

# North Service Road Study

Woodlands County

May 2019

FINAL REPORT



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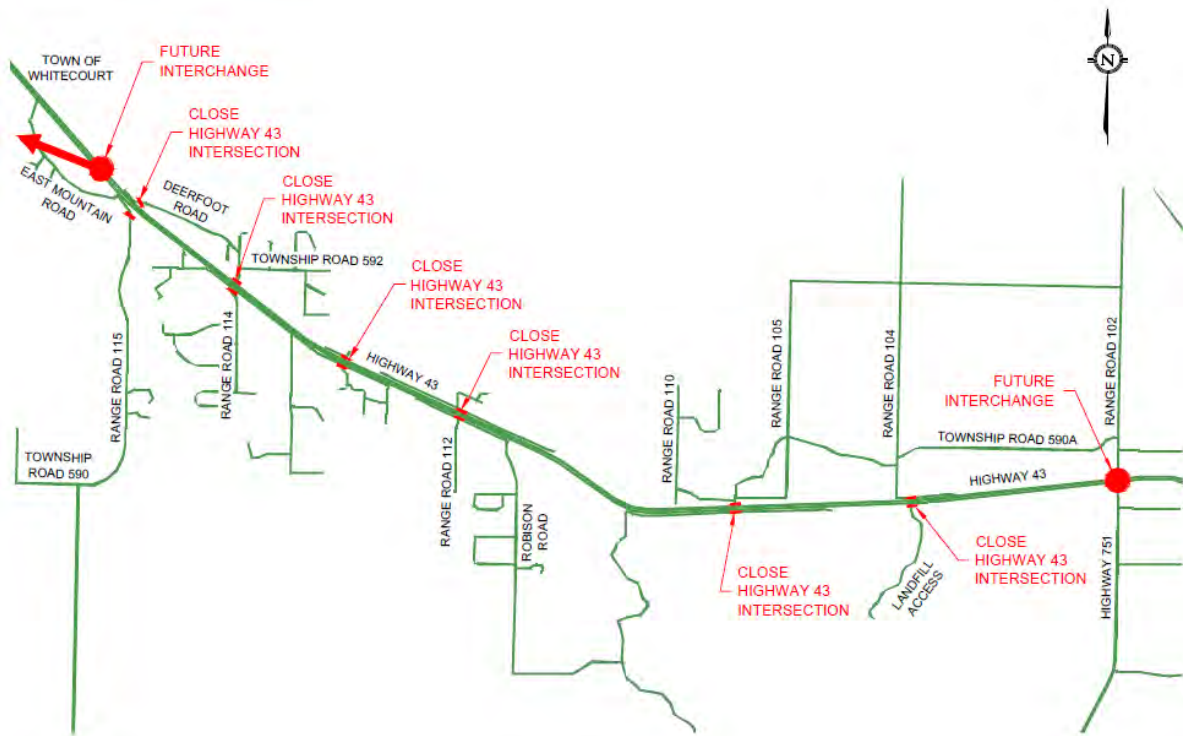
# Introduction

## Background

In July 2013, HDR completed a study for the South Service Road along Highway 43:16 (Whitecourt to Highway 751). Alberta Transportation had recently designated Highway 43 east of Whitecourt as a Freeway. With Freeway designation, the Province will ultimately require all at-grade intersections to be removed. All connections to, and crossings of, Highway 43 will eventually be grade-separated.

The South Service Road Study addressed the closure of intersections on Highway 43 at Range Road 114, Range Road 113, Range Road 112, Range Road 105A and the Landfill Access. With these closures, the only access to Highway 43 will be via future interchanges at Highway 751 and to a future Whitecourt Bypass (Highway 43X) immediately west of the existing East Mountain Road / Deerfoot Road intersection on Highway 43. Figure 1 shows the locations of the ultimate interchanges and Highway 43 access/egress closures.

**Figure 1: Ultimate Highway 43 Configuration**



With these closures, there is a need to realign and connect local roads to accommodate local travel that currently relies on Highway 43. The 2013 study addressed the service and local road connections on the south side of Highway 43.

This study complements the Highway 43:16 South Service Road Study and addresses the service and local road network on the north side of Highway 43 between Whitecourt and Highway 751. Like the 2013 South Service Road Study, this study:

- reviews the existing service road system north of Highway 43 and identifies a preferred network plan to complete a service road system; and
- provides functional designs for the new service roads.

## Study Scope

The study area is the Highway 43 corridor between Highway 751 and the southern boundary of the Town of Whitecourt, and is approximately 1.6 km offset to the north side of Highway 43. A key map of the study area is shown in Figure 2.

This study includes the functional design of the service roads required to complete the service road system on the north side of Highway 43. The study uses the traffic and other analysis completed in 2013 to support the functional design.

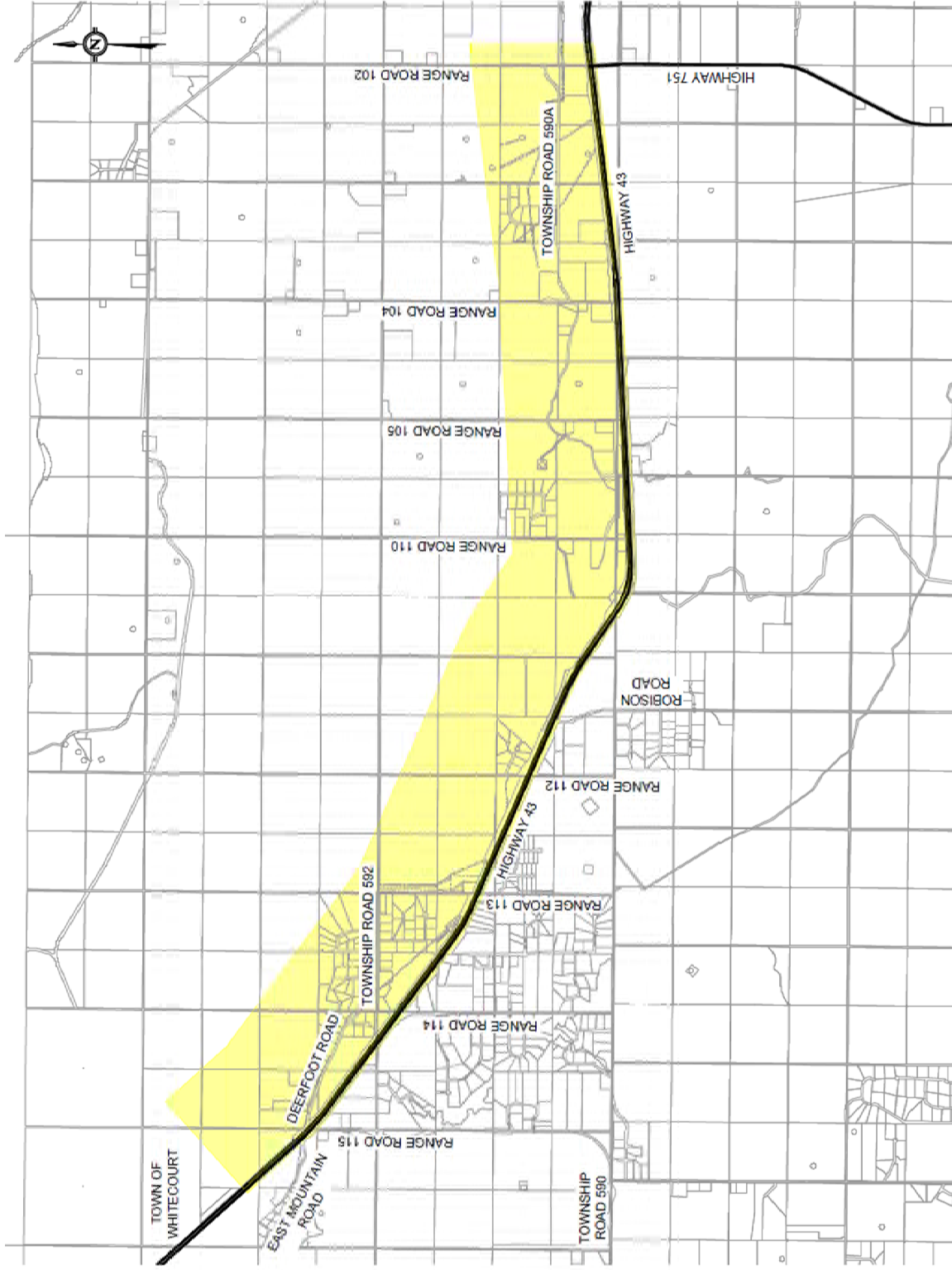
## Objectives

The primary objective of this study is to identify the service road requirements to maintain access connectivity for properties north of Highway 43, to complement the South Service Road Study. The following objectives are similar to those outlined in the South Service Road Study:

- Develop preliminary horizontal and vertical alignments and profiles of the recommended alignment for the north service roads required to complete the network.
- Establish connectivity requirements for the north service road provides at the two new interchanges.
- Review and as necessary update the traffic analysis from the South Service Road Study.
- Identify the north service road cross-section and right-of-way requirements.

The North Service Road Study draws upon the analysis and findings of the South Service Road Study. Those findings were reviewed as necessary. The focus of this study is the development of a functional plan and functional designs for the preferred north service road network.

Figure 2: Study Area



## Existing and Future Conditions

An assessment of existing and future conditions was completed for the South Service Road Study. Those results have been used for the North Service Road study. The key relevant results are summarized in this section.

### Intersection Configurations

Highway 43 is a four-lane divided highway with a 22 to 25m wide median. The seven at-grade intersections on the highway within the study corridor are all unsignalized, include intersection treatments such as left and right turning tapers, and have stop controls on the intersecting minor roads. The configuration of existing intersections on Highway 43 in the study area are summarized in Table 1.

**Table 1: Existing Highway 43 Intersections**

Intersection of Highway 43 and:	Configuration
Deerfoot Road (East Mountain Road)	4 – Leg, 2-way stop
Range Road 114	4 – Leg, 2-way stop
Range Road 113	4 – Leg, 2-way stop
Range Road 112 (Robison Road)	4 – Leg, 2-way stop
Range Road 105A	4 – Leg, 2-way stop
Landfill Access	4 – Leg, 2-way stop
Highway 751 (Range Road 102)	4 – Leg, 2-way stop

The existing service road intersections north of Highway 43 are all low volume roads, and many are essentially driveways. Most do not have any traffic control signage. Key existing north service road intersections included in this study are summarized in Table 2.

**Table 2: Existing Service Road Intersections**

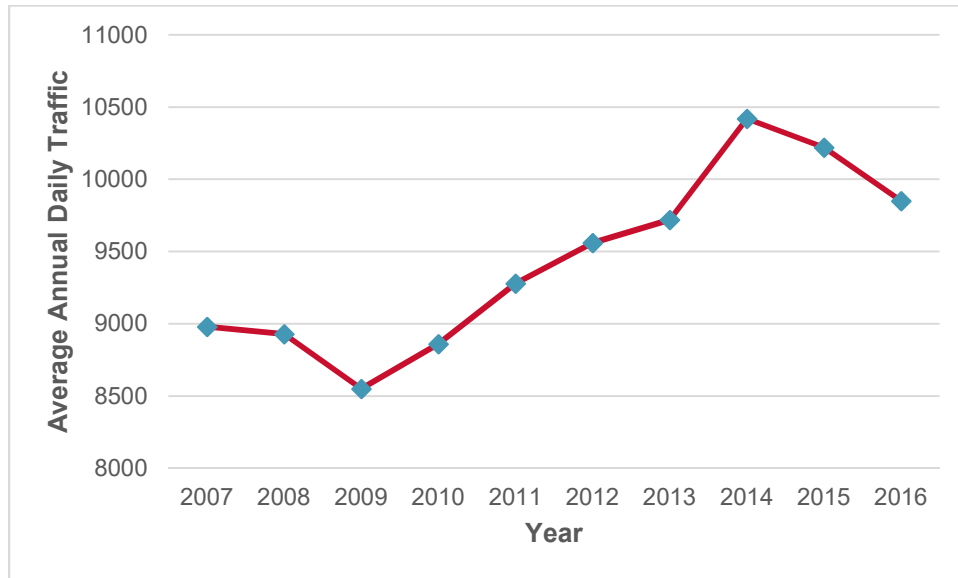
Intersection of:	Configuration
Range Road 114 / Township Road 592A	3 – Leg
Range Road 114 / Township Road 592B (Deerfoot Road)	3-Leg
Range Road 112 (Connection to Highway 43) / North Service Road	3-Leg
Range Road 112 (North Leg) / North Service Road	3-Leg
Range Road 110 / North Service Road	2 Offset 3-leg
Range Road 105A / North Service Road	3-Leg
Highway 751 / Range Road 590B	3-leg

### Historic Traffic Growth

Alberta Transportation maintains a permanent count station on Highway 43, immediately east of Range Road 112 (Station 50431660). The average annual daily traffic (AADT) at this location since 2007 is shown in Figure 3. During this period, the average traffic growth rate has been 1.1% annually. This is a considerable drop from the growth rate of 4.4% reported in the South Service Road Study. The growth rates in the 2013 study were heavily influenced by the

extreme growth that occurred in the mid-2000s. The growth rate over the past 10 years is influenced by recent economic downturns and is lower as a result.

**Figure 3: Average Annual Daily Traffic (Highway 43 East of Range Road 112)**



### **Future Traffic Conditions and Intersection Closures**

The South Service Road study included a detailed traffic forecasting assessment. The existing and future volumes on the local network north of Highway 43 generally serves less traffic than the South Service Road network. No operational issues are anticipated on the North Service Road network.

The South Service Road Study also identified the years that Highway 43 intersection closures would be required. The dates for some of those closures have already passed, and many others were expected to require closure within the next two to three years. As the more recent historical traffic growth on Highway 43 indicates, traffic growth has been considerably slower than anticipated. Therefore, closure requirements will move further into the future. Traffic growth and operations will need to be monitored to determine when closures are required.

## Design Criteria

This section outlines the roadway elements and dimensions for the new service road and provides guidance related to new local road connections that are required to complete the local network.

### Design Designation

The Woodlands County Local Road Collector, Class 3<sup>1</sup> design designation was adopted for the North and South Service roads. From the specification, “*These roadways typically provide access to secondary and / or primary highways*”, which is applicable to these roads.

There are several connecting roads that are also required. These are generally short sections of new roadway connecting to an existing road. The classification of each of these new roadway sections will depend on the specific road being connected, but the approach to the North Service Road should be generally consistent in all cases to create continuity along the full North Service Road corridor.

The proposed design criteria for the North Service Road and connecting roads are summarized in Table 3. The cross-section elements were referenced from the Local Road Collector, Class 3. For other criteria, not provided in the Woodlands County design guidelines, the Alberta Transportation parameters for service roads have been used.

