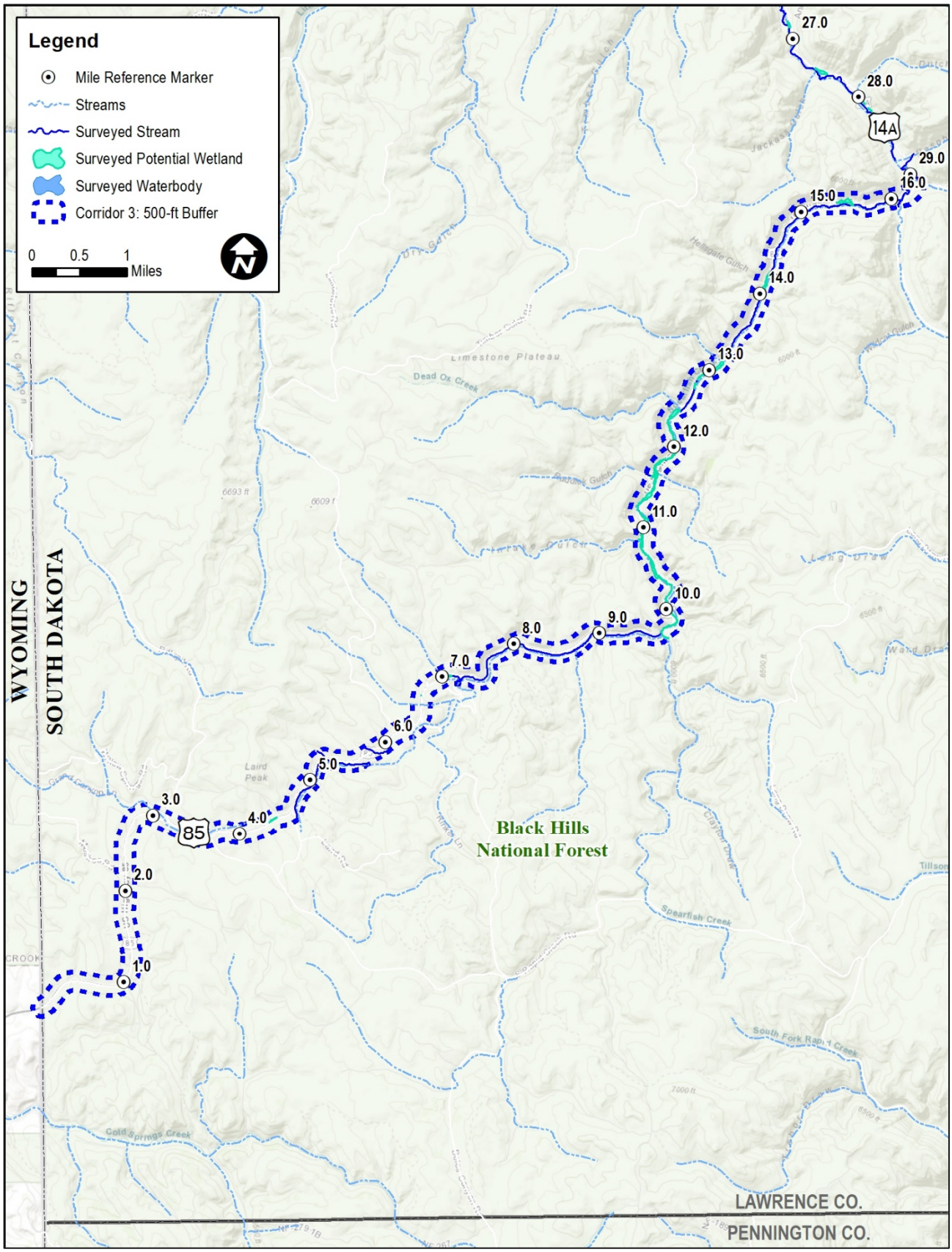
TABLE 1. CORRIDOR 3 INVENTORY OF STREAMS AND POTENTIAL WETLANDS

Streams and Wetlands	Location (MRM or MRM Range)
Stream Crossings / Adjacent Stream Spearfish Creek and tributaries	5.29
	5.82
	7.05
	7.7-7.3
	11.0-8.9
	12.43-11.15
	15.6-12.52
	16.1
Potential Wetlands	4.42 – 4.32
	7.05
	12.43-9.66
	12.77-12.7
	13.15-12.82
	14.23-14.02
	15.53-15.37

A total of 28.29 acres of potential wetlands were identified within the environmental study area. The wetlands consisted of palustrine emergent (PEM) and palustrine scrub-shrub (PSS) wetlands. PEM wetland vegetation included species such as baltic rush (*Juncus balticus*), cattail (*Typha* sp.), common threesquare (*Schoenoplectus pungens*), Nebraska sedge (*Carex nebrascensis*), prairie cordgrass (*Spartina pectinate*), reed canarygrass (*Phalaris arundinacea*), sedge (*Carex* sp.), smartweed (*Polygonum* sp.), and softstem bulrush (*Schoenoplectus tabernaemontani*). Vegetation in the PSS wetlands included Arroyo willow (*Salix lasiolepis*), Bebb willow (*Salix bebbiana*), peachleaf willow (*Salix amygdaloides*), and sandbar willow (*Salix interior*).

Spearfish Creek runs adjacent to the roadway between MRM 7.0 to MRM 16.2. East Spearfish Creek, Dead Ox Creek, and several unnamed tributaries were also found within the environmental study area. The project has a potential to impact Waters of the U.S., including wetlands.

FIGURE 7. WATERS OF THE U.S., INCLUDING WETLANDS



2.5.4 Next Steps

A wetland delineation would be required during the NEPA phase of the project to ensure that the areas preliminarily identified within the study area contain all three requirements of a wetland. When wetland impacts cannot be avoided through design, adequate time must be built into the project schedule to allow for wetland permitting and mitigation.

2.6 Vegetation and Wildlife

This section describes the existing vegetation and wildlife that occurs within the environmental study area for Corridor 3.

2.6.1 Existing Conditions

Vegetation

The environmental study area is located in the Black Hills Core Highlands sub-ecoregion within the Middle Rockies Ecoregion (USEPA, 2006). The Middle Rockies ecoregion consists of individual mountain ranges of mixed geology intermingled with high elevation, grassy parkland. The Black Hills are an outlier of the Middle Rockies and share with them a montane climate, hydrography, and land use pattern. Land uses such as ranching and woodland grazing, logging, recreation, and mining are commonly found throughout this ecoregion. The Black Hills Core Highlands sub-ecoregion consists of higher elevations and cooler temperatures. Increased rainfall in this area fosters boreal species such as white spruce, aspen, and birch trees.

Table 2 provides a list of species observed within the Black Hills corridors.

TABLE 2. OBSERVED BLACK HILLS VEGETATION LIST

Common Name	Scientific Name
Tree	
Aspen	*Populus tremuloides*
Bur oak	*Quercus macrocarpa*
Paper birch	*Betula papyrifera*
Ponderosa pine	*Pinus ponderosa*
Rocky Mountain juniper	*Juniperus scopulorum*
White spruce	*Picea glauca*
Shrub	
Arroyo willow	*Salix lasiolepis*
Bebb willow	*Salix bebbiana*

Common Name	Scientific Name
Buffaloberry	*Shepherdio canadensis*
Chokecherry	*Prunus virginiana*
Common bearberry	*Arctostaphylos uva-ursi*
Common hackberry	*Celtis occidentalis*
Common snowberry	*Symphoricarpos albus*
Creeping Oregon grape	*Mahonia repens*
Ground juniper	*Juniperus communis*
Mountain ninebark	*Physocarpus monogynus*
Peachleaf willow	*Salix amygdaloides*
Prickly wild rose	*Rosa acicularis*
Sandbar willow	*Salix interior*
Saskatoon serviceberry	*Amelanchier alnifolia*
Wood's rose	*Rosa woodsii*
Herb	
Baltic rush	*Juncus balticus*
Bearded wheatgrass	*Elymus caninus*
Canada goldenrod	*Solidago canadensis*
Cattail	*Typha* sp.
Common cowparsnip	*Heracleum sphondylium*
Common dandelion	*Taraxacum officinale*
Common threesquare	*Schoenoplectus pungens*
Common Yarrow	*Achillea millefolium*
Curly dock	*Rumex crispus*
Indian ricegrass	*Oryzopsis hymenoides*
Kentucky bluegrass	*Poa pratensis*
Little bluestem	*Schizachyrium scoparium*
Nebraska sedge	*Carex nebrascensis*
Oxeye daisy	*Leucanthemum vulgare*
Prairie cordgrass	*Spartina pectinata*
Reed canarygrass	*Phalaris arundinacea*
Roughleaf ricegrass	*Oryzopsis asperifolia*
Sedge	*Carex* spp.

Common Name	Scientific Name
Smartweed	*Polygonum* sp.
Smooth brome	*Bromus inermis*
Softstem bulrush	*Schoenoplectus tabernaemontani*
True forget-me-not	*Myosotis scorpioides*

There are a few scattered homes, lodges, vacation rentals, and commercial properties found within the study area. However, much of the environmental study area is comprised of undeveloped forested land within the Black Hills National Forest.

At the time of September 2020 field visit, no noxious weeds were observed within the study area, but they are still possible through the environmental study area. State-listed noxious weed species from the SDDANR (2021) include:

- Absinth wormwood (*Artemisia absinthium*)
- Leafy spurge (*Euphorbia esula*)
- Canada thistle (*Cirsium arvense*)
- Perennial sow thistle (*Sonchus arvensis*)
- Hoary cress (*Cardaria draba*)
- Purple loosestrife (*Lythrum salicaria*)
- Salt cedar (*Tamarix sp.*)

No purple loosestrife has been reported in Lawrence County, but the other six species have documented populations. Locally listed noxious weed species in Lawrence County include Canada thistle, common Tansy (*Tanacetum vulgare*), and common mullein (*Verbascum thapsus*) (Lawrence County, 2021).

Wildlife

The Fish and Wildlife Coordination Act of 1958, as amended, recognizes the vital contribution of wildlife resources to the Nation and requires equal consideration and coordination of wildlife conservation with water resources development programs.

This area is home to a variety of species due to the presence of streams, lakes, varied topography, and vegetation in the Black Hills National Forest. Ungulate species known to occur in or near the environmental study area include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and pronghorn (*Antilocapra americana*).

Many carnivore species occur in the environmental study area, including raccoon (*Procyon lotor*), coyote (*Canus latrans*), red fox (*Vulpes vulpes*), and mountain lion (*Puma concolor*). Individuals of these species may use this area as a movement corridor, for hunting purposes, or for denning purposes.

Many rodent species may occur in the environmental study area. This group is very large, and species likely to be found in or near the environmental study area include the beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), yellow-bellied marmot (*Marmota flaviventris*), porcupine (*Erethizon dorsatum*), mountain cottontail (*Sylvilagus nuttallii*), least chipmunk (*Tamias minimus*), pine squirrel (*Tamiasciurus hudsonicus*). Various mice, voles, and woodrats (*Neotoma* sp.) could also use the environmental study area.

Several bat species have the potential to occur in the environmental study area. These species include the Long-eared Myotis (*Myotis evotis*), Northern Long-eared Bat (*Myotis septentrionalis*), and the Silver-haired Bat (*Lasionycteris noctivagans*).

Several reptile and amphibian species can be present in the environmental study area due to the presence of suitable habitat within the riparian area surrounding Spearfish Creek and other streams crossing the environmental study area. Species such as: bull frogs (*Lithobates catesbeianus*), snapping turtles (*Chelydra serpentina*), common garter snakes (*Thanmophis sirtalis*), bull snakes (*Pituophis catenifer sayi*), and prairie rattlesnakes (*Crotalus viridis*).

Migratory Birds and Raptors

The Migratory Bird Treaty Act (MBTA) of 1918 provides protection of birds classified as migratory birds by the U.S. Fish and Wildlife Service (USFWS). The Migratory Bird Permit memorandum issued in April 2003 stipulates there is no prohibition against destruction of inactive nests. Additionally, any disturbance to these nesting areas must follow the stipulations outlined in the MBTA. Specific protection for Bald and Golden Eagles is authorized under the Eagle Protection Act (16 United States Code 668), which provides additional protection to these species from intentional or unintentional harmful conduct.

Most birds found in South Dakota and their nests are protected under the MBTA. Species not included in the MBTA are nonnative species whose occurrences in the United States are solely the result of intentional or unintentional human-assisted introduction. Disturbance of active migratory bird nests is prohibited (USFWS, 2020a).

Bald eagles (*Haliaeetus leucocephalus*) require mature trees near large, open bodies of water for nesting and winter roosting. Golden eagles (*Aquila chrysaetos*) generally nest on cliffs or escarpments. The study area contains suitable habitat that may provide opportunities for forage, roosts, and nesting to migrating birds, such as raptors and passerines.

2.6.2 Next Steps

A field survey would be required to establish the presence or absence of noxious weeds, migratory bird and raptor nests, and species-specific wildlife habitat during the NEPA phase of the project.

Disturbance of soil due to project activities would have the potential to introduce or spread noxious weeds and other invasive plant species. Mitigation measures should include seeding disturbed areas with mixtures that comply with South Dakota Seed Laws in order to reduce the potential for invasive plant infestations and to comply with South Dakota laws regarding weed and pest control (South Dakota Code, 2005).

2.7 Threatened and Endangered Species

2.7.1 Regulatory

The Endangered Species Act (ESA), administered by the United States Fish and Wildlife Service (USFWS), provides protection to imperiled species and their habitats. Section 7 of the ESA requires federal agencies to consult with USFWS for federally funded or federally permitted projects that may affect a species listed under the ESA. South Dakota State Law (SDCL 34A-8), administered by South Dakota Department of Game Fish and Parks (SDGFP), protects state listed threatened and endangered species.

2.7.2 Methodology

Felsburg Holt & Ullevig (FHU) used the USFWS Information, Planning, and Conservation System (IPaC) website to identify the latest information on threatened and endangered species that may occur in the study area (USFWS, 2021). SDGFP county lists were also reviewed for threatened, endangered, proposed, and candidate species (SDGFP, 2021). Habitat was evaluated in the project area for species listed as potentially present in the Black Hills National Forest.

2.7.3 Existing Conditions

Table 3 identifies federal and state listed species potentially located in the Corridor 3 area.

TABLE 3. THREATENED AND ENDANGERED SPECIES LIST

Common Name	Status	Habitat	Comments
Mammals			
Northern long-eared bat (*Myotis septentrionalis*)	FT	Northern long-eared bats are typically found near water and dense forest conditions. Roost sites consist of shedding bark and tree cavities, open buildings, and caves or mines. Winter hibernacula are frequently caves and mines.	Potential summer roosting habitat for the northern long-eared bat exists along Spearfish Creek, Dead Ox Creek, East Spearfish Creek and other drainages that cross the environmental study area.
Birds			
Osprey (*Pandion haliaetus*)	ST	Lakes, rivers, and coastal bays are primary habitat. Builds nests at the tops of large living or dead trees, utility poles,	Suitable nesting habitat is present near Spearfish Creek, Dead Ox Creek or East

Common Name	Status	Habitat	Comments
		cellphone towers, and other tall structures.	Spearfish Creek; however, no nest sites have been identified.
Red Knot (*Calidris canutus rufa*)	FT	Red knots breed in dry tundra areas and winter at intertidal marine habitats near coastal inlets, estuaries, and bays.	Project lacks dry tundra areas and suitable intertidal marine habitats.
American Dipper (*Cinclus mexicanus*)	ST	Rocky, unpolluted streams. Streams with cliffs, ledges, or bridges nearby are important nesting habitats.	Suitable nesting habitat is present near Spearfish Creek, Dead Ox Creek or East Spearfish Creek; however, no nest sites have been identified.
Peregrine Falcon (*Falco peregrinus*)	SE	Habitat consists of tall cliffs for nesting with open landscapes for foraging. Nests are often established on cliffs at heights ranging from 50 to 200 meters.	Currently the peregrine is a rare summer resident of the Black Hills.
Whooping Crane (*Grus americana*)	FE/SE	Whooping Cranes migration habitat includes freshwater marshes, wet prairies, shallow portions of rivers and reservoirs, grain stubble fields and submerged sandbars in rivers with good horizontal visibility for feeding and resting.	Although individuals can be found during migration anywhere in South Dakota, they are most commonly found along and adjacent to the Missouri River.
Fish			
Finescale dace (*Chrosomus neogaeus*)	SE	Cool spring-fed bogs, lakes and creeks; small, weedy, sluggish streams and small lakes. Sometimes associated with beaver ponds.	Potential habitat is located within the environmental study area. They have been reported in a large population from Cox and Mud lakes near Spearfish.
Longnose sucker (*Catostomus catostomus*)	ST	Habitat for longnose sucker may be lentic or lotic. They prefer cool, clear, spring-fed streams and lakes.	The species is known to exist in very few locations. No recent populations are found on National Forest System lands.

FE = Federally Endangered ST = State Threatened

FT = Federally Threatened SE = State Endangered

References: SDGFP – Accessed July 2021 USFWS Species Profiles – ECOS, IPaC July 2021

In Lawrence County, three federally listed species were identified through the USFWS IPaC. Potential northern long-eared bat summer foraging habitat is present at wooded habitats along Spearfish Creek, East Spearfish Creek, Dead Ox Creek and other drainages, which also includes adjacent non-forested habitats such as wetlands and open fields. There are also several bridges within the study area that could also be considered potential summer habitat.

The SDGFP identified six state listed species as having potential to occur in Lawrence County, South Dakota, including one species that is also federally listed. In general, habitat is lacking for state listed

species within the environmental study area. While some species use stream habitat, channels present within the study area lack suitable habitat. There is potentially suitable habitat along Spearfish Creek for the osprey and the finescale dace.

2.7.4 Next Steps

A field survey would be required to establish the presence or absence of federal or state listed threatened and endangered species habitat during the NEPA phase of the project.

The following measures should be implemented during planning and construction of the project:

- Disturbance to riparian and wetland areas should be kept to an absolute minimum.
- If riparian vegetation is lost it should be quantified and replaced onsite. Seeding of indigenous species should be accomplished immediately after construction to reduce sediment and erosion.
- A site-specific sediment and erosion control plan should be part of the project.
- A post construction erosion control plan should be implemented to provide interim control before reestablishing permanent vegetative cover on the disturbed site.

As the project moves into the NEPA phase, USFWS and SDGFP should be coordinated with for concurrence on effects to the listed species and to identify necessary mitigation commitments.

2.8 Environmental Justice

2.8.1 Regulatory

Under Executive Order 12898 (1994), Federal Actions to Address Environmental Justice in Minority Populations, projects are required to identify and address disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States. In accordance with Council on Environmental Quality (CEQ) guidance, EJ populations occur where either:

- The minority or low-income population of the affected area exceeds 50%.
- The population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Title VI of the Civil Rights Act of 1964 (Title VI) ensures that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance based on race, color, or national origin (42 United States Code [USC] 2000d et seq.). Executive Order 12898 on environmental justice directs that programs, policies,

and activities not have a disproportionately high and adverse human health or environmental effect on minority and low-income populations (59 FR 7629).

When federal funding or a federal action is involved, the lead federal agency procedures for identifying EJ populations should be followed. The potential for disproportionately high or adverse impacts to be borne by EJ populations when compared to the non-EJ populations will need to be determined. Additionally, the opportunity for EJ populations to participate fully in the decision-making process must be provided. The denial, reduction, or delay of receipt of benefits by minority and low-income populations cannot occur.

2.8.2 Methodology

To be consistent with the requirements of Title VI and Executive Order 12898, demographic characteristics of the environmental study area were examined to determine whether a low-income and/or minority population occurs within the study area. The demographic and economic character of the environmental study area was compared with that of the State of South Dakota using data from EJSCREEN, USEPA's Environmental Justice Screening and Mapping Tool (Version 2020) (USEPA, 2020).

2.8.3 Existing Conditions

The study area lies within Census Tract 9666, Block Group 1. A block group is an area defined by the U.S. Census Bureau that usually has in the range of 600-3,000 people living in it. Low-income populations are defined by USEPA as: "*The percent of a block group's population in households where the household income is less than or equal to twice the federal poverty level*." Minority populations are defined by the U.S. Census Bureau as: "*A population of people who are not single-race white and not Hispanic. Populations of individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic*."

EPA's EJSCREEN tool was used and reports approximately 69 habitants within one mile of the proposed project corridor. The minority population is approximately 1 percent, while that of the State of South Dakota is 18 percent. The low-income population is approximately 14 percent, while that of the State of South Dakota 31 percent. The demographic index is 7 percent, while that of the State of South Dakota is 24 percent. The demographic index in EJSCREEN is a combination of percent low-income and percent minority. State Percentiles are a way to see how local residents compare to the rest of the State of South Dakota. Instead of just showing numbers out of context, EJSCREEN compares a community to the rest of the state, by using percentiles. The State percentile tells you what percent of the State population an equal or lower value has, meaning less potential for exposure/ risk/ proximity to certain facilities, or a lower percent minority (USEPA, 2020).

Based on the EJSCREEN the project does not lie within a minority or low-income EJ population.

2.8.4 Next Steps

A more detailed EJ analysis should be completed during the NEPA process to verify the proposed project does not have a potential for disproportionately high or adverse impacts on EJ populations and identify ways to avoid and mitigate for any impacts.

2.9 Historic and Cultural Resources

2.9.1 Regulatory

Historic resources are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible to the National Register of Historic Places (NRHP). Cultural resources are defined as man-made features and physical remains of past human activity, generally at least 45 years old (properties constructed in 1975 or earlier). Cultural resources include historic buildings, bridges, railroads, roads, other structures, and archeological sites. Section 106 of the National Historic Preservation Act of 1966 requires evaluation of project effects on historic properties that are on, or eligible for, the National Register of Historic Places (NRHP). Criteria for determinations of eligibility are set forth in 36 Code of Federal Regulations (CFR) Part 60.4 (70) and are described in National Register Bulletin How to Apply the National Register Criteria for Evaluation (NPS 1995).

2.9.2 Methodology

An initial inventory and analysis of historic and cultural resources was conducted for Corridor 3 by Jake Lloyd, a historian with FHU. This process involved the following steps:

- Initiating a record search request to the South Dakota Archaeological Research Center (SDARC), for previously recorded historic and archaeological resources within a 1-mile buffer of US 85, within the study limits of Corridor 3 (see Section 1.4.1 Logical Termini),
- Mapping of previously recorded resources within 500 ft of US 85.
- Reviewing all previously recorded sites within the 500 ft buffer and identifying NRHP Listed NRHP Eligible sites that may potentially be affected by Corridor 3 improvements.

Results of the Corridor 3 historic and cultural resources inventory and analysis are documented in **Table 4**.

2.9.3 Existing Conditions

A total of 34 previously recorded resources listed in Table 5 were identified within the 500 ft buffer for Corridor 3, including 9-NRHP eligible properties, and 5 properties that are listed on the NRHP.

TABLE 4. CORRIDOR 3 – PREVIOUSLY RECORDED RESOURCES ADJACENT TO US HWY 14A

Resource ID / Site ID	Resource Type	Location	Description	Most Recent National Register Eligibility Determination
N/A	Para.	T3N, R1E Sect(s) 19-20 & 29-30	PEM-0051	*Unknown*
N/A	Para.	T3N, R1E NW ¼ of SE ¼ of Section 21	PEM-0075	*Unknown*
N/A	Para.	T3N, R1E Section 31	PEM-0124	*Unknown*
N/A	Para.	T3N, R1E Sect(s) 20, 29-31 & 32	PEM-0169	*Unknown*
N/A	Para.	T3N, R1E Sect(s) 29-31 & 32	PEM-0191	*Unknown*
N/A	Para.	T3N, R1E NE ¼ of NW ¼ of Section 14	PSP-0067	*Unknown*
N/A	Para.	T4N, R2E NE ¼ of NE ¼ of Section 29	PSP-0082	*Unknown*
N/A	Para.	T3N, R1E SW ¼ of SW ¼ of Section 14	PSP-0120	*Unknown*
12829 / **39LA0101**	Site	T3N, R2E NW ¼ of NE ¼ of Section 6	Native American artifact scatter; road; foundation; euroamerican artifact scatter	***NRHP Eligible***
12830 / **39LA0102**	Site	T3N, R1E NW ¼ of NE ¼ of Section 14	Native American artifact scatter	*NRHP Not Eligible (SHPO Concurrence)*
24042 / **39LA0255**	Site	T3N, R2E NE ¼ of SE ¼ of Section 7	Dump	*NRHP Not Eligible (SHPO Concurrence)*
13327 / **39LA0806**	Site	T3N, R2E NE ¼ of SE ¼ of Section 7	Foundation	***NRHP Eligible***
12383 / **39LA1021**	Site	T3N, R1E SE ¼ of NE ¼ of Section 30	Native American artifact scatter	*NRHP Not Eligible (SHPO Concurrence)*
12492 / **39LA1062**	Site	T3N, R1E NE ¼ of SE ¼ of Section 12	Native American artifact scatter	***NRHP Eligible***
13466 / **39LA1063**	Site	T3N, R1E SW ¼ of SE ¼ of Section 12	Euroamerican artifact scatter	*NRHP Not Eligible (SHPO Concurrence)*
12514 / **39LA1116**	Site	T3N, R1E NW ¼ of SE ¼ of Section 21	Euroamerican artifact scatter; Euroamerican depression	*NRHP Not Eligible (SHPO Concurrence)*
12693 / **39LA1236**	Site	T3N, R1E NW ¼ of SW ¼ of Section 31	Euroamerican artifact scatter	*NRHP Not Eligible (SHPO Concurrence)*

Resource ID / Site ID	Resource Type	Location	Description	Most Recent National Register Eligibility Determination
12701 / **39LA1247**	Site	T3N, R1E SE ¼ of Section 15	Nonfarm ruins; Euroamerican artifact scatter	*NRHP Not Eligible (SHPO Concurrence)*
24048 / **39LA1325**	Site	T4N, R2E SE ¼ of NW ¼ of Section 22	Nonfarm ruins; Euroamerican scatter	*NRHP Not Eligible (SHPO Concurrence)*
12918 / **39LA1353**	Site	T3N, R1E NE ¼ of NE ¼ of Section 30	Nonfarm ruins	***NRHP Eligible***
12990 / **39LA1431**	Site	T4N, R2E SE ¼ of SW ¼ of Section 29	Native American artifact scatter; dump; euroamerican depression	*NRHP Not Eligible (SHPO Concurrence)*
13567 / **39LA1567**	Site	T3N, R1E SE ¼ of NE ¼ of Section 30	Euroamerican isolated find	*NRHP Not Eligible (SHPO Concurrence)*
13481 / **39LA2010**	Site	T3N, R1E Sect(s) 19, 20, 28-30	Railroad	***NRHP Eligible***
24038 / **39LA2053**	Site	T3N, R2E Section 6; T4N, R2E Sect(s) 20, 21, 29, 31, 32	Industrial; Euroamerican artifact scatter	***NRHP Eligible***
27258 / **39LA2057**	Site	T3N, R2E Section 6; T4N, R2E Sect(s) 21, 29, 31-32	Industrial	***NRHP Eligible***
12501 / **39LA2120**	Site	T3N, R2E Section 6	Euroamerican earthwork	***NRHP Eligible***
7162 / **LA00000706**	Structure	T4N, R2E SE ¼ of NE ¼ of Section 31	Summer Cabin	***NRHP Eligible***
7504 / **LA00000707**	Structure	T4N, R2E NW ¼ of NW ¼ of Section 22	McDonald House	*Unevaluated*
55267 / **LA01500001**	Structure	T3N, R1E SE ¼ of SE ¼ of Section 19	CCC Barracks	*NRHP Not Eligible (SHPO Concurrence)*
55270 / **LA01500002**	Structure	T3N, R1E NE ¼ of NE ¼ of Section 30	SD GFP Garage/Shop	***National Register Listed***
55271 / **LA01500003**	Structure	T3N, R1E NE ¼ of NE ¼ of Section 30	Building 3466	***National Register Listed***
55272 / **LA01500004**	Structure	T3N, R1E NE ¼ of NE ¼ of Section 30	Building 3461	***National Register Listed***
55273 / **LA01500005**	Structure	T3N, R1E NE ¼ of NE ¼ of Section 30	Building 3465	***National Register Listed***

Resource ID / Site ID	Resource Type	Location	Description	Most Recent National Register Eligibility Determination
55274 / **LA01500006**	Structure	T3N, R1E NE ¼ of NE ¼ of Section 30	Building 3464	***National Register Listed***
	Previously recorded National Register listed or eligible resources			
	Eligibility determination: not eligible/SHPO concurrence, unevaluated, or *unknown*			

2.9.4 Next Steps

Next steps would be for the responsible agency to initiate a cultural resources survey to determine whether the undertaking (project) could affect these previously recoded historic and cultural resources that are National Register listed or eligible. If so, the agency proceeds to define the Area of Potential Effects (APE), which is the area that an undertaking may directly or indirectly cause changes in the character of use of historic resources. Once the APE has been defined, a cultural resources survey would be conducted, and the agency would consult with the appropriate State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) on effects to historic or potentially historic resources located within the APE.

2.10 Federal and Tribal Lands

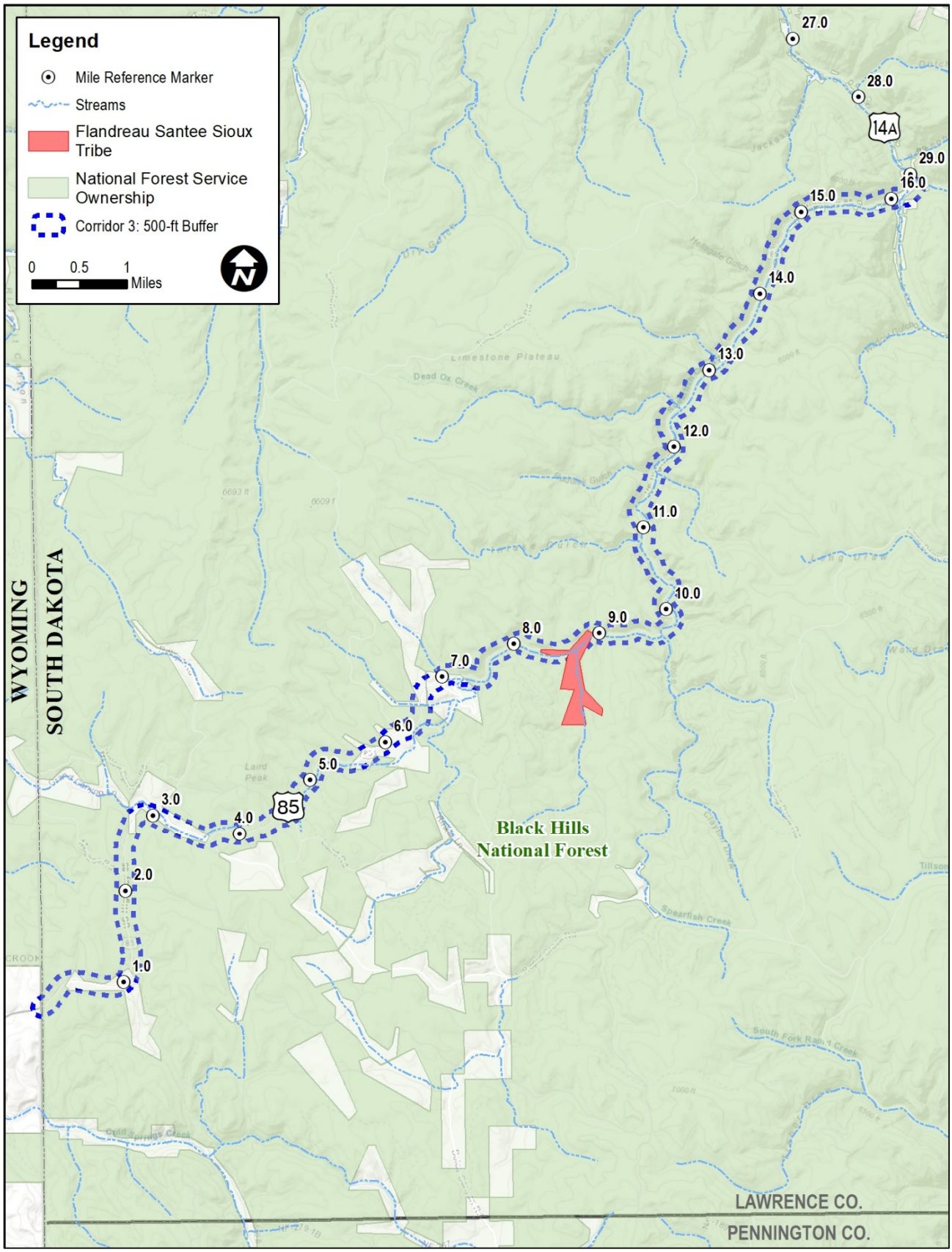
2.10.1 Regulatory

Tribal consultation is conducted for all transportation projects that may be of interest to a Tribe in South Dakota and with Tribes with aboriginal ties to lands in in South Dakota, particular the Black Hills. For projects involving federal funding, SDDOT coordinates with FHWA to conduct regular and meaningful consultation with Tribes, in accordance with Executive Order 13175 on Tribal Consultation.

2.10.2 Methodology

Tribes with interests in lands within Lawrence County were identified based on FHWA's list of *Counties of Interest for Tribes in and near South Dakota* (Environmental Procedures Manual, Table 2.5-1, SDDOT. 2019). It should be noted that while Lawrence County was not included among the counties listed for the Flandreau Santee Sioux Tribe, there is a Flandreau Santee Sioux Tribe parcel of land along US 85 between MRM 8 and MRM 9, as shown in **Figure 4**.

FIGURE 8. FLANDREAU SANTEE SIOUX TRIBE PARCEL



2.10.3 Tribal Consultation

Tribal consultation through coordination with FHWA, the Bureau of Indian Affairs and Lawrence County would involve the following tribes in South Dakota: Cheyenne River Sioux Tribe, Lower Brule Sioux Tribe, Oglala Sioux Tribe, Sisseton-Wahpeton Oyate, Standing Rock Sioux Tribe, Yankton Sioux Tribe, Three Affiliated Tribes, Mandan Hidatsa, Arikara Nation, Ponca Tribe of Nebraska, Northern Arapaho Tribe, Chippewa Cree Tribe, and the Flandreau Santee Sioux Tribe.

2.10.4 Next Steps

An initial step in the NEPA scoping process will be to prepare a letter to each designated tribal representative, including a description of the proposed project, a map, and an invitation to become a consulting party. Under Section 106 regulations, tribes are offered the opportunity to identify concerns about cultural resources, and comment on how the project might affect them. Tribes that that elect to become consulting parties for the undertaking will be notified of the results of any necessary historic property surveys, and they will be asked to comment on eligibility and effects determinations.

2.11 Traffic Noise

Traffic noise can be an important and contentious environmental consideration for highway projects. The locations most often of concern for traffic noise are exterior areas of frequent human use.

2.11.1 Regulatory

At the federal level, highway traffic noise is addressed under 23 CFR 772. The *Noise Analysis and Abatement Guidance* is South Dakota DOT's compliance with 23 CFR 772 and guides highway noise analyses in South Dakota. These regulations apply to projects that receive federal funding or are otherwise subject to FHWA approval. State-only actions do not require a noise analysis.

Some, but not all, federal-aid or federal-approval highway improvement projects will require a traffic noise analysis. Type I projects require a noise analysis; South Dakota does not participate in Type II projects; Type III projects are exempt. No new through lanes are currently planned, so the most likely reasons an improvement may be Type I is from a substantial vertical shift in the road surface near a receptor or a shift in the road alignment that halves the distance between the road and a receptor. In most other cases, the project is likely to be Type III.

If the project is determined to be Type I, a traffic noise impact analysis will be undertaken through computer modeling using prescribed software. The analysis will focus on the presence or absence of noise impacts in the study corridor. Noise abatement, typically in the form of noise barriers, will be evaluated for any noise impacts identified. Noise abatement actions found to be feasible and reasonable, if any, must be included in the final project.

2.11.2 Existing Conditions

US 85 in this corridor is an existing two-lane highway through a rural, mountainous setting. There are dispersed residences and other developed sites within 300 feet of the highway, so nominally there will be noise receptors to consider. Substantial changes to the elevation and alignment of the road are not expected due to the cost and difficulty that would entail but some changes are expected (e.g., curve flattening). There are no existing SDDOT noise abatement measures present.

2.11.3 Next Steps

The specific improvements proposed at the NEPA phase will need to be reviewed to determine the noise type status and what noise analysis may be required. As envisioned by the recommendations from Phases 1 and 2, the conceptual improvements for the corridor suggest a Type III noise project is likely, which will not require a traffic noise analysis. If future decisions on corridor improvements result in a Type I project, a noise analysis may be needed during the NEPA phase where noise impacts and abatement actions are evaluated in accordance with *Noise Analysis and Abatement Guidance*.

2.12 Section 4(f) and Section 6(f) Resources

Section 4(f) properties include publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites as defined in the US Department of Transportation (DOT) Act of 1966. FHWA and other DOT agencies cannot approve use of these properties for transportation projects unless certain conditions apply.

Section 6(f) properties include recreational resources developed with federal funding through the Land and Water Conservation Fund (LWCF). Section 6(f) of the LWCF Act prohibits the conversion of these properties to anything other than public outdoor recreation uses.

2.12.1 Regulatory

Section 4(f) stipulates that FHWA and other United States Department of Transportation (DOT) agencies cannot approve the use of land from publicly owned parks, recreational facilities, wildlife and waterfowl refuges, or historic sites unless there is no feasible and prudent alternative to the use of the land and unless the action includes all possible planning to minimize harm to the property resulting from use. Historic sites that are on or eligible for the NRHP qualify for protection under Section 4(f).

Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with LWCF Act funds be coordinated with the Department of Interior. Usually, replacement in kind is required. Evaluation of Section 6(f) properties is completed for the following reasons:

- To preserve the intended use of public funds for land and water conservation
- To comply with several legal mandates that pertain to the LWCF and Section 6(f)

Section 6(f) of the Act assures that once an area has been funded with LWCF assistance, it is continually maintained for public recreation use unless the NPS approves a substitute property of reasonably equivalent usefulness and location and of at least equal fair market value.

2.12.2 Methodology

Section 4(f): Preliminary inventory included a review of available GIS data for parks, recreational facilities, wildlife and waterfowl refuges for non-historic Section 4(f) resources. For historic Section 4(f) resources, the information provided in Section 2.9 was used to determine the presence of historic Section 4(f) resources.

Section 6(f): Information from The Land and Water Conservation Fund (LWCF) was referenced to identify Section 6(f) properties potentially located near the study area.

2.12.3 Existing Conditions

Section 4(f): Non-Historic Section 4(f) properties located within the within the 500 ft study area for Corridor 3 in the Black Hills National Forest, include:

- Holy Rock Trailhead
- Bratwurst Trailhead
- Dead Ox Picnic Site
- Hellsgate Picnic site
- Snowmobile Trails

There are 5 historic 4(f) properties that are listed on the NRHP, and 9-NRHP eligible historic properties within the 500 ft study area for Corridor 3, including:

- Property # 55270 /LA01500002: SD GFP Garage/Shop—National Register Listed
- Property # 55271 /LA01500003: Building 3466—National Register Listed
- Property # 55272 /LA01500004: Building 3461—National Register Listed
- Property # 55273 /LA01500005: Building 3465—National Register Listed
- Property #55274 /LA01500006: Building 3464—National Register Listed
- Property #12829 /39LA0101 Native American artifact scatter; road; foundation; euroamerican artifact scatter—NRHP eligible
- Property #13327 /39LA0806: Foundation— NRHP eligible
- Property # 12492 /39LA1062: Native American artifact scatter—NRHP eligible
- Property # 12918 /39LA1353: Nonfarm ruins—NRHP eligible
- Property # 13481 /39LA2010: Railroad —NRHP eligible

- Property # 24038 /39LA2053: Industrial: Euroamerican artifact scatter—NRHP eligible
- Property # 27258 /39LA2057: Industrial—NRHP eligible
- Property # 12501 /39LA2120: Euroamerican earthwork—NRHP eligible
- Property # 7162 /LA00000706: Summer Cabin—NRHP eligible

Section 6(f): The Black Hills National Forest - Spring Creek Watershed is located just five miles south of Custer, South Dakota. The 350-acre Spring Creek Watershed property was added to the Black Hills National Forest in 2020 using an investment of $1.719 million from the LWCF in 2019. The acquisition will preserve wildlife habitat, protect watersheds and streams, and provide recreational opportunities for the public, including new access to hunting areas (LWCF, 2021). Information available from the LWCF indicates the boundary of the Black Hills National Forest is included in the Section 6(f) resource boundary.

2.12.4 Next Steps

Section 4(f): If, during the project development processes, parks, trails, or open space are impacted, the next steps of the Section 4(f) process require evaluations of publicly owned parks, trails, and open space lands to be conducted to determine if there are any properties that qualify for protection under Section 4(f). The law says that FHWA (and other DOT agencies) cannot approve the use of land from publicly owned parks, recreation areas, wildlife refuges, or historic sites unless there is no feasible and prudent alternative to the use and the action includes all possible planning to minimize harm to the property. The substantive provisions of Section 4(f) apply only to agencies within the USDOT. A Section 4(f) evaluation would be required for the conversion of any publicly owned parks, trails, or open space lands for transportation improvements.

Section 6(f): During the NEPA process, the boundary for the Black Hills National Forest Section 6(f) resource will be verified and determine if there will be any impacts to Section 6(f) properties. For Section 6(f) properties located in the areas of the improvements, alternatives should be designed to avoid a conversion of these properties and/or determine if improvements would be a benefit to the property. If a conversion of land cannot be avoided, efforts will be made to mitigate effects to these properties. SDDOT, in cooperation with the local government landowner, must identify replacement land of equal value, location, and usefulness before a transfer of property under Section 6(f) can occur.

2.13 Visual Resources

2.13.1 Regulatory

The VIA scoping process applied to Corridor 3 follows guidance from FHWA's Guidelines for the Visual Impact Assessment of Highway Projects (FHWA, 2015) for assessing impacts on visual resources in context to NEPA (See Appendix B, Visual Resource Scoping - Corridor 3).

2.13.2 VIA Scoping

A visual resource scoping process was conducted for Corridor 3, to identify issues related to the transportation improvement concepts planned for **US 85**, and to establish Visual Impact Assessment (VIA) requirements for the National Environmental Policy Act (NEPA) phase.

Context and Landscape Character

The landscape character associated with Corridor 3 within the Black Hill NF is defined by continuous patterns of treelined valleys, meadows, and rolling forested hills. The riparian corridor along Spearfish Creek creates a roadside element of visual diversity and high scenic integrity. The overall composition of the US 85 corridor landscape viewsheds are "panoramic," with rim rock outcroppings creating scenic background "focal points." The landform and vegetation contrast resulting from US 85 roadway widening and realignment concepts is considered moderately compatible with scenery management goals for maintaining the scenic quality of the forest landscapes in the Black Hills National Forest Land and Resource Management Plan (Management Plan).

Black Hills NF Scenery Management

Goals in the Forest Plan include providing for the scenic quality and recreational opportunities, and protection of heritage resources in response to the needs of the Black Hills National Forest visitors and local communities. The Forest Plan also includes Scenic Integrity Objective (SOI) Guidelines. The High SOI for **Corridor 3** encompasses the Immediate Foreground (within 300 feet) and Foreground (within one-half mile), creating a mile-wide protected viewshed centered on US 85. A high SOI indicates that human activities are not visually evident, and planned activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.

The Forest Plan includes applicable guidelines for managing the scenic integrity level for site-specific projects and documentation in decision documents. The "foreground" of high public use areas has the highest priority, along with the length of time for natural processes and rehabilitation measures will take to meet the scenic integrity objective. Site-specific mitigation for impacts resulting from lane and shoulder widening and curve realignments through undisturbed forested areas would require context-sensitive design approaches. The visual impact assessment and mitigation strategies will need to be responsive to the Scenic Byway designation, recreation travel stakeholders, and Black Hills National Forest Scenery Management goals and objectives. Site-specific mitigation for impacts, and design guidelines would be developed during the project specific NEPA process.

2.13.3 VIA Scoping Issues and Next Steps

The proposed improvements for Corridor 3, including curve realignments and 3 ft to 5 ft shoulders, would result in noticeable changes to landscape character within the immediate foreground (within 300 feet) of the US 85 corridor, which would require context-sensitive design and visual impact

mitigation to meet Goals and Objectives of the *Black Hills National Forest Land and Resource Management Plan*, and Scenery Management Objectives.

The VIA Scoping process resulted in a score ranging from 23 to 24 points, indicating that a *Standard VIA* would be appropriate for NEPA documentation. Assumptions are that the proposed project elements could potentially result in adverse visual impacts, and the VIA would receive extensive local, perhaps statewide, public review. The VIA would typically include several visual simulations, and involve a thorough examination of Forest planning and policy documents supplemented with a direct agency and public engagement processes to determine visual preferences, and mitigation.

2.14 Hazardous Materials

2.14.1 Regulatory

Hazardous materials are regulated by various state and federal regulations. NEPA, as amended (42 US Code (USC) 4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that decisions involving federal funds and approvals consider environmental effects from hazardous materials. Other applicable regulations include the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601 et seq.), which provides federal authority for the identification, investigation, and cleanup of sites throughout the US that are contaminated with hazardous substances (as specifically designated in the CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 321 et seq.), which establishes a framework for the management of both solid and hazardous waste. The federal Hazardous and Solid Waste Amendments of 1984 established a new comprehensive regulatory program for underground storage tanks containing petroleum products and hazardous chemicals regulated under CERCLA. In 2016, the EPA retired the CERCLA Information System database, and replaced it with a more modern system called the Superfund Enterprise Management System.

2.14.2 Existing Conditions

A desktop review of the study area revealed facilities that may utilize hazardous materials daily such as the following:

- Hardy Guard Station
- Trailshead Lodge (22075 US-85

In addition to the facilities listed above, there may other properties that were previously located within the study area that may have affected groundwater and subsurface soils but have since been occupied by another business. Finally, there could be facilities located near the study area that may be undergoing active groundwater remediation.

2.14.3 Next Steps

Prior to final design, an environmental database records search of federal and state environmental resources should be obtained and reviewed for the study area. The environmental database records would be evaluated with respect to the status of the facility listing and its location within the study area boundaries. The facilities identified in the environmental database would be ranked as having either a high, medium, or low potential to impact based on the location of these facilities and known releases.

In addition to the environmental database review, an on-site visual inspection of the study area and surrounding areas should be completed. The site visit should be completed by a qualified environmental professional, skilled and experienced in identifying hazardous materials and waste issues, to identify and evaluate present conditions.

Finally, a review of historical site information such as Sanborn fire insurance maps, US Geological Survey topographic maps, and readily available historical aerial photographs should be completed. This review of historical sources should include all obvious uses from the study area's first obvious developed use or 1940, whichever is earlier, to the present time.

If findings from the historical and/or database reviews indicate that subsurface contamination may be present, a limited subsurface investigation to collect soil and/or groundwater samples may be warranted. Based on the information gathered during the subsurface investigation, a Materials Management Plan (MMP) may be recommended to detail the Standard Operating Procedures for handling potentially contaminated media, specifically soil and/or groundwater. The MMP will be designed to minimize worker exposure to potentially contaminated material, prevent releases to the environment, and ensure proper disposal.

2.15 Summary

This environmental review was prepared to evaluate issues and the potential for conflicts with human and natural environment from highlighted key resources within each corridor with a likelihood of potential effects depending on the proposed action and project design development.

Next steps would follow SDDOT NEPA process in coordination with FHWA. The scan report is intended to provide a starting point for the NEPA process.

3. REFERENCES

Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance under the National Environmental Policy Act. https://ceq.doe.gov/docs/ceq-regulations-and-guidance/regs/ej/justice.pdf

Federal Highway Administration (FHWA). 2012. Order 6640.23A FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. June 14. https://www.fhwa.dot.gov/legsregs/directives/orders/664023a.cfm

FHWA. 2016. Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. October 18. https://www.fhwa.dot.gov/environMent/air_quality/air_toxics/policy_and_guidance/msat/

Land and Water Conservation Fund (LWCF). 2021. Past Projects Web Map. https://lwcf.tplgis.org/mappast/ Accessed November 2021.

Lawrence County. 2021. Lawrence County, South Dakota, Invasive Species Management. https://www.lawrence.sd.us/363/Identify-Invasive-Species

Natural Resources Conservation Service (NRCS). Year. Web Soil Survey. Website: http://websoilsurvey.nrcs.usda.gov/app.

South Dakota Department of Agriculture and Natural Resources (SDDANR). 2020. The 2020 South Dakota Integrated Report for Surface Water Quality Assessment. https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_2020_IR_final.pdf

SDDANR. 2021. State Noxious Weed and Pest List. https://danr.sd.gov/Conservation/PlantIndustry/WeedPest/WeedandPestInfo/StateNoxious/default.aspx

South Dakota Department of Transportation (SDDOT). 2019. Environmental Procedures Manual. July 2019. https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf.

United States Environmental Protection Agency (USEPA). 2006. Level III and IV Ecoregions of the Continental United States. Website: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states.

USEPA. 2020. EJSCREEN EPA's Environmental Justice Screening and Mapping Tool (Version 2020). https://ejscreen.epa.gov/mapper/

United States Fish and Wildlife Service (USFWS). 2020a. Migratory Bird Treaty Act; Birds Protected. https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php#.

USFWS. 2020b. National Wetland Inventory (NWI). Wetland Mapper V2. Website: https://www.fws.gov/wetlands/data/mapper.html. Accessed September 2020.

USFWS. 2021. Information, Planning, and Conservation System (IPaC) internet mapping tool website: https://ecos.fws.gov/ipac/. Accessed July 2021.

