BEFORE THE KLICKITAT COUNTY
HEARING EXAMINER

In the Matter of an application by Under Canvas, Inc. for a Conditional Use Permit and Recreational Park Permit, and appeal by Klickitat Land Preservation Fund and Dennis and Bonnie White of a Mitigated Determination of Non-Significance (Under Canvas Resort)	Klickitat County Case Nos. CUP2020-13, RV2020-01, & SEP2020-21 **BRIEF ON REMAND BY KLICKITAT LAND PRESERVATION FUND AND DENNIS AND BONNIE WHITE**

I. INTRODUCTION

On October 11, 2023, the Washington Court of Appeals issued its decision resolving two LUPA[1] appeals challenging the Examiner's decisions in the above-referenced matters dated August 17, 2021.[2] One of those LUPA appeals was filed by the original SEPA appellants in this matter, Klickitat Land Preservation Fund ("KLPF"), Dennis and Bonnie White, and Friends of Oak Ridge Road. The other LUPA appeal was filed by the Applicant—Under Canvas, Inc.—challenging conditions of approval. Among them, Under Canvas challenged Condition 59 to the Examiner's Permit Decision, which provided:

[1] LUPA refers to the Land Use Petition Act at Chapter 36.70C RCW.

[2] On August 17, 2021, the Examiner issued two decisions—one addressing Under Canvas's application for a conditional use permit and recreational park permit, and one addressing the SEPA appeal filed by Klickitat Land Preservation Fund, Friends of Oak Ridge Road, and Dennis and Bonnie White. In this brief, we refer to the former decision as the "Permit Decision," and the latter as the "SEPA Decision."

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> After the first, third, and fifth years of operation, the Applicant shall provide to Klickitat County Planning Department a detailed report with specific facts (and not general conclusory statements) demonstrating how each and every condition of approval is being satisfied. *In the event Klickitat County Planning Department staff, in their sole discretion, believes that the existing conditions should be modified, or deleted, or if new conditions should be added, then this matter shall be returned to the Hearing Examiner for an open record public hearing on issues raised by staff.* Failure to timely submit this report shall result in an immediate suspension of all activities permitted under this permit and the Conditional Use Permit shall be referred to the Hearing Examiner to conduct a hearing and determine what additional actions, sanctions and conditions may apply.

(Permit Decision at 28 (emphasis added).)

This condition was entirely appropriate given the many impacts associated with the proposed Under Canvas resort, including traffic and fire safety. We attempted to defend this condition before the Superior Court and Court of Appeals. For their part, the attorneys for Klickitat County took no position, declining entirely to defend Condition 59. Lacking any defense from the County, this condition was stricken by the courts, eliminating any mechanism to modify conditions in the future should impacts from the proposed glamping resort prove more severe and dangerous than Under Canvas previously represented, as we have consistently advocated will be the case.

In its decision of October 11, 2023, the Court of Appeals remanded the Examiner's Permit Decision for entry of additional findings. Specifically, the Court remanded with instructions that the Examiner address the CUP criteria at KCC 19.53.130.A.3 and A.4. Under these criteria, a CUP may only be granted if the Applicant demonstrates "[t]hat the property is suitable for the proposed use" and that "public facilities and services to serve the use are adequate for the proposed use." As the permit applicant, Under Canvas bears the burden of proof on both of these CUP criteria.

As the Examiner noted in his e-mail to the Parties on November 16, 2023, the Court of Appeals' decision does not *require* that the record be re-opened. But neither did the Court preclude or

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forbid the Examiner from re-opening the record. Below, we explain why Under Canvas failed to carry its burden of demonstrating compliance with the CUP criteria at KCC 19.53.130.A.3 and A.4, by failing to submit hard data on key factors affecting traffic and fire safety. We also request that the Examiner re-open the record to consider the attached survey of Oak Ridge Road and auto-turn modeling data from AKS Engineering & Forestry, LLC, which demonstrate conclusively that Oak Ridge Road is not adequate for the proposed resort due to its narrow width, numerous sight-distance deficiencies, non-compliant cut and fill slopes, and tight curve radii.

The AKS survey of Oak Ridge Road is attached hereto as Attachment A, together with a cover letter from Ross Tilghman, one of the traffic-safety experts who provided written and oral testimony in the above-referenced matters. (*See, e.g.,* Tilghman Decl. & Rpt. (May 31, 2021).) Attachment A also contains a memorandum from Ben Beseda, a traffic engineer with AKS (the author of the Survey), responding to questions by County planning staff. The AKS auto-turn modeling data is attached as Attachment B. The survey and letters from Mr. Tilghman and Mr. Beseda were provided to all counsel of record in this matter on October 31, 2023. The AKS auto-turn modeling data were provided to all counsel on December 5, 2023.

II. OVERVIEW OF THE CASE

It is striking in this case that virtually no hard data was ever presented by the County or Under Canvas concerning the geometry of Oak Ridge Road. Yet, the geometry and physical characteristics of Oak Ridge Road are central to the severity of the project's impacts.

On average, the proposed glamping resort is projected to add 247 vehicle trips per day to the gravel section of Oak Ridge Road, increasing total daily trips from between 34 to 63, to over 300. (Ex. B-31 at 7; Tilghman Decl., Ex. B at 13.) Daily peak-hour volumes would increase 18-fold. (*Id.*) This is more than all other existing uses combined. (Tilghman Decl., Ex. B at 13.) Throughout Under

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Canvas's three Traffic Impact Studies, not once did Under Canvas provide actual data concerning road width (stating falsely that the narrowest section of road is 20 feet wide) or an evaluation of sight-distance or curve radii (except for an evaluation of sight distance at the resort entrance). (*See, e.g.,* Ex. B-31 at 11 (reporting falsely that "[t]he narrowest segment of Oak Ridge Road has a width of 20-feet"); *id*. at 9 (reporting sight-distance evaluation for entrance to resort).) Yet, the County's own third-party reviewer—Skillings—informed the County that curve radii should be evaluated. (Ex. A-29 at 3 (reporting "[o]ne potential area that may [be] of further interest is consideration of sight distances and geometric characteristics along segments of Oak Ridge Road where relatively tight radii currently exist.").) Despite this comment from Skillings, Under Canvas never submitted—and the County never required—an analysis of sight distance deficiencies and curve radii along Oak Ridge Road. (Norris Decl., Ex. A at 4 (noting "[t]he [Under Canvas] Study provides a cursory statement noting 'steep grades and sharp curves' but fails to identify the locations where these deficiencies exist and identify mitigation measures that are necessary to provide an acceptable and safe design").)

Rebutting Under Canvas's false statement that the narrowest segment of Oak Ridge Road is 20 feet wide, Appellant Dennis White submitted evidence that many segments are narrower than 20 feet. This occurred first in his SEPA comments. (*See* SEPA Comments by Dennis White, AR C21553-C21555 (documenting several segments less than 20 feet wide).) KLPF's experts verified that Oak Ridge Road does not meet the County's 20-foot width requirement, the minimum standard for all roads under the County's Transportation Standards. (*See generally* Ross Tilghman & Garry Norris testimony; Norris Decl., Ex. A at 6; Tilghman Decl., Ex. A at 2. *See also* Ex. A-10 at 18 (Transportation Standard 12.30.040.3, providing: "Travel lanes should be a minimum of 10 feet wide, 12 feet being desirable.").) Later, Mr. White presented additional evidence documenting that nearly 665 linear yards—1,994 feet—of Oak Ridge Road are less than 20 feet wide, two narrow for larger

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vehicles to pass safely. (Declaration of Dennis White (June 11, 2021).) The CUP hearing was replete with testimony by area residents that Oak Ridge Road is not safe for the dramatically increased traffic anticipated to be generated by the proposed resort, due principally to the road's inadequate width, steep grades, and sharp curves.[3]

Nor were these issues limited to road safety on ordinary days of resort-generated traffic. Oak Ridge Road's inadequate width, steep grades, and sharp curves obviously pose potential problems for conflicts among users, including vehicles, pedestrians, and cyclists. The road is frequently used by large vehicles including logging trucks, agricultural vehicles, and school buses. But in addition to these "everyday" conflicts, the road's inadequate geometry may also put lives at risk in the event of a wildfire. As our fire expert Ron Scott explained:

> Given that the only access to the site is to the east along Oak Ridge Road, there is a high degree of risk that guests and others on site during a major fire event would be trapped. There is also a high degree of risk that in a major evacuation of all resort guests (potentially totaling in the hundreds), vehicles attempting to flee the project site would interfere with fire-fighting assets trying to reach the site on Oak Ridge Road. Ground-based fire-fighting assets trying to reach the site along Oak Ridge Road could increase the likelihood of guest entrapment due to conflicts. And with only a narrow dirt and gravel road to access the site, there is a high risk for a fire to escape and become uncontrolled. . . .
>
> . . . The location of the project site and large number of people poses obvious problems for evacuation along Oak Ridge Road, and any such evacuation could very easily interfere with incoming firefighting assets. Such conflicts would also put other area residents at risk of becoming trapped in the event of fire since they too, would need to evacuate along Oak Ridge Road. Finally, even if the risk of a fire were to be reduced post-development, as stated in the revised SEPA checklist, the impacts of a fire would be potentially catastrophic if these issues are not resolved. If people become trapped in a wildfire because

[3] See comments and testimony of James Tindall, Steve Morrow, John Farnham, Thomas Woodward, Debbie Wagner, Greg Wagner, Steve Stanfli, Justin Bousquet, Sheri Bousquet, James McGrew, Pat Arnold, Chris Wiggins, Colleen Kraus, William McWethy, David Theis, Elen Forget, Bonnie White, Amanda Kitchings, Delmer Eldred, Jan Muir, Karen Hadley, and Adam Filippino.

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> Oak Ridge Road is clogged with incoming and outgoing traffic, they will likely die.

(Declaration of Ron Scott, Ex. A at 3.) Indeed, the line of cars attempting to flee the Under Canvas resort in a wildfire would stretch more than a mile long, "slow[ing] evacuation for residents along the road" and "conflict[ing] with responding emergency vehicles including fire engines at each of the sharp and on the narrowest (17-feet wide) portions of the road." (Tilghman Decl., Ex. A at 15.)[4]

Ultimately, Under Canvas never submitted any actual data concerning the physical geometry of Oak Ridge Road and whether the road can handle a mass evacuation event, with hundreds of tourists and area residents fleeing for their lives while large fire-fighting vehicles attempt to fight traffic in the opposite direction. This is despite that the County's transportation standards specifically require an evaluation of roadway geometry for every proposal generating more than 40 average daily trips, far less than the 247 daily trips projected to be generated by the proposed resort (*See* Ex. A-10 at 14 (Transportation Standard 12.30.020.10, providing that every traffic impact study should include a "[d]escription of the existing roadway conditions such as traffic volumes, transit accessibility, accident history, *roadway geometrics*, pedestrian needs and overall traffic operations and conditions") (emphasis added).) No such data was submitted for the County's SEPA review. No such data was submitted by Under Canvas or the County at the SEPA appeal hearing, leaving only "opinions" for the Examiner to find more or less "convincing." (*See* SEPA Decision at 16.) Nor was any such data submitted at the CUP hearing, where Under Canvas had the burden of proof.

Instead, the only evidence concerning roadway geometry and the ability of Oak Ridge Road to handle a mass evacuation came from post-MDNS testimony by Mr. Hunter, the County engineer,

[4] We also note that during the pendency of this case, the White Salmon Fire District and Husum Fire District consolidated, potentially making the Husum fire-fighting assets unavailable during a fire, and DNR moved its facilities to Dallesport, shifting its own firefighting assets further away from the proposed Under Canvas resort, extending potential response times.

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who testified without any supporting evidence that approximately 260 linear feet of Oak Ridge Road fail to meet the County's minimum width requirement of 20 feet; and Chief Long, who opined that in his non-expert opinion the road was adequate for emergency response. At the SEPA hearing, Appellants were denied their request to cross-examine these witnesses, on the rationale that they are not experts in their respective fields (engineering and fire safety). Regardless, the Examiner expressly excluded Mr. Hunter's and Mr. Long's oral testimony from the CUP record. (*See* E-mail from Examiner Kottkamp to Parties dated August 2, 2021 ("Omitted from the CUP/RV record is transcript from the July 29, 2021 portion of the hearing involving the SEPA Appeal"). Thus, neither the County nor Under Canvas may rely on their testimony for purposes of demonstrating compliance with the CUP permit criteria at KCC 19.53.130.A.3 and A.4.

Ultimately, the Examiner approved Under Canvas's requested CUP in his Permit Decision. In that decision, the Examiner did not address the approval criteria at KCC 19.53.130.A.3 and A.4—namely, that Under Canvas must demonstrate that public facilities (including Oak Ridge Road) are adequate for the proposed use, and that the property is suitable for the proposed use. The Examiner did not discuss geometric deficiencies in the design of Oak Ridge Road, beyond requiring Under Canvas to develop a new signage plan and potentially bringing Oak Ridge Road up to the County's transportation standards for fire access roads. (*See* Permit Decision at 23 & 24, Conditions 17 & 23; Ex. A-10 at 11 (Transportation Standard 12.30.020.2.F, defining "fire access road" as "[a] private road serving two to four lots").) The Examiner also required that "[t]o the extent required by Klickitat County Public Works, roads serving the project, including Oak Ridge Road, shall meet AASHTO or Washington State Department of Transportation (WSDOT) standards for a fire truck." (Permit Decision at 23, Condition 16.) Yet, to date, neither the County nor Under Canvas has explained what

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AASHTO and WSDOT standards this requirement refers to. No such standard was quoted or even cited at the hearing by Under Canvas or the County.

The Examiner did, however, impose Condition 59 requiring Under Canvas to submit regular compliance reports and reserving authority to impose new conditions as impacts of the proposed glamping resort develop over time and as their true nature becomes apparent. We interpret this condition as expressing the Examiner's view that impacts may indeed be unacceptable as the project develops. Unfortunately, that condition has now been stricken, with zero defense by counsel for Klickitat County. Accordingly, the Examiner's current charge from the Court of Appeals—to determine whether public facilities are adequate, and whether the property is adequate for the proposed use—is critically important. This is now the *only* time the Examiner or anyone else will ever be able to evaluate the evidence submitted by Under Canvas and the projected impacts of the proposed glamping resort, or to impose specific conditions to ensure those impacts are not dangerous. Should the project go forward now, regardless of its impacts, no new conditions can be imposed later.

III. ARGUMENT

For the reasons below, the Examiner should find that Under Canvas did *not* meet its burden of demonstrating compliance with the CUP approval criteria at KCC 19.53.130.A.3 and A.4.

A. Oak Ridge Road Is Inadequate for the Proposed Glamping Resort.

First, the Examiner should find that Oak Ridge Road is not adequate for the proposed resort, because the record establishes that the road fails to meet even minimal "fire access road" standards applicable to small private roads serving two to four lots, let alone standard geometric design standards applicable to public roads serving hundreds of Klickitat County residents.

As discussed above, the Examiner found in his Permit Decision that Oak Ridge Road should be brought up to fire access road standards. (Permit Decision at 23, Condition 17.) As part of the

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MDNS, the County's SEPA Responsible Official similarly imposed a condition that "[a]ll roads that are accessing facility *shall meet* the Klickitat County Title 12 standards for a fire access road." (MDNS Condition 17 (emphasis added).) In turn, one of the County's Title 12 standards for fire access roads is that the road must have "not less than 20 feet of road surface." (Ex. A-10 at 11, Transportation Standard 12.30.2.F.1).)

We submitted evidence at the CUP hearing documenting that nearly 665 linear yards—1,994 feet—of Oak Ridge Road are less than 20 feet wide. (Declaration of Dennis White (June 11, 2021).) Mr. Hunter (the County engineer) acknowledged that approximately 260 feet of Oak Ridge Road fail to meet the County's minimum 20-foot width requirement, though he did not produce any actual evidence disputing Mr. White's photographs documenting a much greater area of non-compliance. Yet, even taking Mr. Hunter's unsubstantiated testimony at face value, Oak Ridge Road does not meet minimal fire access road standards.

This, in turn, precludes the Examiner from finding that public facilities are adequate for the proposed use. KCC 19.53.130.A.4 requires Under Canvas to demonstrate that "public facilities . . . *are adequate* for the proposed use" (emphasis added). This code provision does not ask whether public facilities "will be" adequate, or whether they can be made adequate in the future. Rather, this CUP criterion is phrased in the present tense—whether public facilities "are adequate."

Here, regardless of whether Under Canvas can improve the road in the future to make it adequate, the fact remains that, today, Oak Ridge Road is not adequate because it does not even meet minimum fire access road standards for small private roads, let along public roads serving hundreds of area residents and a large-scale recreational resort. If Under Canvas can improve the road to make it adequate, then it should do so and then re-apply for a conditional use permit at that time. For now,

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the record demonstrates that the road is not adequate. Under Canvas failed to meet its burden under KCC 19.53.130.A.4.

B. Under Canvas Failed to Produce Any Actual Evidence of Critical Roadway Geometrics.

Second, throughout the proceedings in this case, Under Canvas failed to produce any actual evidence of roadway geometrics, including road width, grade, sightlines, curve radii. No survey of Oak Ridge Road was ever produced, either by Under Canvas or the County. Thus, aside from Mr. White's evidence documenting numerous segments of Oak Ridge Road that are too narrow even under minimal fire access road standards, no data on roadway width was submitted. Under Canvas's Traffic Impact Study evaluated sight distance only at the resort entrance; Under Canvas produced no evidence of sight distances anywhere else along the road. Thus, there is no evidence that Oak Ridge Road meets County transportation standards for sight distance. (*See, e.g.,* A-10 at 5, Transportation Standard 12.30.030.1.A (providing minimum stopping sight distances for various design speeds and grades).) At the SEPA appeal hearing, the undersigned asked Under Canvas's traffic consultant (Ms. Brown) whether she measured curve radii along Oak Ridge Road. She answered that she did not, as seen in the following exchange from the hearing transcript:

> Mr. Telegin: Okay. In your traffic impact study, you talk about Oak Ridge Road having steep grades and sharp curves. Did you measure the curve radius of any of those curves?
>
> Ms. Brown: I did not.