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<sup>1</sup> Referenced from Specifications for Roads & Approaches, Woodlands County, 2008, Page 3

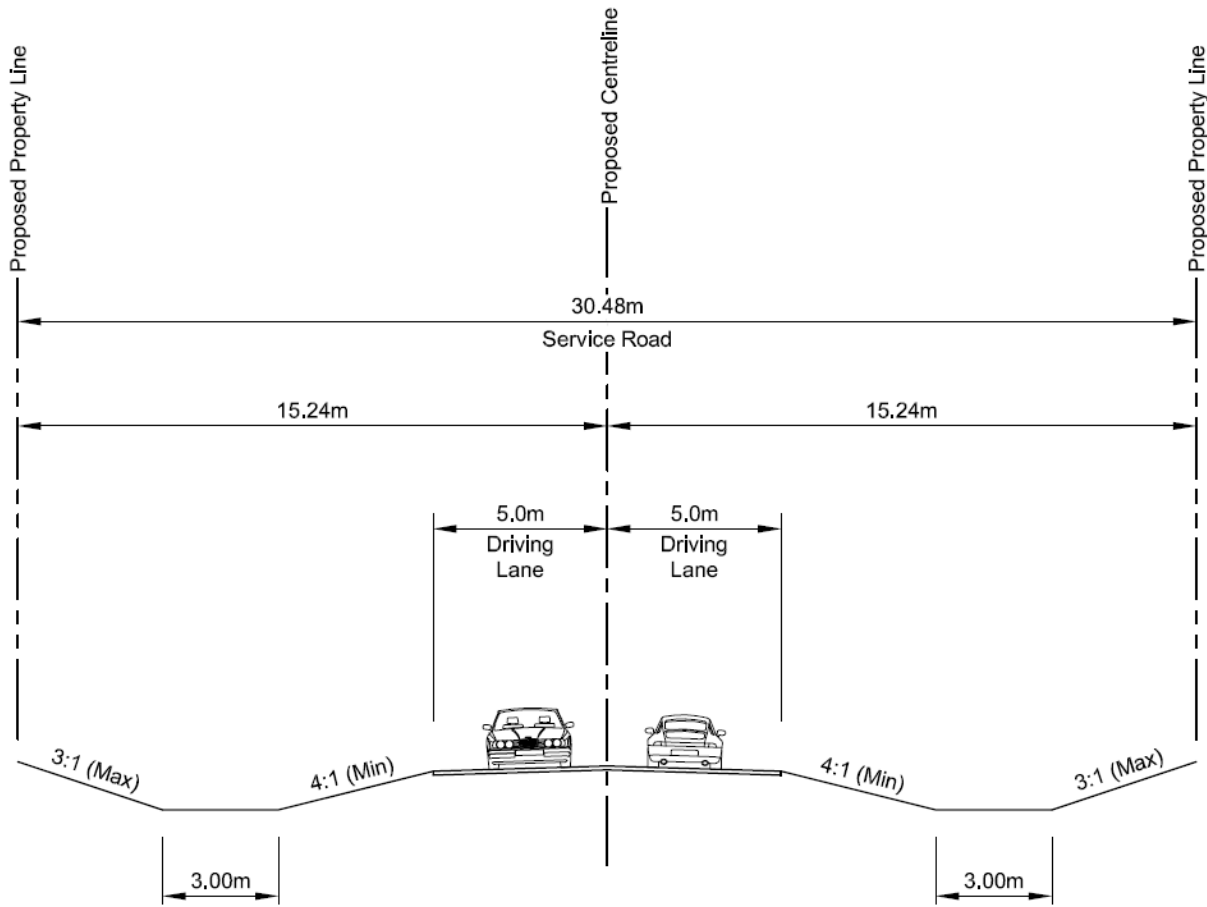
Table 3: Proposed Design Criteria

Design Criteria	Service Road (Local Road Collector- Class 3)	Intersecting Local Road (Variable Classifications)
<b>Typical Section</b>	Undivided	Undivided
<b>Right-of-Way</b>	30.48 m <sup>1</sup>	Variable
<b>Number of Lanes</b>	2	2
<b>Design Speed</b>	90 km/h	50 km/h
<b>Posted Speed</b>	80 km/h	50 km/h
<b>Lane Width (including shoulder)</b>	5.0 m	5.0 m
<b>Ditch width</b>	3.0 m	3.0 m
<b>Crossfall</b>	3.0%	3.0%
<b>Sideslope ratios</b>	4:1 minimum	4:1 minimum
<b>Backslope ratios</b>	3:1 maximum	3:1 maximum
<b>Minimum Centreline Radius</b>	340 m	90 m
<b>Minimum Normal Crown Centreline Radius</b>	4500 m	1400 m
<b>Spiral Length</b>	76 m	47 m
<b>Minimum A Value</b>	690	65
<b>Superelevation e 9Max)</b>	0.06	0.06
<b>Minimum Crest Curve K Value</b>	55	10
<b>Minimum Sag Curve K value</b>	40 (headlight) / 21 (comfort)	12 (headlight) / 7 (comfort)
<b>Minimum Grade</b>	0.6%	0.6%
<b>Maximum Grade</b>	6.0%	8.0%
<b>Minimum Stopping Sight Distance</b>	170 m	65 m

<sup>1</sup> The specification details the right-of-way as variable. The indicated right-of-way of 30.48 m is consistent with the Woodlands County, Local Roads, Class 2 standard

The proposed service road cross section is illustrated in Figure 4.

Figure 4: Service Road Cross Section



### Intersection Design

Ultimately, there will be no service road to highway intersections along Highway 43. Although some will remain in the interim, the development of the North Service Road will allow intersections to be closed in a staged approach.

## North Service Road Alignment Alternatives

The North Service Road was divided into three segments to facilitate identification of potential alignment alternatives:

- West – Deerfoot Road connection to the future Highway 43X interchange to east of Range Road 113;
- Central – East of Range Road 113 to west of Lorina Road; and
- East – West of Lorina Road to Range Road 102.

### West Segment

Ultimately, a new Highway 43 interchange will be developed between 33 Street and Deerfoot Road to accommodate the proposed Highway 43X south bypass of Whitecourt. The final plans have not yet been finalized and the bypass is a long-term initiative that is not currently funded by Alberta Transportation. In the functional plan previously developed, the North Service Road would ultimately use the existing westbound lanes of Highway 43 and would connect to 35 Street at 33 Street. As the timing of the bypass and associated interchange is uncertain, it may be necessary to close the existing Deerfoot Road intersection prior to the Highway 43X bypass and interchange being developed. In this case, a temporary service road could be developed parallel to Highway 43, connecting Deerfoot Road to 35 Street.

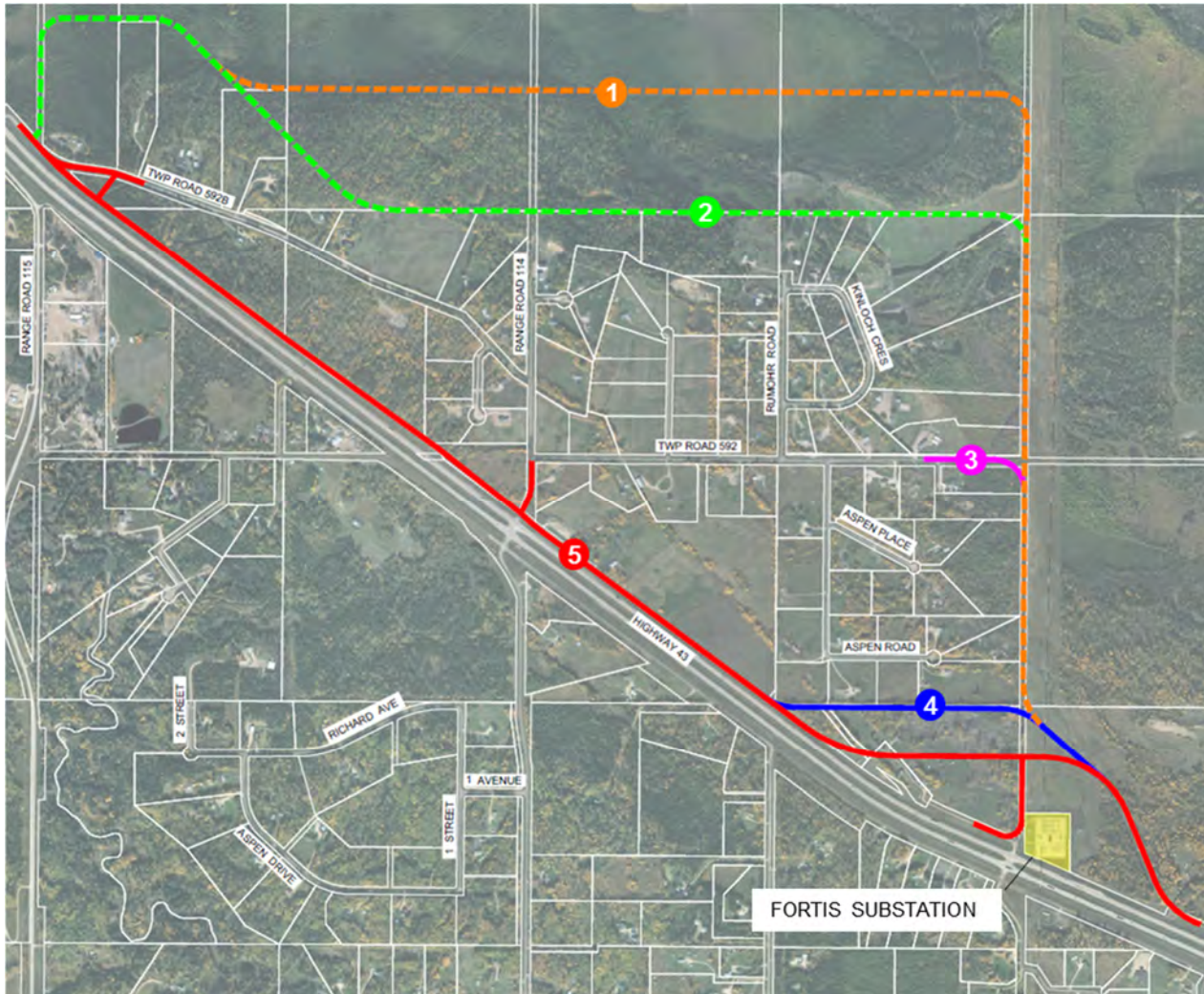
This temporary service road should be delayed as long as possible. As operational issues at the Deerfoot Road / Highway 43 intersection emerge, the left turns onto Highway 43 and through movements across Highway 43 should first be closed. Although inconvenient, these movements can be replaced by a right turn onto Highway 43, then a left turn at the Highway 43 intersection with 33 Street / Range Road 592. It is expected that the left turn off Highway 43 will continue to operate well for some time into the future.

Between Deerfoot Road and Range Road 112, four alternative alignments were identified as shown on Figure 5:

- Options 1 and 2 create a new local east-west road between northerly extensions of Range Road 115 and Range Road 113.
- Option 3 make use of the existing Township Roads 592B (Deerfoot Road) and 592, with a new connection between Township Road 592 and Range Road 113 at the east end.
- Options 4 and 5 include a new service road parallel to Highway 43 to west of Range Road 113.

Options 1 and 2 both involve considerable new road construction and longer travel distances than on Highway 43. For example, the distance from the Fortis substation on Range Road 113 to the existing Deerfoot Road / Highway 43 intersection on the existing Highway 43 route is approximately 2.1 km. The distance between the same origin-destination points on Option 1 triple the distance, to 6.3 km. The route via Option 2 is only slightly shorter. In addition, the topography and existing soil conditions will make these options difficult and expensive to construct.

Figure 5: West Segment Alternative Alignments



Option 3 relies on existing roads that primarily serve residential properties. This option would introduce new through traffic, including truck traffic to existing residential roads. In addition, the route is not continuous and relies on several turns.

Options 4 and 5 use a route parallel to Highway 43, but have different alignments at the east end to avoid the Fortis substation. Option 4 follows the quarter-section boundary north of the substation, then turns south to connect to the existing service route, east of the substation. Option 5 is similar to Option 4, passing the substation, about 400m south of the Option 4 alignment. Table 4 provides a summary of the alternatives comparative evaluation.

**Table 4: Comparative Assessment - West Segment Alternative Alignments**

Criteria	Option 1	Option 2	Option 3	Option 4	Option 5
<b>Traffic and Safety</b>	0	0	-	0	0
<b>Convenience (Travel Time)</b>	-	-	0	+	+
<b>Cost / Ease of Construction</b>	-	-	+	0	0
<b>Community / Property</b>	0	0	-	0	0
<b>Overall Recommendation</b>	Remove	Remove	Remove	Retain	Retain
<b>Legend</b>	+ Substantially better than alternatives 0 Not significantly different than alternatives - Alternatives are substantially better				

Either Option 4 or 5 is preferred over the other options. Options 1 and 2 are too long and Option 3 has considerably higher property and community impacts than the other options. Options 4 and 5 provide a conventional service road that operates within user expectations and places traffic noise next to the highway, where noise already exists.

With these options, the Highway 43/Deerfoot Road intersection will ultimately be closed and a new local road connection from the North Service Road to Deerfoot Road will be provided approximately 450m east of the existing intersection with Highway 43. Similarly, the Range Road 114 / Highway 43 intersection will be closed, but Range Road 114 will connect to the new North Service Road.

## Central Segment

The central segment of the North Service Road will replace the connections lost once the Highway 43 intersections at Range Road 112 and Range Road 105A are closed. A service road already exists for much of the western portion of this segment, and it is logical to retain this as the future North Service Road.

New service road will be required from approximately 1.0 km east of Range Road 112 to Lorina Road. There will be no direct connection to Range Road 110. Instead, the North Service Road will realign a short section of Twp Road 590 east of Range Road 110, and connect the two access road intersections crossing Range Road 105A. Range Road 105A will become the route back to the existing Twp Road 590 alignment to the north, while the North Service Road will continue east approximately parallel to Highway 43. The North Service Road will include new 3-leg intersections at Range Road 105 and Lorina Road.

A single alignment has been proposed for this segment as illustrated in Figure 6. No reasonable alternatives were identified.

Figure 6: Central Segment Alignments



## East Segment

The East Segment provides a connection to Range Road 102, which will ultimately connect to Highway 43 via an interchange, which will also connect it with Highway 751 south of Highway 43. Twp Road 590A currently approximately parallels Highway 43 between Range Road 105 and Range Road 102, from 500 to 1,000m north of Highway 43.