Appendix A. Environmental Resources Map Book

WYOMING

SOUTH DAKOTA

US HWY 85

Black Hills
National Forest

Black Hills Phase III Corridors
Corridor 3: Sheet 1 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

Black Hills Phase III Corridors
Corridor 3: Sheet 2 of 31

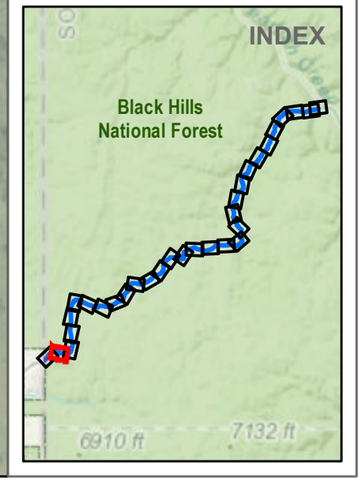
Legend

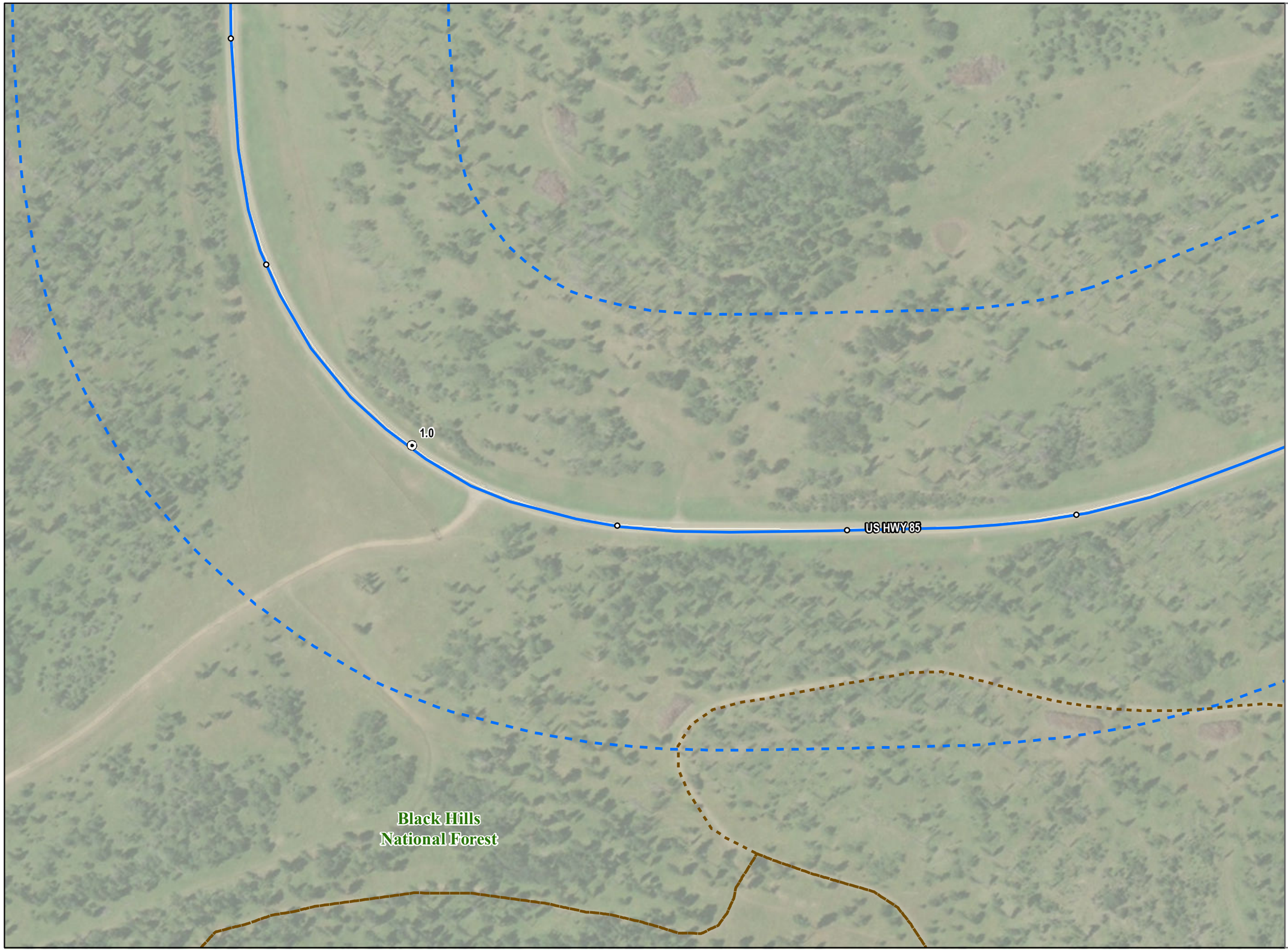
- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

US HWY 85

Black Hills
National Forest





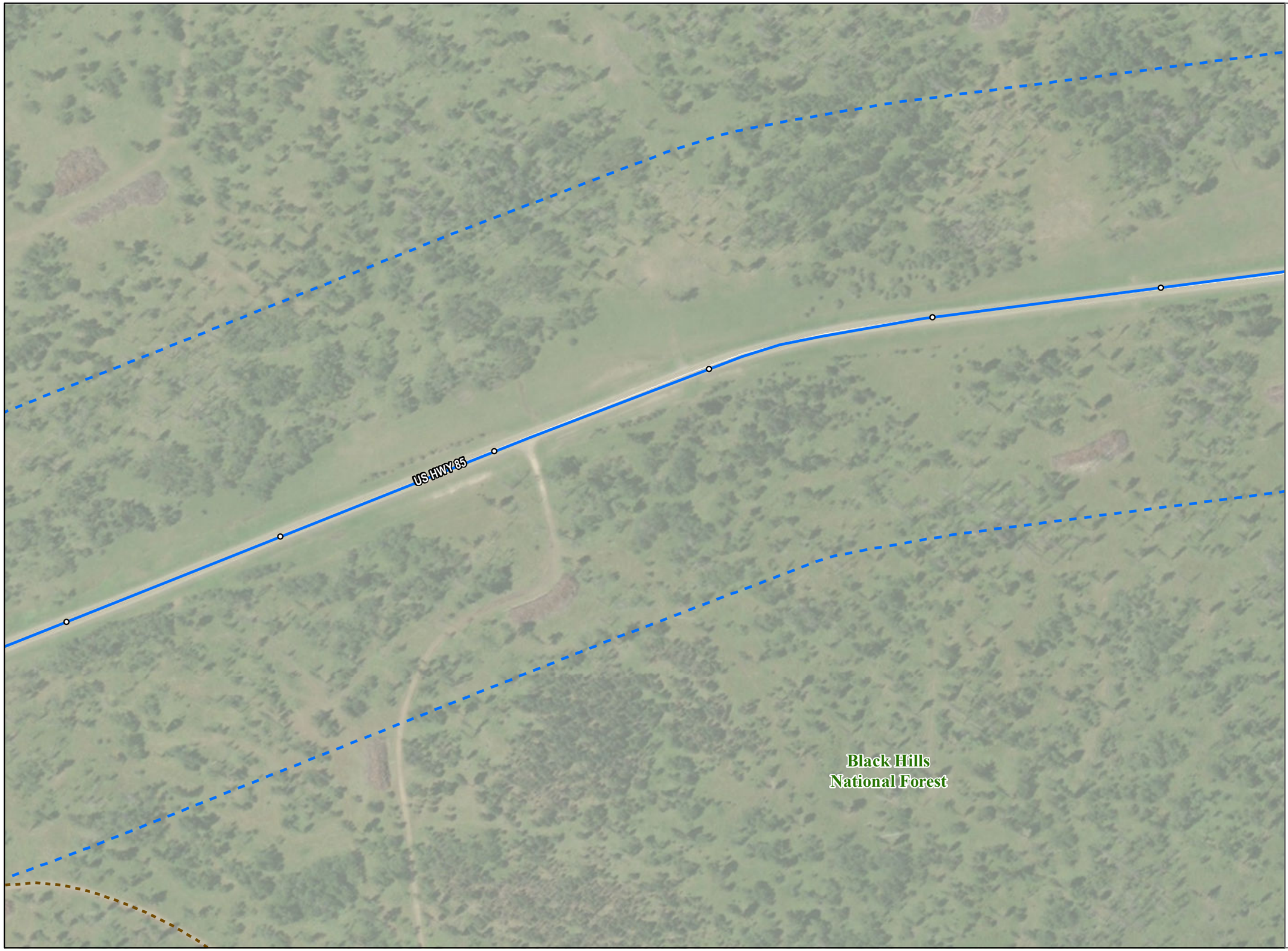
Black Hills Phase III Corridors

Corridor 3: Sheet 3 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

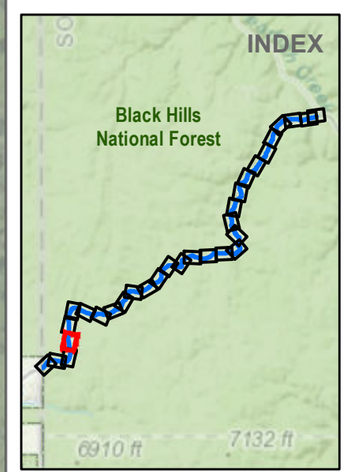


Black Hills Phase III Corridors
Corridor 3: Sheet 4 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



MOSKEE RD

Hardy Guard Station (Historic)

US HWY 85

2.0

Black Hills National Forest

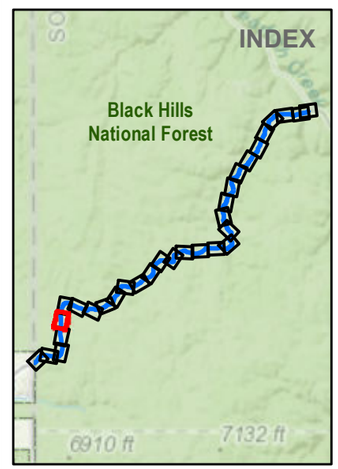
Black Hills Phase III Corridors

Corridor 3: Sheet 5 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Hardy Guard Station (Historic)

Black Hills National Forest

US HWY 85

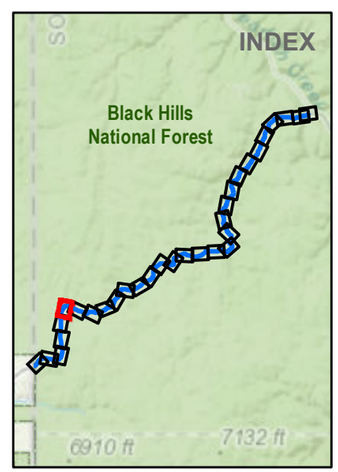
3.0

Black Hills Phase III Corridors
Corridor 3: Sheet 6 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

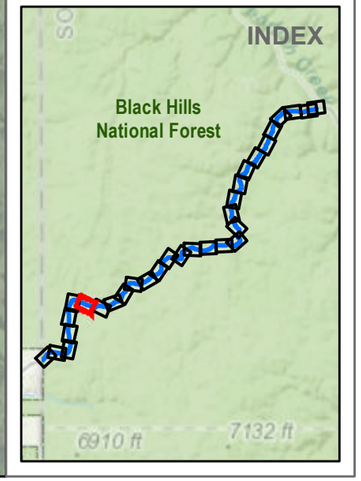


Black Hills Phase III Corridors
Corridor 3: Sheet 7 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Black Hills Phase III Corridors
Corridor 3: Sheet 8 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300
Feet

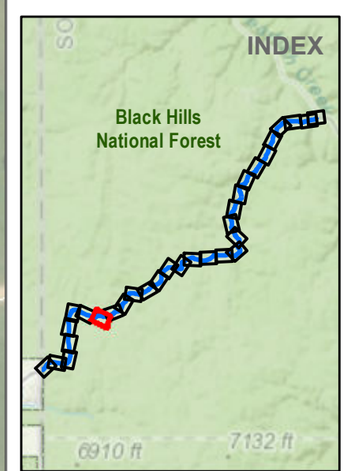
US HWY 85

4.0

Black Hills
National Forest

S RAPID CREEK RD

INDEX



Black Hills Phase III Corridors
Corridor 3: Sheet 9 of 31

Legend

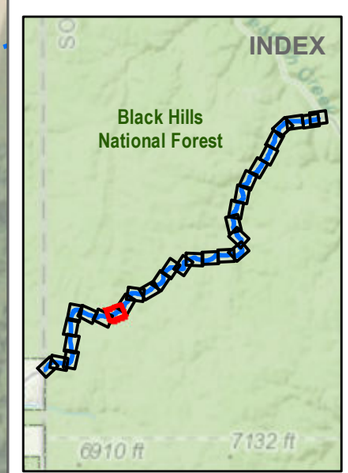
- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300
Feet

US HWY 85

Black Hills
National Forest

ONEIL PASS RD



Black Hills Phase III Corridors
Corridor 3: Sheet 10 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

US HWY 85

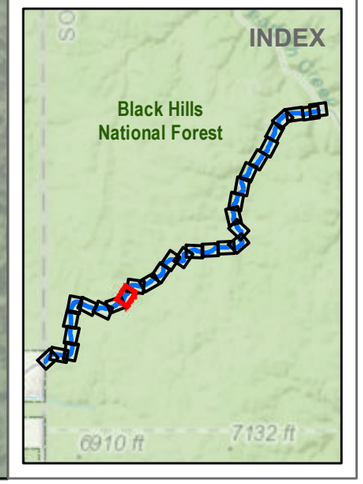
ONEIL PASS RD

5.0

Unknown Tributary

Black Hills
National Forest

INDEX



Black Hills Phase III Corridors
Corridor 3: Sheet 11 of 31

Legend

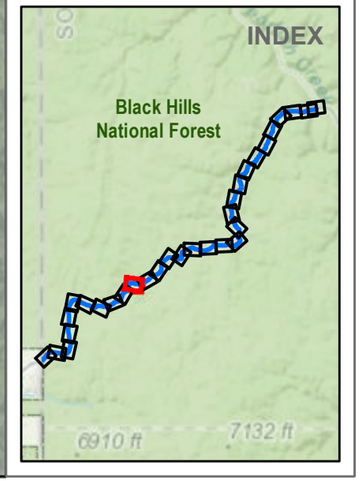
- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

US HWY 85

Black Hills
National Forest

Unknown Tributary



Black Hills Phase III Corridors

Corridor 3: Sheet 12 of 31

Legend

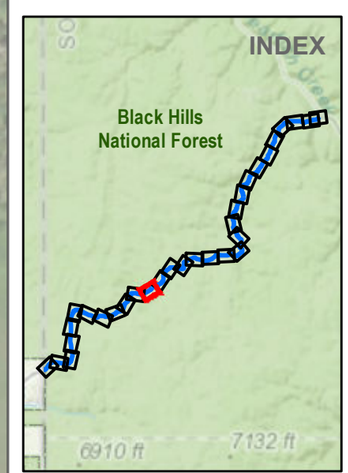
- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

US HWY 85

6.0

Black Hills
National Forest

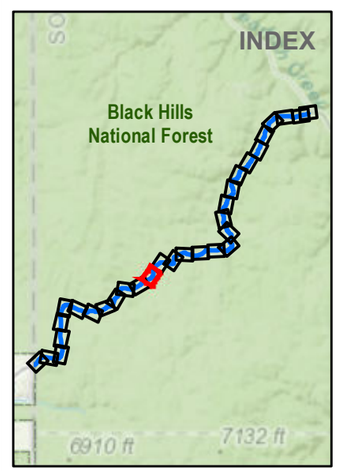


Black Hills Phase III Corridors
Corridor 3: Sheet 13 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Black Hills Phase III Corridors

Corridor 3: Sheet 14 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

Black Hills
National Forest

SUNNY MEADOWS CT

7.0

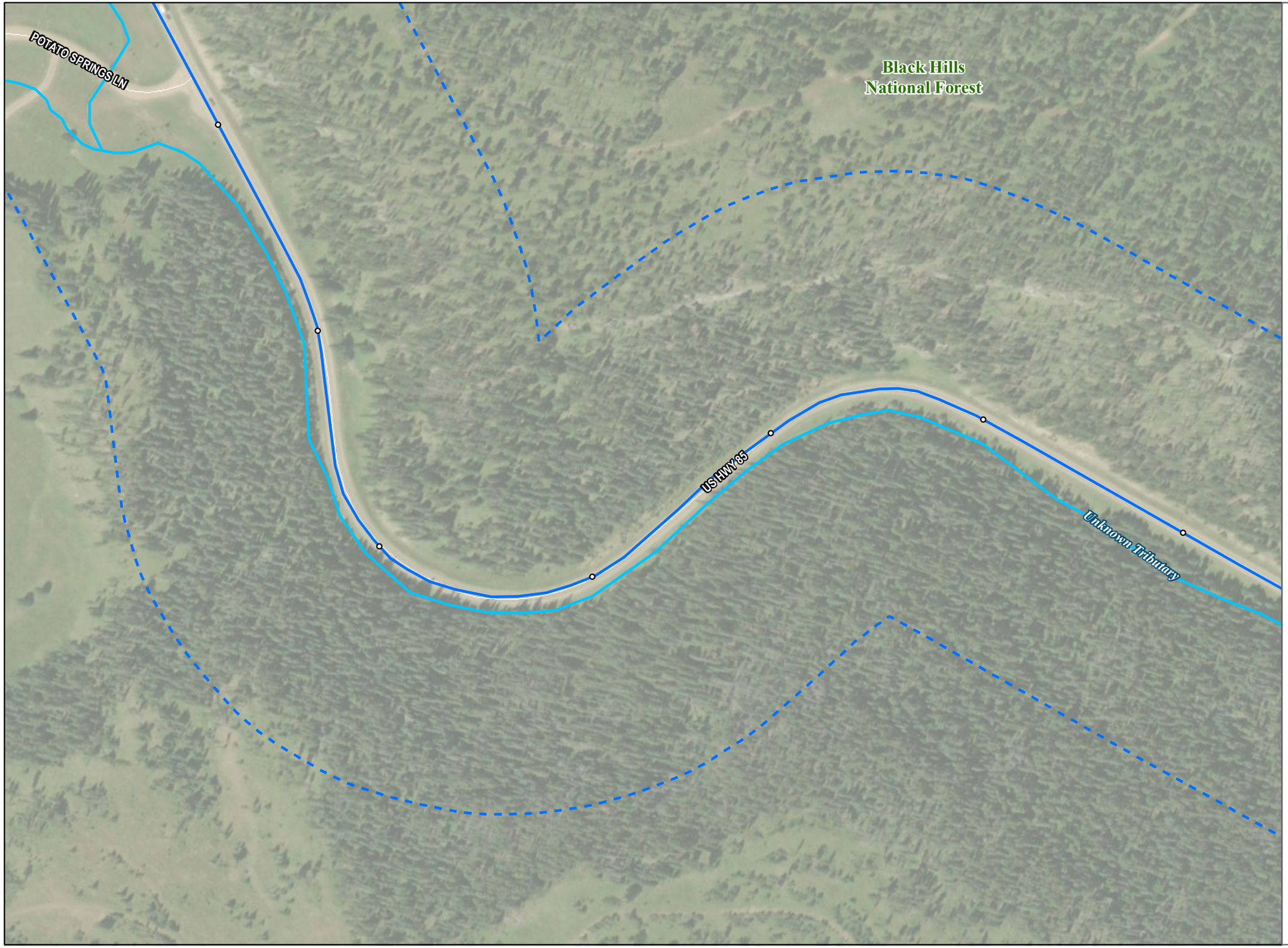
Unknown Tributary

POTATO SPRINGS LN

STONE FLY PL

US HWY 85

Unknown Tributary

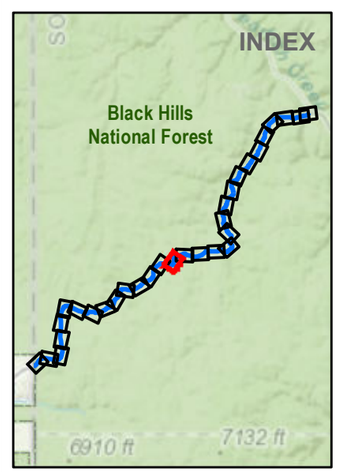


Black Hills Phase III Corridors
Corridor 3: Sheet 15 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Black Hills Phase III Corridors
Corridor 3: Sheet 16 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

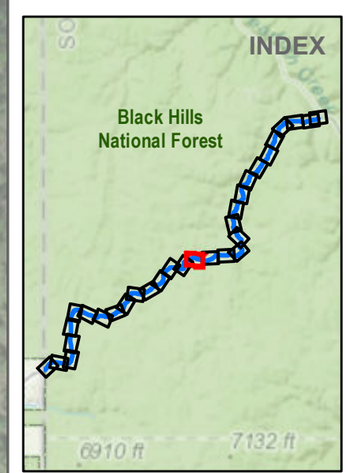
0 100 200 300 Feet

8.0

US HWY 85

Unknown Tributary

Black Hills
National Forest



Black Hills Phase III Corridors
Corridor 3: Sheet 17 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

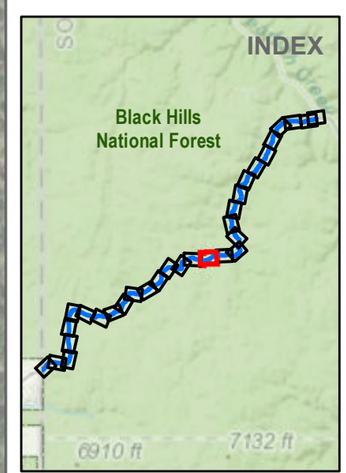
0 100 200 300 Feet

Black Hills
National Forest

Eagle Cliff Trailhead

US HWY 85

Unknown Tributary



Black Hills Phase III Corridors
Corridor 3: Sheet 18 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

9.0

US HWY 85

Unknown Tributary

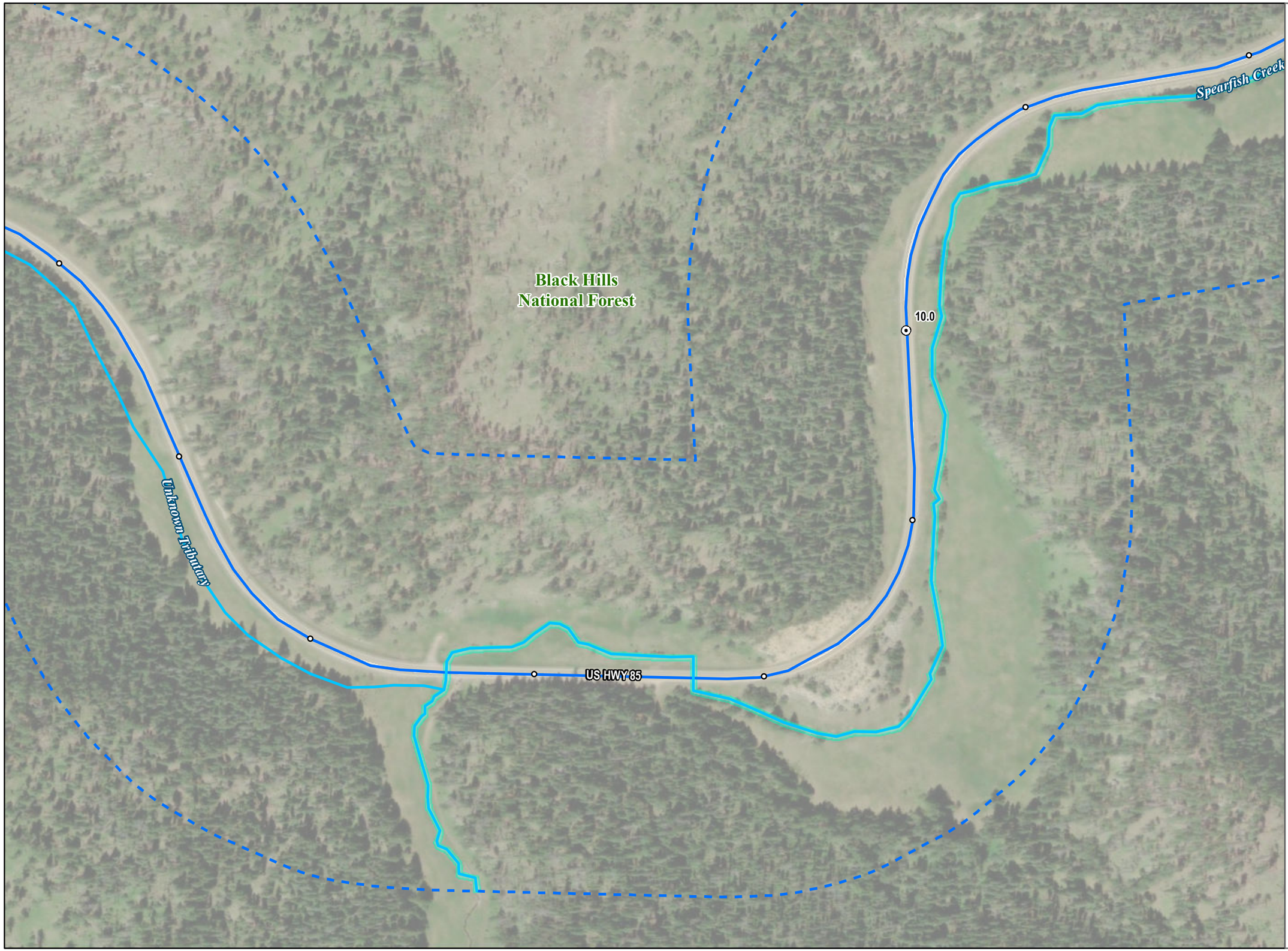
Black Hills
National Forest

INDEX

Black Hills
National Forest

6910 ft

7132 ft

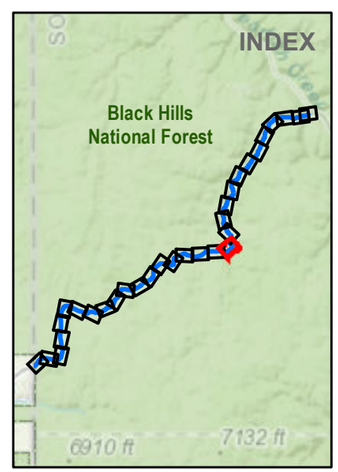


Black Hills Phase III Corridors
Corridor 3: Sheet 19 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Black Hills
National Forest

Spearfish Creek

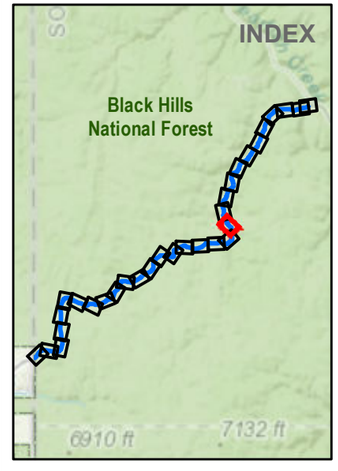
US HWY 85

Black Hills Phase III Corridors
Corridor 3: Sheet 20 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300
Feet



Black Hills Phase III Corridors
Corridor 3: Sheet 21 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

Spearfish Creek

US HWY 85

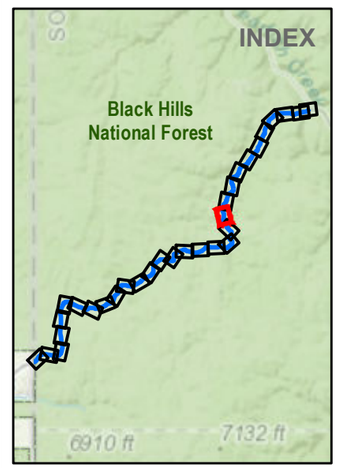
Homestead Wetlands Conservation Project

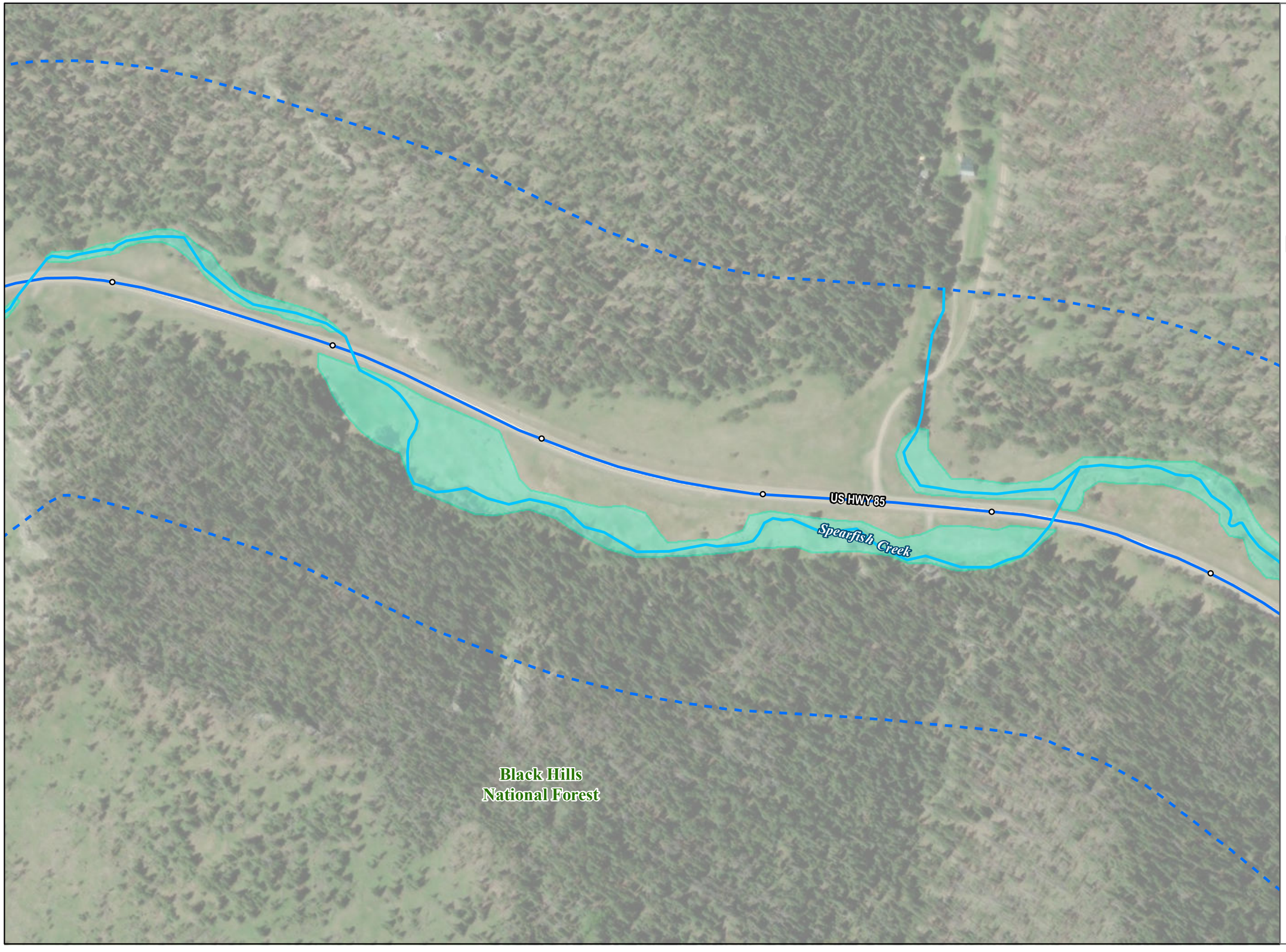
11.0

1948 Box Culvert

Black Hills
National Forest

INDEX





Black Hills Phase III Corridors
Corridor 3: Sheet 22 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300
Feet

Black Hills Phase III Corridors

Corridor 3: Sheet 23 of 31

Black Hills
National Forest

Spearfish Creek

US HWY 85

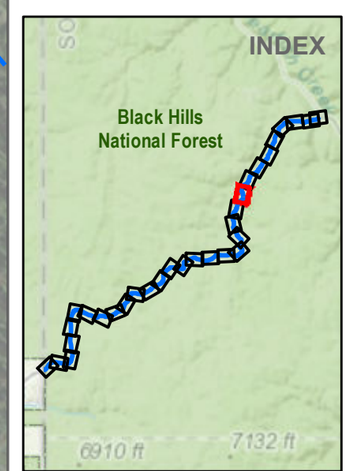
12.0

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

INDEX



Black Hills Phase III Corridors
Corridor 3: Sheet 24 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

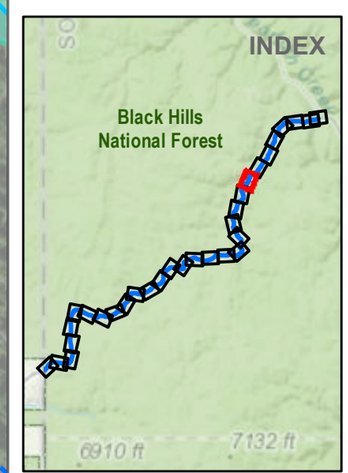
0 100 200 300 Feet

US HWY 85

Spearfish Creek

Rock Wall

Black Hills
National Forest



Black Hills Phase III Corridors
Corridor 3: Sheet 25 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

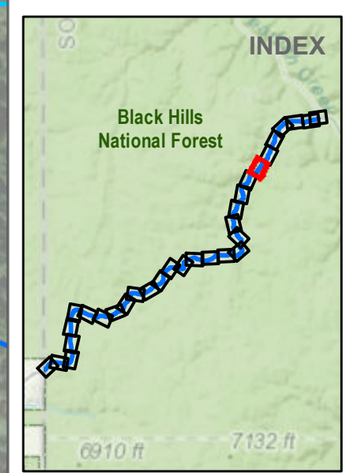
0 100 200 300 Feet

Black Hills
National Forest

13.0

US HWY 85

Spearfish Creek



Black Hills Phase III Corridors
Corridor 3: Sheet 26 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet

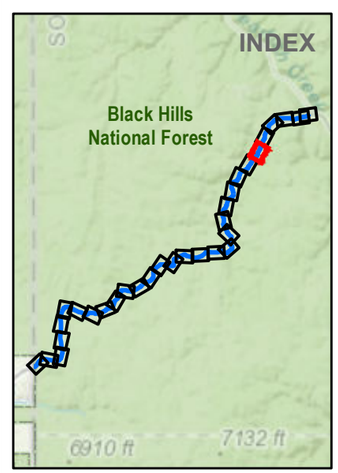
14.0

US HWY 85

Spearfish Creek

Black Hills
National Forest

INDEX

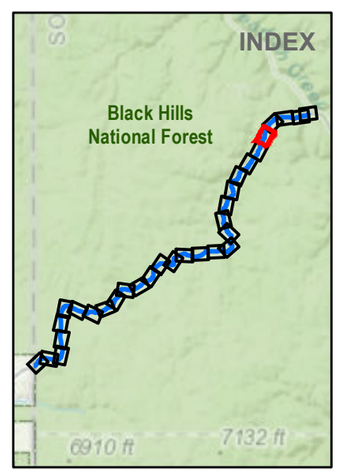


Black Hills Phase III Corridors
Corridor 3: Sheet 27 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300
Feet

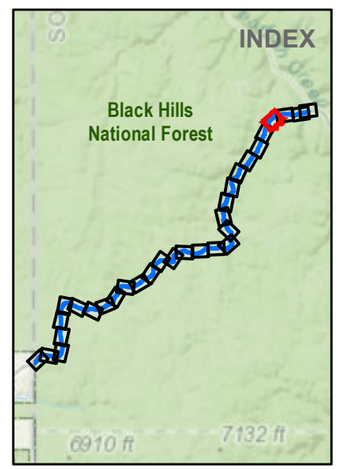


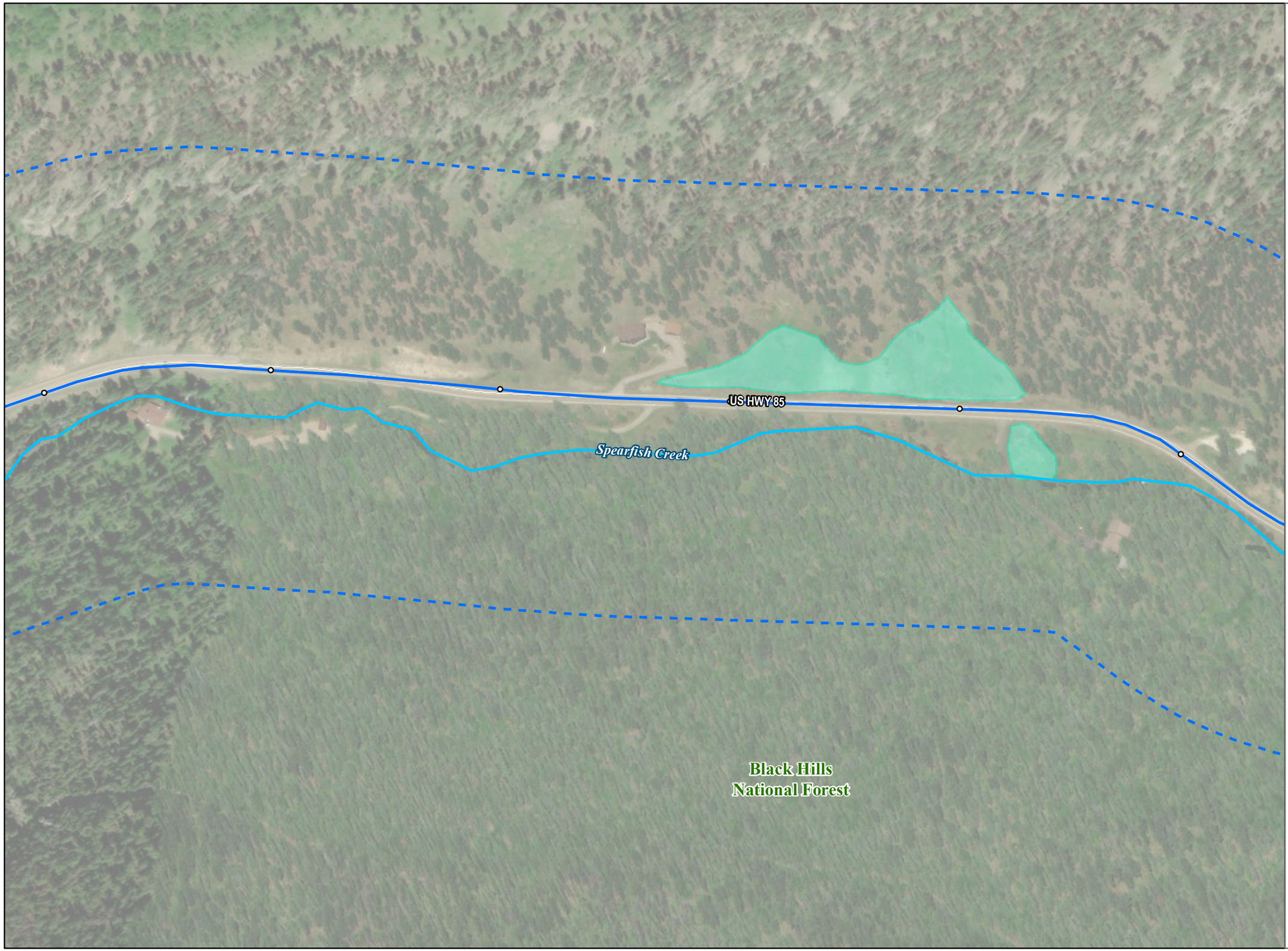
Black Hills Phase III Corridors
Corridor 3: Sheet 28 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



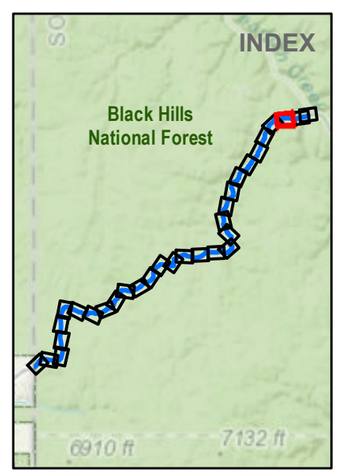


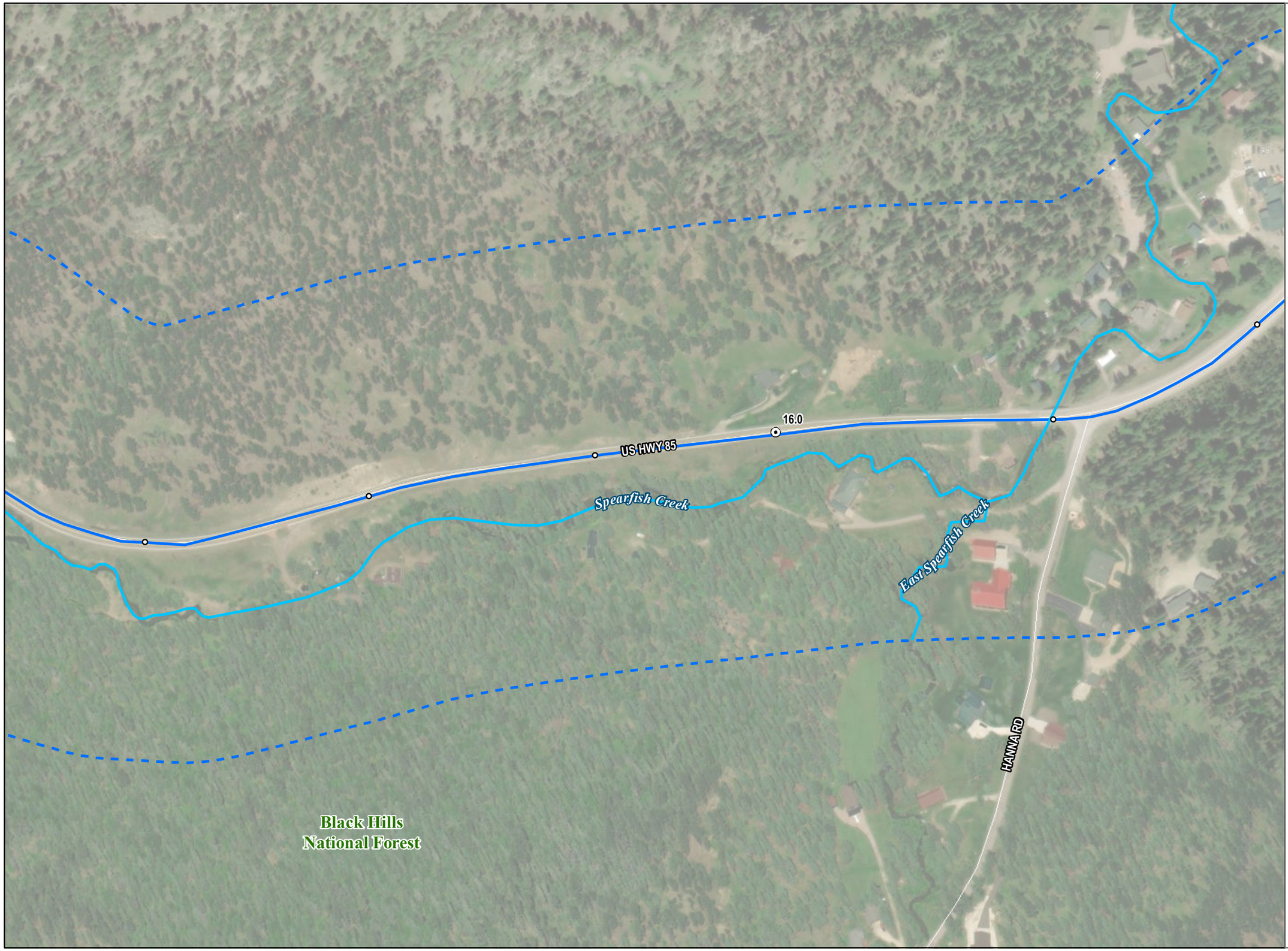
Black Hills Phase III Corridors
Corridor 3: Sheet 29 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet





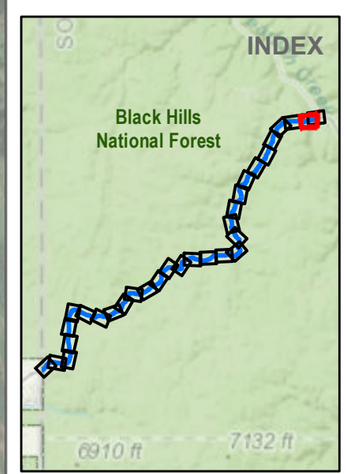
Black Hills Phase III Corridors

Corridor 3: Sheet 30 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Yates Pond

29.0

US HWY 14A

Spearfish Creek

16.0

US HWY 85

East Spearfish Creek

HANNA RD

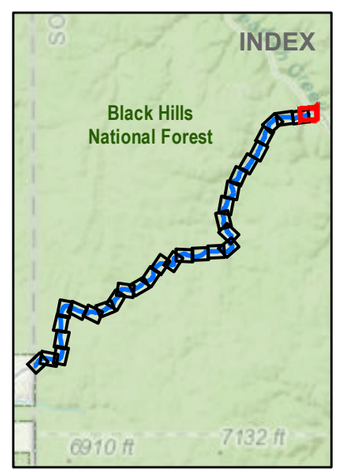
Black Hills
National Forest

Black Hills Phase III Corridors
Corridor 3: Sheet 31 of 31

Legend

- Tenth Mile Marker
- Mile Reference Marker
- Other Environmental Resource
- Snowmobile Trail
- Streams
- Corridor 3: Existing Alignment
- Corridor 3: 500 ft Buffer
- State Boundary
- Black Hills National Forest
- Potential Wetland
- Waterbodies

0 100 200 300 Feet



Appendix B. Visual Impact Analysis Scoping

2.15 Appendix B. Corridor 3 Visual Impact Assessment Scoping

2.15.1 Introduction

This visual impact assessment (VIA) scoping for Corridor 3 identifies issues related to the transportation improvement concepts planned for US 85: Wyoming to US 14A and anticipates the visual resource requirements for the National Environmental Policy Act (NEPA) phase. The VIA scoping process applied to Corridor 3 follows guidance from FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA, 2015) for assessing impacts on visual resources in context to NEPA.

These FHWA Guidelines include a scoping questionnaire, to be applied early in project planning, as a tool to determine the appropriate level of effort for assessing the visual impacts that may result from a proposed highway project. The questionnaire consists of 10 questions, including 5 questions covering *environmental compatibility* and 5 questions covering *viewer sensitivity,* with a scoring system to help determine if a VIA would be required, and if so, the appropriate level of VIA for NEPA documentation: Expanded, Standard, Abbreviated, or Memorandum.

This initial scoping process was based primarily on the Corridor 3 concept planning and design; corridor videos; criteria from the *Black Hills National Forest Land and Resource Management Plan, 1997 Revision, Phase II Amendment;* and guidance from the Black Hills National Forest Landscape Architect regarding applicable Scenic Integrity Objectives and guidelines. Feedback related to visual resources from the Phase 3 public meetings will be incorporated.

The following sections include the initial Corridor 3 VIA Scoping Questionnaire responses, with assumptions, supporting information, and next steps to consider for NEPA.

2.15.2 VIA Scoping

Corridor 3 Scoping Questionnaire

Environmental Compatibility

The five questions about *environmental compatibility* in the VIA Scoping Questionnaire are:

1. ***Will the project result in a noticeable change in the physical characteristics of the existing environment?***

   Consider all project components and construction impacts, both permanent and temporary, including landform changes, structures, noise barriers, vegetation removal, railing, signage, and contractor activities.

   - **High level of permanent change (3)**
   - Moderate level of permanent change (2)
   - Low level of permanent or temporary change (1)
   - No Noticeable Change (0)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-1, following the questionnaire.

2. ***Will the project complement or contrast with the visual character desired by the community?***

   Evaluate the scale and extent of the project features compared to the surrounding scale of the community. Is the project likely to give an urban appearance to an existing rural or suburban community? Do you anticipate that the change will be viewed by the public as positive or negative? Research planning documents or talk with local planners and community representatives to understand the type of visual environment local residents envision for their community.

- **Low Compatibility (3)**
- **Moderate Compatibility (2)**
- High compatibility (1)

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-2, following the questionnaire.

3. ***What types of project features and construction impacts are proposed? Are there particular concerns related to bridge structures, large excavations, sound barriers, vegetation removal, or other features of the proposed project that will raise concerns?***

Certain project improvements can be of special interest to local citizens, causing a heightened level of public concern and requiring a more focused visual analysis.

- **High concern (3)**
- Moderate concern (2)
- Low concern (1)
- Negligible Project Features (0)

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-3, following the questionnaire

4. ***Will the project changes likely be mitigated by normal means such as landscaping and architectural enhancements, or will avoidance or more extensive compensation measures be necessary to minimize adverse change?***

- **Extensive Non-Conventional Mitigation Likely (3)**
- **Some non-conventional Mitigation Likely (2)**
- Only Conventional Mitigation Likely (1)
- No Mitigation Likely (0)

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-4, following the questionnaire

5. ***Will this project, when seen collectively with other projects, result in cumulative adverse impacts to visual resources or their visual character?***

Identify any projects [both state and local] in the area that have been constructed in recent years and those currently planned for future construction. The window of time and the extent of area applicable to possible cumulative impacts should be based on a reasonable anticipation of the viewing public's perception.

- Cumulative Impacts likely: 0– years (3)
- Cumulative Impacts likely: 6–10 years (2)
- **Cumulative Impacts unlikely (1)**

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-5, following the questionnaire.

Viewer Sensitivity

The five questions about *viewer sensitivity* in the VIA Scoping Questionnaire are:

1. ***What is the potential that the project proposal may be controversial within the community, or opposed by any organized group?***

This can be researched initially by talking with the state DOT and local agency management and staff familiar with the affected community's sentiments as evidenced by past projects and/or current information.

- High Potential (3)
- Moderate Potential (2)

- **Low Potential (1)**
- No Potential (0)

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-1, following the questionnaire.

2. ***How sensitive are potential viewer-groups likely to be regarding visible changes proposed by the project?***

   Consider among other factors the number of viewers within the group, probable viewer expectations, activities, viewing duration, and orientation. The expected viewer sensitivity level may be scoped by applying professional judgment and by soliciting information from other DOT staff, local agencies, and community representatives familiar with the affected community's sentiments and demonstrated concerns.

   - **High Sensitivity (3)**
   - Moderate Sensitivity (2)
   - Low Sensitivity (1)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-2, following the questionnaire.

3. ***To what degree does the project appear to be consistent with applicable laws, ordinances, regulations, policies, or standards regarding visual preferences?***

   - **Low Compatibility (3)**
   - Moderate Compatibility (2)
   - High compatibility (1)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-3, following the questionnaire.

4. ***Are any permits going to be required by outside regulatory agencies (i.e., Federal, State, or local) that will necessitate a particular level of Visual Impact Assessment?***

   Permit requirements can have an unintended consequence on the visual environment. Anticipated permits, as well as specific permit requirements – which are defined by the permitter, may be determined by talking with the project environmental planner and project engineer. Note: Coordinate with the state DOT representative responsible for obtaining the permit before communicating directly with any permitting agency. Permits that may benefit from additional analysis include permits that may result in visible built features, such as infiltration basins or devices under a stormwater permit or a retaining wall for wetland avoidance or permits for work in sensitive areas such as coastal development permits or on Federal lands, such as impacts to Wild and Scenic Rivers.

   - Yes (3)
   - **Maybe (2)**
   - No (1)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-4, following the questionnaire.

5. ***Will decision-makers (including the project designers) or the public benefit from a more detailed visual analysis in order to help reach consensus on a course of action?***

   Consider the proposed project features, possible visual impacts, and probable mitigation recommendations.

   - **Yes (3)**
   - Maybe (2)
   - No (1)

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-5, following the questionnaire.

Summary of VIA Scoping Results

This represents an initial VIA scoping effort to get the process started based on a preliminary review of the Corridor 3: US 85: Wyoming to US 14A context-sensitive planning and design documentation and Black Hills National Forest Plan. **With a score ranging from 23 to 25 points, a Standard VIA is appropriate (see below).**

Determining the Level of Visual Impact Assessment

Total scores of the answers to all 10 questions on the Visual Impact Assessment Scoping Questionnaire indicate the appropriate level of VIA to perform for the project. If there remains doubt about whether a VIA needs to be completed, it may be prudent to conduct an Abbreviated VIA. If there remains doubt about the level of the VIA, begin with the simpler VIA process. If visual impacts emerge as a more substantial concern than anticipated, the level of VIA documentation can always be increased.

The level of the VIA can initially be based on the following ranges of total scores:

☐ ***Score 25–30*** An *Expanded VIA* is probably necessary. It is recommended that it should be proceeded by a formal visual scoping study prior to beginning the VIA to alert the project team to potential highly adverse impacts and to develop new project alternatives to avoid those impacts. These technical studies will likely receive statewide, even national, public review. Extensive use of visual simulations and a comprehensive public involvement program would be typical.

x ***Score 20–24*** A *Standard VIA* is recommended. This technical study will likely receive extensive local, perhaps statewide, public review. It would typically include several visual simulations. It would also include a thorough examination of public planning and policy documents supplemented with a direct public engagement processes to determine visual preferences.

☐ ***Score 15–19*** An *Abbreviated VIA* would briefly describe project features, impacts and mitigation requirements. Visual simulations would be optional. An Abbreviated VIA would receive little direct public interest beyond a summary of its findings in the project's environmental documents. Visual preferences would be based on observation and review of planning and policy documents by local jurisdictions.

☐ ***Score 10–14*** A *VIA Memorandum* addressing minor visual issues that indicates the nature of the limited impacts and any necessary mitigation strategies that should be implemented would likely be sufficient along with an explanation of why no formal analysis is required.

☐ ***Score 6–9*** No noticeable physical changes to the environment are proposed and no further analysis is required. Print out a copy of this completed questionnaire for your project file to document that there is no effect. A *VIA Memorandum* may be used to document that there is no effect and to explain the approach used for the determination.

2.15.3 Supporting Information and Assumptions

Environmental Compatibility

The following provides supporting documentation and assumptions related to scores assigned to Environmental Compatibility (EC) Questions 1–5.

Question EC-1: Assumptions

Context and Landscape Character

Corridor 3 is located within the Black Hills National Forest, extending from the Wyoming border to US 14A (approximately 16 miles). Corridor landscape character is defined by continuous patterns of treelined valleys, meadows, and rolling forested hills. The 2-lane US 85 curvilinear roadway alignment fits into the contours of the surrounding topography. The roadway shoulders are grass, bordered by forested edges and hills, with isolated rock outcropping. The riparian corridor along Spearfish Creek create visual diversity, and the overall composition of the US 85 corridor landscape viewsheds is "panoramic," with rim rock outcroppings creating scenic background "focal points."

Roadway Characteristics and Deficiencies (see **Attachment A**)

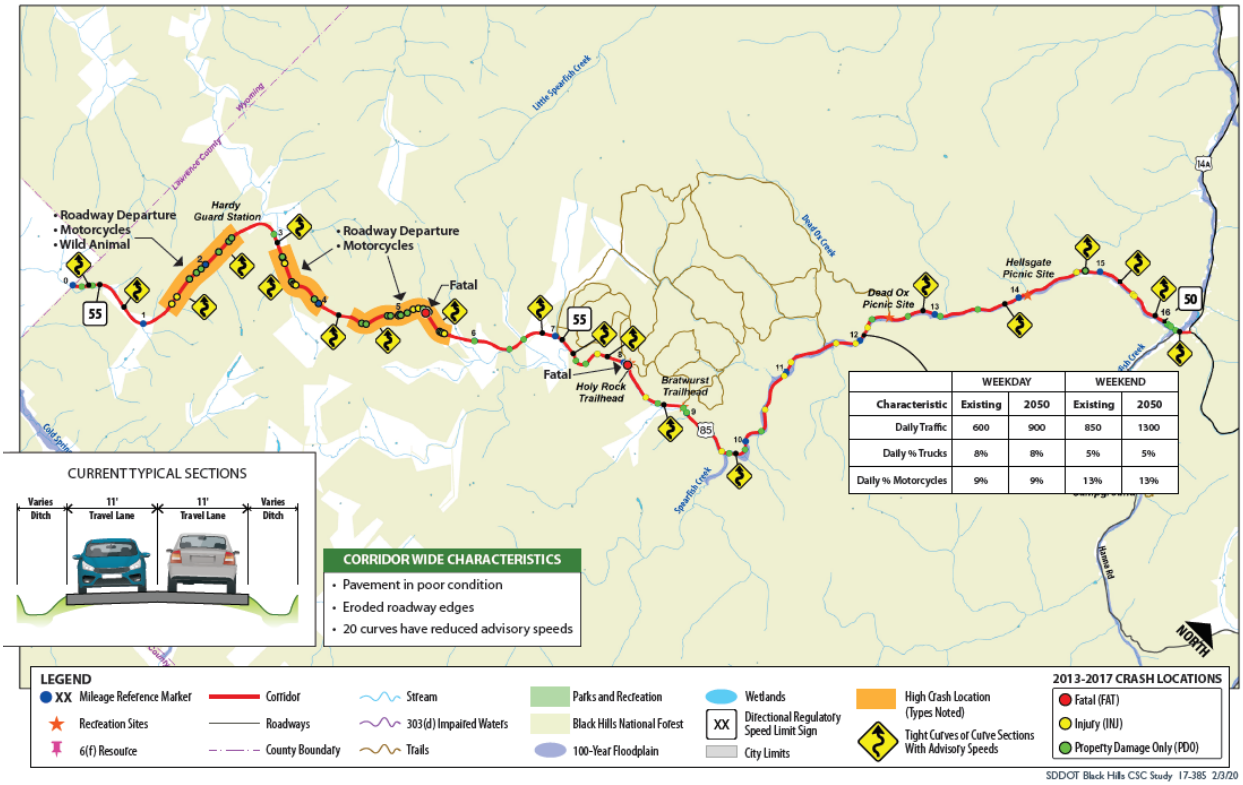
- **Current Typical Roadway Section**: US 85 is a 2-lane roadway with 11-foot lanes, inadequate shoulders with eroding edges, and 20 curves with reduced advisory speeds.
- **Roadway Deficiencies:** Corridor 3 roadway deficiencies include inadequate shoulders with eroding edges and 20 curves with reduced advisory speeds.