At the CUP hearing, dozens of area residents testified based on their own personal knowledge and experience that Oak Ridge Road is a dangerous place to locate a large-scale recreational resort with dramatically increased road traffic. As attested by those same area residents, Oak Ridge Road is frequented by large logging trucks, agricultural vehicles, and school buses, increasing the risk of conflicts to area motorists and tourists alike. Under Canvas's failure to produce any evidence of actual

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roadway geometrics precludes the Examiner from finding that Oak Ridge Road is adequate for the proposed use, especially where the County's own Transportation Standards require such information to be included in every transportation impact study, let alone for a large-scale recreational resort dramatically increasing daily vehicle trips on a primitive county road. (*See* Ex. A-10 at 14 (Transportation Standard 12.30.020.10).)

C. Recent Survey Data Demonstrate that Oak Ridge Rod Is Not Adequate for the Proposed Resort, Even if Minimal Fire Access Roads Standards Are Applied.

Finally, despite the abject failure by Under Canvas and County to produce hard data concerning the adequacy of Oak Ridge Road for the proposed glamping resort—either at the CUP hearing or anytime in the past three years since Under Canvas submitted its application—there is now survey data demonstrating that Oak Ridge Road is not, in fact, adequate for the proposed use.

Specifically, the Oak Ridge Road survey attached hereto as Attachment A demonstrates that 4,899 feet of the gravel section of Oak Ridge Road do not meet the County's minimum 20-foot width requirement for private fire access roads. (*See* Att. A, Survey Sheet TB1.) As explained by Mr. Tilghman, in these areas "opposing vehicles have difficulty passing . . . because the useable traveled way is too narrow." (Att. A, Tilghman Letter at 2.) "These constricted locations would hamper emergency vehicle access and evacuation. That's why the code requires a minimum width of 20 feet – to enable emergency vehicles to pass opposing traffic." (*Id*.)

The survey demonstrates that shoulders are deficient or absent through roughly half the length of the gravel segment of Oak Ridge Road. "Deficiencies frequently exist at many of the narrowest parts of the road, exacerbating the problem of having no room to pull over when encountering opposing traffic." (*Id*.)

Across 13,000 feet of the gravel road length (on both side of the road), roadside slopes are much steeper than the County's fire access road standards allow. "The steep bank with little to no

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shoulder provides no recovery area for a vehicle that runs wide of the travel lane. Vehicles running wide and up a steep bank could be at risk of rolling over." (*Id*.)

Finally, at the tighter curves along Oak Ridge Road, minimum stopping sight distances are not met. (*Id.* at 3.) As Mr. Tilghman observes, "[i]t should be remembered that a variety of agricultural vehicles, semi-trucks hauling fruit and logging trucks use Oak Ridge Road at various times of the year, overlapping the applicant's operating season. Achieving adequate stopping sight-distance will be a vital safety concern in light of adding thousands of new vehicles to the road from the applicant's project each season." (*Id*.) Notably, three segments of the road with deficient sight distance are located at or near intersections with other county roads, including Kirbish Road, Ridgeview Road, and Postgren Road only a quarter-mile south of the entrance to the proposed Under Canvas resort. (*Id*.).

As Mr. Beseda observes, it is "unlikely that the entirety of the roadway meets the 80,000 pound design vehicle requirement, especially those areas that are outside of the traveled way." (Att. A, Beseda Letter at 1. *See also* Ex. A-10 at 11 (Transportation Standard 12.30.020.2.F: "[f]ire access roads shall be designed and maintained to support the imposed loads of fire apparatus (80,000 pounds) . . .").)

Last, the AKS auto-turn modeling in Attachment B shows conclusively that curve radii along four of the tightest curves within the gravel section of Oak Ridge Road are too tight to allow larger vehicles to stay in their lanes while navigating the turns. The modeling shows that for larger vehicles like school buses, trucks, and fire engines, these vehicles must track significantly out of their lanes to navigate the turns. This is despite that three of these four curves currently meet the County's 55-foot curve radius requirements for small private fire access roads serving two to four lots. (*See* Ex. A-10 at 11, Transportation Standard 12.30.020.2.F.3 ("Roadway horizontal curves for fire access roads shall be designed to not have less than a 55-foot center line radii.").) In comparison, the County's

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Transportation Standards provide that the minimum curve radius is 185 feet for local access roads like Oak Ridge Road with a posted speed limit of 25 mph, using the formula at Transportation Standard 12.30.030.2. (Ex. A-10 at 15–16.)

For each of these curves, there is an obvious risk of conflict and collision between larger vehicles like buses, trucks, and fire engines traveling in one direction, and smaller vehicles traveling in the other direction. The same is true of large RVs traveling to and from the proposed resort, which are now allowed despite the Examiner's prior Condition 55 prohibiting them due to road safety concerns.[5] With dramatically increased daily traffic projected to occur with the proposed Under Canvas resort, the geometry of Oak Ridge Road presents serious traffic safety risks. In the event of a wildfire forcing residents and tourists alike to flee the area, there is obviously a significant risk that large fire-fighting vehicles will not be able to navigate the road while fighting over a mile of cars in the opposite direction—and that is so even if the entirety of the road remains clear of falling debris that may make all or part of the road impassable. Finally, none of this will be solved by requiring Under Canvas to bring Oak Ridge Road up to County standards for small private fire access roads. Even if those standards are applied, curve radii would still be two tight for large vehicles to navigate the curves without tracking significantly out of their lanes.

All of this demonstrates that Oak Ridge Road is simply not adequate for the proposed glamping resort, as required for a conditional use permit under KCC 19.53.130.A.3 and A.4. Because of the many geometric deficiencies along virtually the entire gravel length Oak Ridge Road, locating

[5] Under Canvas succeeded in its challenge to Condition 55 of the Permit Decision, which previously prohibited RV parking on site. Attorneys for the County joined Under Canvas in its challenge to this condition. The result is that Under Canvas patrons may now travel to and from the proposed resort in large recreational vehicles, for which—like similarly sized school buses and large trucks—curve radii are not adequate.

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a large-scale recreational resort at this location, at this time, without first completely re-engineering the road, is going to put lives at risk.

IV. CONCLUSION

When the County issued its MDNS, it did not intend Condition 17—requiring "[a]ll roads that are accessing the facility" to be brought up to fire access road standards—to apply to Oak Ridge Road, a primitive public road owned by the County itself. This can be seen by comparing Condition 17 with Condition 18, which provides (conversely) that "all roads *not* accessing the facility" must be closed off by gate or bollard (a condition that obviously would not apply to other area roads serving other private properties). Rather, as the very definition of a "fire access road" makes clear, Condition 17 was meant to apply to *private* roads on the project site itself.

When we questioned the County's traffic and fire safety conclusions, and challenged Under Canvas's blatant and repeated misrepresentation that even the narrowest segment of Oak Ridge Road is 20 -eet wide, the County and Under Canvas shifted gears, presenting a new fiction at the hearing that Condition 17 will ensure Oak Ridge Road is brought up to acceptable road safety standards.

But neither the County nor Under Canvas has ever produced a shred of actual data showing the real geometrics of Oak Ridge Road. There is no guarantee that the many design deficiencies along the gravel section of the road will be remedied prior to operation of the resort—an effort that would effectively require the road to be completely re-engineered. Oak Ridge Road is not safe. It is not adequate for the proposed glamping resort and presents a significant risk to human life should a wildfire ever break out.

The residents of Oak Ridge Road are entitled to a decision on Under Canvas's permit application that is based on actual data and evidence, not speculation and gamesmanship. Because it never presented evidence and data concerning the real-world design of Oak Ridge Road, Under

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Canvas failed to carry its burden of demonstrating compliance with the County's CUP criteria at KCC 19.53.130.A.3 and A.4. We know now that virtually the entire gravel section of Oak Ridge Road—nearly two miles long—fails to meet even minimum safety standards for small private fire access roads serving two to four lots. The Examiner should deny the application, finding that Under Canvas did not demonstrate that public facilities and the project site are adequate for the proposed use. Alternatively, we request that the Examiner re-open the record, consider the new survey and auto-turn modeling in Attachments A and B, and enter specific findings and conditions requiring all of these deficiencies to be remedied before the resort is allowed to operate.

With the elimination of Condition 59, this is now the Examiner's—and the County's—only opportunity to ensure that appropriate conditions are imposed to protect public health, safety, and welfare. The Permit Decision is now remanded having been stripped of conditions that the Examiner previously found necessary to ensure compliance with the County's CUP criteria. There will be no future ability (presumed by the Examiner's prior decision) to gather data and tailor conditions as impacts materialize. The Under Canvas proposal cannot go forward consistent with the Klickitat County Code without additional conditions, based on actual data, to make the proposed glamping resort safe for residents and tourists alike.

Dated this 8th day of December, 2023.

Respectfully submitted,

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By: _____

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ATTACHMENT A

TILGHMAN GROUP
TRANSPORTATION PLANNING

28 September 2023

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115 West Court St. #302
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Jeff Hunter, Deputy Director
Klickitat County Public Works
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re: Oak Ridge Road Survey

Dear Ms. Lindblad and Mr. Hunter:

At the request of Klickitat Land Preservation Fund ("KLPF"), I have reviewed a recent survey commissioned by KLPF of Oak Ridge Road's gravel segment and am writing to summarize the survey's findings. The survey, dated 9/13/2023, was done by Ben Beseda of Tenneson Engineering with AKS Engineering & Forestry, LLC to determine Oak Ridge Road's existing dimensions and the degree to which the road currently meets Fire Access Road standards as stated in Klickitat County's Title 12 Transportation Standards. In approving a Conditional Use Permit for the proposed Under Canvas project, the County's hearing examiner conditioned his approval on the Applicant bringing Oak Ridge Road into compliance with Fire Access Road standards (despite the fact that Section 12.30.020.F of the Transportation Standards define a Fire Access Road as a private road serving two to four lots). Bringing Oak Ridge Road into compliance with these Fire Access Road standards was also a condition to the County's MDNS under SEPA.

Fire Access Road Standards
The County's standards for a Fire Access Road can be found in Section 12.30.020.F and in Standard Drawing TS-1 (attached) of the County's Title 12 Transportation Standards. Chief among these design standards is that the road "shall have an unobstructed width of not less than 20 feet of road surface."

Findings from the Survey
The survey covered 9,804 feet of gravel road (1.85 miles) between the paved segments at its south and north ends. Along that stretch, the survey measured 13 cross-sections to illustrate the range of current dimensions. The survey also makes clear that most of the road is steeply sloped, with an average grade of 6% and extended grades exceeding 9%.

The survey shows that much of the gravel road falls well below the minimum Fire Access Road standards, especially with its sub-standard width and its frequently deficient or missing shoulders. It's not just a few locations that are sub-standard, it's almost the entire 1.85 miles.

Examples of those deficiencies and why they matter include:

1. The width of the road's traveled way is sub-standard for a Fire Access Road over its entire length. None of the 13 sections measured meet the 20-feet minimum standard for a Fire Access Road. The widest sections are only 18-feet wide and the majority (10 out of 13) were significantly narrower, with the narrowest (Section 8) being just 10.3 feet wide. I spoke with Ben Beseda about these widths and he made the important point that while the physical width of the gravel surface may be up to 20 feet, the ***functional*** widths as shown in the survey sections tend to be much less since drivers avoid getting too close to the steep roadside banks or the unprotected soft edges that drop off immediately.
    - Consequently, opposing vehicles have difficulty passing at many locations because the useable traveled way is too narrow.
    - These constricted locations would hamper emergency vehicle access and evacuation. That's why the code requires a minimum width of 20 feet – to enable emergency vehicles to pass opposing traffic.

2. Shoulders are deficient or absent at many locations totaling half of the road's length (4,899 feet out of 9,804 feet = 50% of road's length).
    - This leaves vehicles no place to pull over, and pedestrians with no place to walk but in the road.
    - Deficiencies frequently exist at many of the narrowest parts of the road, exacerbating the problem of having no room to pull over when encountering opposing traffic. See, for instance:
        - Station 29+00 (2,900 feet in) just north of Section 5 that shows traveled way width of 16.2 feet with no shoulders on either side of the road;
        - Station 57+50 just north of Section 9 with just 14.5 feet of traveled way width, no shoulders and steep banks on both sides;
        - Section 10 just north of Postgren Road with 16.5 feet of width, no shoulder and a steep bank on the right (when facing north);
        - Section 11 at station 76+00 with 18.1 feet of width, gravel deficiencies on both sides and a steep slope on the right side.

3. Roadside slopes are frequently much steeper than the standard allows. Generally, this means that the road has been cut into the hill.
    - The steep bank with little to no shoulder provides no recovery area for a vehicle that runs wide of the travel lane. Vehicles running wide and up a steep bank could be at risk of rolling over.
    - At Section 8 the bank slopes steeply (>50%) down from the road's edge where the road is very narrow (10.3 feet) and lacks any shoulder. Vehicles could easily drop a wheel off the edge of the road and that could cause drivers to lose control of their vehicles.

4. Sight distance is deficient at the tighter curves. While sight-distance is best measured directly in the field, the survey provides enough information to indicate that tight curves combined with steep banks create sight-distance deficiencies at many locations. Furthermore, the steep grades on Oak Ridge Road (anything greater than 3%) mean that required stopping sight-distance is greater for vehicles heading down from higher elevations. Whereas the level grade stopping sight-distance requirement for the posted 25 mph speed limit is 155 feet, a downgrade of 9% requires 173 feet (Klickitat County Transportation Standards Table 12.30-5). Examples of steep (>3%) slopes on tight curves requiring longer stopping sight-distances include:
    - Station 1+00 to Station 2+00, the sharp curve immediately north of Kirbish Road
    - Station 41+50 to Station 43+00 at Ridgeview Road
    - Station 66+50 to Station 68+00 at Postgren Road. Postgren's approach to Oak Ridge also has sight-distance deficiencies due to high roadside banks.

    Slopes and vegetation outside of the right-of-way may also contribute to sight-distance deficiencies and would need to be investigated individually for the potential to obtain adequate sight-distance. Any changes needed beyond the right-of-way would require consent of the landowner at the location in question.

    It should be remembered that a variety of agricultural vehicles, semi-trucks hauling fruit and logging trucks use Oak Ridge Road at various times of the year, overlapping the applicant's operating season. Achieving adequate stopping sight-distance will be a vital safety concern in light of adding thousands of new vehicles to the road from the applicant's project each season.

5. The need for guardrails may need to be assessed, as provided by the code (Standard Drawing TS-1 Notes 3 and 4). Locations such as Station 42+25 (Section 8) may be appropriate given the steep side-slope and the significant addition of traffic from the applicant's project.

Conclusion

Based on the survey, no part of Oak Ridge Road currently meets the standards for a Fire Access Road. Serious deficiencies exist:

- Its functional width is way too narrow over its entire length
- It lacks adequate shoulders for 50% of its length
- Its roadside slopes are frequently too steep
- It has numerous sight-distance deficiencies at tighter curves and intersecting roads

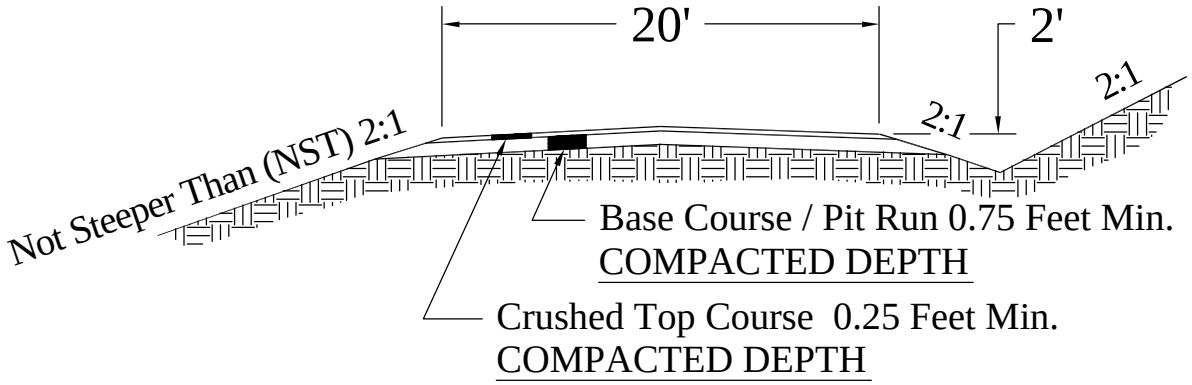
These deficiencies exist either singly or in combination over the entire 1.85 miles of Oak Ridge Road's gravel portion. Complying with the CUP condition of improving the road to Fire Access Road standards will entail significant work to the entire road to remove those deficiencies.

Sincerely,

Ross Tilghman

Ross Tilghman is a transportation planning consultant with his own firm, the **Tilghman Group.** He has 39 years of experience in analyzing transportation demands for a wide variety of land uses and in developing solutions to meet transportation needs. A full member of the Urban Land Institute, Mr. Tilghman is a frequent participant in ULI Advisory Service Panels working in communities around the country and has been active in developing ULI's Building Healthy Communities initiative. He currently serves on ULI's Suburban Development and Redevelopment Council. Tilghman completed five years as a Commissioner on the Seattle Design Commission, including a year as Chair.

FIRE ACCESS ROAD



Notes:

1. Fill and Cut Slopes shall not be steeper than (NST) 2:1 unless otherwise approved by the County Engineer.
2. The County Engineer may require Beveled Ends on Culverts.
3. Guardrail may be Required by the County Engineer.
4. Whenever Guardrail is Required, an additional 2' of Roadway Width is also Required.
5. All courses of Road Construction, Subgrade, Base Course, and Top Course shall be Compacted with a Compactor to the Satisfaction of the County Engineer.

STANDARD DRAWING TS-1

Road Material Specifications

Pit Run

Material for select borrow shall consist of granular material, either naturally occurring or processed, and shall meet the following requirements for grading and quality:

Sieve Size	Percent Passing
2”	75 – 100
No. 40	50 max.
No. 200	10.0 max.
Sand Equivalent	30 min.

All percentages are by weight.

Crushed Surfacing Base and Top Course

Crushed surfacing shall be uniform in quality and substantially free from wood, roots, bark, and other extraneous material and shall meet the following quality test requirements:

Los Angeles Wear, 500 Rev.	35% max.
Degradation Factor – Top Course	25 min.
Degradation Factor – Base Course	15 min.

Crushed surfacing of the various classes shall meet the following requirements for grading and quality when placed in hauling vehicles for delivery to the roadway, or during manufacture and placement into a temporary stockpile.