There were four alternative alignments identified in this segment, as shown on Figure 7:

- Option 1 extends the North Service Road parallel to Highway 43 from Lorina Road for approximately 1,600m to the east then turns northeast to join Twp Road 590A.
- Option 2 uses the same eastward extension of the North Service Road from Lorina Road as Option 1, but makes a 90° turn to the north to connect to Twp Road 590A.
- Option 3 extends the North Service Road 800m to the east from Lorina Road, then turns 90° north to Twp Road 590A, and eastward along Twp Road 590A.
- Option 4 uses the existing Twp 590A and Lorina Road alignments.

Figure 7: East Segment Alternative Alignments



Option 1 has the most new road construction and largest property impact, although it creates the shortest route. Option 2 uses existing right-of-way and has little property impact. It also requires minimal new construction. Option 3 is similar to Option 2 in terms of construction and direct property impact, but has noise and additional traffic impacts on a larger number of properties. Option 4 has the highest noise and traffic impact on existing residences. Table 5: Comparative Assessment – East Segment Alternative Alignments provides a comparative evaluation of the alternatives.

Table 5: Comparative Assessment – East Segment Alternative Alignments

Criteria	Option 1	Option 2	Option 3	Option 4
<b>Traffic and Safety</b>	+	0	0	-
<b>Convenience (Travel Time)</b>	+	0	0	-
<b>Cost / Ease of Construction</b>	-	0	0	+
<b>Community / Property</b>	0	0		-
<b>Overall Recommendation</b>	Remove	Retain	Remove	Remove
<b>Legend</b>	+ Substantially better than alternatives 0 Not significantly different than alternatives - Alternatives are substantially better			

## Recommended North Service Road Alignment

The preferred North Service Road alignment includes:

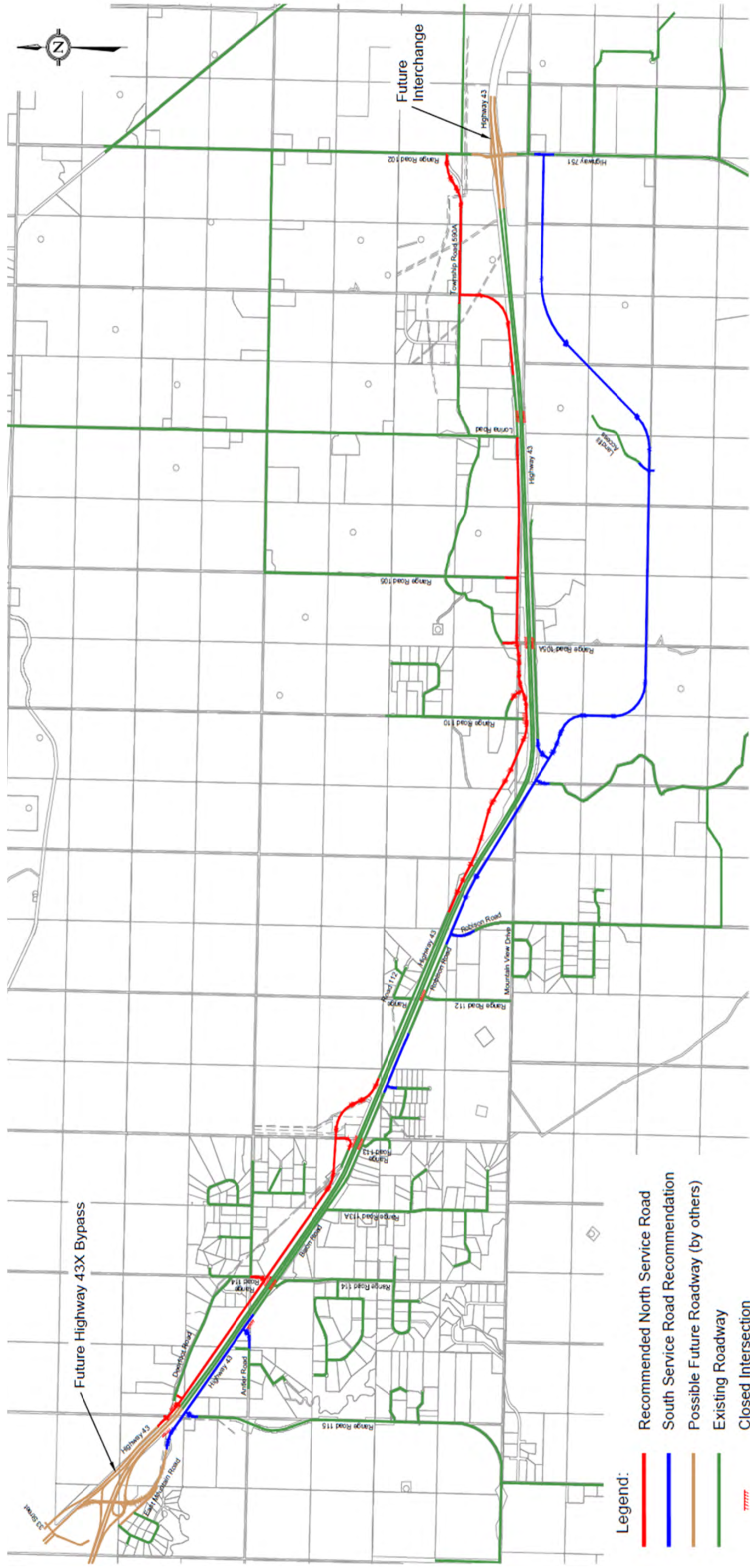
- West – Options 4/5, North Service Road approximately parallel to Highway 43, passing north of the Fortis substation;
- Central – North Service Road approximately parallel to Highway 43
- East – Option 2, continuing the North Service Road parallel for approximately 1,600m east of Lorina Road, then turning north to intersect Twp Road 590A.

The options above were presented to local residents at an open house in January 2019.

Options 4 and 5 are both comparable and acceptable from a technical perspective. With feedback from residents taken into consideration, it is recommended that both of these options be carried forward closer to the timing of the Highway 43 improvements, recognizing that construction is likely many years away. This will allow the options to be re-evaluated with a better understanding of conditions that exist at that time. Alberta Transportation supports this approach, and has requested that they be consulted on future discussions regarding the ultimate decision.

The preferred North Service Road alignment is shown on Figure 8.

Figure 8: Preferred North Service Road Alignment



# Functional Planning and Design

All drawings and plans referenced in this section are included in Appendix A.

## Plan and Profile

The recommended functional plans at a H1:2,500, V1:500 scale are illustrated in the Plan / Profile drawings as follows:

Sheet 100		Key Plan
Sheet 101	Plan / Profile	Road 'N2' – Sta 40+100 to Sta 41+500
Sheet 102	Plan / Profile	Road 'N2' – Sta 41+500 to Sta 43+200
Sheet 103	Plan / Profile	Road 'N2' (Option 5) – Sta 43+200 to Sta 45+050
Sheet 104	Plan / Profile	Road 'N2' (Option 4) – Sta 53+100 to Sta 54+800
Sheet 105	Plan / Profile	Road 'N7' – Sta 32+000 to Sta 32+518
Sheet 106	Plan / Profile	Road 'N4' – Sta 30+000 to Sta 30+301 Road 'N5' – Sta 60+020 to Sta 60+125
Sheet 107	Plan / Profile	Range Road 114 – Sta 80+665 to Sta 80+250
Sheet 108	Plan / Profile	Road 'N6' – Sta 29+967 to Sta 31+400
Sheet 109	Plan / Profile	Road 'N6' – Sta 31+400 to Sta 32+900
Sheet 110	Plan / Profile	Road 'N6' – Sta 32+900 to Sta 34+300
Sheet 111	Plan / Profile	Road 'N6' – Sta 34+300 to Sta 35+752
Sheet 112	Plan / Profile	Twp Rd 590B – Sta 37+500 to Sta 37+677 Rge Rd 105A – Sta 38+000 to Sta 38+173 Road – Sta 38+543 to Sta 38+700
Sheet 113	Plan / Profile	Road 'N1' – Sta 24+010 to Sta 25+408
Sheet 114	Plan / Profile	Twp Rd 590A – Sta 22+200 to Sta 24+060

## Right-of-Way Plans

The Right-of-Way plans are illustrated at a 1:2,500 as follows:

Sheet 201	Right-of-Way Plan	Road 'N2'
Sheet 202	Right-of-Way Plan	Road 'N2' (Option 5) & Road 'N4'
Sheet 203	Right-of-Way Plan	Road 'N2' (Option 4) & Road 'N7'
Sheet 204	Right-of-Way Plan	Road 'N6'
Sheet 205	Right-of-Way Plan	Road 'N6'
Sheet 206	Right-of-Way Plan	Road 'N1'
Sheet 207	Right-of-Way Plan	Twp Rd 590A

## Conclusions

Based on the results of the study the following conclusions can be drawn:

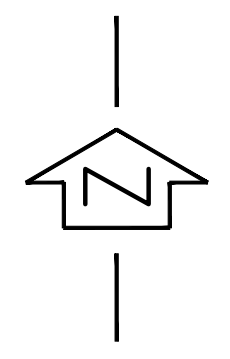
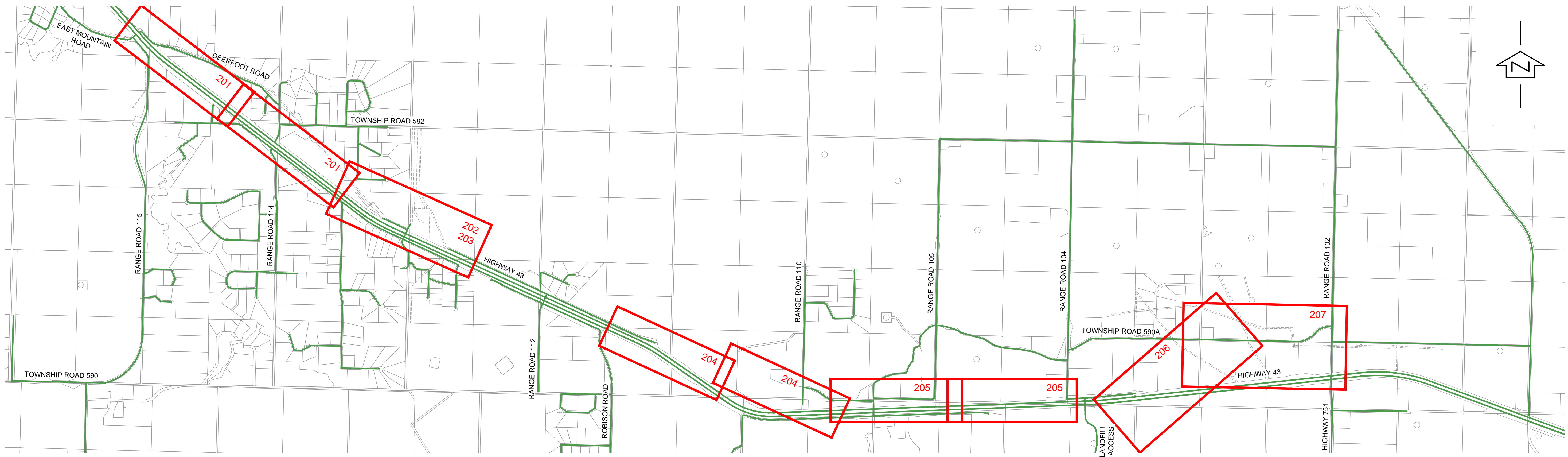
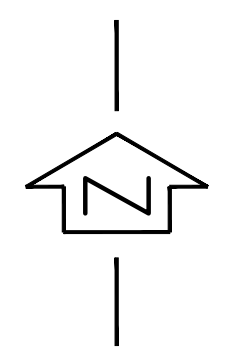
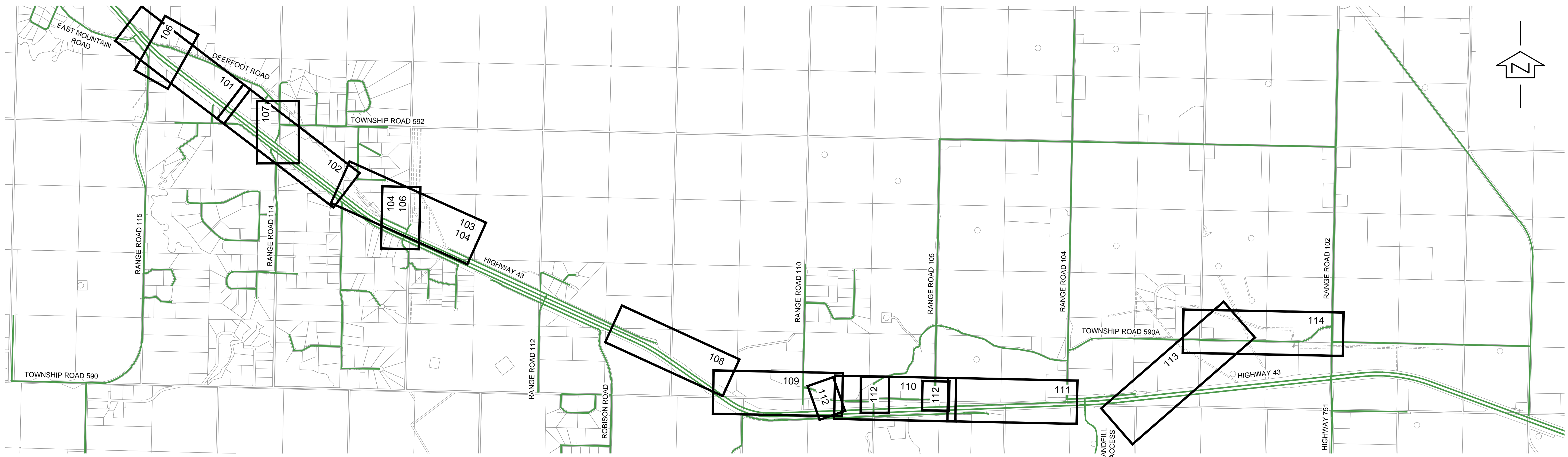
1. No immediate improvements to the existing intersections are required.
2. The final alignment of the North Service Road between Deerfoot Road and 33 Street in Whitecourt will depend on the final configuration and timing of the Highway 43X bypass and associated interchange. If the capacity threshold for Highway 43/Deerfoot Road interchange is reached before the interchange is constructed, Highway 43 crossing and Deerfoot Road left turns onto Highway 43 should first be closed. If the left turns off Highway 43 reach capacity before the interchange is in place, a temporary service road parallel to the existing Highway 43 should be considered.
3. The North Service Road should generally parallel Highway 43 as illustrated on Figure 8.
4. The North Service Road alignment at the Fortis substation should be determined based on community and stakeholder input once timing of Highway 43 improvements in the area is determined.