Attachment A. Corridor 3 Corridor Characteristics

Black Hills CONTEXT SENSITIVE CORRIDORS STUDY

CORRIDOR 3
US 85: Wyoming to US 14A

Corridor Characteristics



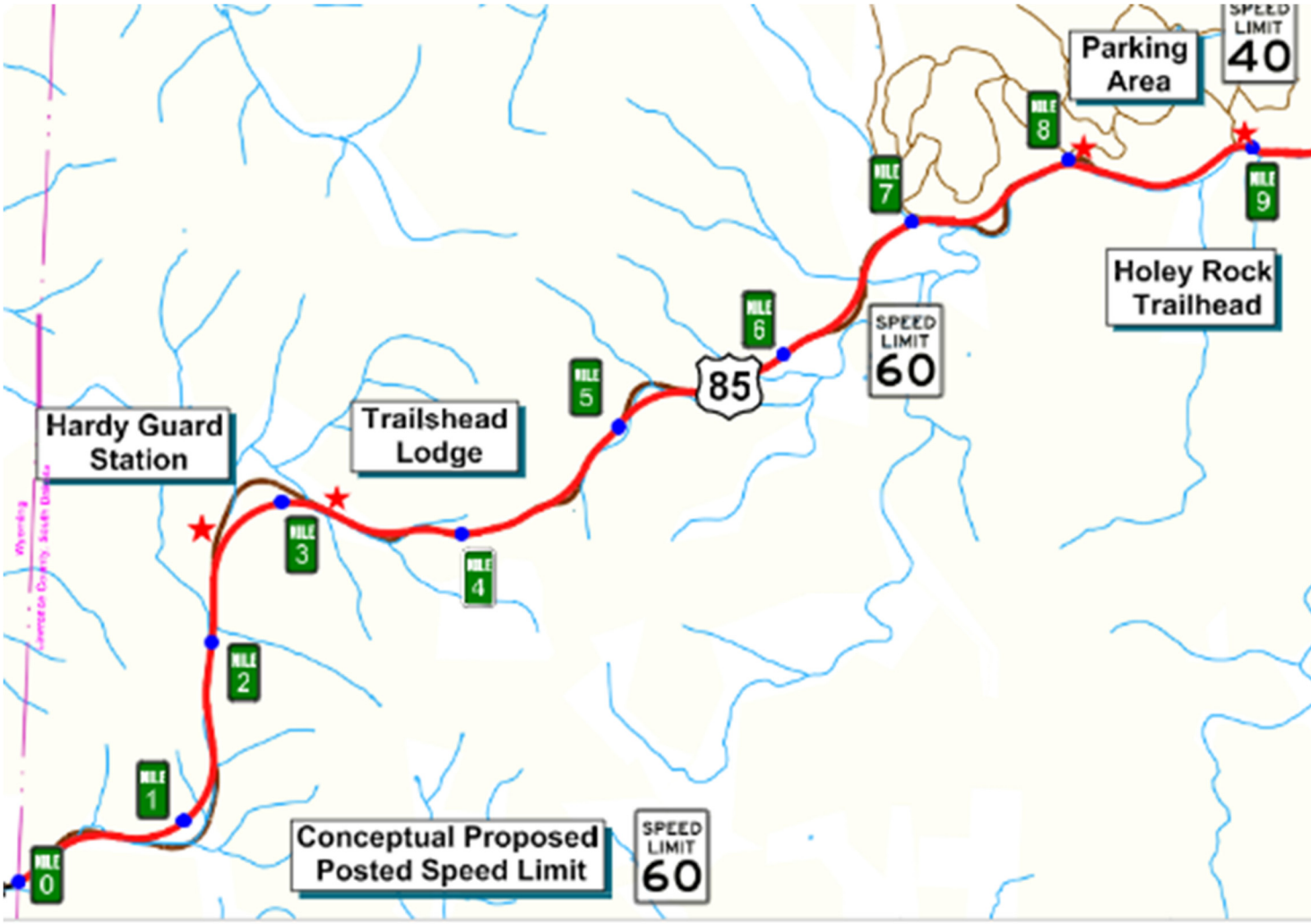
SDDOT Black Hills CSC Study 17-385 2/3/20

Transportation Improvements and Visual Change (see **Attachment B**)

A package of concepts for the corridor could include better signage, shoulder widening, added pullouts, guardrail changes, rumble strips, tree-removal to improve sight distance, and curve smoothing.

Improvements that could result in moderate to strong levels of visual contrast and noticeable visual change include:

- Travel lane and shoulder widening, and pullouts, resulting in roadside tree removal within or adjacent to the right-of-way.
- **Attachment D**. Corridor 3 Proposed Curve Realignments (Mile 1 to Mile 8.1)



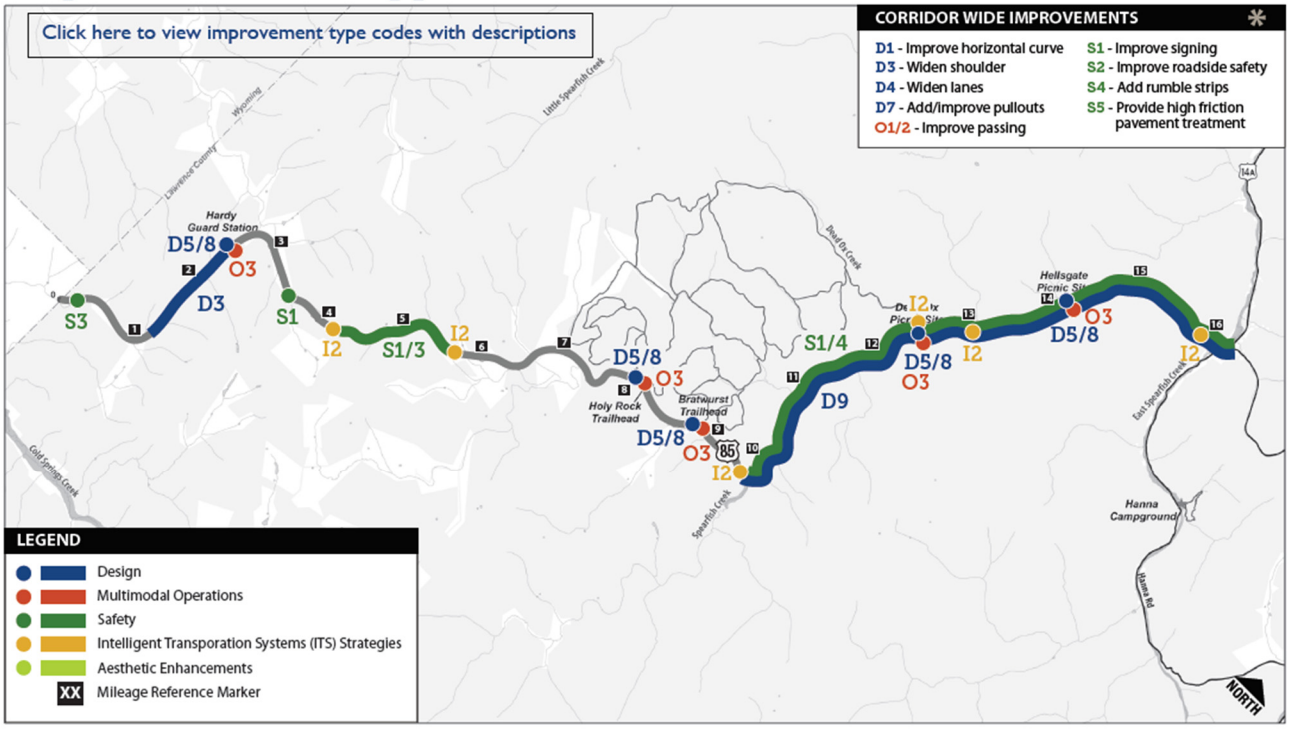
- **Attachment C** illustrates the proposed typical cross-section with variable sections for Corridor 3.
- A sequence of horizontal roadway curve realignments into adjacent forested hills could result in cut and fill slopes, minor rock cuts, and tree-clearing between mile markers 0–8.1 (shear tall rock faces are planned to be avoided). **Attachment D** illustrates proposed curve realignment locations. **Attachment E** illustrates a curve realignment concept for Mile 8.
- East Spearfish bridge replacement.

Attachment B. Corridor 3 Improvements to Support Vision

PURPOSE:
Commuter/Commercial Route

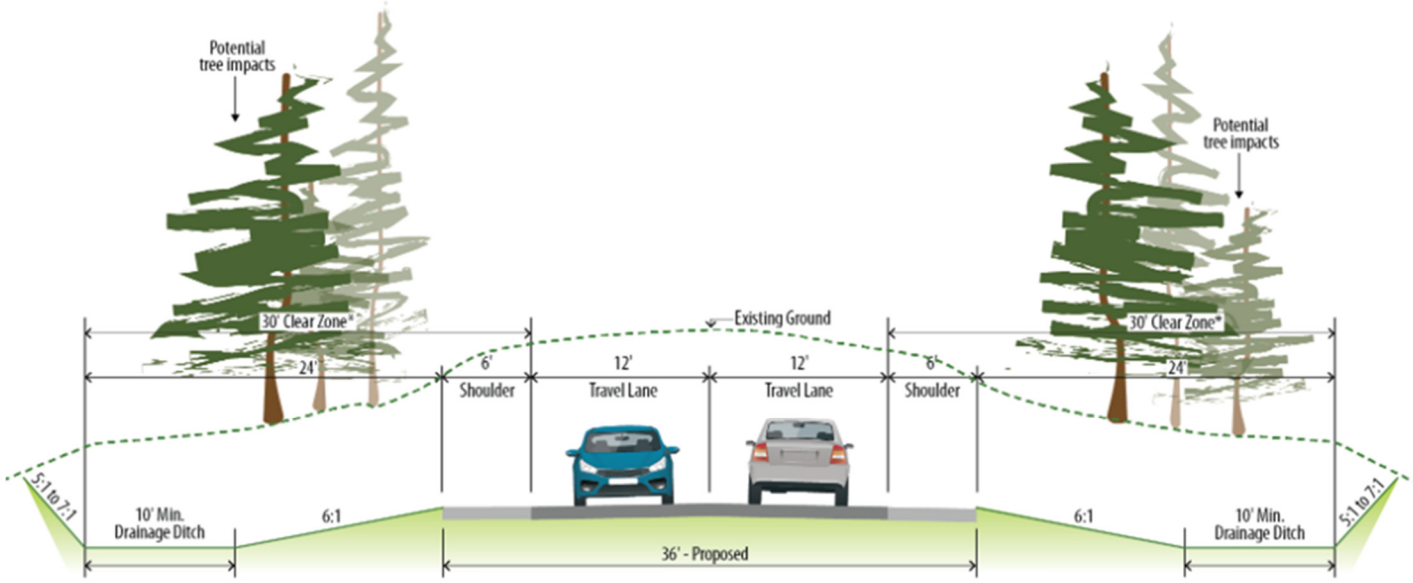
CORRIDOR 3
US 85: Wyoming to US 14A

Improvements to Support Vision



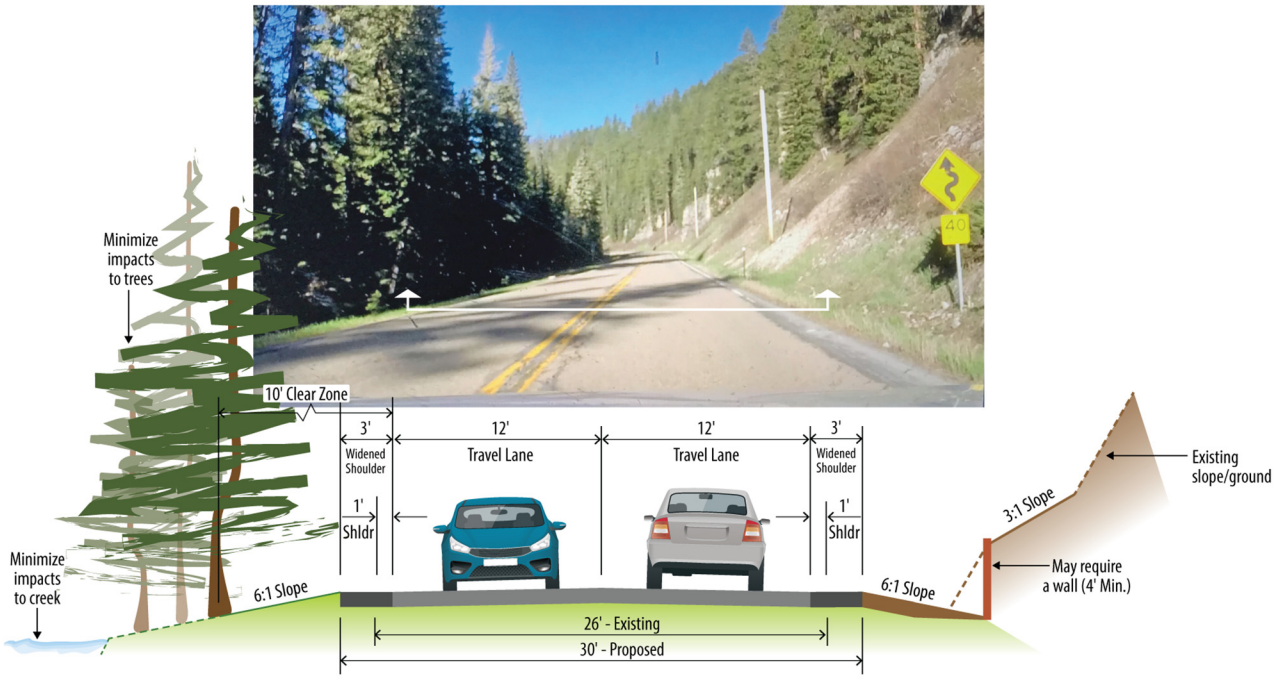
See Corridor Visioning - Potential Improvement Types Table for Specific Element Defintions

Attachment C. Proposed Cross Sections – Variable Shoulder Widths

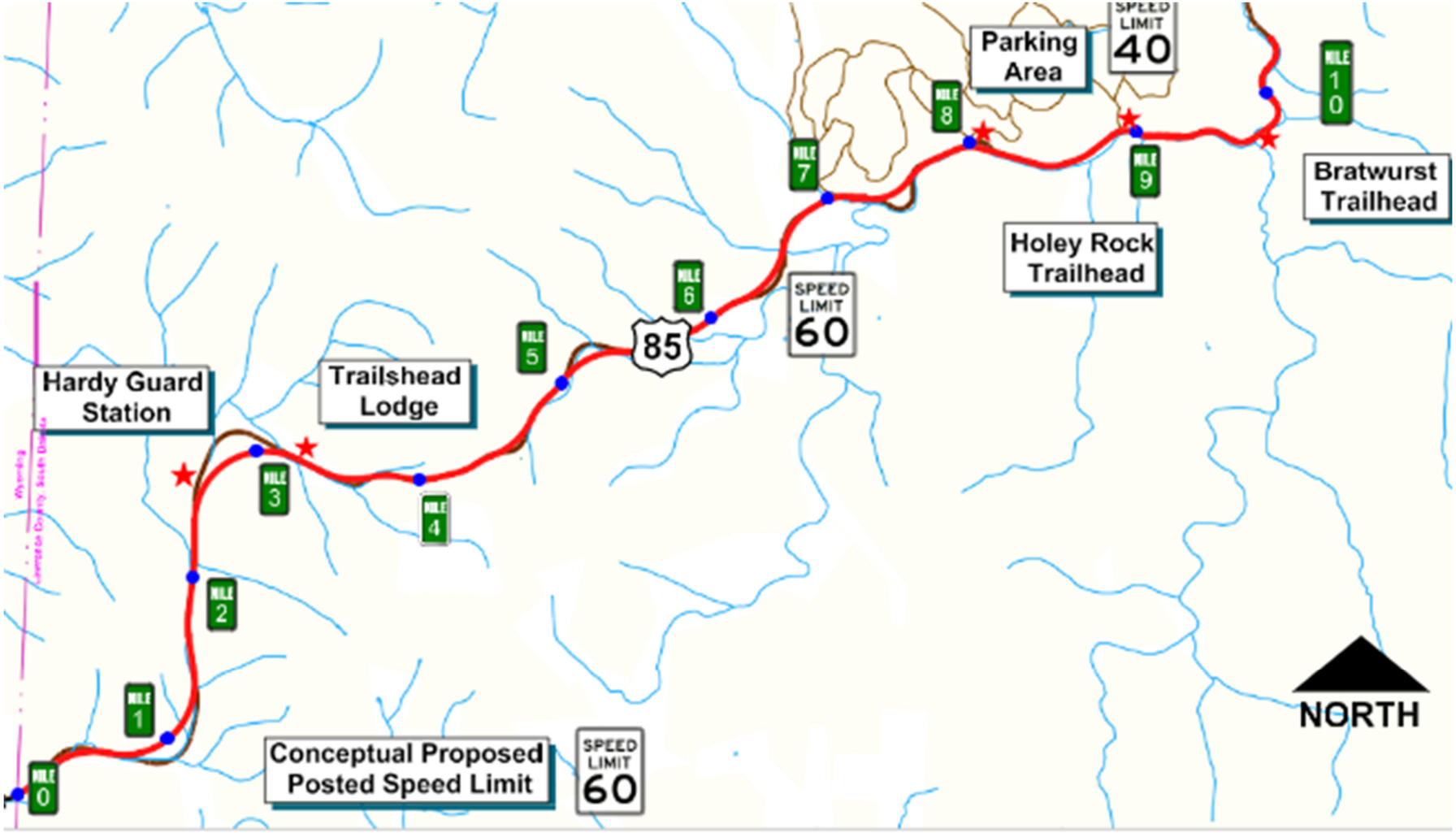


US 85 Typical Section MRM 1.0+/- and 3.0+/-

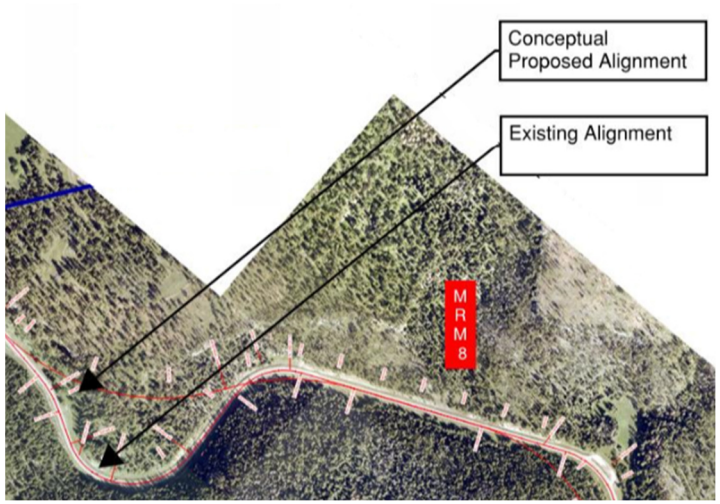
US 85 Typical Section MRM 11.0+/-



Attachment D. Corridor 3 Proposed Curve Realignments (Mile 1 to Mile 8.1)



Attachment E. Corridor 3, US 85 Conceptual Curve Realignment



Curve realignment concept near Mile 8

Street view northeast

Aerial view northeast

Street view southwest

Aerial view southwest

Question EC-2: Assumptions

US 85 is a recreation and commuting oriented corridor through an undeveloped/natural scenic landscape within the Black Hills National Forest. The landform and vegetation contrast resulting from US 85 roadway widening and realignments is considered moderately compatible with scenery management goals for maintaining the scenic quality of the forest landscapes in the *Black Hills National Forest Land and Resource Management Plan*.

Summary of community comments from the public outreach on proposed improvements (July-August 2021):

- Corridor-wide Purpose and Need:
  - *Concerns for widening and increasing speed*
  - *Entire road from Wyoming is essentially a scenic highway*
  - *Impacts on the environment and beauty of this drive are too great to save a few minutes*

Question EC-3: Assumptions

Travel lane and shoulder widening, as well as roadway realignments, will result in new cut and fill slopes and tree clearing through currently undisturbed forest hillsides.

Question EC-4: Assumptions

Site-specific mitigation for impacts resulting from lane and shoulder widening and curve realignments through undisturbed forested areas would require context-sensitive design approaches. The level of non-conventional visual resource-related mitigation development will depend on the extent of tree removal, road cuts, and walls. Mitigation strategies may include conducting detailed site surveys and applying design techniques to reduce visual contrast to the form, line, color, texture, and scale of landform, vegetation, or structural changes, such as:

- Slope rounding and warping to blend cut slopes into adjacent terrain
- Revegetation
- Aesthetic treatment to retaining walls or structural elements

Question EC-5: Assumptions

The existing corridor is visually intact, and the USFS Black Hills National Forest Visual Management classification of High Scenic Integrity rating would retain the landscape character.

Viewer Sensitivity

The following provides supporting documentation and assumptions related to scores assigned to Viewer Sensitivity (VS) Questions 1–5.

Question VS-1: Assumptions

Ongoing public, agency, and stakeholder involvement in the planning and design process will create a positive collaborative approach.

Question VS-2: Assumptions

As a commuting corridor through the Black Hills National Forest, the sensitivity to the visual changes to the landscape character is considered moderate.

Summary of community comments from the public outreach on proposed improvements (July-August 2021):

A homeowner on US 5 emphasized the corridor scenery, and concerns for the impact of proposed improvements on the environment and "beauty of this drive."

Question VS-3: Assumptions

The *Black Hills National Forest Land and Resource Management Plan* (USFS, Phase II Amendment 2006):

Chapter One: Goals and Objectives—*Goal 4*

- **402:** Provide for scenic quality, a range of recreational opportunities, and protection of heritage resources in response to the needs of the Black Hills National Forest visitors and local communities.

Chapter Two: Standards and Guidelines–*Scenery Management*

- ***High Scenic Integrity Objective*:** In the *Immediate Foreground* (within 300 feet) & *Foreground* (within one-half mile) of Corridor 3 = a mile-wide viewshed corridor centered on US 85.
- **High SIO:** A scenic integrity level meaning human activities are not visually evident. In high scenic integrity areas, activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.
- **Applicable Guidelines**: The following ***SIO Guidelines*** from the *Black Hills National Forest Land & Resource Management Plan* apply: 5602, 5603, 5604, 5606, 5607, 5608, 5609, 5610:
  - **5602**. Management activities which are inconsistent with the scenic integrity objectives will be prohibited unless a decision is made to change the scenic integrity objective. Such decisions will be documented in a site-specific decision document.
  - **5603**. Use the following priorities for rehabilitating areas that do not meet scenic integrity objectives (SIO):
    a. Relative importance of the area and the amount of deviation from the scenic integrity objectives. "Foreground" of high public use areas has highest priority;
    b. Length of time it will take natural processes to reduce the visual impacts so that they meet the scenic integrity objective(s);
    c. Length of time it will take for rehabilitation measures to meet the scenic integrity objective; and
    d. Benefits to other resource management objectives to accomplish rehabilitation.
  - **5604.** Achieve enhancement of landscapes where determined appropriate.
  - **5606.** Where the scenic integrity objectives (SIO) criterion is high or moderate, meet the criterion within 1 full growing season after completion of a project.
  - **5607**. Choose facility and structure design, color of materials, location and orientation to meet the scenic integrity for the management area.
  - **5608**. Integrate the protection of aesthetic values with all resource planning.
  - **5609.** Highest priority for protection of scenic quality are those areas of heavy public use, such as scenic byways, major roads or trails, developed recreation sites, administrative sites, and backdrops for cities and towns.
  - **5610**. Within the immediate foreground of primary travelways/use areas, manage tree stands to enhance the scenic quality and recreational opportunities. Manage for a variety of scenic quality and recreation opportunities. Manage for a variety of scenic conditions including areas of large, yellow-barked ponderosa pine, areas of hiding cover for wildlife, and areas with open park-like conditions, except as needed to meet Objective 10-02.

Question VS-4: Assumptions

The project is not subject to visual resource-related permits within the Black Hills National Forest and will require agency consultation.

Question VS-5: Assumptions

The VIA evaluation process provides opportunities for project-specific mitigation strategies for the proposed improvements to the US 85 corridor:

- The visual impact assessment and mitigation strategies will need to be responsive to the Scenic Byway designation, recreation travel stakeholders, and Black Hills National Forest Scenery Management goals and objectives.

APPENDIX C CORRIDOR DESIGN INFORMATION

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

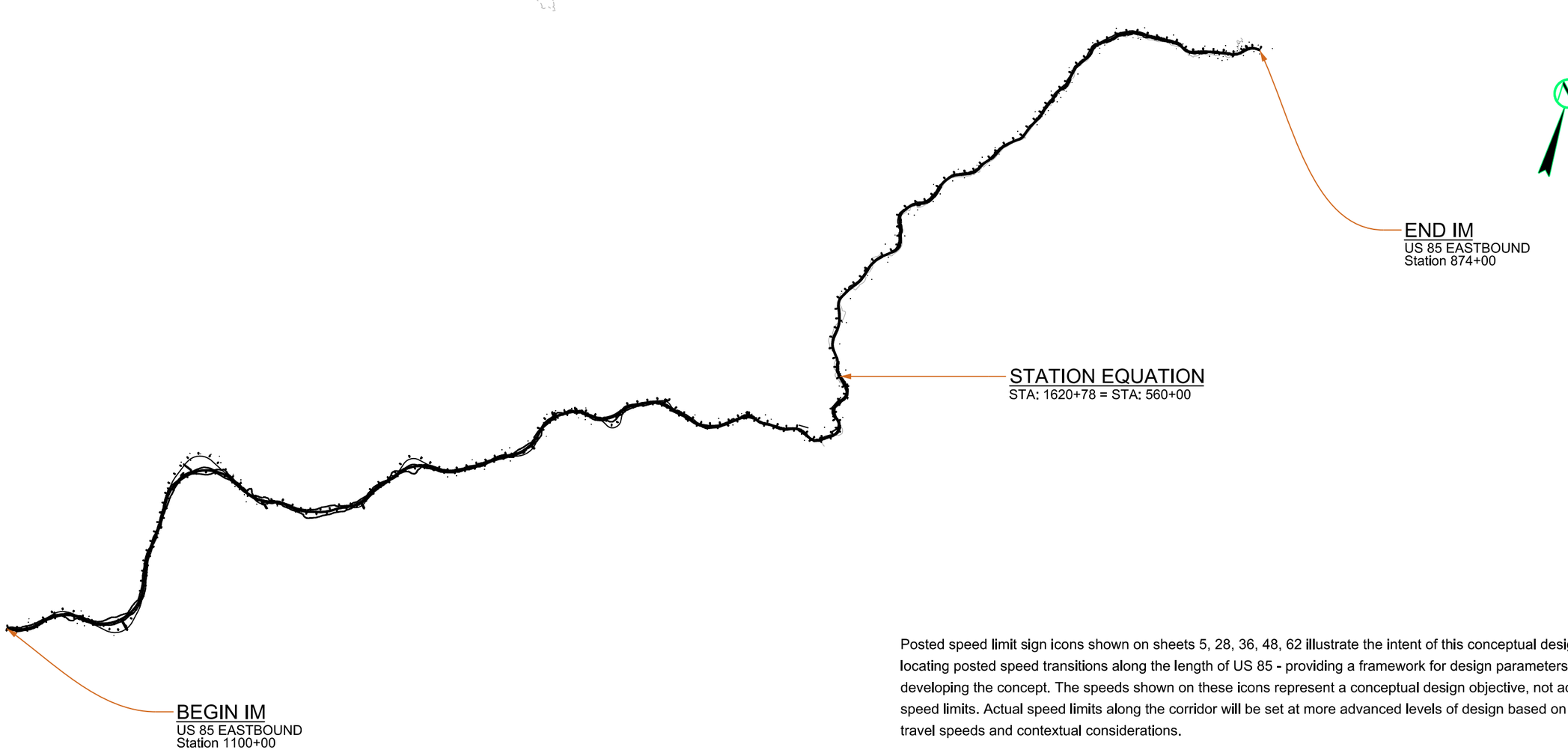
PROJECT NH 0085 (106) 0, PCN 06J8
US HIGHWAY 85
LAWRENCE COUNTY

TYPICAL SECTIONS, CONCEPTUAL PLAN SHEETS, PROFILE SHEETS, AND STRUCTURE SHEETS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0085 (106) 0 N, PCN 06J8	1	105

Plotting Date: 9/28/2022

INDEX OF SHEETS



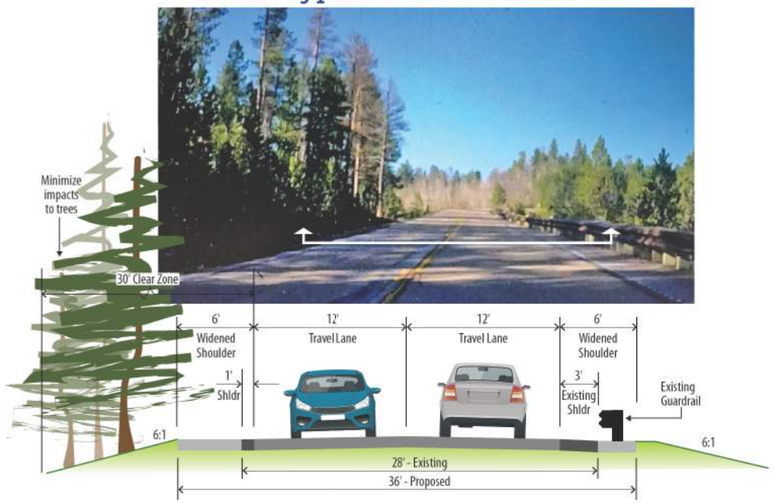
Posted speed limit sign icons shown on sheets 5, 28, 36, 48, 62 illustrate the intent of this conceptual design for locating posted speed transitions along the length of US 85 - providing a framework for design parameters used in developing the concept. The speeds shown on these icons represent a conceptual design objective, not actual posted speed limits. Actual speed limits along the corridor will be set at more advanced levels of design based on anticipated travel speeds and contextual considerations.

Black Hills CONTEXT SENSITIVE CORRIDORS STUDY

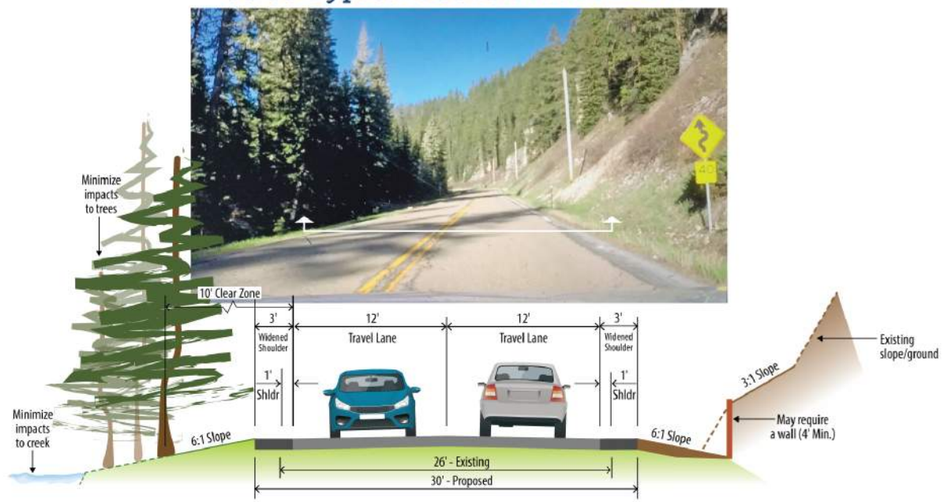
CORRIDOR 3

US 85 (MRM 0-16) **Improvement: Widen Shoulders**

US 85 Typical Section MRM 4.5+/-



US 85 Typical Section MRM 11.0+/-

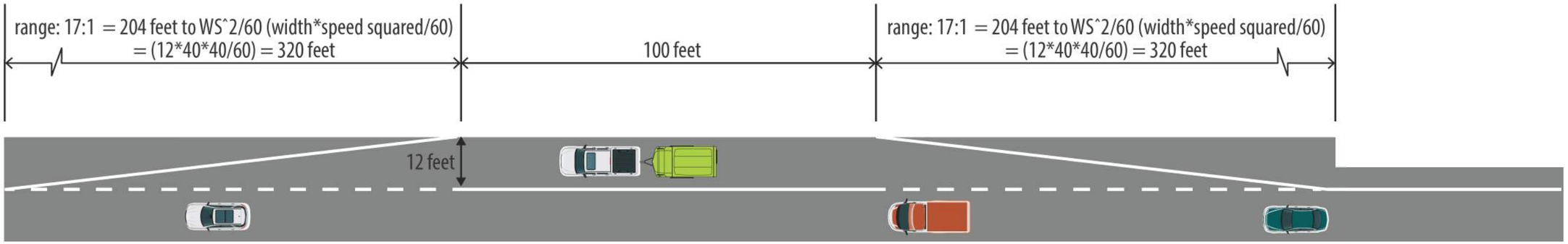


US 85 Typical Section MRM 8.0+/-

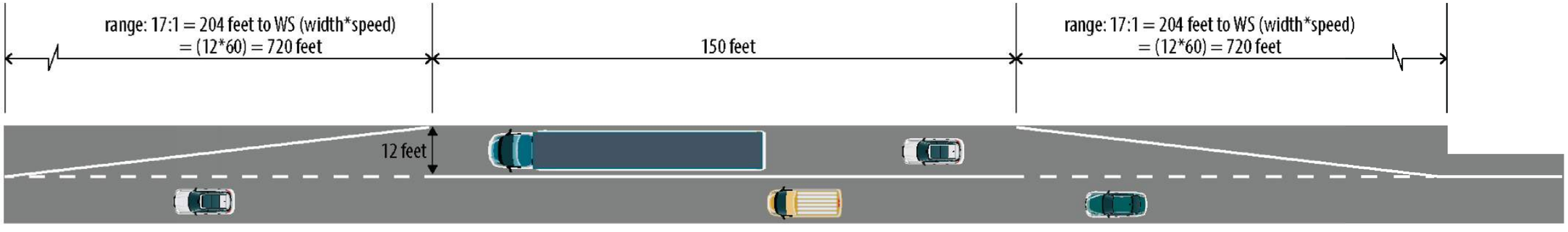
*Clear zone is the width needed for a vehicle to recover once it has left the roadway

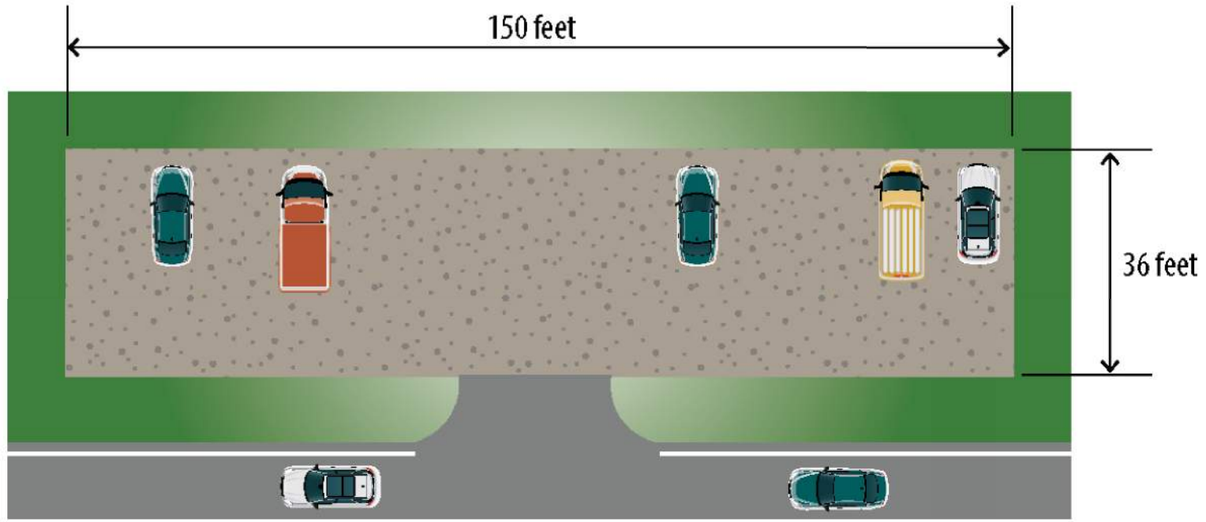
SDDOT Black Hills CSC Study 17-385 4/5/2021

Posted 40 mph Pull-off

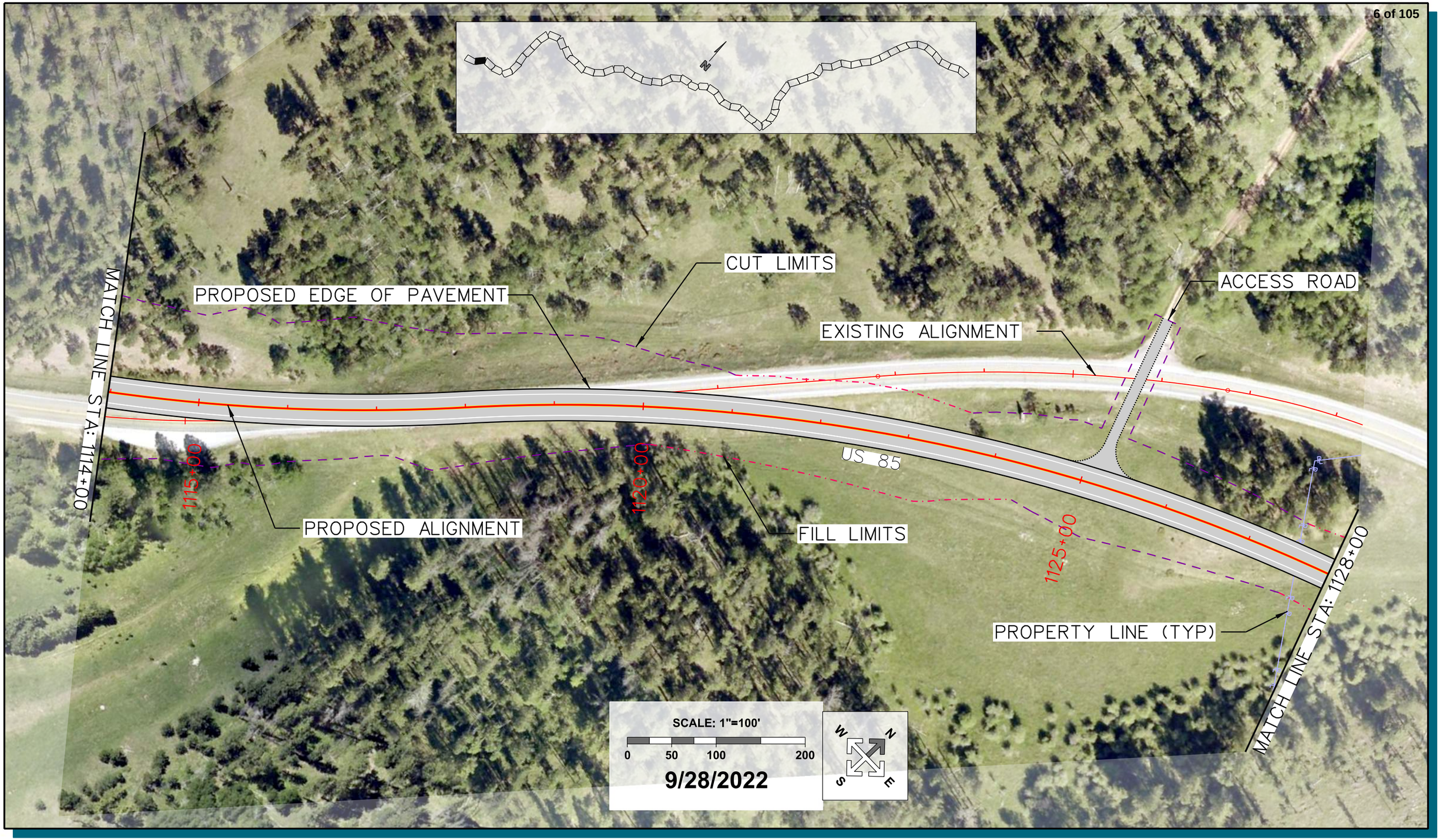


Posted 60 mph Pull-off

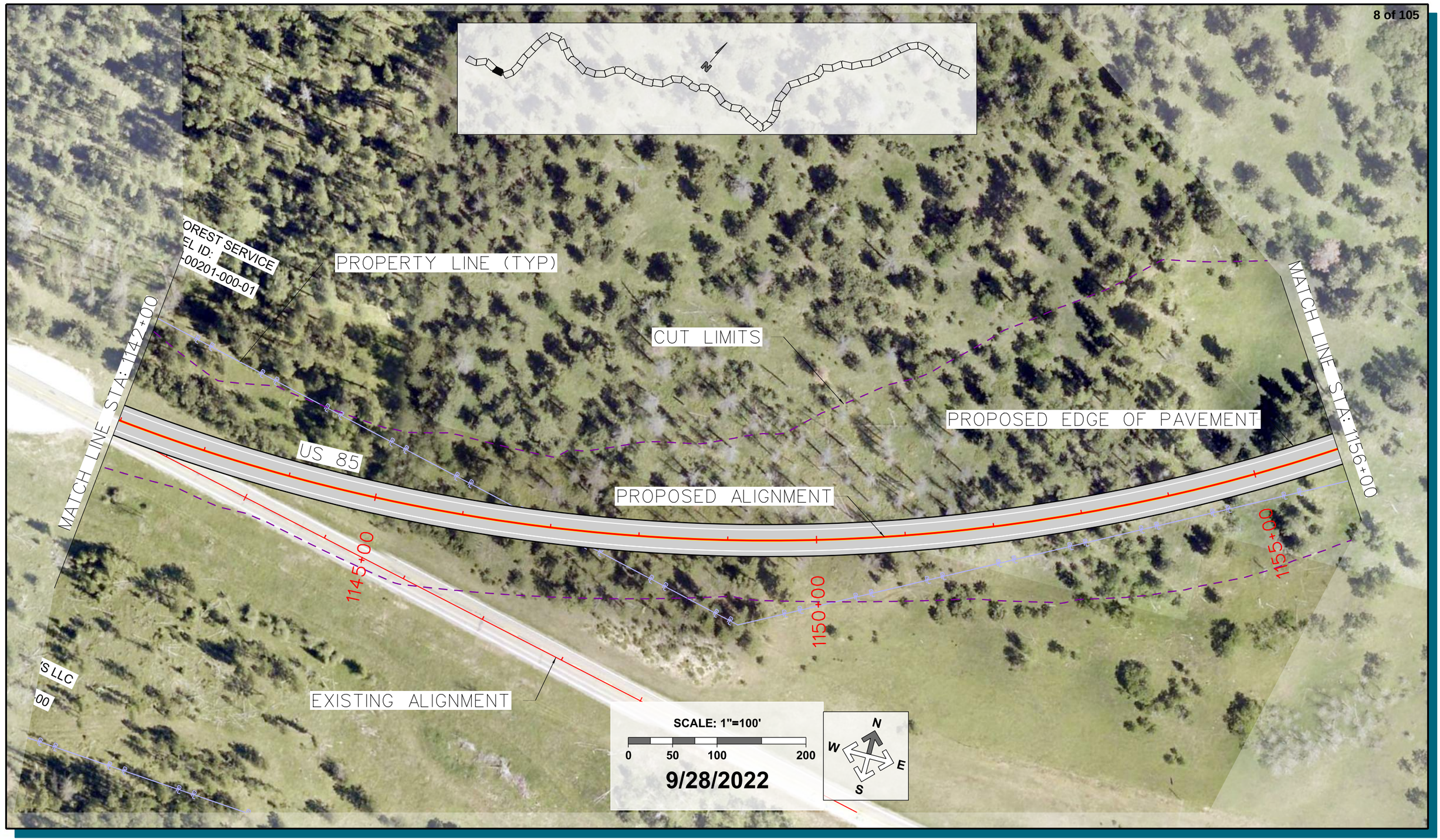


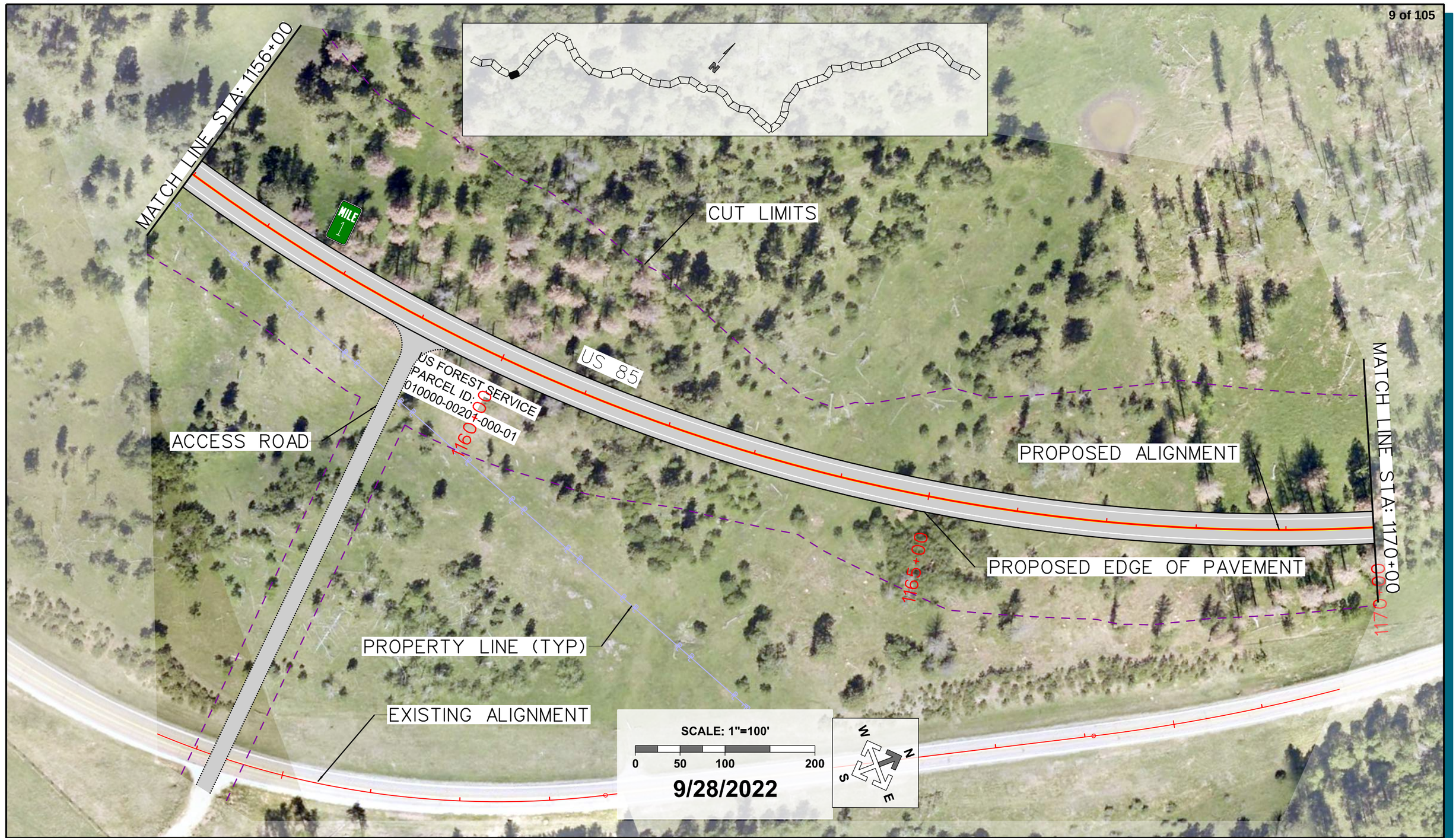

150 feet
36 feet
75 feet
60 feet

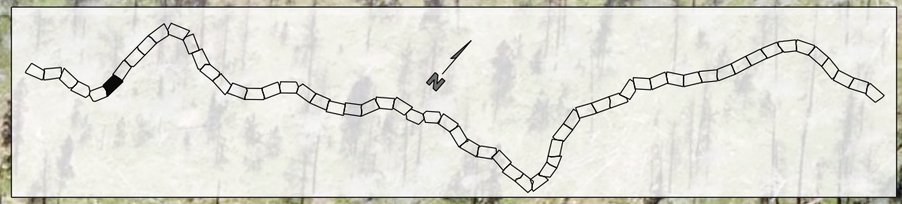

N
STATE OF WYOMING
STATE OF SOUTH DAKOTA
PROPERTY LINE (TYP)
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
MATCH LINE STA: 1114+00
US 85
85
1100+00
STA 1100+00
BEGIN PROJECT
WYOMING STATE LINE
SPEED LIMIT 60
1105+00
MILE 0
1110+00
EXISTING ALIGNMENT
PROPOSED ALIGNMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


N
MATCH LINE STA: 1114+00
PROPOSED EDGE OF PAVEMENT
CUT LIMITS
ACCESS ROAD
EXISTING ALIGNMENT
US 85
1115+00
1120+00
1125+00
PROPOSED ALIGNMENT
FILL LIMITS
PROPERTY LINE (TYP)
MATCH LINE STA: 1128+00
SCALE: 1"=100'
0
50
100
200
9/28/2022
N
E
S
W

Corridor 3 (US 85: Wyoming to US 14A)


PROPERTY LINE (TYP)
CUT LIMITS
MATCH LINE STA: 1142+00
MATCH LINE STA: 1156+00
PROPOSED EDGE OF PAVEMENT
US 85
PROPOSED ALIGNMENT
1145+00
1150+00
1155+00
EXISTING ALIGNMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


MATCH LINE STA: 1156+00
MILE 1
CUT LIMITS
US 85
US FOREST SERVICE
PARCEL ID: 010000-00201-000-01
1160+00
ACCESS ROAD
PROPOSED ALIGNMENT
MATCH LINE STA: 1170+00
1165+00
PROPOSED EDGE OF PAVEMENT
1170+00
PROPERTY LINE (TYP)
EXISTING ALIGNMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W



PROPOSED EDGE OF PAVEMENT

PROPOSED ALIGNMENT

PULLOUT AREA
(SEE 60 MPH
PULLOUT DETAIL)

CUT LIMITS

MATCH LINE STA: 1184+00

MATCH LINE STA: 1170+00

US 85

1170+00

1175+00

1180+00

EXISTING ALIGNMENT

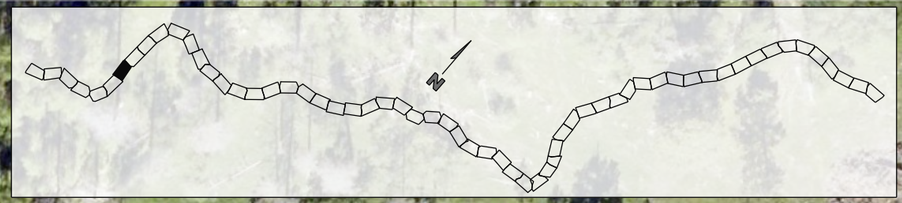
SCALE: 1"=100'

0 50 100 200

9/28/2022

N E S W


PULLOUT AREA
(SEE 60 MPH PULLOUT DETAIL)
PROPOSED EDGE OF PAVEMENT
ACCESS ROAD
EXISTING ALIGNMENT
PROPOSED ALIGNMENT
US 85
MATCH LINE STA: 1184+00
1185+00
1190+00
1195+00
MATCH LINE STA: 1198+00
ACCESS ROAD
CUT LIMITS
PULLOUT AREA
(SEE 60 MPH PULLOUT DETAIL)
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W



MATCH LINE STA: 1198+00

PROPOSED ALIGNMENT

EXISTING ALIGNMENT

FILL LIMITS

MATCH LINE STA: 1212+00

US 85

1200+00

1205+00

1210+00

MILE 2

PROPOSED EDGE OF PAVEMENT

CUT LIMITS

ACCESS ROAD

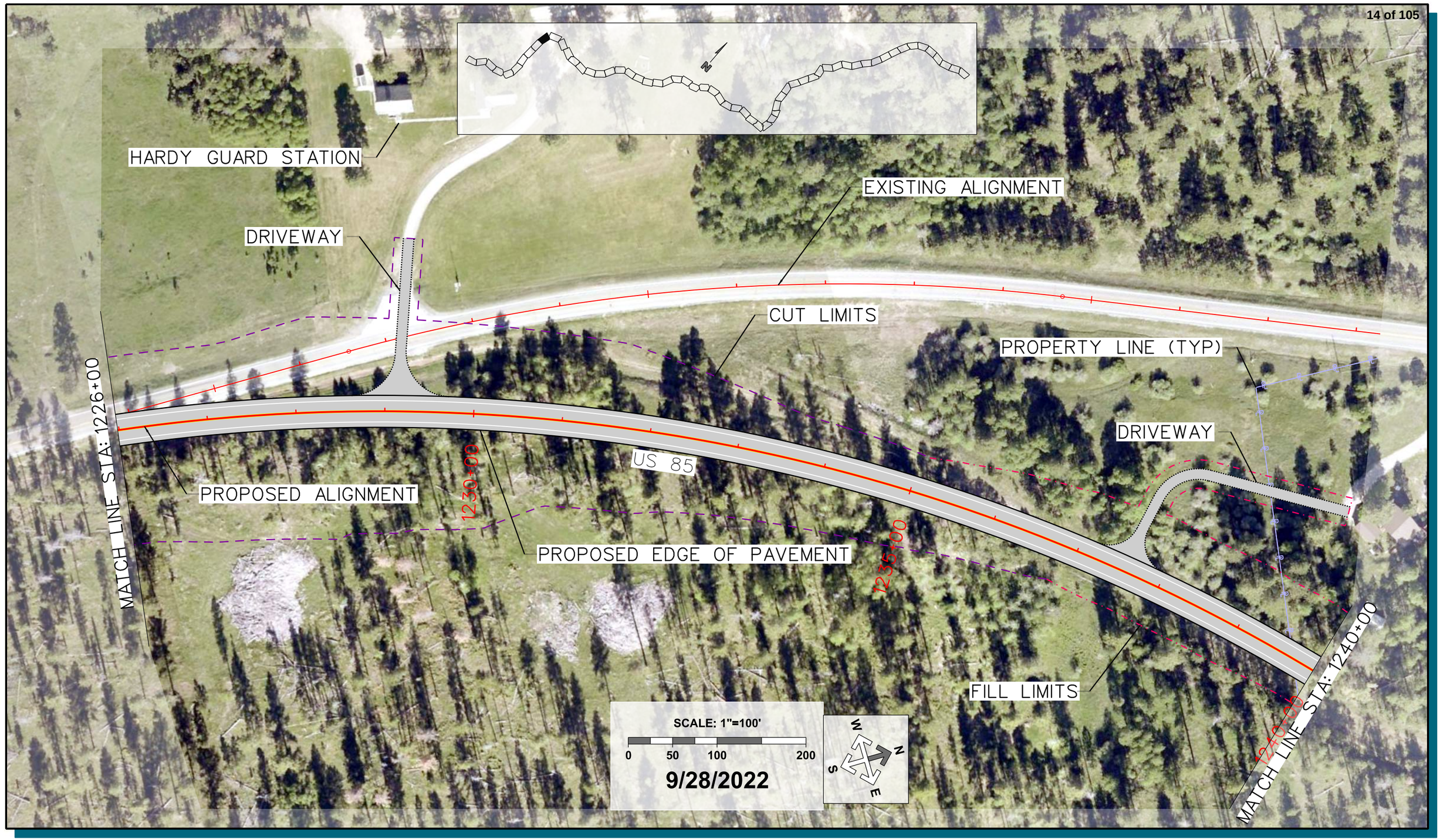
SCALE: 1"=100'

