

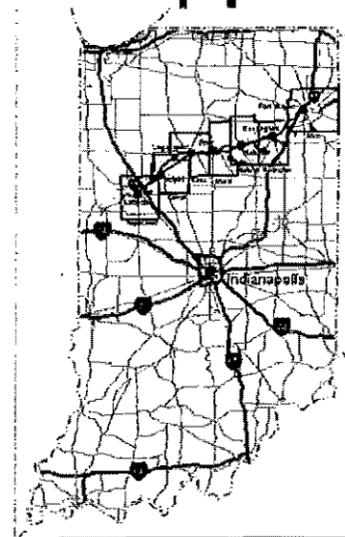


**SR 25 Hoosier Heartland Highway**  
**Lafayette to Logansport, Indiana**

# Engineer's Report

*Prepared for*  
**Indiana Department of Transportation**

*Prepared by*  
**Qk4**  
**December 2003**



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## MEMORANDUM

To: Brad Steckler, Manager  
Engineering Assessment Section  
Division of Environment, Planning and Engineering

From: Qk4  
Engineering Consultants  
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Subject: Engineer's Report  
Project Designation Numbers 9802920, 0300694, 9904200, 0300695  
Project Designation No. NH-071-5 (10) PE, CN  
New Road Construction –  
SR 25 (Hoosier Heartland Highway) from I-65 in Lafayette to US 24 in Logansport  
Tippecanoe, Carroll, and Cass Counties, Indiana

### 1.0 PURPOSE OF ENGINEER'S REPORT

The purpose of the Engineer's Report is to document the engineering assessment phase, including an outline of the proposal "scope of work" for improvements to SR 25. The report includes discussion of alternative improvement plans focusing on engineering requirements of the . The Engineer's Report serves as a guide to downstream project development phases, principally the design phase.

A Draft Environmental Impact Statement (DEIS) was published in August 2002, and a Final EIS is scheduled for submittal in the fall of 2003. A summary of relevant background data from the environmental document is included herein.

### 2.0 PROJECT LOCATION

The proposal effects reconstruction and relocation of SR 25 starting 0.1 mile east of I-65 in Lafayette, Tippecanoe County and extending 35.26 miles east to US 24/US 35, 1.6 miles east of SR 29 in Logansport, Cass County. (See Location Map, Figure 1, aside. Refer to topographic location maps appended, pages W1–W2, C1–C2, E1–E2, and L1.) Equivalent reference posts (RPs) of those termini (for the Preferred Alternative—Alternative 2) are 39+39 on existing SR 25 and 12+92 on existing US 24. Existing SR 25 intersects I-65 on the eastern edge of Lafayette, and serves the communities of Americus in Tippecanoe County; Delphi, Rockfield, and Burrows in Carroll County; Clymers and Logansport in Cass County. The project is in both the Crawfordsville and La Porte districts.

The project's western terminus location was selected because it provides a direct connection with I-65, a major north-south Interstate highway in Indiana. The project's eastern terminus was selected because it connects with the recently constructed multi-lane section of US 24/US 35. The entire corridor of SR 25 and US 24 from Lafayette to Fort Wayne is commonly referenced as the Hoosier Heartland Highway.

For ease of reference and analysis, the project area was divided into four major segments—Western, Central, Eastern, and Logansport—each of which contained two or more of the preliminary alternatives. Four project designation (Des) numbers correspond to these four segments: 9802920, I-65 to 0.5 mile east of the Tippecanoe–Carroll county line, Segment 1; 0300694, 0.5 mile east of the Tippecanoe–Carroll county line to 0.2 mile east of Carroll County Road (CR) 400W, Segment 2; 9904200, 0.2 mile east of Carroll CR 400W to Cass CR 300S, Segment 3; and 0300695, Cass CR 300S to US 24/US 35, Segment 4.

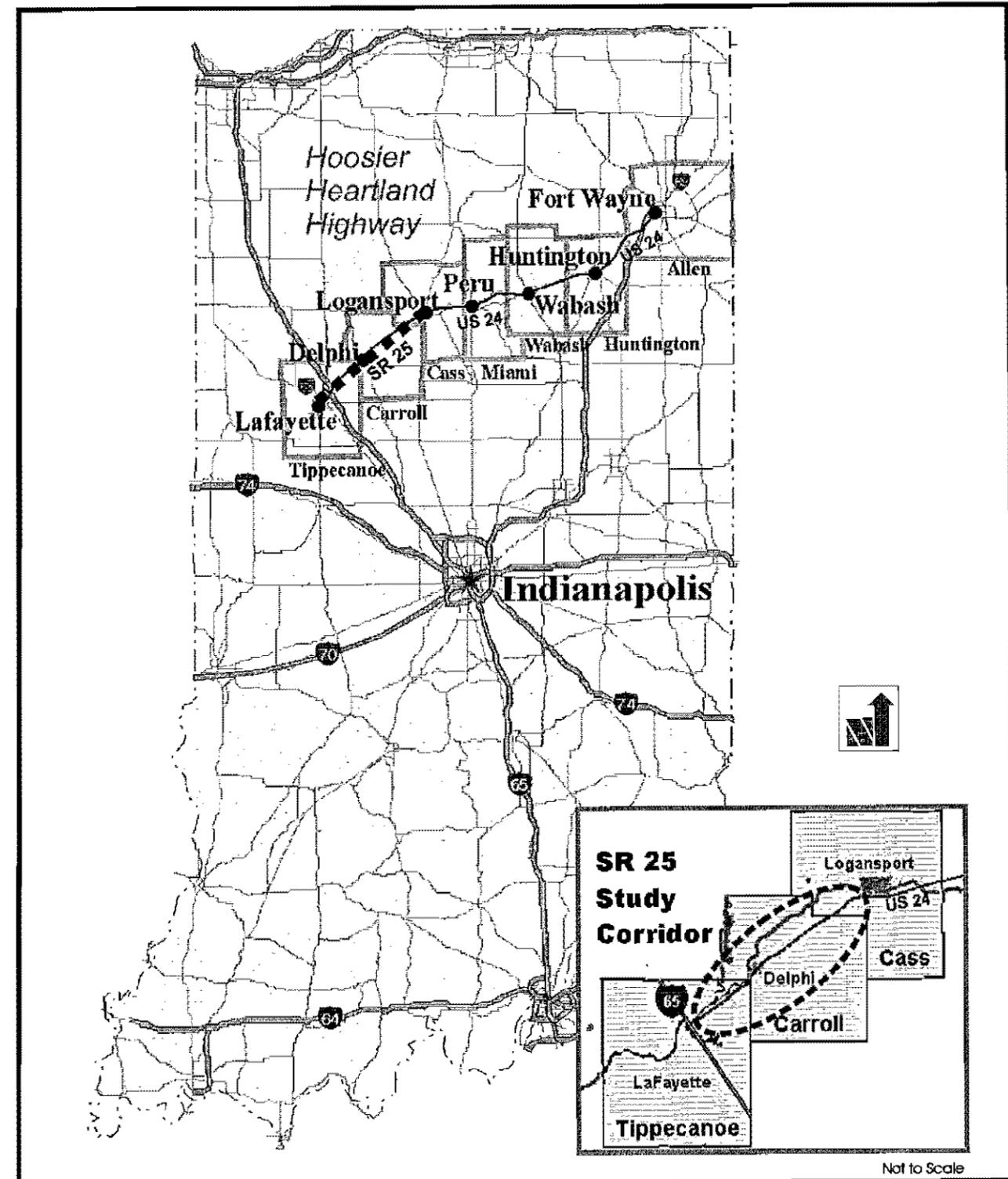


Figure 1  
PROJECT LOCATION

SR 25  
Lafayette to Logansport Segment of  
Hoosier Heartland Highway

### 3.0 SUMMARY OF PROJECT NEED AND PURPOSE

This project is part of a planned Heartland Industrial Corridor improvement from Lafayette, Indiana, to Toledo, Ohio—a distance of approximately 200 miles. The project will complete the 99-mile section of the Heartland Industrial Corridor known as the Hoosier Heartland Highway, from Lafayette to Fort Wayne.

The existing roadway cross section and vertical alignment, among other elements, are substandard to contemporary design. Crash (accident) analysis results show SR 25 has a higher than average rate of injury crashes between Lafayette and Delphi and a slightly higher rate of fatal crashes between Delphi and Logansport. The substandard geometrics and low level of access (drive) control contribute to the crash rates. The need for an improvement in the corridor is also demonstrated by design year 2030 traffic projections that indicate traffic volumes will increase substantially along SR 25, compared with year 2000 volumes, and most sections will operate at unacceptable level of service D or E.

The purpose of the project is as follows:

- To improve travel time, efficiency, and capacity of SR 25 between Lafayette and Logansport.
- To upgrade SR 25 to contemporary design standards.
- To improve safety.
- To enhance the statewide and regional transportation network by improving the Heartland Industrial Corridor and completing the Hoosier Heartland Highway between Fort Wayne and Lafayette.
- To implement federal legislation promulgated in the *Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)* and the *Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21)*, and to comply with the designation of SR 25 as a Statewide Mobility Corridor in INDOT's 2000-2025 Long-Range Plan.

### 4.0 RELATED PROJECT HISTORY, LEGISLATION, PLANS, PRIOR STUDIES

In 1987, the Indiana General Assembly directed INDOT to undertake a feasibility study for a multi-lane highway between Lafayette and Fort Wayne—the Hoosier Heartland Highway. The highway was to follow SR 25 from Lafayette to Logansport and US 24 from Logansport to Fort Wayne. In 1988, the *Feasibility Study: Lafayette to Fort Wayne Corridor* was completed for INDOT. The study recommended upgrading the corridor and prioritized sections for improvement. All sections of the Hoosier Heartland Highway have been reconstructed as a multi-lane divided facility and are open to traffic, except the section from Logansport to Lafayette.

INDOT, the Ohio DOT, and FHWA completed the *United States Route 24 Improvement Feasibility Study* in 1994. This study looked at improving the US 24 corridor between Fort Wayne and Toledo (the remaining portion of the Heartland Industrial Corridor). Currently, the Ohio DOT, in cooperation with INDOT, is sponsoring three studies for US 24 corridor east of Fort Wayne. One study, an EIS with the Ohio DOT as the lead agency, is focusing on the section between New Haven, Indiana, and Defiance, Ohio; the second study is considering the section between Defiance and Napoleon, Ohio; and the third study is focusing on the section from Napoleon to Toledo. In 1995, the *State Road 25 Hoosier Heartland Corridor Study* was prepared for INDOT. The study included an extensive public involvement component, and recommended a partial access control (with limited access right-of-way), four-lane highway as the Preferred Alternative.

The *Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)* identified the Heartland Industrial Corridor from Lafayette, Indiana, to Toledo, Ohio, as "High Priority Corridor #4." Section 1105, "High Priority Corridors on the National Highway System," stated: "the development of transportation corridors is the most efficient and effective way of integrating regions and improving efficiency and safety of commerce and travel and further promoting economic development." The *Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21)*, enacted in 1998, identified the section of the corridor between Lafayette and Fort Wayne as a high priority corridor and provided \$18.75 million toward implementation of the project.

At the state level, the improvement to the SR 25 corridor from Lafayette to Logansport is identified in the statewide transportation plan (*Transportation In Indiana: Multi-modal Plan Development For The 1990's And Beyond*) as a part of one of 27 "Major Commercial Routes." SR 25 is a Statewide Mobility Corridor in INDOT's 2000-2025 Long Range Plan update, published in 2002. As described in the plan update: "Statewide Mobility Corridors serve as the connection between urban areas of 25,000 persons or greater in Indiana and neighboring states, provide macro-level accessibility to cities and regions around the state, and play a vital role in economic development." INDOT's Long Range Plan includes an element to reconstruct SR 25 as a multi-lane facility from Lafayette to Logansport.

Locally, improvements to the SR 25 corridor, as part of the Hoosier Heartland Highway project, are supported by the affected jurisdictions. The Tippecanoe County Area Plan Commission, which is the Metropolitan Planning Organization (MPO) for the Lafayette-West Lafayette area, included the project in its *Adopted Thoroughfare Plan*; the Carroll County Commissioners issued a letter to INDOT consultants Presnell Associates of Indiana (now Qk4), in July 2001, in support of the project; and in February 2002 the Logansport County Council and Cass County Commissioners in February 2002 adopted a new *Thoroughfare Plan* that advocates the project.

### 5.0 EXISTING FACILITY

SR 25, which is part of the National Highway System (NHS), is also on the Indiana 4R Network and National Truck Network. SR 25 is functionally classified on the Indiana highway system as a *Rural Other Principal Arterial*, and an *Urban Other Principal Arterial* within the Lafayette and Logansport Urban Area Boundary (U.A.B.) The functional classifications of the other state roads in the project corridor are as follows: SR 218, Rural Major Collector; US 421/SR 39/SR 18, Rural Minor Arterial north from SR 25; SR 29, Rural Minor Arterial north to the Logansport U.A.B. (at Burlington Avenue intersection), and Urban Minor Arterial north from the U.A.B. to the intersection with US 24/US 35; and US 24/US 35, Urban Principal Arterial within Logansport U.A.B.

The existing SR 25 is a two-lane facility, constructed circa 1931, with approximately 4-foot-wide earth shoulders throughout most of the 33-mile-long Lafayette-to-Logansport corridor. The highway travel (driving) lanes are 12 feet wide and the pavement surface is asphalt throughout. In the 1970s, approximately 1.0 mile on the western limits of this project was reconstructed to a four-lane curb and gutter section with continuous median left-turn lanes. In addition, much of the portion of SR 25 through the corporate limits of Delphi is a curb and gutter section. Just east of Delphi, the roadway was reconstructed to overpass the Norfolk Southern railroad. Shoulders are 8–10 feet wide in this area and consist of compacted aggregate throughout the section. The right-of-way width is variable (60–100 feet).

The predominant posted speed is 55 mph. Table 1, below, shows the posted speed limits along SR 25.

**Table 1—Speed Limits Regulating SR 25**

Location	Reference Post (approximate)	Posted Speed (mph)	Comments
I-65 / SR 25 in Lafayette	39+50	50	Signalized (Start of Project)
CR 300N	39+90	55	
Approaching Americus	45+50	45	
Americus Court	--	55	
US 421 west of Delphi	52+10	45	Signalized
US 421 in Delphi	52+60	25	Signalized
Union Street in Delphi		35	
Delphi area	53+00	45	
Delphi City Limits (N)	53+80	55	
Approaching Rockfield	59+20	40	
CR 225	59+80	55	
Approaching Burrows	63+00	45	
Burrows	63+50	35	
Leaving Burrows	64+50	55	
Clymers	N/A	55	No reduced speed

See Sheets W34, C34, E34, and L2 for approximate Reference Post locations.

**Table 2—SR 25 Deficiencies** (Note: All stations have been approximately measured as 1" = 2,000' USGS map.)

Station	NORTH BOUND		SOUTH BOUND	
	Deficiency	Note	Deficiency	Note
<b>Lafayette to Americus (RP 38+80 to 45+80)</b>				
38+50 - 39+45	1, 2		1, 2	
39+45 - 39+92	1		1	
40+39 - 40+66	2, 4	trees in clear zone	2, 3	
41+40 - 41+42			2, 3	
41+72			2, 3	
42+95	2		2, 3	
43+01	2		2, 3	
43+06	2, 5			
43+06 - 43+77	2	headwall with no guardrail		
43+71 - 43+82	2		2, 3	trees in clear zone
43+86 - 44+37	3, 2	poles in clear zone		
44+43	2, 3			
44+43 - 44+84			2, 3	trees in clear zone
45+13			4, 3	
45+32 - 45+38	2, 5			
<b>Americus to North of Delphi (RP 45+80 to 52+90)</b>				
46+02	2	headwall with no guardrail		
46+64	2	steep embankment		
46+83 - 47+02	2, 3	headwall with no guardrail	2, 3	headwall with no guardrail
47+02 - 47+59	2			
47+97	2			
49+30 - 49+35	2		2	headwall with no guardrail
49+56	2		2, 4	
49+73 - 49+90	2	embankment with trees		
49+96			2, 4	trees in clear zone
49+96 - 50+02	2	embankment with trees		
50+58 - 50+61			2, 5	
51+09 - 51+38	2, 3	telephone poles in clear zone		
<b>North of Delphi to Rockfield (RP 52+90 to 59+20)</b>				
53+27 - 53+39	4		4	
54+22 - 54+79	2, 3	trees in clear zone		
54+79			2, 3	
54+84			2, 3	
55+32			2, 3	
55+79 - 55+87	2		2, 3	
56+11 - 56+61	2			
56+49 - 56+74			2, 3	
57+44	2, 3		2, 3	
58+05	2, 3		2, 3	
58+48 - 58+59			2	
<b>Rockfield to Burrows (RP 59+20 to 63+40)</b>				
59+14 - 60+02			2, 3	trees in clear zone
60+02	2	trees in clear zone		
60+84			2, 3	
60+90 - 60+03			2, 3	trees in clear zone
60+96	2, 3			
63+01	8, 3			
63+06	2			
<b>Burrows to Logansport (RP 63+40 to 72+20)</b>				
65+26	2			
65+85			2, 3	
66+04	2	steep embankment	2	
67+80	2	steep embankment		
69+22			2	
69+90			2	
69+92	2			
70+51			2	
70+77			2, 3	trees in clear zone
70+81	2	steep embankment		
71+32			2	

The existing horizontal alignment is good throughout the Lafayette to Logansport segment of SR 25, with 5 curves from 0°30' to 6°00'. Assuming proper superelevation, each of these meets the requirements for a 55-mph roadway. While much of the vertical alignment meets the minimum requirements for a stopping sight distance (SSD) for 55-mph roadway, there are sections between Lafayette and Americus where reduced speed is desirable. Vertical curve deficiencies in the existing alignment create substandard stopping and intersection sight distances (ISD) for a sum of approximately 4 miles in the overall project length.

Access control is by drive permit only. There are approximately 81 public crossroads and 145 private entrances along this corridor. At-grade railroad crossings occur on approximately 40 of these crossroads, and mainline SR 25 has three at-grade railroad crossings. Currently 41 trains per day, on average, use the Norfolk Southern railroad through the area (according to the trainmaster for the Norfolk Southern Railway Company). The average is expected to increase to 65 trains per day within the next few years.

Obstructions on SR 25's existing roadside slopes—including trees, culvert headwalls, utility poles, and substandard guardrail end treatments or steep embankment slopes without roadside barrier protection—reduce the desired recovery zone. Table 2, at left, summarizes the existing road's deficiencies, by reference post, from Lafayette to Logansport. The deficiencies/substandard attributes along the route are identified on the table by number, as follows:

- 1 - Substandard shoulder 3.3–7.9 feet, broken asphalt (4R reconstruction standard is 11-foot usable shoulder, 10 feet paved)
- 2 - Obstructions inside clear zone and obstruction-free zone
- 3 - Non-traversable fill slope steeper than 3:1 without guardrail
- 4 - Substandard guardrail and guardrail end treatment

Bridges occur at the following locations along existing SR 25: Buck Creek, Sugar Creek, Deer Creek, Norfolk Southern Railroad, and Rock Creek. (The Rock Creek bridge will be replaced by a new facility. The remaining bridges will be transferred to local jurisdictions). Table 3 lists types and other features of bridges on existing SR 25.

**Table 3—Bridges on Existing SR 25**

Structure	Log Mile	Feature Crossed	Type of Structure	Span Lengths	Roadway Width	Year Last Rehab'd	Year Built
<b>Tippecanoe County</b>							
25-79-6633	31.04	SR 25 @ Sugar Creek	CSB	65, 78, 65	44-01		82
25-79-7161	34.98	SR 25 @ Bridge Creek	CRCS	19-3, 24, 19-3	45-04		91
<b>Carroll County</b>							
25-08-11458	1.34	SR 25 @ Deer Creek	CPCBB, RCA	41-8, 2275-4	43-10	R-92	31
25-08-4113A	3.18	SR 25 @ Robinson Branch	CRCS	30, 40, 30	41-02	R-91	63
25-08-2217	3.47	SR 25 @ Abandoned RR	SB	45			
25-08-2218A	3.77	SR 25 @ Norfolk Southern RR	RCG, SB, RCG	40, 40, 56, 40, 40	31-00	R-74	63
25-08-1148A	11.29	SR 25 @ Rock Creek	RCA	24, 88, 24	41-00	W-60	32
<b>Cass County</b>							
25-09-2040	5.05	SR 25 @ Whipperman Ditch					
(35129-09-2279)	5.75	US 35 over SR 25	Underpass		2233-10		
25-79-7401	26.78	SR 25 @ Dry Run	KPCIB	88-6	66-10		93
25-79-7868	29.39	SR 25 @ Buck Creek	CTB	96-9	44-07		98

Signalized intersections occur at the following locations along existing SR 25: northbound and southbound I-65 ramps, Tippecanoe CR 300N, US 421 just west of Delphi, and US 421 in downtown Delphi.

The majority of the land use in the project area is agricultural, followed by rural-residential uses interspersed with pockets of suburban neighborhoods in outlying areas surrounding Lafayette, Delphi, and Logansport. Other land uses encountered within the project corridor—along the existing road and the new SR 25 alignment—include

commercial and industrial facilities near the project's western terminus in Lafayette, in isolated locations along rural stretches, and in Logansport, Delphi, and Clymers. Institutional land uses including a social services agency and a church, and riparian areas and other undeveloped land not in agricultural use are also within the project corridor. Most of the recent development in the project corridor has occurred in the Lafayette, Delphi and Logansport urban areas. Recent development trends in these areas have included a mix of infill of both commercial and residential uses.

The Norfolk Southern and Winamac Southern railroads traverse the project corridor. Existing SR 25 has either at-grade or grade-separated railroad crossings at the following locations:

<u>Location</u>	<u>Railroad</u>	<u>Crossing</u>	<u>Warning Device</u>
▪ Delphi, on US 421 (common route with SR 25)	Norfolk Southern	At-grade	Gates, flashing lights, and warning signs
▪ Delphi, east of Deer Creek Commerce Park	Norfolk Southern	SR 25 overpass	--
▪ Clymers, at CR 400W	Winamac Southern	At-grade	Gates and warning signs
▪ Industrial properties, east of Clymers	Norfolk Southern spur	At-grade	Warning signs

The Preferred Alternative (described in Section 9.0, "Discussion of Alternatives") will intersect the following existing state and county roads, and Norfolk Southern and Winamac Southern railroads:

- Tippecanoe County: Existing SR 25, CR 400E, CR 300N, CR 500E, CR 400N, CR 625E, CR 450N, CR 750E, CR 900E, CR 600N, CR 700N, CR 1000E, CR 800N, Norfolk Southern, CR 900N
- Carroll County: CR 900W, CR 800W, CR 100N, US 421, CR 200N, CR 300N, Norfolk Southern, SR 218, existing SR 25, CR 500W, CR 400W, CR 600N, North Walnut Street, CR 250W, CR 750N, CR 100W, Meridian Line Road, CR 900N, CR 100E, CR 150E
- Cass County: CR 500S, CR 500W, CR 400S, CR 400W, Winamac Southern, CR 325W, CR 275W, CR 300S, existing SR 25, Norfolk Southern, CR 175W, CR 115W, SR 29, Burlington Avenue, Kokomo Pike

The following streams will be crossed by the Preferred Alternative (in order of crossing, from Lafayette northward to Logansport). Major streams are identified with an asterisk (\*):

- Dry Run tributaries (3), Buck Creek tributary, Buck Creek, Sugar Creek tributary, Sugar Creek\*, Bridge Creek East tributary, Bridge Creek East, Bridge Creek West tributary, Bridge Creek West, Bridge Creek West tributary, Bridge Creek West, Deer Creek\*, Robinson Branch, Rock Creek\*, Little Rock Creek, Cronin Ditch, Keeps Creek, unnamed ditch, Goose Creek tributary, Goose Creek
- 19 intermittent streams

## 6.0 FIELD CHECKS, MEETINGS AND COORDINATION

An interagency meeting was held in February 2000, and each of the representatives was afforded the opportunity to visit the project site. Qk4 personnel met with the Tippecanoe County Engineer and representatives of the Lafayette/Tippecanoe County Metropolitan Planning Organization on March 26, 2003, with the Carroll County Engineer on March 25, 2003, and the Cass County Highway Supervisor and the Logansport Street Superintendent also on March 25, to review the proposal. Qk4 staff also met with the

Cass County Engineer on June 19, 2003. The engineering assessment and environmental phases involved numerous other meetings to advise and coordinate efforts.

## 7.0 TRAFFIC DATA AND CAPACITY ANALYSIS

Existing SR 25 serves as the main highway between Lafayette, Delphi, and Logansport. According to 1997 data from the Tippecanoe County Area Plan Commission (APC), approximately 3,000 people who work in Tippecanoe County live in Carroll and Cass counties, and most use SR 25 for their commute. In addition, Lafayette serves as a regional shopping/entertainment district and health-care center for the study area, and Purdue University's main campus is in West Lafayette.