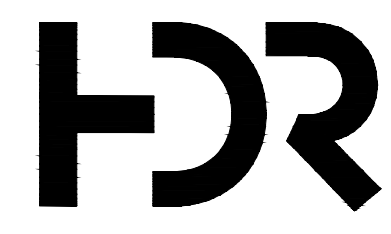
## Appendix A





**LEGEND**

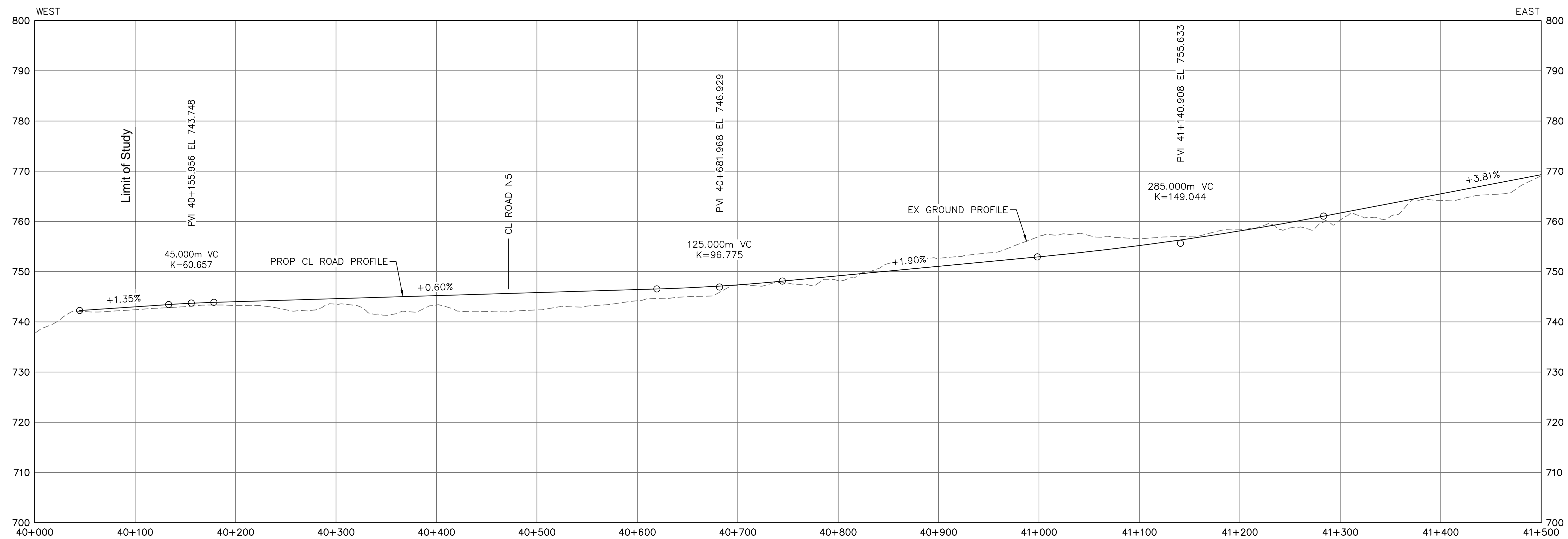
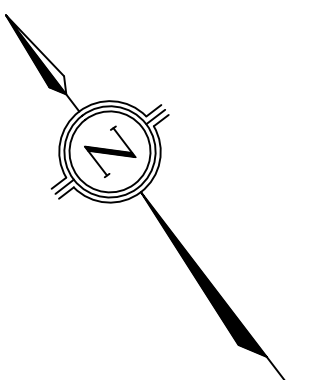
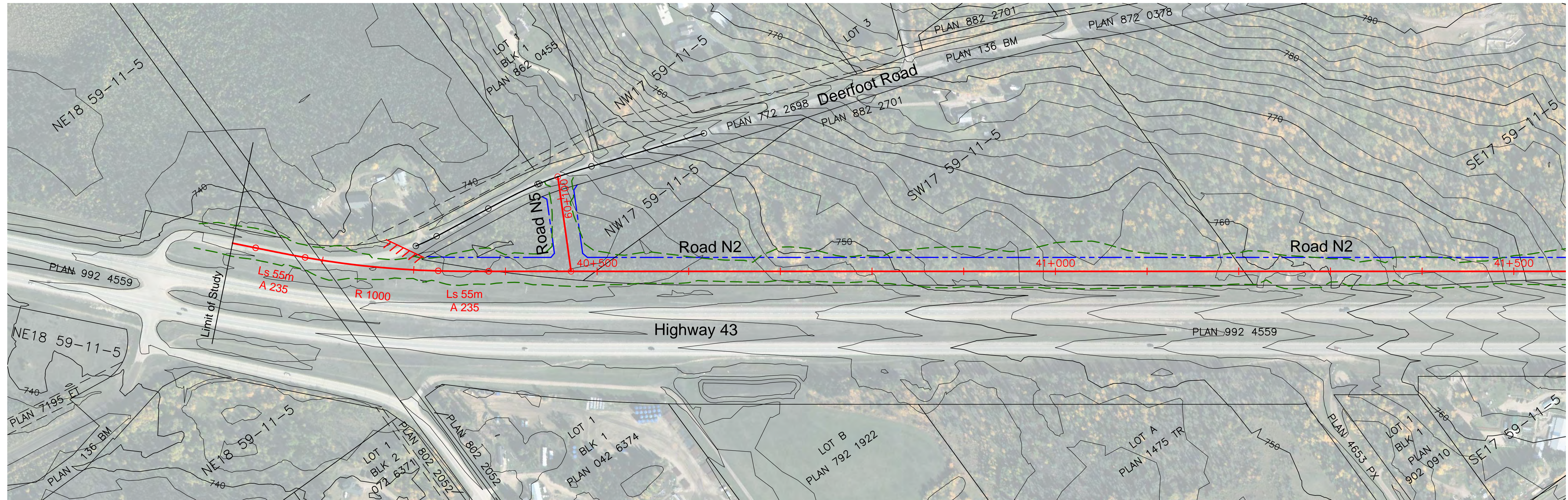
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	RIGHT-OF-WAY PLAN BOUNDARY



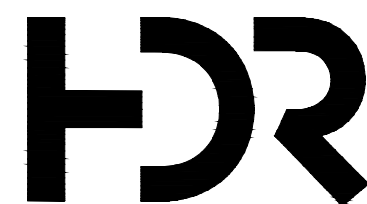
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ISSUE	DATE	DESCRIPTION
PROJECT NUMBER		



**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Key Plan**



- Legend:**
- Proposed Road CL
  - Existing Road CL
  - - - - Proposed Right-of-Way
  - - - - Proposed Daylight Line
  - ||||| Proposed Road Closure



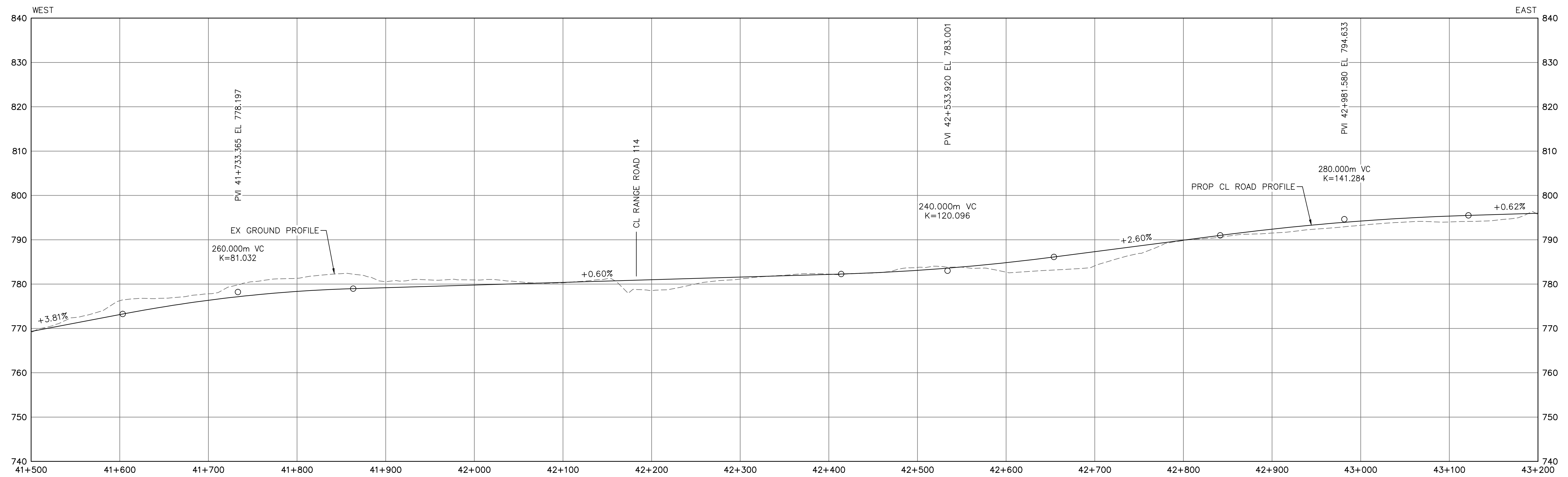
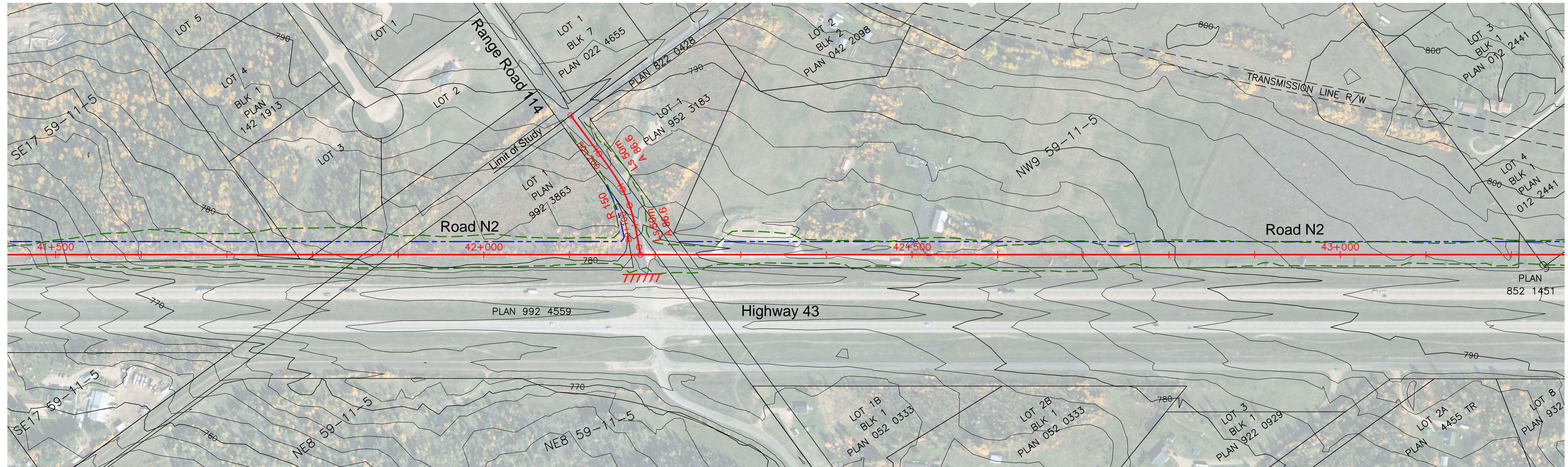
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ISSUE	DATE	DESCRIPTION
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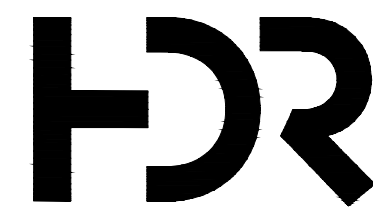
**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N2' - Sta 40+100 to Sta 41+500**

FILENAME  
 SCALE H 1:2,500  
 V 1:500


SHEET  
**101**



- Legend:**
- Proposed Road CL
  - Existing Road CL
  - - - Proposed Right-of-Way
  - - - Proposed Daylight Line
  - ||||| Proposed Road Closure

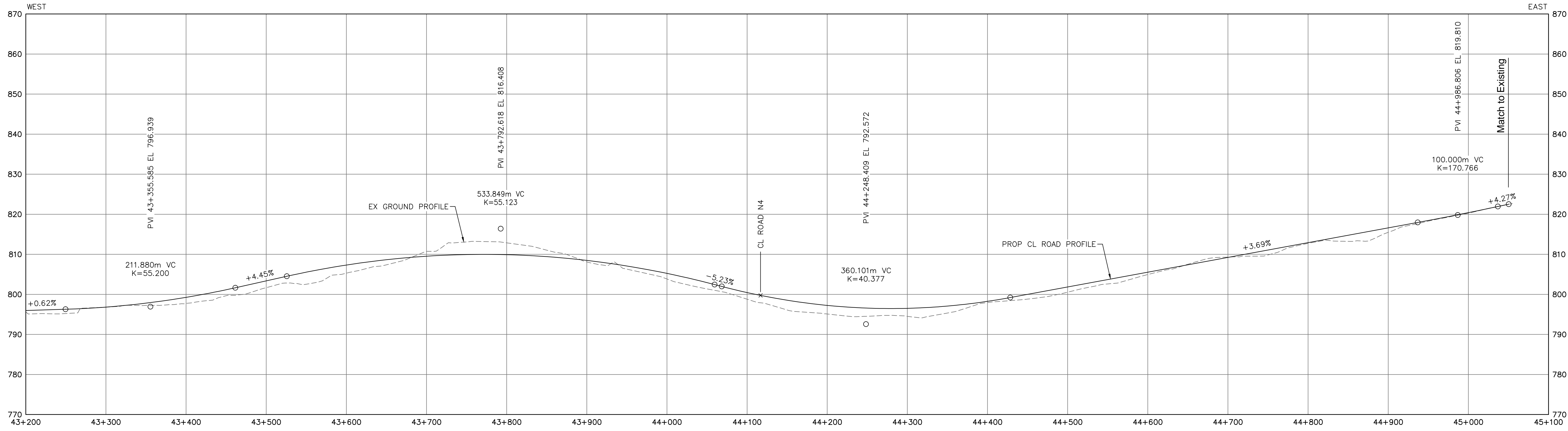
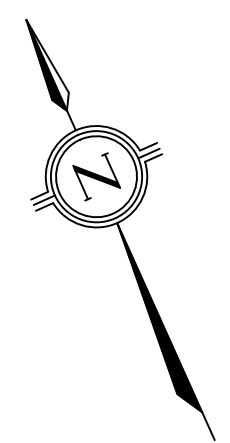
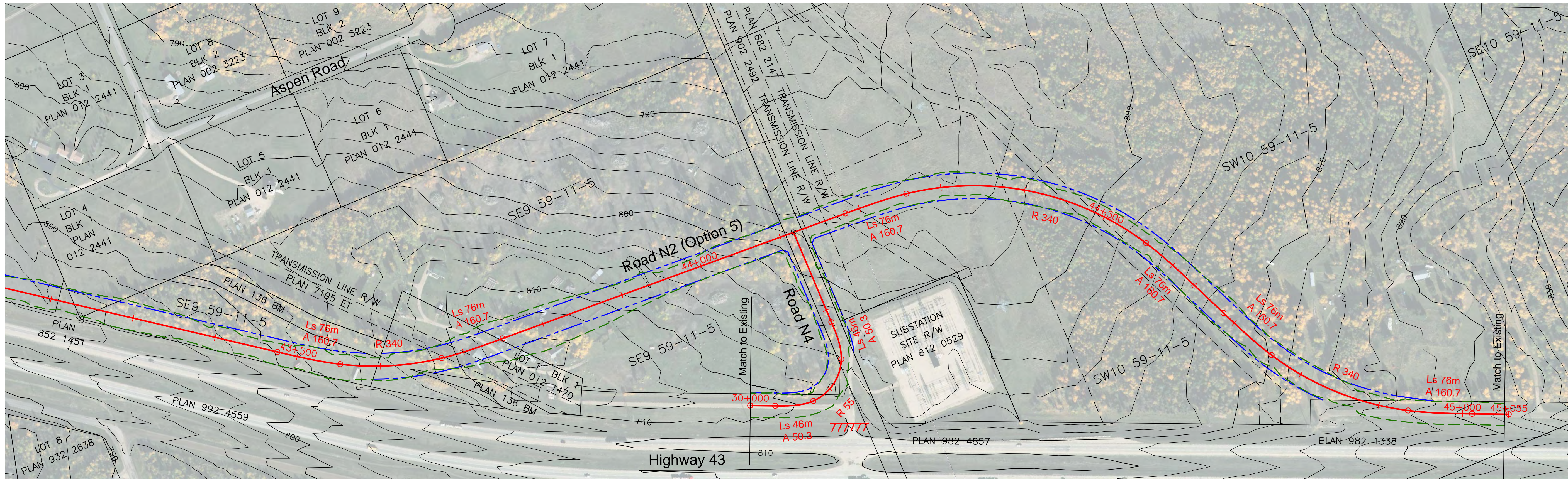