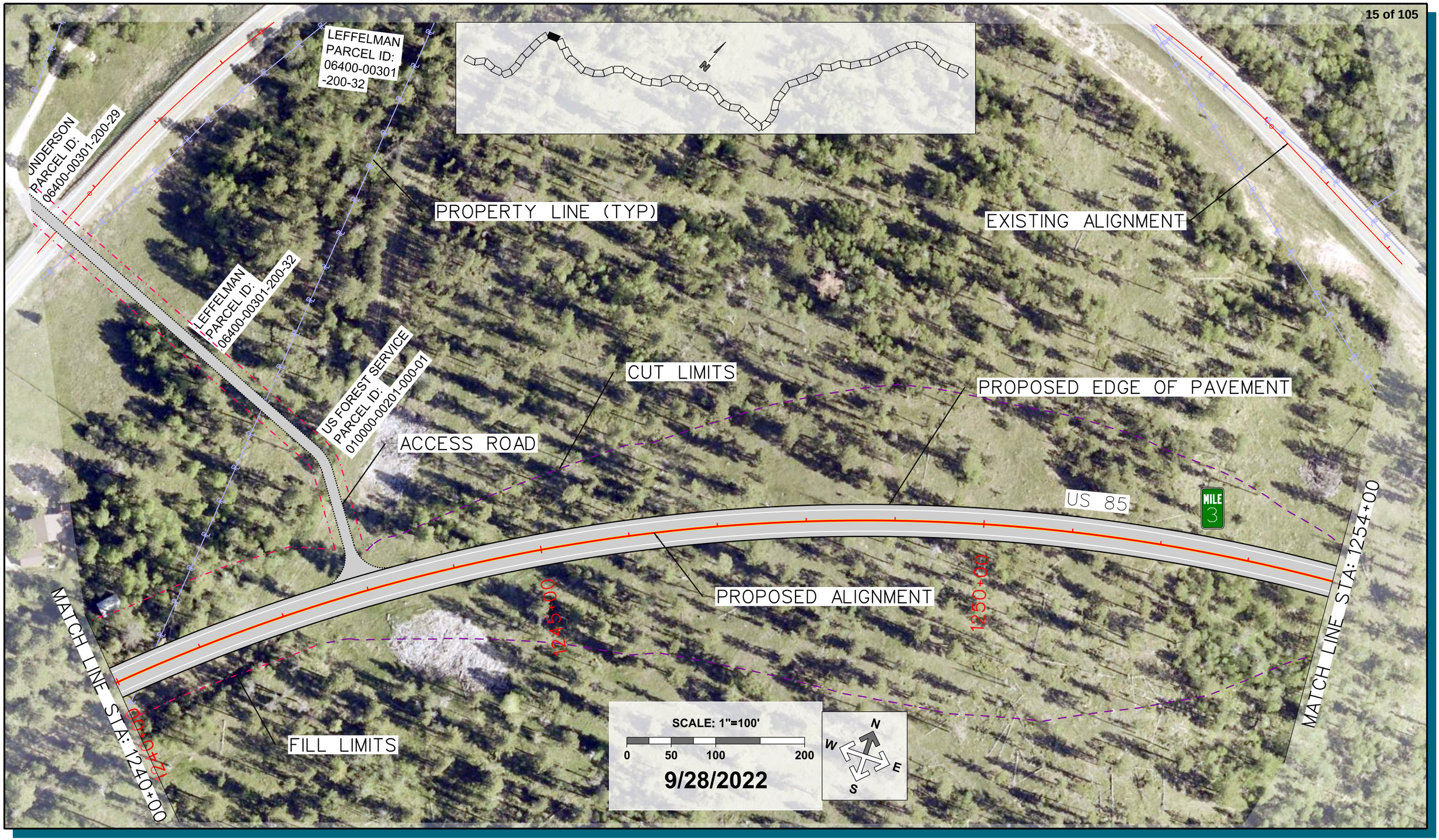
0 50 100 200

9/28/2022

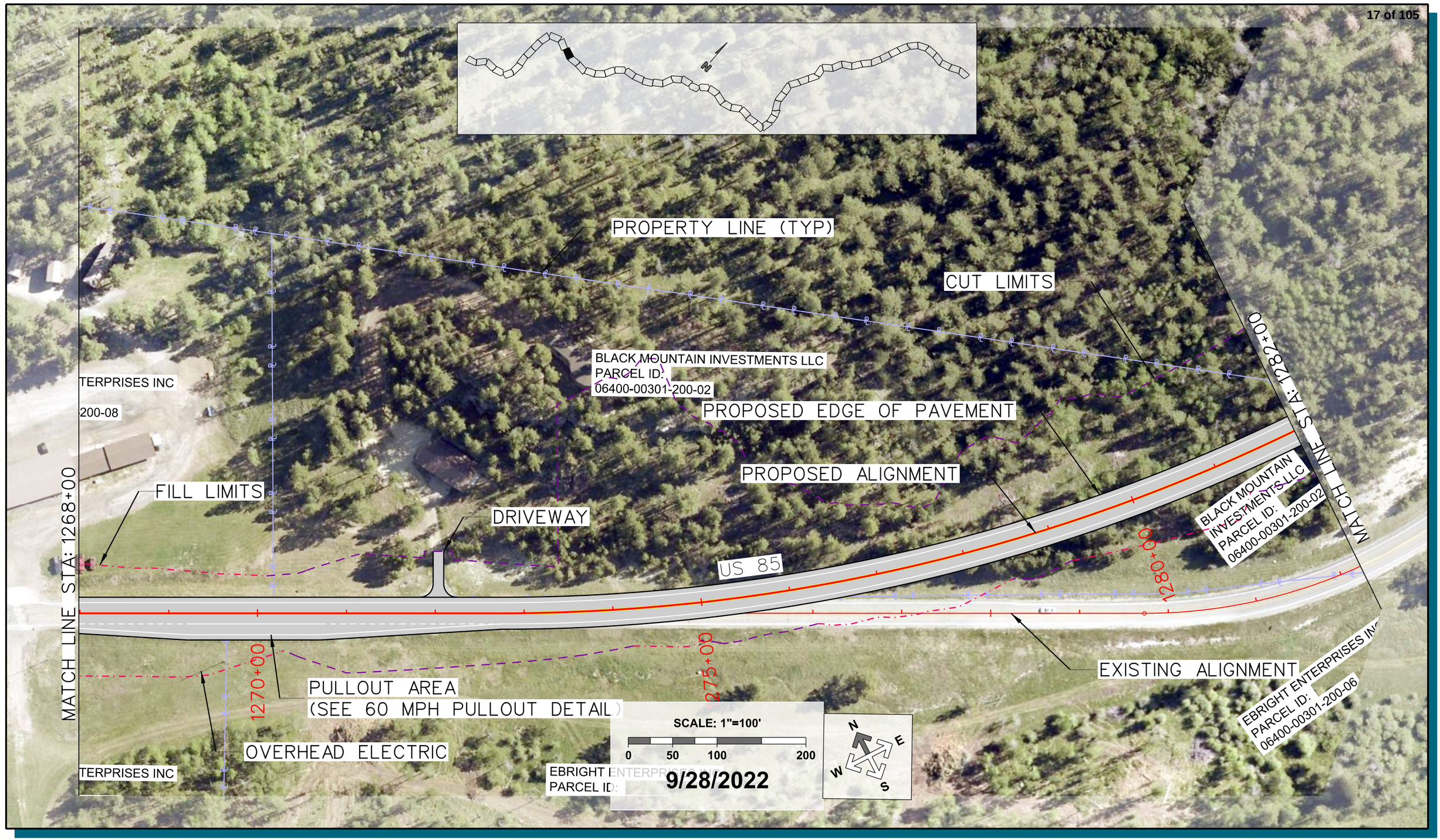
W N S E

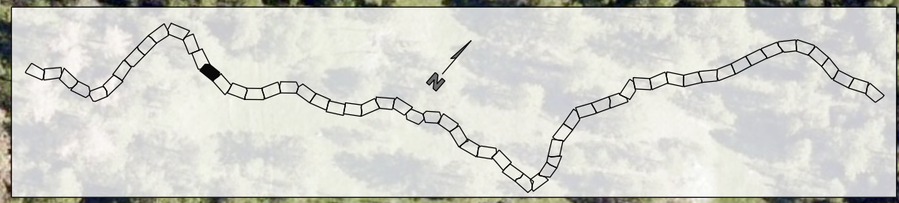
Corridor 3 (US 85: Wyoming to US 14A)


HARDY GUARD STATION
DRIVEWAY
EXISTING ALIGNMENT
CUT LIMITS
PROPERTY LINE (TYP)
DRIVEWAY
MATCH LINE STA: 1225+00
1230+00
US 85
PROPOSED ALIGNMENT
PROPOSED EDGE OF PAVEMENT
1235+00
FILL LIMITS
1240+00
MATCH LINE STA: 1240+00
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W


LEFFELMAN
PARCEL ID:
06400-00301
-200-32
JNDERSON
PARCEL ID:
06400-00301-200-29
LEFFELMAN
PARCEL ID:
06400-00301-200-32
US FOREST SERVICE
PARCEL ID:
010000-00201-000-01
PROPERTY LINE (TYP)
EXISTING ALIGNMENT
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
ACCESS ROAD
US 85
MILE
3
PROPOSED ALIGNMENT
1245+00
1250+00
MATCH LINE STA: 1240+00
MATCH LINE STA: 1254+00
FILL LIMITS
SCALE: 1"=100'
0
50
100
200
9/28/2022
N
W
E
S


GRAND CANYON LANE
RIFLEPIT ROAD
KELLEY
PARCEL ID:
06400-00301-200-12
FILL LIMITS
EXISTING ALIGNMENT
POVANDRA
PARCEL ID:
06400-00301-200-08
TRAILSHEAD LODGE
EBRIGHT EN
PARCEL ID:
06400-00301-
DRIVEWAY
PROPOSED ALIGNMENT
DRIVEWAY
MATCH LINE STA: 1268+00
EBRIGHT ENTERPRISES INC
PARCEL ID:
06400-00301-200-07
US 85
1260+00
EBRIGHT ENTERPRISES INC
PARCEL ID:
06400-00301-200-08
1265+00
OVERHEAD ELECTRIC LINE
PROPOSED EDGE OF PAVEMENT
EBRIGHT EN
PARCEL ID:
06400-00301-
MATCH LINE STA: 1254+00
1256+00
PROPERTY LINE (TYP)
CUT LIMITS
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
E
W
S


PROPERTY LINE (TYP)
CUT LIMITS
BLACK MOUNTAIN INVESTMENTS LLC
PARCEL ID:
06400-00301-200-02
TERPRISES INC
200-08
PROPOSED EDGE OF PAVEMENT
PROPOSED ALIGNMENT
FILL LIMITS
DRIVEWAY
US 85
MATCH LINE STA: 1268+00
MATCH LINE STA: 1282+00
1280+00
1275+00
1270+00
PULLOUT AREA
(SEE 60 MPH PULLOUT DETAIL)
EXISTING ALIGNMENT
OVERHEAD ELECTRIC
TERPRISES INC
EBRIGHT ENTERPRISES INC
PARCEL ID:
06400-00301-200-06
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
E
W
S



MATCH LINE STA: 1282+00

PROPOSED ALIGNMENT

FILL LIMITS

US 85

EXISTING ALIGNMENT

1285+00

1290+00

1295+00

PROPOSED EDGE OF PAVEMENT

US FOREST SERVICE
PARCEL ID:
06400-00301-000-01

CUT LIMITS

MATCH LINE STA: 1296+00

S. RAPID CREEK ROAD

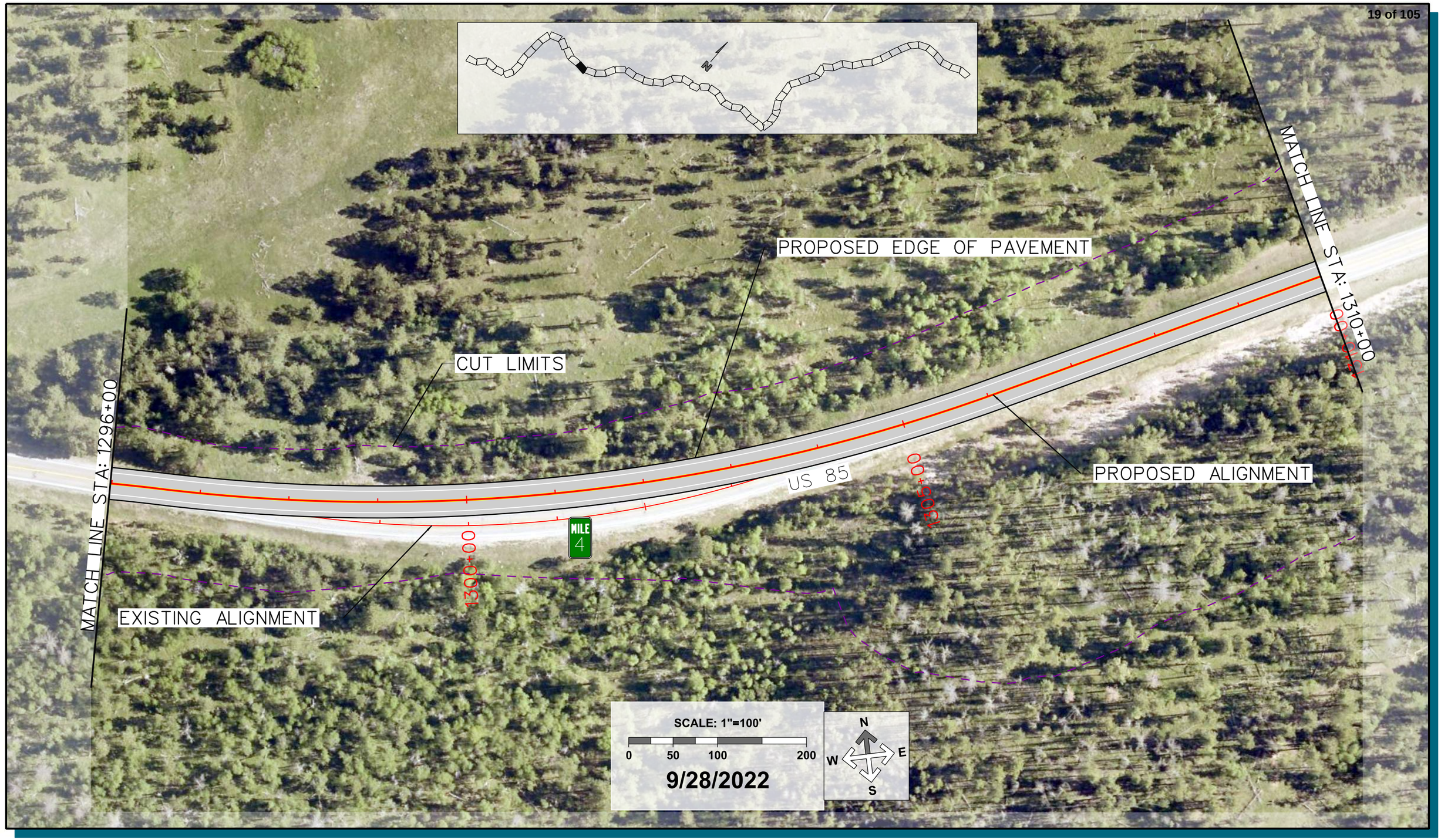
PROPERTY LINE (TYP)

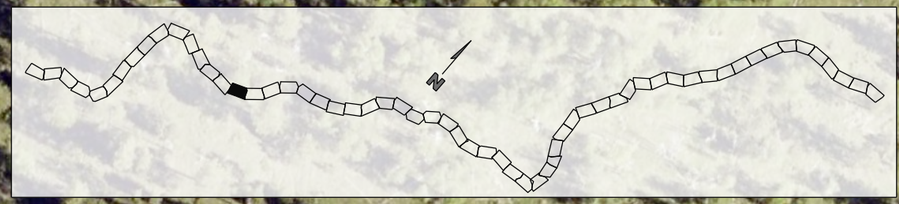
SCALE: 1"=100'

0 50 100 200

9/28/2022

N W E S


PROPOSED EDGE OF PAVEMENT
MATCH LINE STA: 1310+00
CUT LIMITS
MATCH LINE STA: 1296+00
US 85
1305+00
PROPOSED ALIGNMENT
MILE 4
1300+00
EXISTING ALIGNMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W E
S



CUT LIMITS

EXISTING ALIGNMENT

PROPOSED EDGE OF PAVEMENT

PULLOUT AREA
(SEE 60 MPH PULLOUT DETAIL)

MATCH LINE STA: 1310+00

1310+00

US 85

1315+00

1320+00

PROPOSED ALIGNMENT

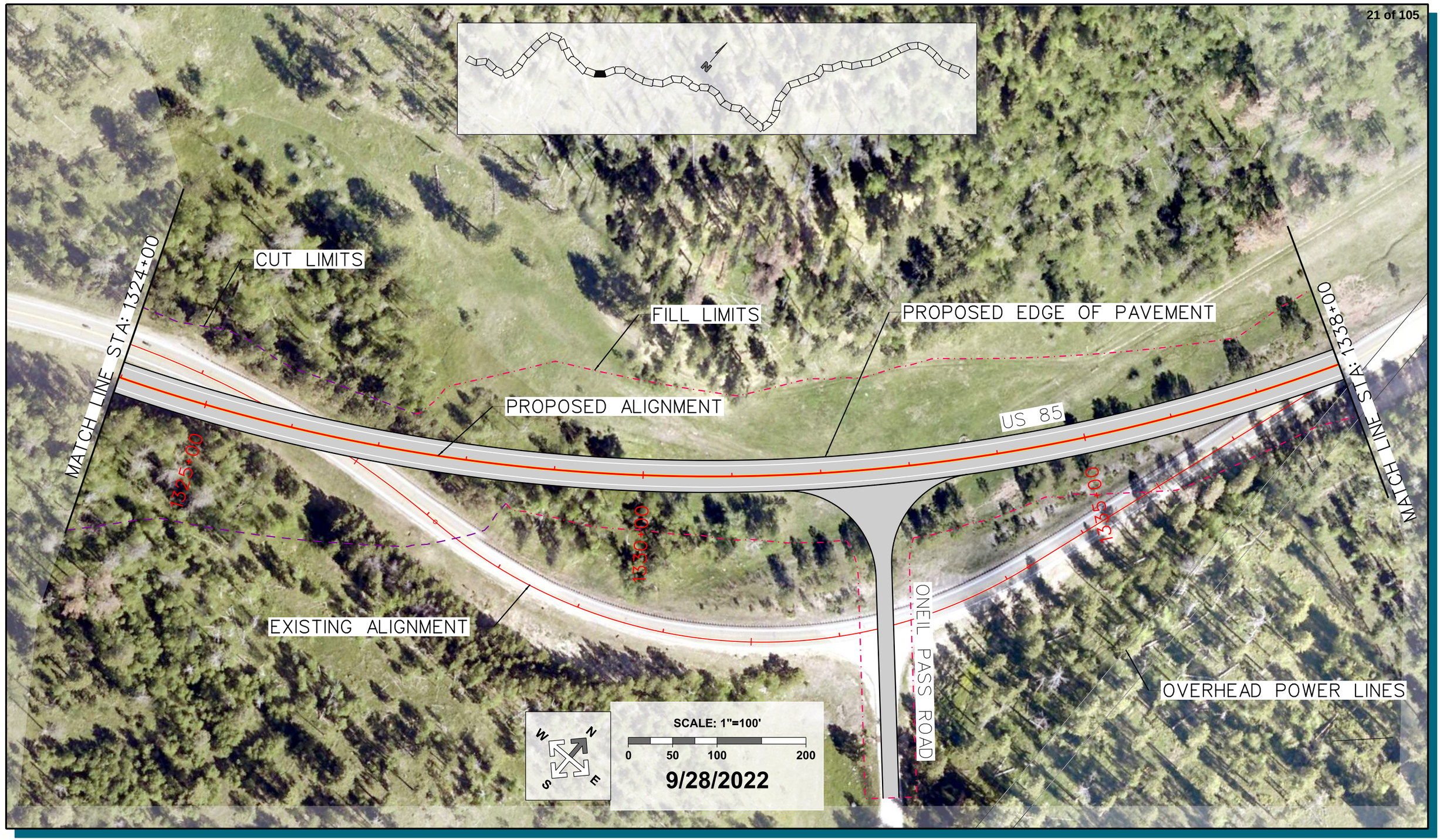
MATCH LINE STA: 1324+00

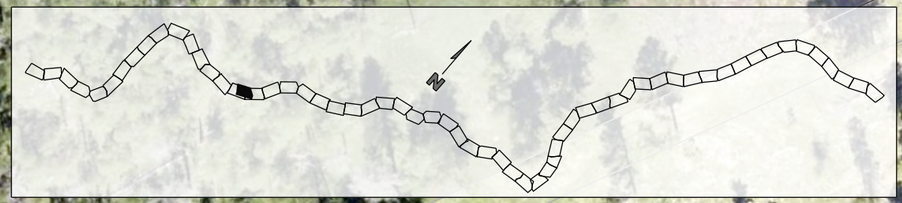
SCALE: 1"=100'

0 50 100 200

9/28/2022

N W E S


CUT LIMITS
FILL LIMITS
PROPOSED EDGE OF PAVEMENT
MATCH LINE STA: 1324+00
MATCH LINE STA: 1338+00
PROPOSED ALIGNMENT
US 85
1325+00
1350+00
1375+00
EXISTING ALIGNMENT
ONEIL PASS ROAD
OVERHEAD POWER LINES
N
W
E
S
SCALE: 1"=100'
0
50
100
200
9/28/2022



OVERHEAD POWER LINE

FILL LIMITS

EXISTING ALIGNMENT

ACCESS ROAD

MATCH LINE STA: 1338+00

1340+00

US 85

1345+00

PROPOSED ALIGNMENT

PROPOSED EDGE OF PAVEMENT

1350+00

MATCH LINE STA: 1352+00

CUT LIMITS

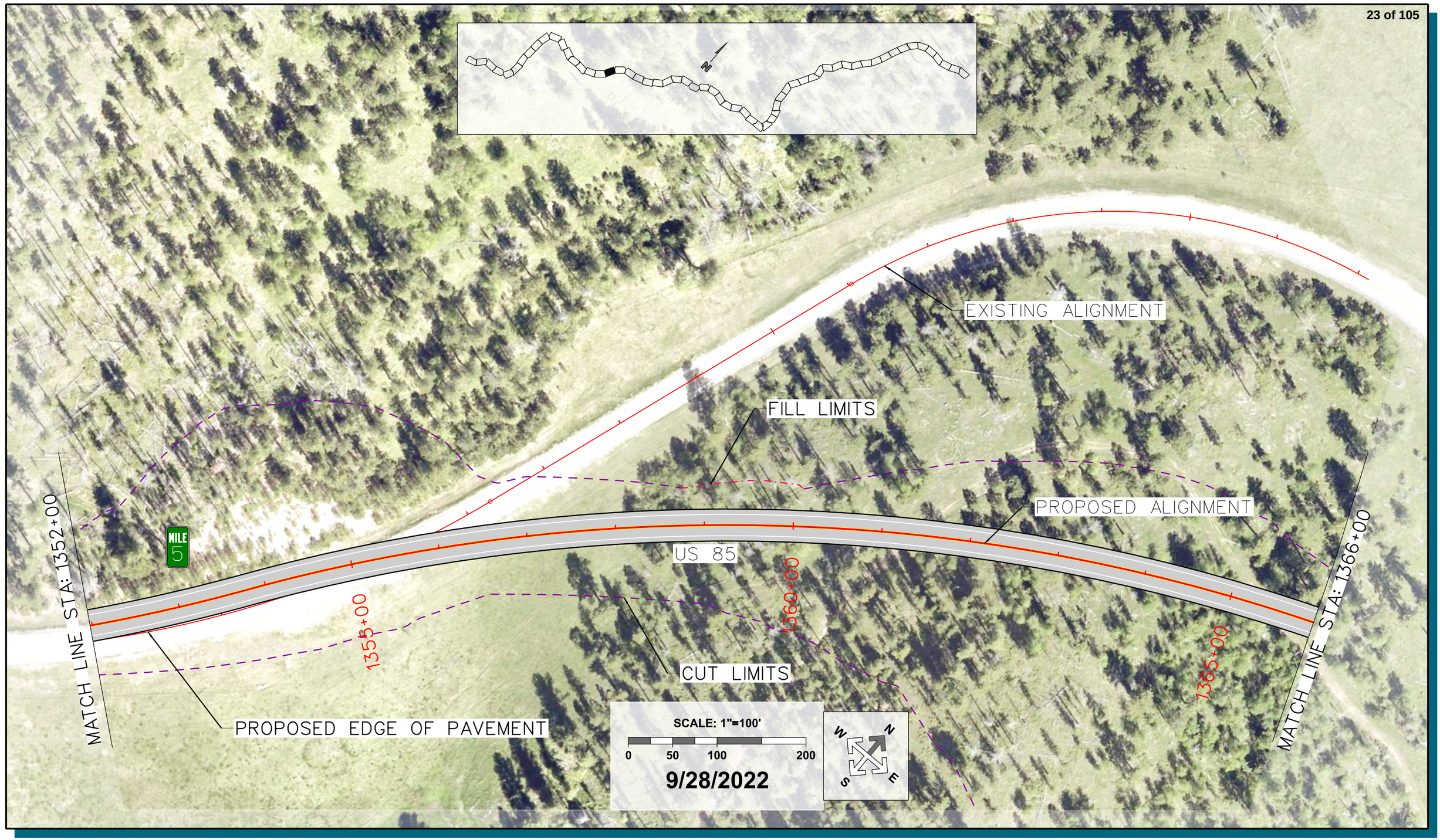
SCALE: 1"=100'

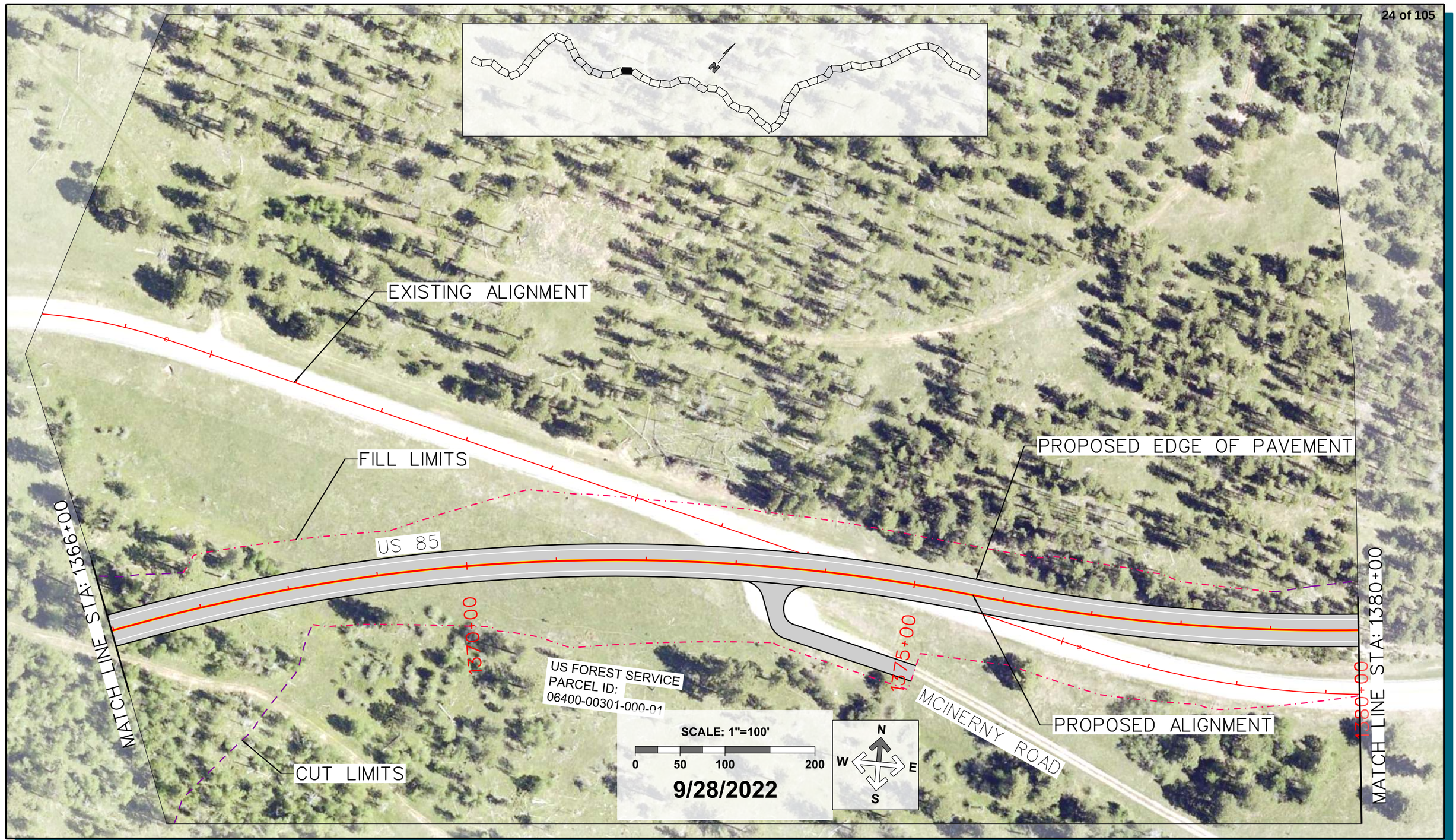
0 50 100 200

9/28/2022

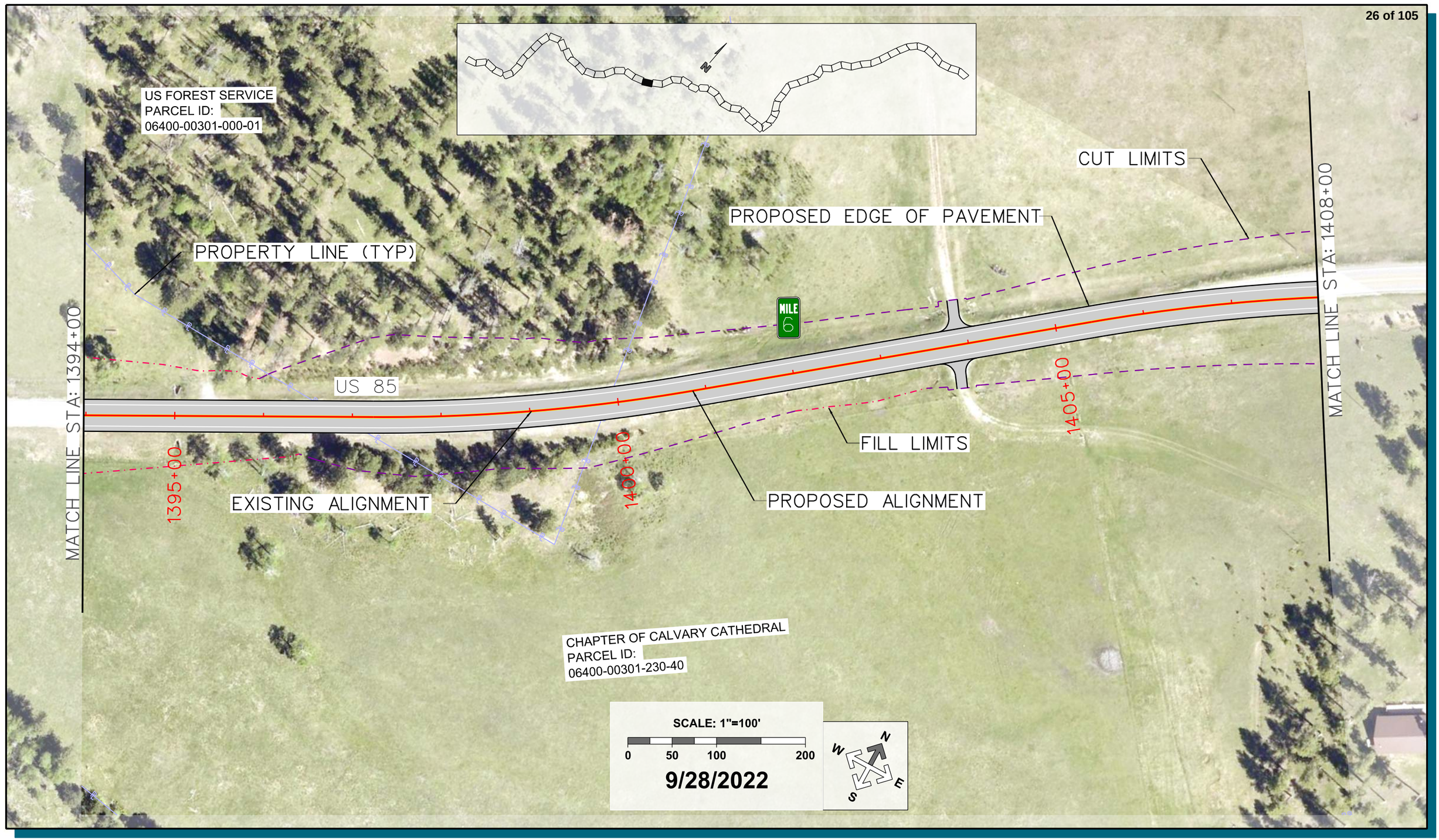
N E S W

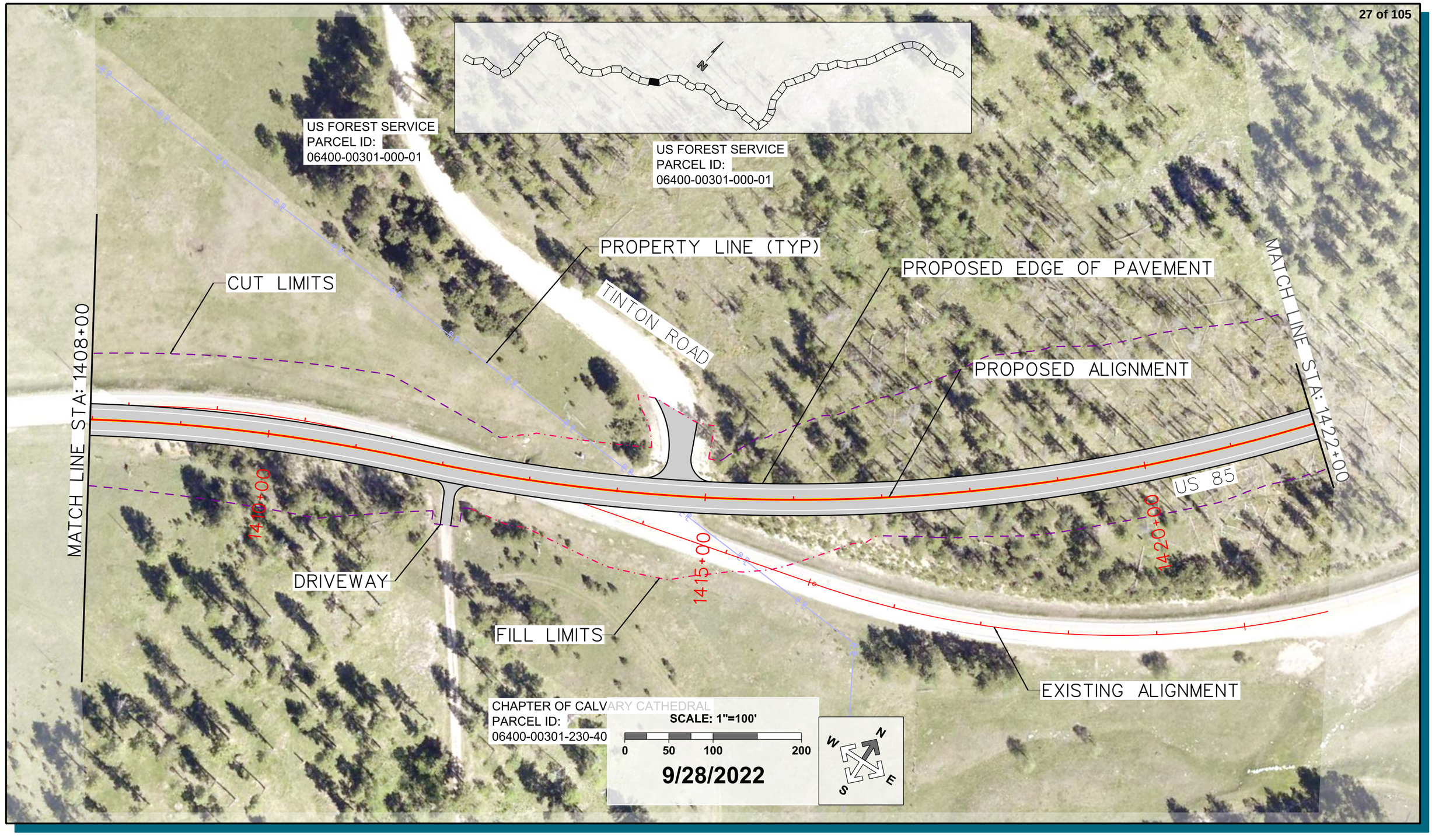
Corridor 3 (US 85: Wyoming to US 14A)

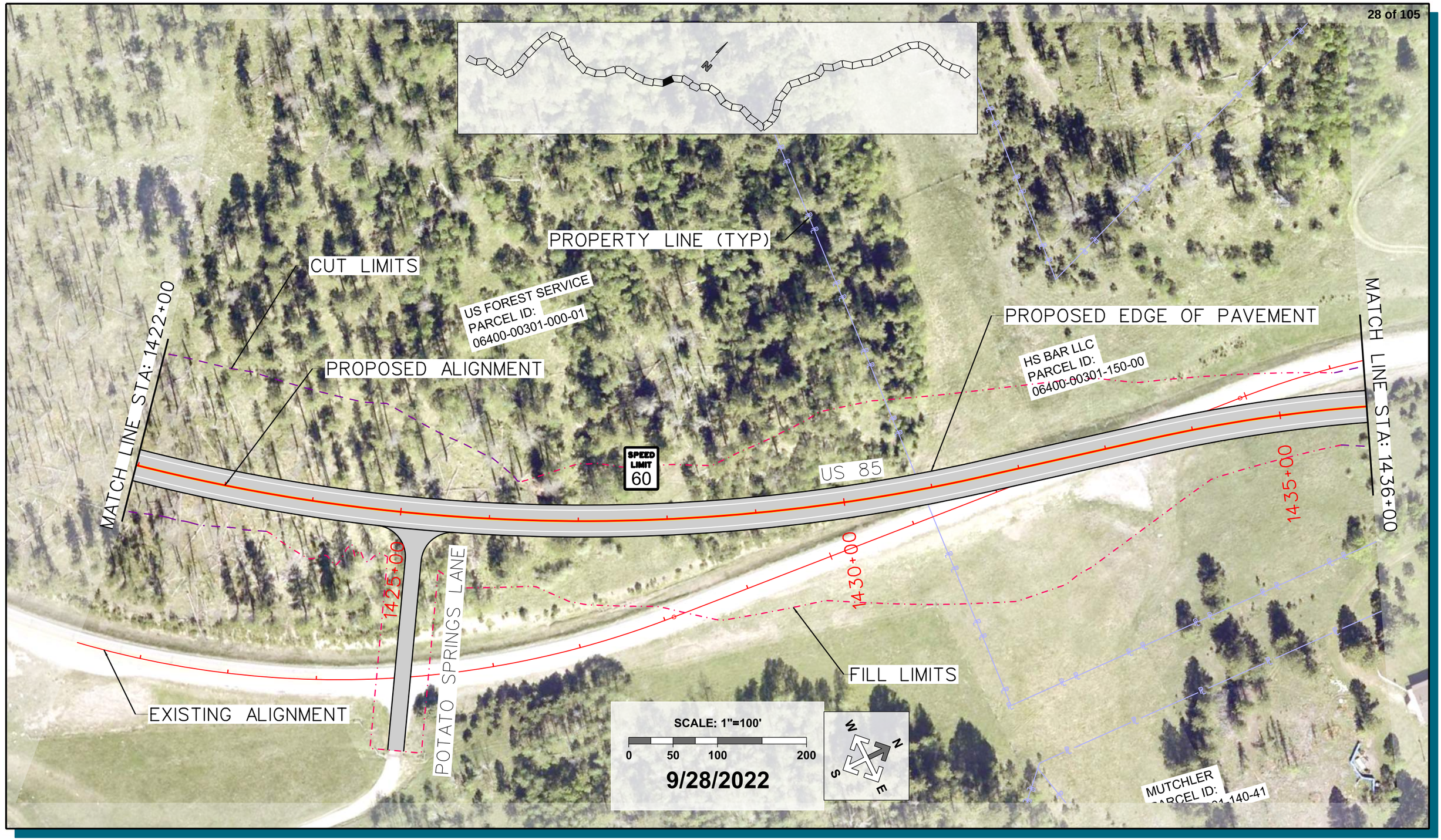


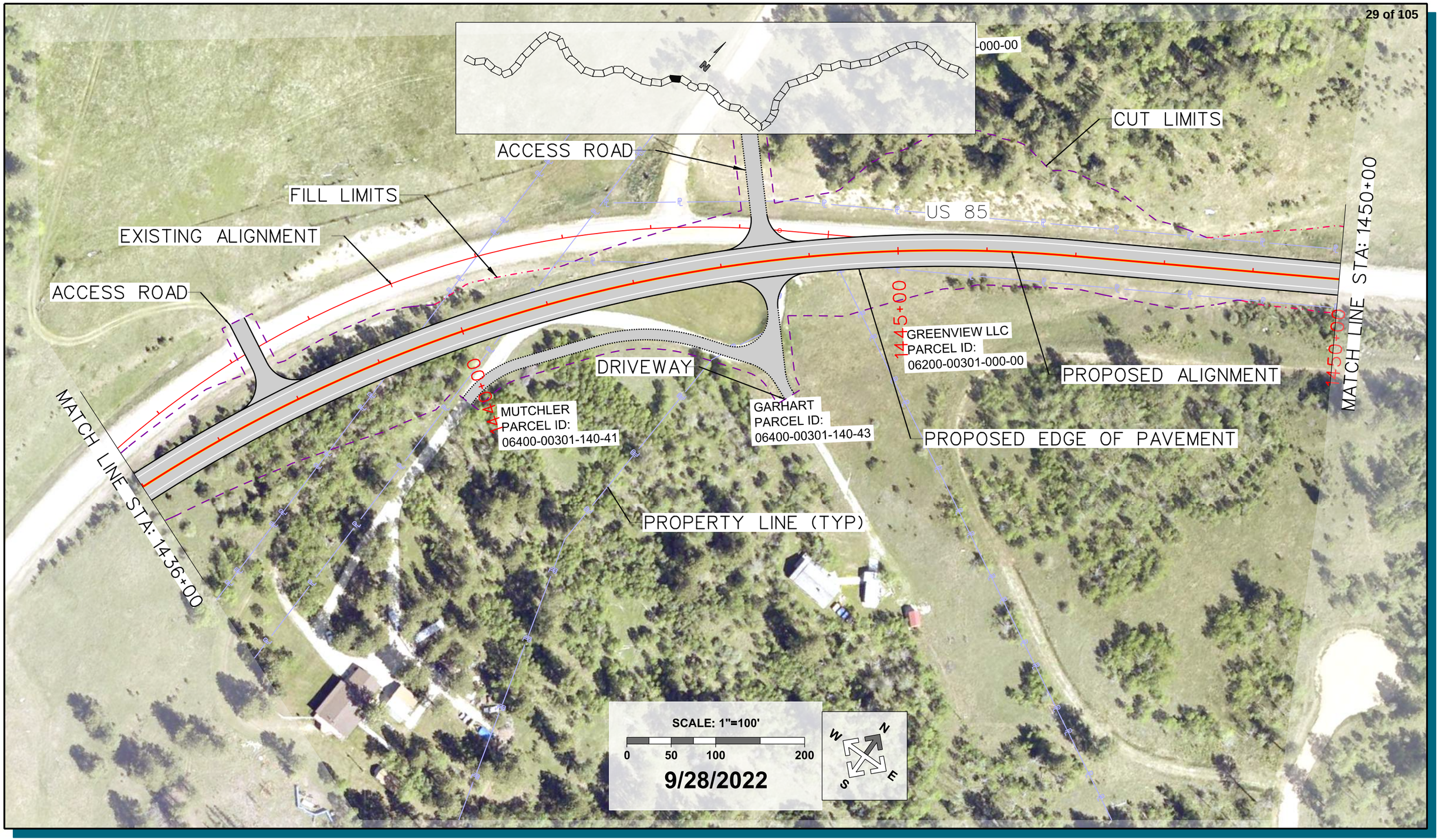

EXISTING ALIGNMENT
FILL LIMITS
US 85
MATCH LINE STA: 1366+00
1370+00
US FOREST SERVICE
PARCEL ID:
06400-00301-000-01
CUT LIMITS
1375+00
MCINERNY ROAD
PROPOSED EDGE OF PAVEMENT
PROPOSED ALIGNMENT
1380+00
MATCH LINE STA: 1380+00
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W E
S

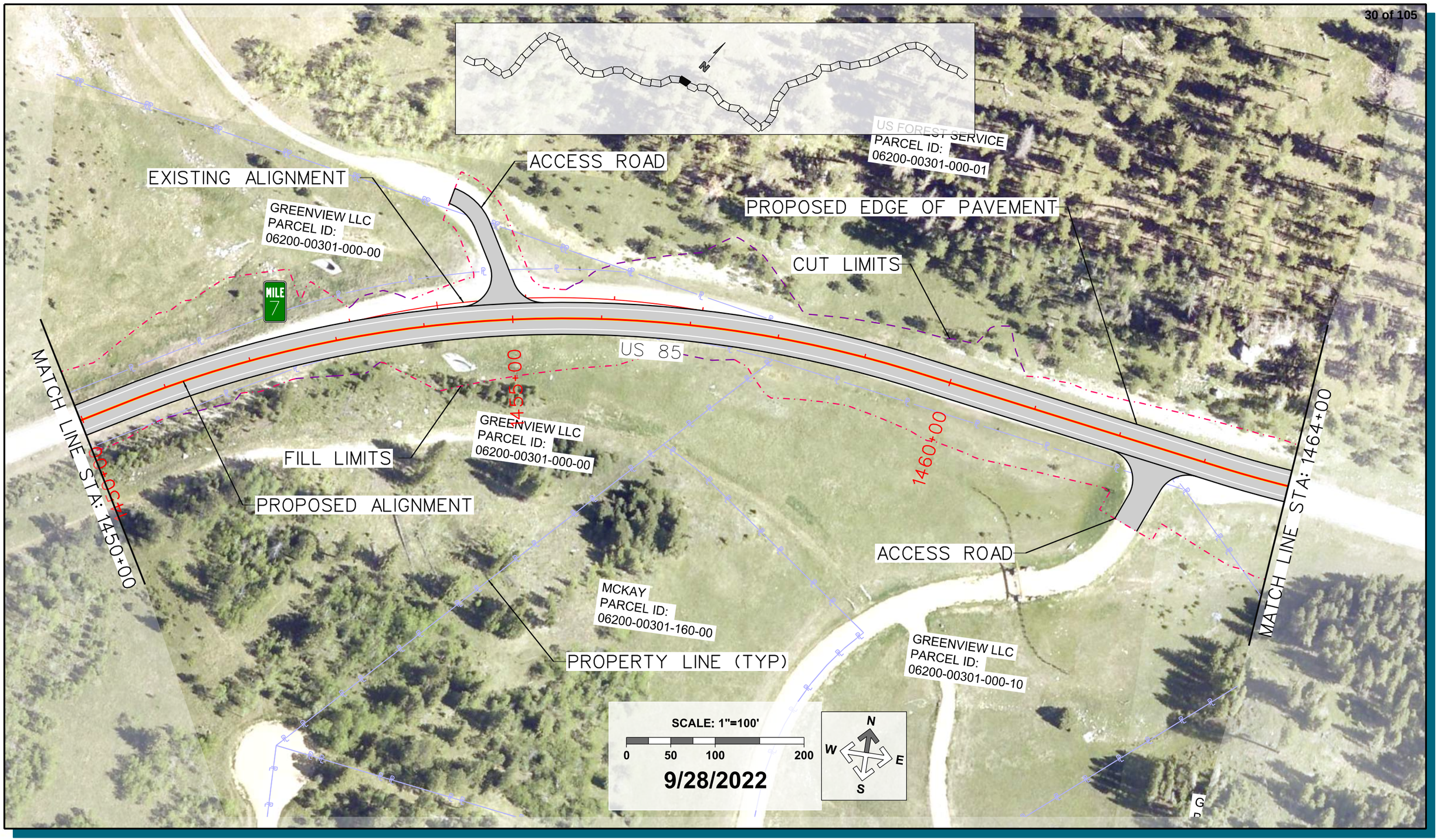

PROPERTY LINE (TYP)
PROPOSED EDGE OF PAVEMENT
CUT LIMITS
PROPOSED ALIGNMENT
US 85
MATCH LINE STA: 1380+00
1380+00
1385+00
1390+00
MATCH LINE STA: 1394+00
FILL LIMITS
EXISTING ALIGNMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


US FOREST SERVICE
PARCEL ID:
06400-00301-000-01
N
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
PROPERTY LINE (TYP)
MILE 6
MATCH LINE STA: 1394+00
US 85
1395+00
1400+00
1405+00
MATCH LINE STA: 1408+00
FILL LIMITS
EXISTING ALIGNMENT
PROPOSED ALIGNMENT
CHAPTER OF CALVARY CATHEDRAL
PARCEL ID:
06400-00301-230-40
SCALE: 1"=100'
0
50
100
200
9/28/2022
N
W
E
S

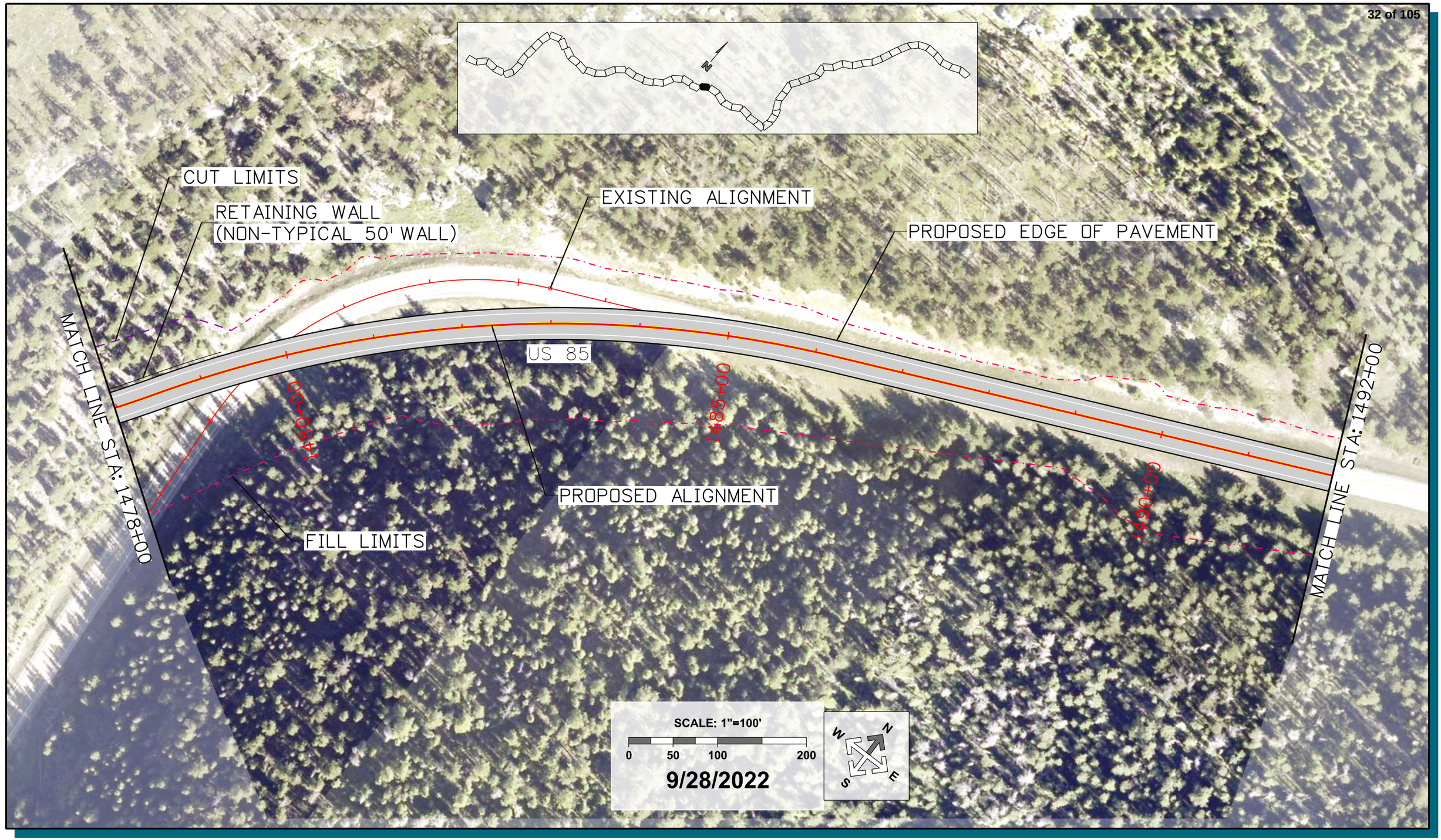

US FOREST SERVICE
PARCEL ID:
06400-00301-000-01
US FOREST SERVICE
PARCEL ID:
06400-00301-000-01
PROPERTY LINE (TYP)
CUT LIMITS
TINTON ROAD
PROPOSED EDGE OF PAVEMENT
MATCH LINE STA: 1408+00
PROPOSED ALIGNMENT
MATCH LINE STA: 1422+00
US 85
1410+00
1415+00
1420+00
DRIVEWAY
FILL LIMITS
EXISTING ALIGNMENT
CHAPTER OF CALVARY CATHEDRAL
PARCEL ID:
06400-00301-230-40
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S