Traffic volume data along existing SR 25 was obtained from INDOT, mechanical traffic counters, intersection turning movement counts, and the Tippecanoe County APC travel model. From the I-65 interchange to Tippecanoe CR 450N, the current (base year 2000) traffic volume on SR 25 is approximately 21,600 vehicles per day (vpd), and the projected volume for design year 2030 is 29,000 vpd. Between CR 450N and Main Street in Delphi, current traffic volumes range from 7,700–15,500 vpd, and between Delphi and Logansport they range from 4,400–6,800 vpd. By the design year 2030, the traffic in those locations is projected to increase to 11,700–23,400 vpd and 6,500–8,600 vpd, respectively, given the No-Build scenario. Tables 1.1 – 1.2 in this section show existing and projected traffic volumes and levels of service (LOS) for existing SR 25.<sup>1</sup>

The need for an improvement in the corridor is demonstrated by an analysis of the capacity of the existing facility. The traffic-carrying capacity of existing SR 25 was analyzed for existing volumes, 2010 volume projections, and 2030 volume projections between I-65 and Logansport, assuming no roadway capacity improvements. The capacity analyses included a comparison (expressed as a volume to capacity ratio— $v/c$ ) of the traffic volume to the operating capacity (service flow rate of LOS E) of the road lane based on its characteristics (number of lanes, shoulder width, grades, passing opportunity, etc.).

The methodology used to analyze the capacity and level of service was based on standard traffic engineering procedures outlined in the year 2000 *Highway Capacity Manual* (HCM) "Special Report 209", published by the Transportation Research Board (TRB). The analysis was performed using Highway Capacity Software (HCS). The procedure considers traffic and geometric conditions of the facility such as traffic volumes, percent of large vehicles, operating speed, lane and shoulder widths, grades, and directional distributions to determine the LOS.

Both the Indiana Department of Transportation *Design Manual* and the American Association of Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets* state that for the design of an arterial highway in rural areas (4R reconstruction design class), LOS C is the minimum acceptable, LOS B is desirable, and LOS D, E and F are unacceptable. (INDOT's Design Manual prescribes LOS B desirable and LOS D minimum for 3R rehabilitation design class.)

One criterion for measuring the effectiveness of relocating SR 25 is the ability to attract enough traffic away from existing SR 25 so that it can maintain at least LOS C, or above.

<sup>1</sup> *Transportation Needs Study for Hoosier Heartland Highway (SR 25) and Burlington Avenue* was prepared by consultants under contract with the City of Logansport, Cass County, and Logansport-Cass County Economic Development Foundation. The study was conducted to assess SR 25's access at Burlington Avenue.

### 7.1 Corridor Sections Analyzed

To perform the analyses, existing levels of service were identified for thirteen sections of SR 25, and projections were made for the years 2010, 2020 and 2030 for these same sections. Existing and projected levels of service were also determined for six intersections along the SR 25 corridor. The thirteen roadway sections and six intersections, five of which are signalized, are identified below:

#### 13 ROADWAY SECTIONS

##### Tippecanoe County:

- I-65 to CR 450N
- CR 450N to SR 225
- SR 225 to Grant Road
- Grant Road to County Line

##### Carroll County:

- County Line to US 421
- US 421 to Main Street (Delphi)
- Main Street to CR 300N
- CR 300N to SR 218
- SR 218 to County Line

##### Cass County:

- County Line to CR 400S (Vandalia Street)
- CR 400S (Vandalia Street) to CR 300S
- CR 300S to CR 200S
- CR 200S to US 24

#### 6 INTERSECTIONS

##### Tippecanoe County:

- SR 25 and I-65 Southbound Ramps (S)
- SR 25 and I-65 Northbound Ramps (S)
- SR 25 and CR 300N / Deems Drive (S)

##### Carroll County:

- SR 25 and US 421N (S)
- SR 25 and US 421S / Washington Street (S)

##### Cass County:

- US 24 / US 35/SR 29 (U)

(U) = Unsignalized

(S) = Signalized

TABLE 5—Intersection Level of Service Summary – Base Year 2000 Volumes— Existing SR 25

Intersection With Existing SR 25	AM Peak Hour			PM Peak Hour		
	LOS	Avg. Delay (sec.)	v/c	LOS	Avg. Delay (sec.)	v/c
SR 25/I-65 SB	*	*		*	*	
SR 25/I-65 NB	C	17	0.83	B	10	0.50
SR 25/CR 300N	B	10	0.53	B	10	0.57
SR 25/US 421N	B	11	0.49	B	11	0.53
SR 25/US 421S	C	21	0.67	C	23	0.68
US 24/US 35/SR 29	A			A		

\* This intersection had not been signalized when the capacity analysis was performed; therefore, LOS and average delay have not been evaluated.

Note: Average delay was not evaluated for unsignalized intersections.

v/c = volume/capacity, i.e., a comparison of the traffic volume to the service capacity of the roadway based on the roadway's characteristics.

TABLE 6— Year 2000 Heavy Vehicle Traffic (Percent of Total Traffic)

Location on Existing SR 25	Percent Heavy Vehicles		
	EB	WB	Average
I-65 to SR 225	22.7	12.3	17.8
SR 225 to Americus	11.9	19.1	15.6
Americus to Delphi	21.4	14.7	18.1
Rockfield to Burrows	27.1	15.8	21.5
Corridor Average	17.7 %		

### 7.2 Base Year 2000 Volumes

Table 4 shows the existing levels of service for the thirteen identified sections of SR 25. The analysis reveals that over 50 percent of the corridor is operating at unacceptable levels of service D or E (see shaded rows on Table 4). At the west end of the corridor, near Lafayette, which has a five-lane section, the level of service is B. The eastern half of SR 25 is operating at LOS C. A separate analysis was performed for the AM and PM peak-hour volumes at each of the six intersections. Table 5, aside, provides a summary of the intersection capacity analyses. As indicated in the table, none of the intersections analyzed currently have unacceptable levels of service. (The SR 25/I-65 southbound ramp, which is now signalized, was not signalized at the time the analysis was performed. It has not been analyzed as a signalized intersection.) Table 6, aside, show the percent of heavy vehicle traffic on existing SR 25, eastbound and westbound.

TABLE 4—Level of Service Summary – Base Year 2000 Volumes – Existing SR 25

Roadway Section of Existing SR 25	Existing Traffic Volume: AADT	Level of Service
I-65 to CR 450N	21,600	B
CR 450N to SR 225	16,600	E
SR 225 to Grant Road	13,800	E
Grant Road to Tippecanoe/Carroll Co. Line	10,800	D
County Line to US 421	7,700	D
US 421 to Main Street (Delphi)	10,900	D
Main Street to CR 300N	8,000	D
CR 300N to SR 218	6,700	C
SR 218 to Carroll/Cass Co. Line	4,400	C
County Line to CR 400S (Vandalia Street)	4,600	C
CR 400S (Vandalia Street) to CR 300S	5,200	C
CR 300S to CR 200S	5,800	C
CR 200S to US 24	6,800	C

AADT = Annual Average Daily Traffic. Source of data: INDOT traffic counts factored to the current year.

NOTE: Shaded rows indicate roads operating at unacceptable levels of service.

### 7.3 Year 2010 Volumes

Traffic volumes were projected to the year 2010 based on historical growth trends along the entire length of SR 25. The LOS analysis was again made assuming the increased traffic volumes on the existing roadway conditions. Using the projected 2010 traffic, the analysis indicates that over half of the corridor would operate at an unacceptable level of service D or E. Compared with year 2000 volumes, the level of service remains the same for the westerly sections between I-65 and CR 300N east of Delphi. The section from CR 300N to SR 218 drops from LOS C to LOS D. Also, the segment of SR 25 from CR 200S to US 24 worsens from LOS C to LOS D. Table 7 summarizes the results of the SR 25 mainline capacity analyses.

TABLE 7—Level of Service Summary – Year 2010 Volumes, "No-Build" Condition

Roadway Section of Existing SR 25	Projected Traffic Volume: AADT	Level of Service
I-65 to CR 450N	24,100	B
CR 450N to SR 225	18,100	E
SR 225 to Grant Road	16,100	E
Grant Road to Tippecanoe/Carroll Co. Line	12,000	D
County Line to US 421	10,600	D
US 421 to Main Street (Delphi)	11,200	D
Main Street to CR 300N	9,200	D
CR 300N to SR 218	7,300	D
SR 218 to Carroll/Cass Co. Line	5,100	C
County Line to CR 400S (Vandalia Street)	5,800	C
CR 400S (Vandalia Street) to CR 300S	6,200	C
CR 300S to CR 200S	6,600	C
CR 200S to US 24	7,300	D

AADT = Annual Average Daily Traffic.

NOTE: Shaded rows indicate roads operating at unacceptable levels of service.

Intersection capacity analyses were performed for 2010 traffic on the previously referenced intersections. Table 8 summarizes the capacity analyses. As shown in the table, one intersection will experience service level problems (LOS D) with PM peak-hour traffic: SR 25 / US 421S. (The existing signalized intersection at US 421 can reach an acceptable level of service through the addition of turn lanes.)

**TABLE 8—Intersection Level of Service Summary – Year 2010 Volumes, “No-Build” Condition**

Intersection With Existing SR 25	AM Peak Hour			PM Peak Hour		
	LOS	Avg. Delay (sec.)	v/c	LOS	Avg. Delay (sec.)	v/c
SR 25/I-65 SB	*	*	*	*	*	*
SR 25/I-65 NB	C	18	0.85	B	12	0.61
SR 25/CR 300N	B	11	0.64	B	12	0.63
SR 25/US 421N	B	13	0.54	B	14	0.65
SR 25/US 421S	C	23	0.72	D	27	0.83
US 24/US 35/SR 29	A			A		

\* This intersection had not been signalized when the capacity analysis was performed; therefore, LOS and average delay have not been evaluated.

Note: Average delay was not evaluated for unsignalized intersections.

v/c = volume/capacity, i.e., a comparison of the traffic volume to the theoretical capacity of the roadway/travel lane based on the roadway geometry/assumptions made.

#### 7.4 Year 2030 Volumes

The projections for 2030 indicate that the traffic volumes will increase significantly along the entire length of SR 25 and, compared with year 2000 volumes, the level of service will deteriorate at eight of the thirteen locations analyzed (see Table 9). For example, SR 25 from Grant Road to the Tippecanoe/Carroll County line will decrease from LOS D to LOS E. By year 2030, the only sections of SR 25 operating at LOS C are those from I-65 to CR 450N (four-lane section divided by continuous median/left-turn lane) and SR 218 to the Carroll/Cass County line. All remaining sections of existing SR 25 will be operating at LOS D or E, which is unacceptable for efficient operation. Accommodating this additional traffic with an acceptable level of service would require adding travel lanes to the existing roadway or removing traffic demand from existing SR 25 by building a new parallel facility.

**TABLE 9—Level of Service Summary – Year 2030 Volumes, “No-Build” Condition**

Existing Section of Existing SR 25	Proposed Traffic Volume (AADT)	Level of Service
I-65 to CR 450N	24,100	B
CR 450N to SR 225	18,100	E
SR 225 to Grant Road	15,100	E
Grant Road to Co. Line	12,000	D
<b>CARROLL COUNTY</b>		
Co. Line to US 421	10,500	D
US 421 to Main St. (Delphi)	11,200	D
Main St. to CR 300N	9,200	D
CR 300N to SR 218	7,300	D
SR 218 to Co. Line	5,100	C
<b>CASS COUNTY</b>		
Co. Line to CR 400S	5,800	C
CR 400S to CR 300S	6,200	C
CR 300S to CR 200S	6,600	C
CR 200S to US 24	7,300	D

AADT = Annual Average Daily Traffic.

NOTE: Shaded rows indicate roads operating at unacceptable levels of service.

An intersection capacity analysis of the six intersections was performed using year 2030 AM and PM peak-hour traffic. Four intersections were found to have service level problems for this traffic scenario: SR 25/ I-

65 northbound (LOS D, AM peak hour), SR 25/CR 300N (LOS D, AM peak hour), SR 25/US 421 North (LOS D, PM peak hour) and South (LOS F, AM and PM peak hour), and US 24/US 35/SR 29 (westbound left-turn, LOS F, AM and PM peak hour). The unsignalized intersection (US 24 / US 35 / SR 29) can reach an acceptable level of service through the installation of a traffic signal. Left-turn-lane additions are necessary for the intersections of SR 25 / CR 300N, and SR 25 / US 421 North and South, to attain an acceptable level of service. Table 10 summarizes the intersection capacity analyses.

**TABLE 10—Intersection Level of Service Summary – Year 2030 Volumes, “No-Build” Condition**

Intersection With Existing SR 25	AM Peak Hour			PM Peak Hour		
	LOS	Avg. Delay (sec.)	v/c	LOS	Avg. Delay (sec.)	v/c
SR 25/I-65 SB	B	15	0.82	C	21	0.94
SR 25/I-65 NB	D	38	1.02	C	20	0.92
SR 25/CR 300N	D	31	0.93	B	14	0.81
SR 25/US 421N	C	19	0.78	D	32	0.92
SR 25/US 421S	F	*	*	F	*	*
US 24/US 35/SR 29						
Unsignalized	B (WB left-turn, F)			B (WB left-turn, F)		
Signalized	B	10	0.36	B	10	0.48

v/c = volume/capacity, i.e., a comparison of the traffic volume to the theoretical capacity of the roadway/travel lane based on the roadway geometry/assumptions made. \* = v/c ratio greater than 1.0; delay could not be calculated.

Note: Average delay was not evaluated for unsignalized intersections.

#### 7.5 Years 2010 and 2030 Traffic Volumes and Level of Service: Preferred Alternative

In the design year 2030, traffic volumes on the new road are projected to range from 4,600–22,500 vpd with Preferred Alternative 2. LOS A is projected in all areas except between I-65 and SR 225 in Tippecanoe County, where the highest traffic volumes (22,500–18,100 vpd) and LOS B are projected (see Table 11). Residual traffic on existing SR 25 will range from 2,400–6,500 vpd, with the LOS ranging from A to C. Between Delphi and Logansport, Alternative 2 will incorporate the existing roadway for most of the distance. Therefore, the volume of residual traffic on the existing road will be “0,” as shown on Table 11.

**TABLE 11—Years 2010 and 2030 Traffic Volumes and Level of Service: Preferred Alternative**

Preferred Alternative 2 (OWA1-PCA1-PEA-YLA)	2010						2030					
	No-Build Traffic Existing SR 25	LOS	Traffic on Alternative	LOS	Residual Traffic Existing SR 25	LOS	No-Build Traffic Existing SR 25	LOS	Traffic on Alternative	LOS	Residual Traffic Existing SR 25	LOS
<b>TIPPECANOE COUNTY</b>												
I-65 to CR 450N	24,100	B	18,700	B	5,400	A	29,000	C	22,500	B	6,500	A
CR 450N to SR 225	18,100	E	14,000	A	4,100	C	23,400	E	18,100	B	5,300	C
SR 225 to Grant Road	15,100	E	13,000	A	2,100	B	17,600	E	15,100	A	2,500	B
Grant Road to Co. Line	12,000	D	9,700	A	2,300	B	15,100	E	12,200	A	2,900	C
<b>CARROLL COUNTY</b>												
Co. Line to US 421	10,500	D	6,300	A	4,200	C	16,000	E	9,600	A	6,400	C
US 421 to Main St. (Delphi)	11,200	D	8,900	A	2,300	B	11,700	D	9,300	A	2,400	B
Main St. to CR 300N	9,200	D	7,100	A	2,100	A	11,700	D	9,300	A	2,400	A
CR 300N to SR 218	7,300	D	7,000	A	300	A	8,600	D	8,100	A	500	A
SR 218 to Co. Line	5,100	C	5,100	A	0	N/A	6,500	C	6,500	A	0	N/A
<b>CASS COUNTY</b>												
Co. Line to CR 400S	5,800	C	5,800	A	0	N/A	8,100	D	8,100	A	0	N/A
CR 400S to CR 300S	6,200	C	6,200	A	0	N/A	8,100	D	8,100	A	0	N/A
CR 300S to CR 200S	6,600	C	4,200	A	2,400	A	8,100	D	5,100	A	3,000	A
CR 200S to US 24	7,300	D	4,600	A	2,700	A	8,100	D	5,100	A	3,000	A

## 8.0 CRASH DATA AND ANALYSIS

The existing two-lane road fails to meet current design standards along most of the length, with substandard shoulder width, roadside clearances, and vertical alignment among the main deficiencies. INDOT's geometric design criteria for rural, multi-lane arterials (new construction/reconstruction) specifies that usable shoulder width should be 11 feet, of which 10 feet should be paved and that roadside ditches should be traversable (3:1 or flatter) if not recoverable (4:1 or flatter). In addition, substandard vertical curves occur throughout the project length, but are most frequent in the western segment from Lafayette to Delphi, where over one third of the vertical alignment is substandard with respect to INDOT standards for stopping sight distance.

Vehicle mix is another concern. SR 25 is the major commercial corridor for the study area. Heavy vehicles (i.e., large trucks, farm vehicles, buses) make up 15 to 20 percent of the existing traffic along SR 25 between Lafayette and Logansport (see Table 6, page 5). Large trucks and farm vehicles entering and exiting industrial sites, commercial establishments, and farm businesses create conflict points with the high-speed mainline traffic. The poorer acceleration characteristics of trucks, farm equipment, and buses, in combination with the limited number of passing zones in some locations, contribute to high risk passing maneuvers. At-grade railroad crossings on existing SR 25 and on numerous public crossroads in the project corridor between Lafayette and Logansport present conflicts between vehicles and trains, and can cause delays. The parallel Norfolk Southern railroad averages about 41 trains per day.

Access to the existing SR 25 roadway is controlled by drive permit, the lowest level of access control. This 33-mile-long section of SR 25 has 81 at-grade public street intersections, three at-grade railroad crossings, and approximately 145 private entrances. In addition there are at-grade railroad crossings on numerous public crossroads that provide access to existing SR 25. AASHTO's *Highway Safety Design and Operations Guide 1997* states that "access control is one of the most significant factors in the safe, efficient operation of a highway." Reducing the number of drive access points and at-grade railroad crossings and access points would reduce delays in travel time and improve safety within this corridor.

Traffic crash data indicates that numerous crashes occur at the at-grade intersections and private entrances, all but a few of which are unsignalized and have stop control for crossroad approaches. Signalization along the existing roadway occurs at SR 25 and the I-65 interchange ramps, SR 25 at Tippecanoe CR 300N, and at both SR 25 (Main Street) intersections with US 421/SR 39/SR 18 in Delphi. To determine if there are segments along existing SR 25 with high rates of crashes, crash data was obtained using the INDOT and Indiana State Police databases for the four-year period 1995-1998. This data was analyzed for determining statewide injury and fatal crash rates by type of roadway.

Results of the analysis, summarized in Tables 12 and 13, aside, show that SR 25, compared to similar facilities (Rural Arterials) in Indiana, has a higher than average rate of injury crashes occurring between Lafayette and Delphi and a slightly higher rate of fatal crashes occurring between Delphi and Logansport. The injury crash rate for Lafayette to Delphi (61.16) is higher than that for the state (51.88), while the same rate for the segment from Delphi to Logansport (35.24) is lower than the statewide rate (51.88). However, the fatal crash rate for the segment from Delphi to Logansport (2.25) is higher than the statewide rate (1.99), while that rate for Lafayette to Delphi is lower, at 1.52.

TABLE 12—Traffic Crash Summary (1995 to 1998)

Location	No. Fatal Crashes	No. Injury Crashes
Lafayette to Delphi	3	121
Delphi To Logansport	3	47
Corridor Total	6	168

TABLE 13—Crash Rate Comparison

Location	Fatal Crash Rate	Injury Crash Rate
Other Principal Arterials <sup>(1)</sup>	1.99	51.88
SR 25: Lafayette to Delphi <sup>(2)</sup>	1.52	61.16
SR 25: Delphi to Logansport <sup>(2)</sup>	2.25	35.24
Indiana Statewide Average: Rural Roads <sup>(1)</sup>	1.72	60.78

Fatal Crash and Injury Crash rates are the number of fatal/injury crashes per 100 million vehicle miles of travel.

(1) Source: INDOT, 1997 *Motor Vehicle Fatalities and Rates*

(2) Source: INDOT, 1995-1998 Accident Statistics

To improve safety and meet current design standards, existing SR 25 would need to be reconstructed to the AASHTO and INDOT design standards, as detailed in the INDOT *Design Manual for Rural Arterials – New Construction/Reconstruction for a New Roadway*, and AASHTO's publication, *A Policy on Geometric Design of Highway and Streets*. The standards relate to such factors as traveled-way and shoulder widths, horizontal and vertical geometry, stopping and intersection sight distances (SSD and ISD) roadside clearance, intersection access control, etc. Alternatives were evaluated to determine their ability to comply with all current roadway design standards and improve safety by reducing conflicts including railroad crossings, intersections with public crossroads, and access to/from private drives.

## 9.0 DISCUSSION OF ALTERNATIVES

### 9.1 Development of Corridors

As a first step in developing and evaluating build alternatives, the project team identified several broad corridors that 1) would best meet the project's purpose and need while minimizing adverse effects, and 2) could contain one or more build alternatives that, from an engineering standpoint, would be feasible to construct. The corridors were approximately 1,000 to 2,000 feet wide and spanned the length of the study area. For ease of reference, each corridor was assigned a color—Orange, Purple, Teal, Red, and Yellow. Connectors, colored Black, were also developed to create logical links between the corridors. Once the corridors had been screened for their ability to meet the project's purpose and need and avoid Section 4(f) resources, the preliminary alternative alignments within the corridors advanced for further analysis were modified and refined for detailed evaluation and comparison of alternative routes.

### 9.2 Development of Build Alternatives

It was recognized that, within any of the corridors surviving the initial screening, there were many environmentally sensitive areas, home sites, businesses, cultural resources, etc., that could be avoided with a judiciously placed 300-foot-wide right-of-way—which would approximate the right-of-way for the proposed multilane divided roadway in level terrain. Therefore, 300-foot-wide build alternative alignments were developed within the broad corridors for detailed evaluation. Information from preliminary design work, technical studies, coordination with regulatory

agencies, and public input was used to identify alignments that would be both constructible and responsive to social, economic, and environmental constraints/concerns.

For ease of reference and analysis, the overall project corridor was divided into four major segments—Western, Central, Eastern, and Logansport. In each segment, two or more 300-foot-wide build alternatives were identified. Alignments within one segment could connect to those in preceding and following segments to form a variety of build alternatives extending the full length of the project—from Lafayette to Logansport.

Following the analysis of design considerations and environmental constraints, several preliminary alignments were eliminated. The remaining alignments within each of the four major segments were combined, in all ways feasible, to form four build alternatives that extend from the western terminus at the I-65 interchange to the eastern terminus at US 24. The following feasible alternatives are the subjects of the discussion in the remainder of this document. (The reader may refer to the Environmental Impact Statement for an expanded discussion of alternatives' development and assessment.)

### 9.2.1 No-Build Alternative

Under the No-Build Alternative INDOT would not reconstruct or relocate SR 25 between Lafayette and Logansport. Routine maintenance and repairs would continue to be made on existing SR 25. Traffic volumes, characteristics, and development inside and outside the project area will change. Normal growth in the area would contribute to increases in traffic volumes and a worsening of existing problems. Under the No-Build Alternative, interruptions to traffic flow would increase, passing opportunities would decrease, levels of service (LOS) would deteriorate, congestion and accident risk would increase, and overall roadway conditions would worsen. In addition, the No-Build Alternative would leave the final link in the Lafayette to Fort Wayne section of the Hoosier Heartland Highway as a substandard, two-lane roadway tying into an interstate (I-65) at its western terminus and the improved, four-lane US 24 at its eastern terminus. The No-Build Alternative would not meet the stated purpose and need for the project, i.e., to improve the transportation network, reduce congestion, increase capacity, and improve safety between Lafayette and Logansport.

### 9.2.2 Build Alternatives

The build alternatives identified below and shown on Figure 2, pages 10–13, were formed by combining one alignment from each of the four segments developed for purposes of the preliminary analyses.

Name	Combination	Length (in Miles)	Estimated Cost
Alternative 1	O-WA + P-CA1 + P-EA + Y-LA	35.3	\$219 million
Alternative 2	O-WA1 + P-CA1 + P-EA + Y-LA	35.3	\$225 million
Alternative 3	O-WA + P-CA2 + P-EB + Y-LB	35.2	\$213 million
Alternative 4	O-WA1 + P-CA2 + P-EB + Y-LB	35.3	\$218 million

From among these four build alternatives, **Alternative 2** was identified by INDOT as the Preferred Alternative following the issuance of the DEIS in August 2002 and requisite public hearing and comment period. **Alternative 2** is described below, by corridor segment, and depicted on the exhibits following the text of this report. (Refer to the attached conceptual drawings showing **Alternative 2** in the form of topographic maps, plan view sheets, profile view sheets, and aerial base photographs, pages W1–W 59, C1–C40, E1–E54, and L1–L21.) Table 14, aside, shows the beginning and ending stations and length of each of the four corridor segments. Table 15, page 9, compares the impacts of the no-build and preferred build alternatives.