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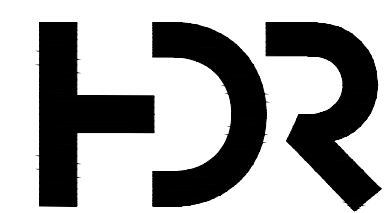
  
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**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N2' - Sta 41+500 to Sta 43+200**

FILENAME  
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 V 1:500

SHEET  
**102**



- Legend:**
- Proposed Road CL
  - Existing Road CL
  - Proposed Right-of-Way
  - Proposed Daylight Line
  - ||||| Proposed Road Closure



MAY 24 2019			PROJECT NUMBER
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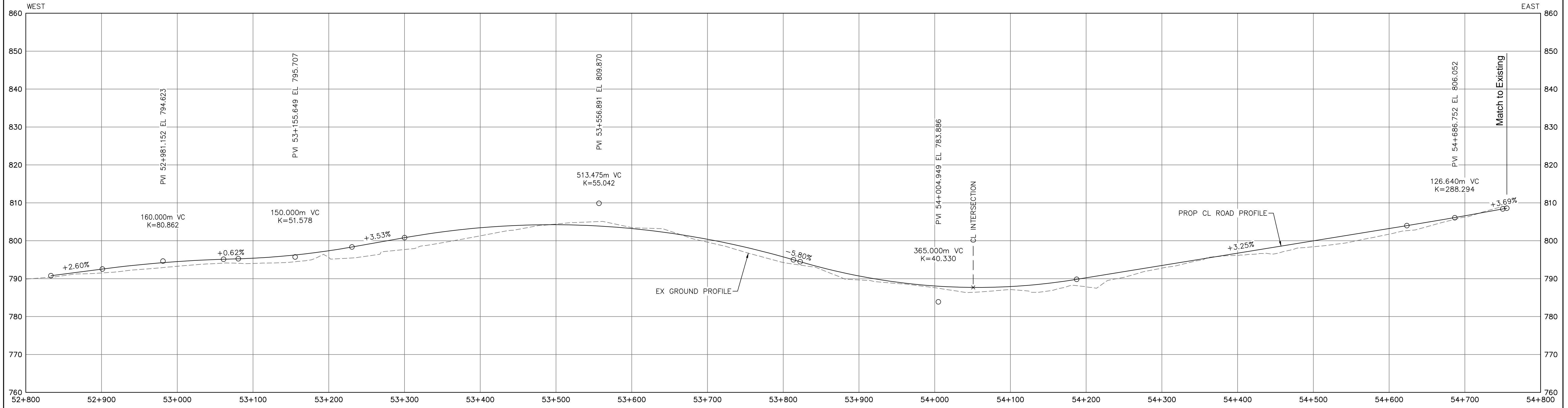
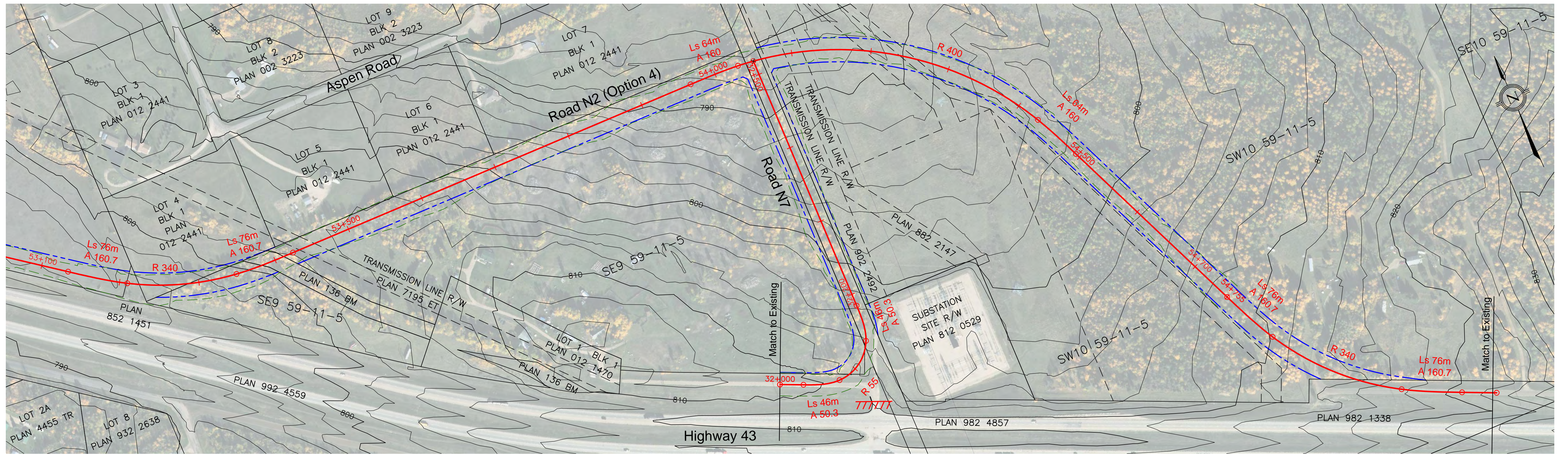
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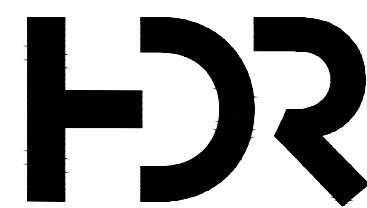
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**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N2' (Option 5) - Sta 43+200 to Sta 45+050**

FILENAME  
 SCALE H 1:2,500  
 V 1:500

SHEET  
**103**



- Legend:**
- Proposed Road CL
  - Existing Road CL
  - Proposed Right-of-Way
  - Proposed Daylight Line
  - TTTTT Proposed Road Closure