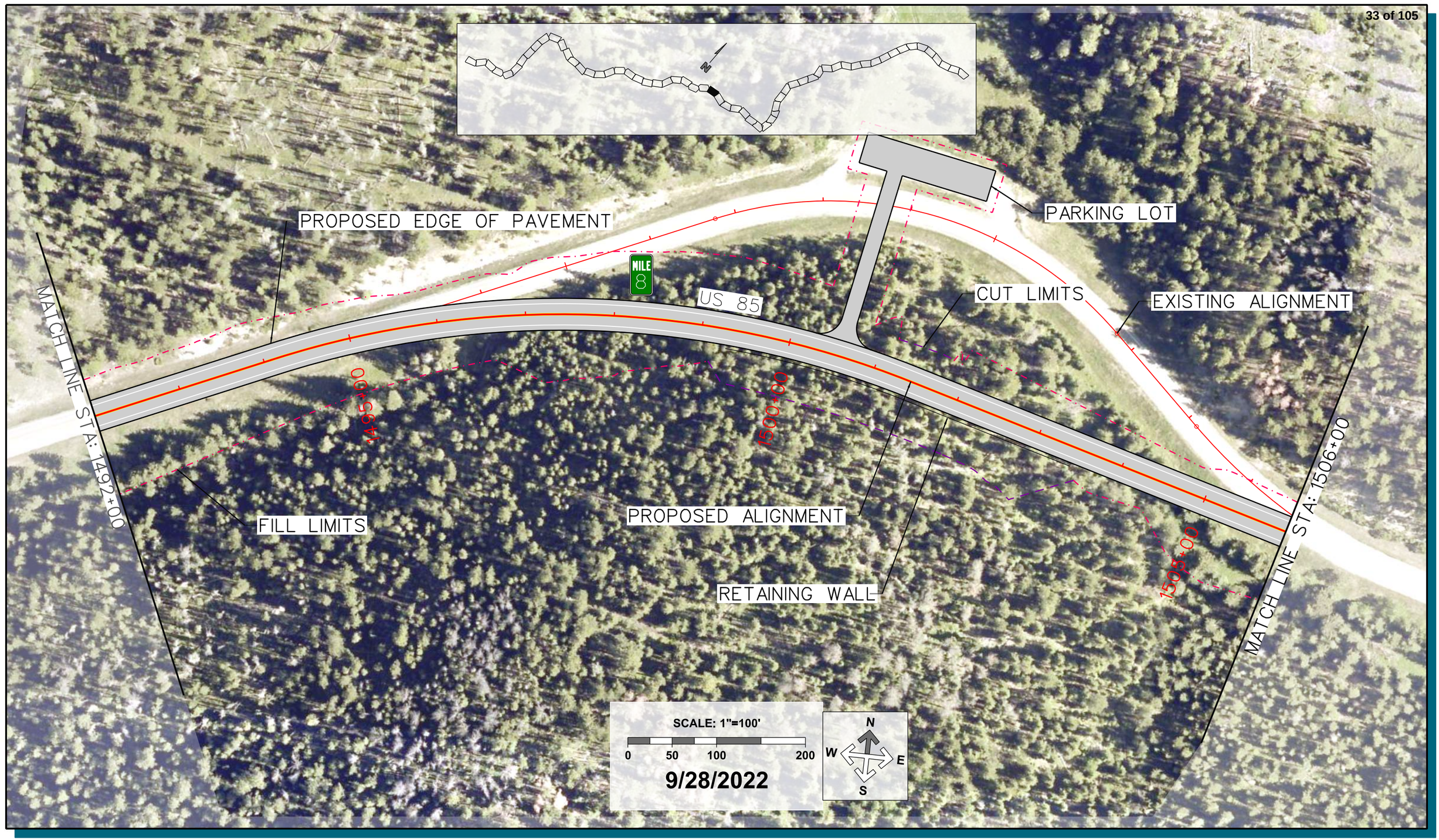

PROPERTY LINE (TYP)
CUT LIMITS
US FOREST SERVICE
PARCEL ID:
06400-00301-000-01
PROPOSED ALIGNMENT
PROPOSED EDGE OF PAVEMENT
HS BAR LLC
PARCEL ID:
06400-00301-150-00
MATCH LINE STA: 1422+00
MATCH LINE STA: 1436+00
SPEED LIMIT 60
US 85
1425+00
1430+00
1435+00
POTATO SPRINGS LANE
EXISTING ALIGNMENT
FILL LIMITS
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S
MUTCHLER
PARCEL ID:

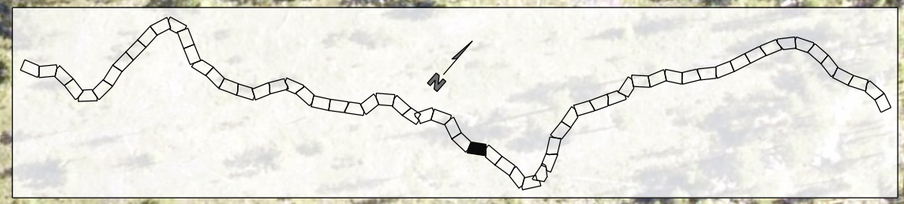

ACCESS ROAD
FILL LIMITS
EXISTING ALIGNMENT
ACCESS ROAD
MATCH LINE STA: 1436+00
1440+00
DRIVEWAY
MUTCHLER
PARCEL ID:
06400-00301-140-41
GARHART
PARCEL ID:
06400-00301-140-43
PROPERTY LINE (TYP)
-000-00
CUT LIMITS
US 85
1445+00
GREENVIEW LLC
PARCEL ID:
06200-00301-000-00
PROPOSED ALIGNMENT
PROPOSED EDGE OF PAVEMENT
1450+00
MATCH LINE STA: 1450+00
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


EXISTING ALIGNMENT
ACCESS ROAD
US FOREST SERVICE
PARCEL ID:
06200-00301-000-01
PROPOSED EDGE OF PAVEMENT
GREENVIEW LLC
PARCEL ID:
06200-00301-000-00
CUT LIMITS
MILE 7
US 85
MATCH LINE STA: 1450+00
1455+00
1460+00
MATCH LINE STA: 1464+00
FILL LIMITS
GREENVIEW LLC
PARCEL ID:
06200-00301-000-00
PROPOSED ALIGNMENT
ACCESS ROAD
MCKAY
PARCEL ID:
06200-00301-160-00
PROPERTY LINE (TYP)
GREENVIEW LLC
PARCEL ID:
06200-00301-000-10
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


MATCH LINE STA: 1464+00
MATCH LINE STA: 1478+00
PROPOSED EDGE OF PAVEMENT
FILL LIMITS
RETAINING WALL
(NON-TYPICAL 50' WALL)
US 85
1465+00
1470+00
1475+00
PROPOSED ALIGNMENT
CUT LIMITS
PROPERTY LINE (TYP)
EXISTING ALIGNMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


CUT LIMITS
RETAINING WALL
(NON-TYPICAL 50' WALL)
EXISTING ALIGNMENT
PROPOSED EDGE OF PAVEMENT
US 85
MATCH LINE STA: 1478+00
1480+00
1485+00
1490+00
MATCH LINE STA: 1492+00
PROPOSED ALIGNMENT
FILL LIMITS
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


PROPOSED EDGE OF PAVEMENT
PARKING LOT
MILE 8
US 85
CUT LIMITS
EXISTING ALIGNMENT
MATCH LINE STA: 1492+00
1495+00
1500+00
1505+00
MATCH LINE STA: 1506+00
FILL LIMITS
PROPOSED ALIGNMENT
RETAINING WALL
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S



CUT LIMITS

RETAINING WALL

EXISTING ALIGNMENT

PROPOSED ALIGNMENT

US FOREST SERVICE
PARCEL ID:
06200-00301-000-01

MATCH LINE STA: 1506+00

1510+00

US 85

1515+00

1520+00

MATCH LINE STA: 1520+00

FLANDREAU SANTEE SIOUX TRIBE
PARCEL ID:
06200-00301-130-00

PROPOSED EDGE OF PAVEMENT

FILL LIMITS

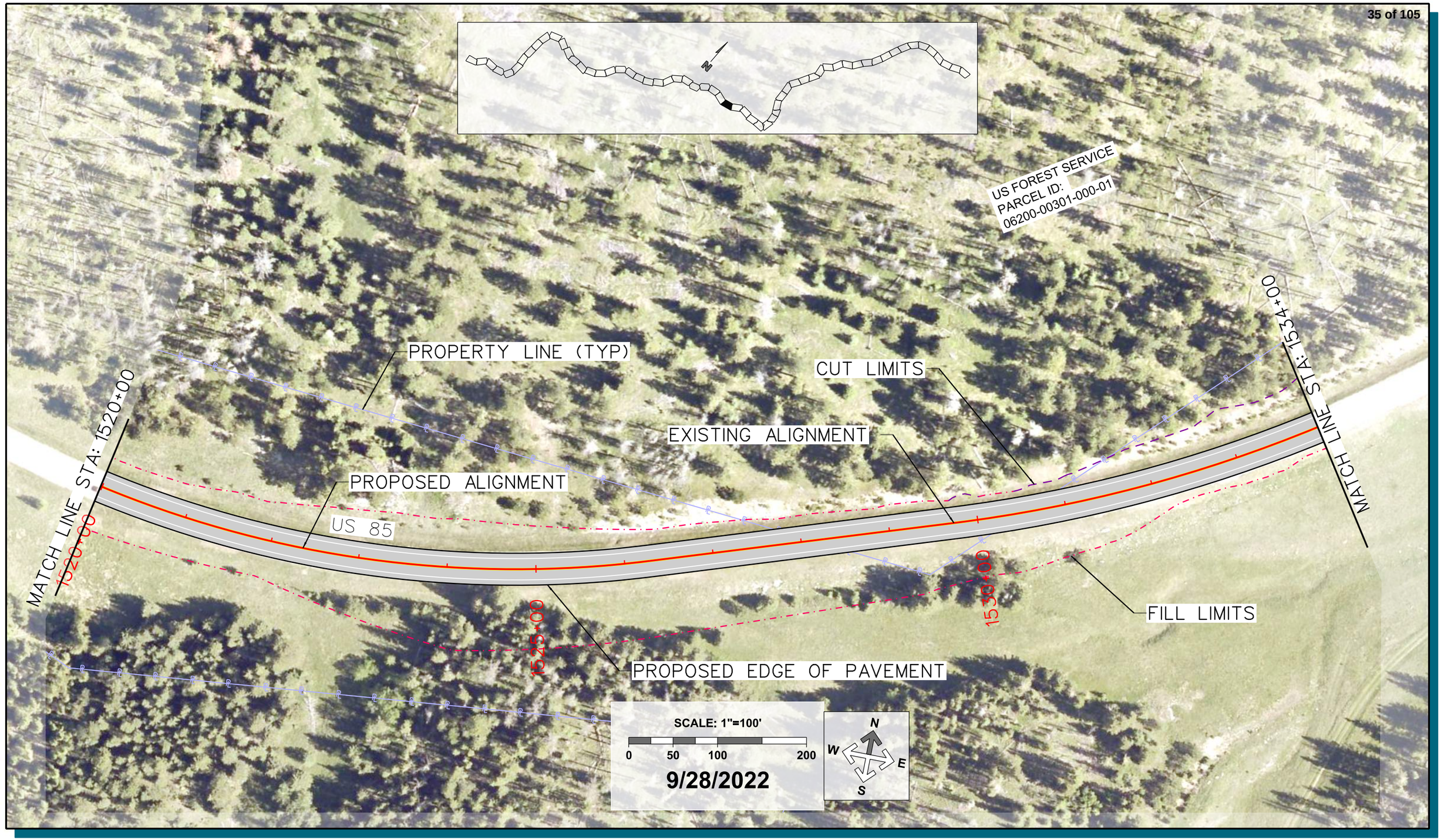
PROPERTY LINE (TYP)

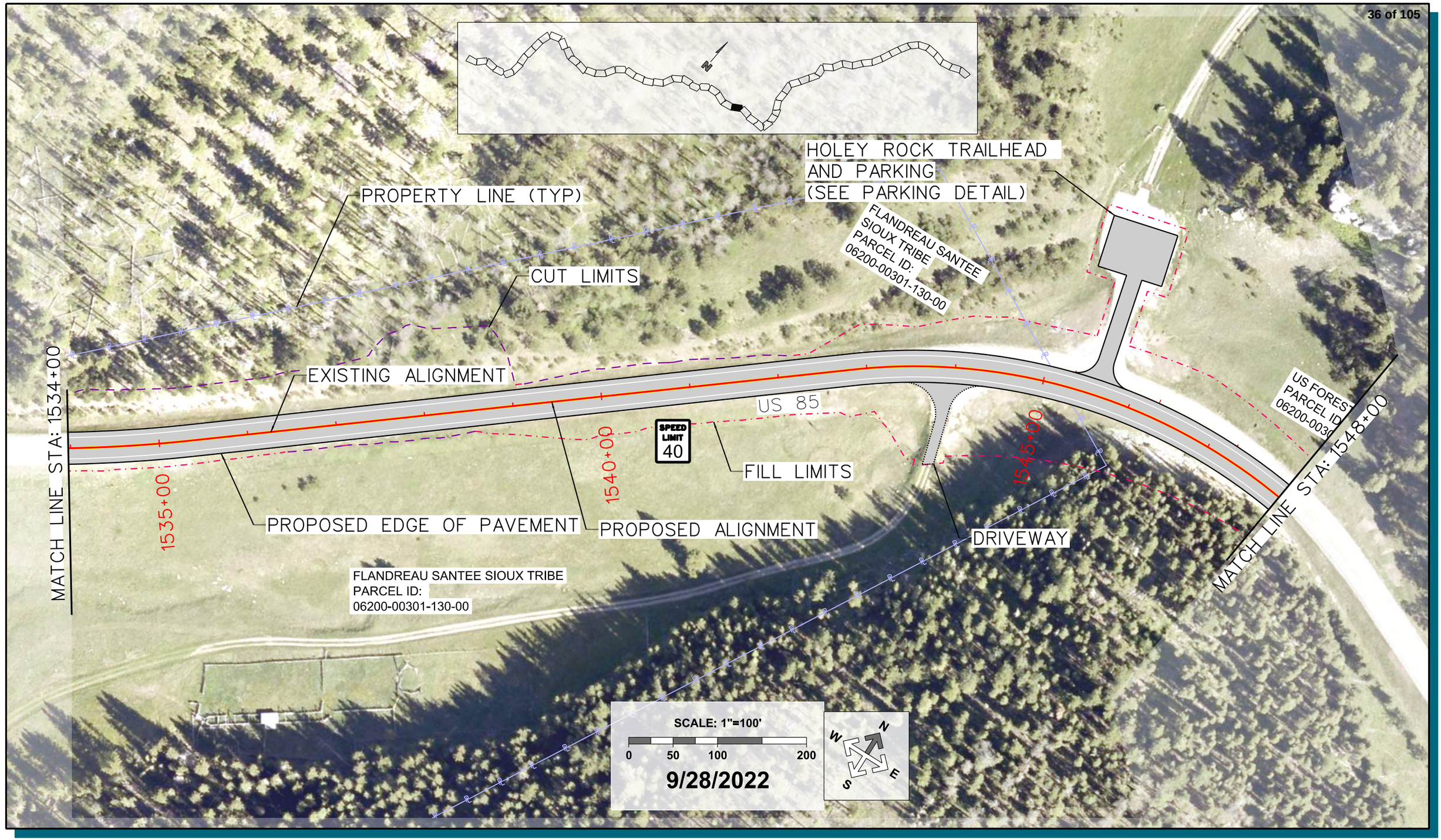
SCALE: 1"=100'

0 50 100 200

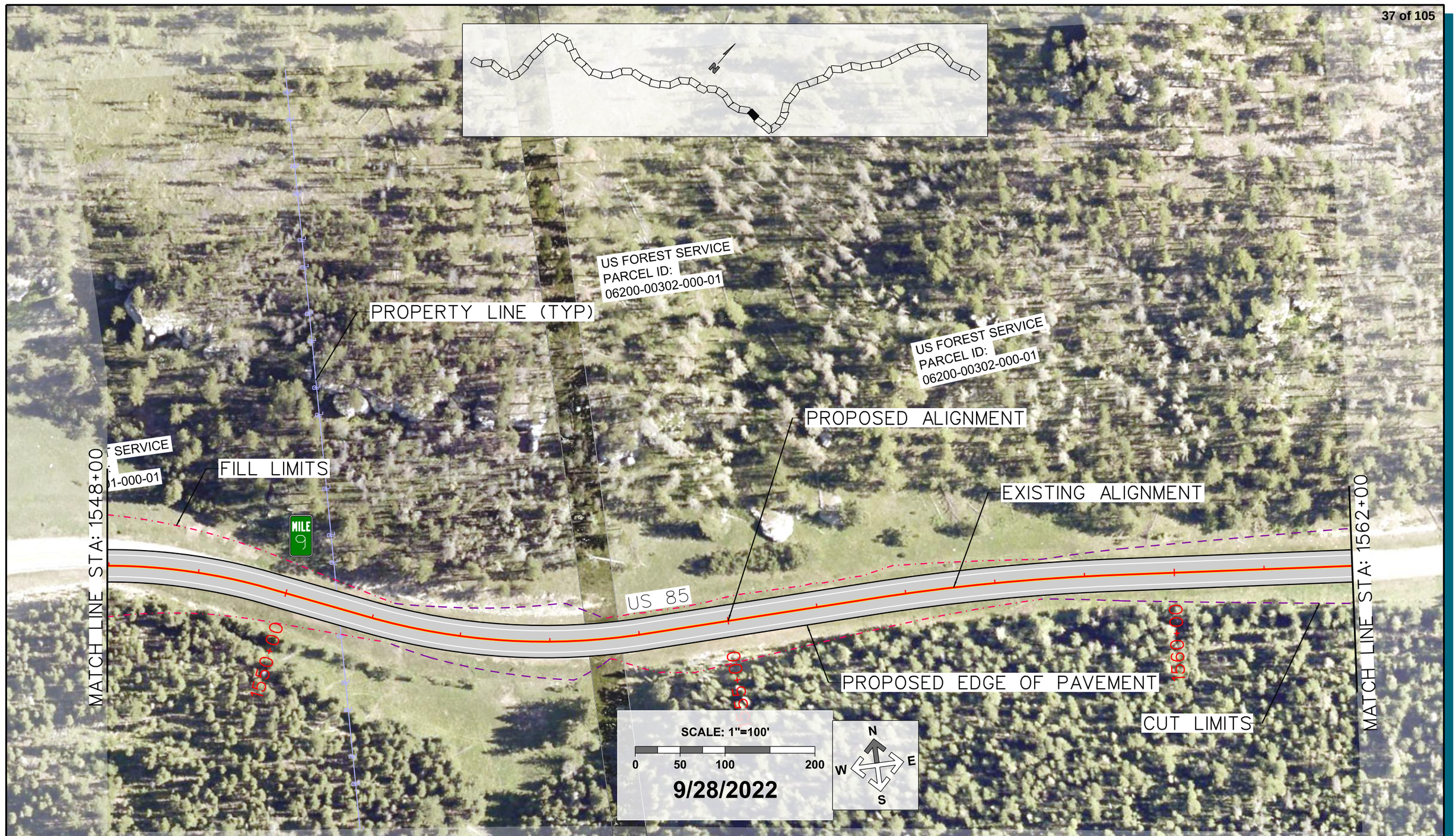
9/28/2022

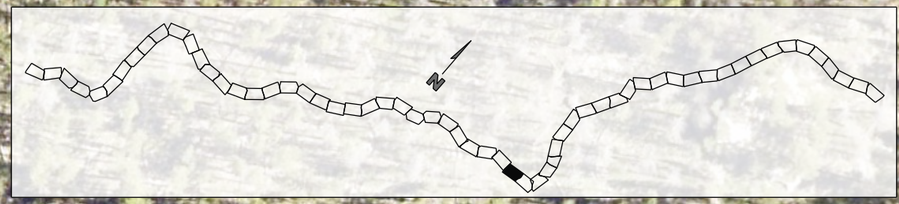
N E S W


US FOREST SERVICE
PARCEL ID:
06200-00301-000-01
PROPERTY LINE (TYP)
CUT LIMITS
EXISTING ALIGNMENT
PROPOSED ALIGNMENT
US 85
MATCH LINE STA: 1520+00
1520+00
1525+00
1530+00
MATCH LINE STA: 1534+00
FILL LIMITS
PROPOSED EDGE OF PAVEMENT
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


HOLEY ROCK TRAILHEAD AND PARKING (SEE PARKING DETAIL)
PROPERTY LINE (TYP)
FLANDREAU SANTEE SIOUX TRIBE PARCEL ID: 06200-00301-130-00
CUT LIMITS
EXISTING ALIGNMENT
US 85
SPEED LIMIT 40
1540+00
1545+00
FILL LIMITS
1535+00
PROPOSED EDGE OF PAVEMENT
PROPOSED ALIGNMENT
DRIVEWAY
MATCH LINE STA: 1534+00
MATCH LINE STA: 1548+00
US FORES
PARCEL ID
06200-003
FLANDREAU SANTEE SIOUX TRIBE
PARCEL ID:
06200-00301-130-00
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S

Corridor 3 (US 85: Wyoming to US 14A)





PROPOSED ALIGNMENT

RETAINING WALL

CUT LIMITS

MATCH LINE STA: 1562+00

US 85

1565+00

1570+00

1575+00

MATCH LINE STA: 1576+00

PROPOSED EDGE OF PAVEMENT

FILL LIMITS

EXISTING ALIGNMENT

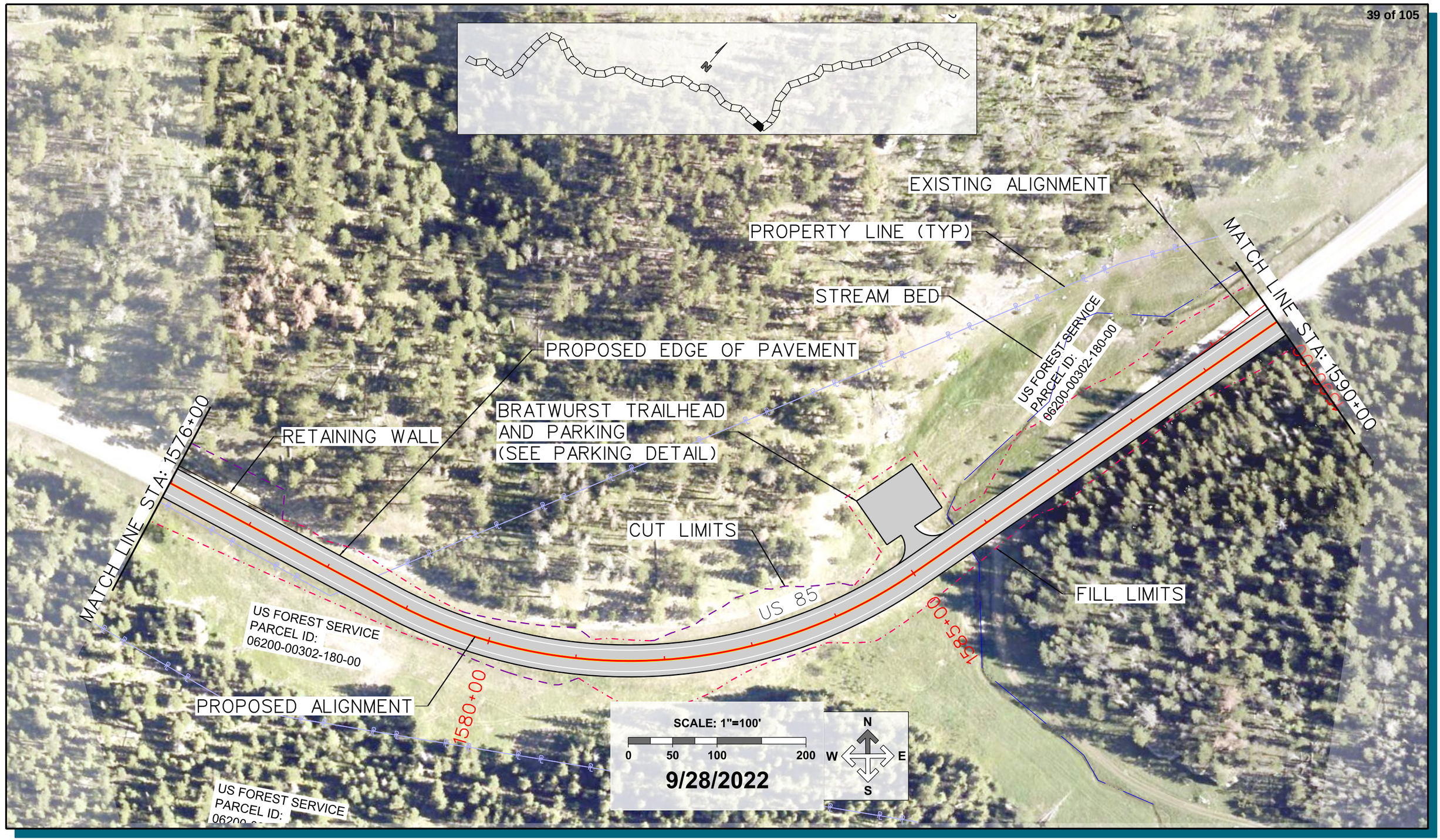
PROPERTY LINE (TYP)

SCALE: 1"=100'

0 50 100 200

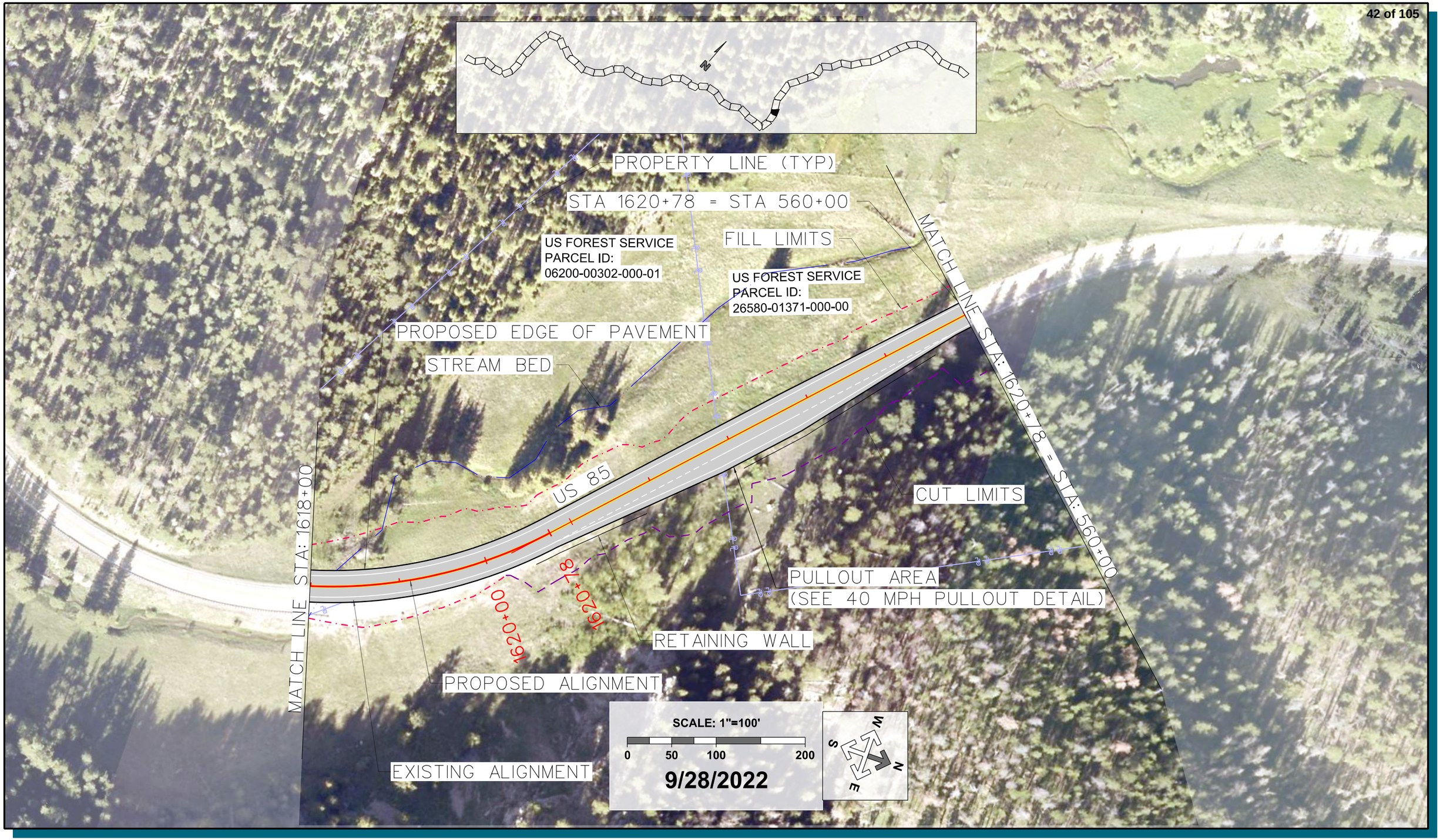
9/28/2022

N
W E
S

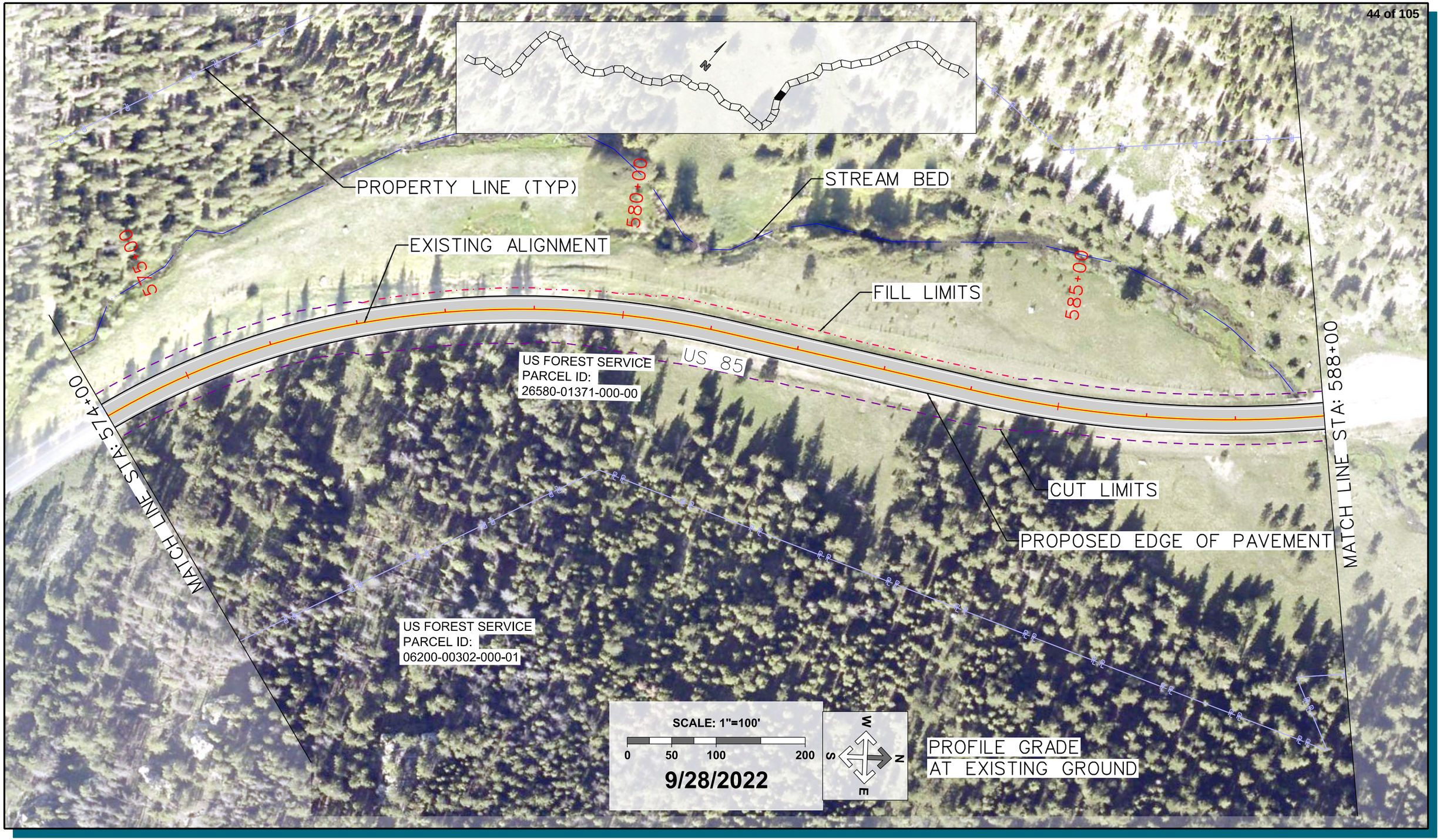

EXISTING ALIGNMENT
PROPERTY LINE (TYP)
STREAM BED
PROPOSED EDGE OF PAVEMENT
MATCH LINE STA: 1590+00
US FOREST SERVICE PARCEL ID: 06200-00302-180-00
BRATWURST TRAILHEAD AND PARKING (SEE PARKING DETAIL)
RETAINING WALL
MATCH LINE STA: 1576+00
CUT LIMITS
FILL LIMITS
US 85
1585+00
US FOREST SERVICE PARCEL ID: 06200-00302-180-00
PROPOSED ALIGNMENT
1580+00
US FOREST SERVICE PARCEL ID: 06200-
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W E
S

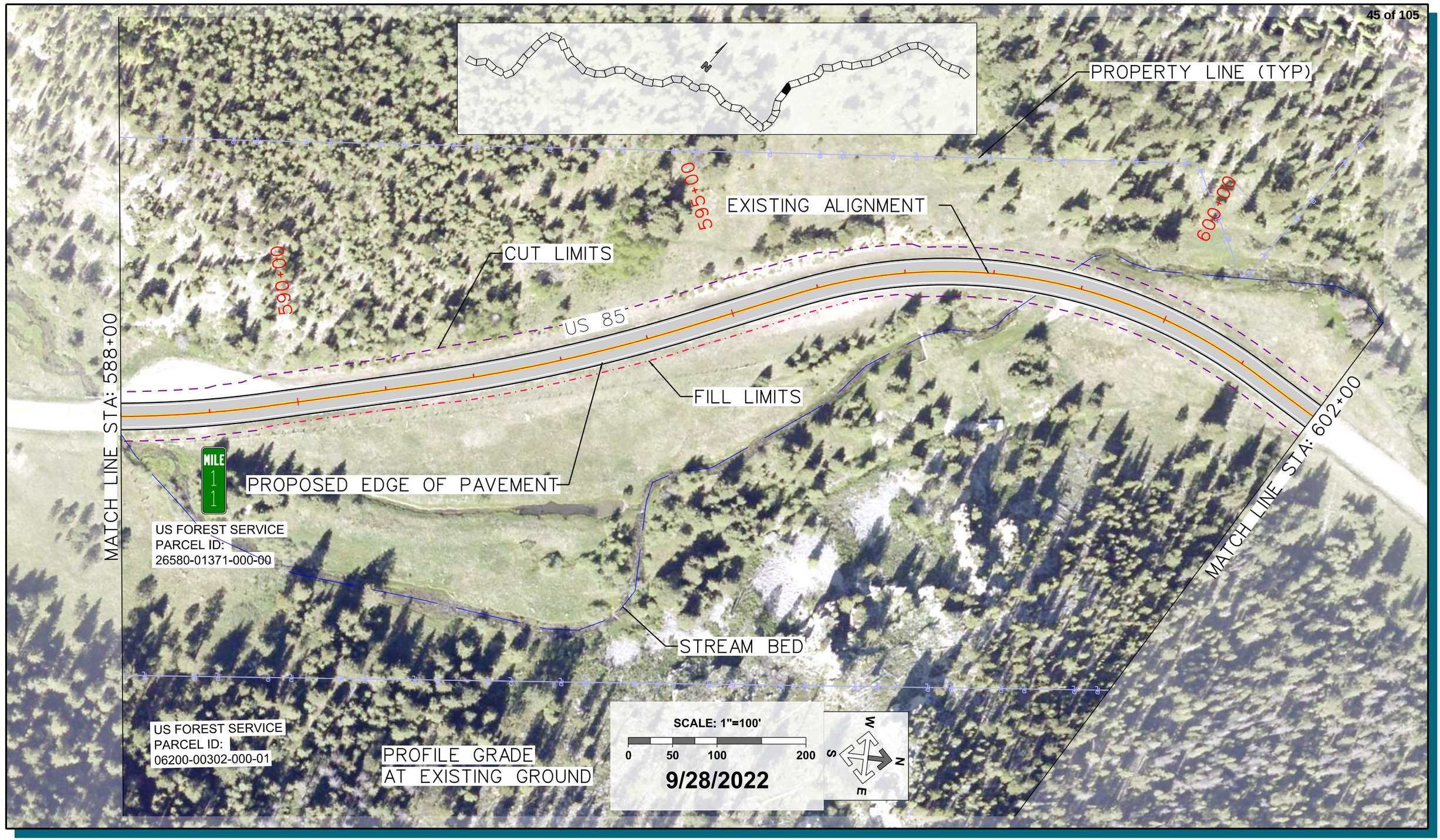

MATCH LINE STA: 1604+00
US FOREST SERVICE
PARCEL ID:
06200-00302-180-00
MILE
10
PROPOSED EDGE OF PAVEMENT
CUT LIMITS
EXISTING ALIGNMENT
MATCH LINE STA: 1590+00
1590+00
PROPOSED ALIGNMENT
US 85
FILL LIMITS
STREAM BED
1595+00
1600+00
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
PROPERTY LINE (TYP)
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W

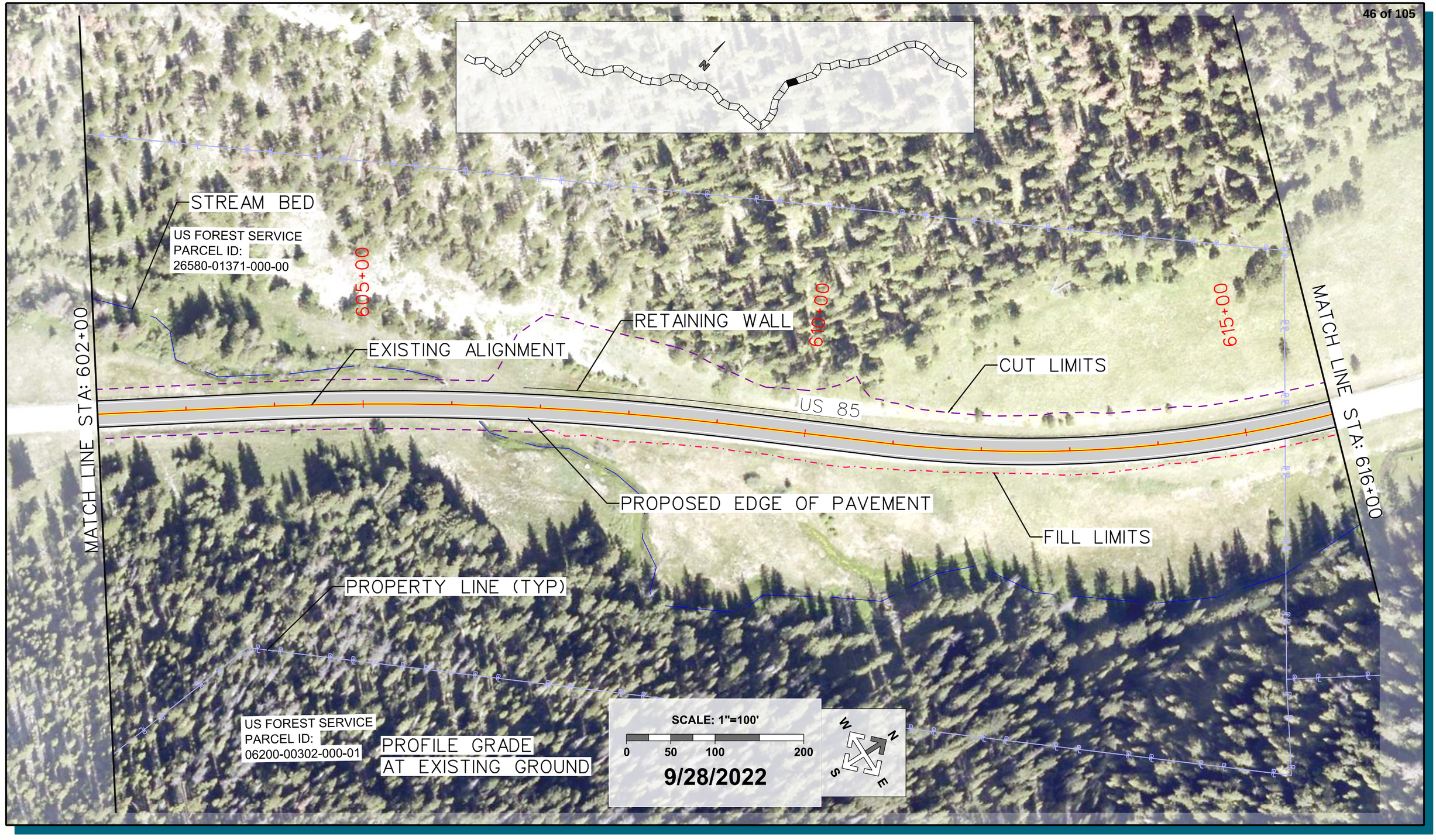

EXISTING ALIGNMENT
MATCH LINE STA: 1604+00
US 85
1605+00
STREAM BED
1610+00
PROPOSED EDGE OF PAVEMENT
RETAINING WALL
CUT LIMITS
PROPOSED ALIGNMENT
PROPERTY LINE (TYP)
FILL LIMITS
1615+00
US FOREST SERVICE
PARCEL ID:
06200-00302-180-00
MATCH LINE STA: 1618+00
SCALE: 1"=100'
0 50 100 200
9/28/2022
W
S
N
E

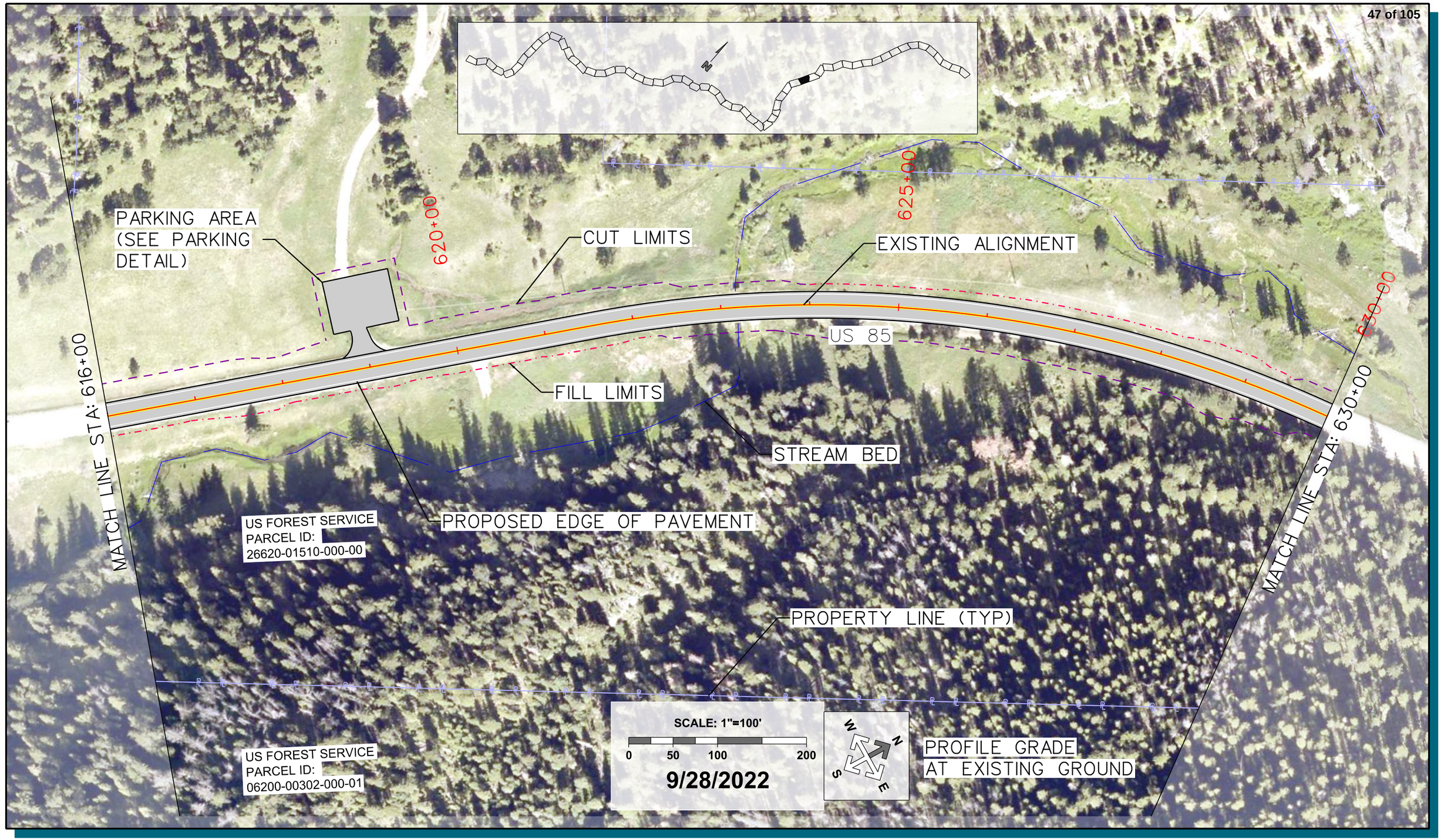

PROPERTY LINE (TYP)
STA 1620+78 = STA 560+00
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
FILL LIMITS
US FOREST SERVICE
PARCEL ID:
26580-01371-000-00
MATCH LINE STA: 1620+78 = STA: 560+00
PROPOSED EDGE OF PAVEMENT
STREAM BED
US 85
CUT LIMITS
MATCH LINE STA: 1618+00
1620+00
1620+78
PULLOUT AREA
(SEE 40 MPH PULLOUT DETAIL)
RETAINING WALL
PROPOSED ALIGNMENT
EXISTING ALIGNMENT
SCALE: 1"=100'
0
50
100
200
9/28/2022
W
S
N
E


PROPERTY LINE (TYP)
STREAM BED
FILL LIMITS
565+00
570+00
560+00
574+00
US 85
STA: 560+00
MATCH LINE STA: 1620+78 = STA: 560+00
MATCH LINE STA: 574+00
US FOREST SERVICE
PARCEL ID:
26580-01371-000-00
RETAINING WALL
EXISTING ALIGNMENT
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
STA 1620+78 = STA 560+00
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
E
S
W
PROFILE GRADE
AT EXISTING GROUND


PROPERTY LINE (TYP)
EXISTING ALIGNMENT
STREAM BED
FILL LIMITS
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
PROFILE GRADE
AT EXISTING GROUND
US 85
US FOREST SERVICE
PARCEL ID:
26580-01371-000-00
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
545+00
574+00
580+00
585+00
588+00
MATCH LINE STA: 574+00
MATCH LINE STA: 588+00
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
W
E


PROPERTY LINE (TYP)
595+00
EXISTING ALIGNMENT
600+09
590+06
CUT LIMITS
US 85
FILL LIMITS
MATCH LINE STA: 588+00
MILE 111
PROPOSED EDGE OF PAVEMENT
MATCH LINE STA: 602+00
US FOREST SERVICE
PARCEL ID:
26580-01371-000-00
STREAM BED
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
PROFILE GRADE
AT EXISTING GROUND
SCALE: 1"=100'
0 50 100 200
9/28/2022
W
S
N
E


STREAM BED
US FOREST SERVICE
PARCEL ID:
26580-01371-000-00
605+00
EXISTING ALIGNMENT
RETAINING WALL
610+00
CUT LIMITS
915+00
MATCH LINE
MATCH LINE STA: 602+00
US 85
MATCH LINE STA: 616+00
PROPOSED EDGE OF PAVEMENT
FILL LIMITS
PROPERTY LINE (TYP)
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
PROFILE GRADE
AT EXISTING GROUND
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
E
S
W


PARKING AREA (SEE PARKING DETAIL)
620+00
CUT LIMITS
625+00
EXISTING ALIGNMENT
US 85
630+00
FILL LIMITS
STREAM BED
MATCH LINE STA: 616+00
PROPOSED EDGE OF PAVEMENT
US FOREST SERVICE
PARCEL ID:
26620-01510-000-00
PROPERTY LINE (TYP)
MATCH LINE STA: 630+00
US FOREST SERVICE
PARCEL ID:
06200-00302-000-01
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W
PROFILE GRADE
AT EXISTING GROUND

US FOREST SERVICE
PARCEL ID:
06200-00402-000-01

PROPERTY LINE (TYP)

CUT LIMITS

EXISTING ALIGNMENT

MATCH LINE STA: 630+00

630+00

635+00

640+00

MATCH LINE STA: 644+00

PROPOSED EDGE OF PAVEMENT

US 85

MILE 12

SPEED LIMIT 40

STREAM BED

US FOREST SERVICE
PARCEL ID:
26620-01510-000-10

FILL LIMITS

US FOREST SERVICE
PARCEL ID:
06200-00302-000-01

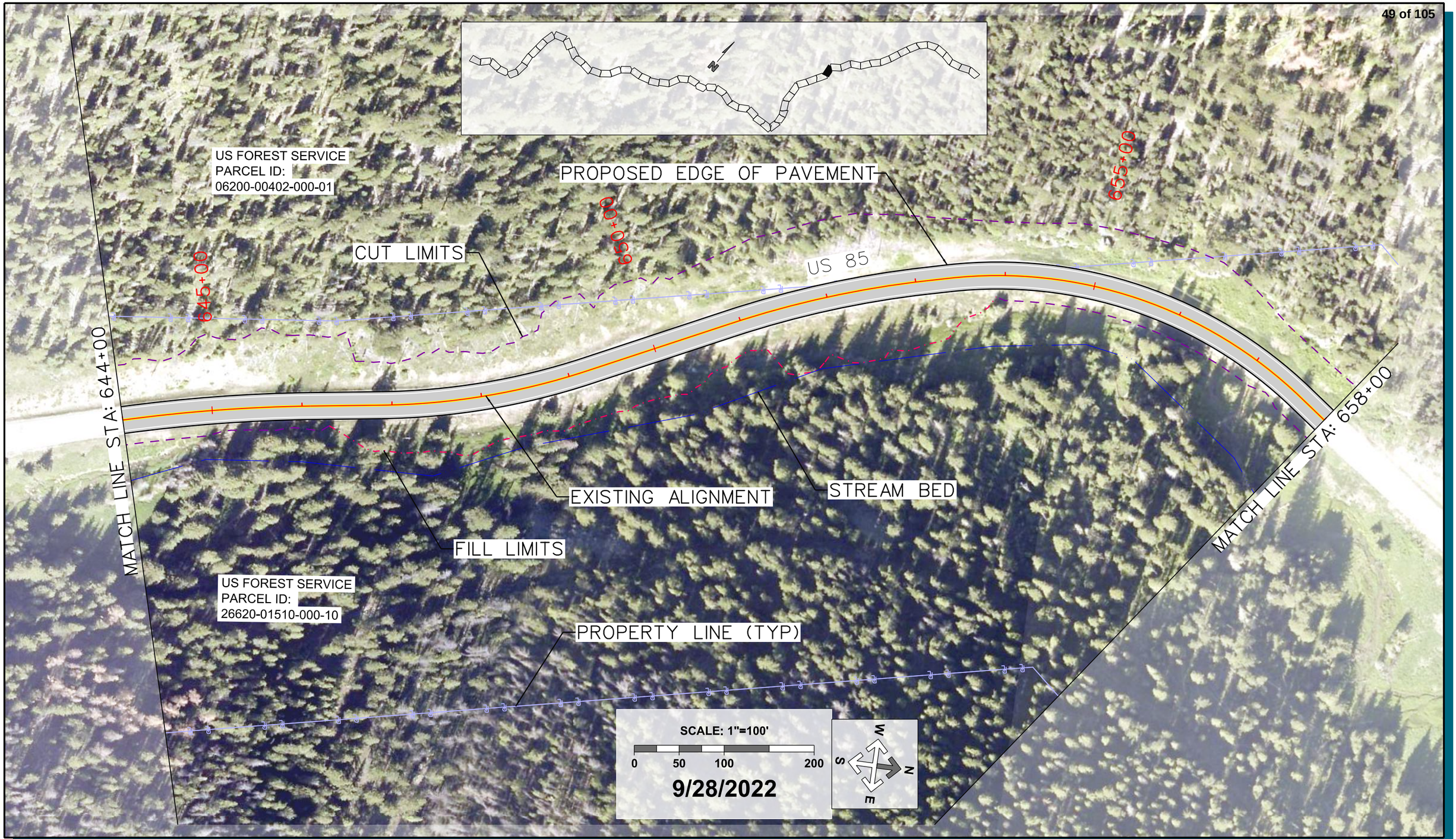
SCALE: 1"=100'