**Table 14—Section Limits: SR 25 Preferred Alternative**

	Station Meters	Crossing	Length		
			Meters	Feet	Miles
Western Section	0+450	CR 500E / HHH (SR 25) & RR	18,681	61,289	11.61
	19+131	Existing SR 25 Connector			
Central Section	19+000	CR 200N / HHH	13,571	44,524	8.43
	32+571	CR 500W / HHH			
Eastern Section	32+000	North Walnut St. / HHH	18,000	59,055	11.18
	50+000	CR 325W / HHH & RR			
Logan. Section	50+200	HHH / Existing SR 25 & RR	6,500	21,325	4.04
	56+700	HHH / SR 29			
<b>TOTALS</b>			<b>56,752</b>	<b>186,193</b>	<b>35.26</b>
<p>NOTE: Due to combining of various alternatives the station equations listed below were used at the match line of each section.</p> <p>19+131 Back (Western Segment) = 19+000 Ahead (Central Segment)            32+571 Back (Central Segment) = 32+000 Ahead (Eastern Segment)            50+000 Back (Eastern Segment) = 50+107.60 Ahead (Logansport Segment)</p>					

#### Western Segment

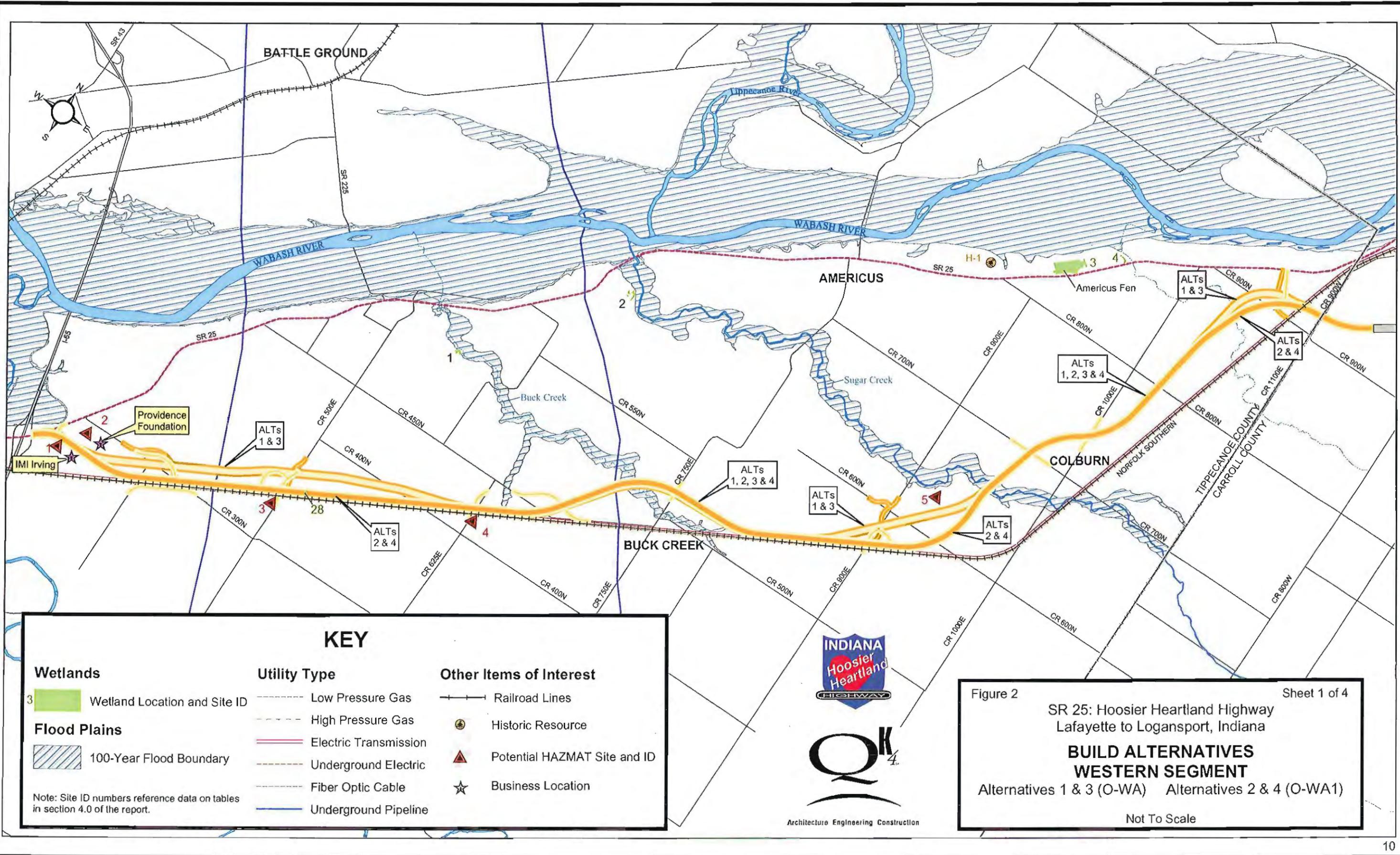
In this segment of the project corridor, alignments O-WA and O-WA1 were advanced for detailed analysis in the DEIS. Essentially, OWA separated the mainline from the Norfolk Southern railroad track by 1,000 feet while OWA-1 reduced this separation to 150 feet. O-WA1 was identified by INDOT as the preferred alignment. The alignment's western terminus begins immediately east of the intersection of existing SR 25 and the I-65 northbound exit/entrance ramps, and heads east to traverse the north and northwest edges of a limestone quarry's gravel stockpile area. The alternative next traverses a portion of the former Aretz airstrip property now owned by the Providence Foundation, and then continues east adjacent to and paralleling the Norfolk Southern railroad track. The alignment crosses Tippecanoe CR 400E and CR 300N. The assessment of access to CR 300N and CR 400E is ongoing. Three optional treatments have been developed, as illustrated on Exhibit sheets W-5 – W-8. The Preferred Alternative continues eastward adjacent to the track, providing a one-quadrant interchange (grade separation with a single connector roadway ramp) with CR 500E, a grade separation with CR 625E (with indirect access to the mainline via CR 450N), and an at-grade intersection with CR 450N. Passing north of the community of Buck Creek, the alignment crosses Buck Creek and provides an at-grade intersection with CR 750E. The alignment rejoins the railroad right-of-way and provides a one-quadrant interchange (grade separation with a single connector roadway ramp) with CR 900E. It then turns northward, away from but still more-or-less parallel to the railroad right-of-way, and crosses CR 600N, which would not have direct access to the mainline. The alignment next crosses Sugar Creek, and passes to the west of Colburn, providing an at-grade intersection with CR 700N and grade separation with CR 1000E. The alignment next crosses CR 800N, which would not have direct access to the mainline, and CR 900N, which would be grade separated with the new mainline road. A new connecting road (local service road) links existing SR 25 to the new alignment. The mainline then crosses the railroad and CR 900W whereupon it enters Carroll County. CR 900W remains open but will not have direct access to the new SR 25.

**Table 15—Comparative Impacts Summary: No-Build Alternative and Preferred Build Alternative (Alternative 2)**

DEIS Section	Impacts	No-Build Alternative	Build Alternative—Preferred Alternative 2 O-WA1+P-CA1+P-EA+Y-LA
	Length (miles)	0	35.26
	Estimated project cost	0	\$225 million
4.1	Land use—Additional acres of ROW to be acquired (by use):		
	Agricultural (cultivable + uncultivated, in 4.2, below)	0	1,171
	Residential/Rural Residential	0	267
	Commercial/Industrial	0	90
	Institutional	0	1
	Total acres	0	1,529
	Total number of parcels	0	309
4.2	Farmland impacts:	No effect	
	Number of parcels of 20+ cultivable acres from which ROW would be acquired (i.e., farm parcels severed)		142
	Cultivable (20+ acres) farmland acres in ROW	0	1,001
	Uncultivated (incl. riparian, forest, wetlands) farmland acres in ROW	0	170
	Prime/Unique Farmland acres in ROW	0	834.6
	Statewide + Local Important Farmland acres in ROW	0	11
	Mitigation discussion required?	No	No
4.3	Social:		
	Travel time, community access, etc.	Road deficiencies, traffic, slow travel time, increase costs and reduce ease, safety of local/regional access.	Improves travel time and costs, improves area/regional access.
	Crossroads closed to through traffic at new SR 25	0	16
	Railroad crossings eliminated	0	16 (plus 3 open to provide access to adjacent property, only)
	Special groups/unique communities	No effect	No impact. (Alignment is not near local German Baptist Community.)
4.4	Relocations / displacements:		
	Residential	0	26 single-family; 2 duplexes (30 households)
	Commercial	0	5
	Institutional	0	1
4.5	Economic	Increased traffic, reduced road capacity impair development potential, increase travel cost.	Improved travel time, safety, and local/regional access increase development potential and employment opportunities. Provides added access to Delphi, improved access to Logansport.
4.6	Joint development	No change.	Possible trail development in Delphi
4.7	Pedestrians and bicyclists (trails crossed)	0	Crosses 3 bike routes sharing road ROW: access maintained on all. Crosses 3 proposed hiking trails not open to public: access could be maintained. No Section 4(f) involvement.
4.8	Air quality	Some reduction in quality over time.	Steadying traffic flow by reducing number of access points and railroad crossings would reduce vehicle-related pollutants. No exceedance of standards projected.
4.9	Noise	Noise levels increase as traffic volume increases and road capacity is exceeded. Increase at one NRHP-eligible resource.	Notable decrease in noise along existing SR 25 at all but one monitored site near I-65, where minimal (3 dBA) increase over existing/No-Build is projected.
4.10	Energy	No effect.	Major one-time energy resources demand. Improved access, travel time, safety make operational costs less than or equivalent to No-Build.
4.11	Water quality, related impacts:		
	Stream crossings (incl. Intermittent)	0	43
	Bridges (Stream / Railroad/ Highway)	0	7 / 11 / 9
	Length of stream impact (feet)	0	8,871 major / minor + 8,694 Intermittent
	General Impacts	No change in existing conditions.	Possible short-term increase in stream sedimentation, groundwater turbidity during construction. Roadway pollutants introduced along new alignment. Grass swales, pipes proposed.
4.12	Wetland areas within ROW (acres)	0	2.68
4.13	Permits	None	USACE 404, IDEM 401, IDNR Construction in a Floodway
4.14	Water body modifications/wildlife	No effect	Wildlife habitat impacts = 170 acres (uncultivated agricultural land/riparian/wetland/forest areas).
4.15	Endangered species	No effect	Indiana bats captured on Sugar Creek and habitat exists through project corridor.
4.16	Floodplains (acres)	0	25
4.17	Wild and scenic rivers	None in area	None in area
4.18	Potential Hazardous Materials sites	No effect	11
4.19	Visual	No effect	Pleasant view from the road through rural areas. Visual impacts to cultural resources (see 4.21 below).
4.20	Construction	No effect	Temporary dust, noise, traffic delays, water quality impacts.
	Cultural resources		
4.21	Archaeological resources (NRHP eligible / listed)	No effect	34 sites and 2 floodplain areas recommended for avoidance/further testing [SHPO and FHWA determinations pending]
	Historic properties (eligible for / listed on NRHP)	Increase over existing noise level at an NRHP-eligible resource.	Visual impact to NRHP-listed Rural Historic District and 3 eligible resources.
	NOTE: Section 106 coordination on-going. No 4(f) involvement.		
4.22	Long-term impacts	Would not improve accessibility, safety, travel time, economic development potential.	Completes a link in the Hoosier Heartland Industrial corridor and enhances long-term productivity for the area and region.

**Abbreviations Key:**

- 4.2: ROW = Right-of-way
- 4.7 Section 4(f) = A section of the Department of Transportation Act (1966) requiring avoidance of certain resources (such as public parks and recreational areas, historic and archaeological sites, wild and scenic rivers, or wildlife management areas) when a feasible alternative is possible.
- 4.9 NRHP = National Register of Historic Places
- 4.13 USACE = U.S. Department of the Army, Corps of Engineers IDEM = Indiana Department of Environmental Management IDNR = Indiana Department of Natural Resources
- 4.21 Section 106 = A section of the National Historic Preservation Act (1966), as amended, requiring the federal government to "take into account" the effect of its proposed actions on archaeological and historic resources before making project decisions.

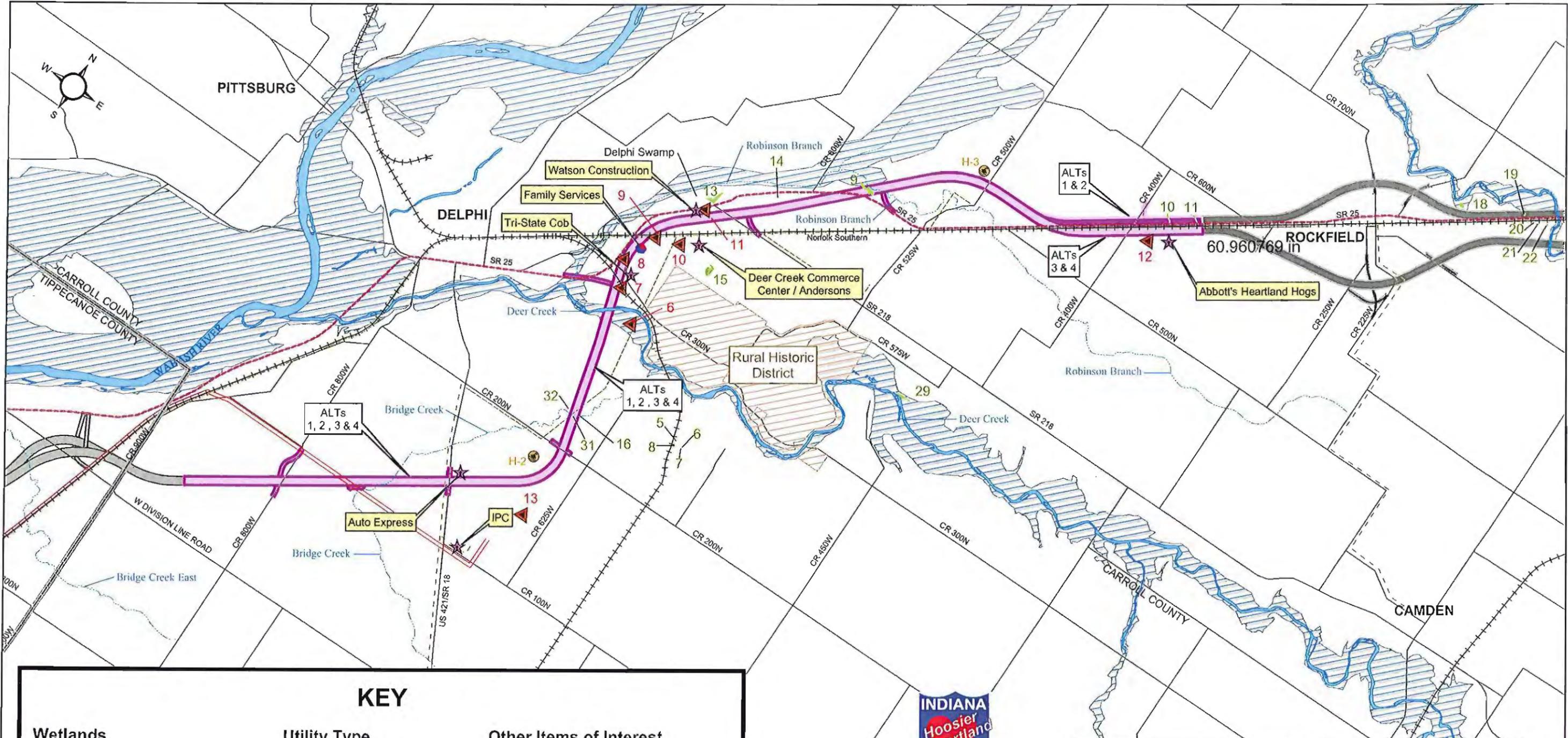


**KEY**

- |  |   |   |
|--|---|---|
| <p><b>Wetlands</b></p> <p>3  Welland Location and Site ID</p> <p><b>Flood Plains</b></p> <p> 100-Year Flood Boundary</p> <p>Note: Site ID numbers reference data on tables in section 4.0 of the report.</p> | <p><b>Utility Type</b></p> <p> Low Pressure Gas</p> <p> High Pressure Gas</p> <p> Electric Transmission</p> <p> Underground Electric</p> <p> Fiber Optic Cable</p> <p> Underground Pipeline</p> | <p><b>Other Items of Interest</b></p> <p> Railroad Lines</p> <p> Historic Resource</p> <p> Potential HAZMAT Site and ID</p> <p> Business Location</p> |
|--|---|---|

Figure 2  
 SR 25: Hoosier Heartland Highway  
 Lafayette to Logansport, Indiana  
**BUILD ALTERNATIVES  
 WESTERN SEGMENT**  
 Alternatives 1 & 3 (O-WA) Alternatives 2 & 4 (O-WA1)  
 Not To Scale





**KEY**

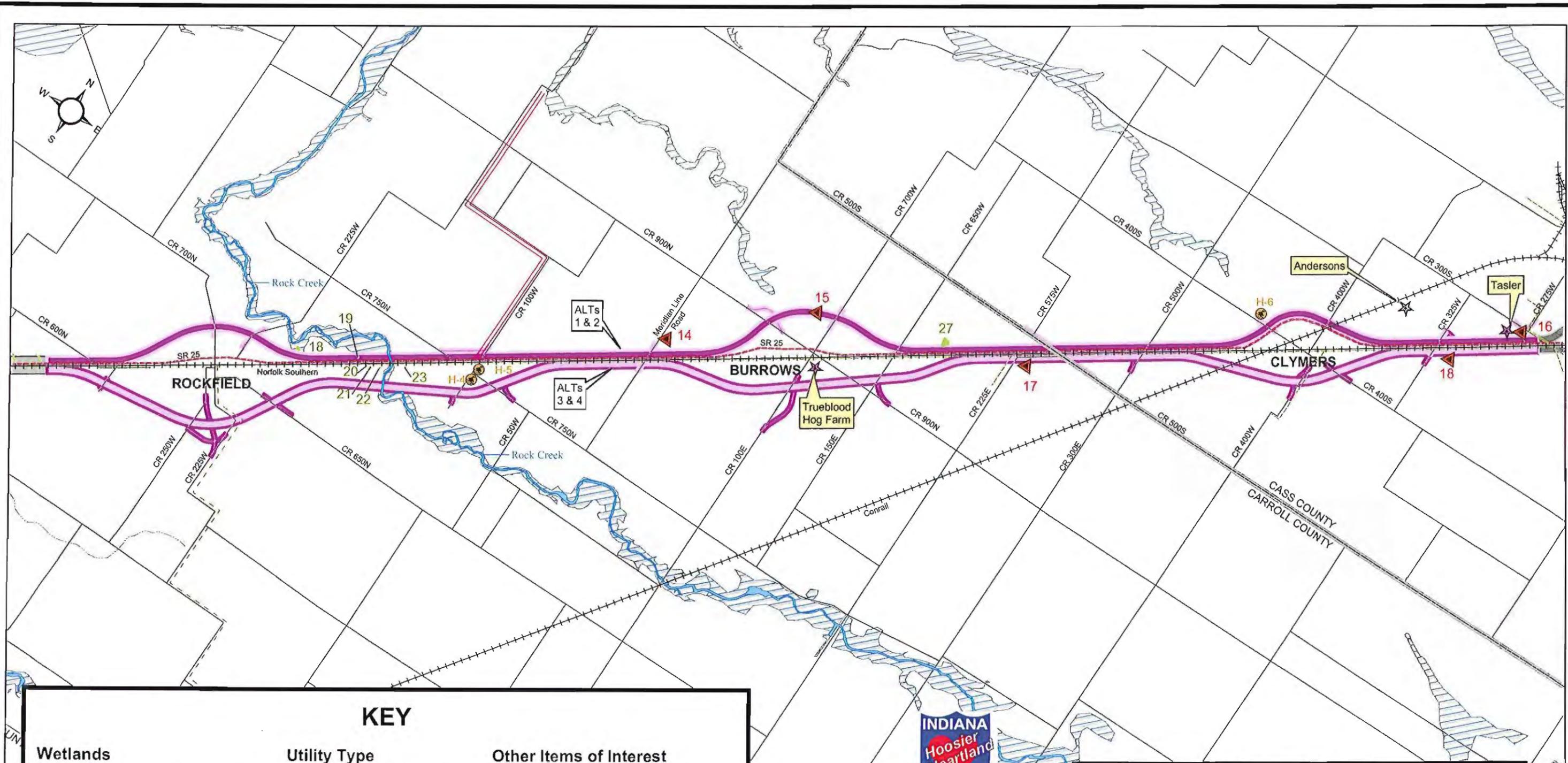
<p><b>Wetlands</b></p> <p>3 <span style="display: inline-block; width: 15px; height: 10px; background-color: #90EE90; border: 1px solid black;"></span> Wetland Location and Site ID</p> <p><b>Flood Plains</b></p> <p><span style="display: inline-block; width: 15px; height: 10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, #ccc 2px, #ccc 4px); border: 1px solid black;"></span> 100-Year Flood Boundary</p> <p><small>Note: Site ID numbers reference data on tables in section 4.0 of the report.</small></p>	<p><b>Utility Type</b></p> <p>----- Low Pressure Gas</p> <p>----- High Pressure Gas</p> <p>==== Electric Transmission</p> <p>----- Underground Electric</p> <p>----- Fiber Optic Cable</p> <p>==== Underground Pipeline</p>	<p><b>Other Items of Interest</b></p> <p>---+--- Railroad Lines</p> <p><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; border-radius: 50%;"></span> Historic Resource</p> <p><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; transform: rotate(45deg);"></span> Potential HAZMAT Site and ID</p> <p>★ Business Location</p> <p><span style="display: inline-block; width: 10px; height: 10px; background-color: #0000FF; border-radius: 50%;"></span> Government Services</p>
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Architecture Engineering Construction

Sheet 2 of 4

Figure 2  
 SR 25: Hoosier Heartland Highway  
 Lafayette to Logansport, Indiana  
**BUILD ALTERNATIVES**  
**CENTRAL SEGMENT**  
 Alternatives 1 & 2 (P-CA1) Alternatives 3 & 4 (P-CA2)  
 Not To Scale



**KEY**

<p><b>Wetlands</b></p> <p>3  Wetland Location and Site ID</p> <p><b>Flood Plains</b></p> <p> 100-Year Flood Boundary</p> <p>Note: Site ID numbers reference data on tables in section 4.0 of the report.</p>	<p><b>Utility Type</b></p> <p> Low Pressure Gas</p> <p> High Pressure Gas</p> <p> Electric Transmission</p> <p> Underground Electric</p> <p> Fiber Optic Cable</p> <p> Underground Pipeline</p>	<p><b>Other Items of Interest</b></p> <p> Railroad Lines</p> <p> Historic Resource</p> <p> Potential HAZMAT Site and ID</p> <p> Business Location</p>
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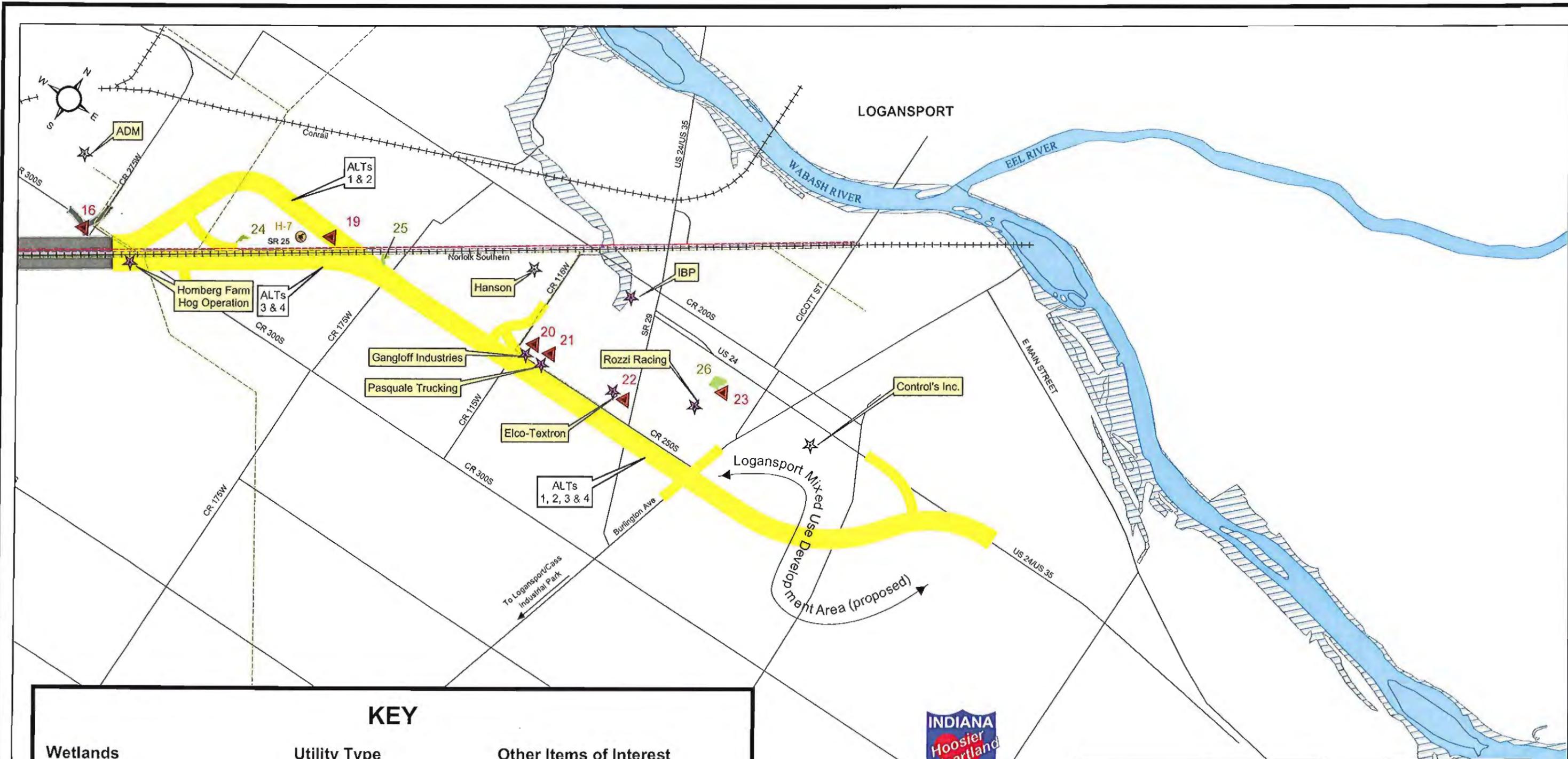
Figure 2 Sheet 3 of 4