	Base Course	Top Course
Sieve Size	Percent Passing	
1 ¼”	99 – 100	
1”	80 – 100	
¾”		99 – 100
5/8”	50 – 80	
½”		80 – 100
NO. 4	25 - 45	46 – 66
No. 40	3 - 18	8 – 24
No. 200	7.5 min.	10.0 max.
% Fracture	75 min.	75 min.
Sand Equivalent	40 min.	40 min.

All percentages are by weight.

The fracture requirement shall be at least one fractured face and will apply to the combined aggregate retained on the No. 4 sieve in accordance with FOP for AASHTO T 335.

The portion of crushed surfacing retained on a No. 4 sieve shall not contain more than 0.15 percent wood waste.

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White Salmon, WA 98672
(509) 281-3227

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Date: 10/31/2023
To: Klickitat County Public Works Department
Attention: Nathen Erickson, Design Engineer I
From: Benjamin B. Beseda, P.E., P.L.S.
Project Name: Klickitat Land Preservation Fund
AKS Job No.: **TEC 16577 / AKS 10634**
Project Site: Oak Ridge Road

Subject: **October 11, 2023, Email**

The purpose of this memo is to provide a formal response to the questions in your email of October 11, 2023, on the survey completed by Tenneson Engineering on Oakridge Road. Tenneson Engineering (now a division of AKS Engineering & Forestry) mapped the existing roadway across the entire constructed road prism. Typically, this was from the toe of slope on the westerly side to the top of the slope on the easterly side for the entire remaining unpaved portion of Oakridge Road being just short of 2 miles. To complete this work, we utilized conventional survey equipment and methods. We completed cross-sections of the road at approximate 25-foot intervals in curves and 50-foot in tangent sections. I used the terms "physical" and "traveled" associated with the width of the road. Physical is typically edge of gravel to edge of gravel but can also be top of fill slope to top of ditch as not 100% of the road width is graveled in all locations. Traveled width is where it is clear on the roadway that the vehicle themselves are traveling. In most areas, these are two different numbers. On the attached map set, the areas outside of the modeled 20 foot width but inside the physical edge of road are shown in brown.

Tenneson Engineering did not create a standard geometric centerline for the road. Initially we attempted to create standard road geometry that fit the traveled roadway. However, we found that when we attempted to fit curves or compound curves and tangents to the road it invariably strayed too far from aligning with the center of the traveled way. What we did was create a line midway between the edges of the traveled way and used that as the centerline. It is in the middle of where vehicles are currently traveling the road. From this centerline, a 10-foot offset was made in each direction to illustrate the required 20-foot width. This was then compared to the width of the existing traveled way to show deficient areas. This comparison shows how the road as driven today compares to the 20-foot width requirement.

It is my understanding that one of my client's reasons for commissioning this survey was to provide information to assist in determining if Oakridge Road meets County fire access road standards. It is my understanding of the fire access road standard that the required 20 foot of road width be capable of supporting an 80,000 pound vehicle. Measurements of the road width, whether the physical width or traveled width, in no way imply that the road will support the 80,000 pound design vehicle. I would find it unlikely that the entirety of the roadway meets the 80,000 pound design vehicle requirement, especially those areas that are outside of the traveled way.

Here are the responses to the specific cross-sections you inquired about:

- Just north of Section 5: Section 5 is at Station 28+50. We completed a physical cross-section of the roadway at Station 28+67. The width of the traveled way at this station is 16.6 feet.

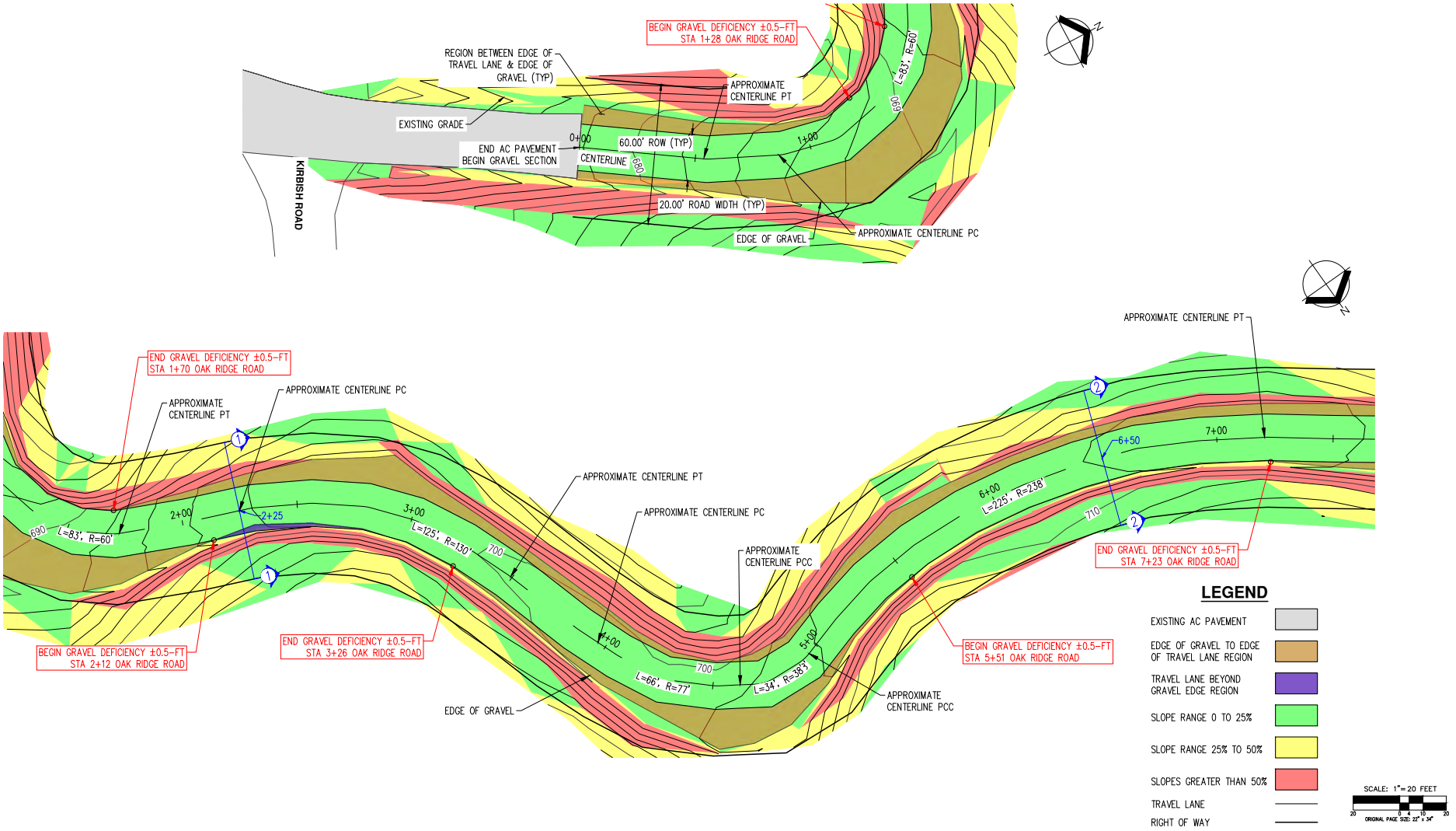
- Just north of Section 9: Section 9 is at centerline Station 57+50. A cross-section of the road was completed at centerline Station 57+62. The width of the traveled way at this station is 14.3 feet.

- At Section 10, being Station 67+50, the width of the traveled way is 14.6 feet.

- At Section 11, centerline Station 76+00, the width of the traveled way is 16.7 feet.

- At Section 8, centerline Station 42+25, the width of the traveled way is 14.7 feet.

I hope that this information furthers your understanding of the mapping work completed by Tenneson Engineering on Oakridge County Road. An updated copy of the completed Oakridge Road evaluation mapping is attached with this memo. Should you have any additional questions, please feel free to contact me at any time.



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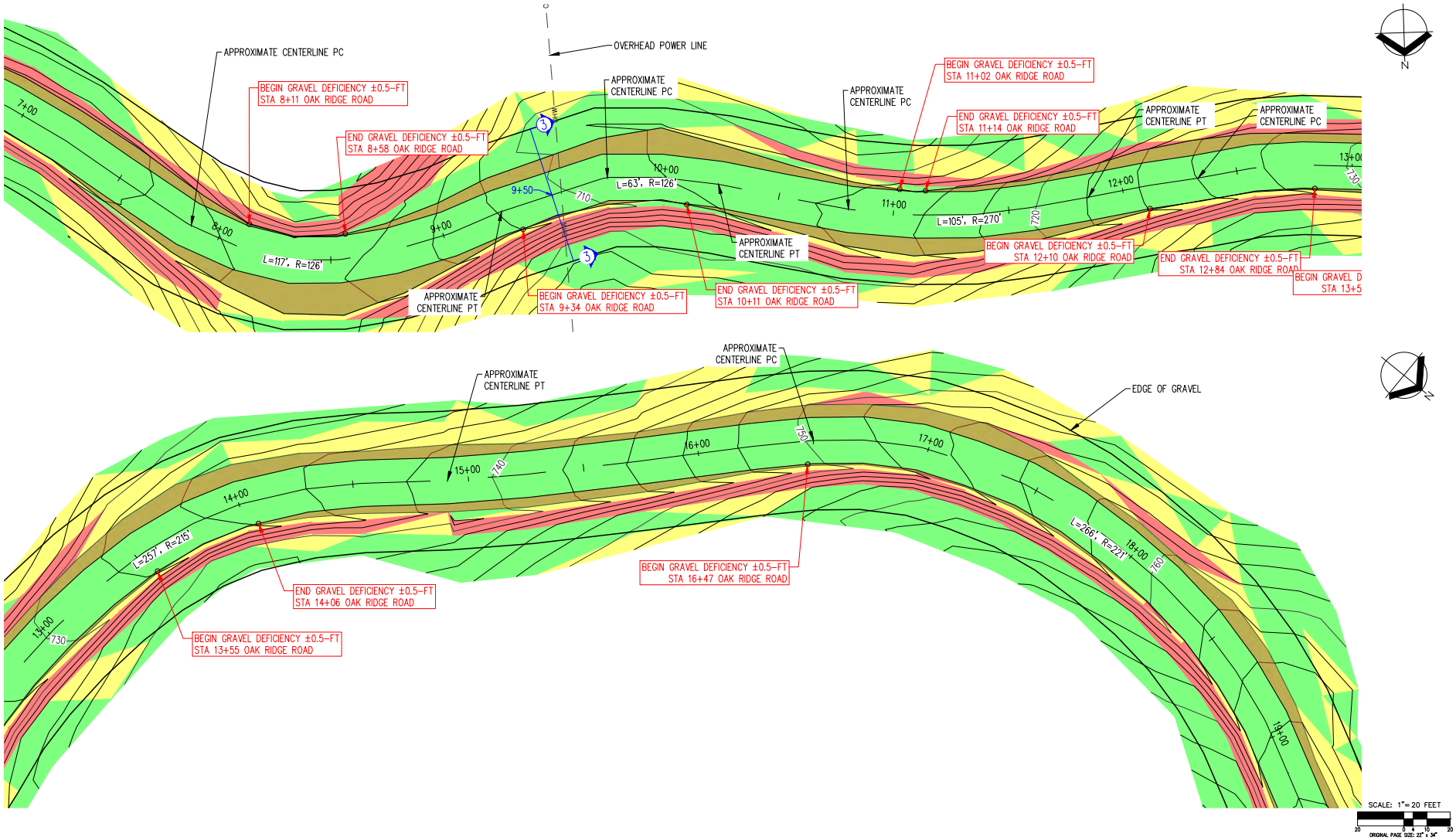
OAK RIDGE ROAD: STA 0+00 - 7+50

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PV 1



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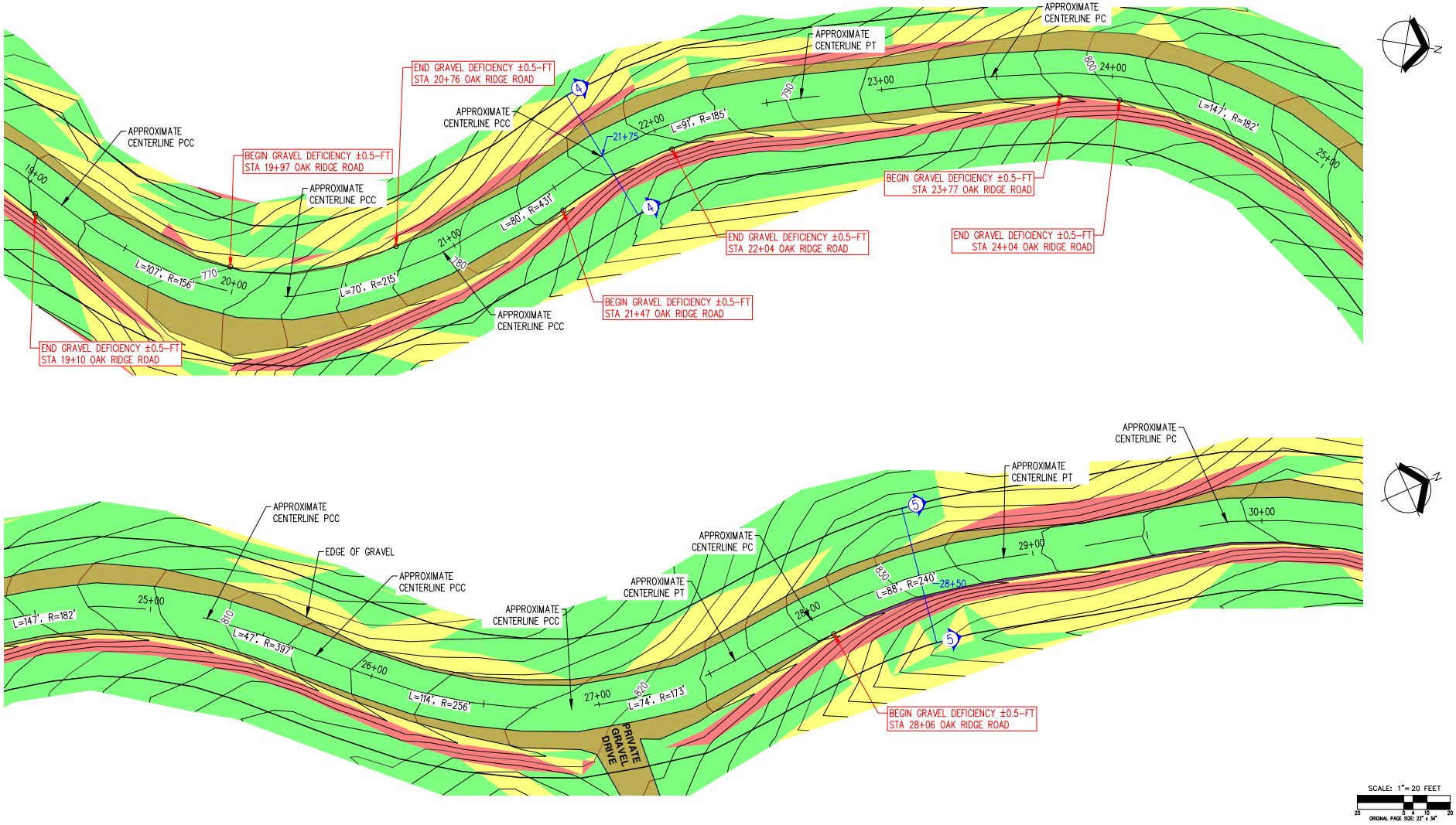
OAK RIDGE ROAD: STA 7+50 - 19+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PV 2



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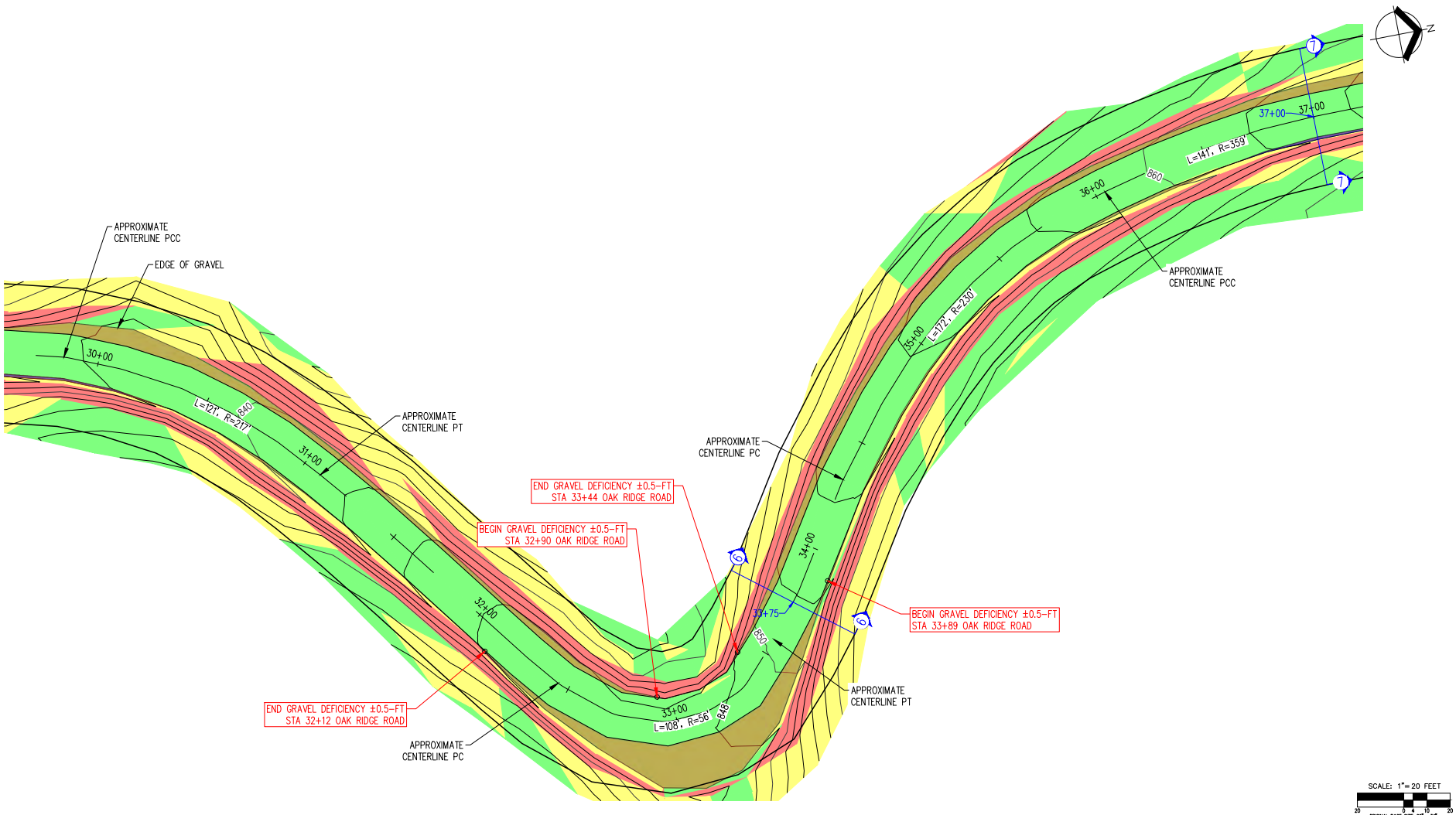
OAK RIDGE ROAD: STA 19+00 - 30+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PV 3