0 50 100 200

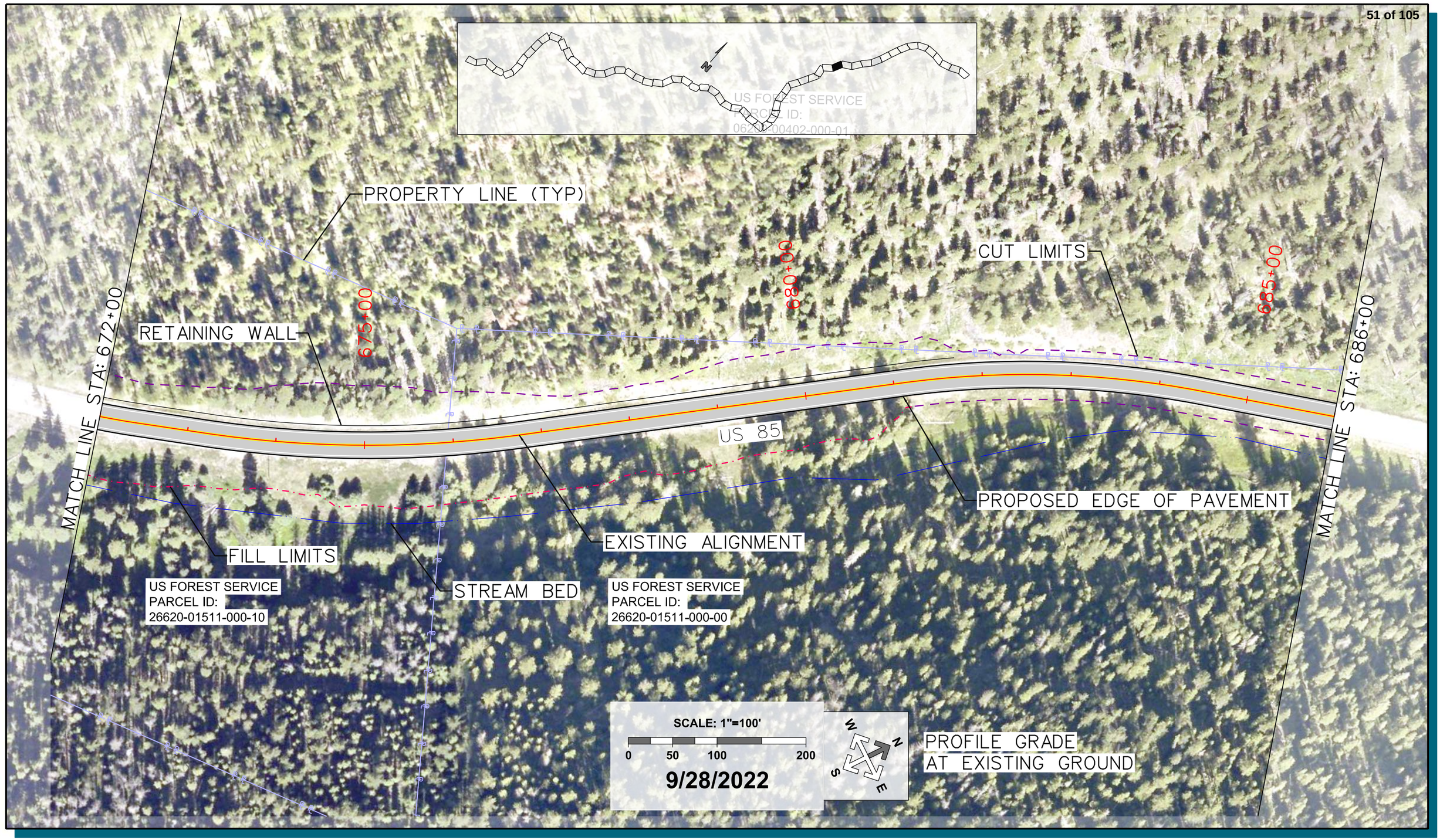
9/28/2022

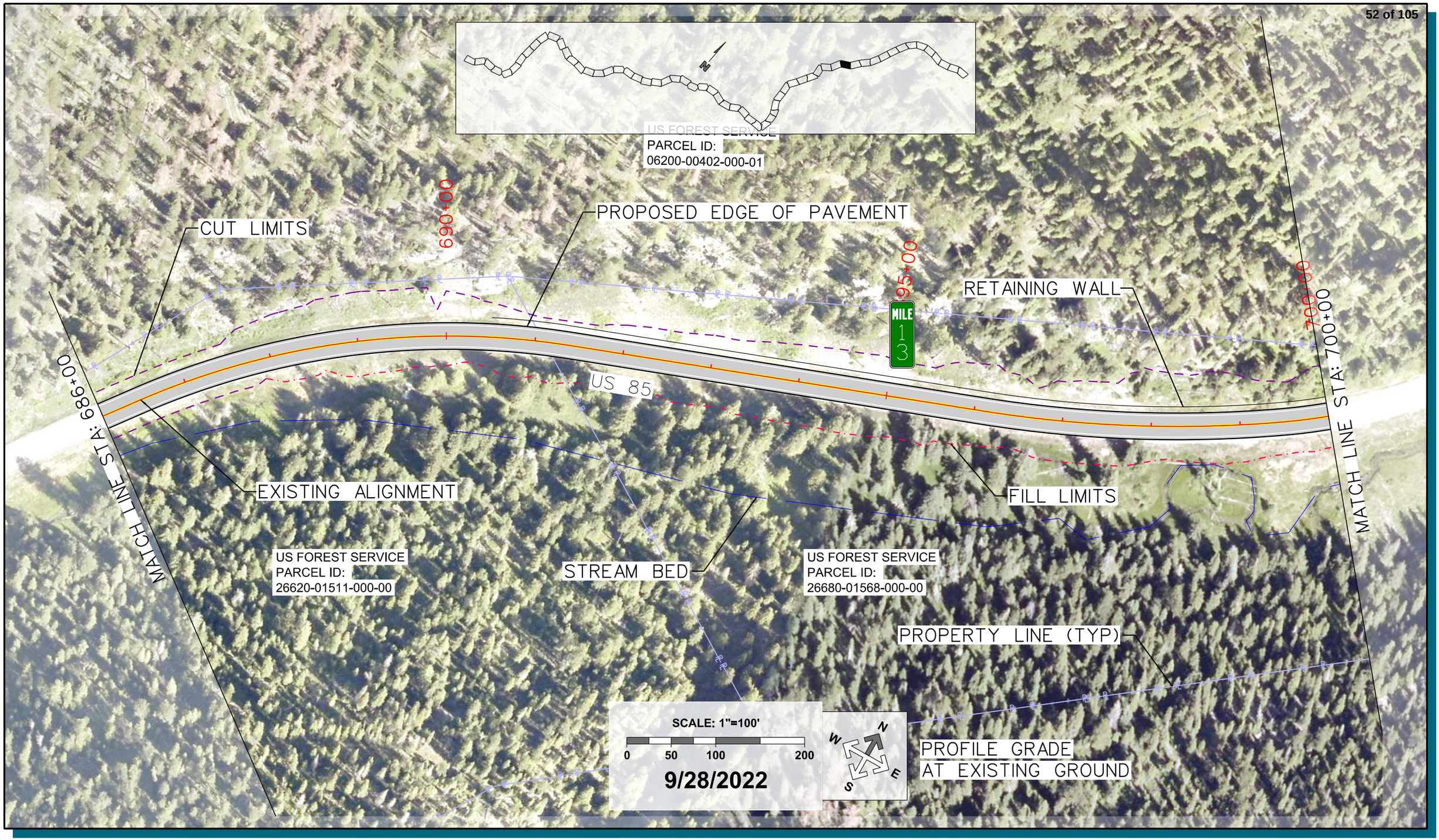
N E S W

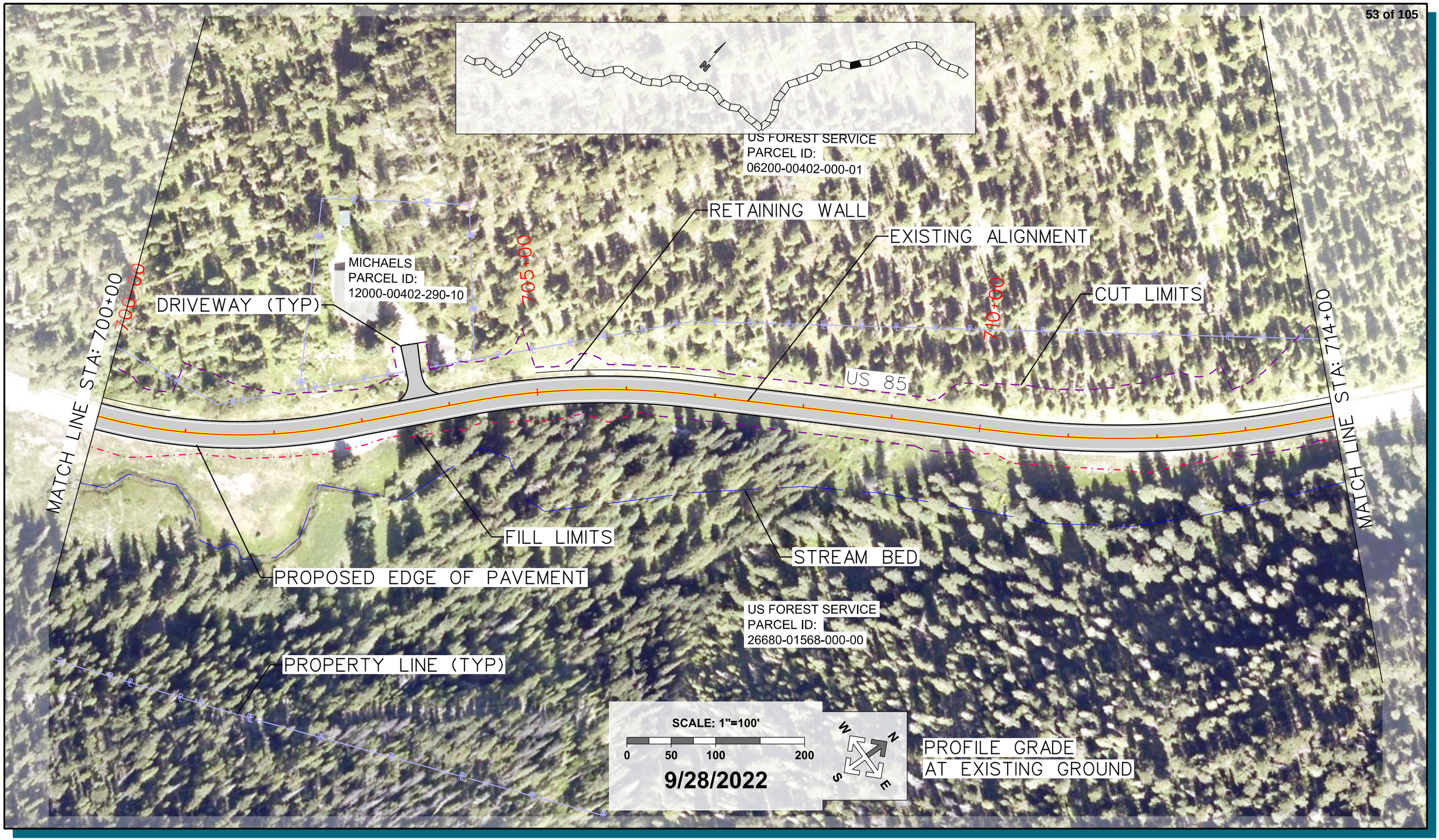
PROFILE GRADE
AT EXISTING GROUND

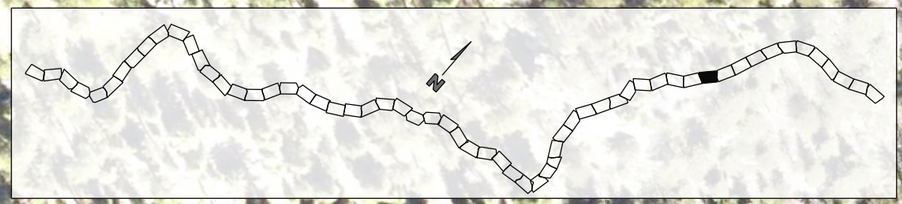

US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
PROPOSED EDGE OF PAVEMENT
CUT LIMITS
645+00
650+00
655+00
US 85
MATCH LINE STA: 644+00
MATCH LINE STA: 658+00
EXISTING ALIGNMENT
STREAM BED
FILL LIMITS
US FOREST SERVICE
PARCEL ID:
26620-01510-000-10
PROPERTY LINE (TYP)
SCALE: 1"=100'
0 50 100 200
9/28/2022
W
S
N
E


PROPERTY LINE (TYP)
PROPOSED EDGE OF PAVEMENT
EXISTING ALIGNMENT
CUT LIMITS
660+00
665+00
670+00
MATTI
PARCEL ID:
26985-00009
-000-61
ACCESS ROAD
RETAINING WALL
US 85
STA: 658+00
STA: 672+00
MATCH LINE
MATCH LINE
DEAD OX PICNIC PARKING
(SEE PARKING DETAIL)
FILL LIMITS
STREAM BED
US FOREST SERVICE
PARCEL ID:
26620-01510-000-10
US FOREST SERVICE
PARCEL ID:
26620-01511-000-10
US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S
PROFILE GRADE
AT EXISTING GROUND


PROPERTY LINE (TYP)
RETAINING WALL
675+00
680+00
685+00
CUT LIMITS
STA: 672+00
STA: 686+00
MATCH LINE
MATCH LINE
US 85
PROPOSED EDGE OF PAVEMENT
EXISTING ALIGNMENT
FILL LIMITS
STREAM BED
US FOREST SERVICE
PARCEL ID:
26620-01511-000-10
US FOREST SERVICE
PARCEL ID:
26620-01511-000-00
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
PROFILE GRADE
AT EXISTING GROUND


US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
690+00
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
695+00
RETAINING WALL
700+00
MILE 13
US 85
MATCH LINE STA: 686+00
EXISTING ALIGNMENT
FILL LIMITS
MATCH LINE STA: 700+00
US FOREST SERVICE
PARCEL ID:
26620-01511-000-00
STREAM BED
US FOREST SERVICE
PARCEL ID:
26680-01568-000-00
PROPERTY LINE (TYP)
SCALE: 1"=100'
0 50 100 200
9/28/2022
N W E S
PROFILE GRADE
AT EXISTING GROUND


US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
RETAINING WALL
EXISTING ALIGNMENT
CUT LIMITS
MICHAELS
PARCEL ID:
12000-00402-290-10
DRIVEWAY (TYP)
700+00
705+00
710+00
MATCH LINE STA: 700+00
MATCH LINE STA: 714+00
US 85
FILL LIMITS
STREAM BED
PROPOSED EDGE OF PAVEMENT
US FOREST SERVICE
PARCEL ID:
26680-01568-000-00
PROPERTY LINE (TYP)
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S
PROFILE GRADE
AT EXISTING GROUND



US FOREST SERVICE
PARCEL ID:
06200-00402-000-01

RETAINING WALL

720+00

PROPERTY LINE (TYP)

715+00

725+00

CUT LIMITS

US 85

714+00

MATCH LINE STA: 714+00

MATCH LINE STA: 728+00

FILL LIMITS

EXISTING ALIGNMENT

PROPOSED EDGE OF PAVEMENT

US FOREST SERVICE
PARCEL ID:
26680-01568-000-00

STREAM BED

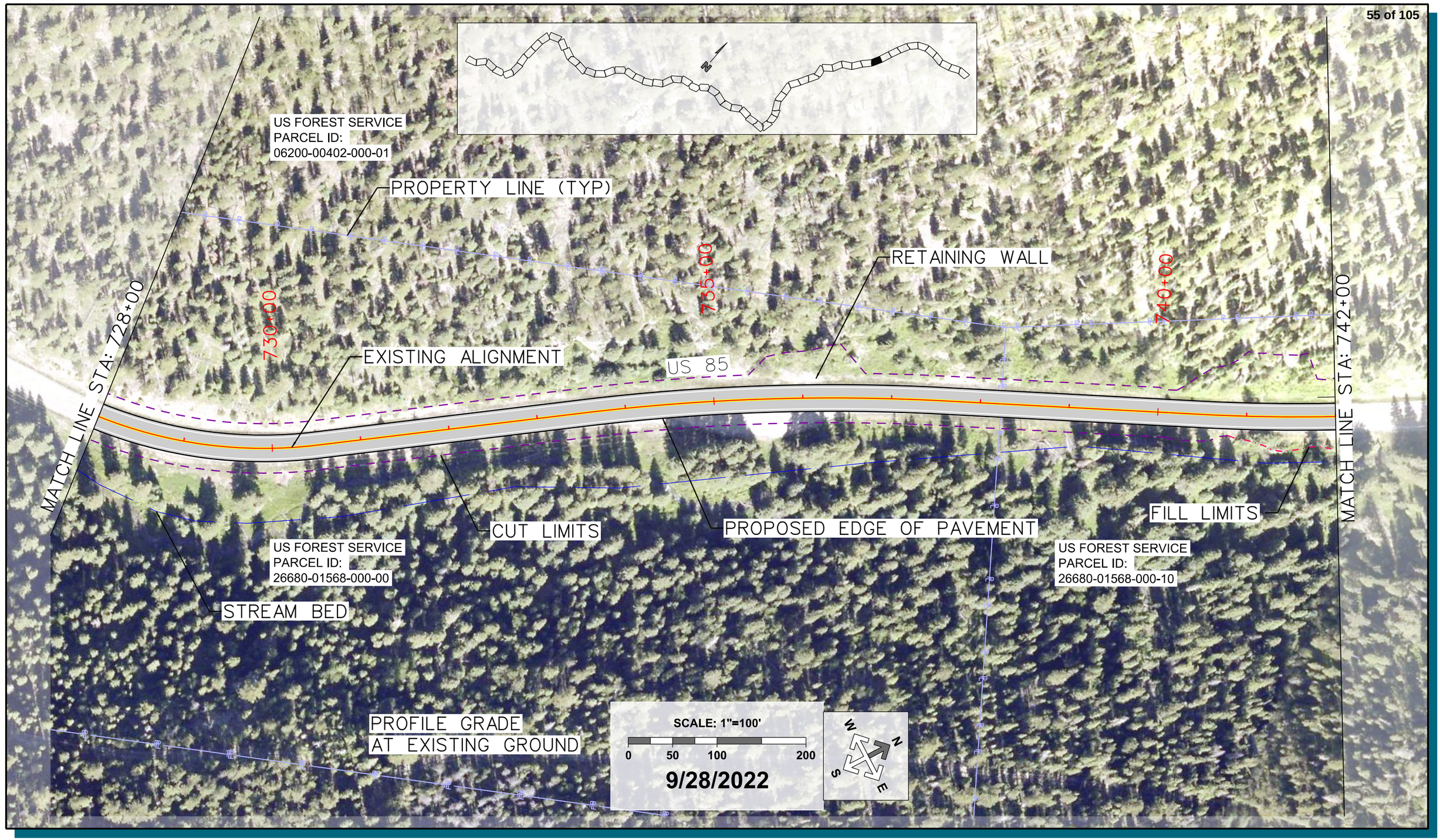
PROFILE GRADE
AT EXISTING GROUND

SCALE: 1"=100'

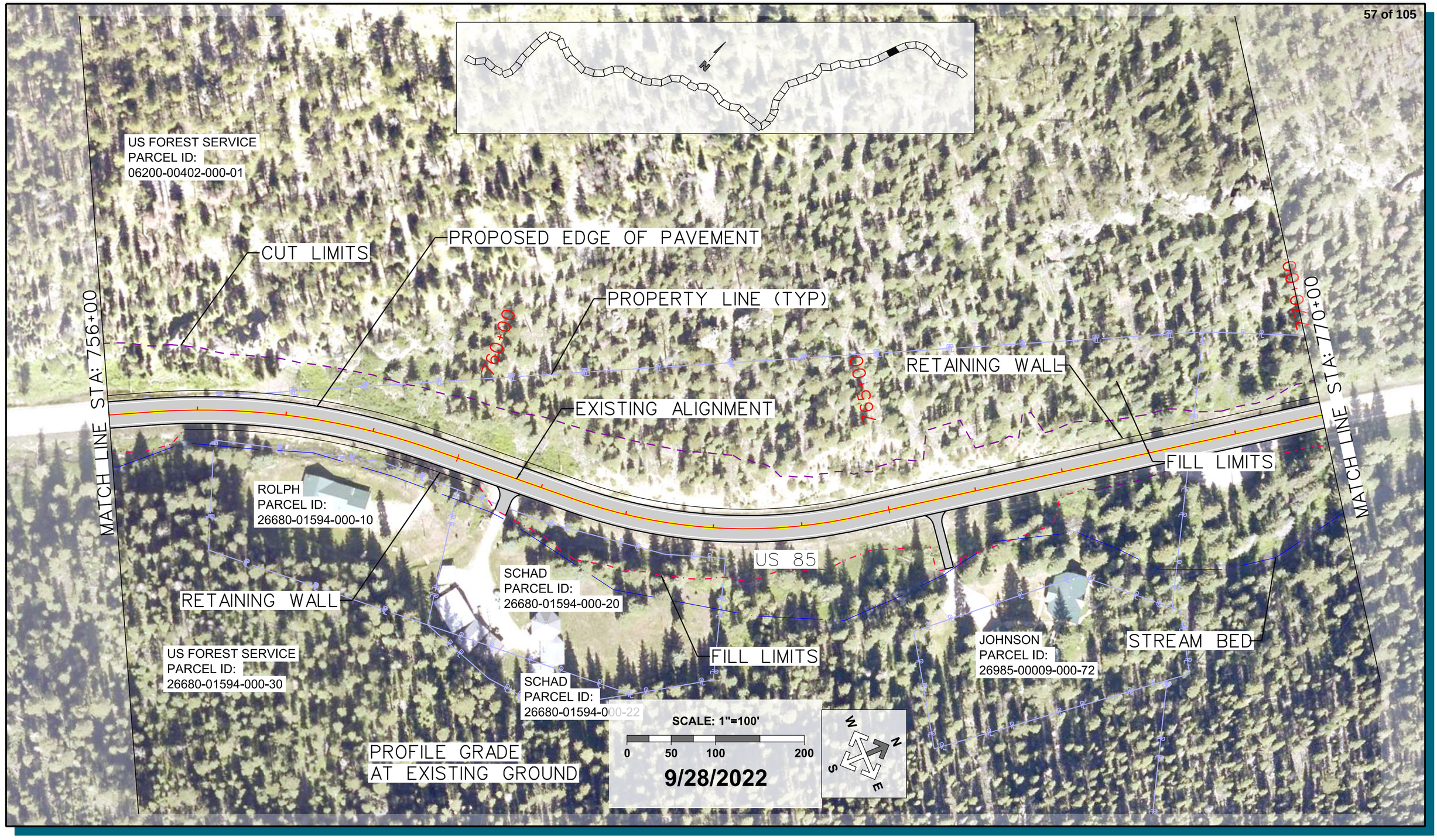
0 50 100 200

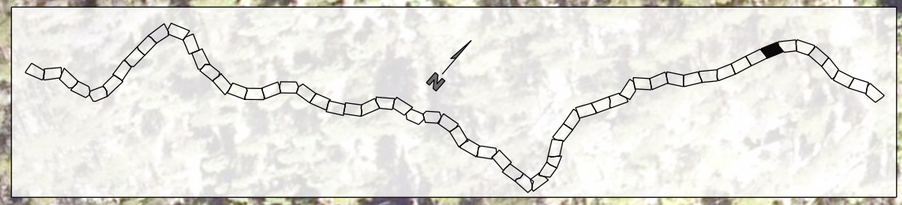
9/28/2022

N E S W


US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
PROPERTY LINE (TYP)
730+00
735+00
740+00
RETAINING WALL
EXISTING ALIGNMENT
US 85
MATCH LINE STA: 728+00
MATCH LINE STA: 742+00
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
FILL LIMITS
US FOREST SERVICE
PARCEL ID:
26680-01568-000-00
US FOREST SERVICE
PARCEL ID:
26680-01568-000-10
STREAM BED
PROFILE GRADE
AT EXISTING GROUND
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W


US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
EXISTING ALIGNMENT
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
RETAINING WALL
745+00
750+00
755+00
MILE 14
US 85
MATCH LINE STA: 742+00
MATCH LINE STA: 756+00
US FOREST SERVICE
PARCEL ID:
26680-01568-000-10
FILL LIMITS
MURPHY
PARCEL ID:
26985-00009-000-73
PALMER
PARCEL ID:
26985-00010-000-15
STREAM BED
HELLSGATE PICNIC
AREA PARKING
(SEE PARKING DETAIL)
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
PROPERTY LINE (TYP)
PROFILE GRADE
AT EXISTING GROUND
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W


US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
CUT LIMITS
PROPOSED EDGE OF PAVEMENT
PROPERTY LINE (TYP)
760+00
765+00
770+00
RETAINING WALL
EXISTING ALIGNMENT
MATCH LINE STA: 756+00
MATCH LINE STA: 770+00
FILL LIMITS
ROLPH
PARCEL ID:
26680-01594-000-10
US 85
SCHAD
PARCEL ID:
26680-01594-000-20
RETAINING WALL
FILL LIMITS
STREAM BED
JOHNSON
PARCEL ID:
26985-00009-000-72
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
SCHAD
PARCEL ID:
26680-01594-000-22
PROFILE GRADE
AT EXISTING GROUND
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
S
E
W



US FOREST SERVICE
PARCEL ID:
06200-00402-000-01

PROPERTY LINE (TYP)

RETAINING WALL

775+00

EXISTING ALIGNMENT

780+00

CUT LIMITS

770+00

MATCH LINE STA: 770+00

US 85

784+00

MATCH LINE STA: 784+00

FILL LIMITS

PROPOSED EDGE OF PAVEMENT

STREAM BED

US FOREST SERVICE
PARCEL ID:
26680-01594-000-30

SCALE: 1"=100'

0 50 100 200

9/28/2022

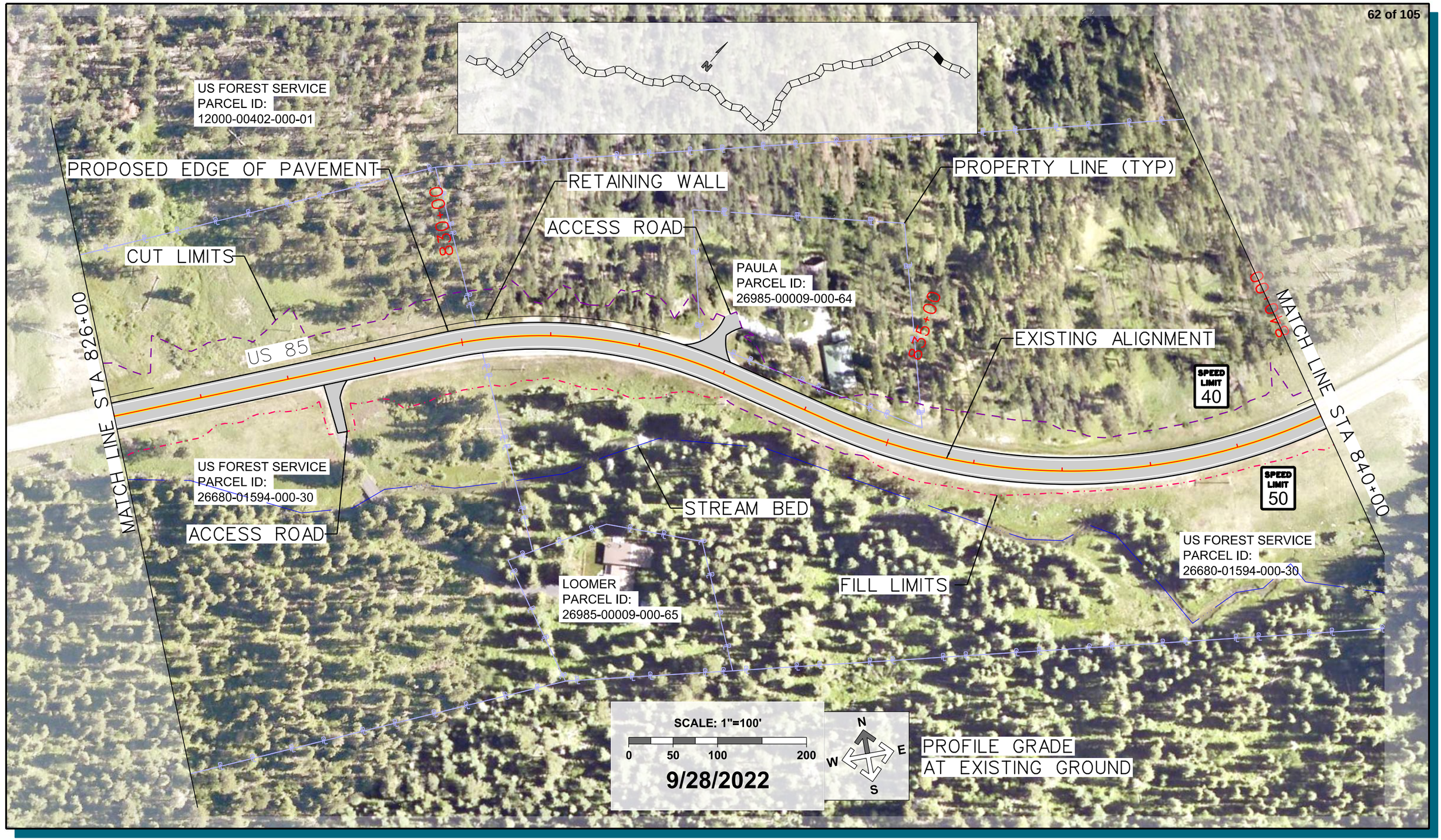
N NE E S W

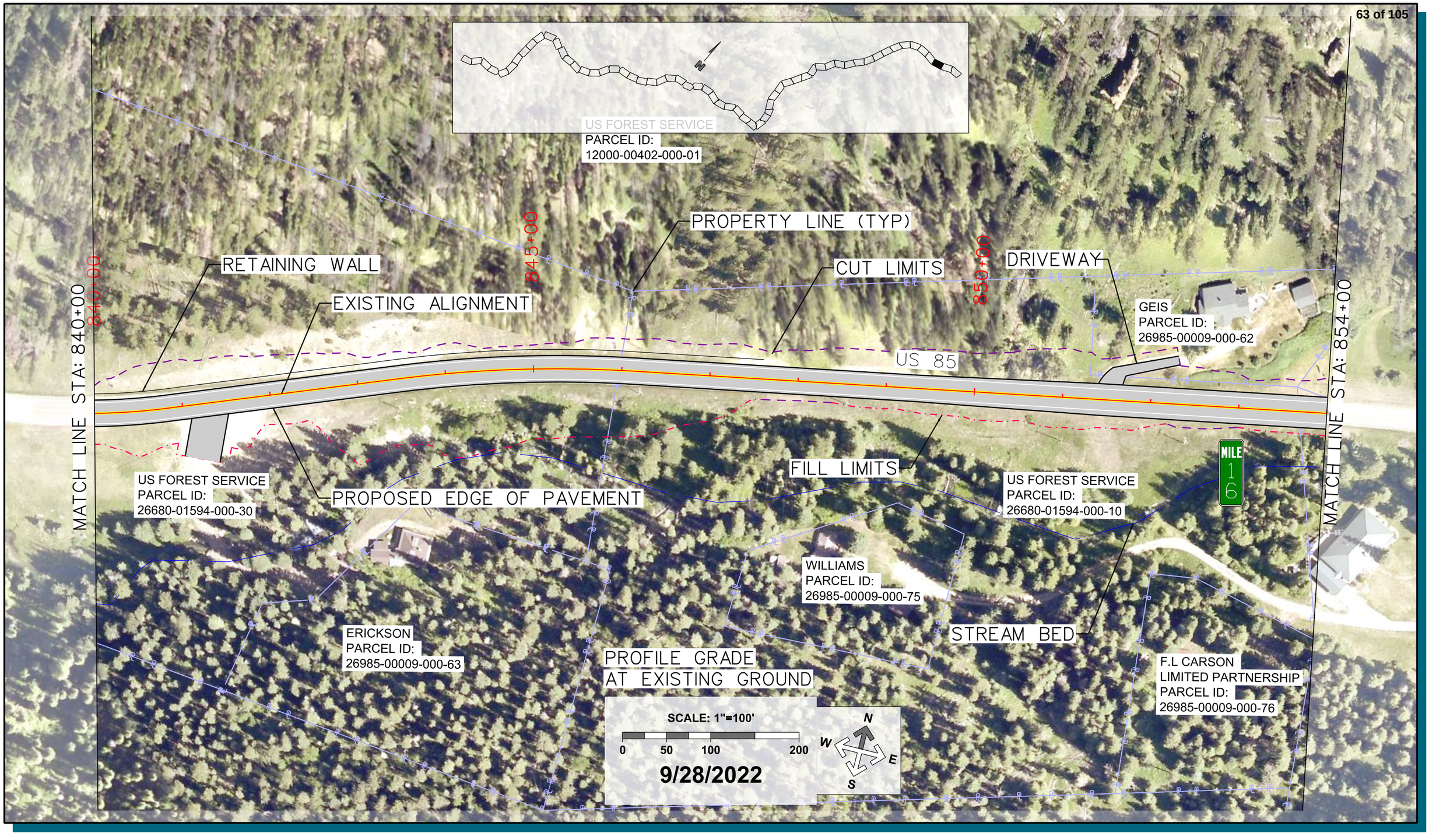
PROFILE GRADE
AT EXISTING GROUND

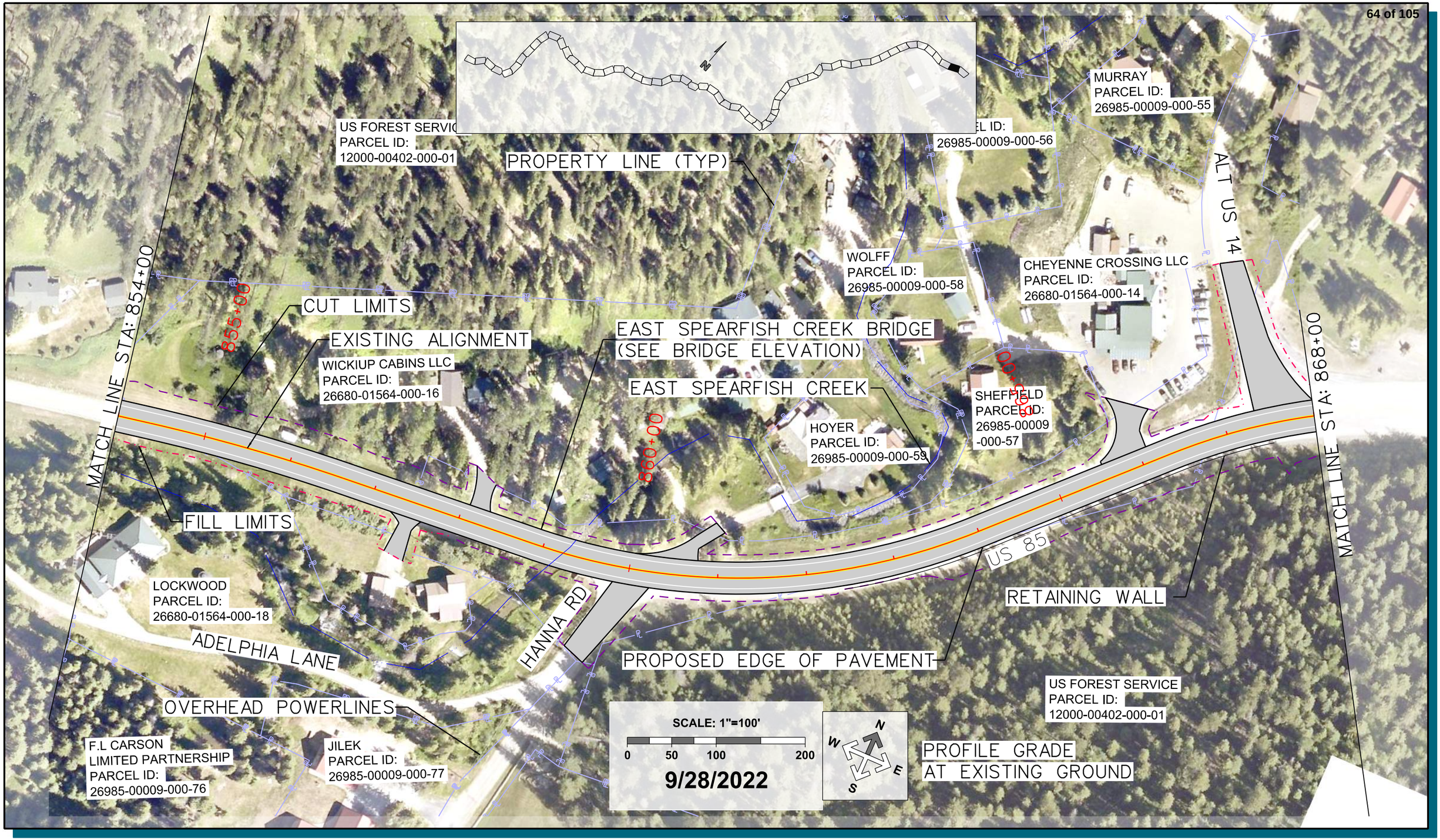

EXISTING ALIGNMENT
CUT LIMITS
FILL LIMITS
US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
RIZZI
PARCEL ID:
26985-00009-000-71
DALY
PARCEL ID:
26985-00009-000-70
US FOREST SE
PARCEL ID:
26680-01594-000-30
PROPERTY LINE (TYP)
PROPOSED EDGE OF PAVEMENT
US 85
STREAM BED
790+00
795+00
785+00
784+00
MATCH LINE STA: 784+00
MATCH LINE STA: 798+00
N
SCALE: 1"=100'
0 50 100 200
9/28/2022
W N S E
PROFILE GRADE
AT EXISTING GROUND


US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
RETAINING WALL
EXISTING ALIGNMENT
805+00
PROPOSED EDGE OF PAVEMENT
CUT LIMITS
810+00
800+00
MILE 511
US 85
798+00
MATCH LINE STA: 798+00
812+00
MATCH LINE STA: 812+00
US FOREST SERVICE
PARCEL ID:
26680-01594
-000-30
PARKING
(SEE PARKING DETAIL)
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
STREAM BED
FILL LIMITS
EBBERT
PARCEL ID:
26985-00009-000-69
DRISCOLL
PARCEL ID:
26985-00009-000-68
PROPERTY LINE (TYP)
DRISCOLL
PARCEL ID:
26985-00009
-000-67
PROFILE GRADE
AT EXISTING GROUND
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S

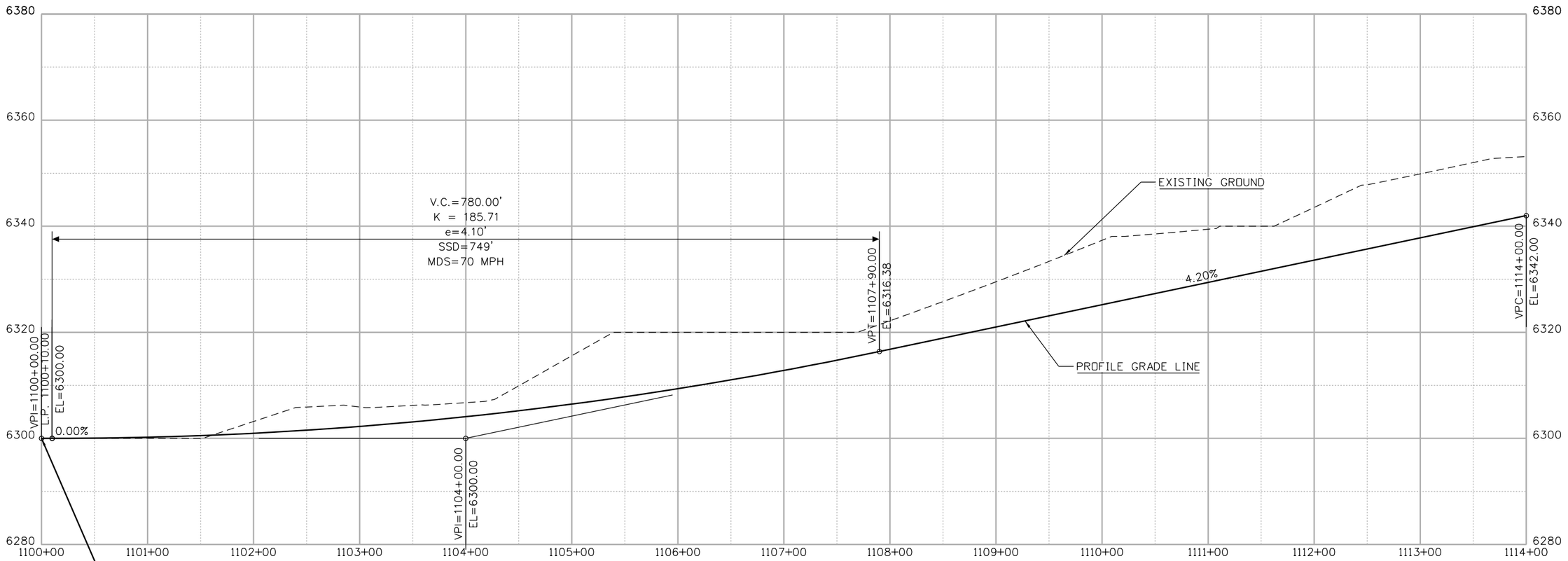

US FOREST SERVICE
PARCEL ID:
06200-00402-000-01
PROPERTY LINE (TYP)
PROPOSED EDGE OF PAVEMENT
CUT LIMITS
RETAINING WALL
EXISTING ALIGNMENT
REAUSAW
PARCEL ID:
26985-00009-000-66
MATCH LINE STA: 812+00
MATCH LINE STA: 826+00
US 85
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
STREAM BED
FILL LIMITS
DRISCOLL
PARCEL ID:
26985-00009-000-67
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W E
S
PROFILE GRADE
AT EXISTING GROUND

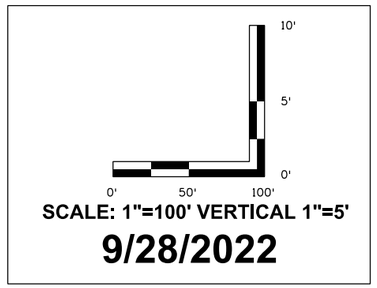

US FOREST SERVICE
PARCEL ID:
12000-00402-000-01
PROPOSED EDGE OF PAVEMENT
RETAINING WALL
PROPERTY LINE (TYP)
ACCESS ROAD
CUT LIMITS
830+00
835+00
PAULA
PARCEL ID:
26985-00009-000-64
EXISTING ALIGNMENT
MATCH LINE STA 826+00
MATCH LINE STA 840+00
US 85
SPEED LIMIT 40
SPEED LIMIT 50
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
STREAM BED
ACCESS ROAD
LOOMER
PARCEL ID:
26985-00009-000-65
FILL LIMITS
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S
PROFILE GRADE
AT EXISTING GROUND


US FOREST SERVICE
PARCEL ID:
12000-00402-000-01
PROPERTY LINE (TYP)
RETAINING WALL
EXISTING ALIGNMENT
CUT LIMITS
DRIVEWAY
840+00
845+00
850+00
STA: 840+00
STA: 854+00
US 85
GEIS
PARCEL ID:
26985-00009-000-62
MATCH LINE STA: 840+00
MATCH LINE STA: 854+00
US FOREST SERVICE
PARCEL ID:
26680-01594-000-30
PROPOSED EDGE OF PAVEMENT
FILL LIMITS
US FOREST SERVICE
PARCEL ID:
26680-01594-000-10
MILE 16
WILLIAMS
PARCEL ID:
26985-00009-000-75
STREAM BED
ERICKSON
PARCEL ID:
26985-00009-000-63
PROFILE GRADE
AT EXISTING GROUND
F.L CARSON
LIMITED PARTNERSHIP
PARCEL ID:
26985-00009-000-76
SCALE: 1"=100'
0 50 100 200
9/28/2022
N
W
E
S


US FOREST SERVIC
PARCEL ID:
12000-00402-000-01
PROPERTY LINE (TYP)
MURRAY
PARCEL ID:
26985-00009-000-55
EL ID:
26985-00009-000-56
ALT US 14
WOLFF
PARCEL ID:
26985-00009-000-58
CHEYENNE CROSSING LLC
PARCEL ID:
26680-01564-000-14
MATCH LINE STA: 854+00
855+00
CUT LIMITS
EXISTING ALIGNMENT
WICKIUP CABINS LLC
PARCEL ID:
26680-01564-000-16
EAST SPEARFISH CREEK BRIDGE
(SEE BRIDGE ELEVATION)
EAST SPEARFISH CREEK
860+00
HOYER
PARCEL ID:
26985-00009-000-59
SHEFFIELD
PARCEL ID:
26985-00009
-000-57
865+00
MATCH LINE STA: 868+00
FILL LIMITS
US 85
LOCKWOOD
PARCEL ID:
26680-01564-000-18
HANNA RD
RETAINING WALL
ADELPHIA LANE
PROPOSED EDGE OF PAVEMENT
US FOREST SERVICE
PARCEL ID:
12000-00402-000-01
OVERHEAD POWERLINES
F.L CARSON
LIMITED PARTNERSHIP
PARCEL ID:
26985-00009-000-76
JILEK
PARCEL ID:
26985-00009-000-77
SCALE: 1"=100'
0 50 100 200
9/28/2022
N W E S
PROFILE GRADE
AT EXISTING GROUND

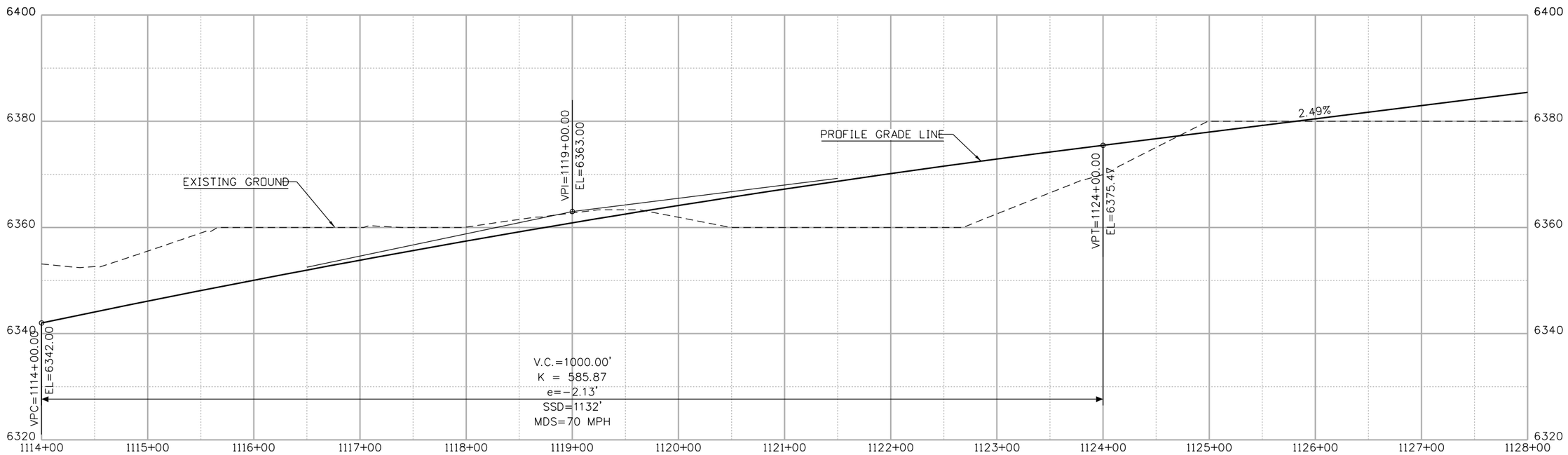

MORAN
PARCEL ID:
12000-00402-220-14
FILL LIMITS
870+00
WELLS
PARCEL ID:
12000-00402
-220-12
874+00
EXISTING ALIGNMENT
END STA. 874+00
US FOREST SERVICE
PARCEL ID:
12000-00402-000-01
US 85
MATCH LINE STA: 868+00
CUT LIMITS
AL JO PROPERTIES LLC
PARCEL ID:
12000-00402-220-11
KUSSER
PARCEL ID:
12000-00402-220-10
PROPOSED EDGE OF PAVEMENT
PROPERTY LINE (TYP)
SCALE: 1"=100'
0
50
100
200
9/28/2022
N
W
E
S
PROFILE GRADE
AT EXISTING GROUND

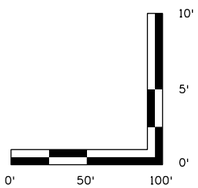




SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

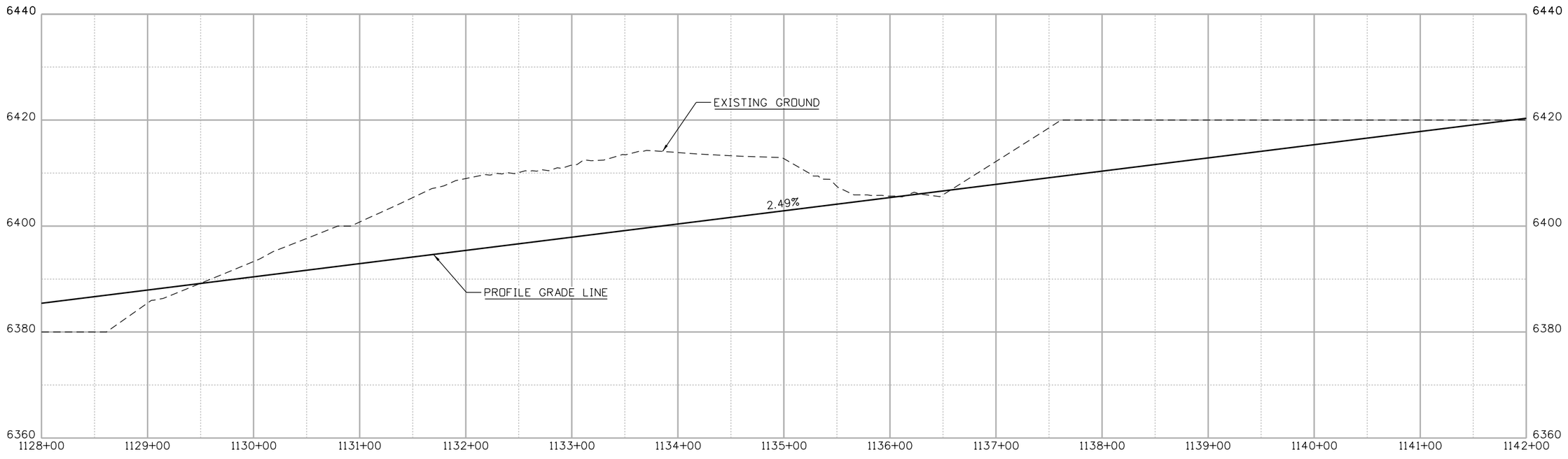


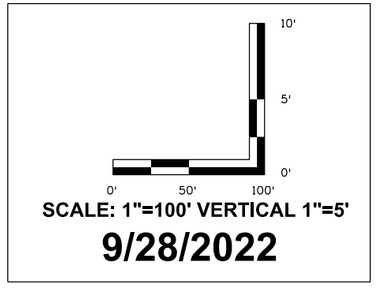


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

Corridor 3 (US 85: Wyoming to US 14A)

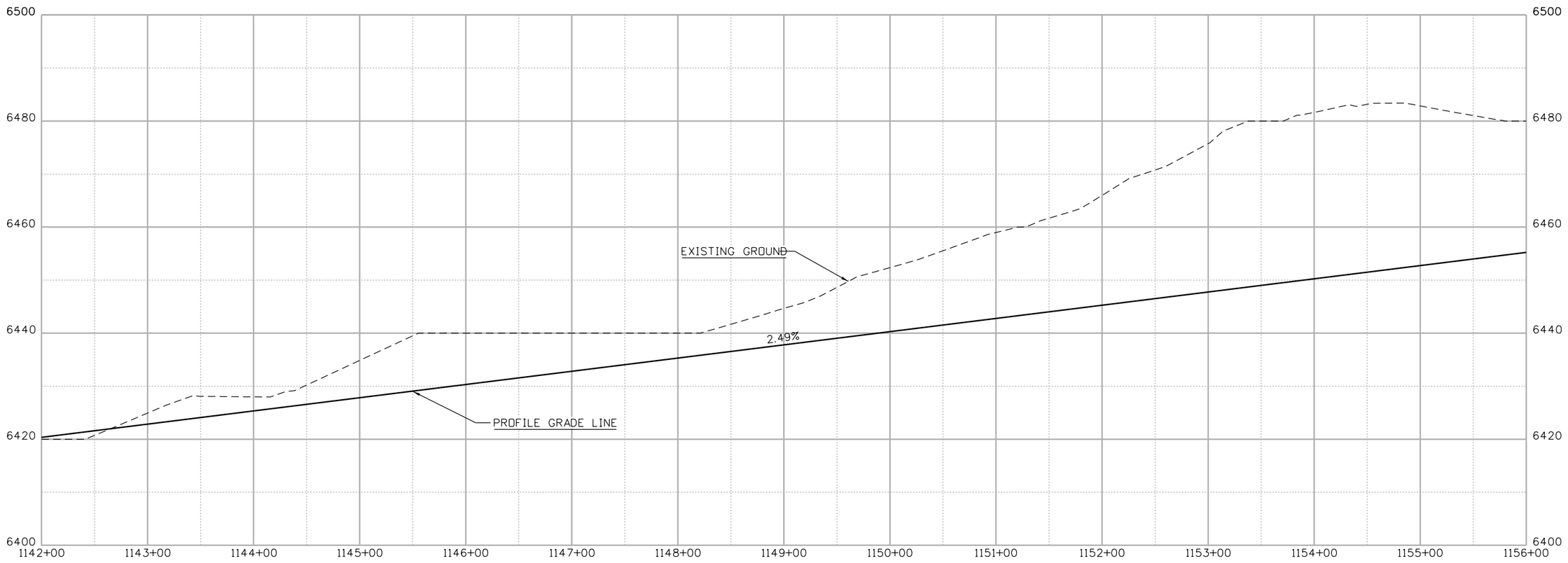


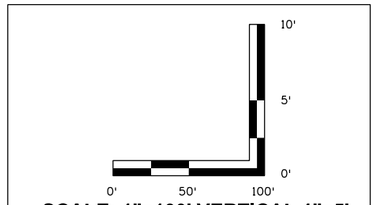


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

Corridor 3 (US 85: Wyoming to US 14A)

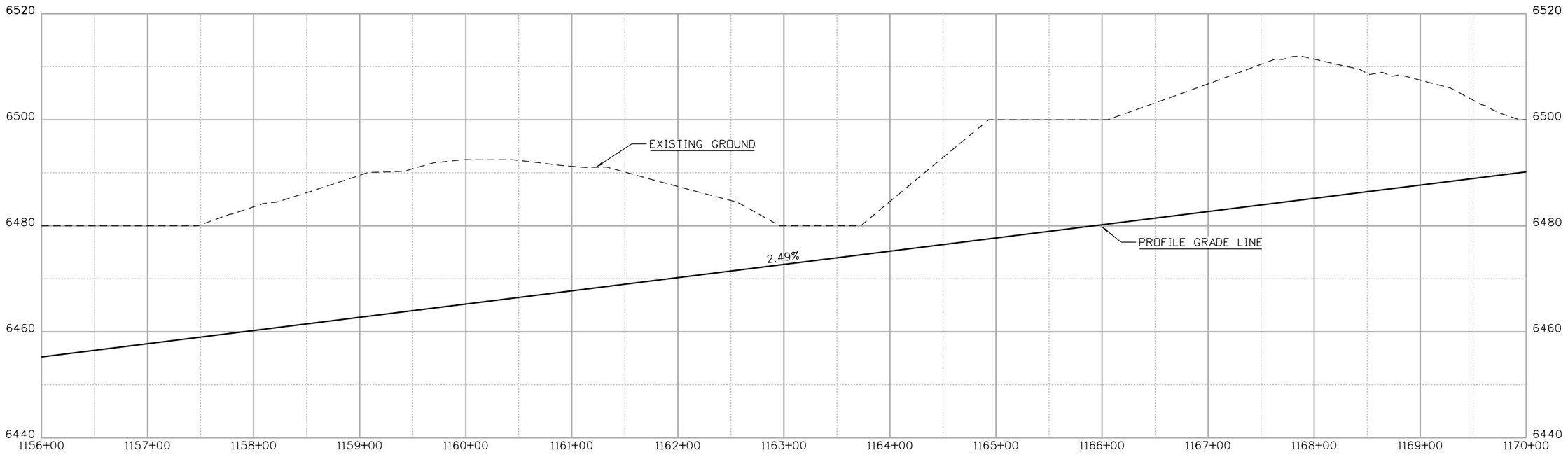


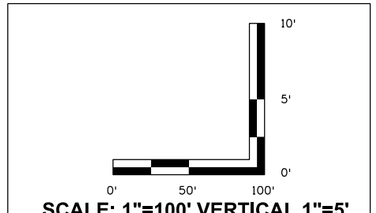


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

Corridor 3 (US 85: Wyoming to US 14A)