SR 25: Hoosier Heartland Highway  
Lafayette to Logansport, Indiana

**BUILD ALTERNATIVES  
EASTERN SEGMENT**

Alternatives 1 & 2 (P-EA) Alternatives 3 & 4 (P-EB)

Not To Scale



**KEY**

<p><b>Wetlands</b></p> <p>3  Wetland Location and Site ID</p> <p><b>Flood Plains</b></p> <p> 100-Year Flood Boundary</p> <p><small>Note: Site ID numbers reference data on tables in section 4.0 of the report.</small></p>	<p><b>Utility Type</b></p> <p> Low Pressure Gas</p> <p> High Pressure Gas</p> <p> Electric Transmission</p> <p> Underground Electric</p> <p> Fiber Optic Cable</p> <p> Underground Pipeline</p>	<p><b>Other Items of Interest</b></p> <p> Railroad Lines</p> <p> Historic Resource</p> <p> Potential HAZMAT Site and ID</p> <p> Business Location</p>
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Architecture Engineering Construction

Figure 2  
 SR 25: Hoosier Heartland Highway  
 Lafayette to Logansport, Indiana  
**BUILD ALTERNATIVES  
 CENTRAL SEGMENT**  
 Alternatives 1 & 2 (Y-LA) Alternatives 3 & 4 (Y-LB)  
 Not To Scale

### Central Segment

In this segment of the project corridor, alignments P-CA1 and P-CA2 were advanced for detailed analysis in the DEIS. (P-CA1 and P-CA2 have a common alignment until one-half mile east of CR 500W, where P-CA2 crosses existing SR 25 and Norfolk Southern railroad to connect with the P-EB alignment south of the railroad in the Eastern Segment.) P-CA1 was identified by INDOT as the preferred alignment. This section of the preferred alignment connects with O-WA1 and continues in a northeasterly direction, providing an at-grade intersection with Carroll CR 800W and US 421 (SR 18, SR 39) and crossing Bridge Creek midway between those two roads. The alignment turns to the north and intersects CR 200N, which overpasses new SR 25. It again crosses Bridge Creek, and then crosses Deer Creek west of the High Bridge area and the Deer Creek Valley Rural Historic District. After the Deer Creek crossing the alignment crosses the abandoned Monon Railroad and overpasses CR 300N, which will not have a direct connection to the new SR 25. However, connection will be made in that vicinity between the new SR 25 and the existing SR 25/Main Street via construction of a local access (service) road, intersecting the new mainline 800 feet east of Deer Creek. The alignment continues north, traversing the western edge of the Deer Creek Commerce Center property, west of The Andersons Grain Mill, and crosses over the Norfolk Southern railroad before turning to the northeast to align parallel to and south of existing SR 25 to just east of CR 600W, where it crosses existing SR 25. A new connector creates an at-grade intersection with SR 218, extending to existing SR 25. Another new connector creates an at-grade intersection with the mainline linked to existing SR 25 0.7 mile east of CR 600W. The alignment continues in the northeasterly direction, crossing CR 500W, which will overpass the new mainline road, and then curves to the east to adjoin the railroad right-of-way and cross CR 400W, which will not have direct access to the new SR 25. This segment terminates east of CR 400W.

### Eastern Segment

In this segment of the project corridor, alignments P-EA and P-EB were advanced for detailed analysis in the DEIS. P-EA is on the north side of the Norfolk Southern railroad and P-EB is south of the railroad. P-EA was identified by INDOT as the preferred alignment. From the terminus of the P-CA1 alignment in Carroll County to CR 300S in Cass County, the Preferred Alternative uses the existing SR 25 right-of-way, except where the alignment curves to pass north of Rockfield, Burrows, and Clymers. From west to east, the new road crosses Carroll CR 600N, which would have, by way of a connector (LSR), an at-grade intersection with the new mainline road; and Walnut Street, which would be grade-separated with the mainline; and CR 250W, which would be provided an at-grade intersection. Just east of Rockfield, the new road crosses Rock Creek. It then encounters CR 750N and CR 100W, which would be denied direct access at the new road but be connected to each other via construction of a section of local service road. Continuing eastward, the Preferred Alternative provides a grade separation to carry Meridian Line Road over the new road and the railroad. Passing north of Burrows, at-grade intersections are proposed on the mainline with CR 900N and CR 100E. East of Burrows the Preferred Alternative crosses CR 150E, which would not have direct access to the mainline; and CR 500S, on the Carroll-Cass County line, where a grade separation is proposed to carry the crossroad over the new mainline road and the railroad. Next, the Preferred Alternative crosses CR 500W, which would not have direct access to SR 25. Passing north of Clymers, the alignment provides an at-grade intersection with CR 400S, and then crosses over CR 400W (Main Street) and the Winamac Southern railroad. The local road, CR 400W, would not have direct access to the mainline. The new alignment then bridges over a railroad spur linked to the Norfolk Southern railroad. East of Clymers the alignment provides a grade-separation with CR 325W, thereby carrying the crossroad over the new mainline road and the Norfolk Southern railroad. It also provides an at-grade "T"-intersection with a connector (LSR) to CR 300S. The Eastern Segment terminates just east of this intersection.

### Logansport Segment

In this segment of the project corridor, alignments Y-LA and Y-LB were advanced for detailed analysis in the DEIS. Y-LA and Y-LB shared an alignment except at their western termini, where Y-LA connects to the eastern terminus of P-EA north of the Norfolk Southern railroad, and Y-LB connected to P-EB south of the railroad. Y-LA was identified by INDOT as the preferred alignment. Just east of its connection with P-EA, Y-LA heads north and forms an at-grade "T"-intersection with a new connector to existing SR 25. Y-LA then turns southward to overpass the Norfolk Southern railroad and existing SR 25. It then crosses CR 175W, which will have no direct access to the new SR 25. The alignment then heads eastward to provide an at-grade "T"-intersection with a connector (LSR) to CR 115W, which would be denied direct access to the mainline. The Preferred Alternative parallels CR 250S and continues eastward overpassing SR 29, which would have no direct connection with the new mainline road. The Preferred Alternative provides an at-grade intersection with Burlington Avenue, and then heads northeast overpassing Old Kokomo Pike, with no direct connection to that crossroad. The mainline forms an at-grade "T"-intersection with a new connector to existing US 24/US 35. The Preferred Alternative terminates at its connection with US 24/US 35 east of Old Kokomo Pike.

### 9.2.3 Typical Cross Sections

The new SR 25 mainline typical section (Figure 3, pages 15–16) would have an approximately 300-foot-wide right-of-way (the precise dimension will vary, depending on alignment and terrain features) within which would be two 3.6-meter-wide (12-foot) lanes in each direction separated by a 24-meter-wide (80-foot) depressed median that would include 1.2-meter-wide (4-foot) inside shoulders (paved and usable); a minimum 9-meter-wide (30-foot) outside clear zone containing 3.3-meter-wide (11-foot) usable shoulders, 3.0 meters (10 feet) of which would be paved. The typical section for state routes and high-volume county maintained connecting roads would include two 3.6-meter-wide (12-foot) lanes with 2.4-meter-wide (8-foot) usable outside shoulders, 1.8 meters (6 feet) of which would be paved. (The proposed state-jurisdictional connector from existing US 24/US 35 to the proposed mainline would match the existing prevailing cross-section of US 24/US 35.) Low volume county roads would have two 3.3-meter-wide (11-foot) lanes with 1.8-meter-wide (6-foot) outside usable shoulders of which 1.2 meters (4 feet) would be paved.

### 9.2.4 Design Guidelines: Rural Arterials, New Construction, Table 53-2 INDOT Design Manual

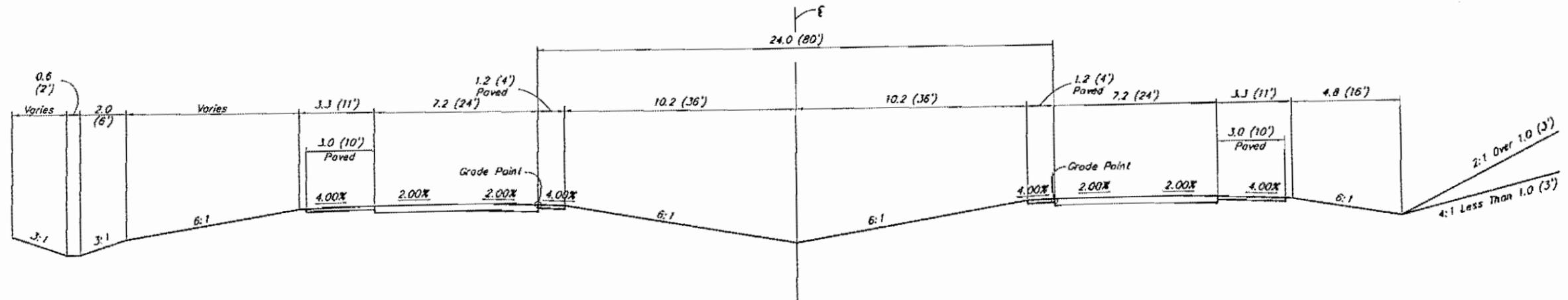
Functional Classification.....	Rural Other Principal Arterial, and an Urban Other Principal Arterial within the Lafayette and Logansport U.A.B.
Design Class.....	4R Multilane Rural Arterial (Ch. 53, Indiana Design Manual)
Type of Terrain.....	Level
Design Speed.....	I-65 interchange to approx. 1,500 ft E of existing SR 25 connector 55 mph; and 70 mph the remainder of the distance to the project's terminus
Access Control.....	Partial (L.A. R/W with breaks at select public roads)
Typical Section (see Fig. 3).....	4-lane divided Two 12-ft through lanes in each direction separated by an 80-ft depressed median
Shoulder Width.....	Inside 4 ft paved and usable; outside 11 ft usable (10 ft of which paved)
AADT (design year 2030).....	Ranges from 29,000 vpd in Lafayette area – 4,400 vpd in Logansport area
Clear Zone.....	34 ft (including shoulders)
Proposed right-of-way widths.....	300 ft (variable)
Additional R/W required and No. of Parcels.....	1,529 ac; 309 parcels
Maintenance of Traffic.....	New alignment—traffic maintained on existing roadway

UPDATE DATE  
LETTING DATE

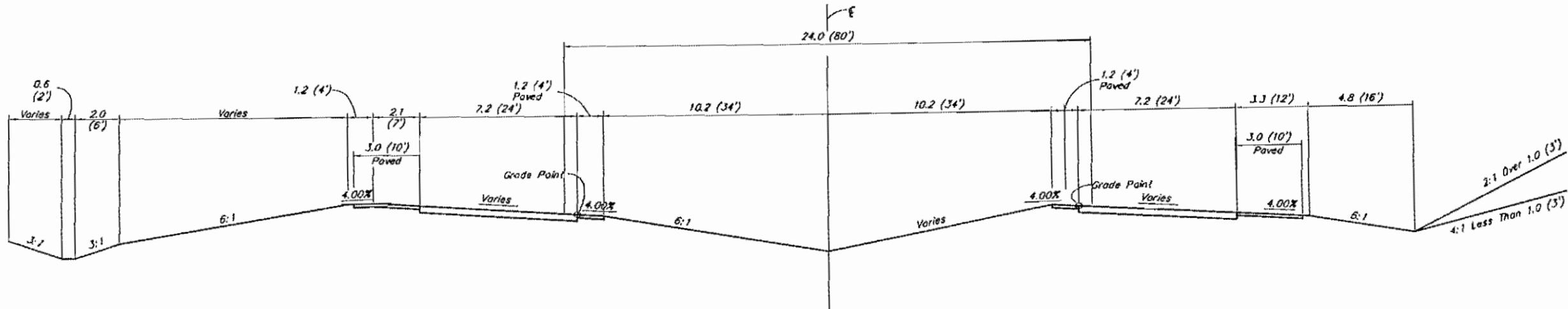
PREPARED BY :  
OK4  
CONSULTING ENGINEERS

DESIGNED BY :  
CHECKED BY :  
DATE 10-04-88  
DATE 10-04-88  
REVISED BY :  
REVISED BY :

TYPICAL CROSS SECTIONS



NORMAL CROSS SECTION



SUPERELEVATED CROSS SECTION

STATE ROAD 25

Figure 3  
TYPICAL CROSS SECTION  
Sheet 1 of 2

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 QK4  
 CONSULTING ENGINEERS

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 BY \_\_\_\_\_

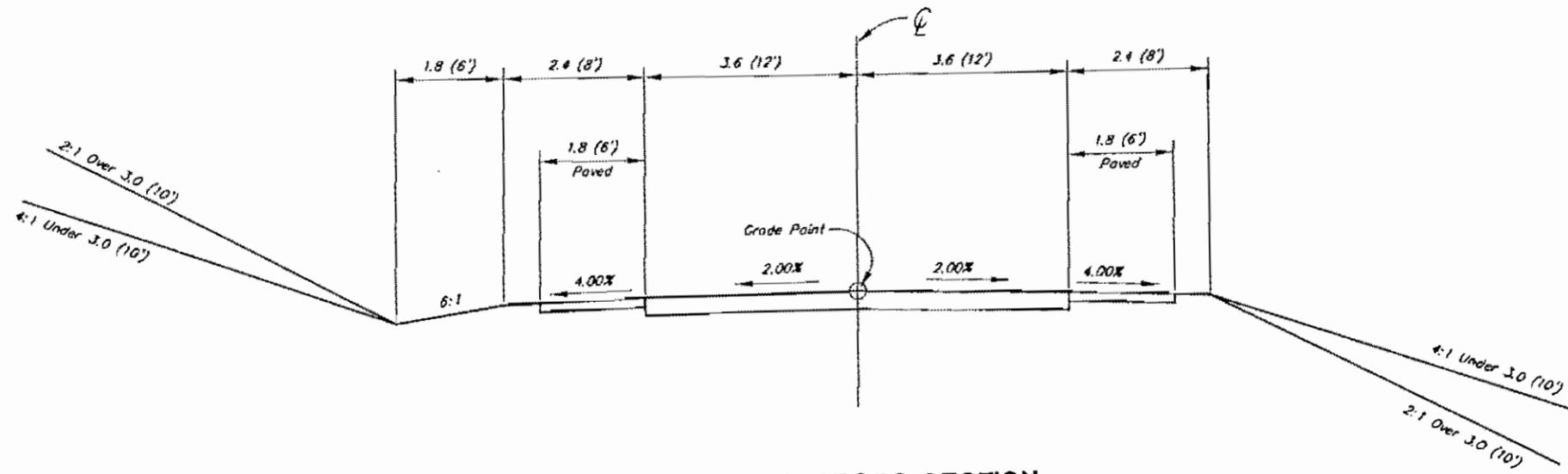
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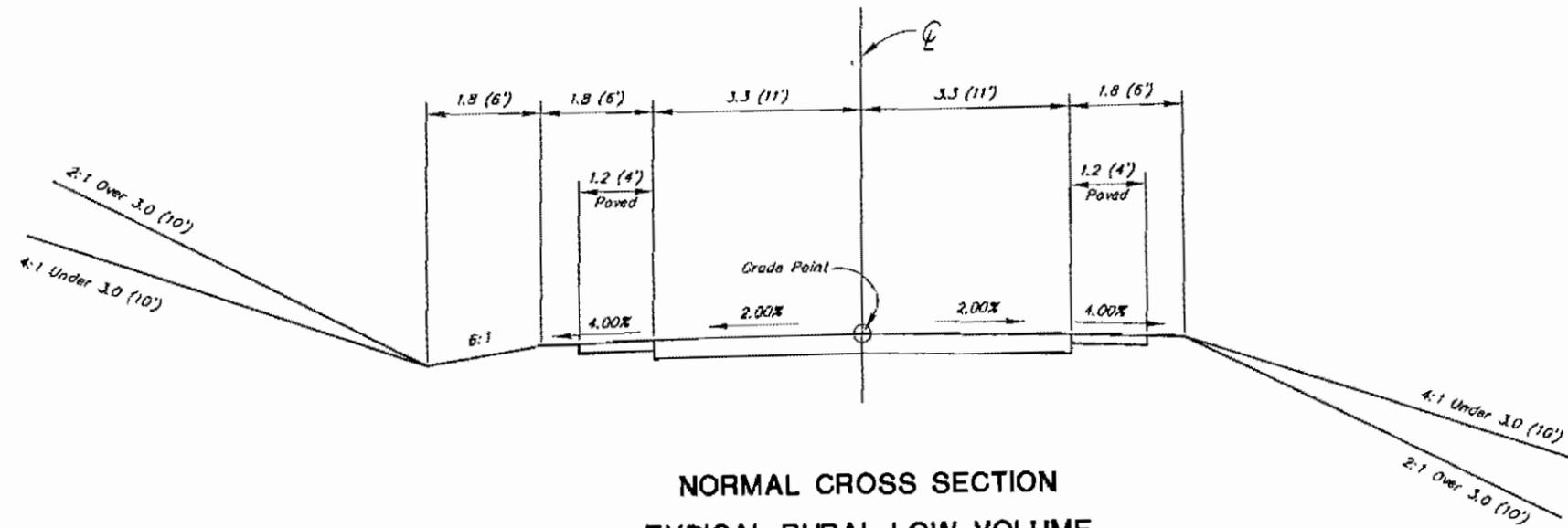
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TYPICAL CROSS SECTIONS



NORMAL CROSS SECTION

TYPICAL RURAL STATE ROAD AND HIGH  
 VOLUME LOCAL ROAD APPROACH



NORMAL CROSS SECTION

TYPICAL RURAL LOW VOLUME  
 LOCAL ROAD APPROACH

Figure 3  
 TYPICAL CROSS SECTION  
 Sheet 2 of 2

### 9.2.5 Proposed Bridges

The following table provides data for the preferred course of action (Alternative 2) on proposed bridge locations, lengths, widths, and cost estimates.

Table 16—Proposed Bridges: SR 25 Preferred Alternative

	Station Meters	Crossing	Length		Width		Cost
			Meters	Feet	Meters	Feet	
Western Section	3+753	CR 500E / HHH (SR 25) & NS Railroad	150.00	500	11.00	37	\$ 1,560,000
	6+250	CR 625E / HHH & NS Railroad	151.00	503	11.00	37	\$ 1,570,000
	8+275	HHH / Buck Creek	75.00	250	24.60	82	\$ 1,740,000
	11+479	CR 900E / HHH & NS Railroad	150.00	500	11.00	37	\$ 1,560,000
	13+450	HHH / Sugar Creek	80.00	267	24.60	82	\$ 1,860,000
	14+834	CR 1000E / HHH	120.00	400	11.00	37	\$ 1,250,000
	16+125	HHH / Creek	80.00	267	24.60	82	\$ 1,860,000
	17+300	HHH / Bridge Creek	100.00	333	24.60	82	\$ 2,320,000
	17+700	HHH / CR 900N	100.00	333	24.60	82	\$ 2,320,000
	18+150	HHH / NS Railroad	100.00	333	24.60	82	\$ 2,320,000
18+450	HHH / CR 900W	80.00	267	24.60	82	\$ 1,860,000	
Central Section	23+452	CR 200N / HHH	120.00	400	11.00	37	\$ 1,250,000
	23+850	HHH / Bridge Creek	120.00	400	24.60	82	\$ 2,790,000
	25+100	HHH / Deer Creek	300.00	1000	24.60	82	\$ 6,970,000
	25+700	HHH / CR 300N	80.00	267	24.60	82	\$ 1,860,000
	26+100	HHH / NS Railroad	80.00	267	24.60	82	\$ 1,860,000
	30+013	CR 500W / HHH	120.00	400	11.00	37	\$ 1,250,000
Eastern Section	34+047	N. Walnut St. / HHH	120.00	400	11.00	37	\$ 1,250,000
	36+225	HHH / Rock Creek	90.00	300	24.60	82	\$ 2,090,000
	40+775	Meridian Line Rd./HHH & NS Railroad	150.00	500	11.00	37	\$ 1,560,000
	44+333	CR 500S / HHH & NS Railroad	190.00	633	11.00	37	\$ 1,970,000
	47+700	HHH / 400W & WS Railroad	140.00	467	24.60	82	\$ 3,250,000
	48+500	HHH / Railroad Spur	80.00	267	24.60	82	\$ 1,860,000
	49+024	CR 325 / HHH & NS Railroad	150.00	500	11.00	37	\$ 1,560,000
Logansport Section	51+800	HHH / Exist. SR 25 & NS Railroad	120.00	400	24.60	82	\$ 2,790,000
	53+900	HHH / SR 29	120.00	400	24.60	82	\$ 2,790,000
	55+500	HHH / Kokomo Pike	110.00	367	24.60	82	\$ 2,560,000

### 9.2.6 Proposed Intersections and Spacing

The following table provides data for the preferred course of action (Alternative 2) on proposed intersection spacing.

Table 17—Intersection Spacing: SR 25 Preferred Alternative

	Intersection	Station	Spacing (Meters)	Spacing (Miles)	SR 25 Alignment	Aux. Turn Lanes				Comments	
						Mainline		Crossroad			
						LF	RT	LF	RT		
Western Section	Start of Project I-65 Ramps	0+450			Tangent					Existing signalized Intersection	
	Exist. SR 25	0+757	307	0.19	Curve	X	X			T-Intersection,	
	CR 500E	3+500	2,743	1.70	Tangent	X	X			T-Intersection	
	CR 450N (Buck Creek)	7+372	3,872	2.41	Tangent	X	X		X	County would prefer overpass here	
	CR 750E (Buck Creek)	8+922	1,550	0.96	Tangent	X	X			Cross Road	
	CR 900E	11+781	2,859	1.78	Tangent	X	X		X	T-Intersection	
	CR 700N	14+027	2,246	1.40	Tangent	X	X			Cross Road	
	Exist. SR 25 Connector	17+944	3,917	2.43	Tangent	X	X	X		T-Intersection	
	Central Section	CR 800W	20+061	2,117	1.32	Tangent	X	X			Cross Road
		US 421	21+995	1,934	1.20	Tangent	X	X	X		Access type under review
Exist SR 25 Connector to Delphi		25+385	3,390	2.11	Tangent	X	X	X	X	T-Intersection	
SR 218		27+257	1,872	1.16	Tangent	X	X		X	Cross Road	
Exist. SR 25 Connector		28+805	1,548	0.98	Tangent	X	X		X	T-Intersection	
Eastern Section	CR 600N Connector	32+104	3,299	2.05	Tangent	X	X		X	T-Intersection	
	CR 250W (Rockfield)	34+575	2,471	1.54	Tangent	X	X		X	Cross Road	
	CR 900N (Burrows)	40+770	6,175	3.84	Tangent	X	X		X	Cross Road	
	CR 100E (Burrows)	41+698	948	0.59	Tangent	X	X			Cross Road -- Overpass may be appropriate here	
	CR 400S (Clymers)	46+902	5,204	3.23	Tangent	X	X			Cross Road	
	CR 300S	49+850	2,948	1.83	Tangent	X	X		X	T-Intersection, heavy truck traffic expected	
	Logansport Section	Exist. SR 25 Connector	50+797	947	0.59	Tangent	X	X		X	T-Intersection
CR 115W		53+038	2,241	1.39	Tangent	X	X		X	T-Intersection, primary onrnce to industrial plant	
Burlington Ave.		54+534	1,497	0.93	Tangent	X	X		X	Access type under review	
US 24 Connector		56+003	1,469	0.91	Curve	X	X			T-Intersection	
Avg. Spacing				1.57							

### 9.2.7 General Instructions to Designer

Refinements to the conceptual plan presented in this Engineer's Report will take place in the subsequent design phase. The designer is instructed to commit attention to these elements, among others: coordination of proposed horizontal alignment with vertical profile gradeline, approach lanes' layout at intersections, mainline and crossroad treatment at railroads, over vs. under issues at grade separations, local service roads (LSR), and pavement removal on vacated road sections. The designer shall monitor any future changes to the proposal in the form of an Addendum to this Engineer's Report possibly relating to railroad crossings and access type at select major crossroads.