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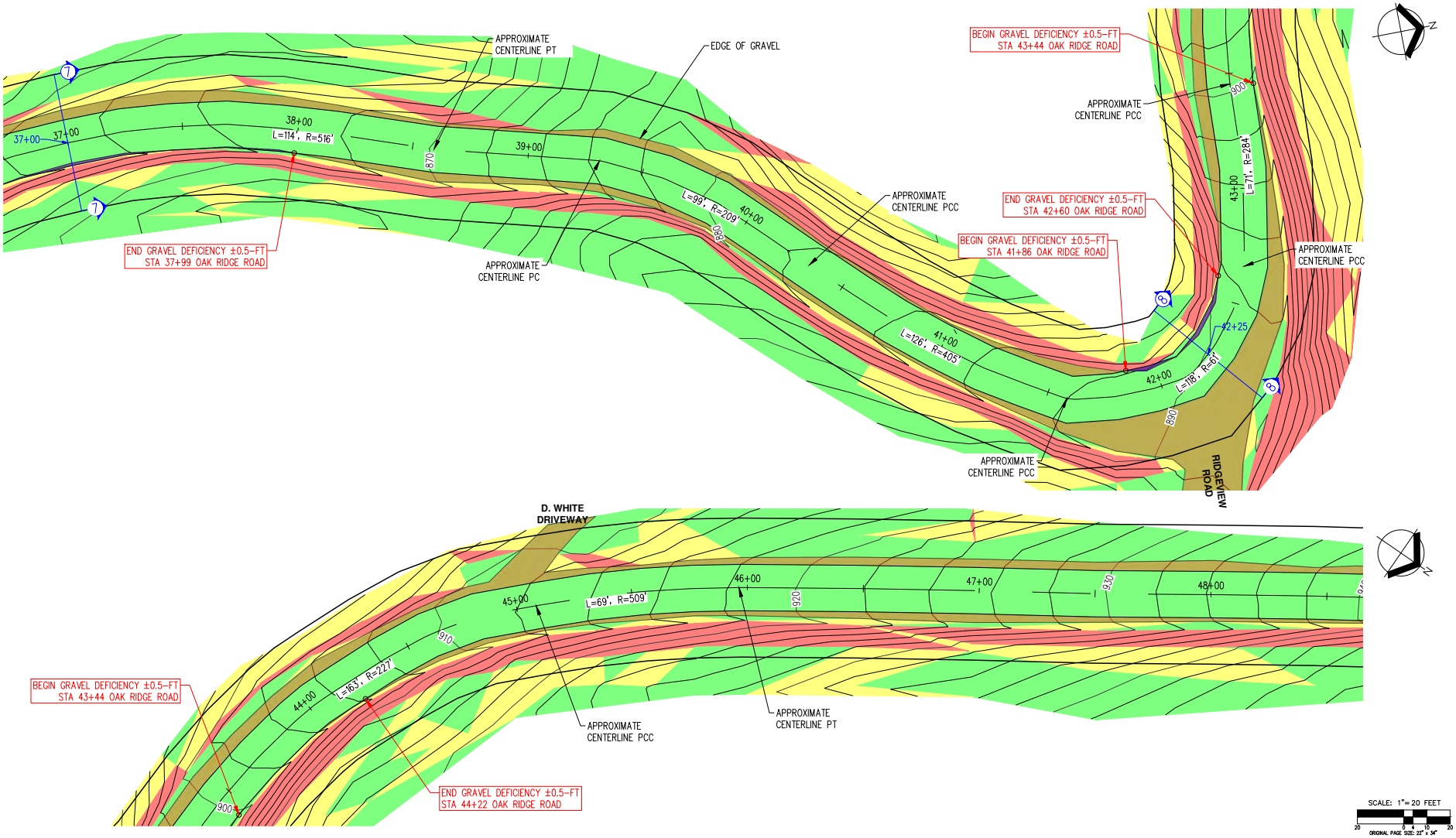
OAK RIDGE ROAD: STA 30+00 - 37+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PV 4



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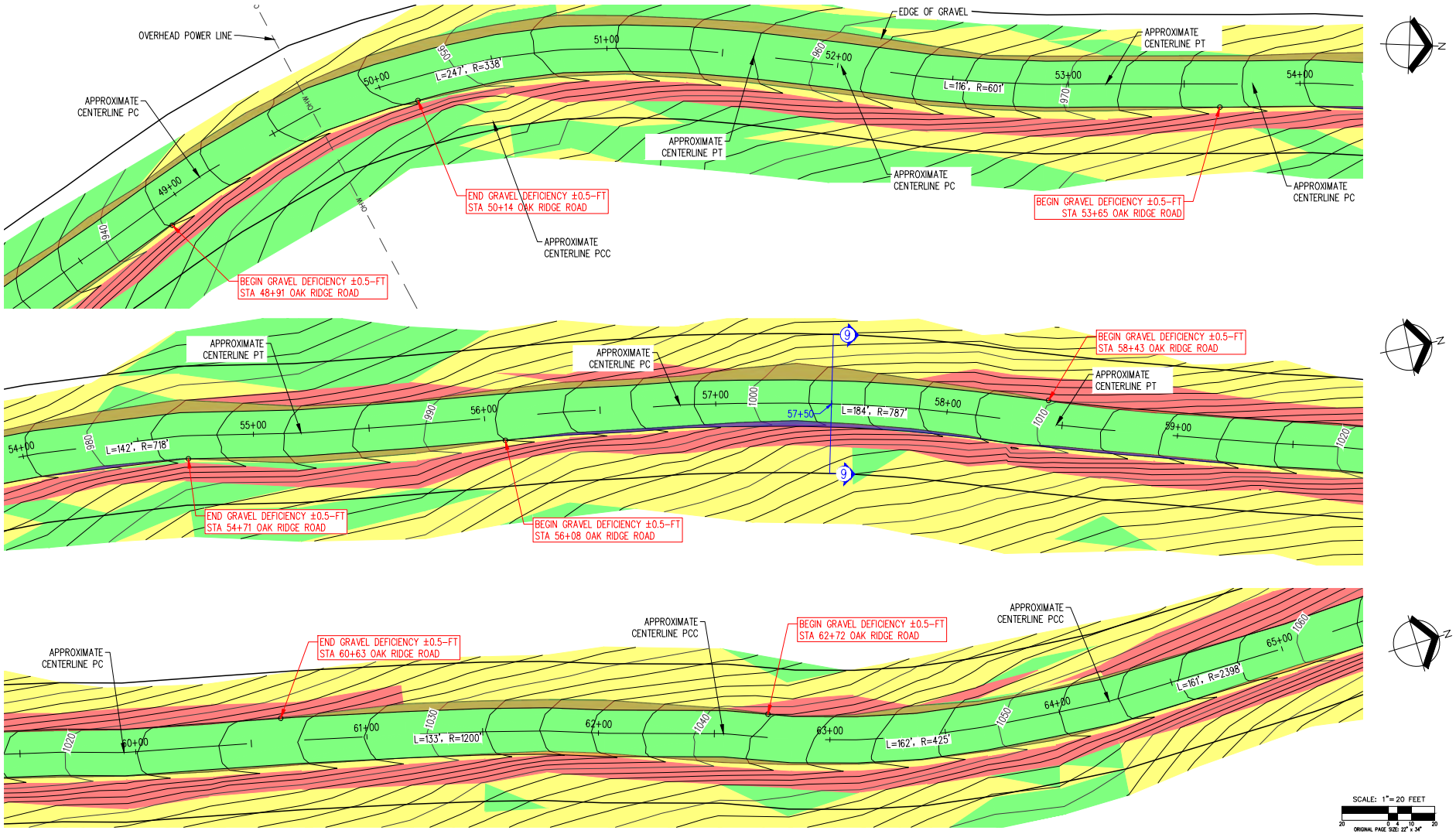
OAK RIDGE ROAD: STA 37+00 - 48+50

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PV 5



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OAK RIDGE ROAD: STA 48+50 - 65+00

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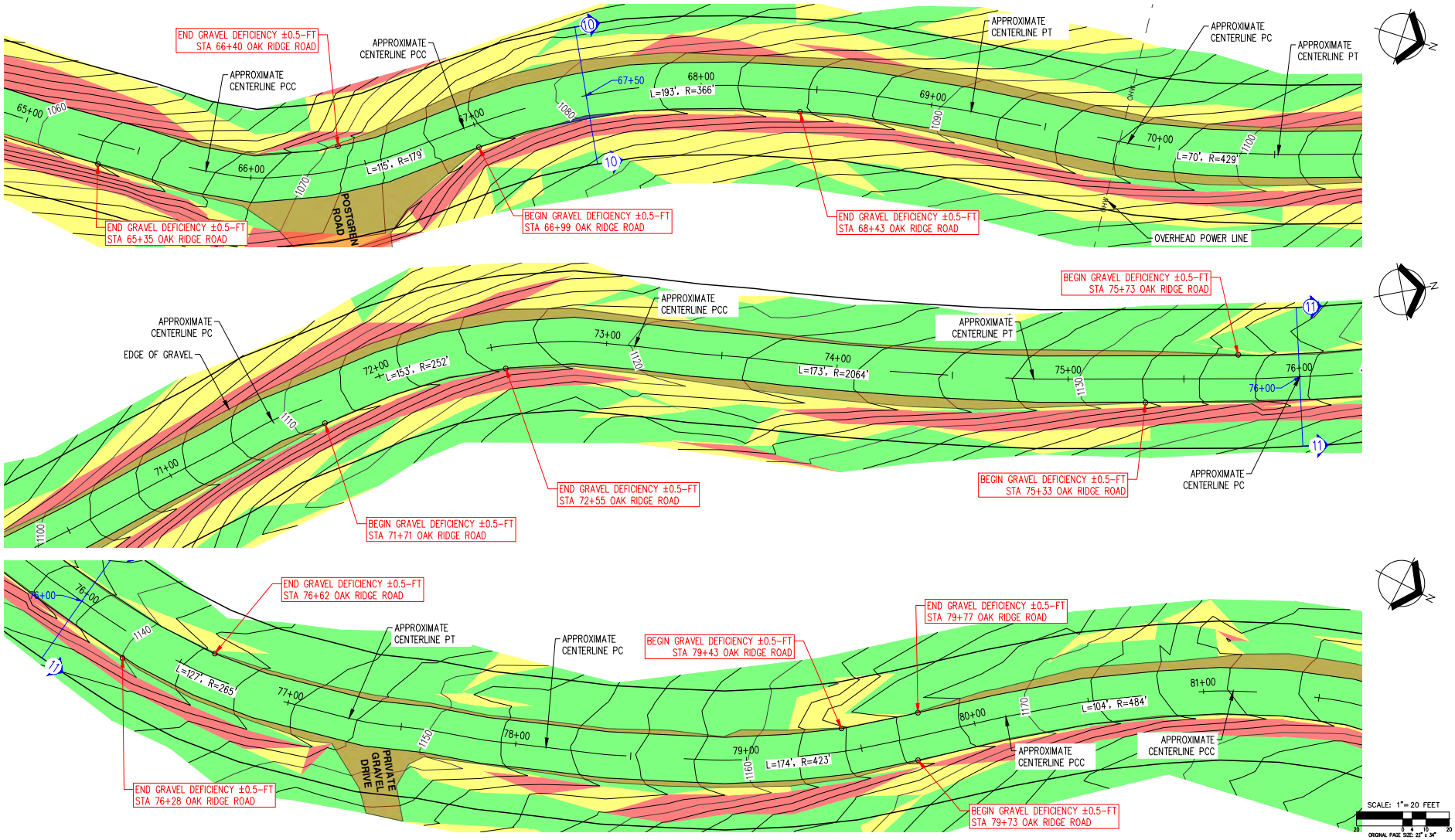
KLICKITAT COUNTY, WA

PV 6



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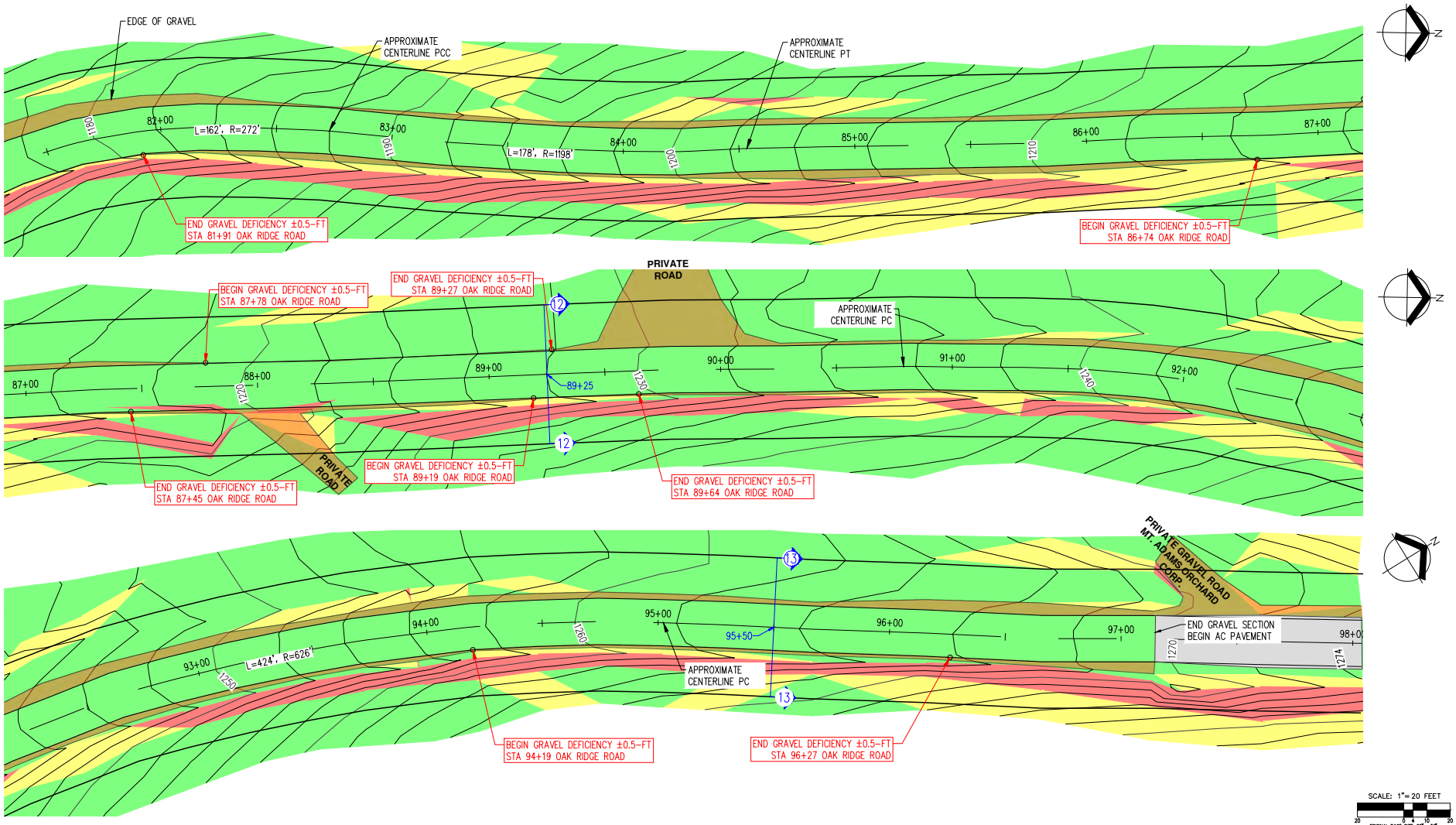
OAK RIDGE ROAD: STA 65+00 - 81+50

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PV 7



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OAK RIDGE ROAD: STA 81+50 - 98+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