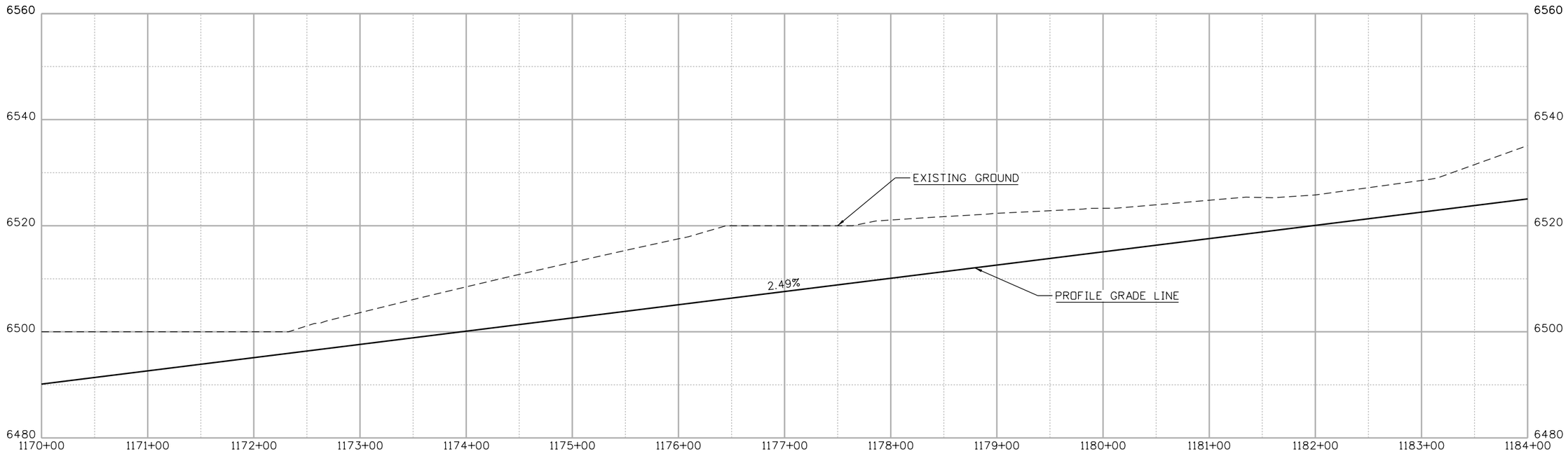


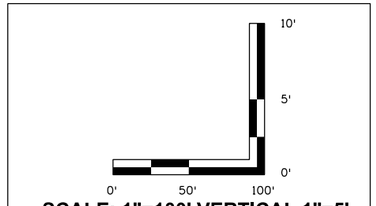


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

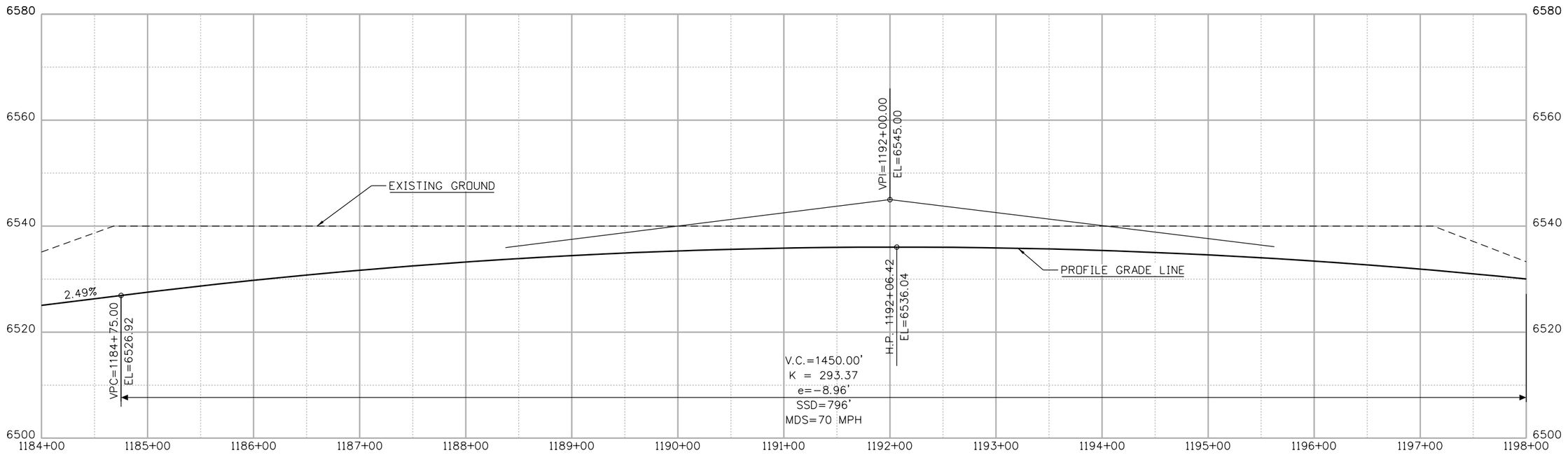
Corridor 3 (US 85: Wyoming to US 14A)

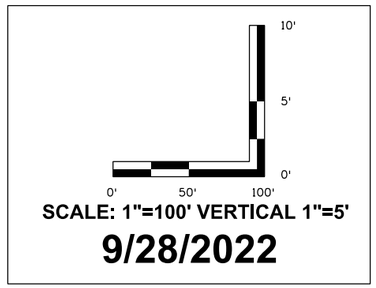




SCALE: 1"=100' VERTICAL 1"=5'

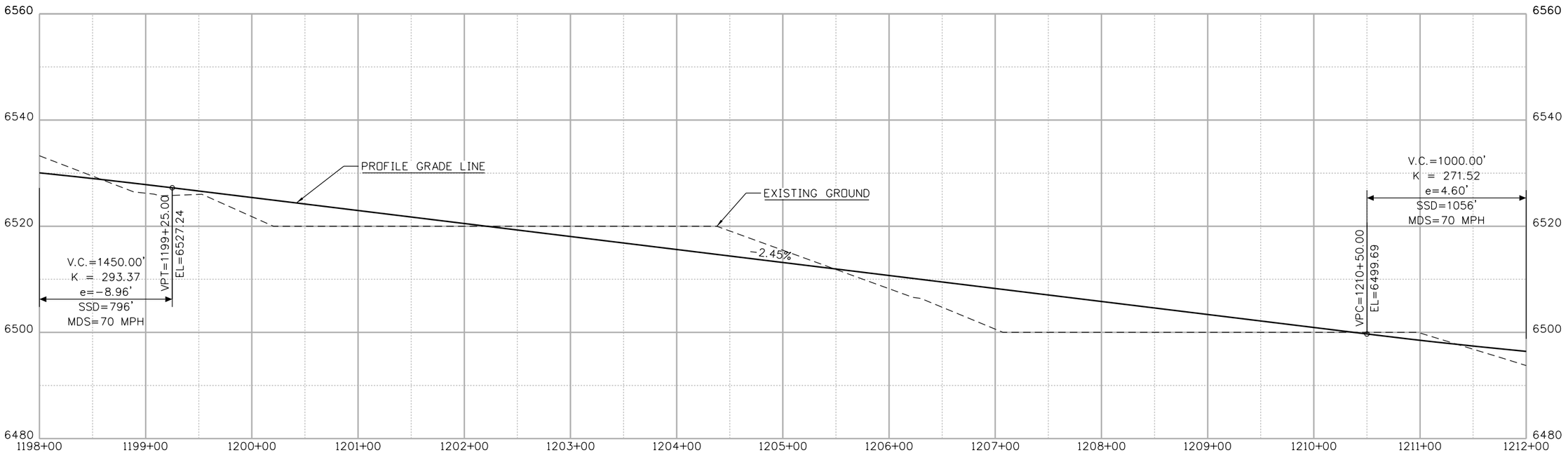
9/28/2022

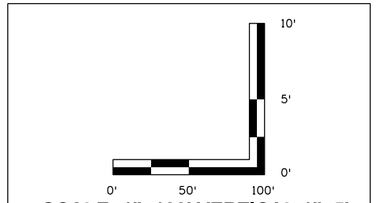




SCALE: 1"=100' VERTICAL 1"=5'

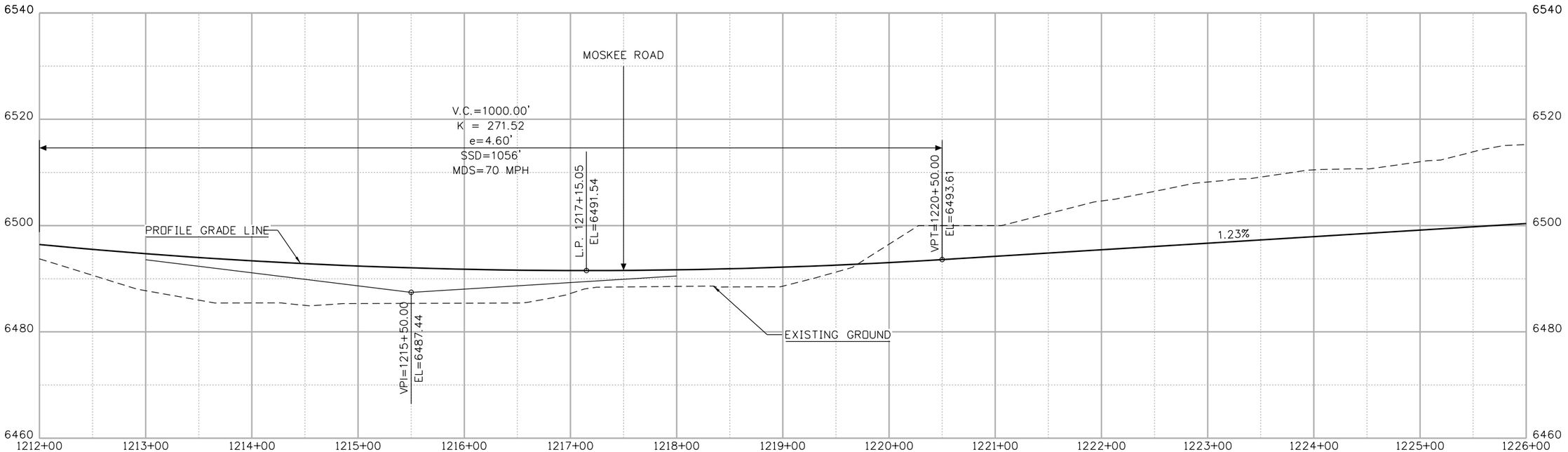
9/28/2022

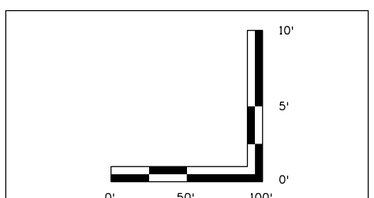




SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

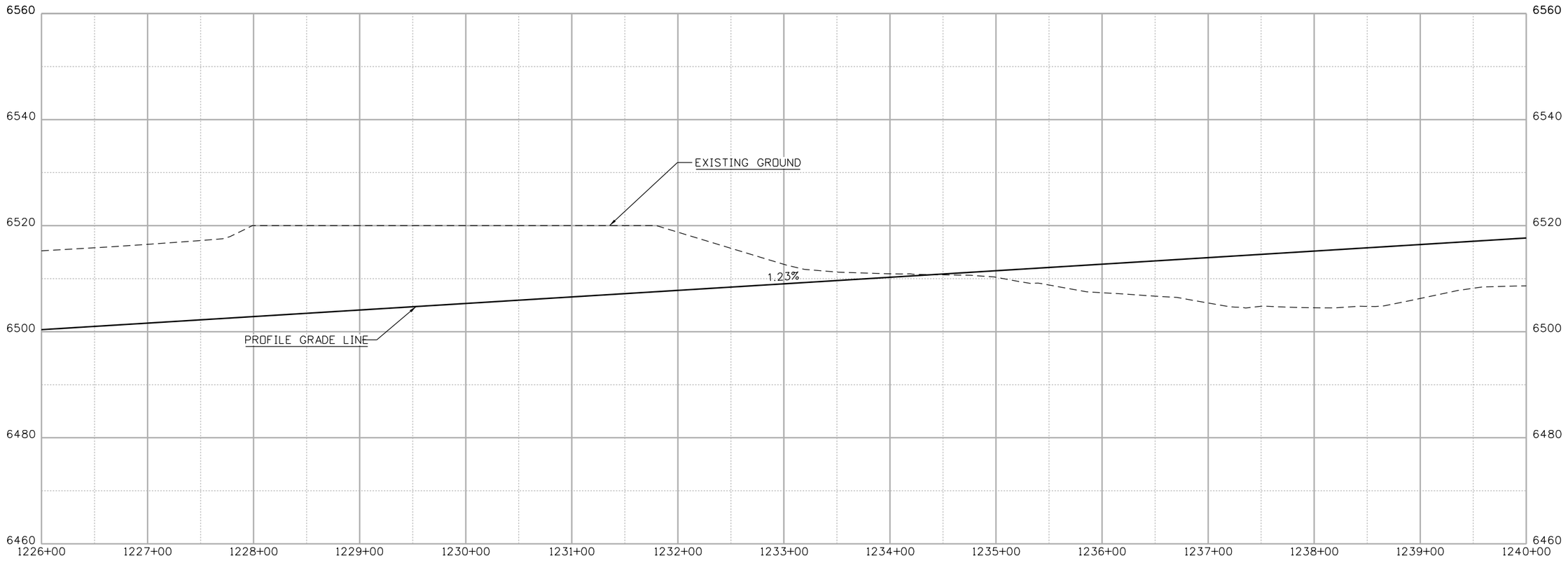


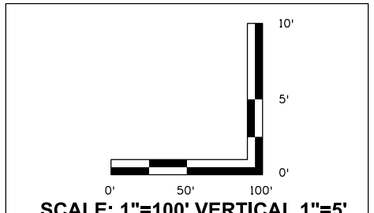


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

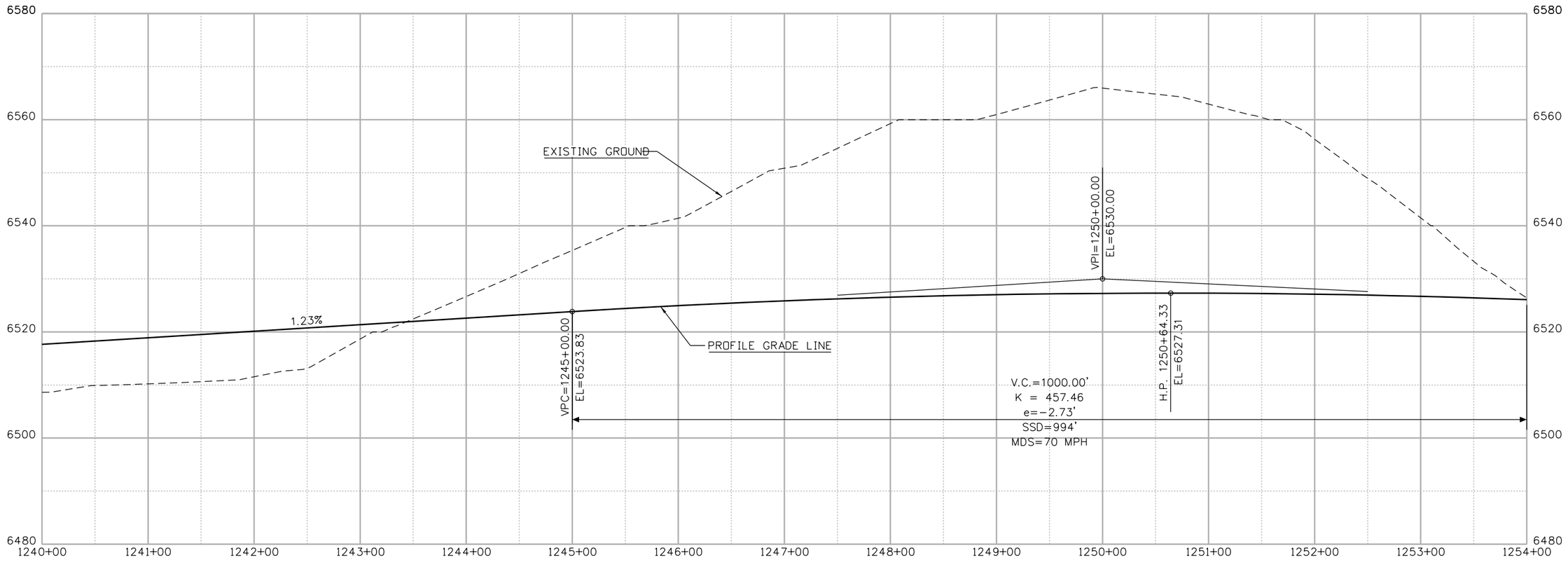
Corridor 3 (US 85: Wyoming to US 14A)

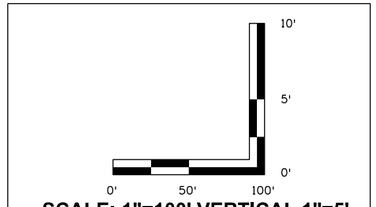




SCALE: 1"=100' VERTICAL 1"=5'

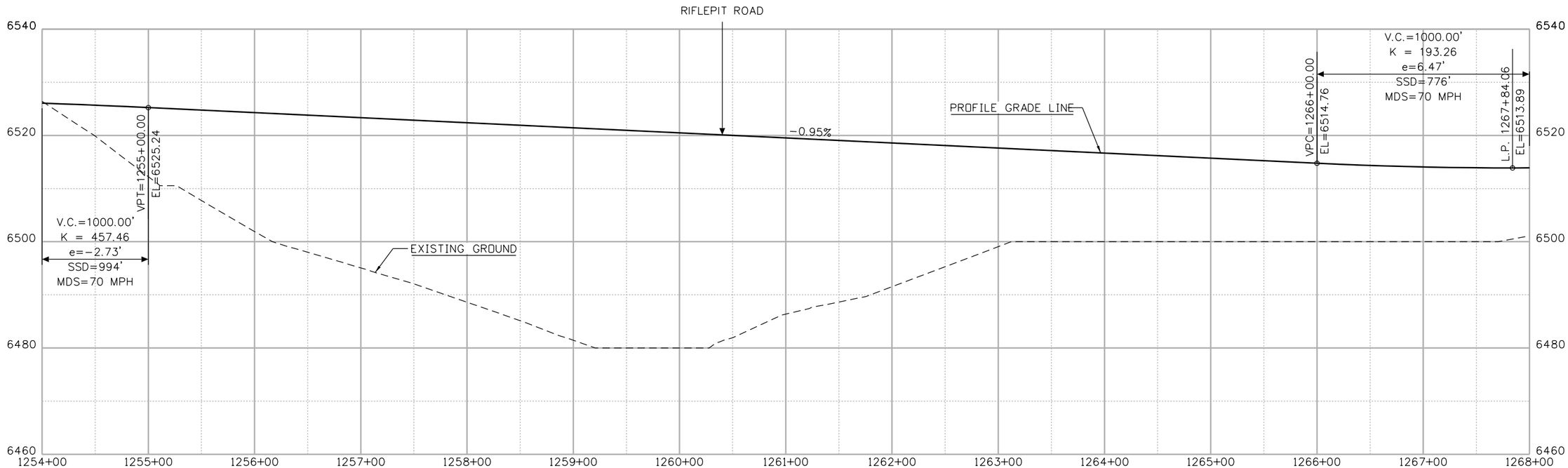
9/28/2022

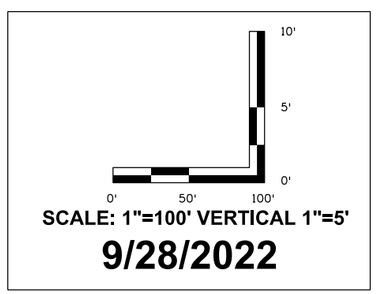




SCALE: 1"=100' VERTICAL 1"=5'

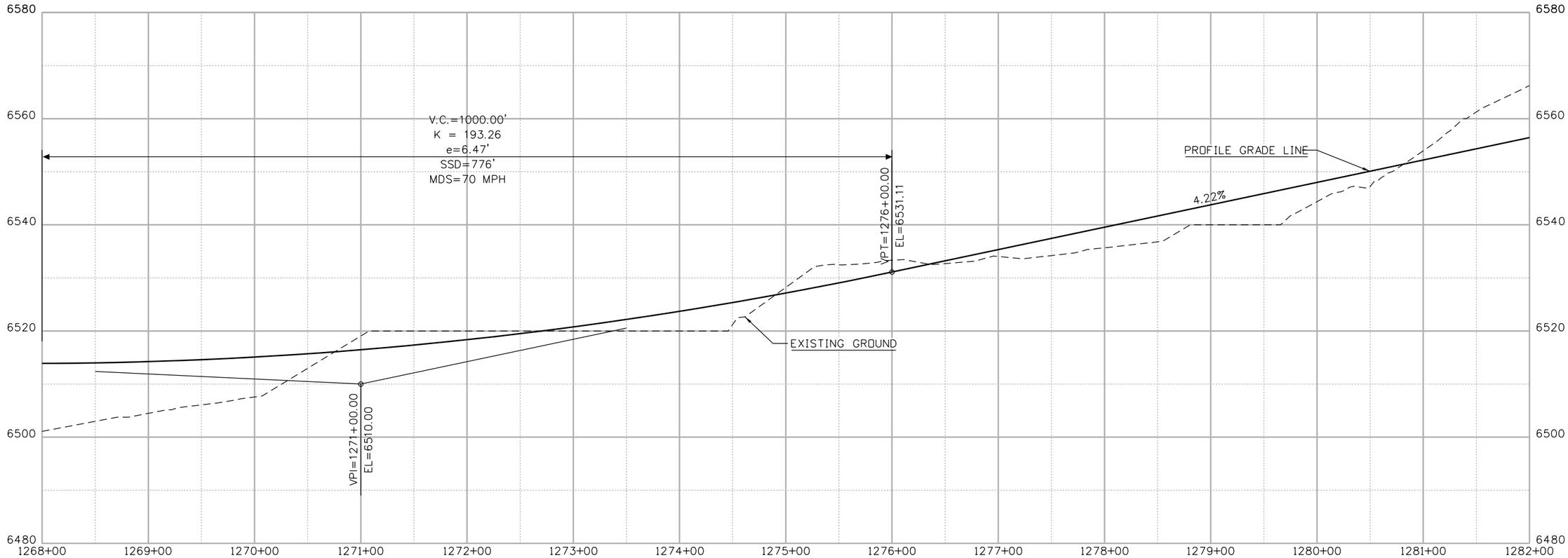
9/28/2022

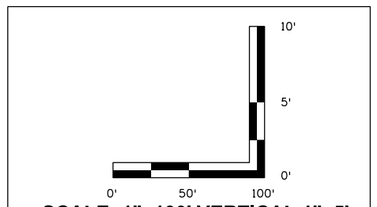




SCALE: 1"=100' VERTICAL 1"=5'

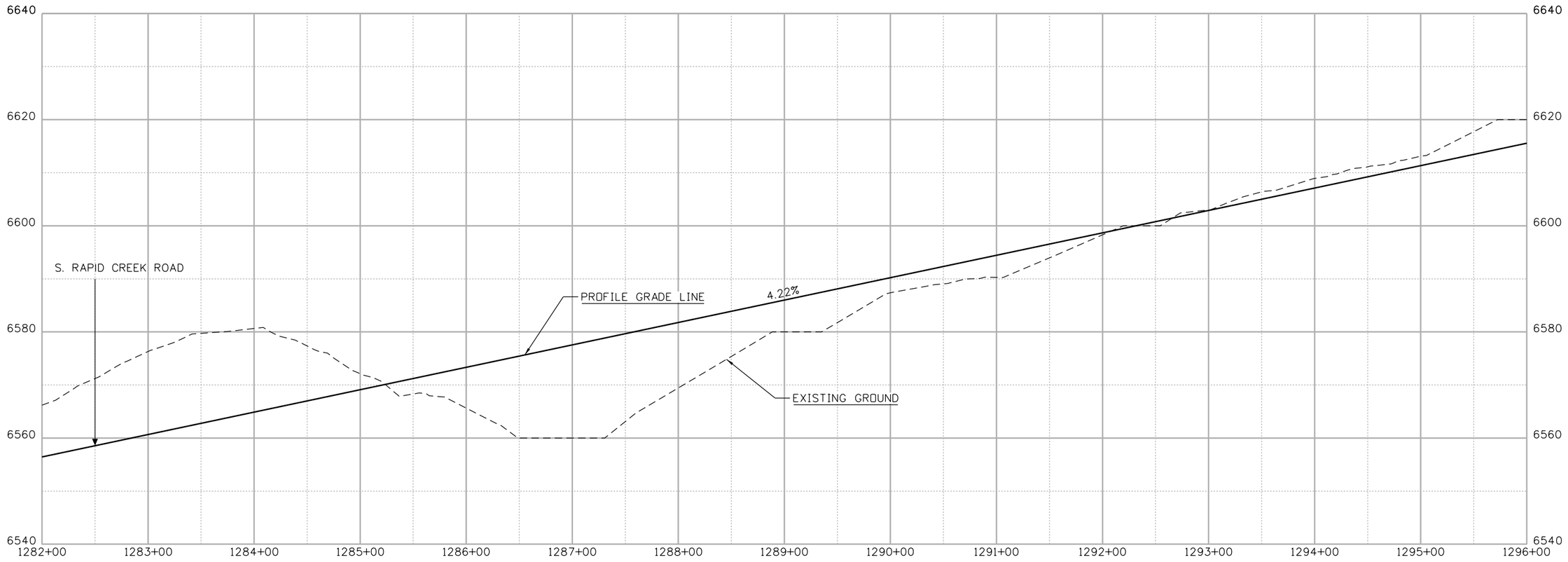
9/28/2022

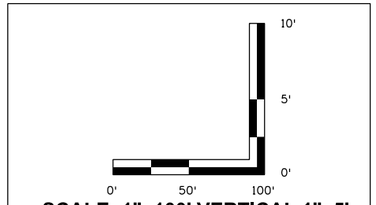




SCALE: 1"=100' VERTICAL 1"=5'

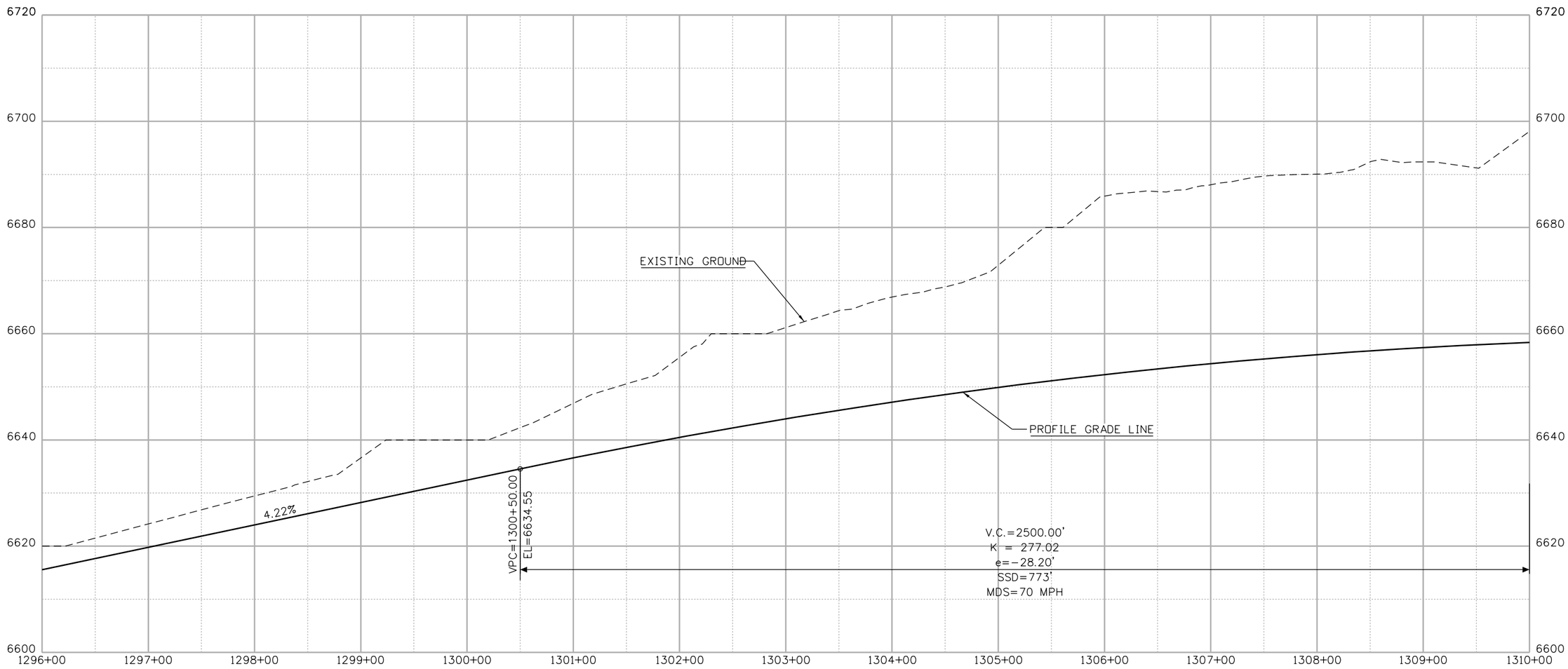
9/28/2022

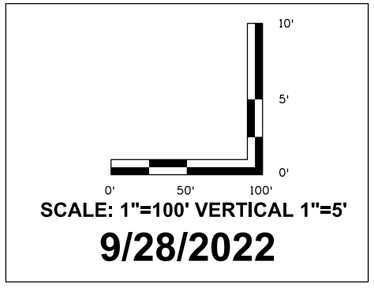




SCALE: 1"=100' VERTICAL 1"=5'

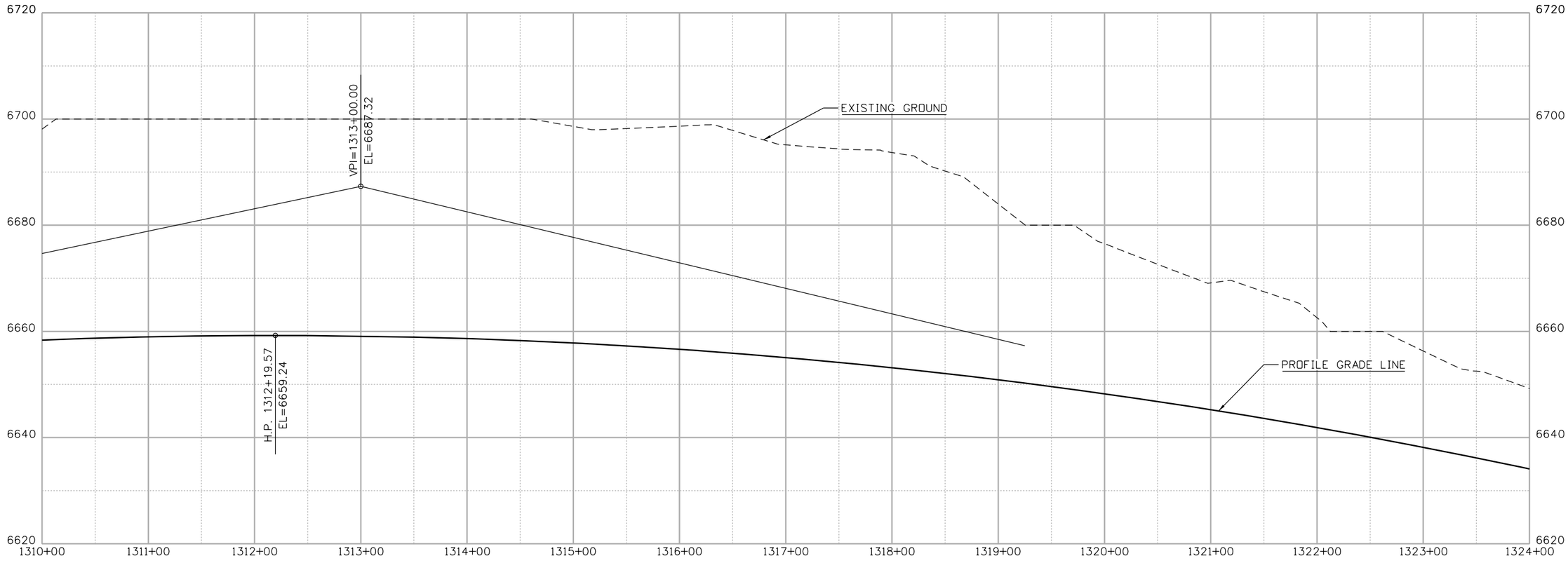
9/28/2022

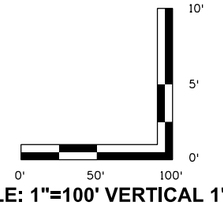




SCALE: 1"=100' VERTICAL 1"=5'

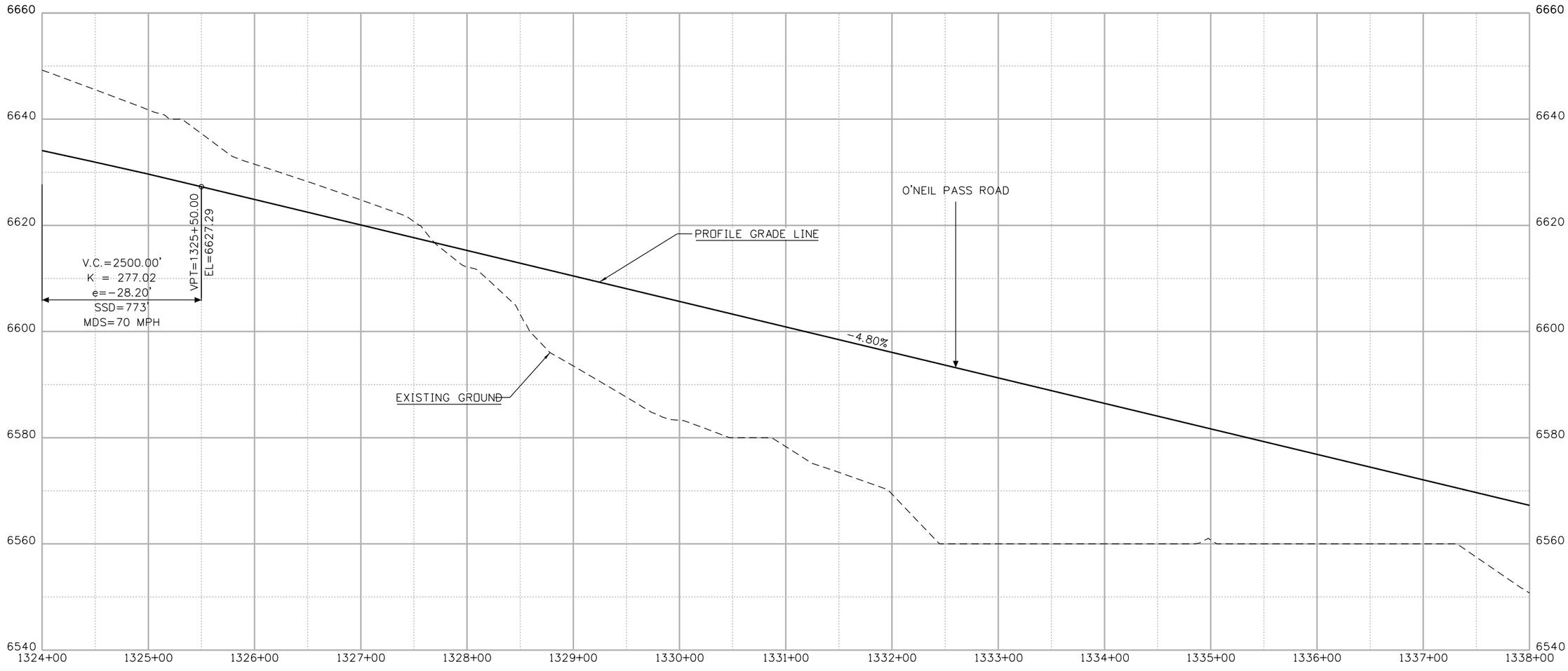
9/28/2022

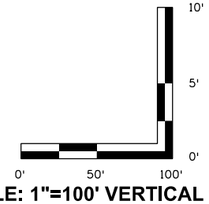




SCALE: 1"=100' VERTICAL 1"=5'

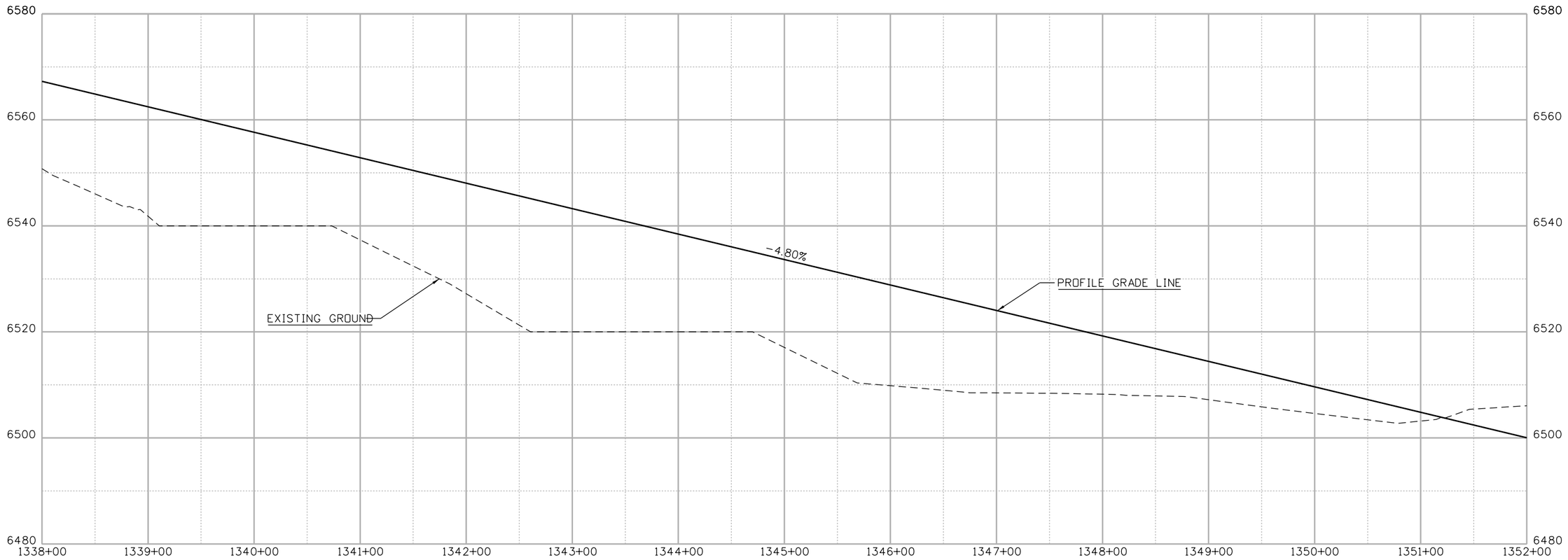
9/28/2022

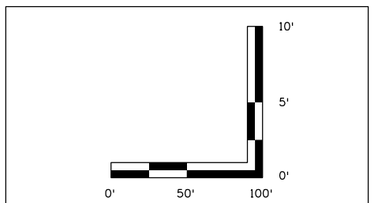




SCALE: 1"=100' VERTICAL 1"=5'

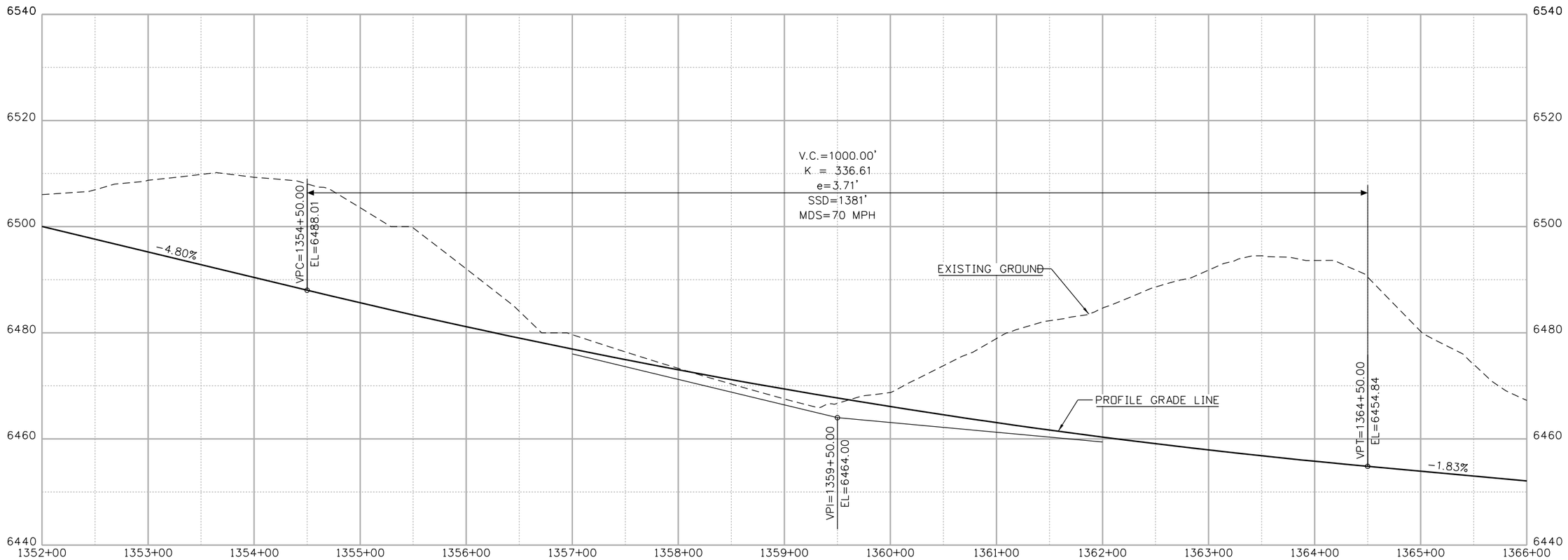
9/28/2022

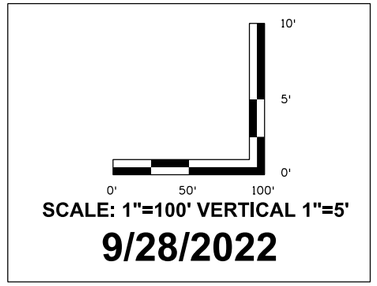




SCALE: 1"=100' VERTICAL 1"=5'

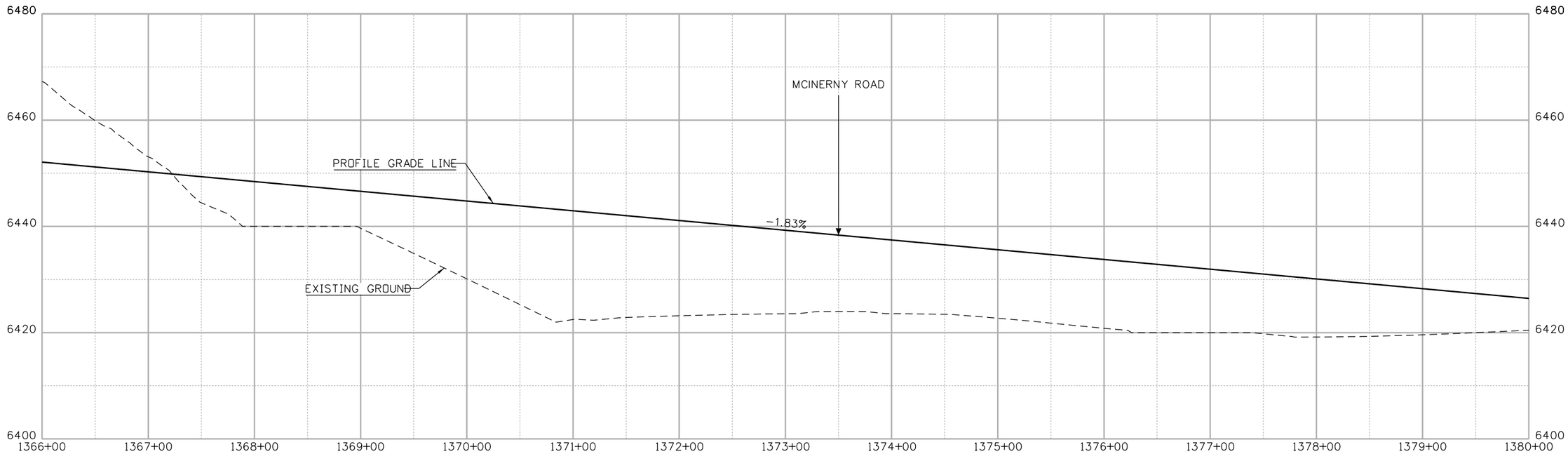
9/28/2022

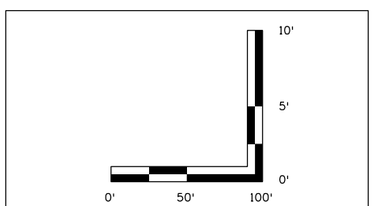




SCALE: 1"=100' VERTICAL 1"=5'

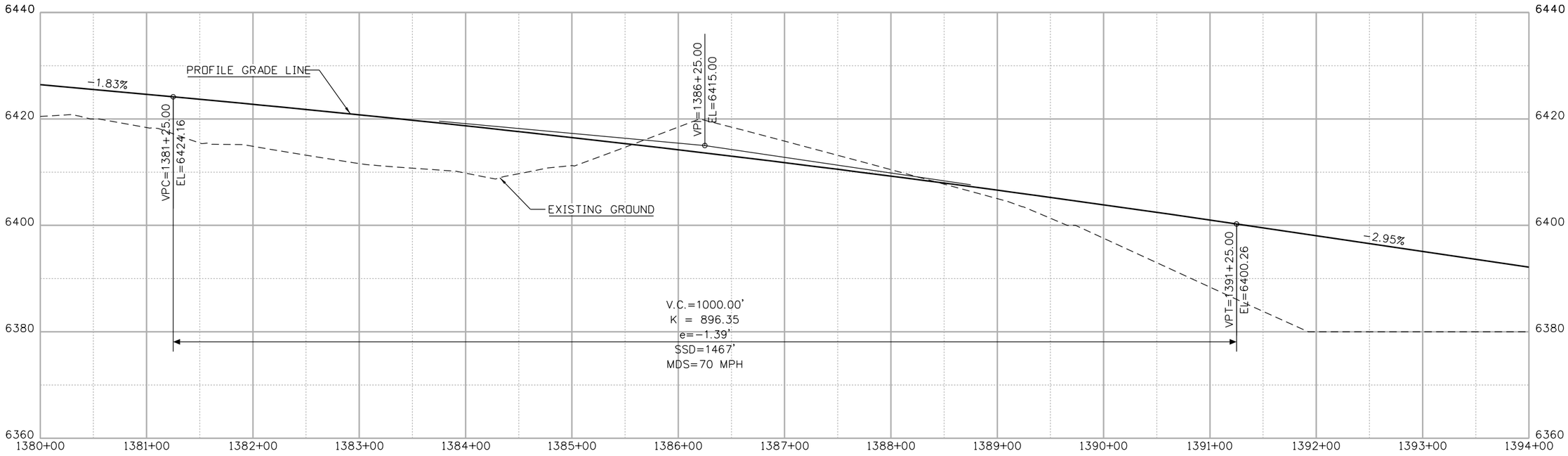
9/28/2022

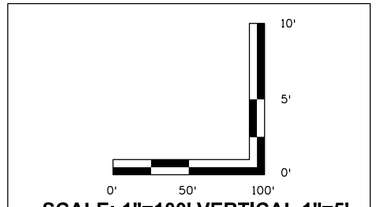




SCALE: 1"=100' VERTICAL 1"=5'

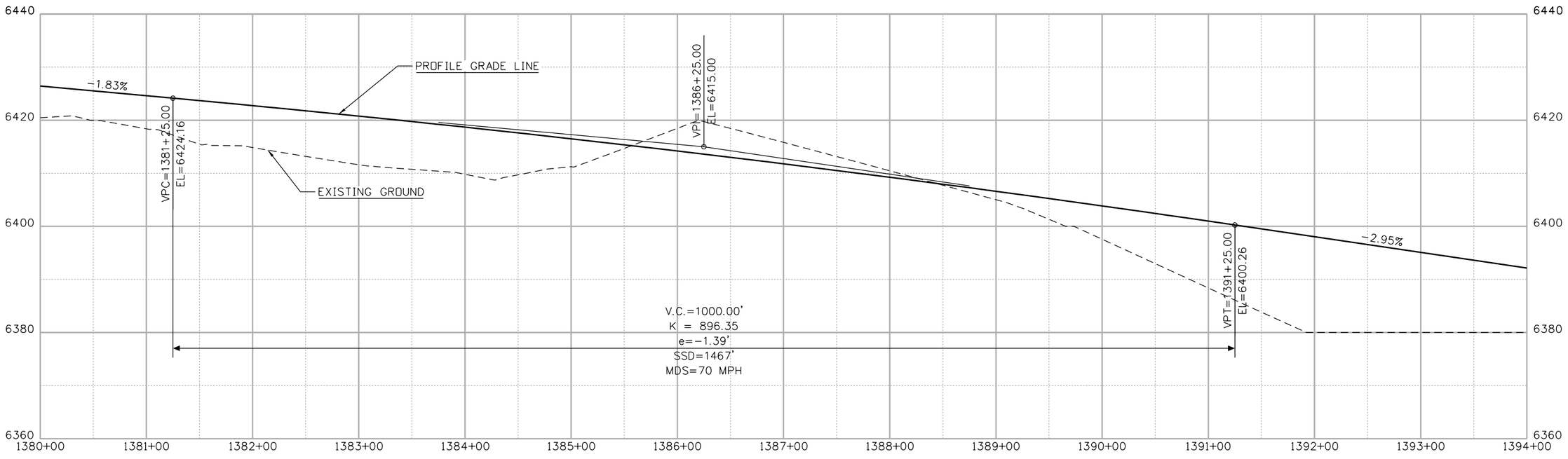
9/28/2022

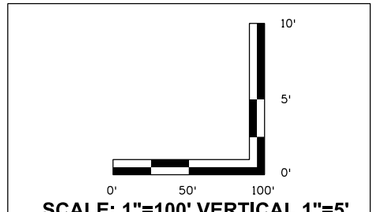




SCALE: 1"=100' VERTICAL 1"=5'

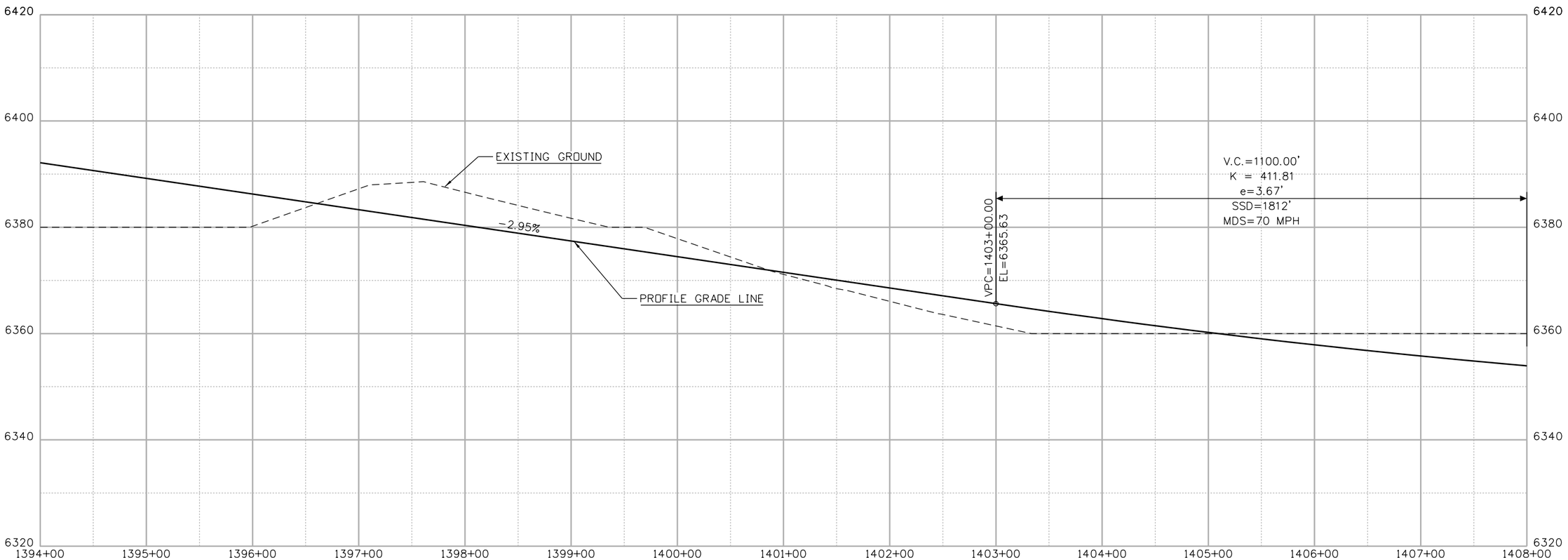
9/28/2022

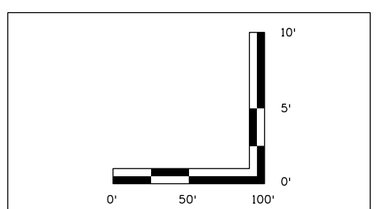




SCALE: 1"=100' VERTICAL 1"=5'