## 10.0 COST ESTIMATES

To estimate project costs for each alternative, a number of individual segments were identified and cost estimates were developed for each segment. Costs for the following items were estimated for each individual segment, for basis of estimating cost:

- Crossroads
- Culverts, river and railroad bridges, and other bridges (small creeks, etc.)
- Pavement
- Earthwork (including excavation, embankment, and borrow)
- Land acquisition and relocations

The size and length of bridges and culverts were estimated by examining aerial photos, U.S. Geological Survey quadrangle maps (USGS quad maps), and the road profile. Pavement costs were based on the calculated segment lengths using an assumed pavement section and costs associated with each layer and thickness. Earthwork quantities for the crossroads and mainline were determined by the road profile, typical section, and average end area method.

Costs assigned the first four items were then tallied, per alternative, and an additional cost was added based on a percentage of the subtotal (25 percent of pavement, crossroads, culverts, and other bridges subtotal) to account for items such as guardrails, mobilization, clearing and grubbing, traffic control, etc., that would be required to construct this project. Finally, an additional 15 percent was added to the subtotal to account for contingencies. All cost estimates were then rounded to the nearest \$10,000.

Land acquisition costs were estimated using per-acre prices for farmland. Costs for improvements were estimated based on lump sum amounts for the type and condition of the property, with an estimate for severance damages, where applicable. Table 18 lists the estimated costs, in 2002 dollars, by type of work.

**Table 18—Estimated Costs by Type of Work**

Type of Work	Alt. 1	Preferred Alt. 2 †	Alt. 3	Alt. 4
Earthwork	\$ 40,040,000	\$ 37,940,000	\$ 43,970,000	\$ 41,860,000
Mainline Pavement	\$ 53,860,000	\$ 53,960,000	\$ 53,480,000	\$ 53,570,000
Bridges	\$ 50,670,000	\$ 57,990,000	\$ 44,090,000	\$ 51,420,000
Small Drainage Structures	\$ 2,800,000	\$ 2,770,000	\$ 2,680,000	\$ 2,650,000
Approaches	\$ 13,890,000	\$ 13,560,000	\$ 13,380,000	\$ 13,060,000
Signing	\$ 2,820,000	\$ 2,830,000	\$ 2,800,000	\$ 2,810,000
Mobilization/Demobilization	\$ 8,260,000	\$ 8,510,000	\$ 8,080,000	\$ 8,330,000
<b>Construction Sub-total</b>	<b>\$ 172,340,000</b>	<b>\$ 177,560,000</b>	<b>\$ 168,480,000</b>	<b>\$ 173,700,000</b>
Contingencies/Miscellaneous (15%)	\$ 25,851,000	\$ 26,634,000	\$ 25,272,000	\$ 26,055,000
<b>Construction Total</b>	<b>198,191,000</b>	<b>\$ 204,194,000</b>	<b>\$ 193,752,000</b>	<b>\$ 199,755,000</b>
Land Acquisition (ROW/Damage/Relocation)	\$ 10,700,000	\$ 10,200,000	\$ 9,100,000	\$ 8,600,000
Design Engineering	\$ 10,000,000	\$ 10,300,000	\$ 9,800,000	\$ 10,100,000
<b>Total</b>	<b>\$ 218,891,000</b>	<b>\$ 224,694,000</b>	<b>\$ 212,652,000</b>	<b>\$ 218,455,000</b>

## 11.0 ENVIRONMENTAL ISSUES

The *Draft Environmental Impact Statement (DEIS)* approved in August 2002 contains the detailed analysis of the potential environmental impacts of the project. The *DEIS* is available for viewing at the offices of the Indiana Department of Transportation (INDOT) in Indianapolis; INDOT's District Office in Crawfordsville; at

the Tippecanoe, Delphi, and Logansport-Cass County public libraries; and at many city, town, and county offices.

## 12.0 SURVEY REQUIREMENTS

Horizontal and vertical controls have been established in the field by Qk4 survey personnel for the entire project. Aerial photography and mapping for the entire project were developed by Photo Science. This mapping was used as the basis for creating profiles and cross sections included in this report. Although the project is in both the east and west zones of Indiana, the mapping was developed using the east zone coordinates for ease of reference. Table 19 shows roadway lengths for the Preferred Alternative where construction is anticipated. Full, updated land survey is necessary to carry out detailed design tasks.

**Table 19—Roadway Lengths**

	Road	Meters	Feet	Miles
WESTERN SEGMENT	Mainline—SR 25 HHH	18,656	61,207	11.61
	Relocated Exist. SR 25	207	679	0.13
	Local Service Road	1,217	3,992	0.76
	Relocated CR 500E	800	2,624	0.50
	CR 500E Connector	524	1,719	0.33
	Relocated CR 625E	900	2,953	0.56
	Relocated CR 450N	1,123	3,684	0.70
	Relocated CR 750E	286	939	0.18
	Relocated CR 900E	961	3,151	0.60
	CR 900E Connector	290	951	0.18
	CR 700N	600	1,970	0.37
	CR 1000E	1,000	3,281	0.62
	SR 25 (Connector)	440	1,445	0.27
<b>Subtotal</b>	<b>27,004</b>	<b>88,595</b>	<b>16.80</b>	
CENTRAL SEGMENT	Mainline—SR 25 HHH	13,500	44,290	8.43
	Relocated CR 800W	636	2,088	0.40
	Frontage Road	177	579	0.11
	US 421	301	988	0.19
	CR 200N	650	2,133	0.40
	Relocated Exist. SR 25	611	2,004	0.38
	SR 25 Connector	218	716	0.14
	SR 218	743	2,437	0.46
	SR 25 Connector	319	1,048	0.20
	CR 500W	886	2,908	0.55
	<b>Subtotal</b>	<b>18,042</b>	<b>59,192</b>	<b>11.25</b>
EASTERN SEGMENT	Mainline—SR 25 HHH	18,000	59,055	11.18
	Relocated CR 600N	290	950	0.16
	N. Walnut St.	500	1,640	0.31
	CR 250W	379	1,244	0.24
	Local Service Road	608	1,994	0.38
	Meridian Line Rd.	1,000	3,281	0.62
	CR 900N	584	1,915	0.36
	CR 100E	280	919	0.17
	CR 500S	1,000	3,281	0.62
	CR 400S	287	940	0.18
	CR 325W	1,000	3,281	0.61
	CR 300S Connector	257	843	0.16
	<b>Subtotal</b>	<b>24,184</b>	<b>79,343</b>	<b>15.03</b>
LOGANSPORT SEGMENT	Mainline—SR 25 HHH	6,421	21,066	4.04
	SR 25 Connector	414	1,358	0.26
	CR 115W	458	1,502	0.28
	CR 250S Connector	242	794	0.15
	Burlington Ave.	448	1,470	0.28
	Exist. US 24/US 25	487	1,599	0.30
	<b>Subtotal</b>	<b>8,470</b>	<b>27,789</b>	<b>5.31</b>

### 13.0 RIGHT-OF-WAY IMPACTS

Construction of the Preferred Alternative, **Alternative 2**, would require the acquisition of approximately 1,529 acres of additional right-of-way from approximately 309 parcels of land (see Table 20).

**Table 20—Potential Right-of-Way Impacts of Preferred Alternative**

Number of parcels from which ROW would be acquired	309
Number of acres to be acquired, by land use:	
Agricultural (cultivable acres)	1,001
Residential/Rural Residential	267
Commercial/Industrial	90
Institutional	1
Wildlife Habitat	170
Total	1,529
Number Relocations/Displacements:	
Residential (number of households / number of dwellings)	30 / 28*
Commercial/Industrial	5
Institutional	1
* Two of the housing units are duplexes	

The majority of the land that would be acquired is currently used for agriculture, followed by rural-residential uses interspersed with pockets of suburban neighborhoods in outlying areas surrounding Lafayette, Delphi, and Logansport. Other land uses encountered along the project's alternative alignments include commercial and industrial facilities (in isolated locations along rural stretches, and more heavily concentrated in communities such as Logansport, Delphi, and Clymers), a family services agency, and riparian areas and other undeveloped land not in agricultural use.

### 14.0 TRAFFIC MAINTENANCE DURING CONSTRUCTION

The following general discussion of traffic maintenance is presented with a provisional strategy outlined for phasing construction. The designer is instructed to refine this plan.

Traffic flow maintenance and construction sequences would be planned and scheduled to minimize traffic delays on existing public crossroads and SR 25, where necessary. Signs would be used to notify the traveling public of road closures and other pertinent information. The local news media would be notified in advance of road closings and other construction-related activities that could excessively inconvenience the community so motorists can plan travel routes in advance. Access to all properties would be maintained to the extent practical through controlled construction scheduling. Traffic delays would be controlled to the extent possible where many construction operations are in progress at the same time. The contractor would be required to maintain one lane of traffic in each direction at all times.

In Tippecanoe County, 11 miles of the existing SR 25 would remain open to traffic. The new mainline parallels the Norfolk Southern railroad some two miles to the south for most of its distance through this area. In Carroll County approximately 9 miles the existing SR 25 would remain in use and open to traffic—mainly through the communities of Delphi, Rockfield and Burrows. In Cass County, approximately 3 miles of existing SR 25 will remain open throughout and following construction of the new road, including the section through the community of Clymers.

### 15.0 RELATED PROJECTS, PLANS, AND STUDIES

Among others, the following projects (Table 21) are in the vicinity of the SR 25 Hoosier Heartland Highway project:

**Table 21—Related Projects**

Project	Sponsor	Description/Location	County	Status
9980850, 9325070, and others	INDOT, Logansport	Road Rehabilitation, Intersection Improvement, Traffic Signals Modernization Old US 24 and Market St. from WCL of Logansport to SR 25 & from 24 <sup>th</sup> St. to ECL of Logan	Cass	Let 10-2001
9682280	Carroll Co.	City Street, Bridge Replacement Bridge # 121 over Deer Creek	Carroll	RFC * 6-2005
9981360	Delphi	City Street, Transportation Enhancement (TE) City of Delphi Wabash & Erie Canal Interpretive Center	Carroll	Let 10-2001
9981310	Tippecanoe Co.	City Street, Transportation Enhancement (TE) Museums at Prophetstown State Park, Indiana NDR	Tippecanoe	RFC 7-2005
0017170	INDOT	SR 25, Resurfacing From I-65 to US 421	Tippecanoe, Carroll	Let 4-2003
0012660	INDOT	I-65, Bridge Rehabilitation Bridge over Wabash River, 1.13 miles N of SR 25	Tippecanoe	RFC 7-2004
0066610 0066620	INDOT	I-65, Interstate Rehabilitation From 0.6 mile N of SR 26 to 1.1 miles N of SR 25 (includes 1 bridge)	Tippecanoe	Let 1-2003
9904240	INDOT	SR 225, New Bridge Construction Bridge over Park Road (Prophetstown State Park)	Tippecanoe	Let 10-2001
9704040	INDOT	US 421, Small Structure Replacement Over ditch 6.0 miles S of S jct with SR 18	Carroll	RFC 8-2003
8720075	INDOT	US 421, Intersection Improvement At N jct with SR 18	Carroll	RFC 3-2005
8720335	INDOT	SR 25, Railroad Crossing 0.1 mile east of west junction with US 421	Carroll	Eliminated 8-2003
9702530	INDOT	SR 25, Bridge Rehabilitation NS grade separation, 0.6 mile west of SR 218	Carroll	Suspended
0101446	INDOT	SR 25, Bridge Replacement At Rock Creek, 5.9 miles east of SR 218	Carroll	Elimination pending
0101447	INDOT	SR 25, Small Structure Replacement At Longcliff Creek, 0.23 mile S of US 35	Cass	RFC 12-2003

\* RFC = ready-for-contracts date

#### Burlington Avenue in Logansport and US 421 in Delphi

During the public hearing/public comment portion of the process, numerous local government and economic development officials, emergency responders and members of the general public urged the construction of an interchange, rather than an at-grade intersection, at Burlington Avenue in Logansport. Future traffic volumes at the location, safety factors, and local access were the primary reasons given for supporting an interchange. A traffic study—*Transportation Needs Study for Hoosier Heartland Highway (SR 25) and Burlington Avenue*—was prepared by The Mannik & Smith Group for the City of Logansport, Cass County, and Logansport-Cass County Economic Development Foundation. The report evaluated the operation of the proposed new SR 25-Burlington Avenue junction as both an at-grade intersection and a grade-separated interchange. The study recommends that a grade-separated interchange be installed at the junction of the new mainline road and Burlington Avenue. The report was entered into the record at the public hearing in Logansport. Following the public hearing a request was made for an interchange at US 421. Any revision to the proposal outlined in this Engineer's Report with respect to type of access at Burlington Avenue and US 421 would be presented in a future Addendum.

### Pedestrian Trails—Delphi

There are three potential hiking trails in the Delphi area that would be encountered by the preferred build alternative—Alternative 2. These trails are not officially dedicated, are on private property, and are open to the public for guided hikes only a few times annually. The preliminary design for the does not specifically provide for uninterrupted access to the proposed trails. While it is probable that the Deer Creek bridge's vertical clearance would be sufficient to permit pedestrian use, the bridge's location would require detouring a portion of the trail to the edge of the creek embankment. When a long-range trail master plan is prepared and presented for adoption by the local government jurisdictions guaranteeing long-term public access to the trails, INDOT could consider ways to accommodate the trails in the vicinity of new SR 25. The designer is instructed to monitor the progress of local trails' planning.

## **16.0 COORDINATION, MEETINGS, CONCURRENCE**

Since public involvement plays such an important role in the development of the project, a public participation program was developed that included a project web site, a series of newsletters, and numerous informational meetings with the public and with representatives of local and state government organizations and regulatory agencies; businesses, utilities, interest groups, etc. During this period, the web site received over 800 "hits," and several hundred letters/written comments were submitted. All of those requesting information received responses. The newsletter mailing list contained more than 2,100 names, many of which were identified from meeting attendance records and web site requests.

In addition to identifying issues of concern to the general public, the informal meetings were instrumental in initiating coordination with requisite state and federal regulatory agencies, local government officials, and local planning and economic development groups; and in identifying and evaluating the numerous study corridors and alternative alignments under consideration during the course of this project.

The *DEIS* was submitted in August 2002. The formal comment period began September 13, 2002, with the *Federal Register* notice of the document's availability; included three formal public hearings, one each in Lafayette, Delphi, and Logansport; and concluded on November 1, 2002. Over 700 persons attended the public hearings, and comments were received (including emails, letters, and petitions) from more than 450 persons and agencies. The following is a chronological list of key informational meetings and the public hearings:

- January 18, 19, and 20, 2000—First series of public meetings, in Lafayette, Delphi, and Logansport. A total of 498 people attended.
- February 14, 2000—Informational meeting and discussion of public involvement approach with Carroll County Commissioners and the Mayor of Delphi.
- February 15, 2000—Scoping Meeting with federal, state and local agencies to discuss purpose and need, environmental constraints, Section 106 cultural resources, ecological resources, socioeconomic issues, and traffic and engineering issues.
- March 8 and 9, 2000—Task Force meetings, with representatives of interest groups and residents in Lafayette, Delphi, and Logansport. A total of 151 people attended.
- April 5, 10, and 11, 2000—Second series of public meetings, in Buck Creek, Logansport, and Delphi. A total of 471 people attended.
- June 8, 2000—Purpose and Need/Preliminary Corridor Review meeting with representatives of Federal Highway Administration (FHWA), Indiana Department of Natural Resources (IDNR), Tippecanoe Area Plan Commission, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers (USACE), and U.S. Fish and Wildlife Service (USFWS) discussing the purpose and need and the review of the preliminary corridors recommended to be dropped from further consideration.

- August 11 and September 6, 2000—Meetings with Cass County and the Logansport Economic Development Foundation (LEDF) officials to present the alignment studies completed to date and to discuss the termini alternatives near Logansport.
- September 6 and 7, 2000—Meetings with Cass and Carroll Counties' Emergency Services Agencies to discuss the potential effects of the proposed partial access control alternatives on the provision of emergency services.
- September 12, 13, and 14, 2000—Third series of public meetings, in Lafayette, Delphi, and Logansport. A total of 483 people attended.
- September 12 and 13, 2000—Meetings with Tippecanoe County Commissioners, and Delphi officials and Carroll County Commissioners to discuss alternative alignments and potential right-of-way impacts.
- November 17, 2000—Meeting with the Hoosier Heartland Industrial Corridor (HHIC) coalition regarding alternative alignments. January 10, 2001—Meeting with the HHIC coalition to discuss alternative alignments.
- January 26, 2001—Meeting with Norfolk Southern Railway Company (NS) officials to discuss issues relating to railroad access to The Andersons' plant in Clymers.
- March 7, 2001—Meeting with HHIC representatives to discuss project status and schedule.
- April 25, 2001—Meeting with The Andersons, Inc., officials, NS representatives, and Carroll County Commissioners to discuss impact of alternatives, railroad access, and right-of-way issues.
- June 6, 2001—Meeting with IDNR to discuss issues related to natural areas and historic resources in project corridor.
- July 11, 2001—Section 106 "Consulting Parties" meeting at Delphi to discuss the area of potential effect (APE) and the eligibility of properties for listing on the National Register of Historic Places.
- July 18, 2001—Meeting with the HHIC coalition regarding progress on the project.
- September 26, 2001—Meeting with the HHIC coalition regarding progress to date.
- November 26, 2001—Meeting with the HHIC coalition to discuss the status of the DEIS and Section 106 activities, and steps needed to take the project to final design.
- March 21, 2002—Section 106 "Consulting Parties" meeting in Delphi to review the project status, APE, and eligible historic properties, and to discuss the possible effects of the project on the properties.
- May 3, 2002— Meeting with the HHIC coalition to discuss the status of the DEIS and Section 106 activities.
- July 16, 2002—Meeting with HHIC coalition to discuss timeframe for DEIS completion and public hearings.
- October 1, 2, and 3, 2002—Public hearings regarding the DEIS, in Lafayette, Delphi, and Logansport, Indiana. A total of 737 people were recorded as attending.
- April 3, 2003—Meeting with representatives of FHWA, USFWS, USACE, and IDNR to review environmental impacts identified in the *DEIS*, and discuss potential mitigation measures.
- April 16, 2003—Meeting with Delphi government officials, and representatives of FHWA and Carroll County Wabash & Erie Canal, Inc., to discuss the proposed pedestrian trails and access issues related to the alignment of the recommended Preferred Alternative.
- April 16, 2003—Section 106 "Consulting Parties" meeting in Delphi to discuss potential mitigation for the project's adverse visual effects to NRHP-listed/eligible properties.

- June 19, 2003—Field reconnaissance of Delphi Swamp and environs with FHWA, USACE, USFWS, IDNR, IDEM to review the area's potential as a wetland mitigation site.
- July 15, 2003—Meeting with HHIC coalition to discuss the timetable for completion of the environmental documentation phase of the project.
- September 2, 2003—Meeting with HHIC coalition to discuss the status of the FEIS.

#### 17.0 FHWA REVIEW AND OVERSIGHT

This project has been developed following the guidelines of the NEPA process and, as a result, has had close coordination with the FHWA. A Record of Decision (ROD) on the FEIS will be required for completion of this project. Given that the project is not on the Interstate System, design oversight is not required of FHWA.

#### 18.0 CHANGES TO PROPOSAL

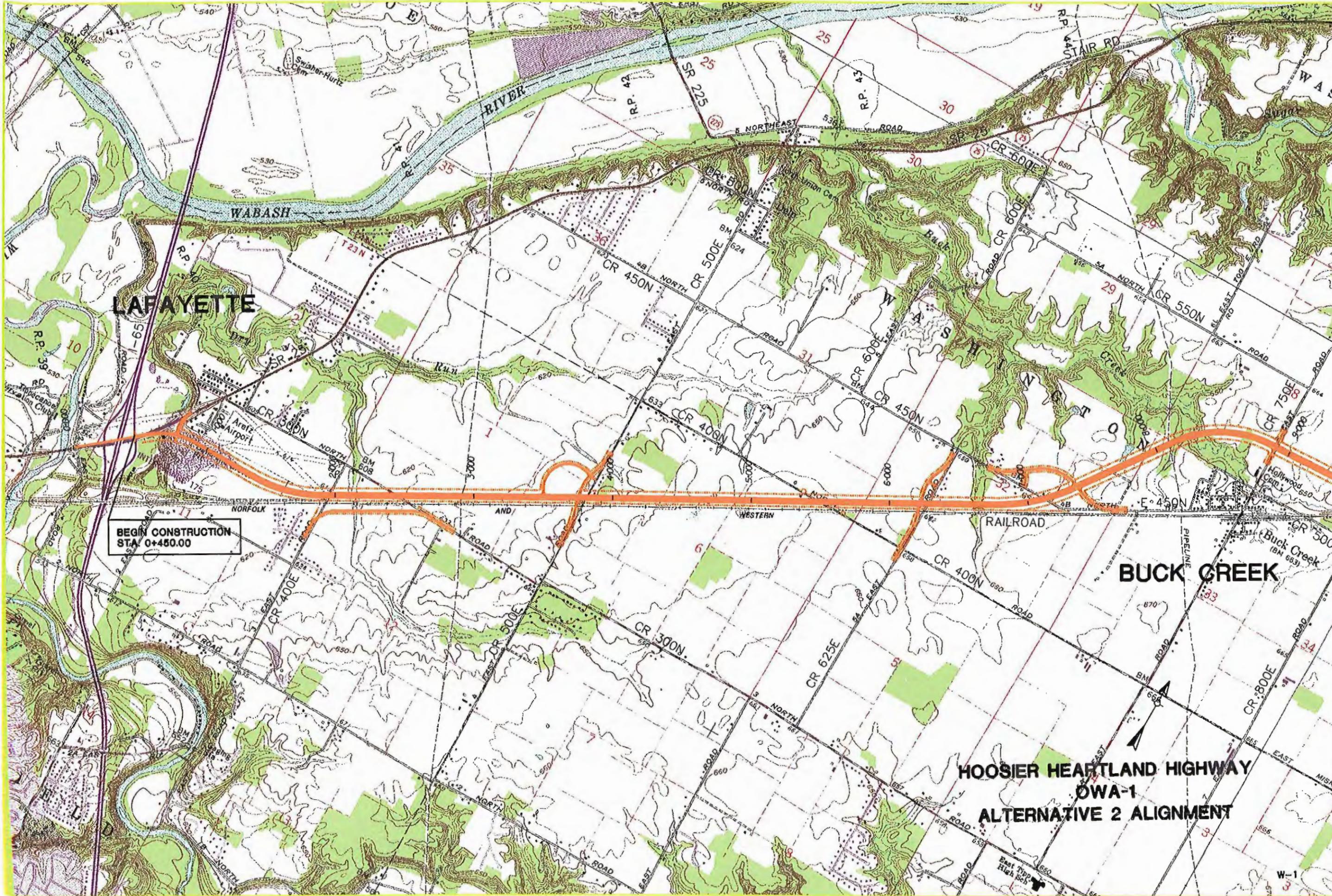
The Engineering Assessment Section shall be consulted if the proposal (scope of work) is to be changed. The person initiating the change should by letter or memo request concurrence from the Engineering Assessment Section Manager. The designer should route the request through the appropriate Design Development Section Manager.