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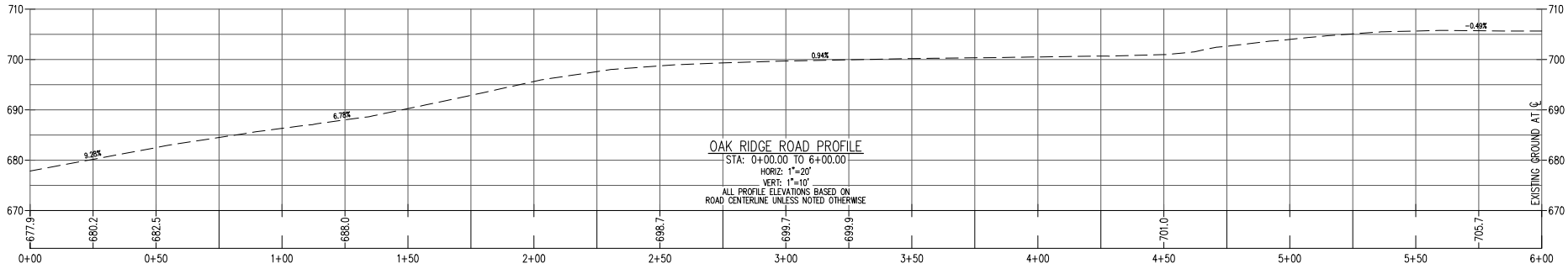
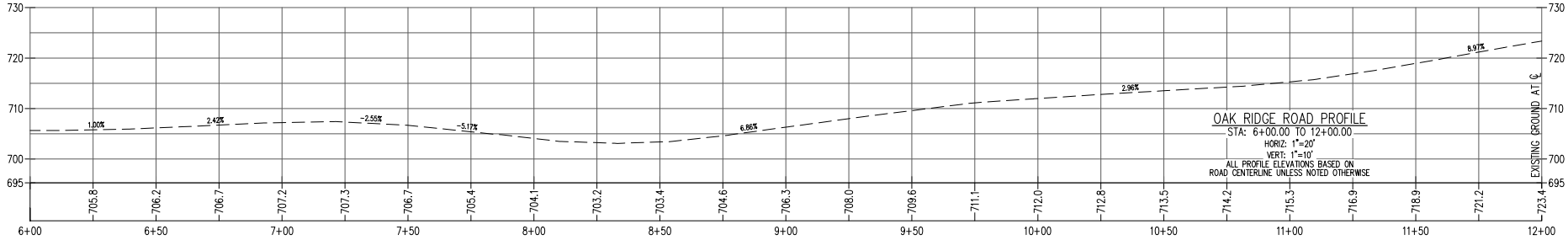
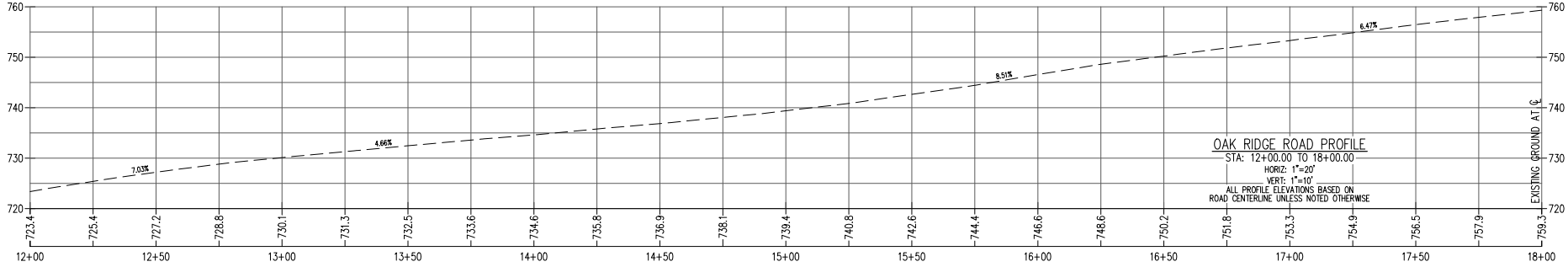
PV 8







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OAK RIDGE ROAD PROFILE: STA 0+00 - 18+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
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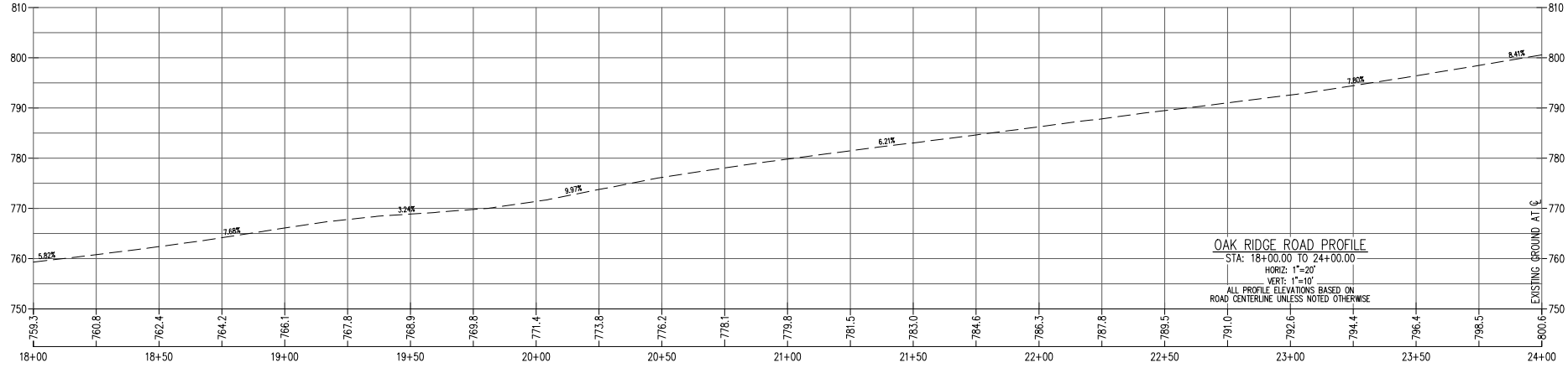

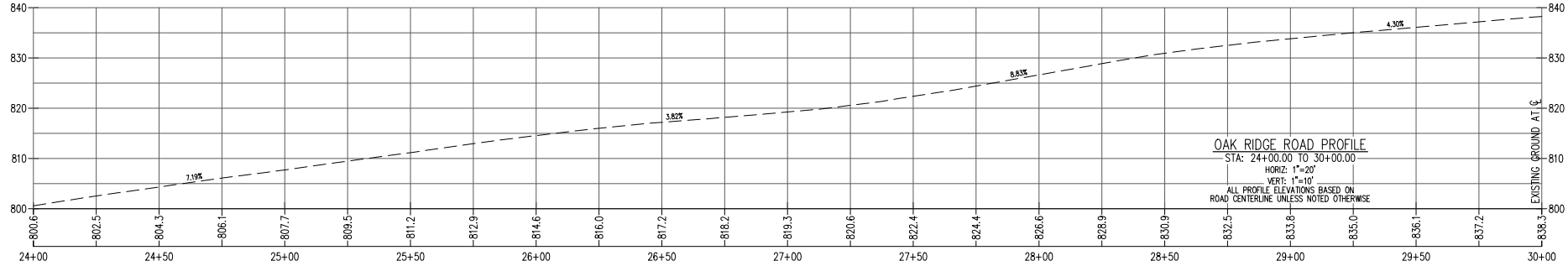

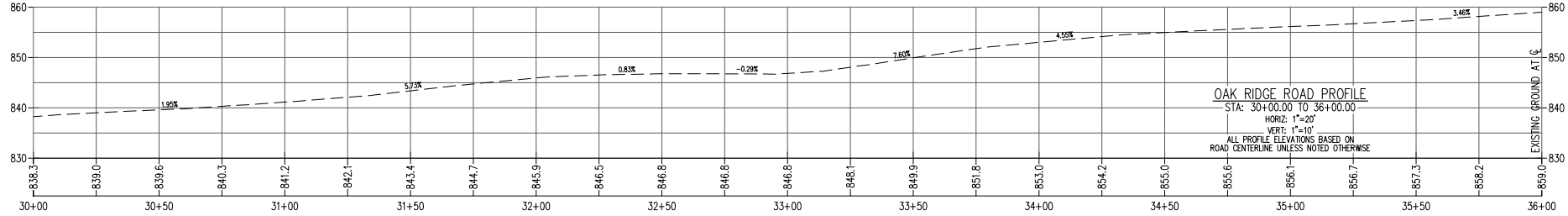

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OAK RIDGE ROAD PROFILE: STA 18+00 - 36+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

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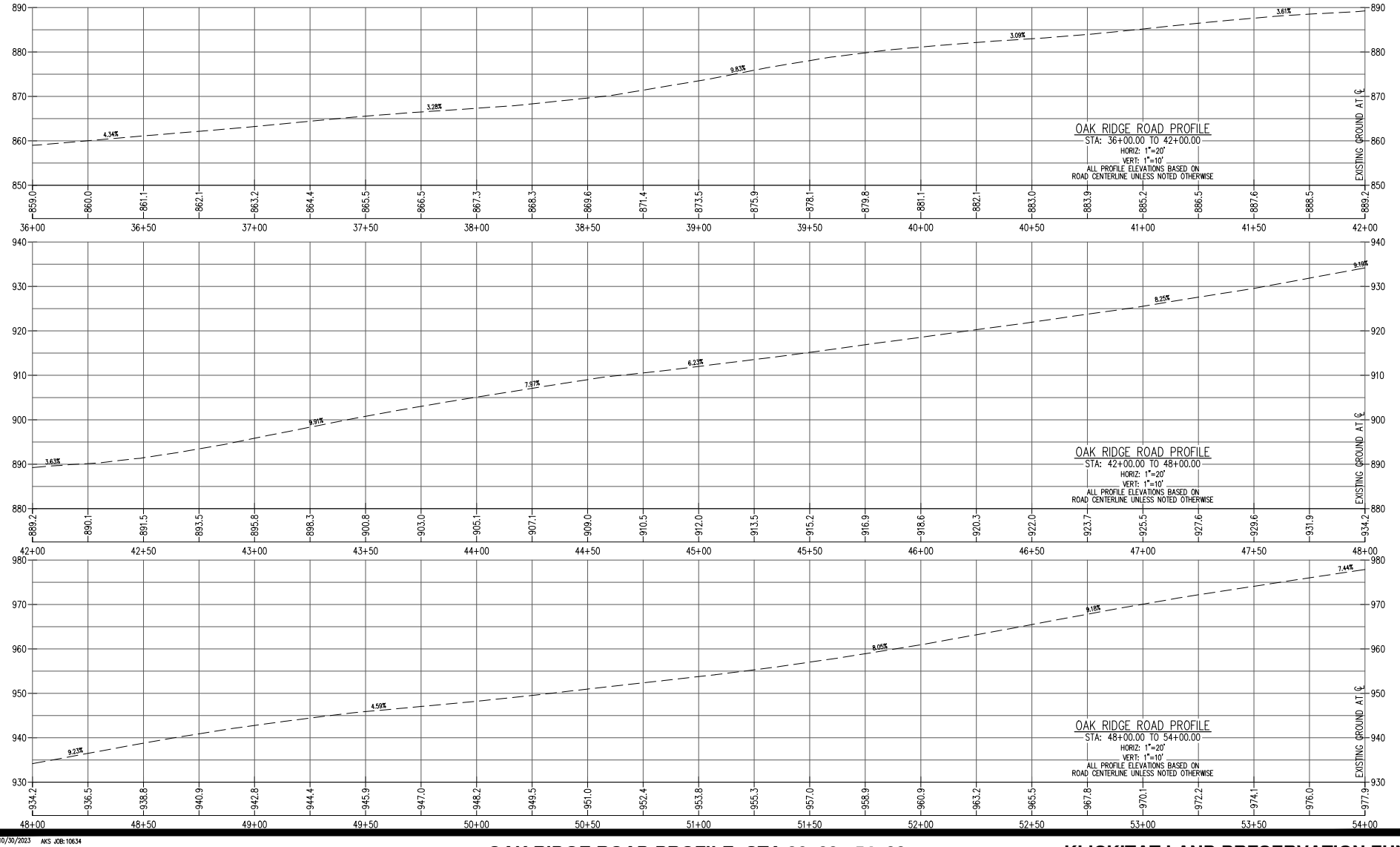
KLICKITAT COUNTY, WA

PF 2



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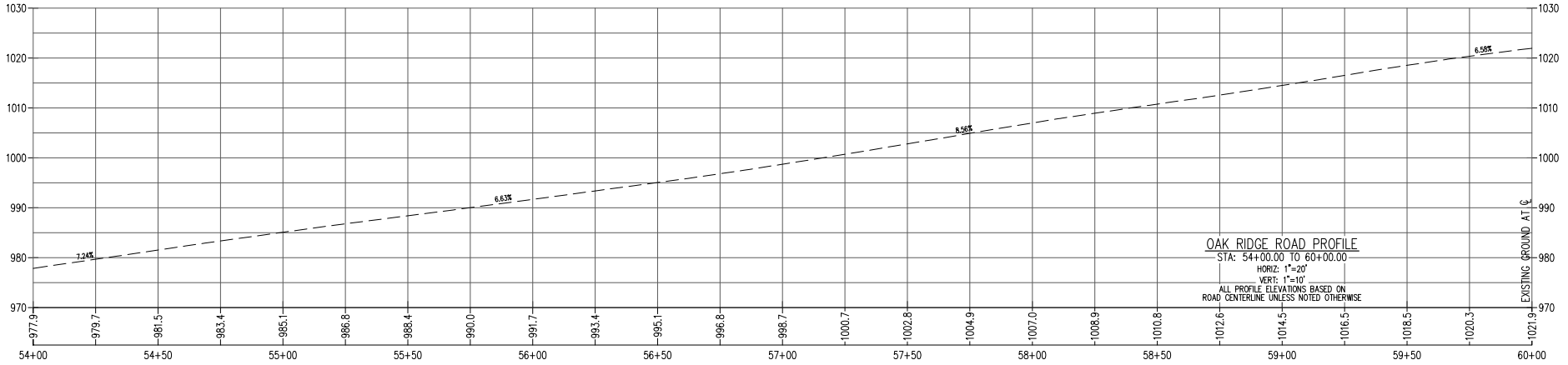
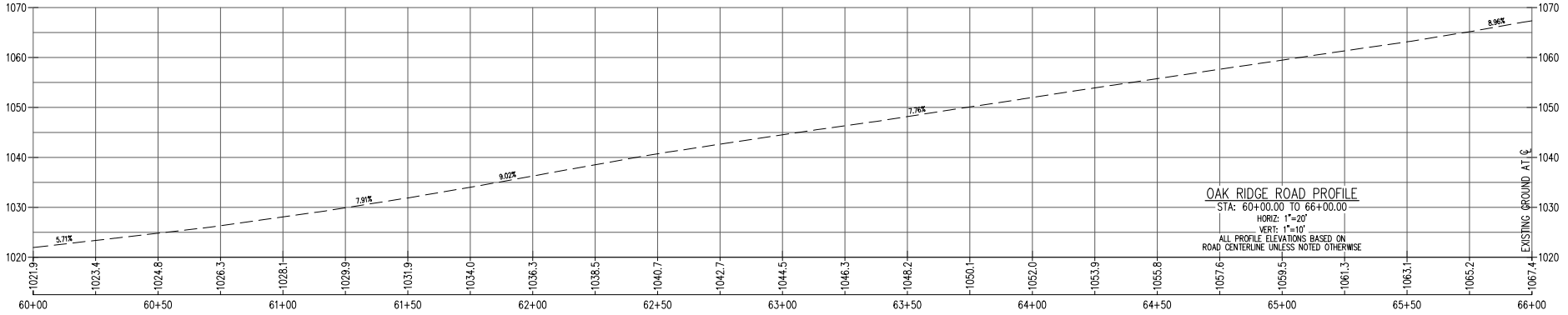
OAK RIDGE ROAD PROFILE: STA 36+00 - 54+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

PF 3





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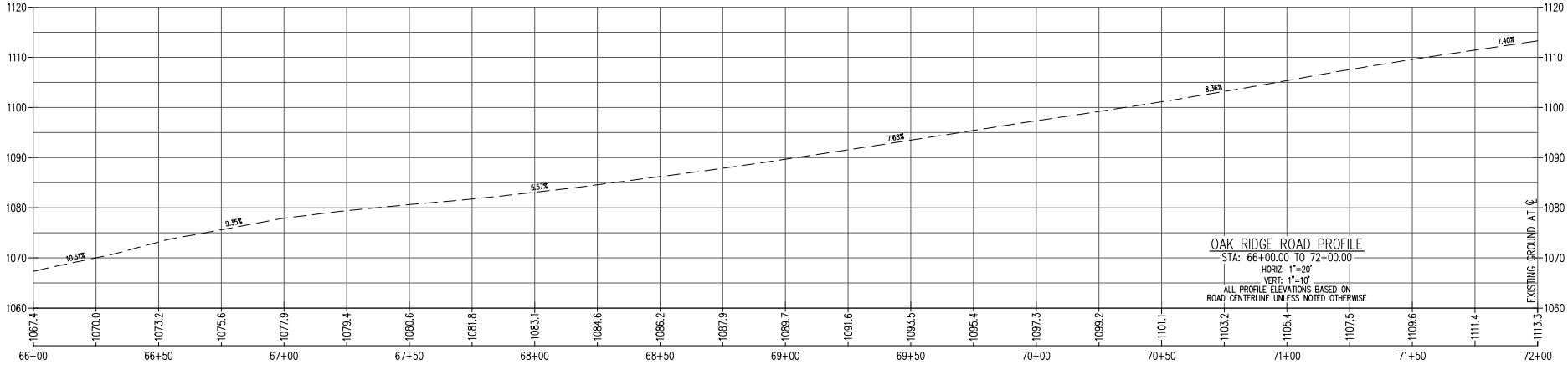
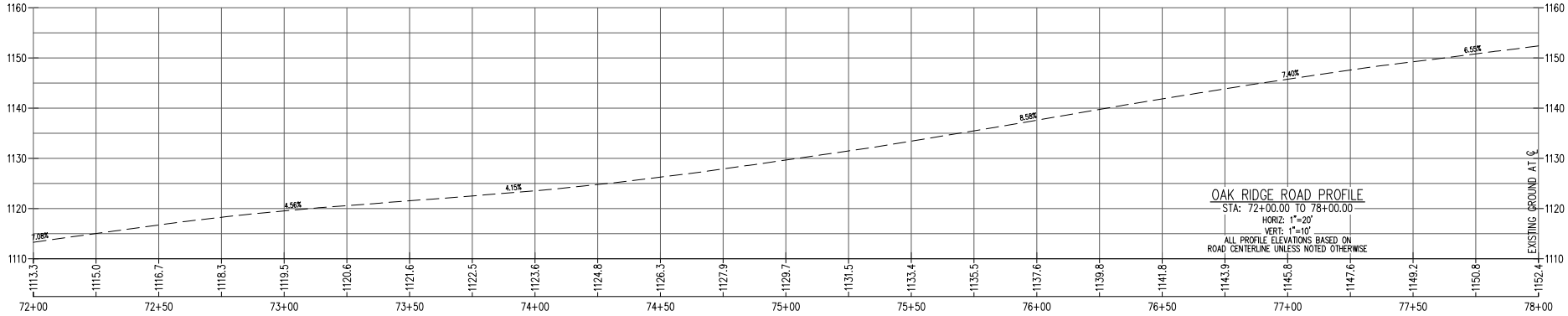
OAK RIDGE ROAD PROFILE: STA 54+00 - 66+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA