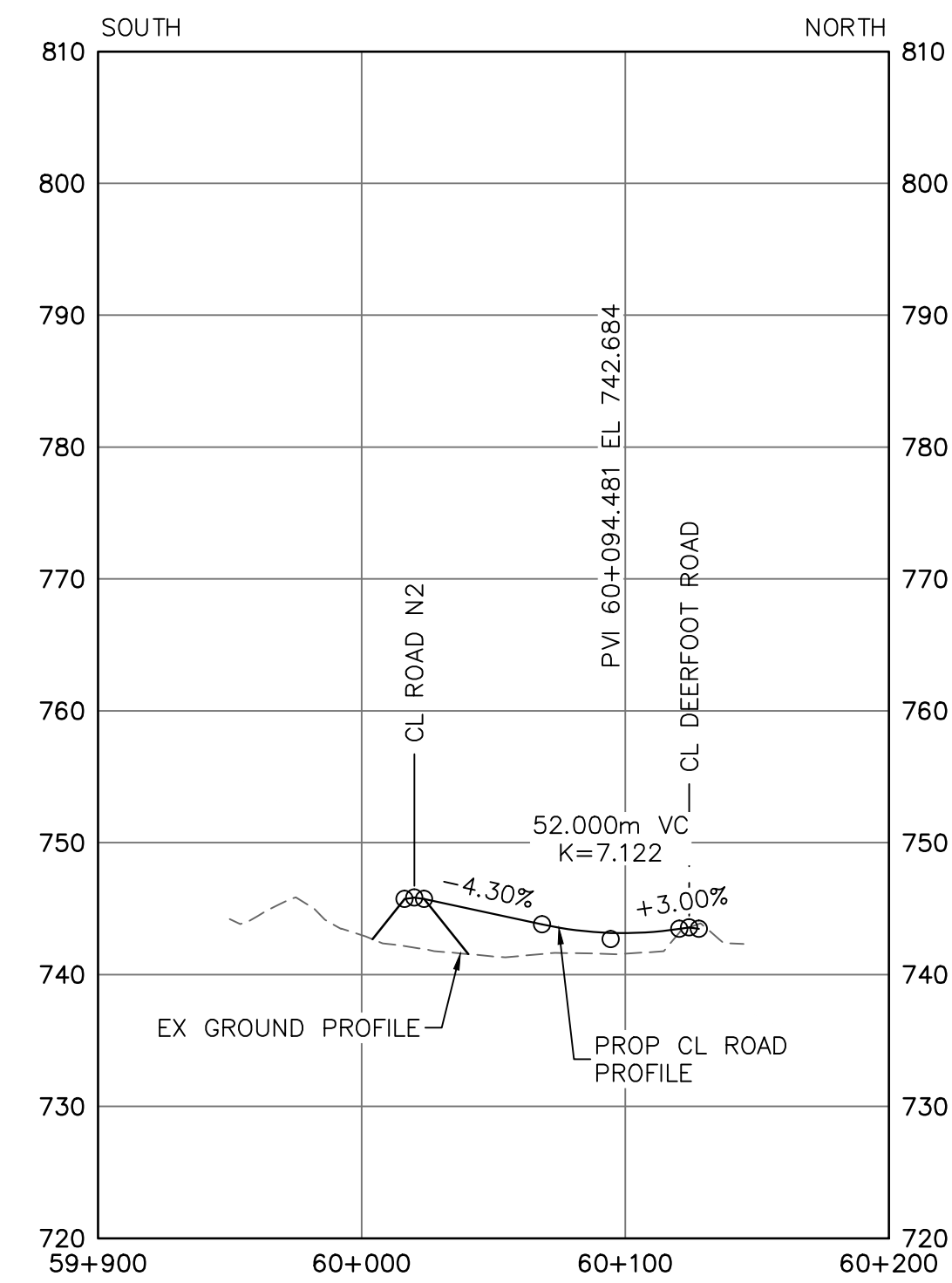
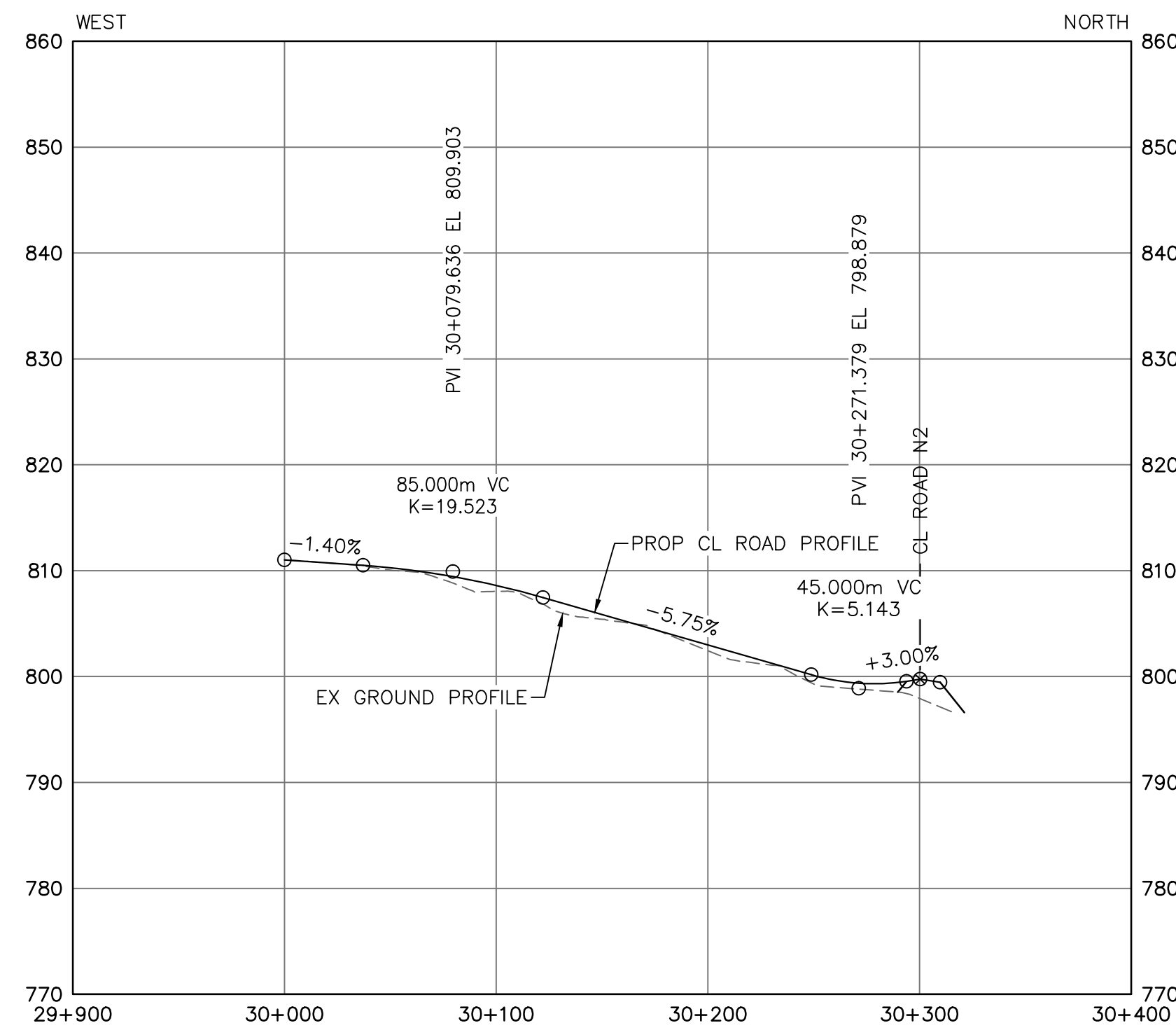
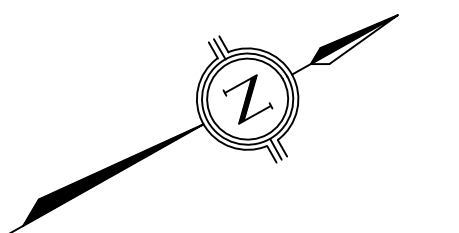
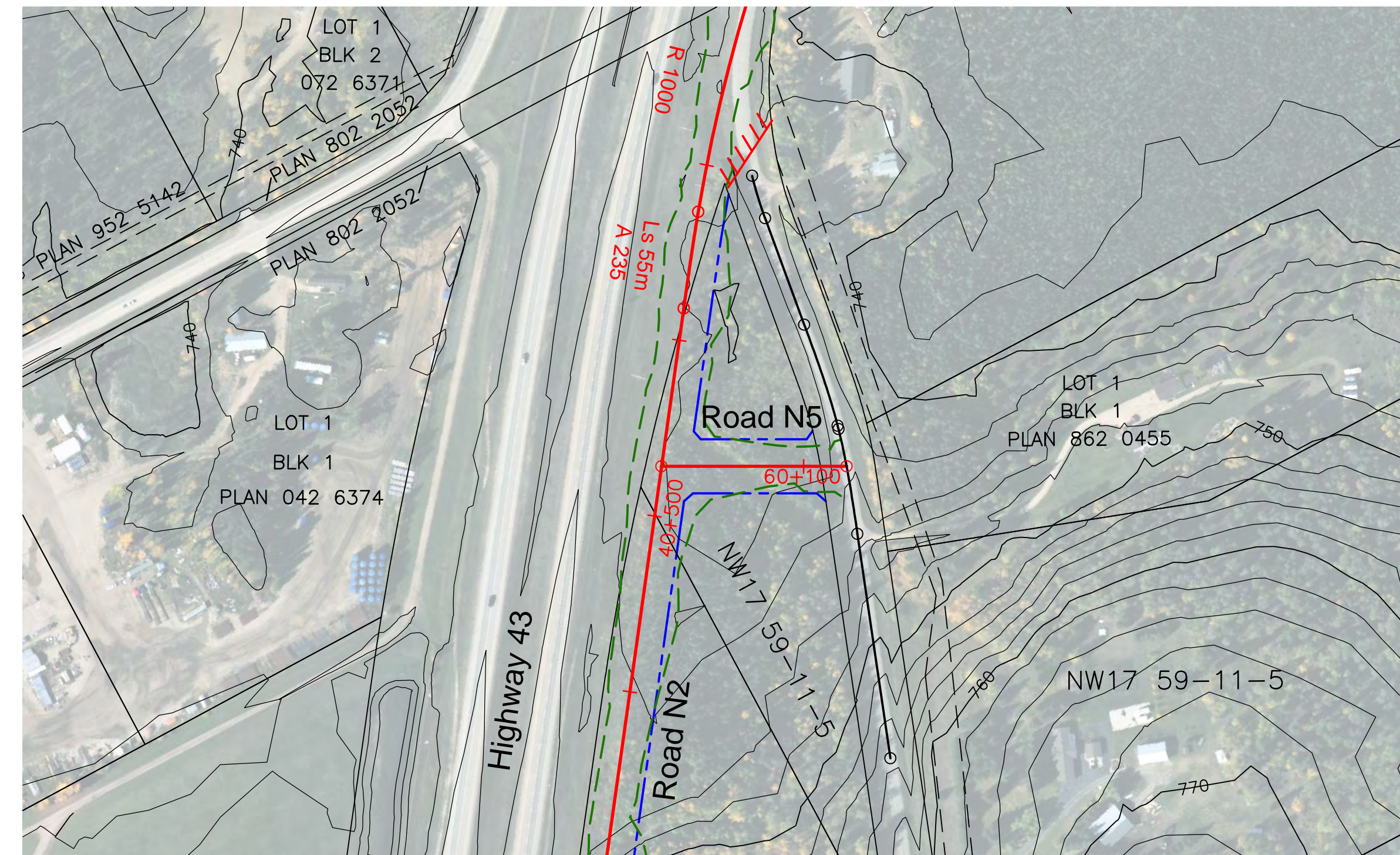
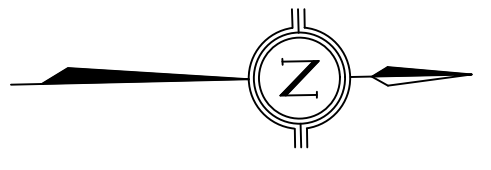
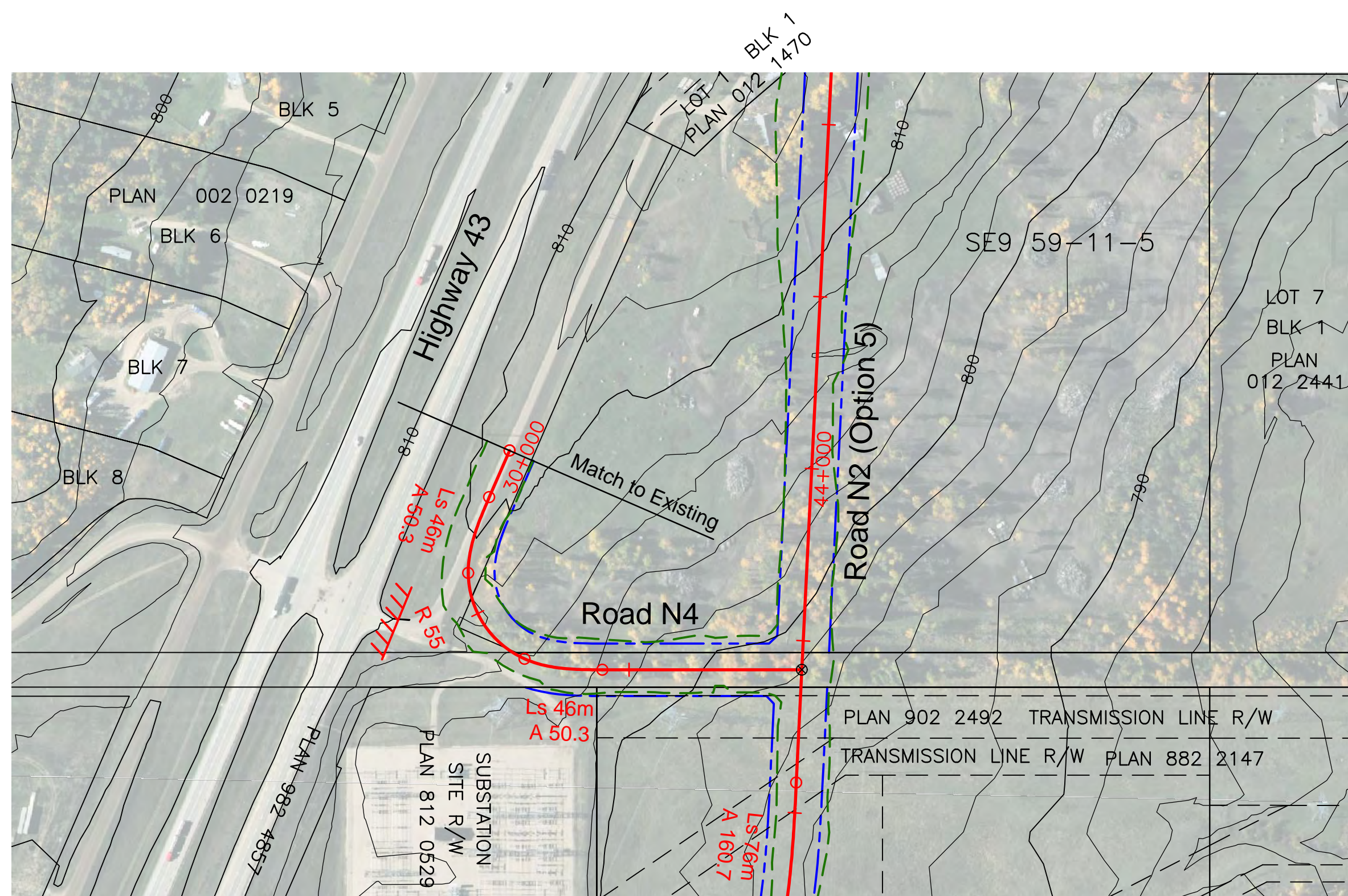


PROJECT MANAGER IAN MACLEOD		
MAY 24 2019		
ISSUE	DATE	DESCRIPTION
PROJECT NUMBER		

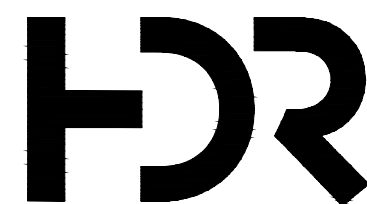


**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N2' (Option 4) - Sta 53+100 to Sta 54+800**





- Legend:**
- Proposed Road CL
  - Existing Road CL
  - - - - Proposed Right-of-Way
  - - - - Proposed Daylight Line
  - TTTTT Proposed Road Closure



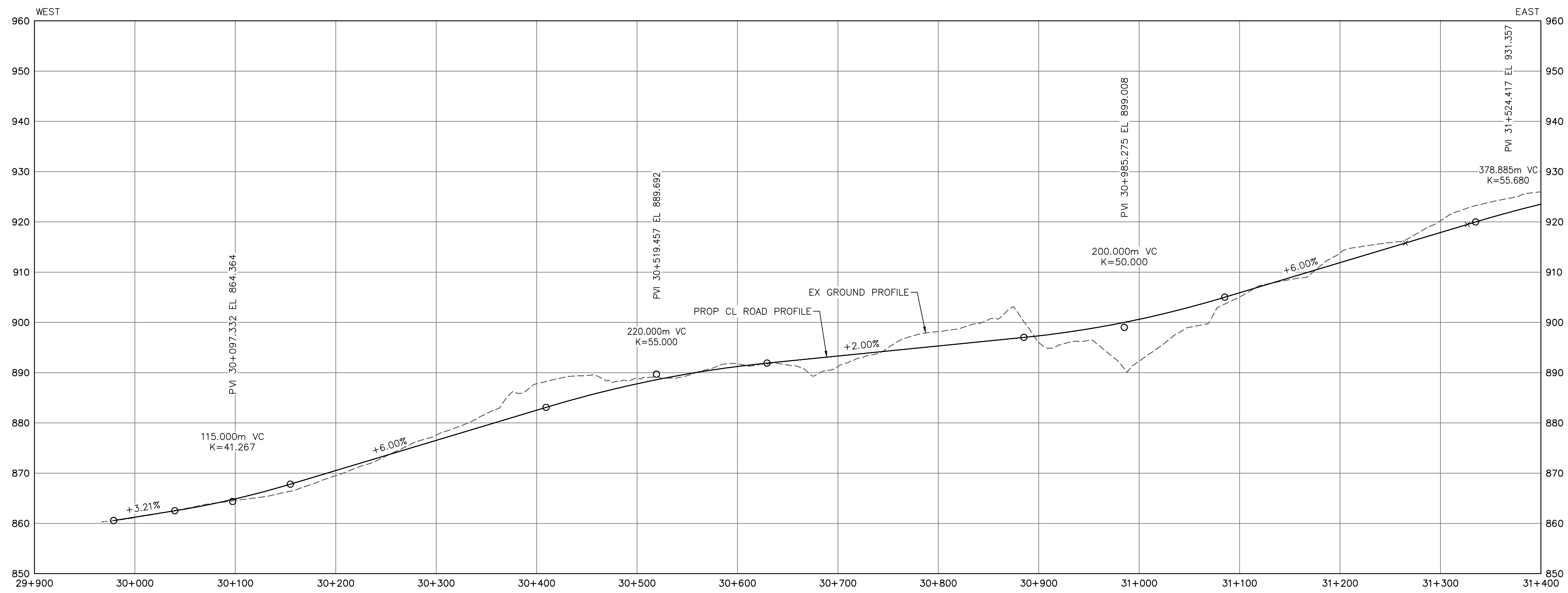
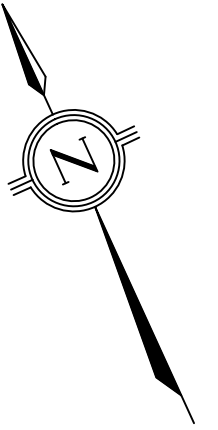
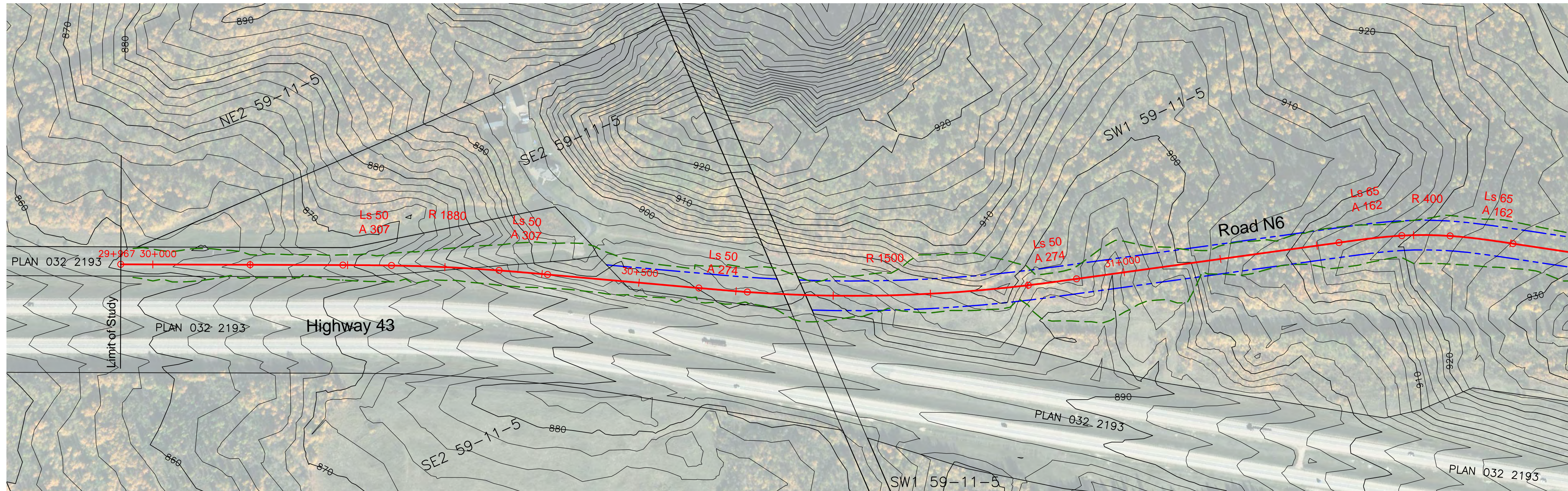
MAY 24 2019			PROJECT MANAGER IAN MACLEOD	
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	