Concur: *Brad L. Steckler* Date: 12-30-03

**Brad L. Steckler, P. E.**  
 Manager of Engineering Assessment  
 Indiana Department of Transportation

#### Attachments

cc: Salley Morgan (5 copies)  
 Gary Mroczka  
 Matt Thomas  
 Bill Schmidt (Survey Unit)  
 Bob Cales  
 Jim Juricic  
 Athar Khan  
 Roberta Johnson  
 Jamie Gallagher  
 Bruce Conrad  
 Don Abraham  
 Ron Adams  
 David Unkefer (FHWA)  
 Engineering Assessment Section file



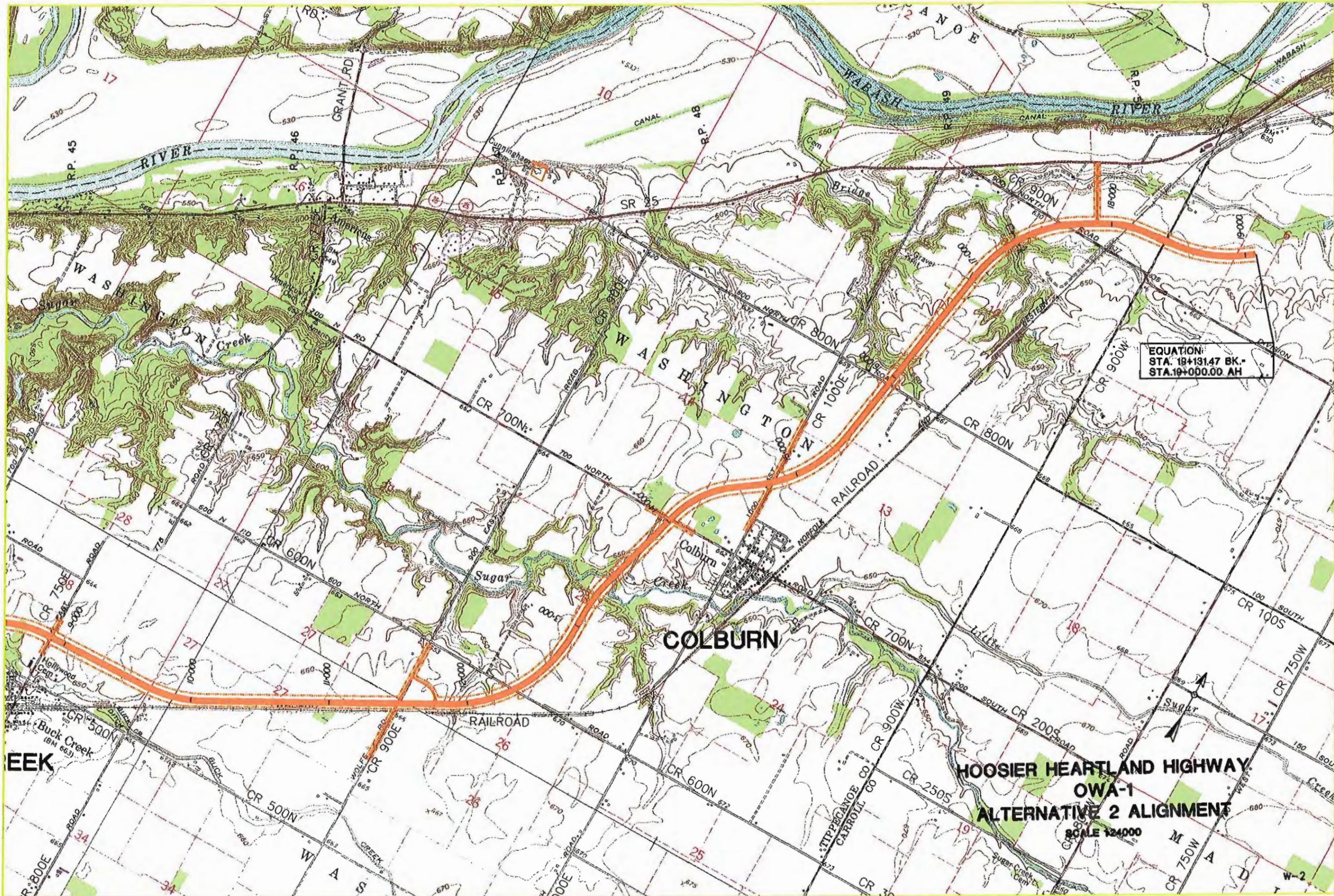
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BUCK CREEK

HOOSIER HEARTLAND HIGHWAY  
OWA-1  
ALTERNATIVE 2 ALIGNMENT

W-1



EQUATION:  
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STA. 19+000.00 AH

COLBURN

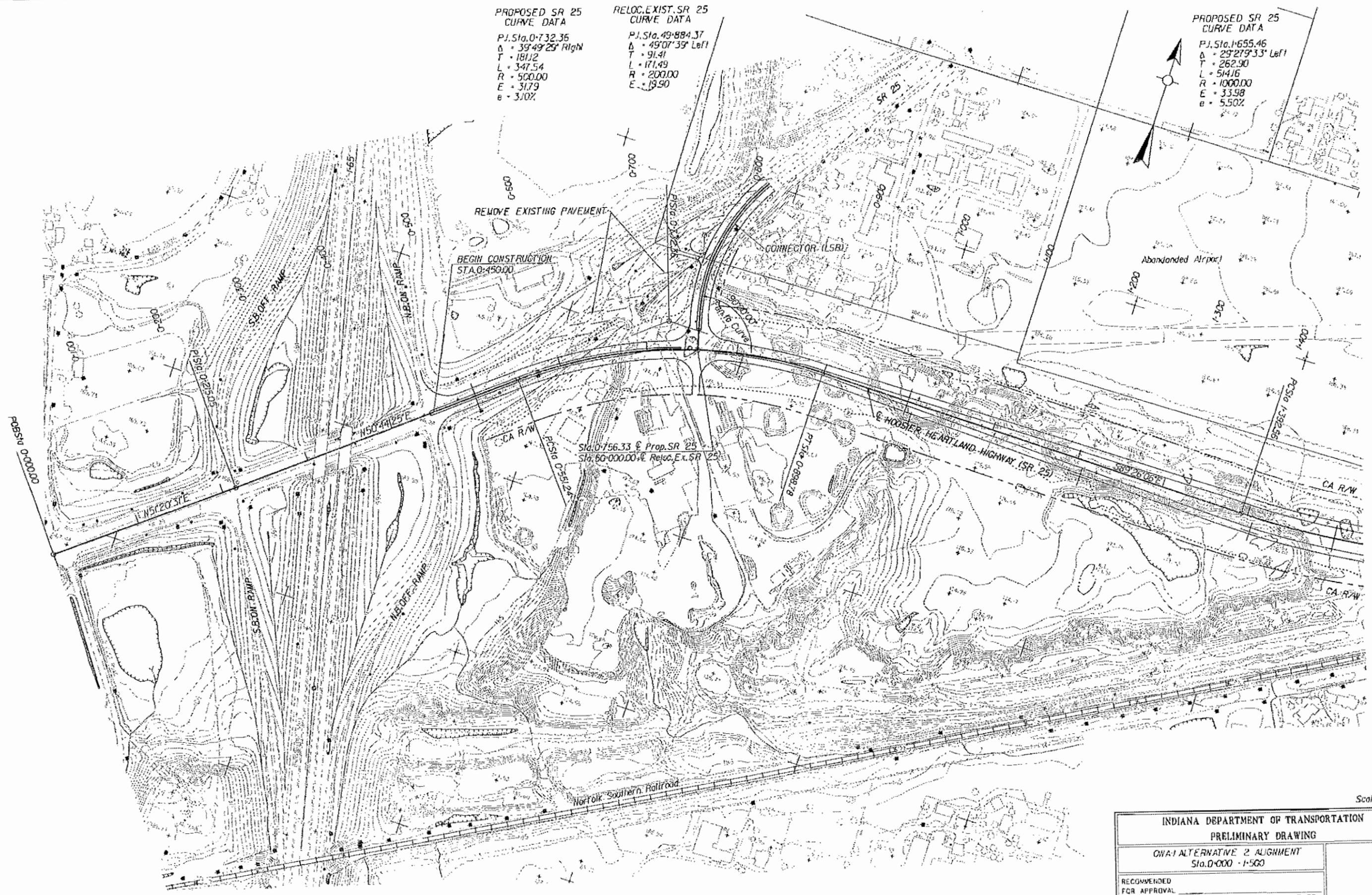
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ALTERNATIVE 2 ALIGNMENT

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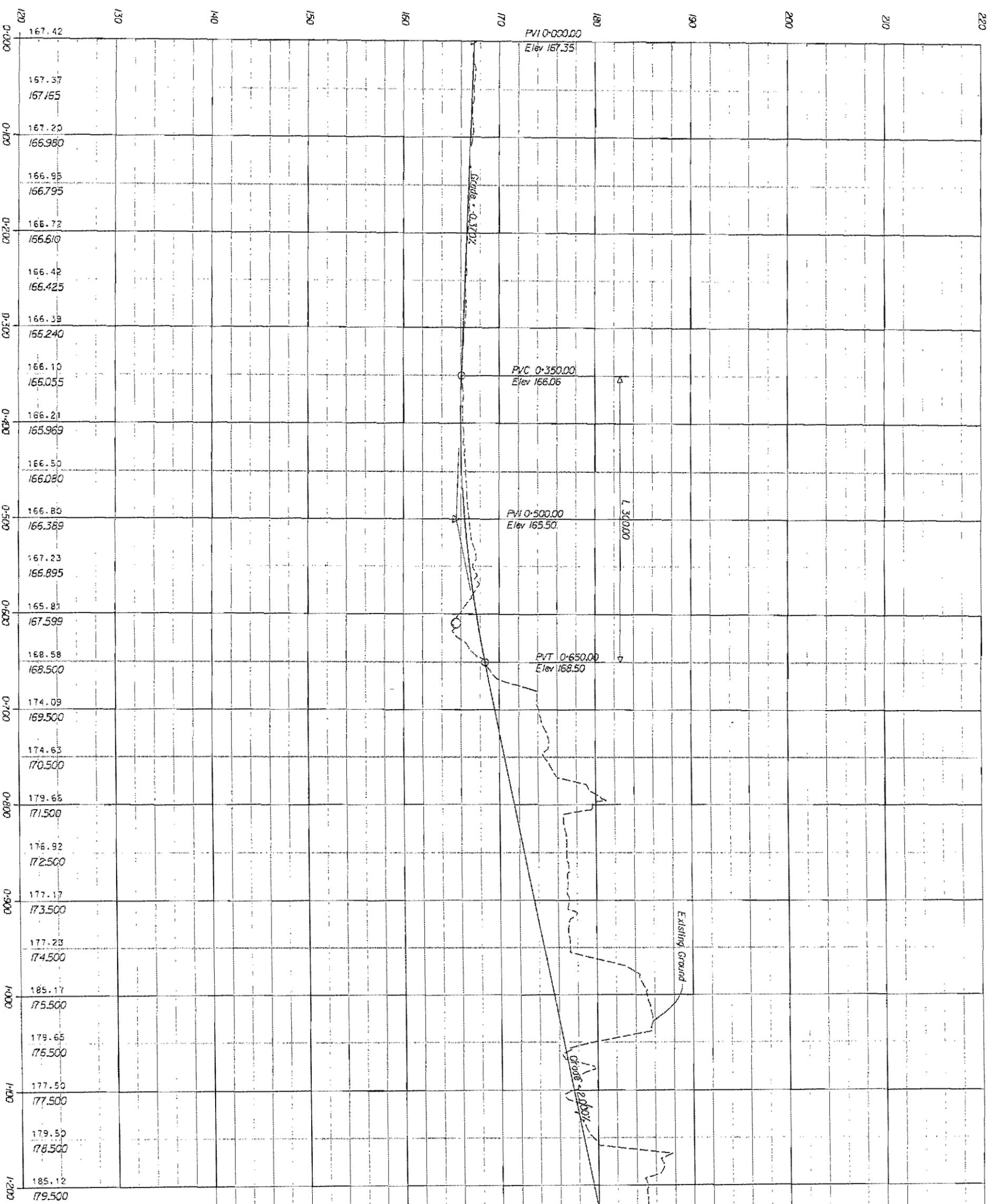
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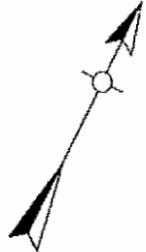
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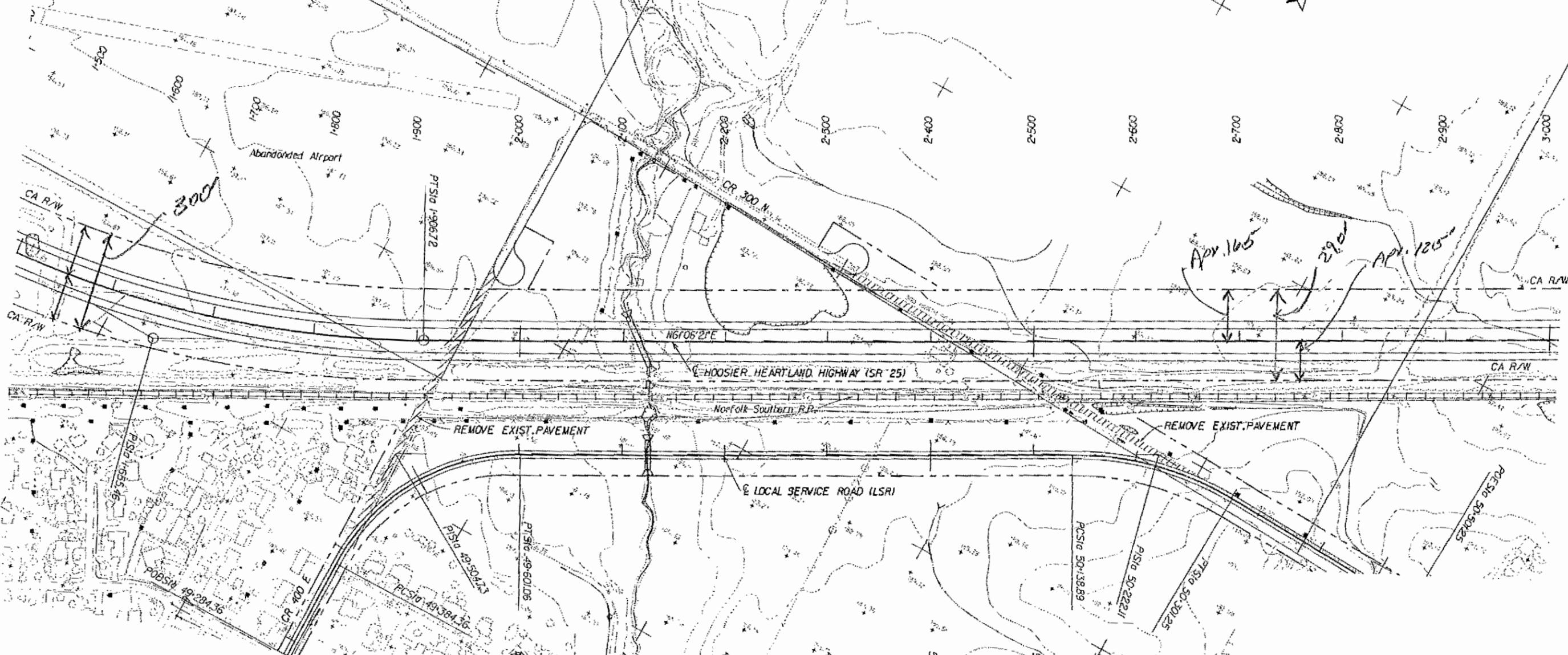
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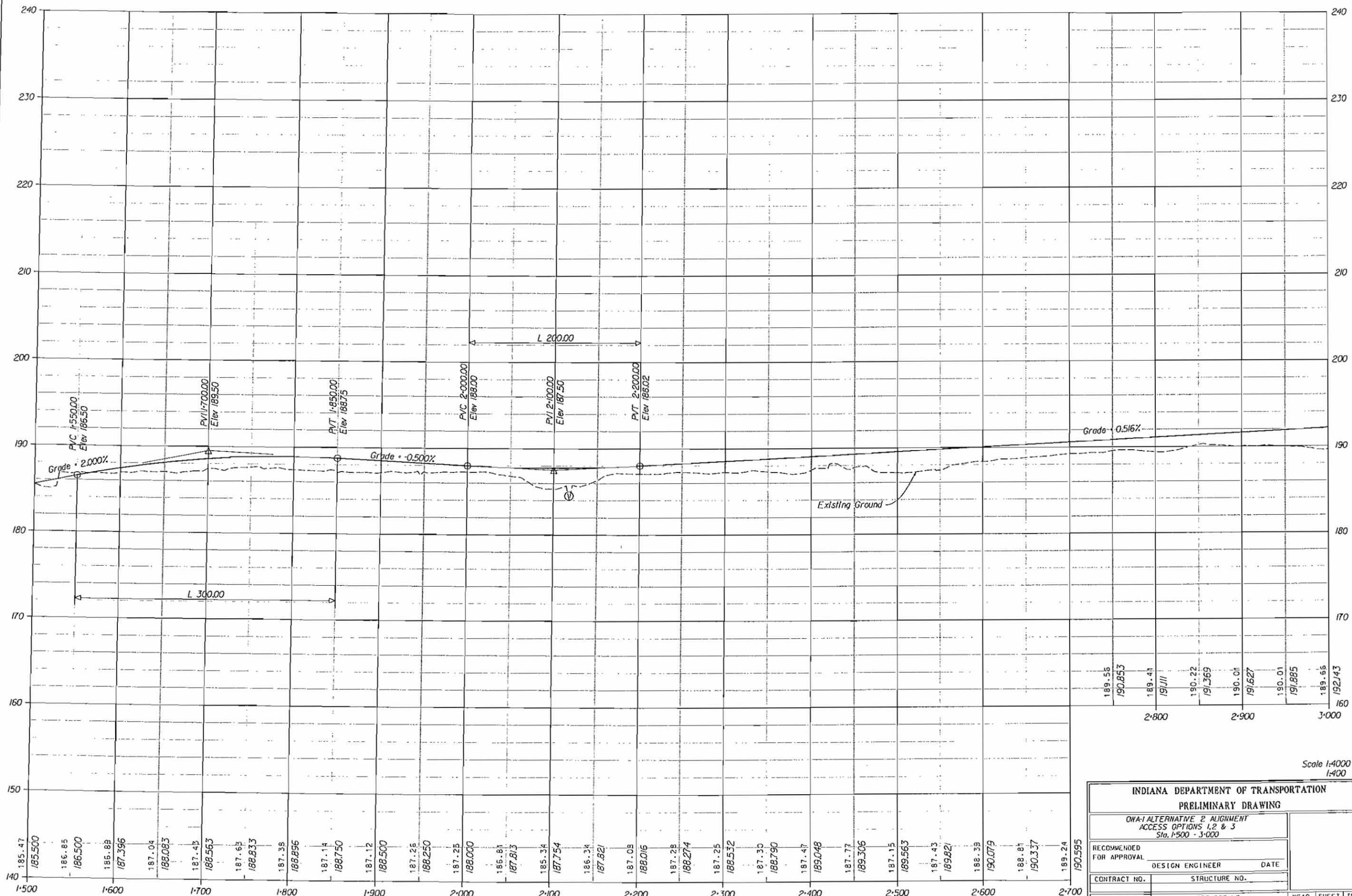
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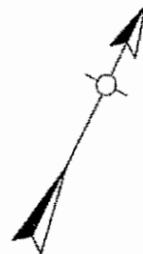
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DES. NO.	



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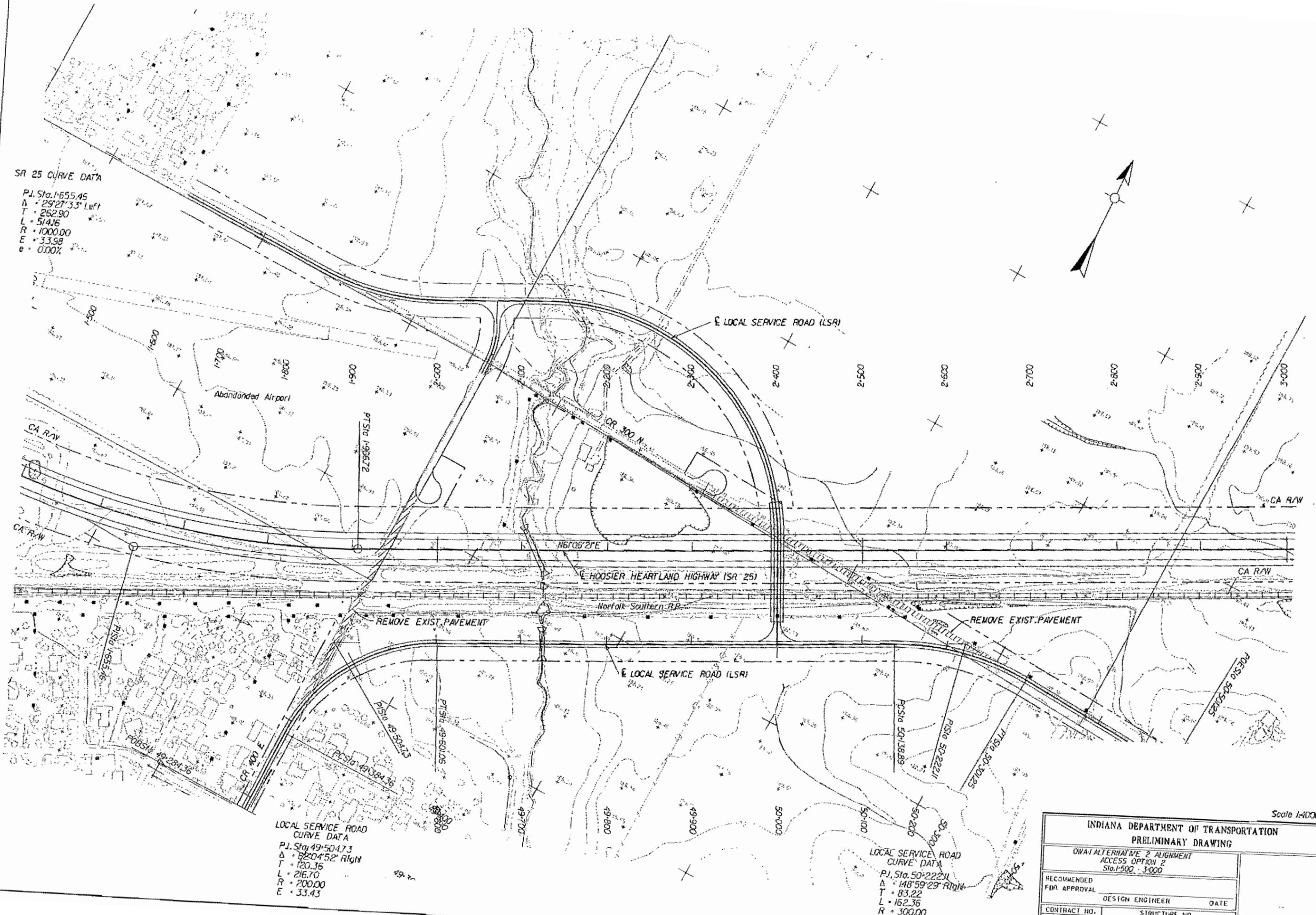