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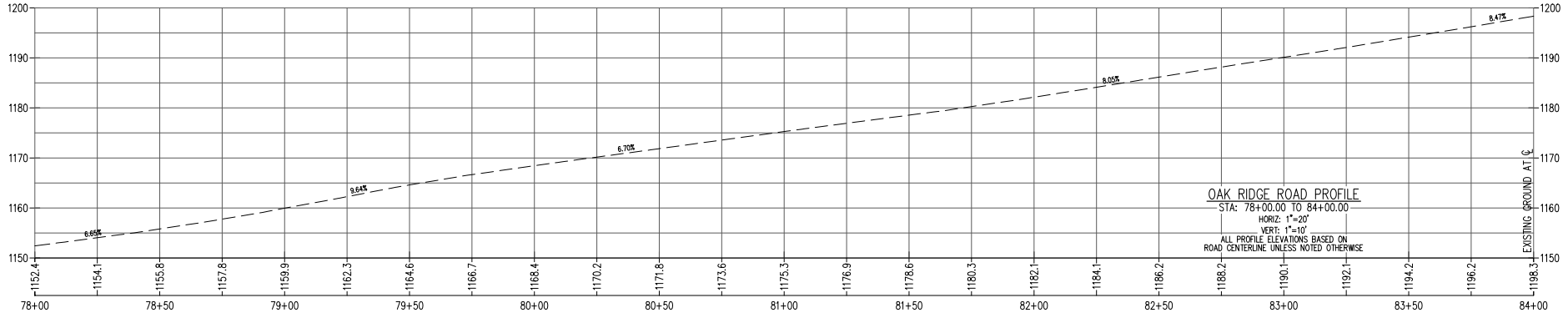
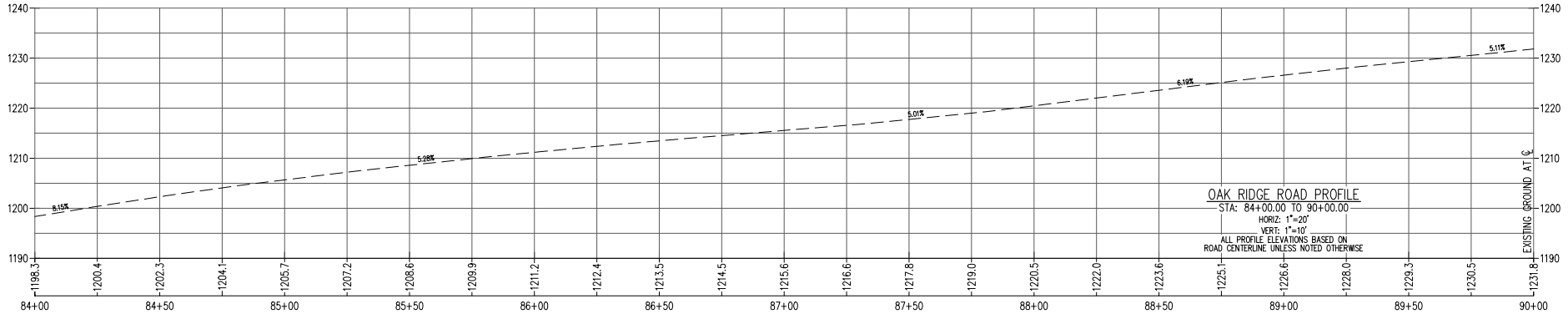
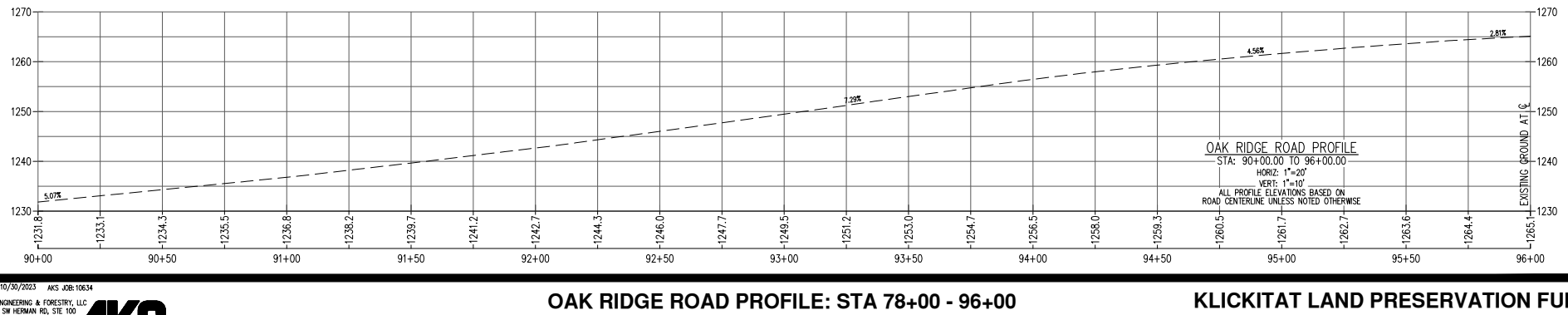
OAK RIDGE ROAD PROFILE: STA 66+00 - 78+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA







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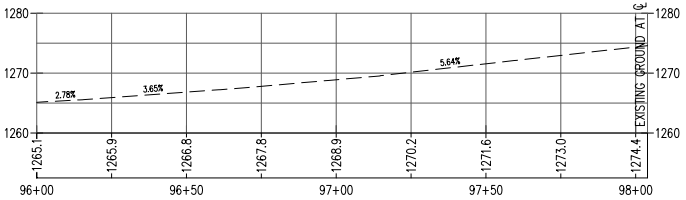
OAK RIDGE ROAD PROFILE: STA 78+00 - 96+00

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA



OAK RIDGE ROAD PROFILE
STA: 96+00.00 TO 98+03.95
HORIZ: 1"=20'
VERT: 1"=10'
ALL PROFILE ELEVATIONS BASED ON ROAD CENTERLINE UNLESS NOTED OTHERWISE

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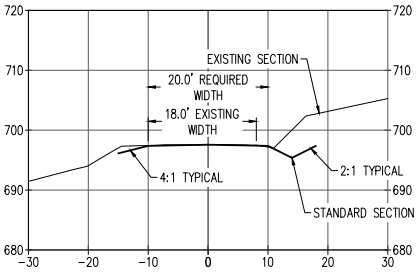
OAK RIDGE ROAD PROFILE: STA 96+00 - 98+04

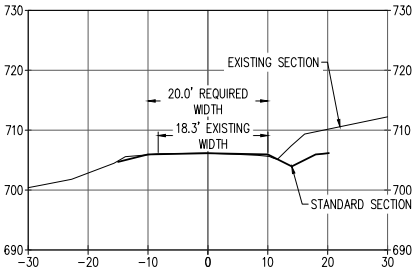
OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

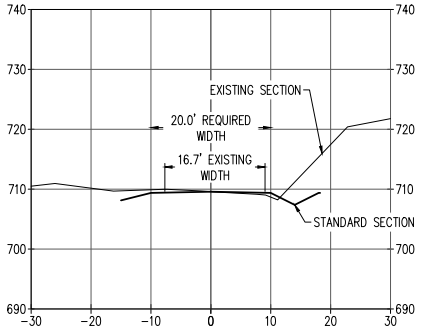
1
OAK RIDGE ROAD
STA. 2+25
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



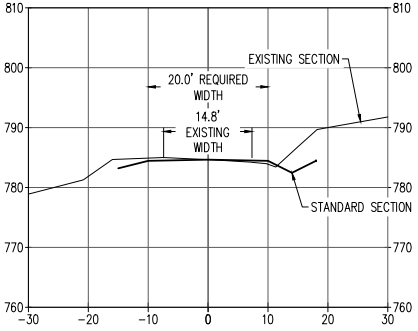
2
OAK RIDGE ROAD
STA. 6+50
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



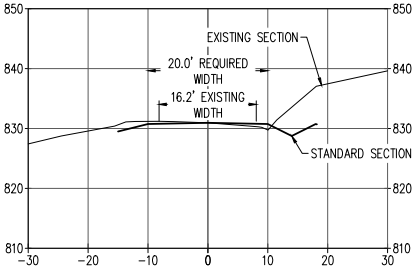
3
OAK RIDGE ROAD
STA. 9+50
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



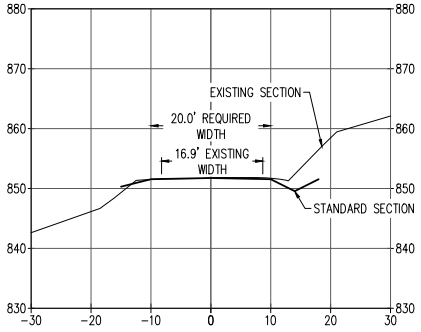
4
OAK RIDGE ROAD
STA. 21+75
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



5
OAK RIDGE ROAD
STA. 28+50
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



6
OAK RIDGE ROAD
STA. 33+75
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



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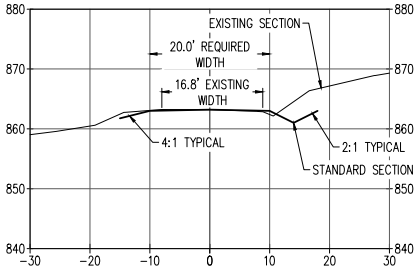
OAK RIDGE ROAD SECTION VIEWS: STA 2+25 - 33+75

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

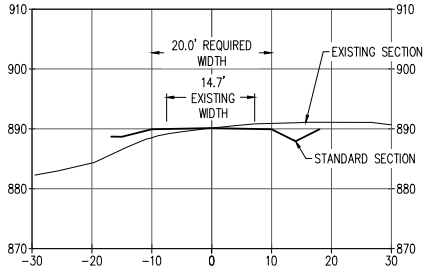
KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

SV 1

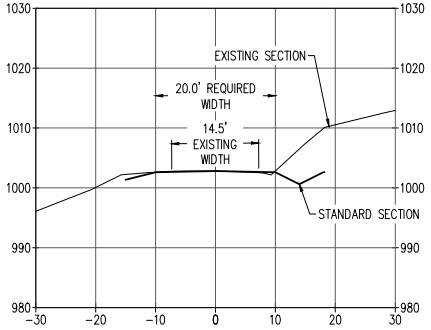
7
OAK RIDGE ROAD
STA. 37+00
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



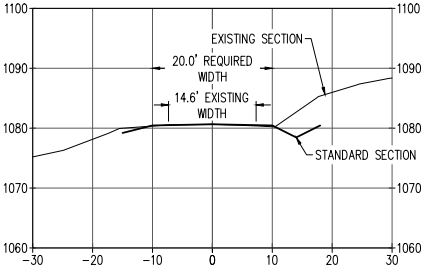
8
OAK RIDGE ROAD
STA. 42+25
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



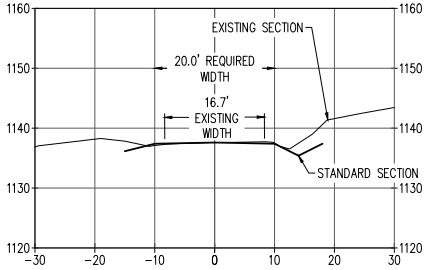
9
OAK RIDGE ROAD
STA. 57+50
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



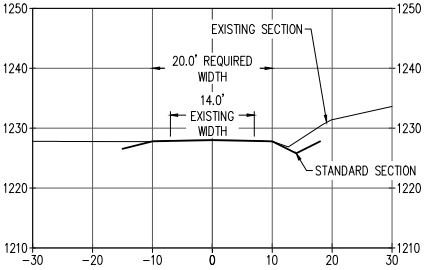
10
OAK RIDGE ROAD
STA. 67+50
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



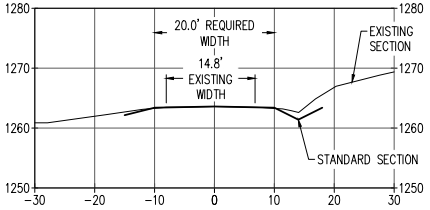
11
OAK RIDGE ROAD
STA. 76+00
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



12
OAK RIDGE ROAD
STA. 89+25
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



13
OAK RIDGE ROAD
STA. 95+50
HORZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 10'



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OAK RIDGE ROAD SECTION VIEWS: STA 2+25 - 33+75

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

SV 2

SUMMARY OF OAK RIDGE ROAD WIDTH DEFICIENCIES			
SIDE OF ROAD	START STATION	END STATION	LENGTH (FT)
LEFT	1+28	1+70	42
RIGHT	2+12	3+26	114
RIGHT	5+51	7+23	172
LEFT	8+11	8+58	47
RIGHT	9+34	10+11	77
LEFT	11+02	11+14	12
RIGHT	12+10	14+06	196
RIGHT	16+47	19+10	263
LEFT	19+97	20+76	79
RIGHT	21+47	22+04	57
RIGHT	23+77	24+04	27
RIGHT	28+06	32+12	406
LEFT	32+90	33+44	54
RIGHT	33+89	37+99	410
LEFT	41+86	42+60	74
RIGHT	43+44	44+22	78
RIGHT	48+91	50+14	123
RIGHT	53+65	54+71	106
RIGHT	56+08	65+35	927
LEFT	58+43	60+63	220
LEFT	62+72	65+50	278
RIGHT	66+99	68+43	144
RIGHT	71+71	72+55	84
RIGHT	75+33	76+28	95
LEFT	75+73	76+62	89
LEFT	79+43	79+77	34
RIGHT	79+73	81+91	218
RIGHT	86+74	87+45	71
LEFT	87+78	89+27	149
RIGHT	89+19	89+64	45
RIGHT	94+19	96+27	208
TOTAL DEFICIENCY LENGTH			4899

SUMMARY OF OAK RIDGE ROAD SLOPE EXCEEDANCE			
SIDE OF ROAD	START STATION	END STATION	LENGTH (FT)
LEFT	0+00	2+60	260
RIGHT	0+00	1+00	100
RIGHT	1+60	4+50	290
LEFT	2+80	9+20	640
RIGHT	4+75	8+10	335
RIGHT	8+55	19+80	1125
LEFT	10+30	13+50	320
LEFT	16+50	18+50	200
RIGHT	20+00	27+00	700
LEFT	20+75	22+00	125
LEFT	22+50	23+50	100
RIGHT	27+50	41+90	1440
LEFT	28+75	30+10	135
LEFT	30+50	37+00	650
LEFT	39+60	45+50	590
RIGHT	42+30	73+10	3080
LEFT	54+70	57+00	230
LEFT	57+90	61+20	330
LEFT	62+60	66+50	390
LEFT	67+70	68+80	110
LEFT	70+25	72+85	260
RIGHT	73+80	77+20	340
RIGHT	78+00	86+30	830
RIGHT	88+40	98+00	960
TOTAL DEFICIENCY LENGTH			13540

ATTACHMENT B

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Bend, OR 97703
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Keizer, OR 97303
(503) 400-6028

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The Dalles, OR 97058
(541) 296-9177

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Tualatin, OR 97062
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Vancouver, WA 98682
(360) 882-0419

WHITE SALMON, WA
107 W Jewett
Suite 100
White Salmon, WA 98672
(509) 281-3227

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Date: 12/5/2023
To: Klickitat Land Preservation Fund Attn. Dennis White
From: Ben Beseda
AutoTurn Narrative by: Justin McArthur
Project Name: Oak Ridge Road Existing Condition Evaluation
AKS Job No.: **10634**
Project Site: Klickitat County, Washington

Subject: **Vehicle Turning Movements**

A portion of Oak Ridge Road, located near White Salmon, Washington, was evaluated for potential required improvements including regrading, widening, and realignment due to increased traffic resulting from a proposed large scale private development. Several horizontal curves along Oak Ridge Road were being assessed for their ability to accommodate a full-size school bus and a standard loaded log truck. The selected curves were evaluated using AutoTurn Pro (version 11) on Autodesk Civil 3D 2022 software.

AutoTurn Pro, by Transoft Solutions, is an industry standard, vehicle turning simulator software that uses American Association of State Highway and Transportation Officials (AASHTO) approved vehicles to evaluate and calculate the space required for a vehicle to make a turning maneuver. This type of evaluation is also known as Swept Path Analysis. AutoTurn Pro uses Swept Path Analysis to provide the user several methods to simulate the selected vehicle through the desired path. The manual 2D Arc Path and 2D Corner Path methods of simulation were used to model the selected vehicles. The 2D Arc Path generates the simplest and most commonly used type of 2D turn simulation. It generates a path that follows an arc from start position to the desired end position. The arc is defined by the turning speed and steering angle of the vehicle. The Corner Path generates a 2D turn simulation using an entrance tangent arc, and exit tangent, with input for the turn radius and the amount of turn sweep. Both methods of simulation require the user to manually guide the vehicle along the path, while operating within the parameters of the specific vehicle.

Klickitat Land Preservation Fund requested the turning movements of a standard school bus and a standard loaded log truck to be simulated along four separate curves of Oak Ridge Road. Based on the images provided and standard vehicle lengths of a log truck and school bus, similar vehicle sizes available within the AutoTurn Pro 11 vehicle library were used in the turning simulations. A Type D school bus was used to model the school bus. A Type D school bus is the largest school bus, with a total length of 45-feet and steering angle of 45.2-feet. Based on the image provided, standard log truck lengths, and available vehicles within the Autoturn Pro 11 vehicle library, the WB-67 is used to model the loaded log truck. A WB-67 has a truck and trailer length of 15-feet and 53-feet, respectively. The steering angle is 28.4-feet.

The turning movements for the Type D school bus and the WB-67 were simulated using 2D Arc Path and Corner Path methods for both northbound and southbound travel at specific stations along Oak Ridge Road. Both vehicles were modeled at 10-mph for the entirety of the simulation.

Four curves along Oak Ridge Road were evaluated for the ability to accommodate the passage of a Type D school bus and a WB-67 truck and trailer in the northbound and southbound directions along the horizontal centerline alignment. The vehicles were simulated using AutoTurn Pro 11, a vehicle turning simulation software approved by most government agencies. The attached exhibits illustrate the vehicle paths at these specific stations.

Please feel free to reach out if you have any questions.