  
**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N4' - Sta 30+000 to Sta 30+301**  
**Road 'N5' - Sta 60+020 to Sta 60+125**

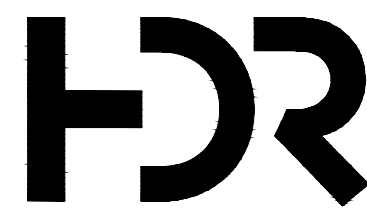
FILENAME  
 SCALE H 1:2,500  
 V 1:500

SHEET  
**106**

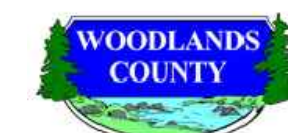




- Legend:**
- Proposed Road CL
  - Existing Road CL
  - - - - Proposed Right-of-Way
  - - - - Proposed Daylight Line
  - ||||| Proposed Road Closure



PROJECT MANAGER IAN MACLEOD		
MAY 24 2019		
ISSUE	DATE	DESCRIPTION
PROJECT NUMBER		

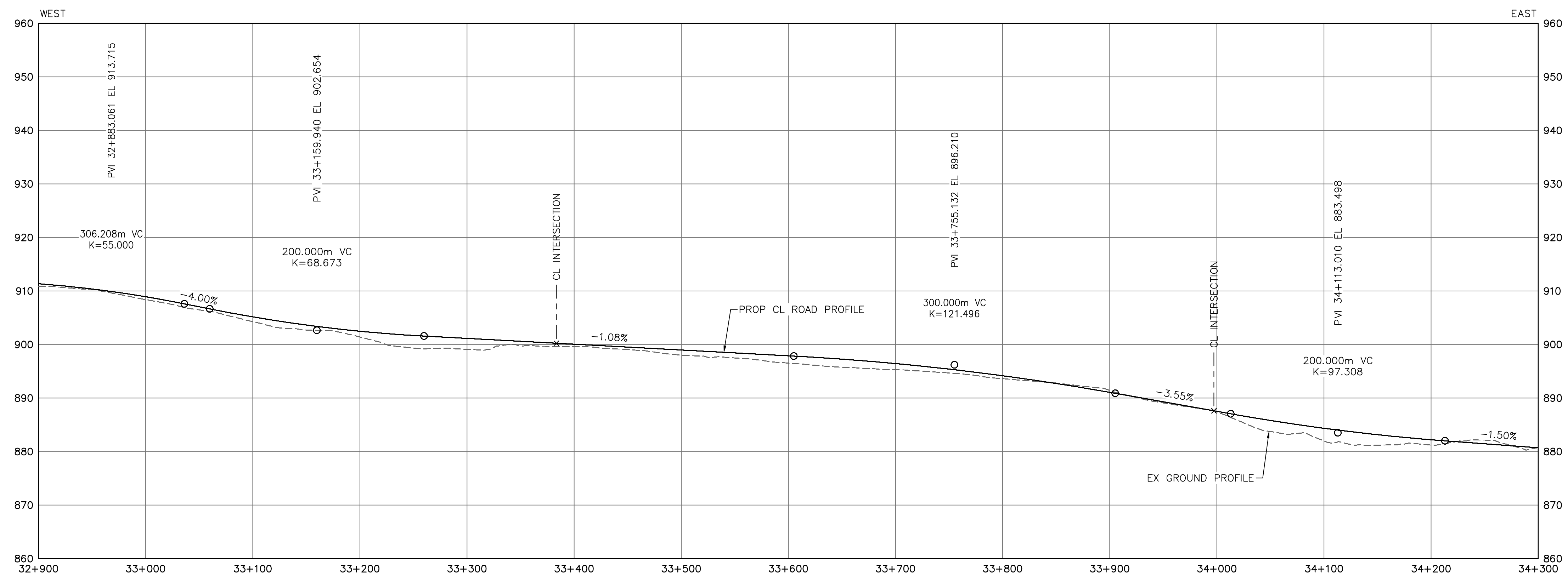
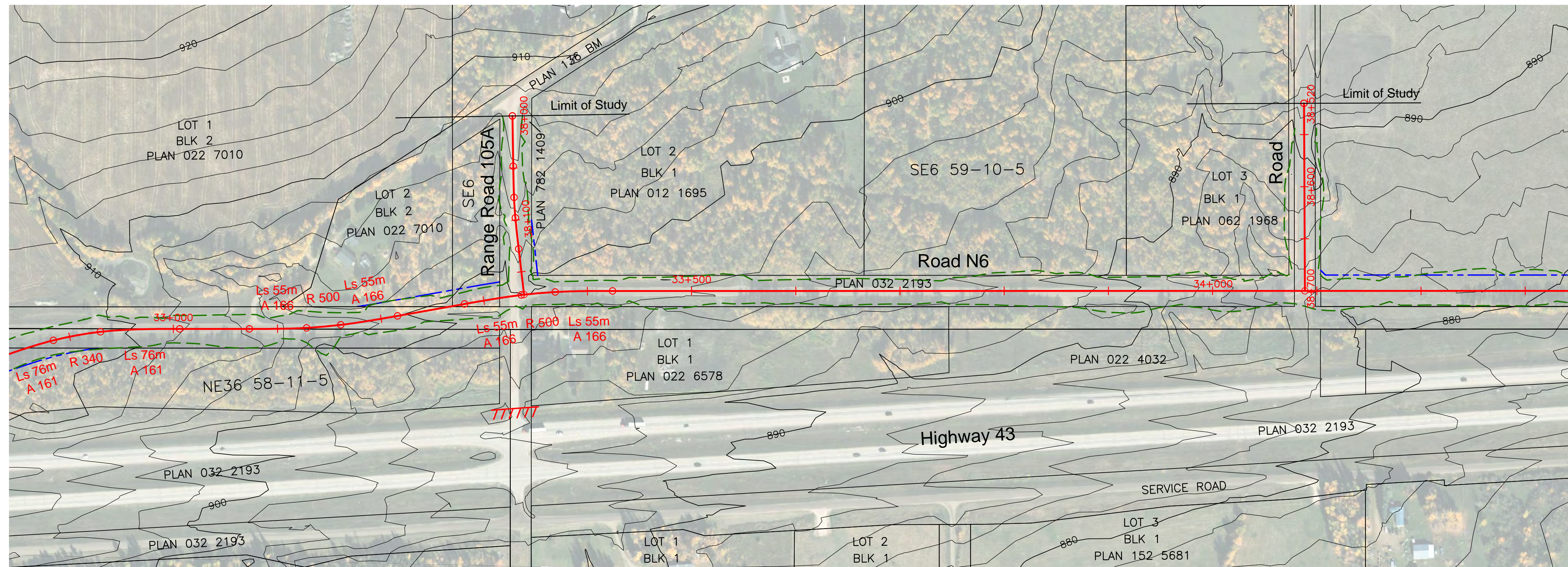


**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N6' - Sta 29+967 to Sta 31+400**

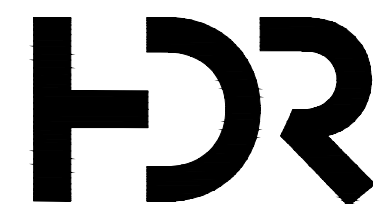
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SHEET  
**108**

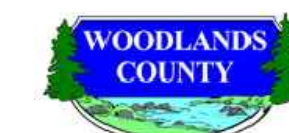




- Legend:**
- Proposed Road CL
  - Existing Road CL
  - - - Proposed Right-of-Way
  - - - Proposed Daylight Line
  - TTTTT Proposed Road Closure



PROJECT MANAGER IAN MACLEOD		
ISSUE	DATE	DESCRIPTION
	MAY 24 2019	
PROJECT NUMBER		



**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Plan / Profile**  
**Road 'N6' - Sta 32+900 to Sta 34+300**

FILENAME  
 SCALE H 1:2,500  
 V 1:500

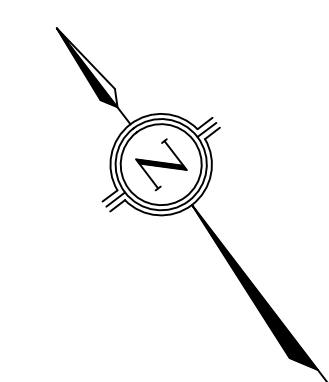
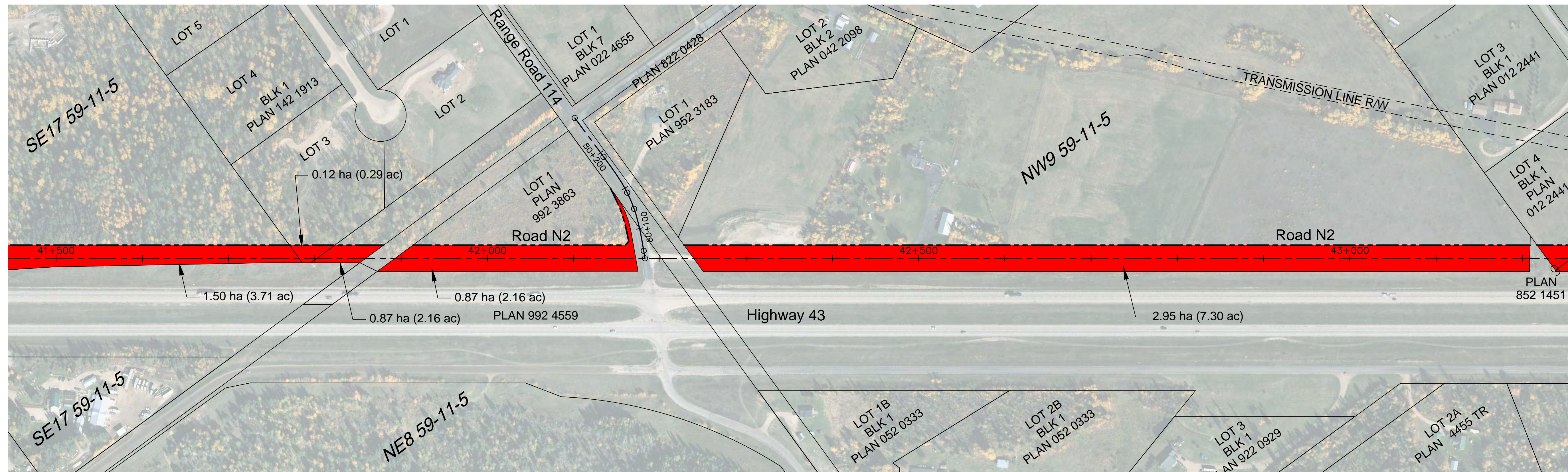
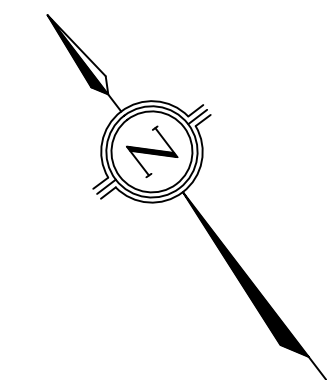
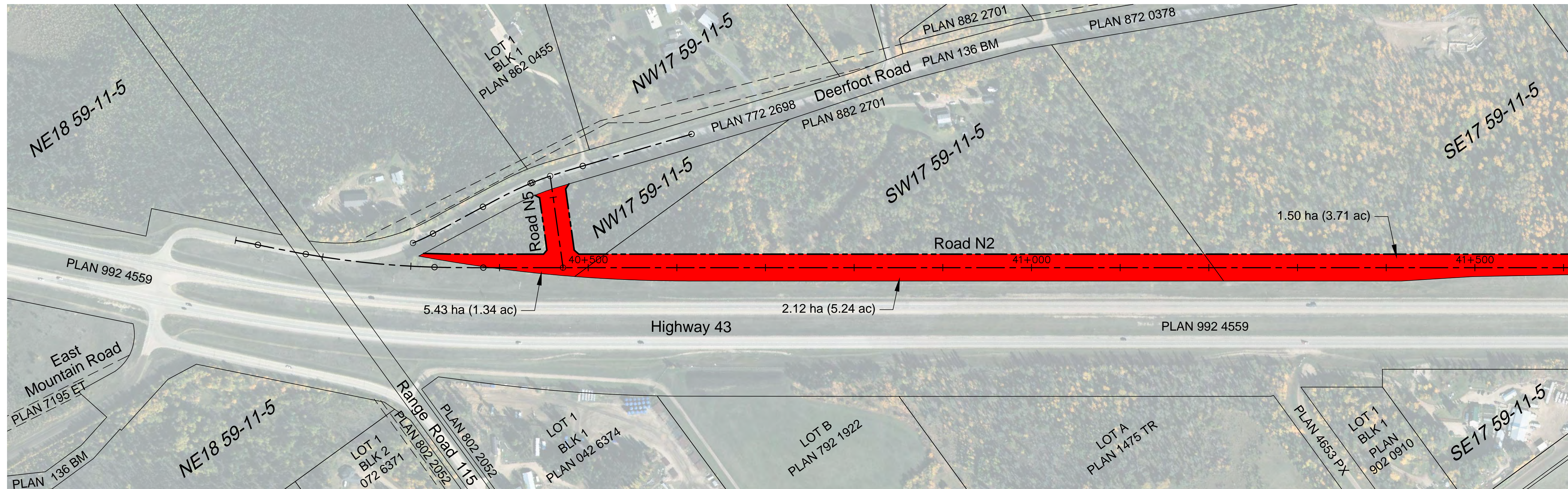
SHEET  
**110**