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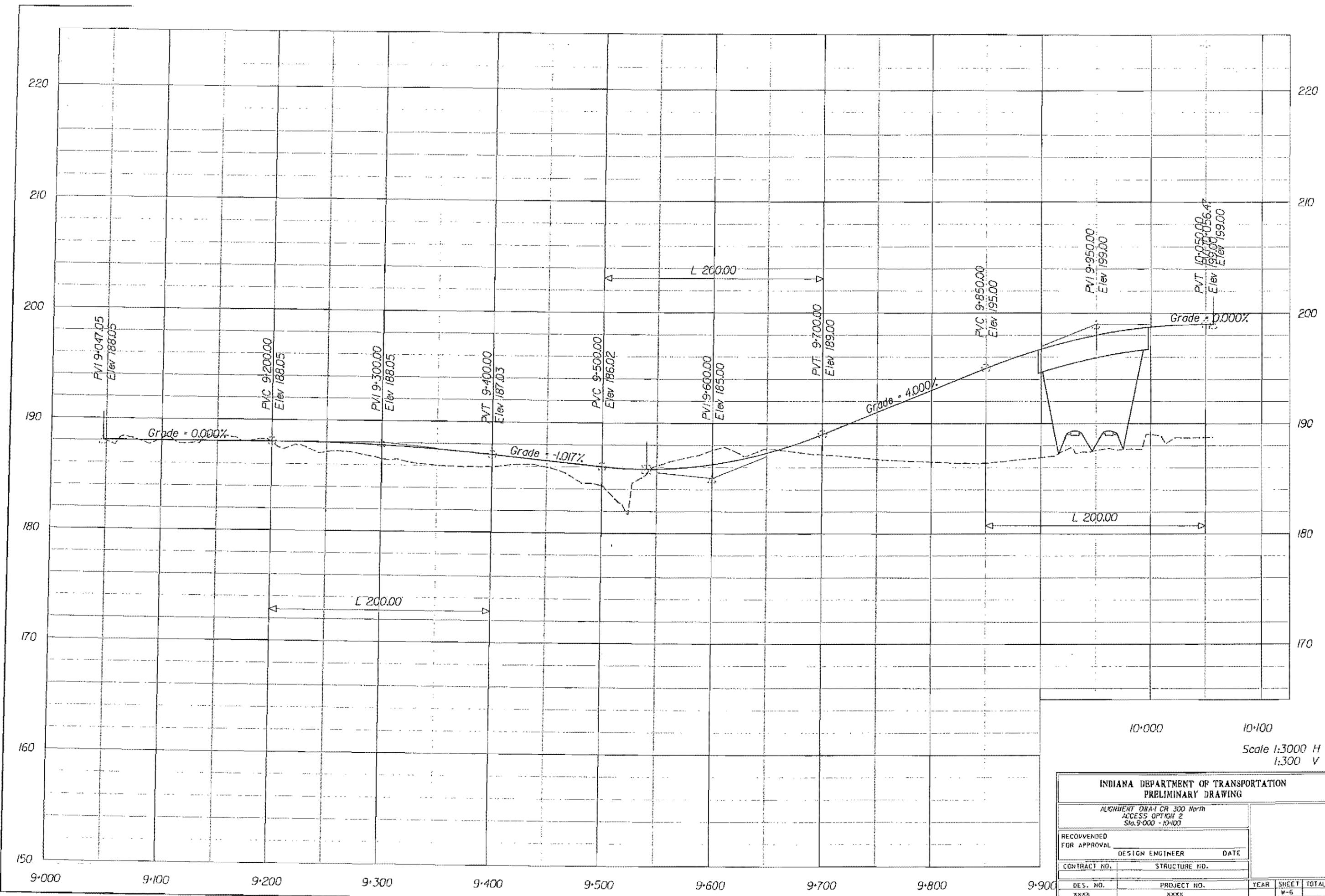
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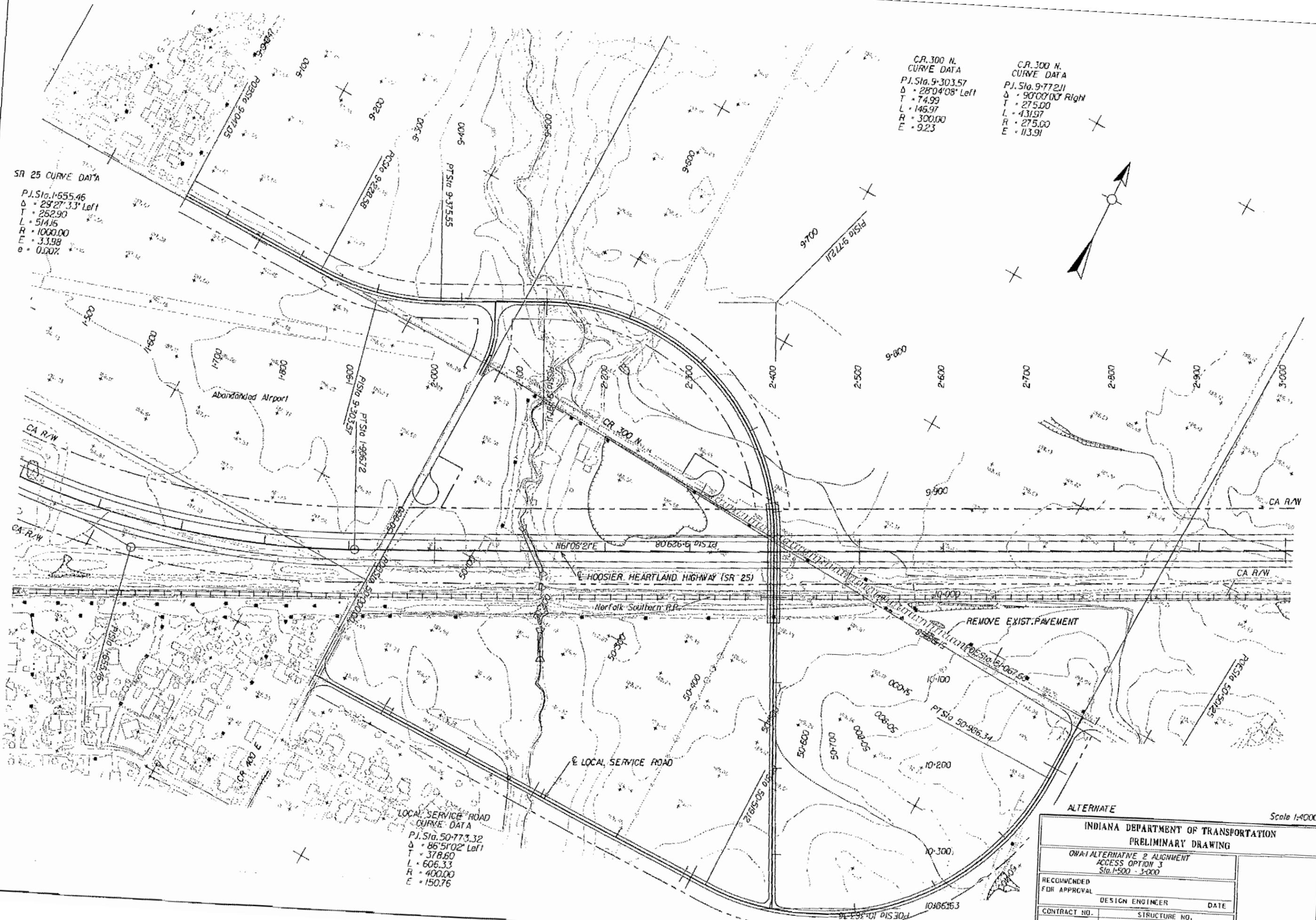
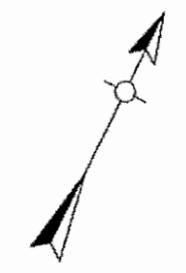
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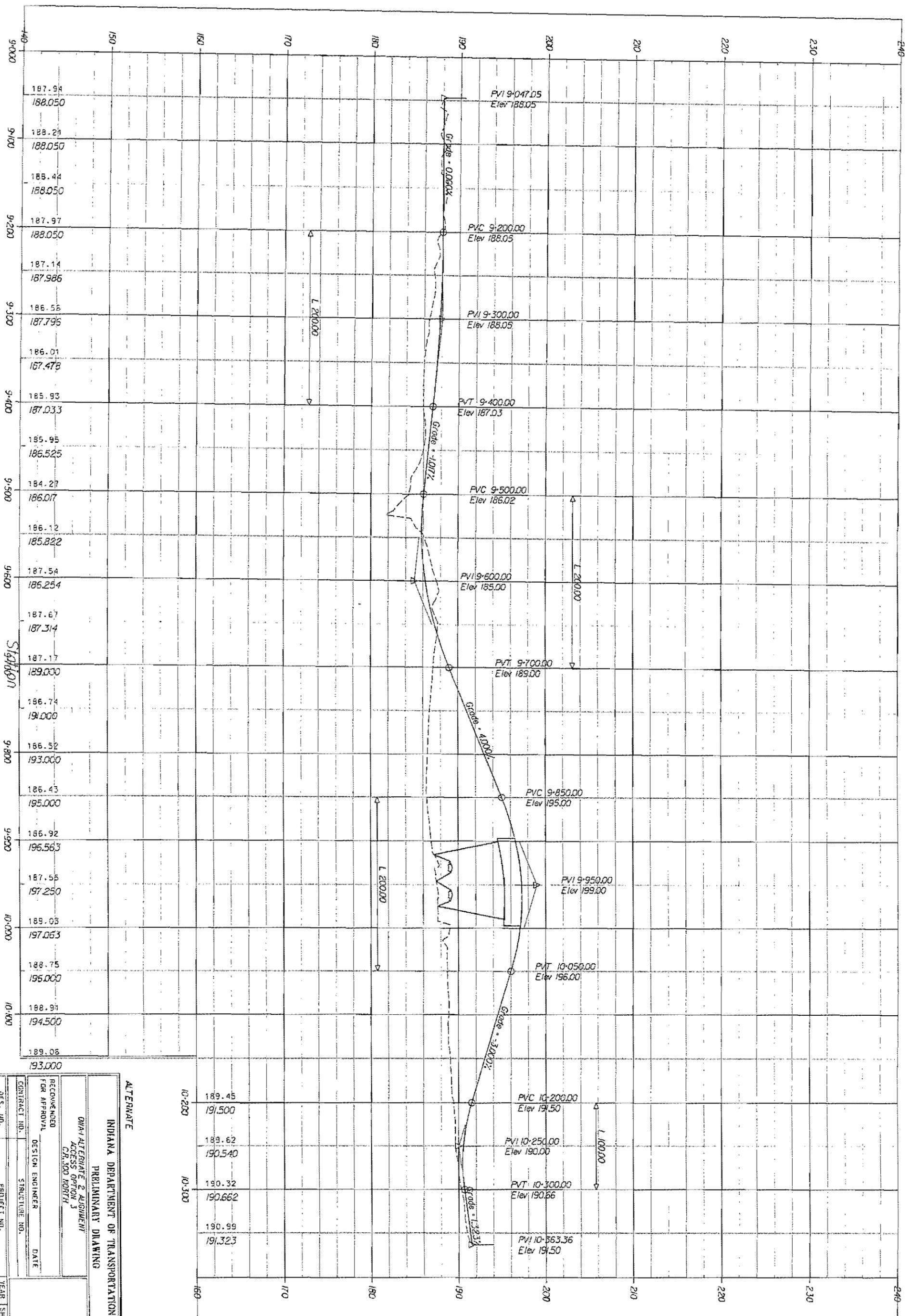
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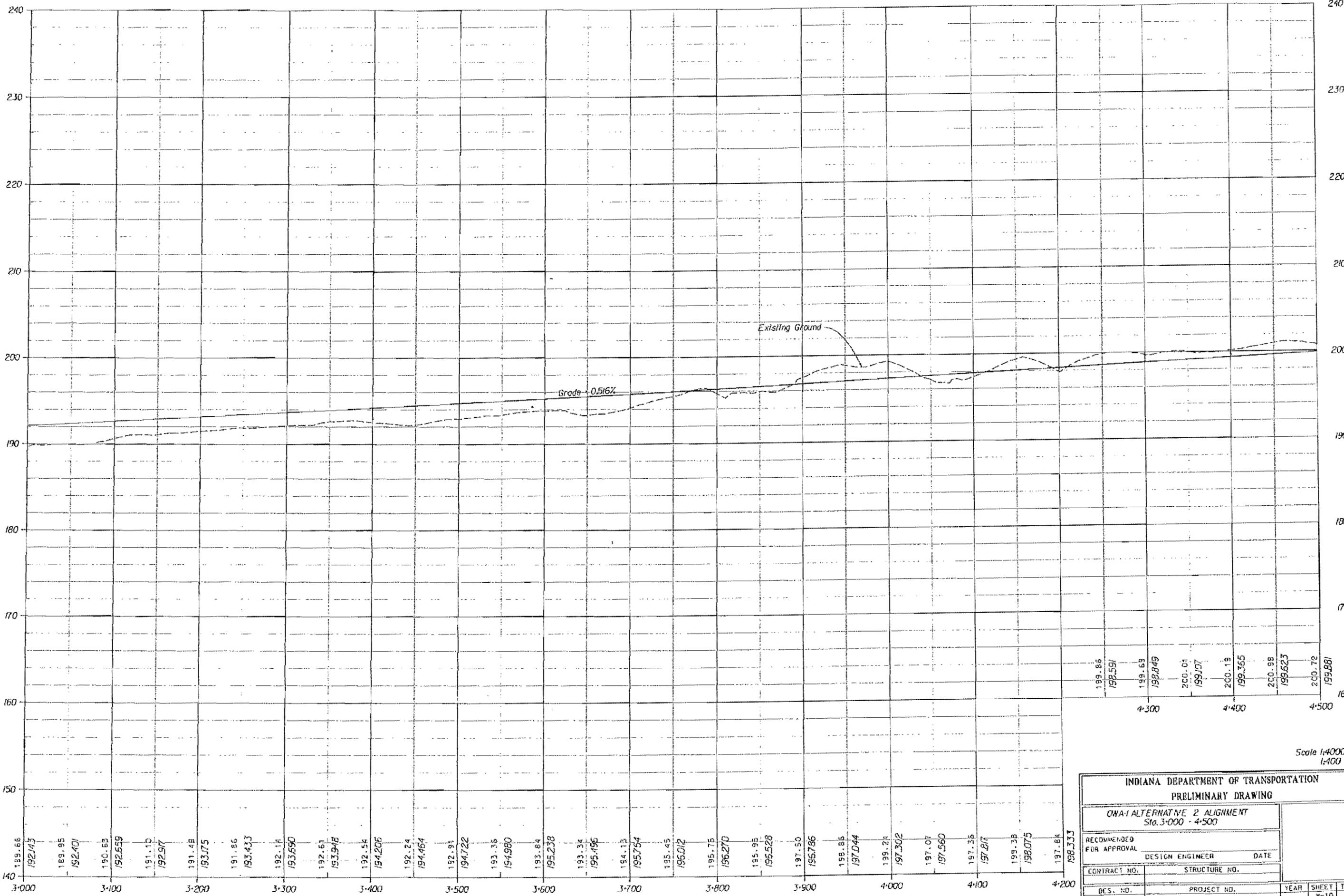


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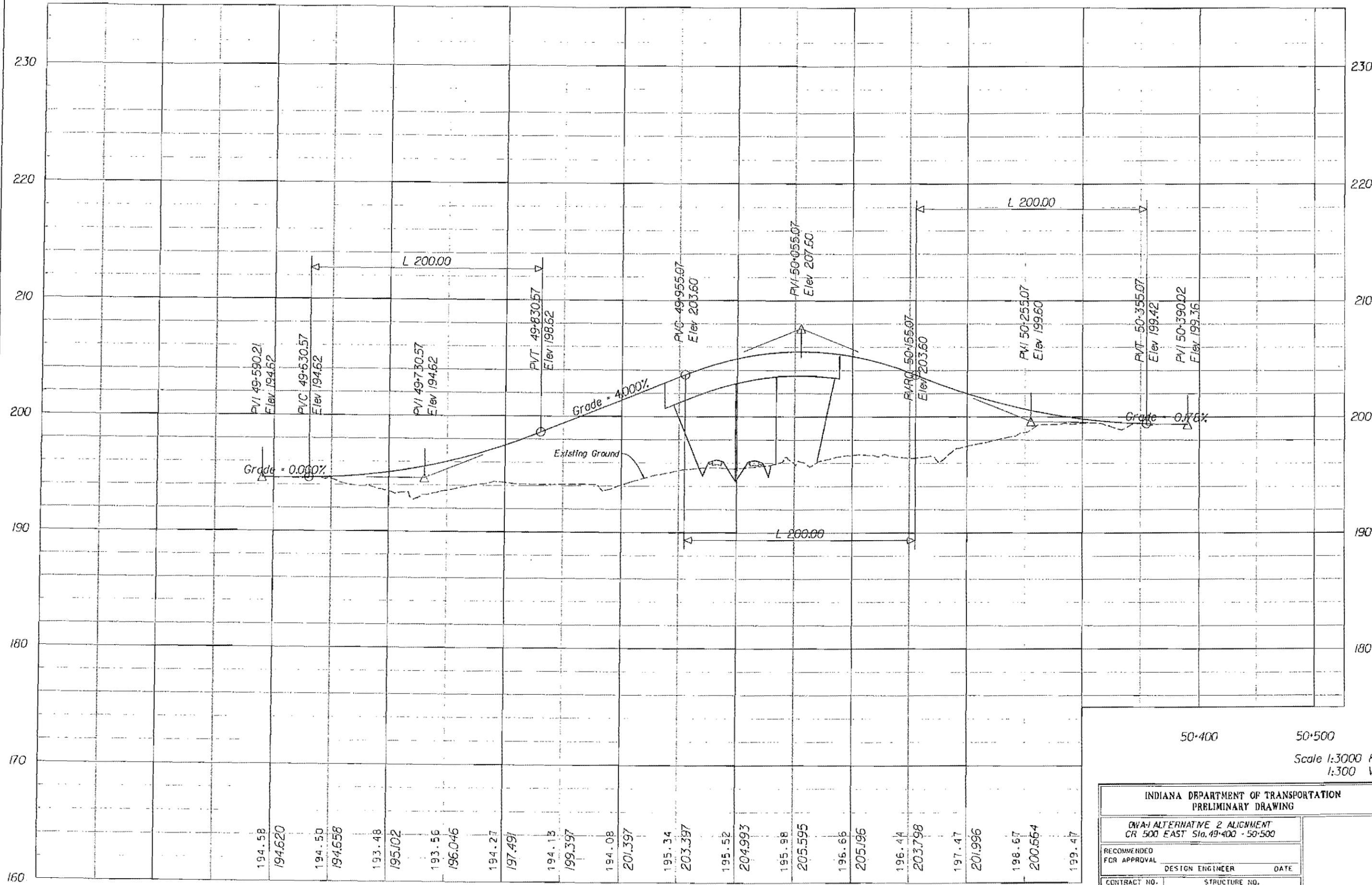
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188.050  
187.97  
188.050  
9+300 187.14  
187.986  
186.56  
187.796  
9+400 186.01  
187.478  
185.93  
187.033  
9+500 185.95  
186.525  
184.27  
186.017  
9+600 186.12  
185.822  
187.54  
186.254  
9+700 187.67  
187.314  
187.17  
189.000  
9+800 186.74  
191.000  
166.52  
193.000  
9+900 186.43  
195.000  
186.92  
196.563  
10+000 187.55  
197.250  
189.03  
197.063  
10+100 188.75  
195.000  
188.91  
194.500  
189.06  
193.000





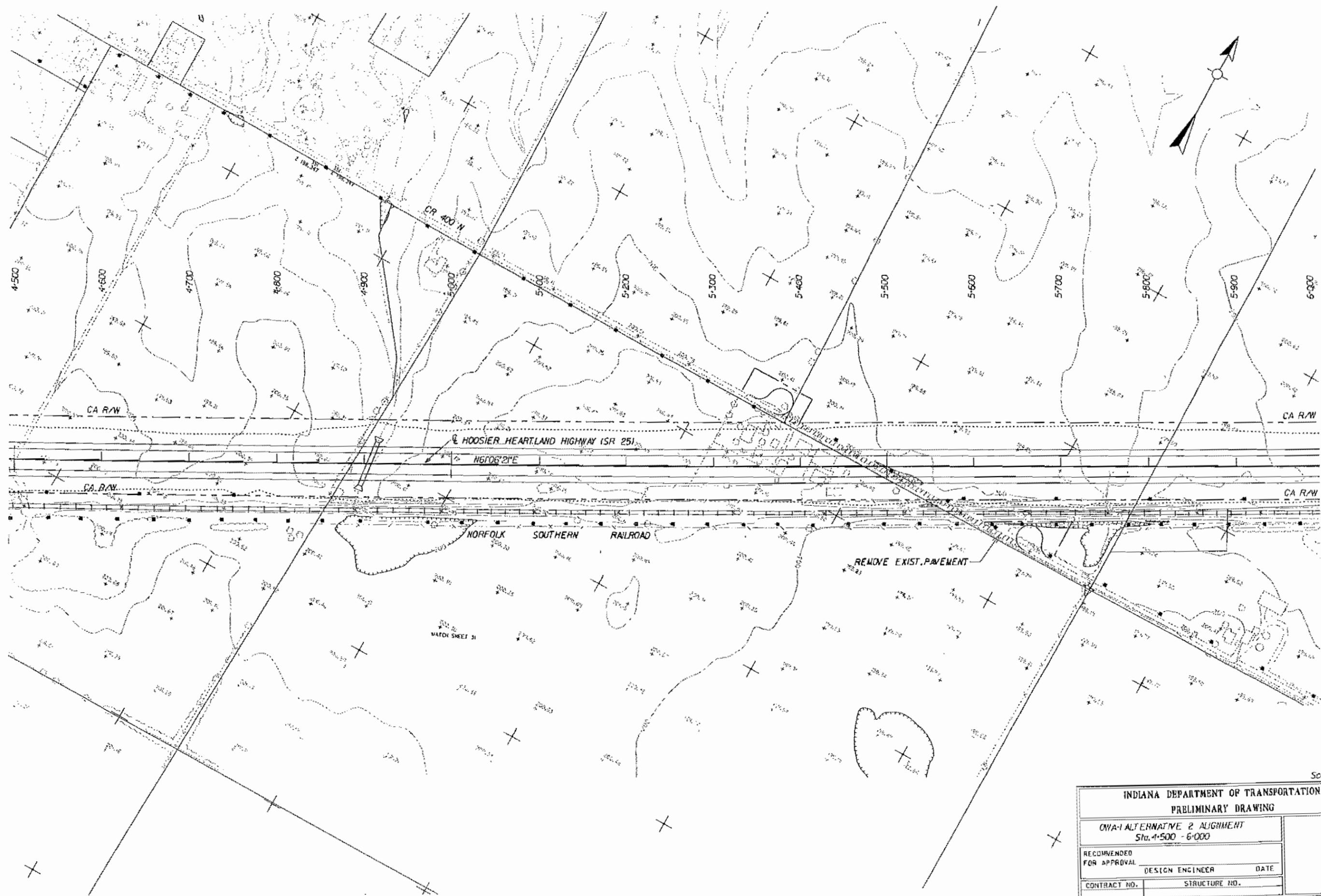
Scale 1:4000 H  
1:400 V

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
CWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 3+000 - 4+500				
RECOMMENDED FOR APPROVAL		DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.			
BES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXXX	XXXXX		W-10	



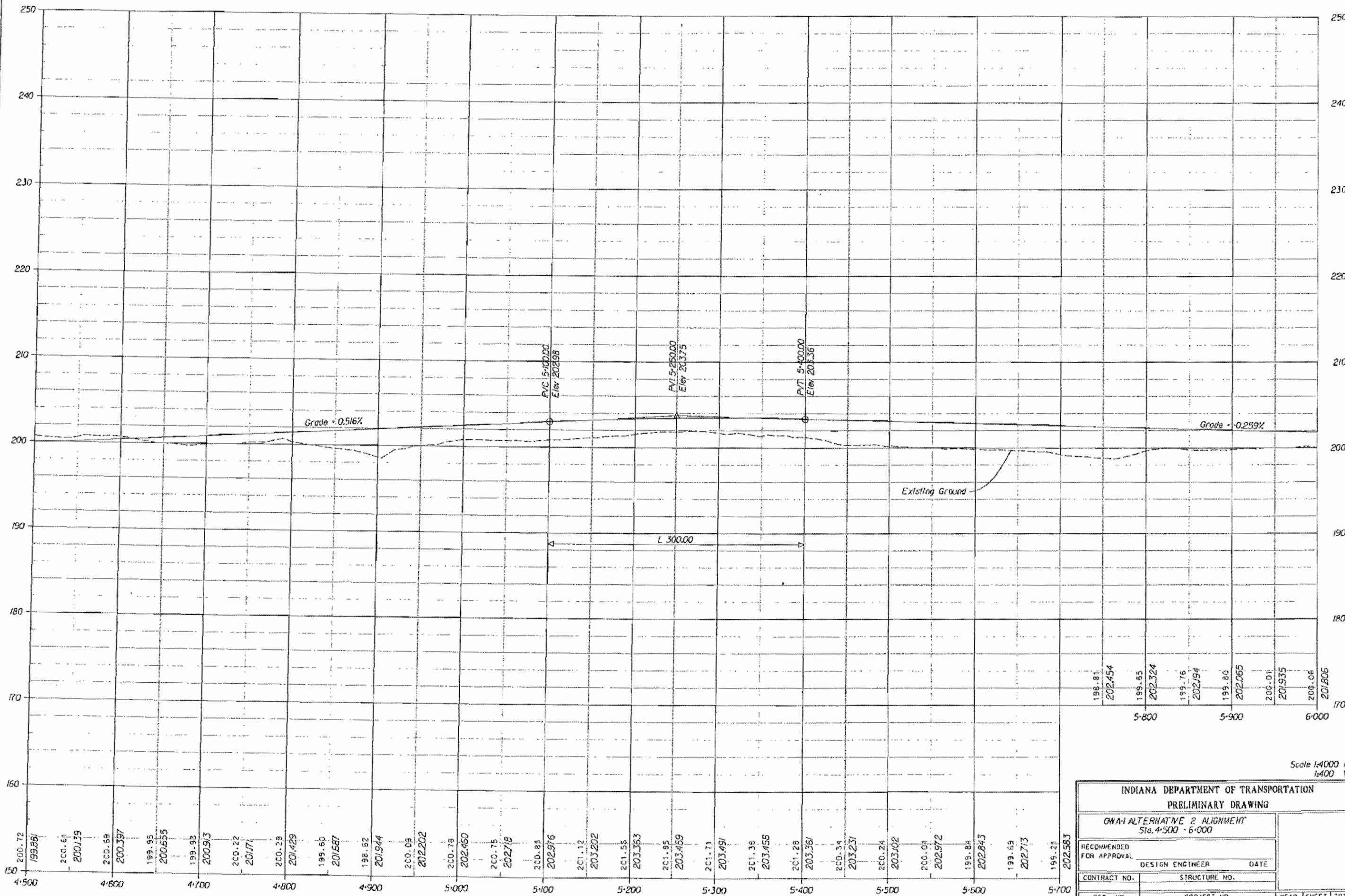
50+400                      50+500  
 Scale 1:3000 H  
 1:300 V

<b>INDIANA DEPARTMENT OF TRANSPORTATION PRELIMINARY DRAWING</b>			
DVA-1 ALTERNATIVE 2 ALIGNMENT CR 500 EAST Sta. 49+400 - 50+500			
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.		
DES. NO.	PROJECT NO.	YEAR	SHEET TOTAL
XXXXX	XXXXX		N-11



Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 4+500 - 6+000				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXXX	XXXXX		#-12	



200.72  
199.86  
200.61  
200.79  
200.69  
200.397  
199.95  
200.555  
199.98  
200.913  
200.22  
201.71  
200.29  
201.429  
199.59  
201.687  
198.62  
201.944  
200.09  
202.202  
200.78  
202.460  
200.75  
202.718  
200.85  
202.976  
201.12  
203.202  
201.56  
203.363  
201.85  
203.459  
201.71  
203.491  
201.39  
203.458  
201.28  
203.361  
200.34  
203.231  
200.24  
203.402  
200.01  
202.972  
199.84  
202.843  
199.69  
202.713  
199.21  
202.583