Sincerely,

Justin McArthur

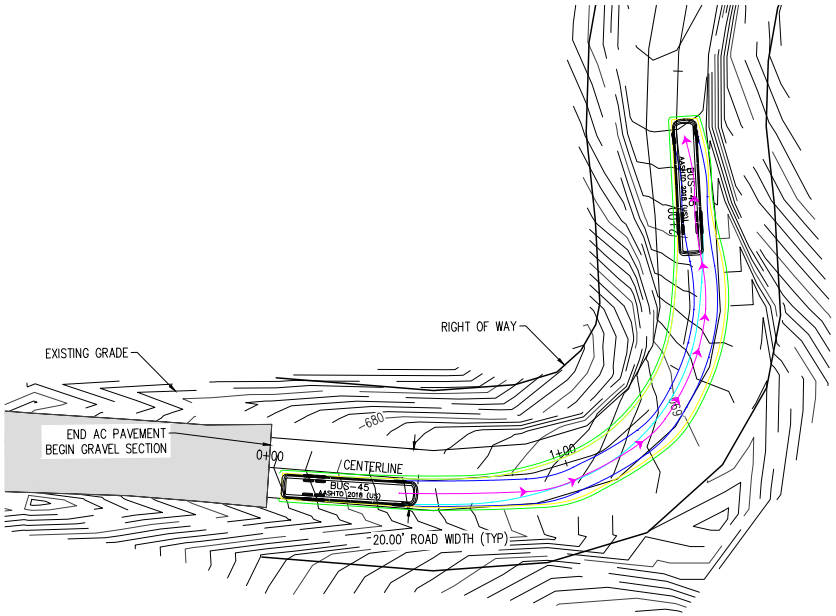
(503)-563-6151

mcarthurj@aks-eng.com

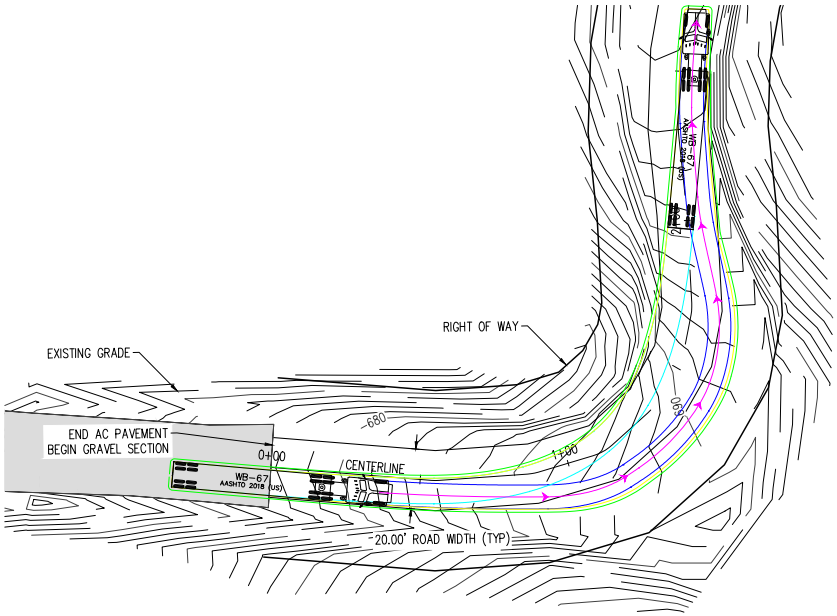
Attachments:

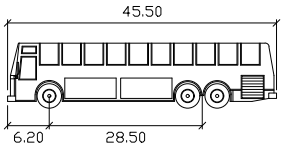
- Oak Ridge Road Turning Movements

SCHOOL BUS TURNING DETAIL AT STATION 1+00



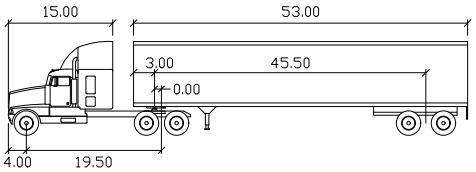
LOG TRUCK TURNING DETAIL AT STATION 1+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"=20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

DATE: 12/1/2023 AKS JOB: 10634

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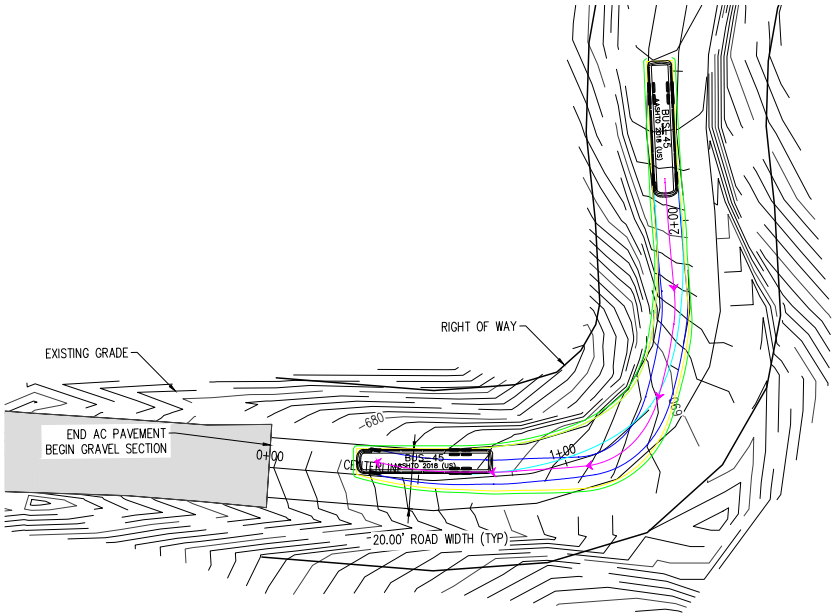
OAK RIDGE ROAD: NORTHBOUND TURNING MOVEMENTS

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

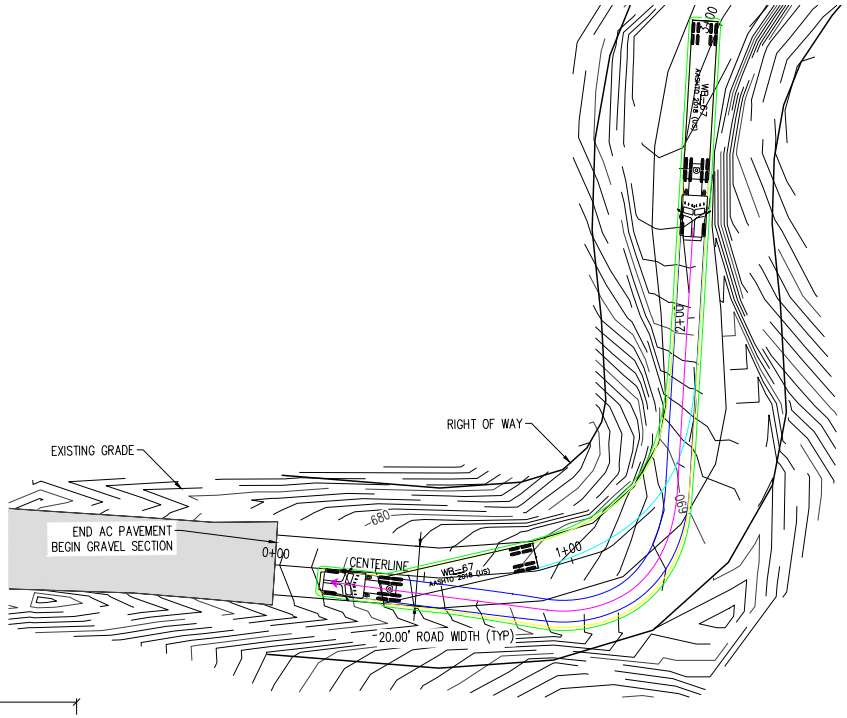
KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

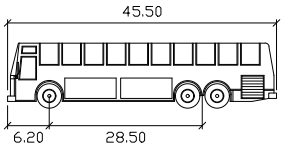
EX 1

SCHOOL BUS TURNING DETAIL AT STATION 1+00



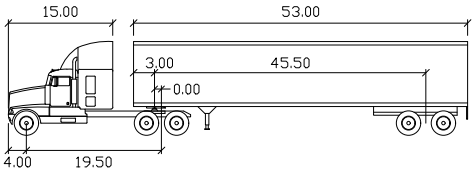
LOG TRUCK TURNING DETAIL AT STATION 1+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"=20 FEET

ORIGINAL PAGE SIZE: 22" x 34"

DATE: 12/1/2023 AKS JOB: 10634

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OAK RIDGE ROAD: SOUTHBOUND TURNING MOVEMENTS

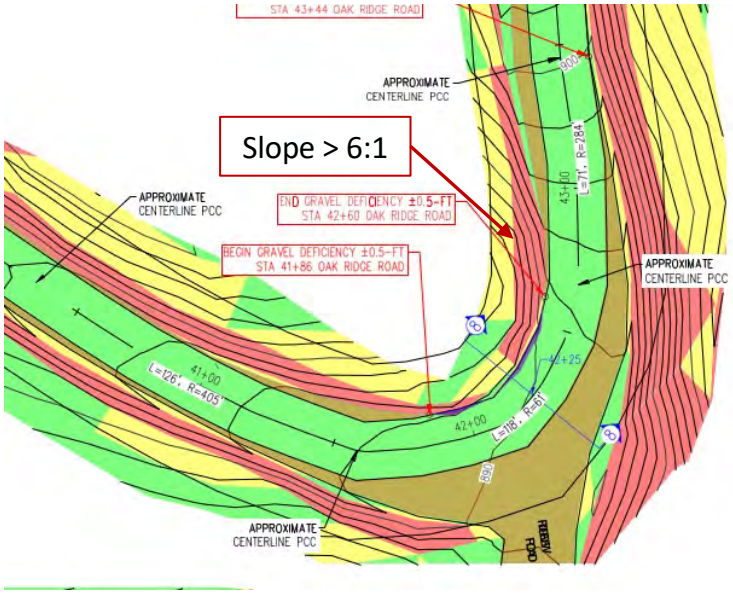
OAK RIDGE ROAD EXISTING CONDITION EVALUATION

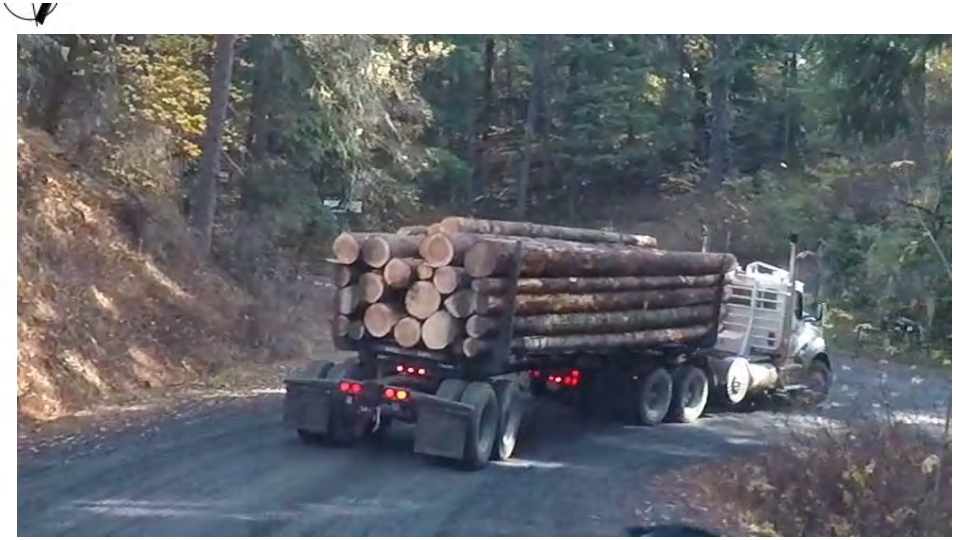
KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

EX 1A

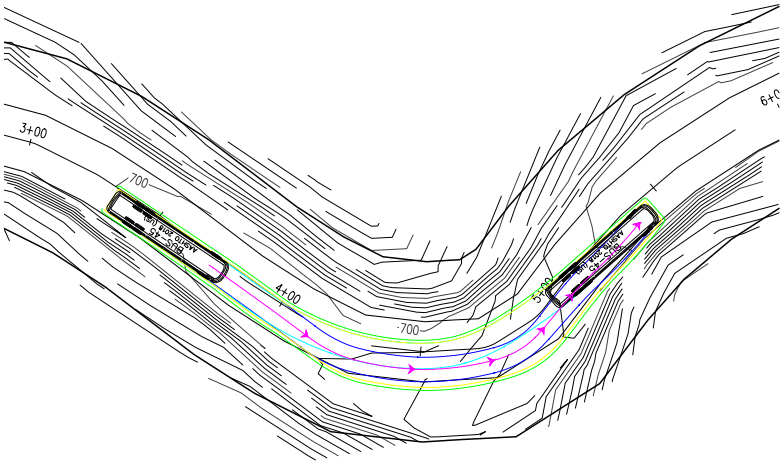
Horizontal Curves

MP 3.5

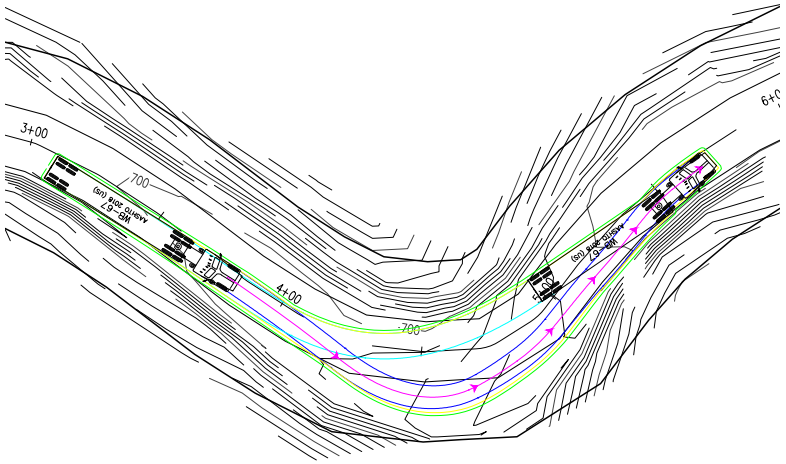


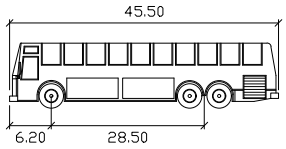


SCHOOL BUS TURNING DETAIL AT STATION 4+00



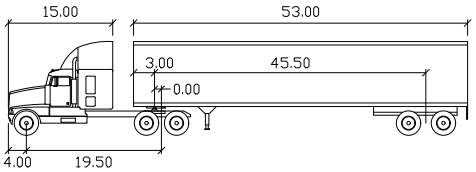
LOG TRUCK TURNING DETAIL AT STATION 4+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"=20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

DATE: 12/1/2023 AKS JOB: 10634

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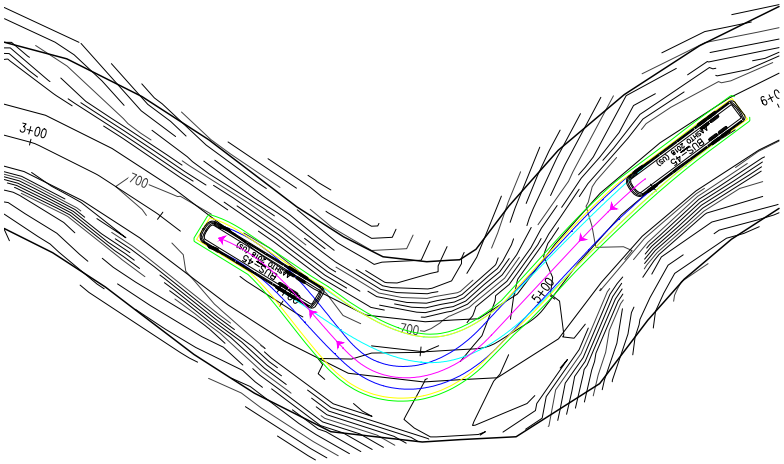
OAK RIDGE ROAD: NORTHBOUND TURNING MOVEMENTS

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

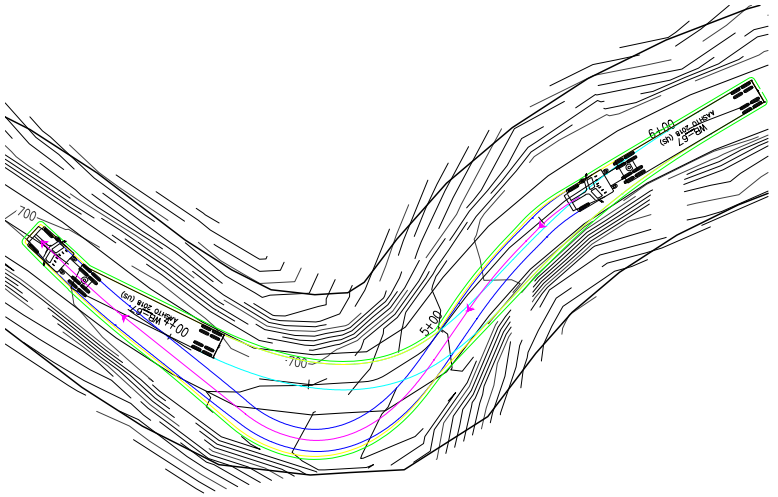
KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

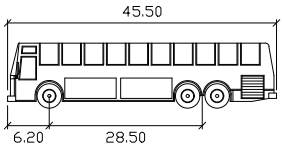
EX 2

SCHOOL BUS TURNING DETAIL AT STATION 4+00



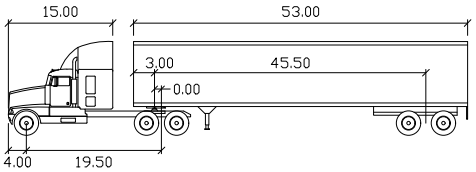
LOG TRUCK TURNING DETAIL AT STATION 4+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"=20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