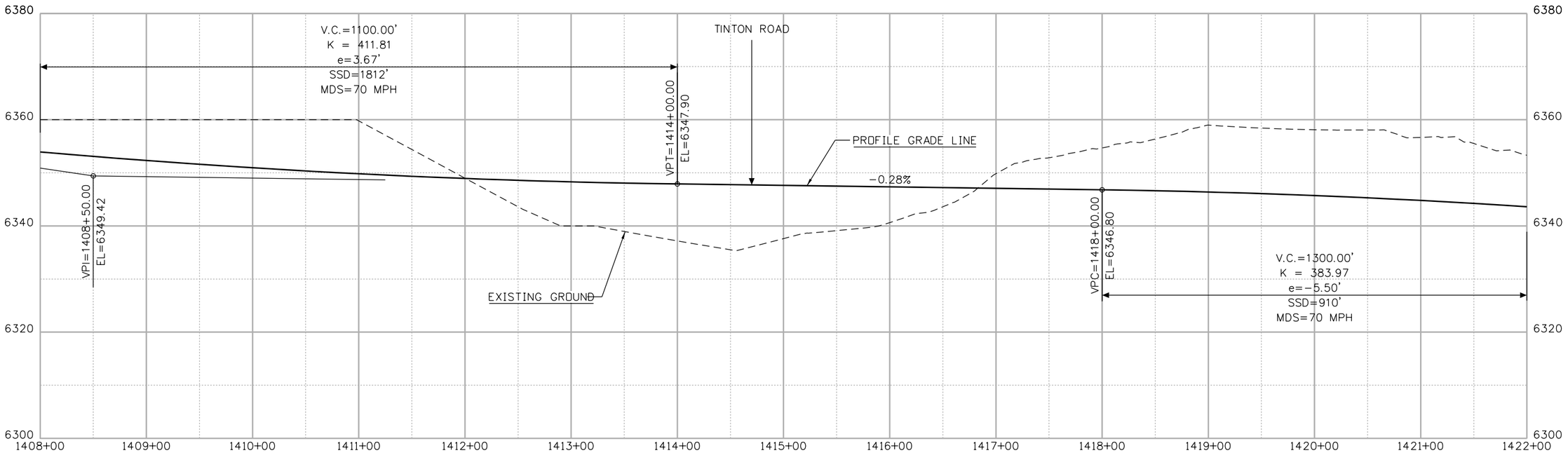
9/28/2022

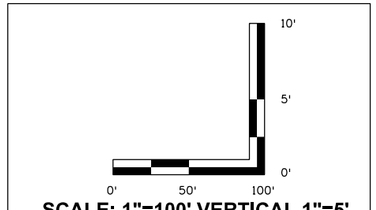




SCALE: 1"=100' VERTICAL 1"=5'

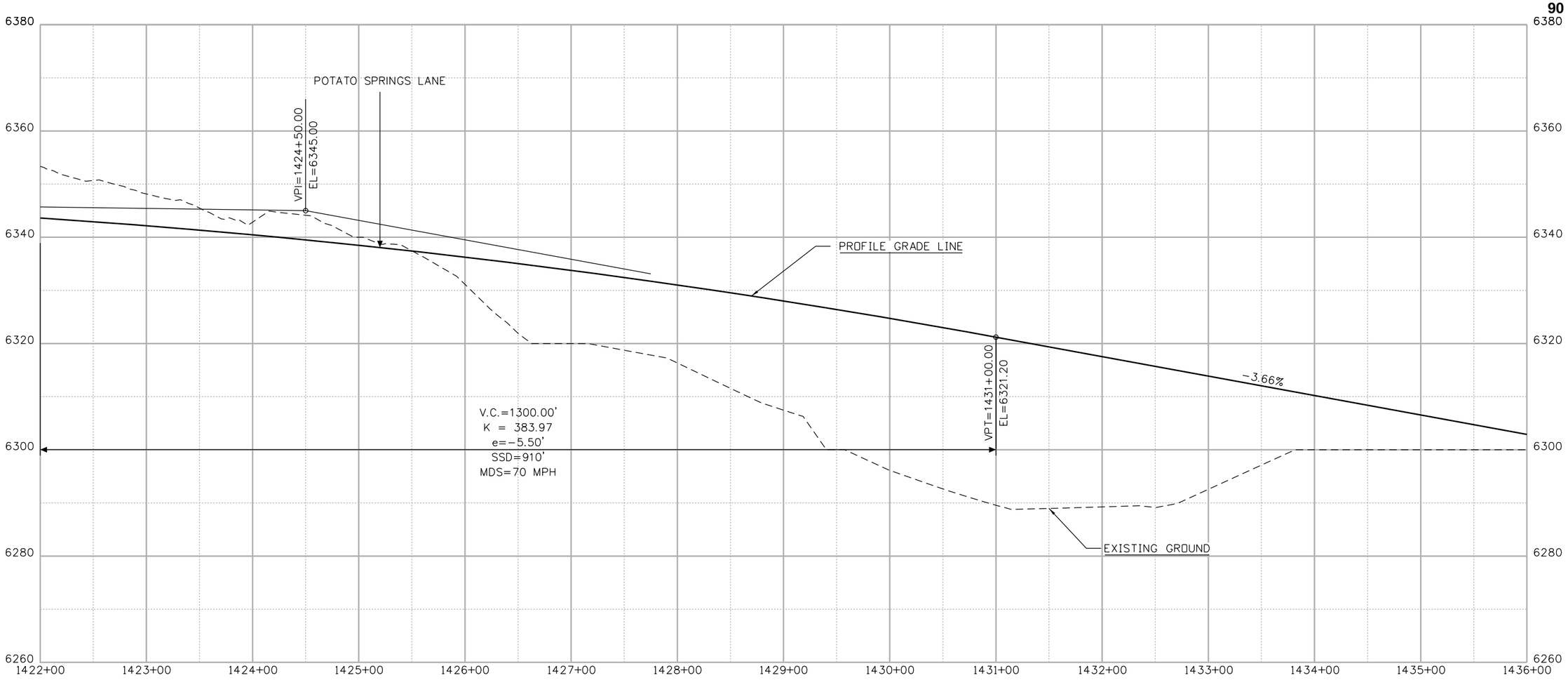
9/28/2022

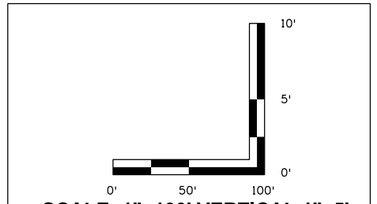




SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

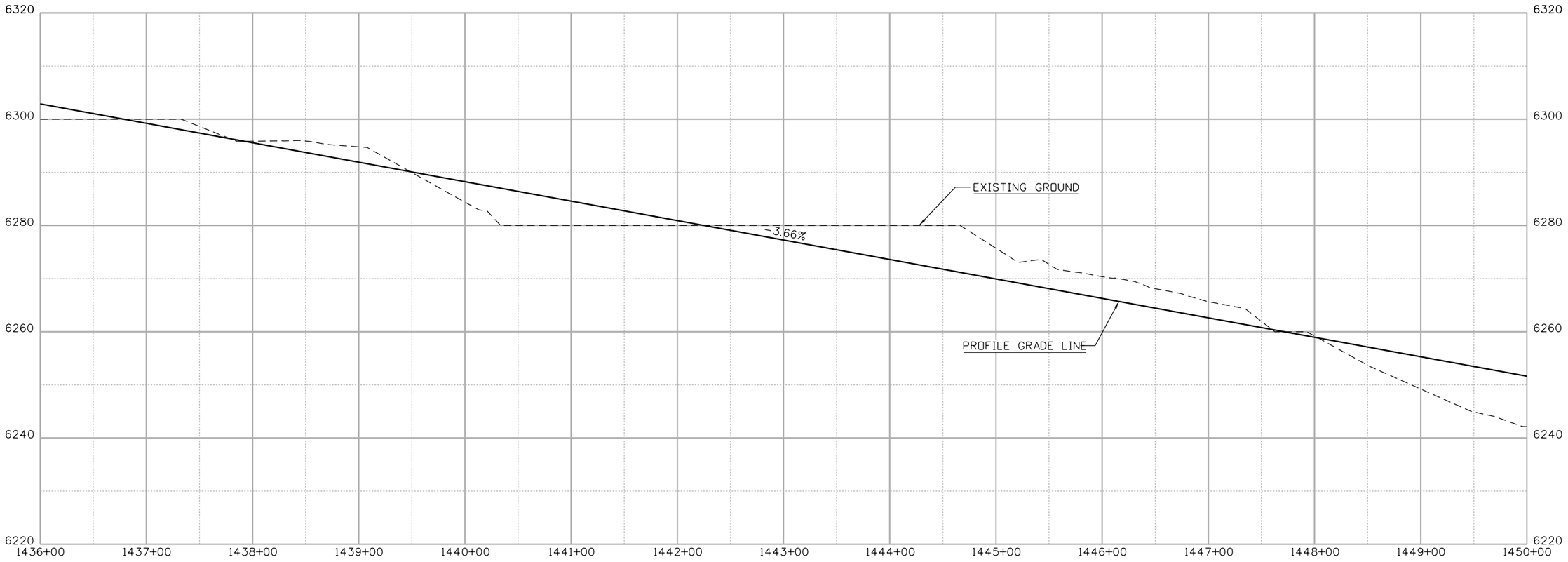


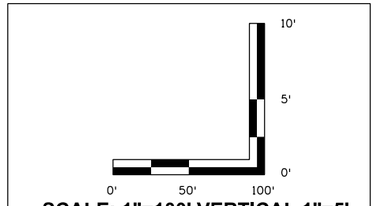


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

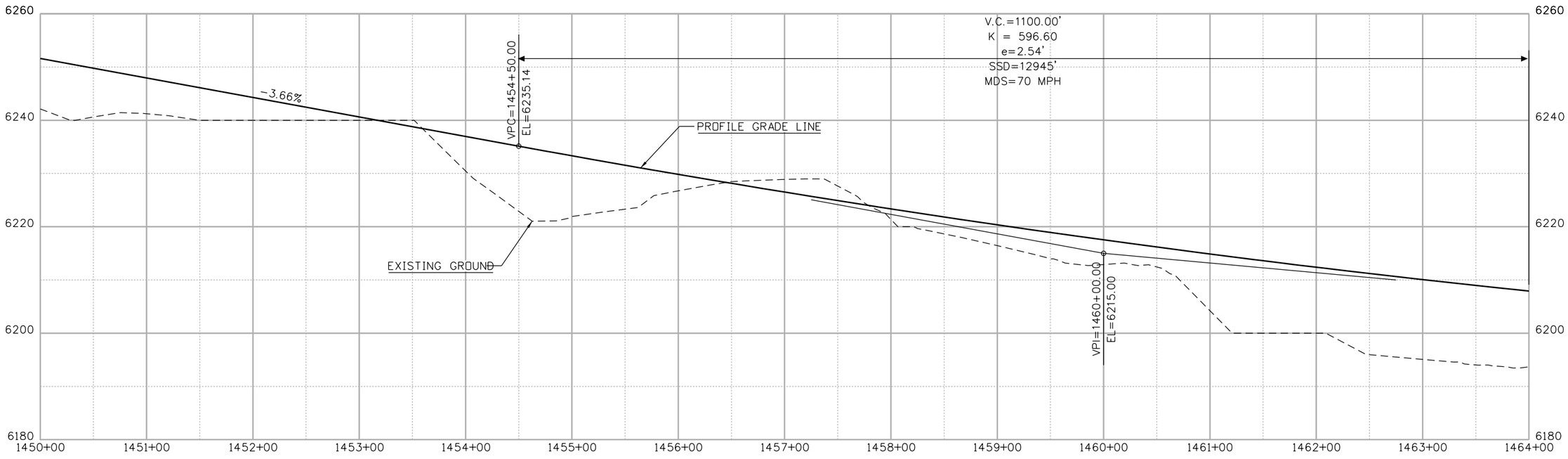
Corridor 3 (US 85: Wyoming to US 14A)

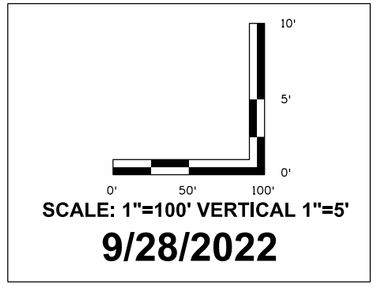




SCALE: 1"=100' VERTICAL 1"=5'

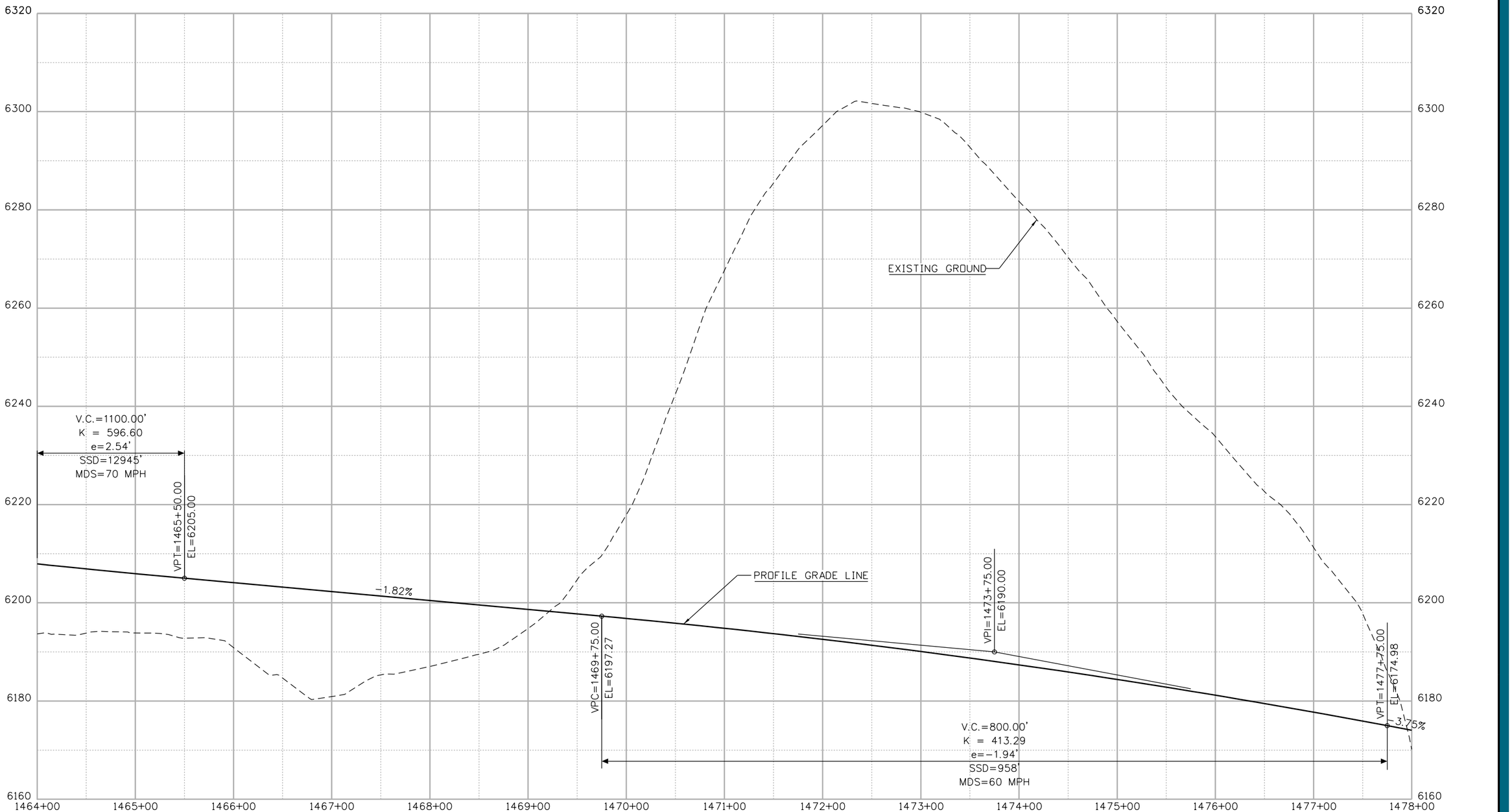
9/28/2022

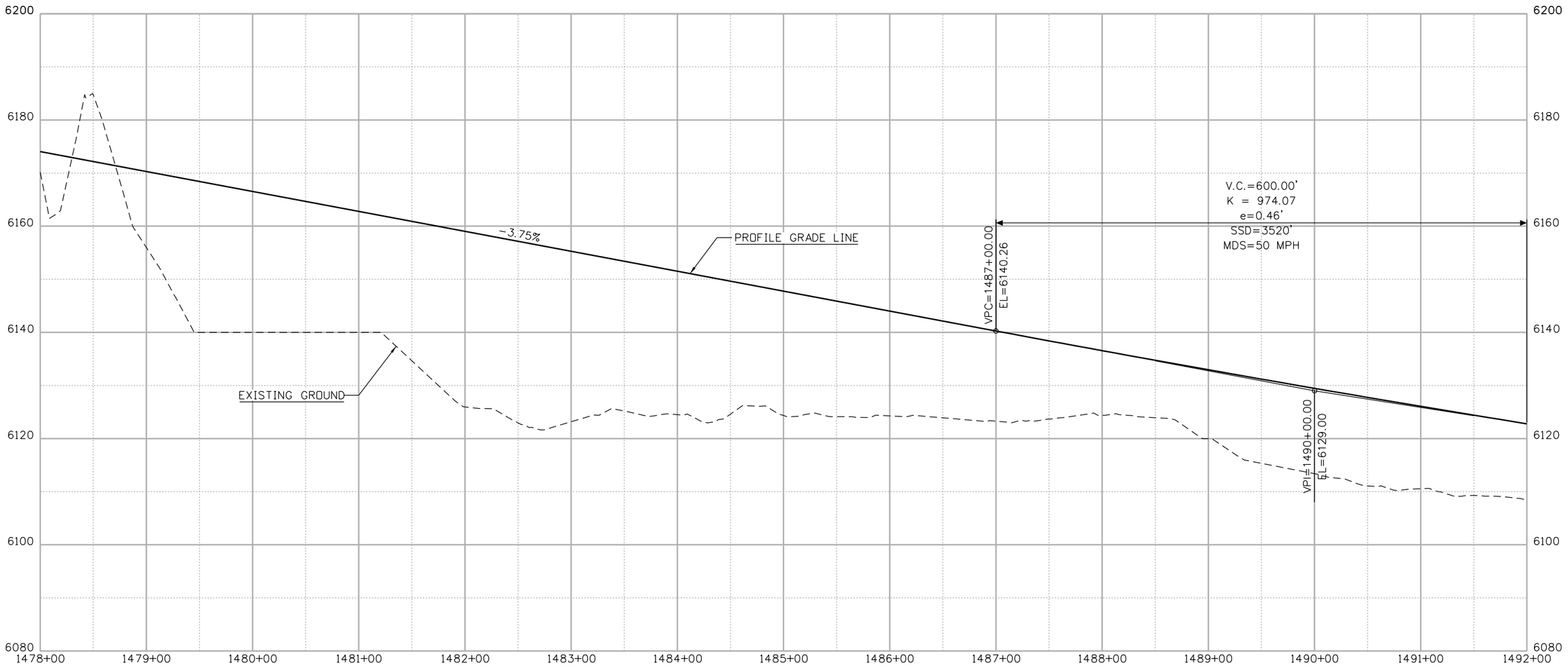


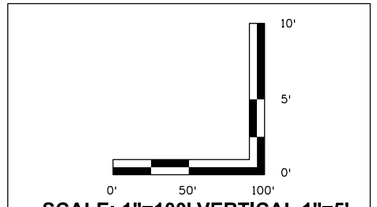


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

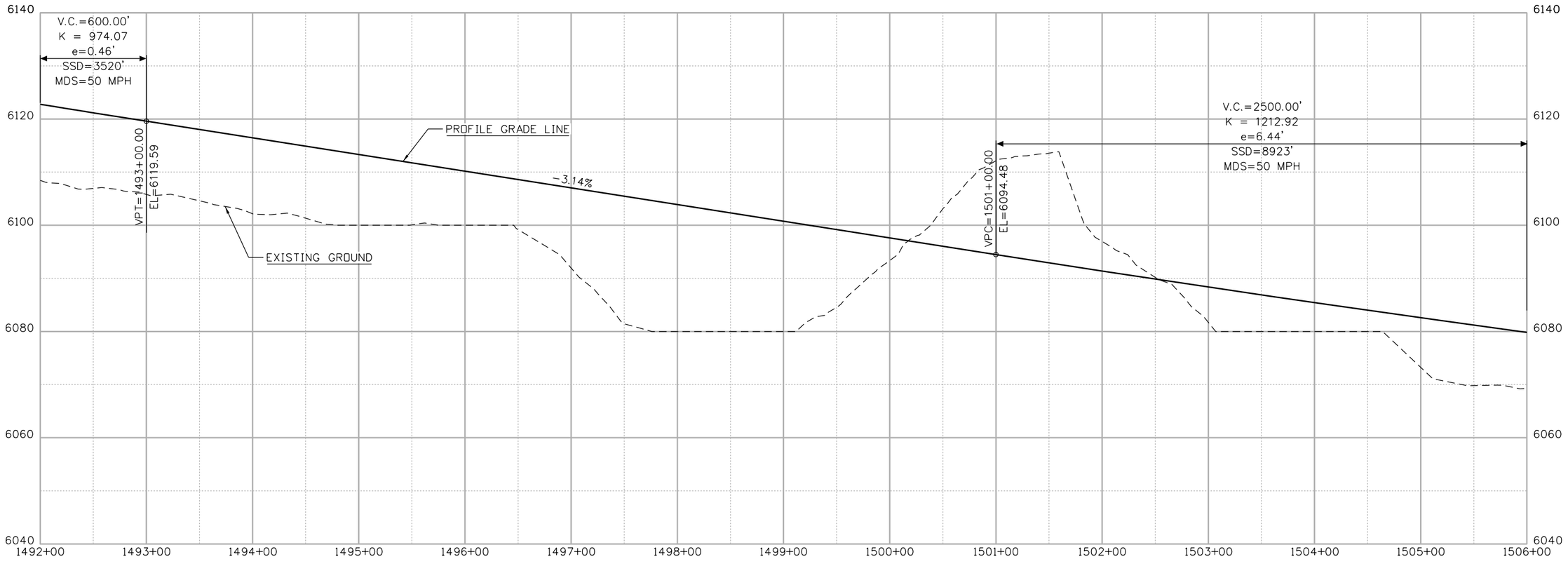

6320
6300
6280
6260
6240
6220
6200
6180
6160
1464+00
1465+00
1466+00
1467+00
1468+00
1469+00
1470+00
1471+00
1472+00
1473+00
1474+00
1475+00
1476+00
1477+00
1478+00
EXISTING GROUND
PROFILE GRADE LINE
V.C.=1100.00'
K = 596.60
e=2.54'
SSD=12945'
MDS=70 MPH
VPT=1465+50.00
EL=6205.00
-1.82%
VPC=1469+75.00
EL=6197.27
VPI=1473+75.00
EL=6190.00
V.C.=800.00'
K = 413.29
e=-1.94'
SSD=958'
MDS=60 MPH
VPT=1477+75.00
EL=6174.98
3.75%

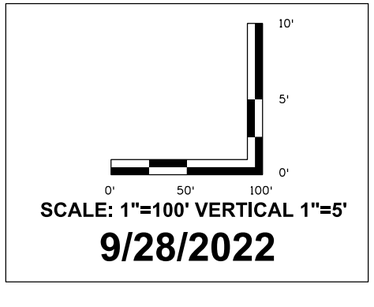




SCALE: 1"=100' VERTICAL 1"=5'

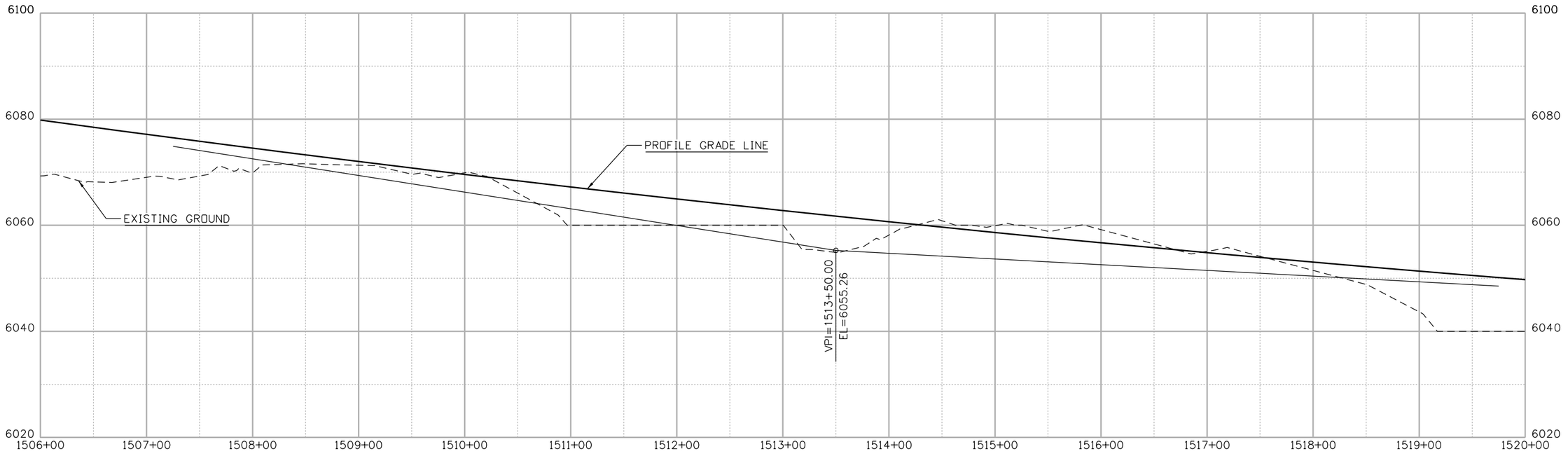
9/28/2022

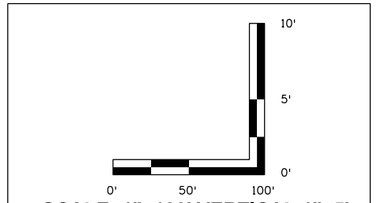




SCALE: 1"=100' VERTICAL 1"=5'

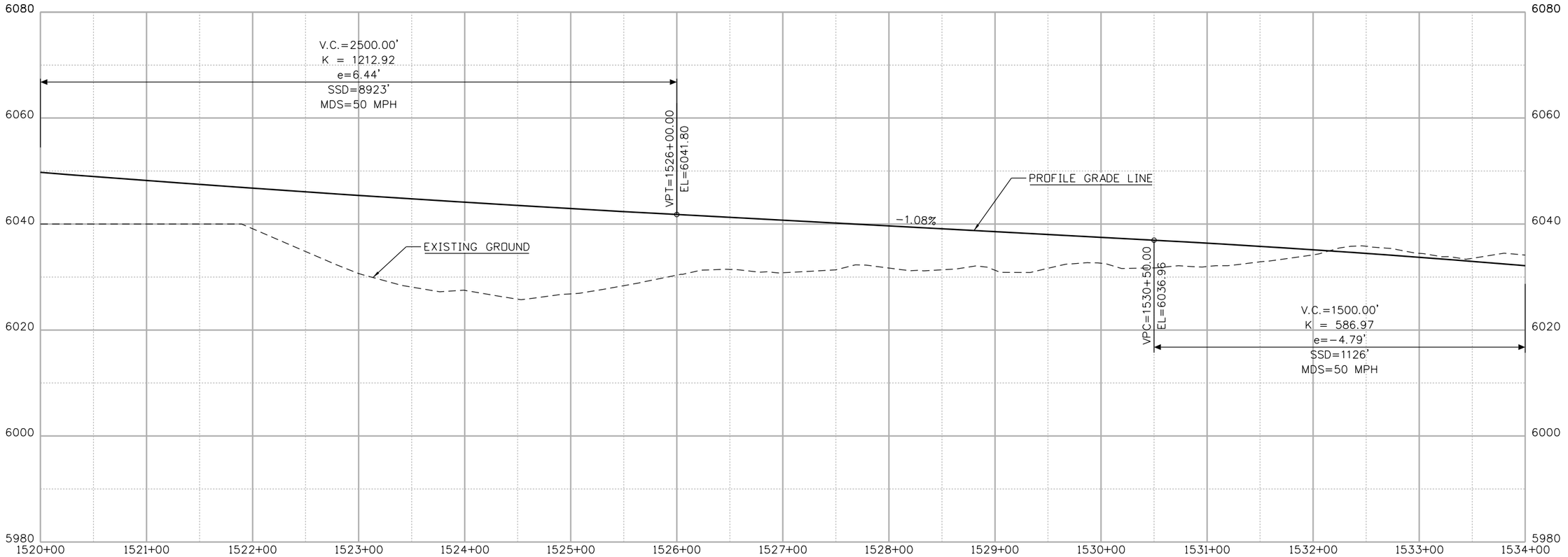
9/28/2022

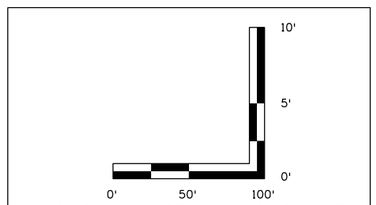




SCALE: 1"=100' VERTICAL 1"=5'

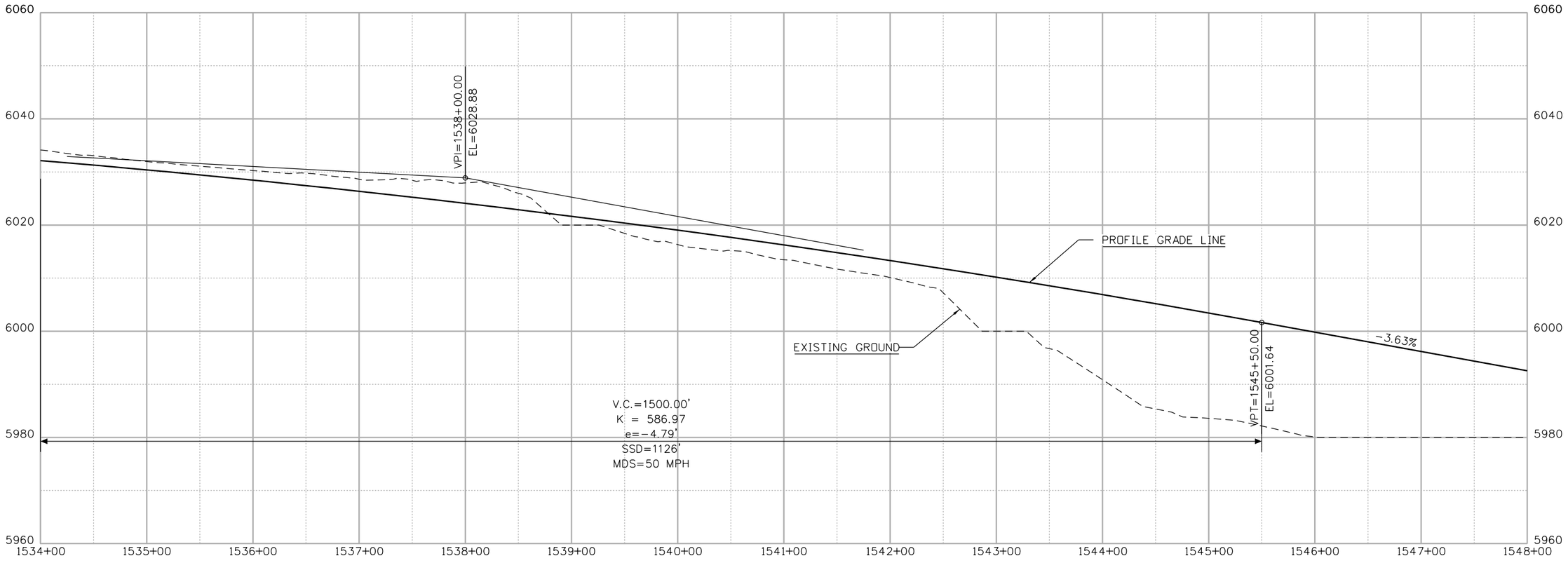
9/28/2022

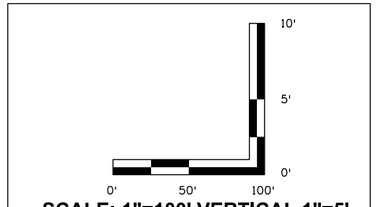




SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

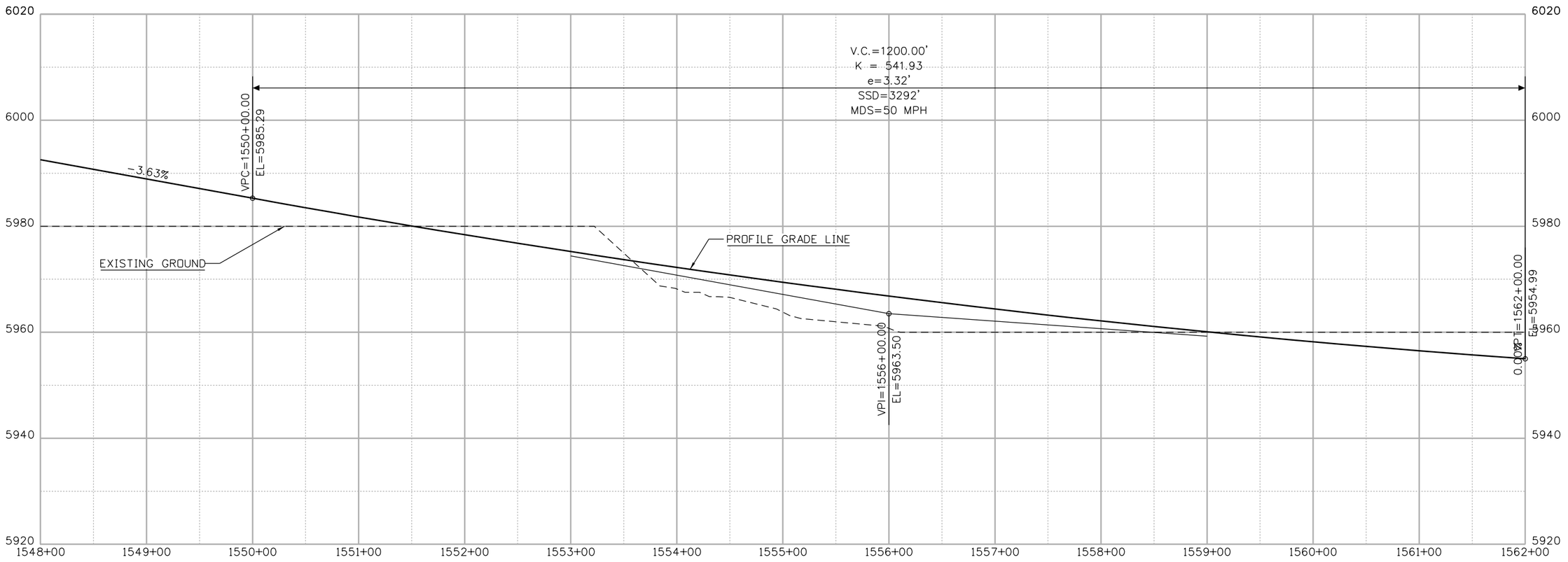


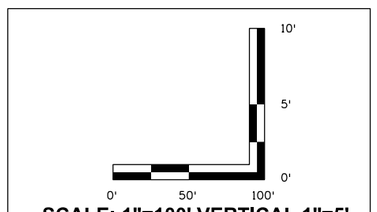


SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

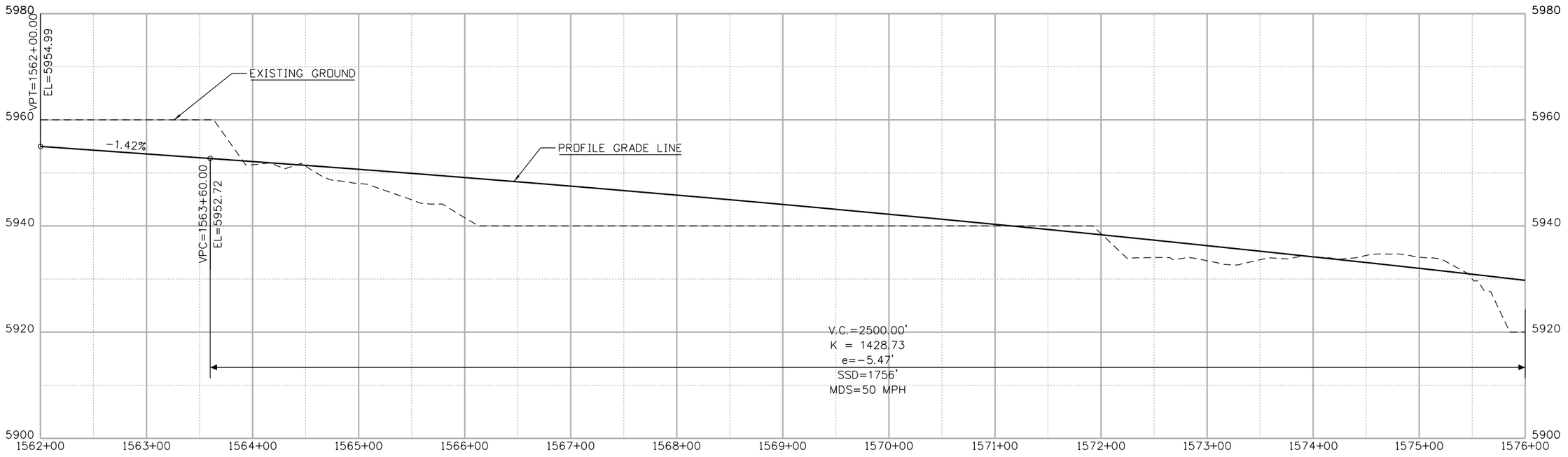
Corridor 3 (US 85: Wyoming to US 14A)

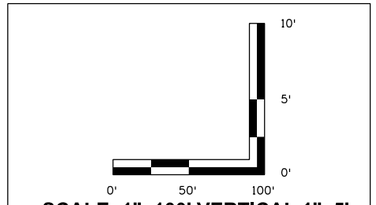




SCALE: 1"=100' VERTICAL 1"=5'

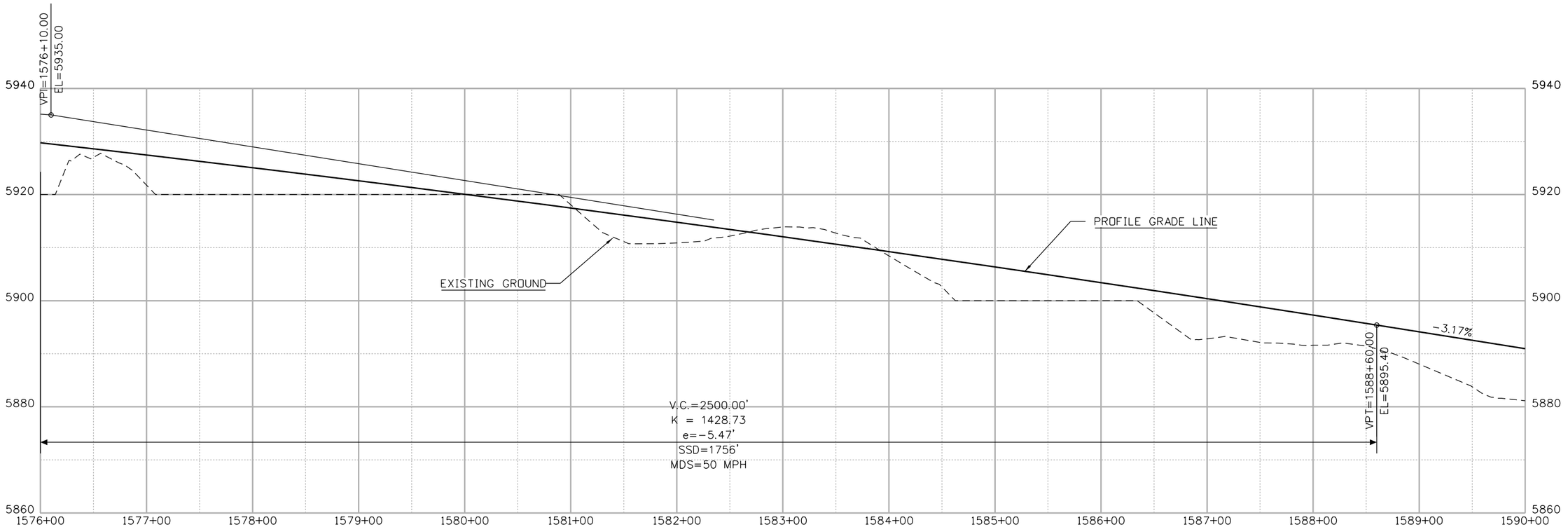
9/28/2022

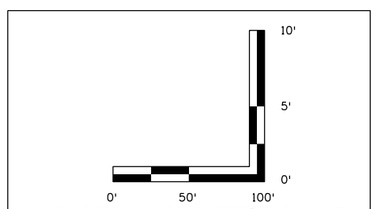




SCALE: 1"=100' VERTICAL 1"=5'

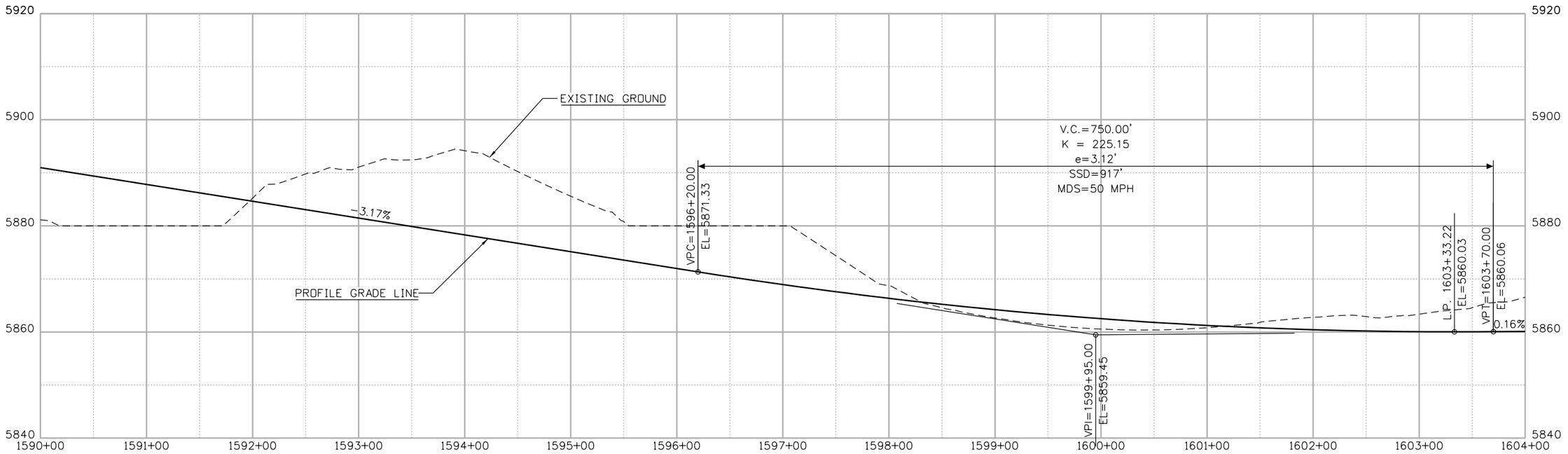
9/28/2022

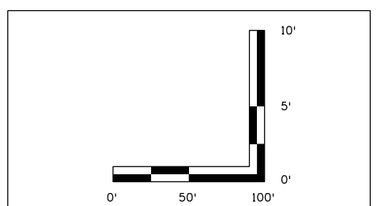




SCALE: 1"=100' VERTICAL 1"=5'

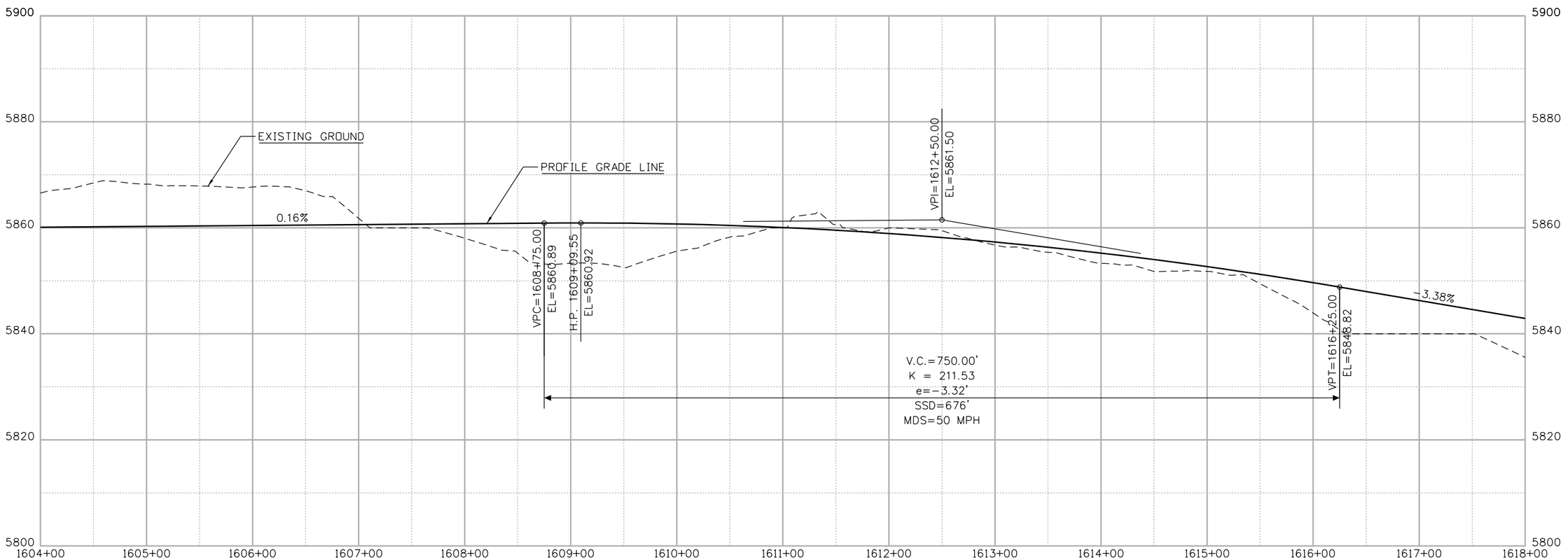
9/28/2022

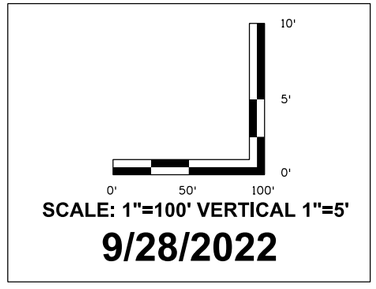




SCALE: 1"=100' VERTICAL 1"=5'

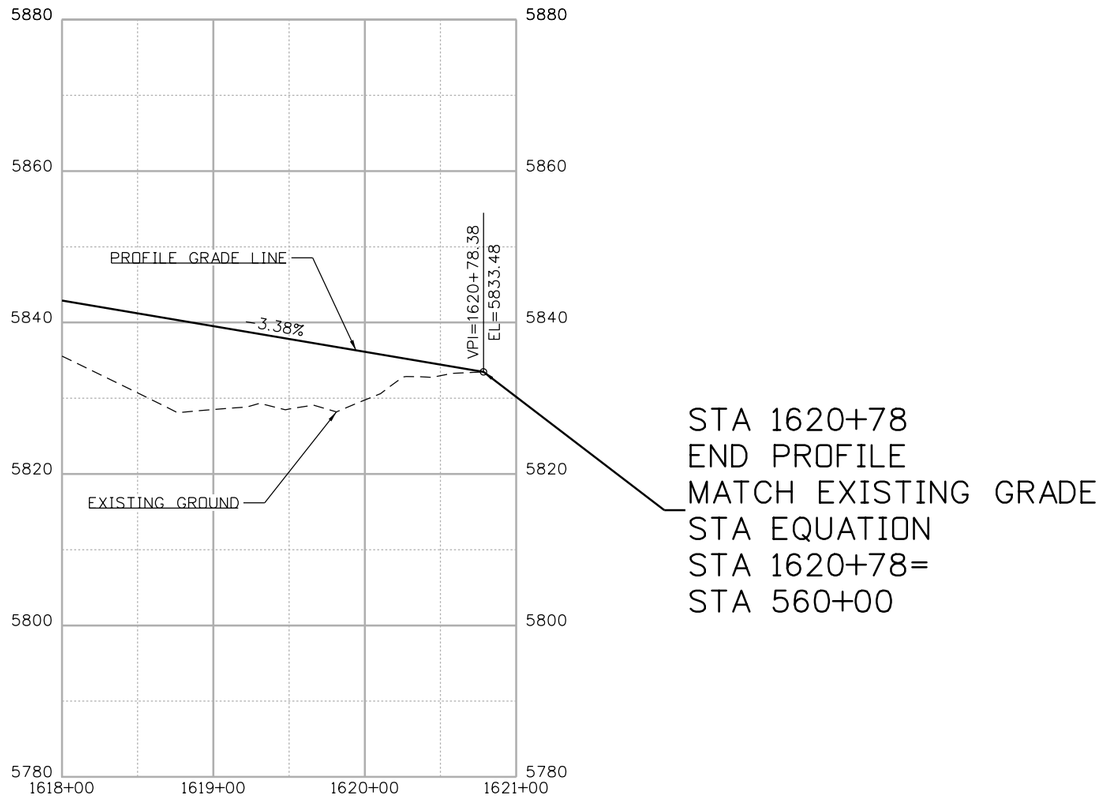
9/28/2022

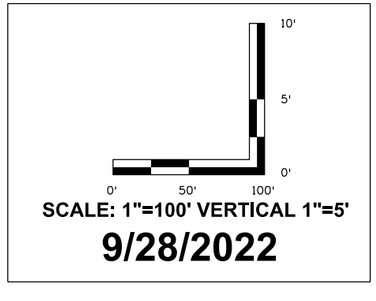




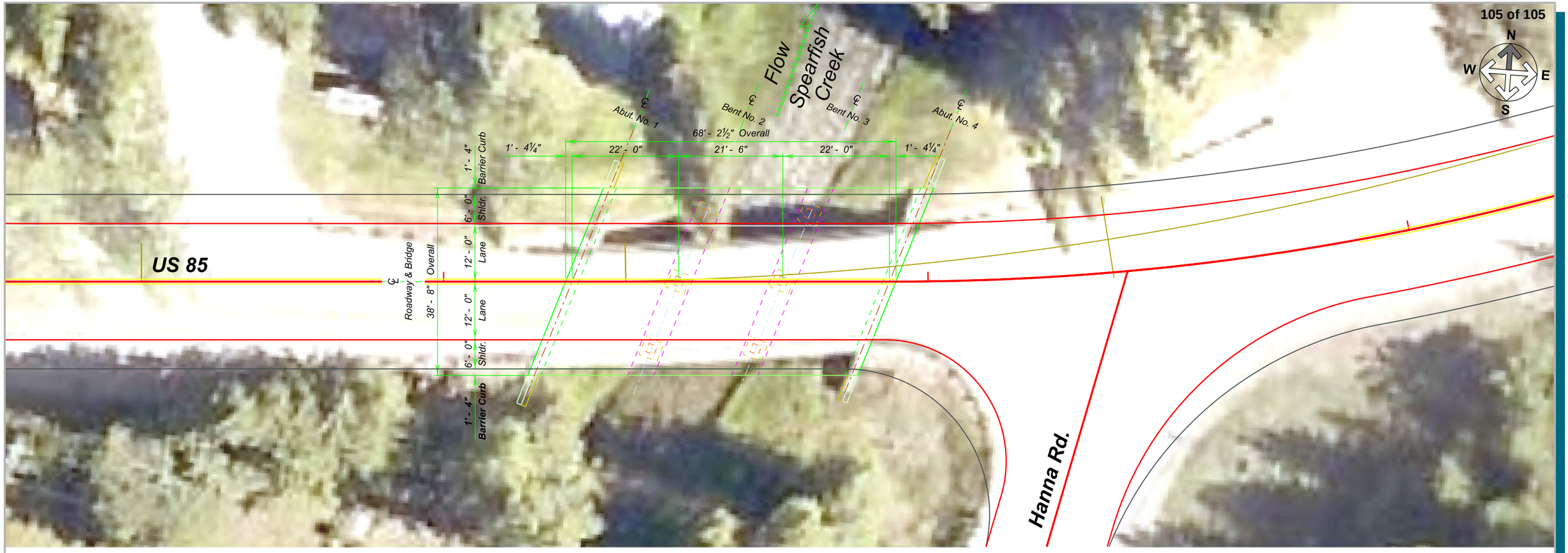
SCALE: 1"=100' VERTICAL 1"=5'

9/28/2022

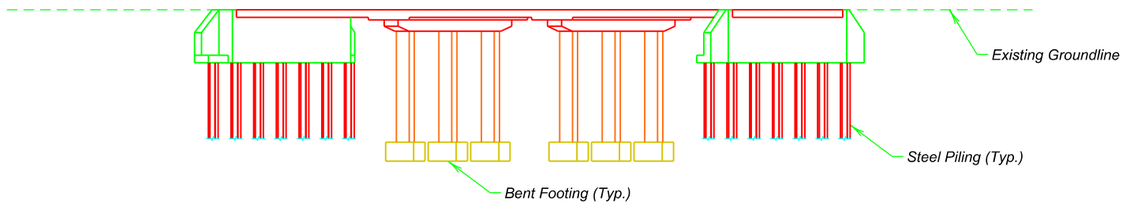




NOTE: REMAINING ALIGNMENT MATCHES EXISTING GRADE (NO PROFILE SHEETS)



PLAN



ELEVATION
(sidewalk barrier not shown)

WORK IN PROGRESS