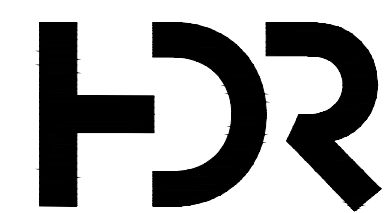






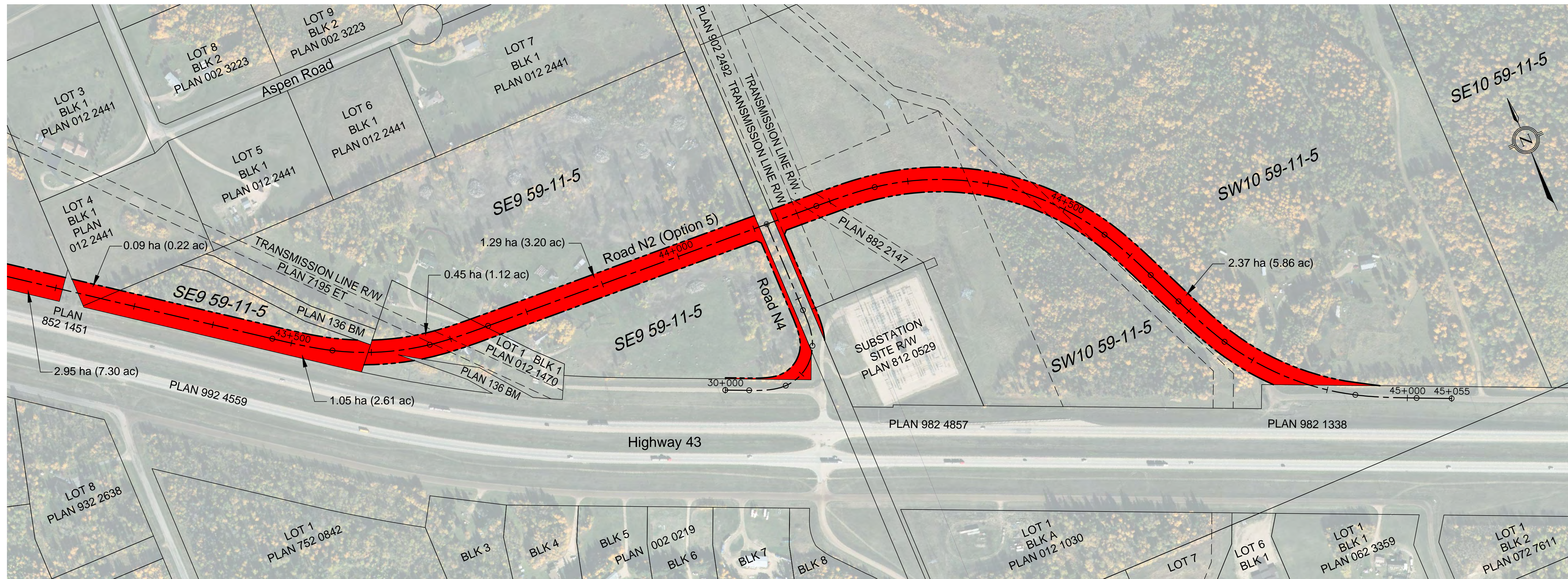


Legend:  
 - - - Proposed Road CL  
 - - - Proposed Right-of-Way  
 ■ Area to be Acquired

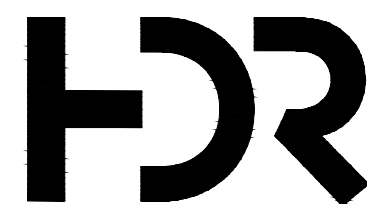


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ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	

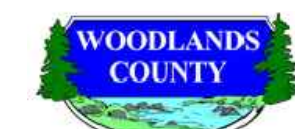
  
**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Right-of-Way Plan**  
**Road 'N2'**



- Legend:**
- Proposed Road CL
  - Proposed Right-of-Way
  - Area to be Acquired



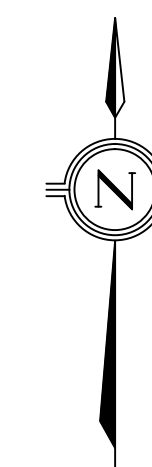
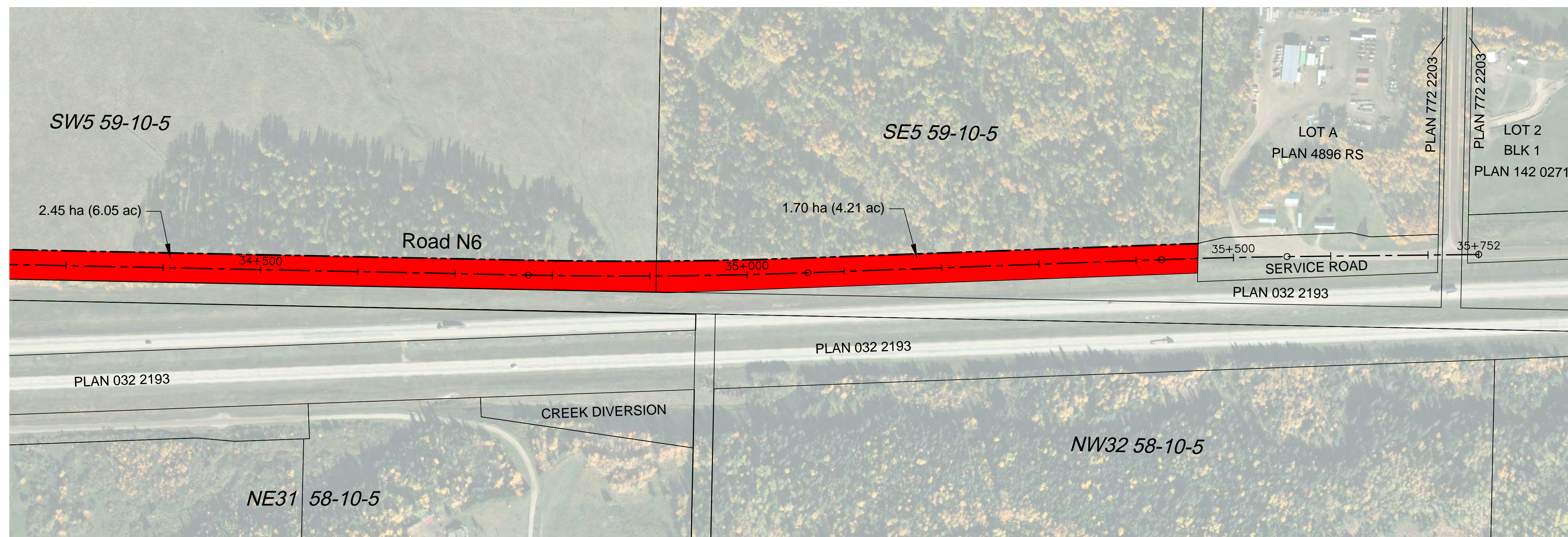
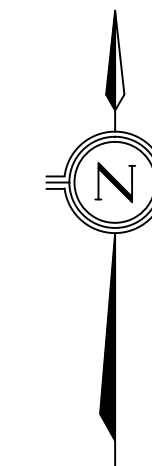
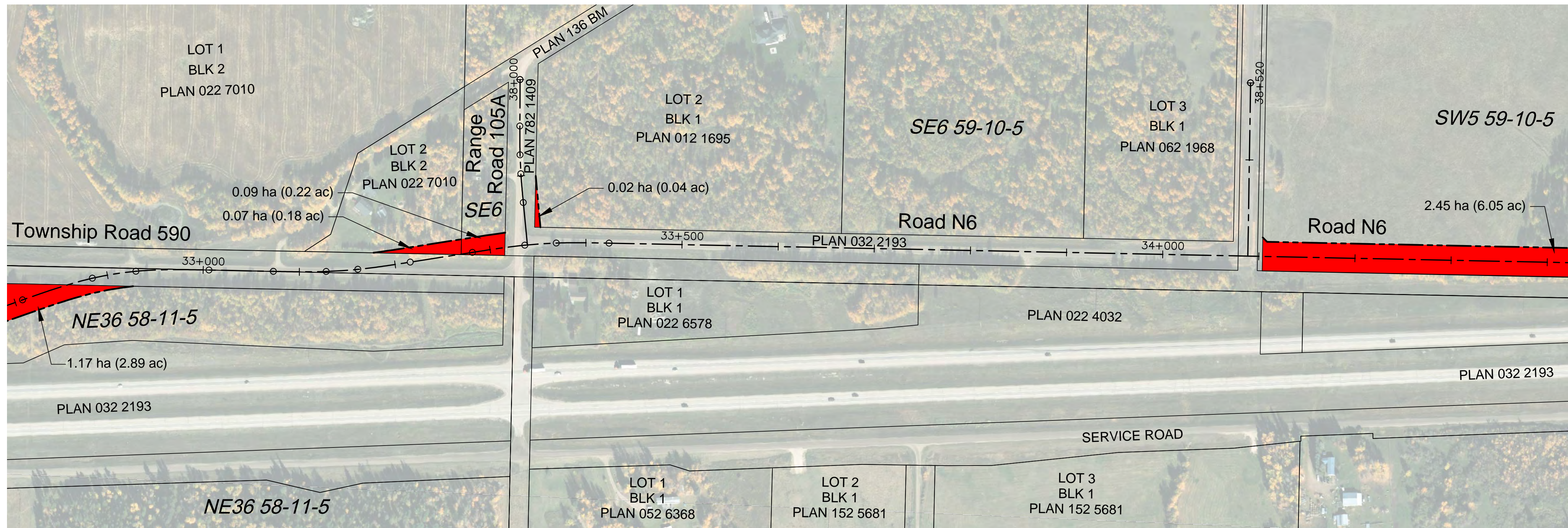
MAY 24 2019			PROJECT MANAGER IAN MACLEOD	
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	



**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Right-of-Way Plan**  
**Road 'N2' (Option 5) & Road 'N4'**





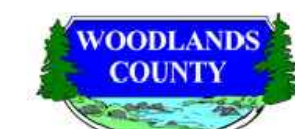


- Legend:
- Proposed Road CL
  - Proposed Right-of-Way
  - Area to be Acquired



ISSUE			PROJECT NUMBER

PROJECT MANAGER IAN MACLEOD



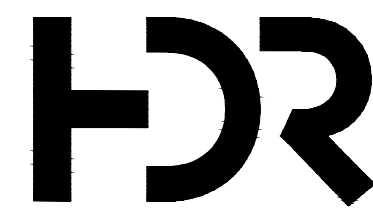
Woodlands County  
 Highway 43:16 North Service Road Study  
 Right-of-Way Plan  
 Road 'N6'

FILENAME  
 SCALE 1:2,500

SHEET  
 205

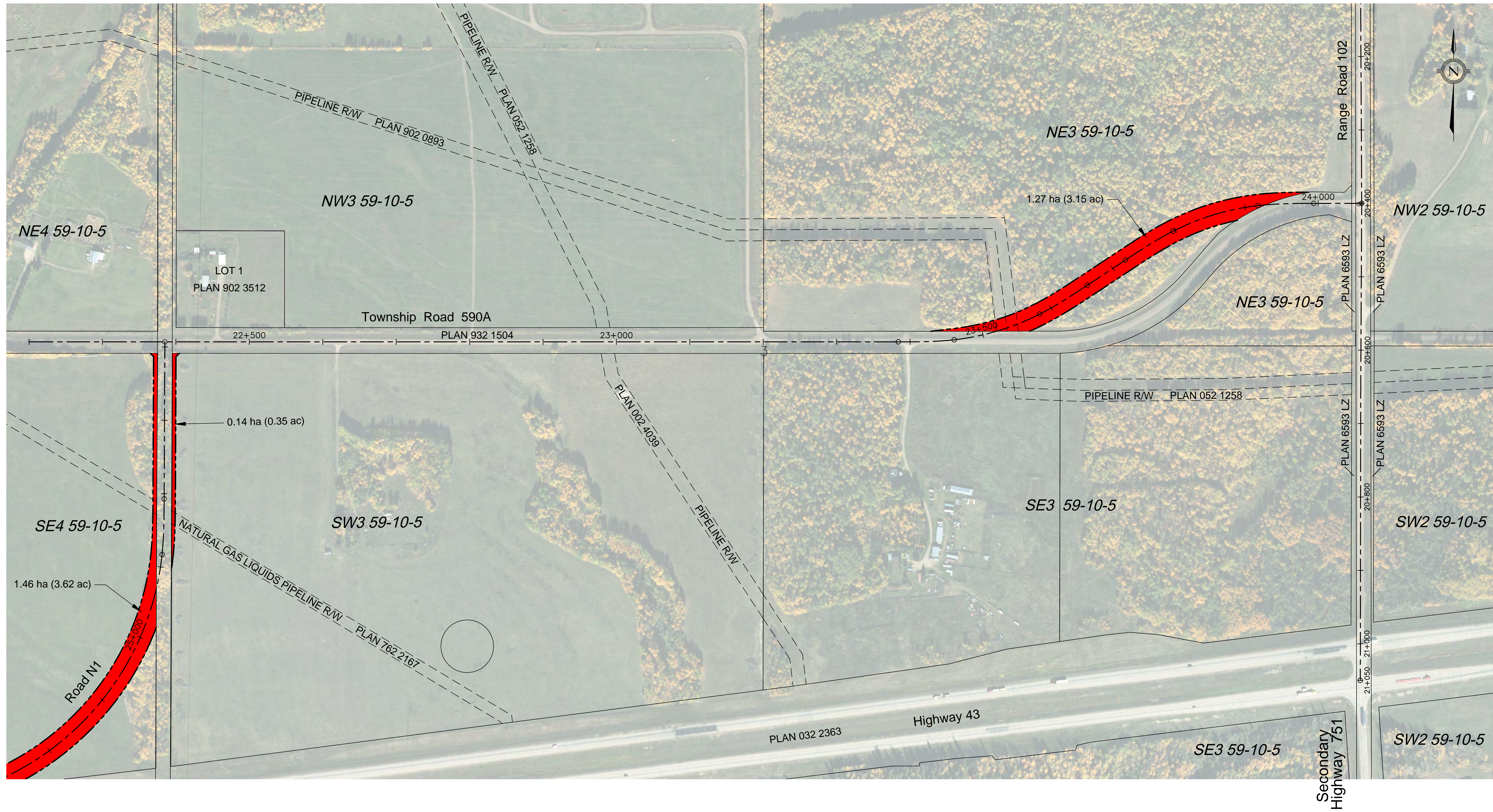


- Legend:
- Proposed Road CL
  - Proposed Right-of-Way
  - Area to be Acquired



MAY 24 2019			PROJECT MANAGER IAN MACLEOD	
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	


**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Right-of-Way Plan**  
**Road 'N1'**



**Legend:**  
 - - - Proposed Road CL  
 - - - Proposed Right-of-Way  
 ■ Area to be Acquired



MAY 24 2019			PROJECT MANAGER IAN MACLEOD	
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	

  
**Woodlands County**  
**Highway 43:16 North Service Road Study**  
**Right-of-Way Plan**  
**Twp Rd 590A**