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OAK RIDGE ROAD: SOUTHBOUND TURNING MOVEMENTS

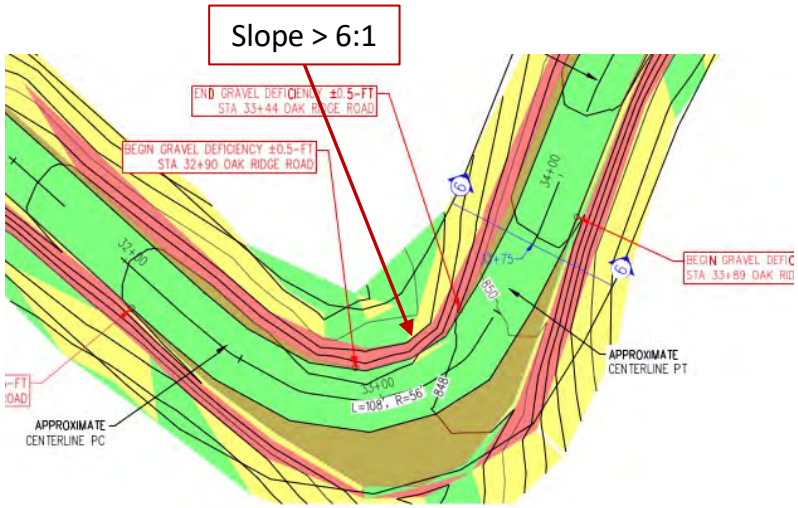
OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

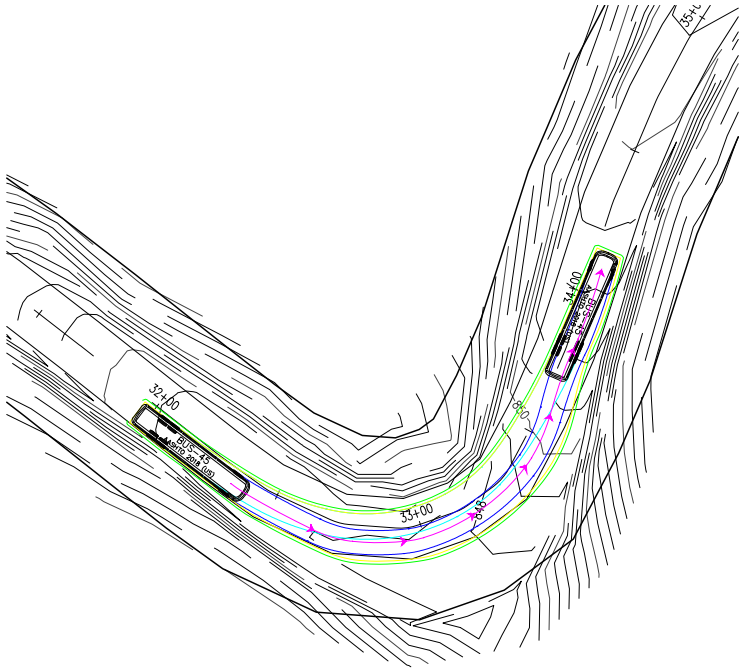
EX 2A

Horizontal Curves

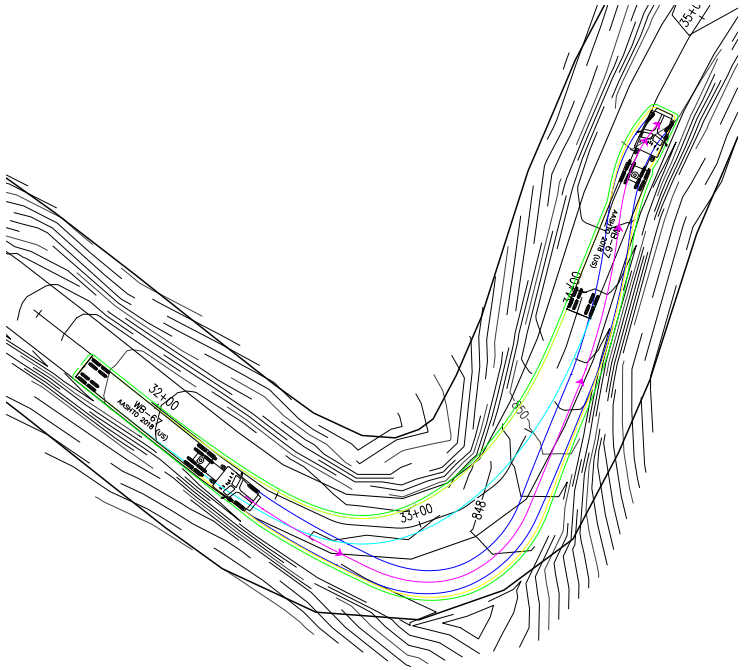
MP 3.3

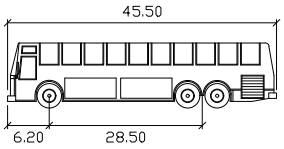


SCHOOL BUS TURNING DETAIL AT STATION 32+00



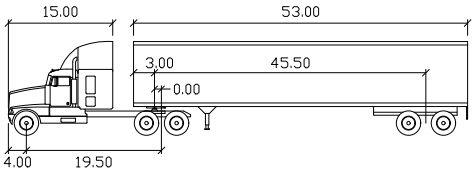
LOG TRUCK TURNING DETAIL AT STATION 32+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"= 20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

DATE: 12/1/2023 AKS JOB: 10634

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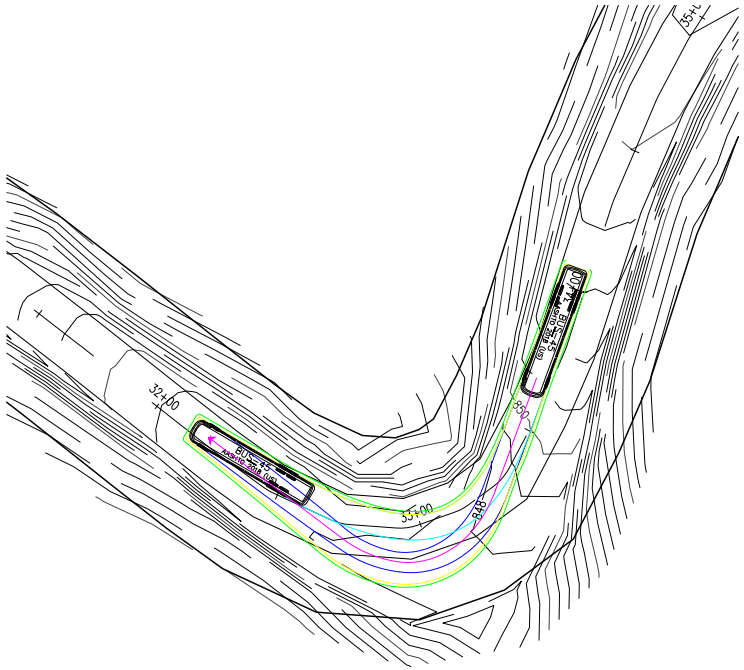
OAK RIDGE ROAD: NORTHBOUND TURNING MOVEMENTS

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

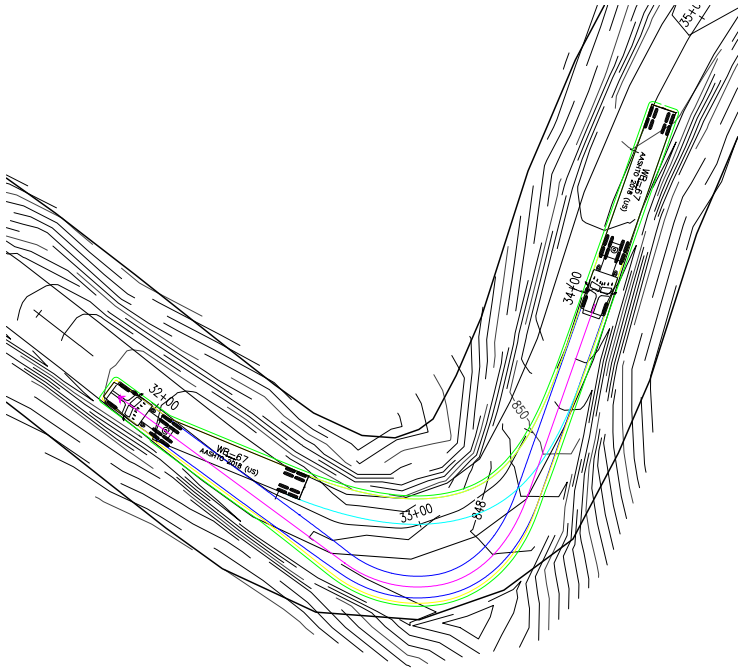
KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

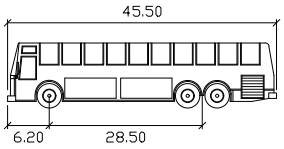
EX 3

SCHOOL BUS TURNING DETAIL AT STATION 32+00



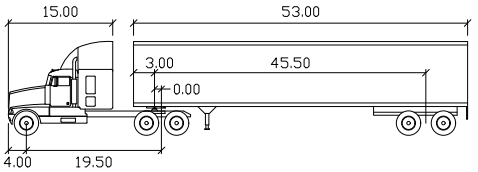
LOG TRUCK TURNING DETAIL AT STATION 32+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1" = 20 FEET

ORIGINAL PAGE SIZE: 22" x 34"

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OAK RIDGE ROAD: SOUTHBOUND TURNING MOVEMENTS

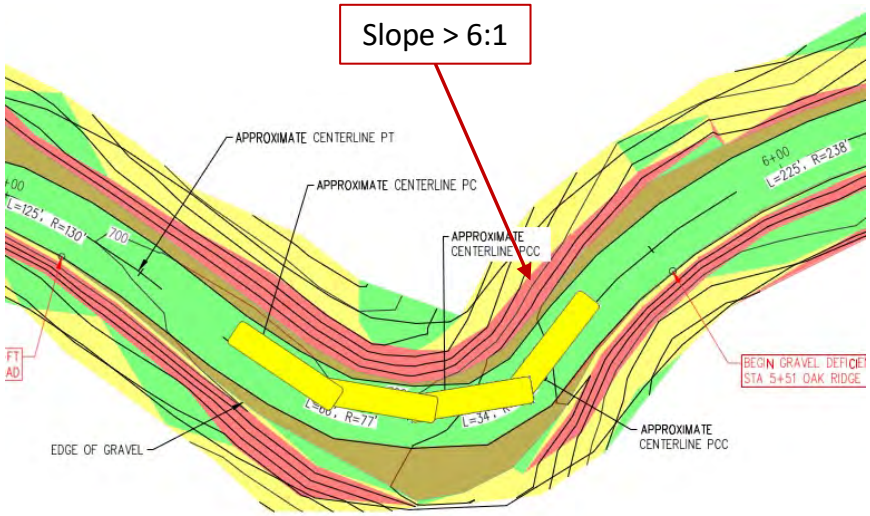
OAK RIDGE ROAD EXISTING CONDITION EVALUATION

KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

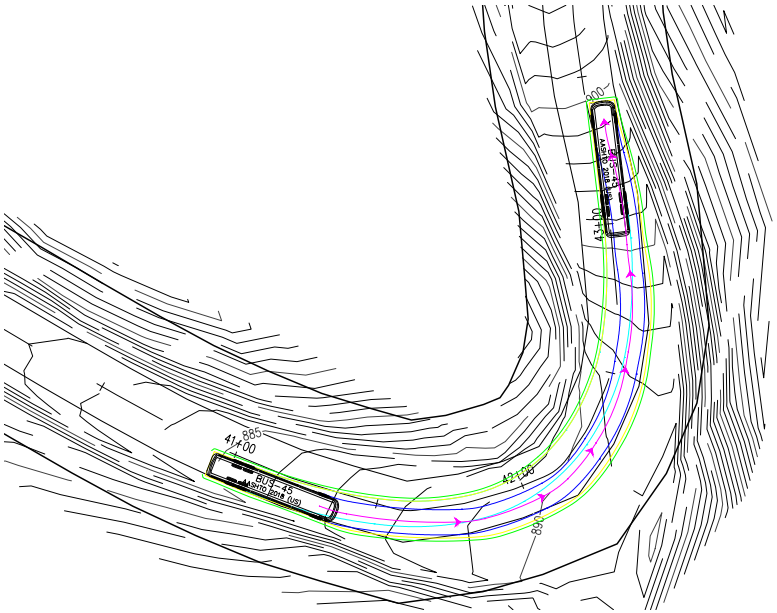
EX 3A

Horizontal Curves

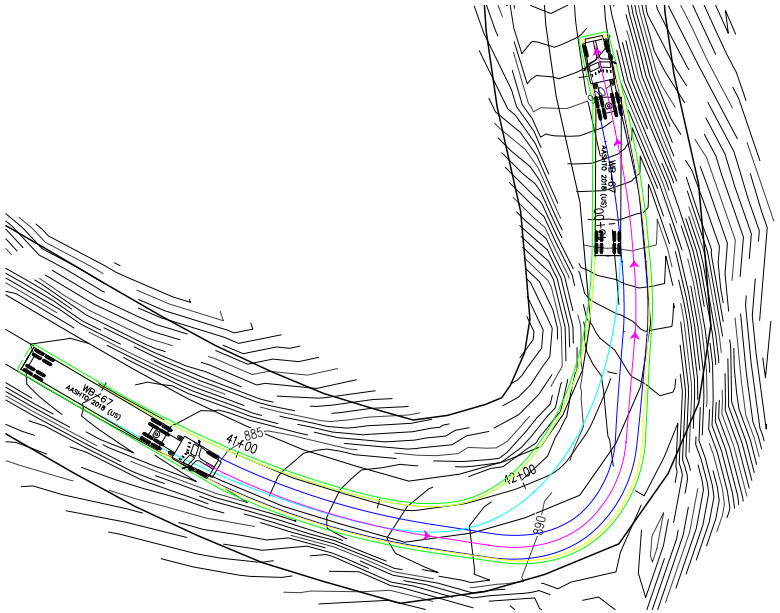
MP 3.0

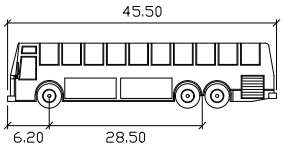


SCHOOL BUS TURNING DETAIL AT STATION 41+00



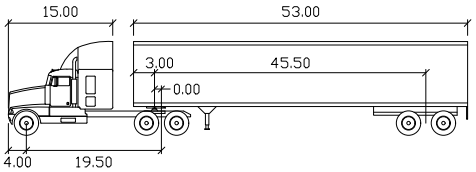
LOG TRUCK TURNING DETAIL AT STATION 41+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"= 20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

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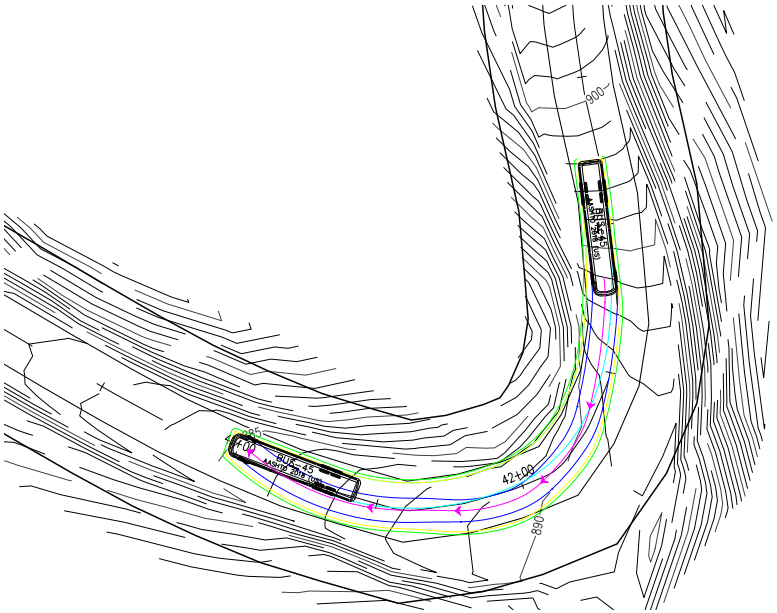
OAK RIDGE ROAD: NORTHBOUND TURNING MOVEMENTS

OAK RIDGE ROAD EXISTING CONDITION EVALUATION

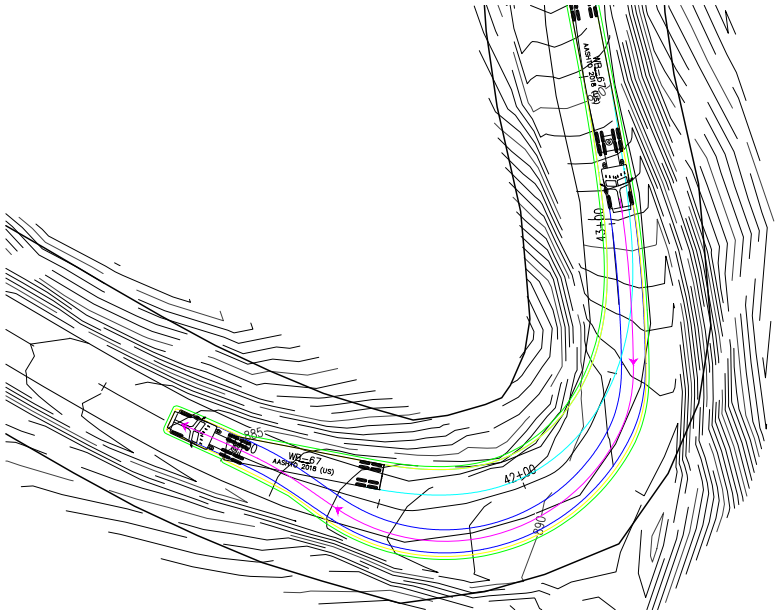
KLICKITAT LAND PRESERVATION FUND
KLICKITAT COUNTY, WA

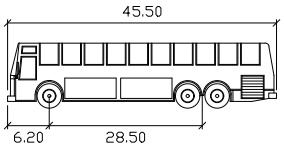
EX 4

SCHOOL BUS TURNING DETAIL AT STATION 41+00



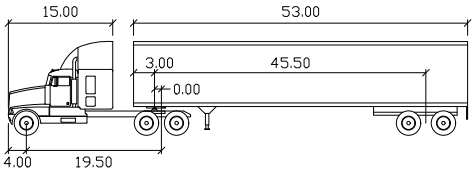
LOG TRUCK TURNING DETAIL AT STATION 41+00





BUS-45 (SCHOOL BUS)

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.2



WB-67 (LOG TRUCK)

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

VEHICLE LEGEND

- VEHICLE CENTERLINE PATH
- FRONT TIRE PATH
- REAR TIRE PATH
- VEHICLE BODY
- MIRROR BUFFER

SCALE: 1"=20 FEET

20 0 4 10 20

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EX 4A

Horizontal Curves

MP 2.8