198.91  
202.454  
199.55  
202.324  
199.76  
202.194  
199.80  
202.065  
200.01  
201.935  
200.06  
201.805

Scale 1:4000 H  
1:400 V

INDIANA DEPARTMENT OF TRANSPORTATION			
PRELIMINARY DRAWING			
GWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 4+500 - 6+000			
RECOMMENDED FOR APPROVAL		DESIGN ENGINEER	DATE
CONTRACT NO.	STRUCTURE NO.		
DES. NO.	PROJECT NO.	YEAR	SHEET TOTAL
XXXX	XXXX		W-13

RELOCATED 625 EAST  
CURVE DATA

P.I. Sta. 50+167.89  
 $\Delta = 41^{\circ}39'57''$  Left  
 T = 85.62  
 L = 163.62  
 R = 225.00  
 E = 15.74  
 e = 0.00%

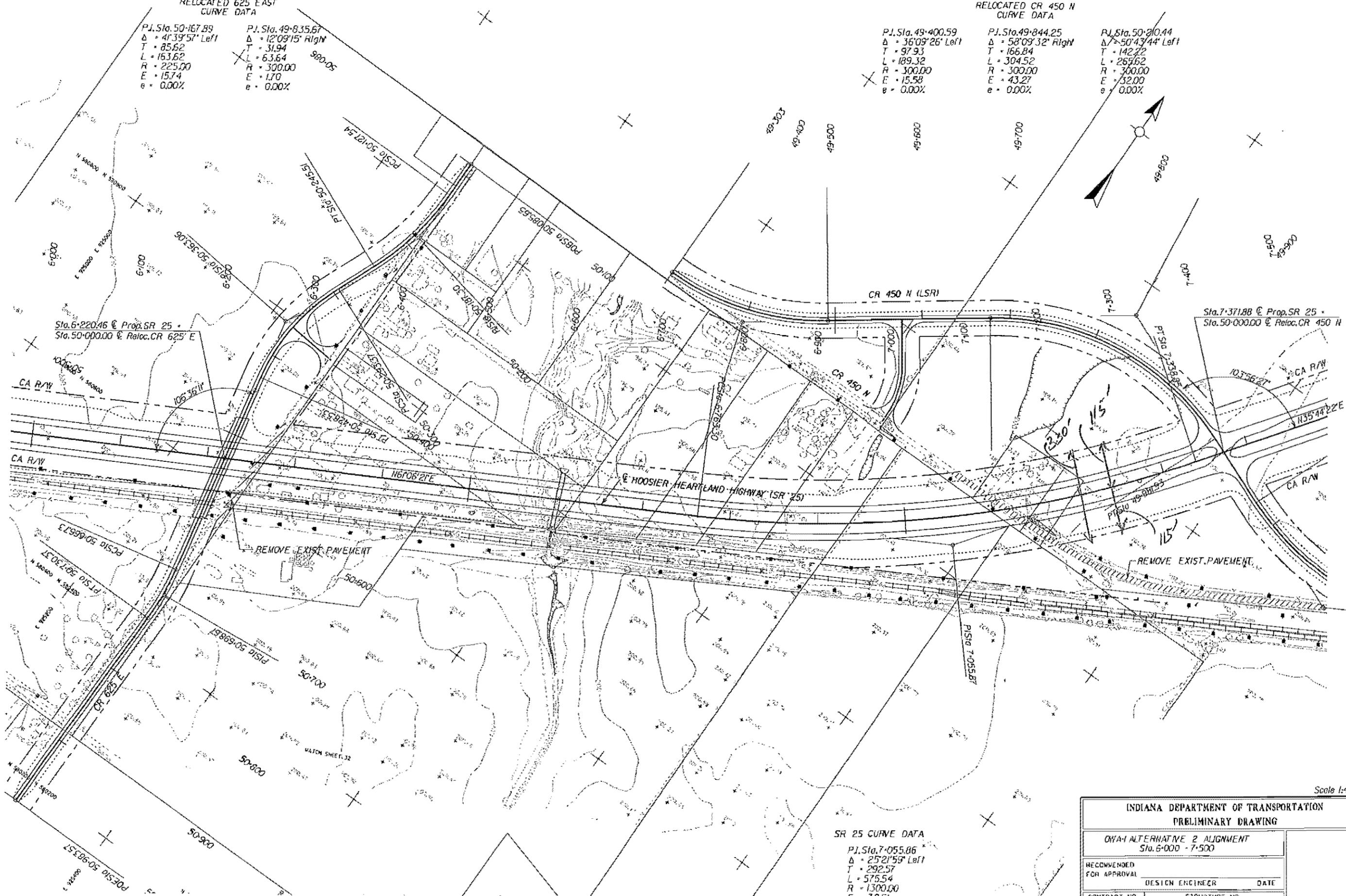
P.I. Sta. 49+835.67  
 $\Delta = 12^{\circ}09'15''$  Right  
 T = 31.94  
 L = 63.84  
 R = 300.00  
 E = 1.70  
 e = 0.00%

RELOCATED CR 450 N  
CURVE DATA

P.I. Sta. 49+400.59  
 $\Delta = 36^{\circ}09'26''$  Left  
 T = 97.93  
 L = 189.32  
 R = 300.00  
 E = 15.58  
 e = 0.00%

P.I. Sta. 49+844.25  
 $\Delta = 58^{\circ}09'32''$  Right  
 T = 166.84  
 L = 304.52  
 R = 300.00  
 E = 43.27  
 e = 0.00%

P.I. Sta. 50+210.44  
 $\Delta = 50^{\circ}43'44''$  Left  
 T = 142.22  
 L = 269.62  
 R = 300.00  
 E = 32.00  
 e = 0.00%



Sta. 6+220.46 @ Prop. SR 25  
 Sta. 50+000.00 @ Reloc. CR 625 E

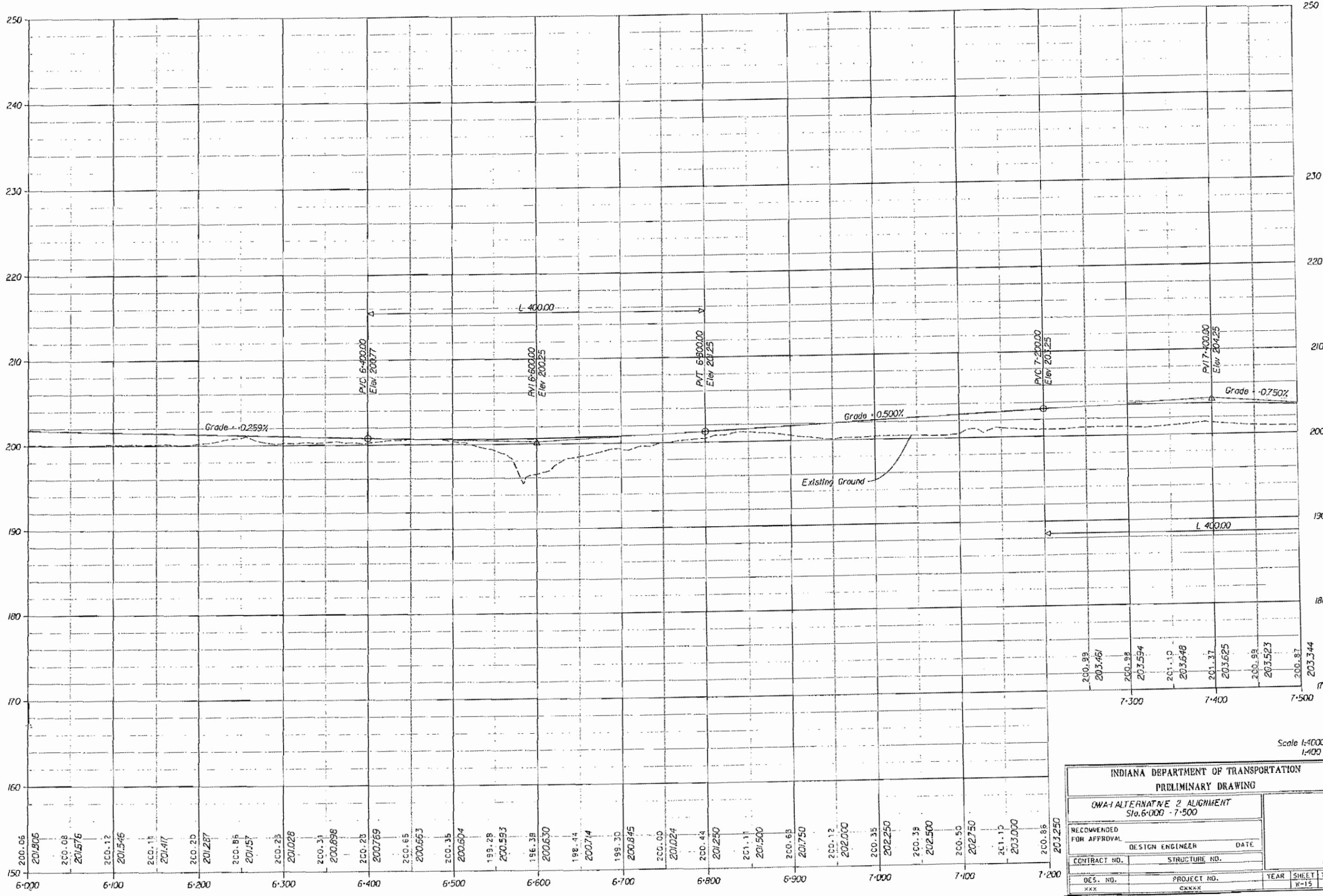
Sta. 7+371.88 @ Prop. SR 25  
 Sta. 50+000.00 @ Reloc. CR 450 N

SR 25 CURVE DATA

P.I. Sta. 7+055.86  
 $\Delta = 25^{\circ}21'59''$  Left  
 T = 292.57  
 L = 575.54  
 R = 1300.00  
 E = 32.51  
 e = 5.50%

Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION PRELIMINARY DRAWING			
DMA-1 ALTERNATIVE 2 ALIGNMENT Sta. 6+000 - 7+500			
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.		
DES. NO. XXXX	PROJECT NO. XXXX	YEAR	SHEET TOTAL R-14

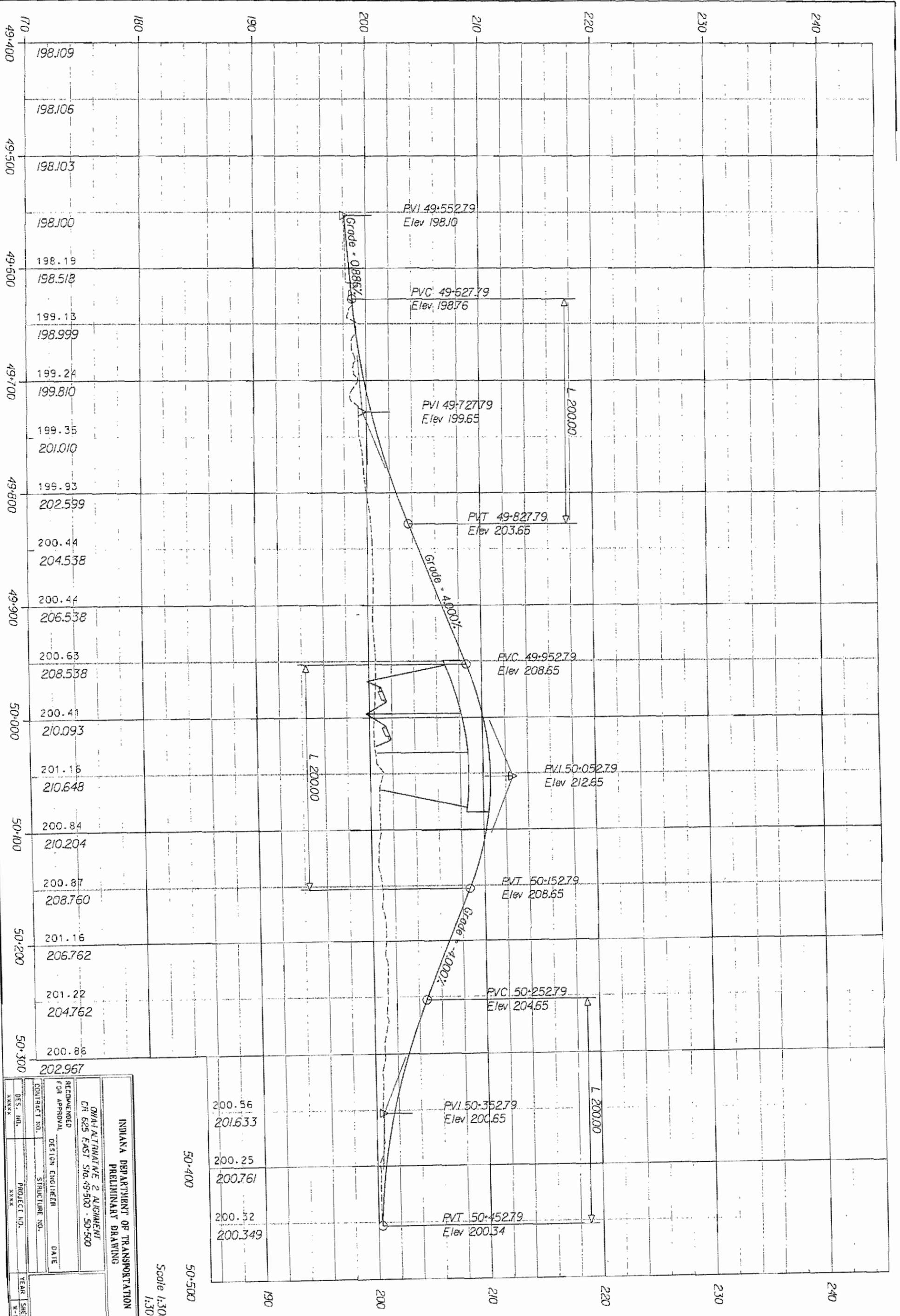


200.66 201.806  
 200.08 201.576  
 200.12 201.546  
 200.11 201.417  
 200.20 201.287  
 200.86 201.157  
 200.25 201.028  
 200.31 200.898  
 200.25 200.769  
 200.65 200.663  
 200.35 200.604  
 199.28 200.593  
 196.38 200.630  
 198.44 200.714  
 199.30 200.845  
 200.00 201.024  
 200.44 201.250  
 201.11 201.500  
 200.68 201.750  
 200.12 202.000  
 200.35 202.250  
 200.39 202.500  
 200.50 202.750  
 201.10 203.000  
 200.86 203.250

200.99 203.451  
 200.98 203.594  
 201.10 203.648  
 201.37 203.625  
 200.99 203.523  
 200.87 203.344

Scale 1:4000 H  
1:100 V

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 6+000 - 7+500				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.		150	
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXX	CKXXX		W-15	V



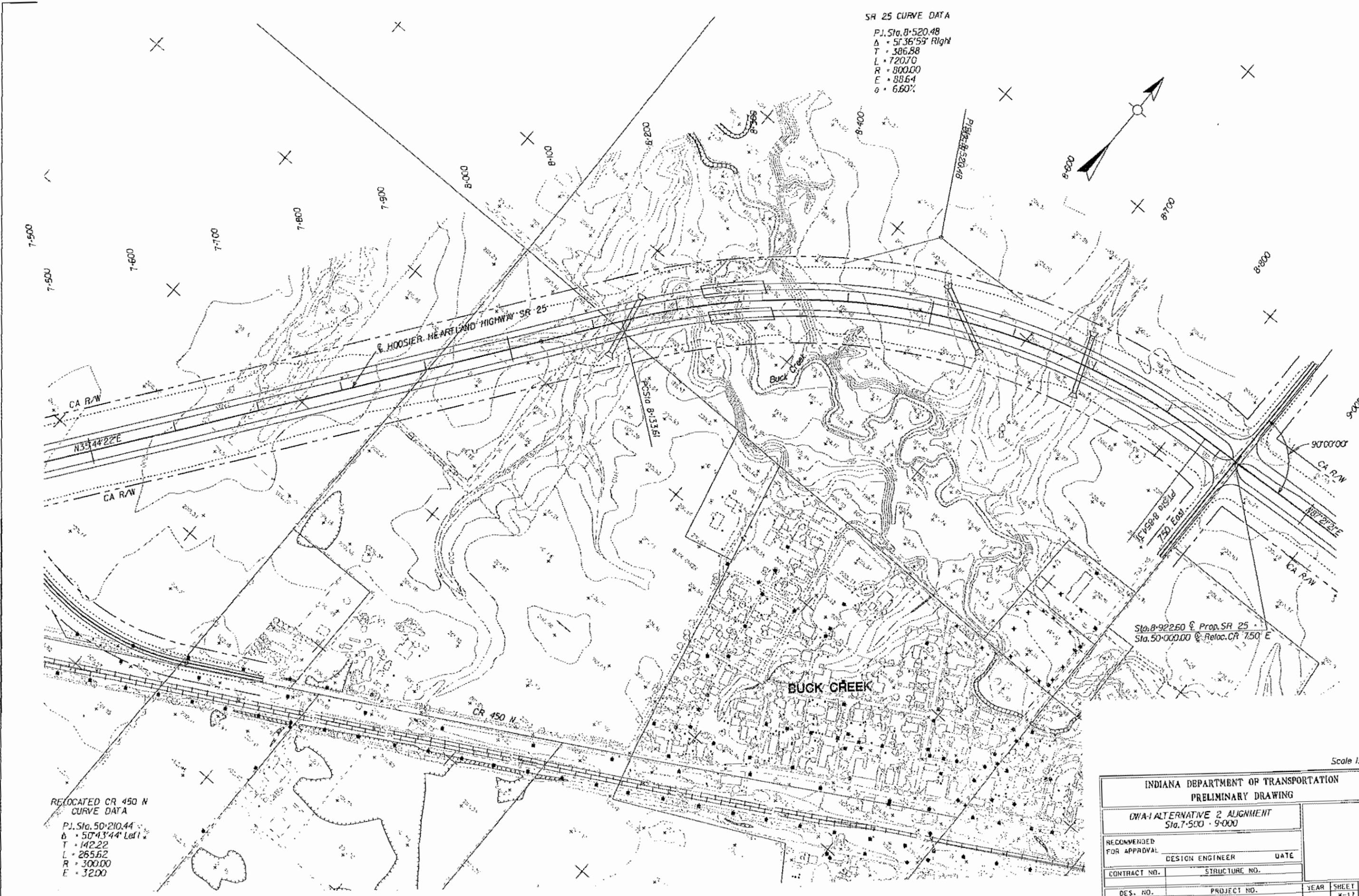
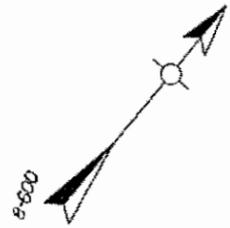
INDIANA DEPARTMENT OF TRANSPORTATION PRELIMINARY DRAWING	
DESIGN NO. XXXX	PROJECT NO. XXXX
RECORDED FOR APPROVAL	DATE
DESIGN ENGINEER	SIGNATURE NO.
YEAR	SHEET NO.
	TOTAL SHEETS

Scale 1:3000 H  
1:300 V

200.56 201.633	PVI 50:352.79 Elev 200.65
200.25 200.761	
200.32 200.349	PVT 50:452.79 Elev 200.34

SR 25 CURVE DATA

P.I. Sta. 8+520.48  
 $\Delta = 51^{\circ}36'53''$  Right  
 T = 386.88  
 L = 720.70  
 R = 800.00  
 E = 88.64  
 $\theta = 6.60\%$



RELOCATED CR 450 N  
 CURVE DATA  
 P.I. Sta. 50+210.44  
 $\Delta = 50^{\circ}43'44''$  Left  
 T = 142.22  
 L = 265.62  
 R = 300.00  
 E = 32.00

Sta. 8+922.60 @ Prop. SR 25  
 Sta. 50+000.00 @ Reloc. CR 750 E

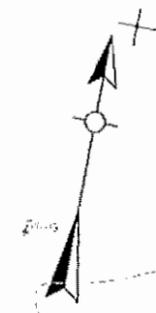
Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
DWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 7+500 - 9+000				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXX		W-17	



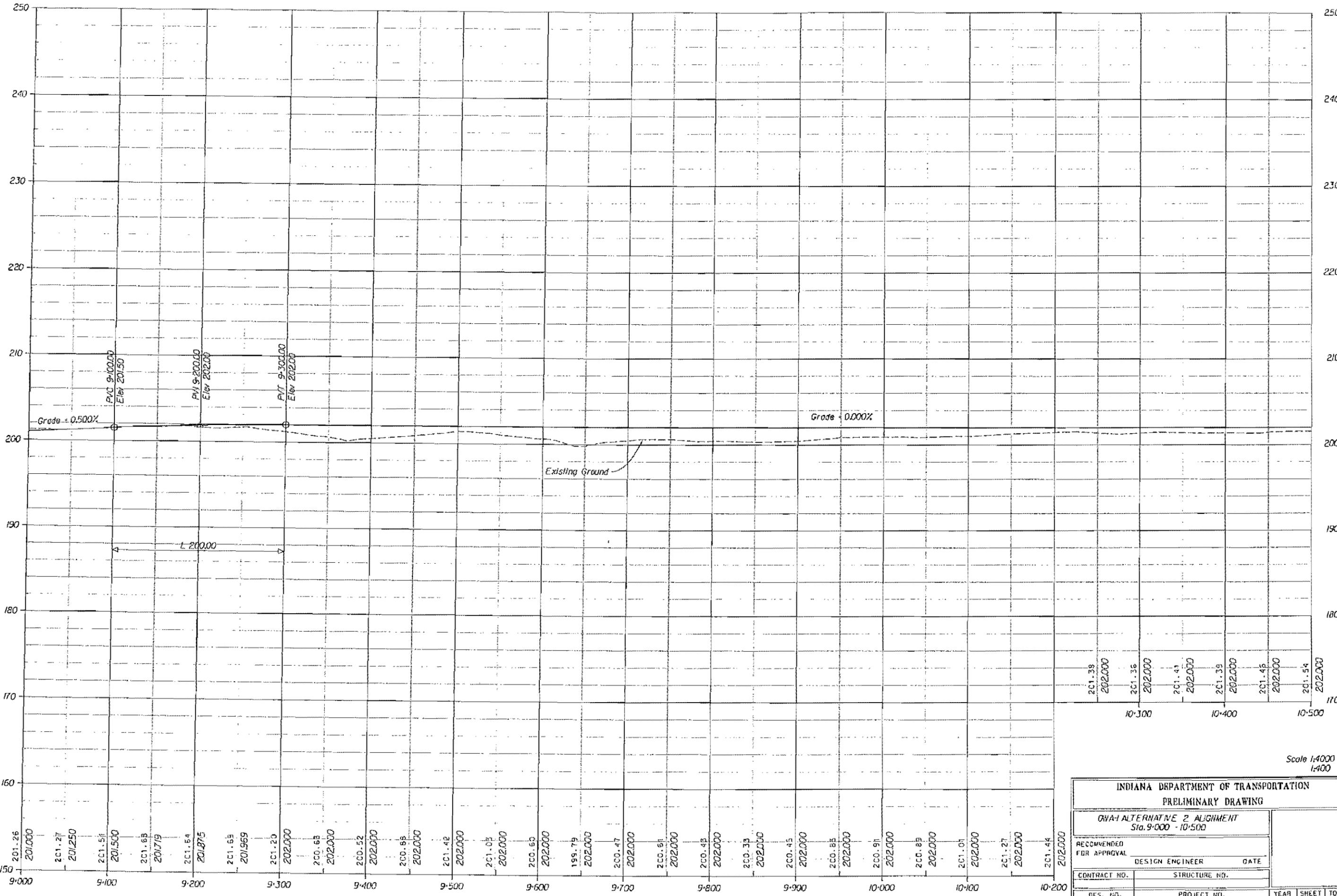
SR 25 CURVE DATA

P.I. Sta. 9+895.36  
 Δ = 2615'00" Lat  
 T = 23317  
 L = 45815  
 R = 1000.00  
 E = 26.82  
 e = 5.50%



Scale 1/4000

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
DWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 9+000 - 10+500				
RECOMMENDED FOR APPROVAL		DESIGN ENGINEER	DATE	
CONTRACT NO.		STRUCTURE NO.		
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXX		W-19	



201.39	202.000
201.36	202.000
201.41	202.000
201.38	202.000
201.46	202.000
201.54	202.000

201.26	201.000	201.27	201.250	201.51	201.500	201.63	201.669	201.20	202.000	200.68	202.000	200.52	202.000	200.85	202.000	201.42	202.000	201.03	202.000	200.60	202.000	199.79	202.000	200.47	202.000	200.61	202.000	200.48	202.000	200.33	202.000	200.45	202.000	200.85	202.000	200.91	202.000	200.83	202.000	201.01	202.000	201.27	202.000	201.44	202.000							
9+000		9+100		9+200		9+300		9+400		9+500		9+600		9+700		9+800		9+900		10+000		10+100		10+200																												

Scale 1:4000 H  
1:400 V

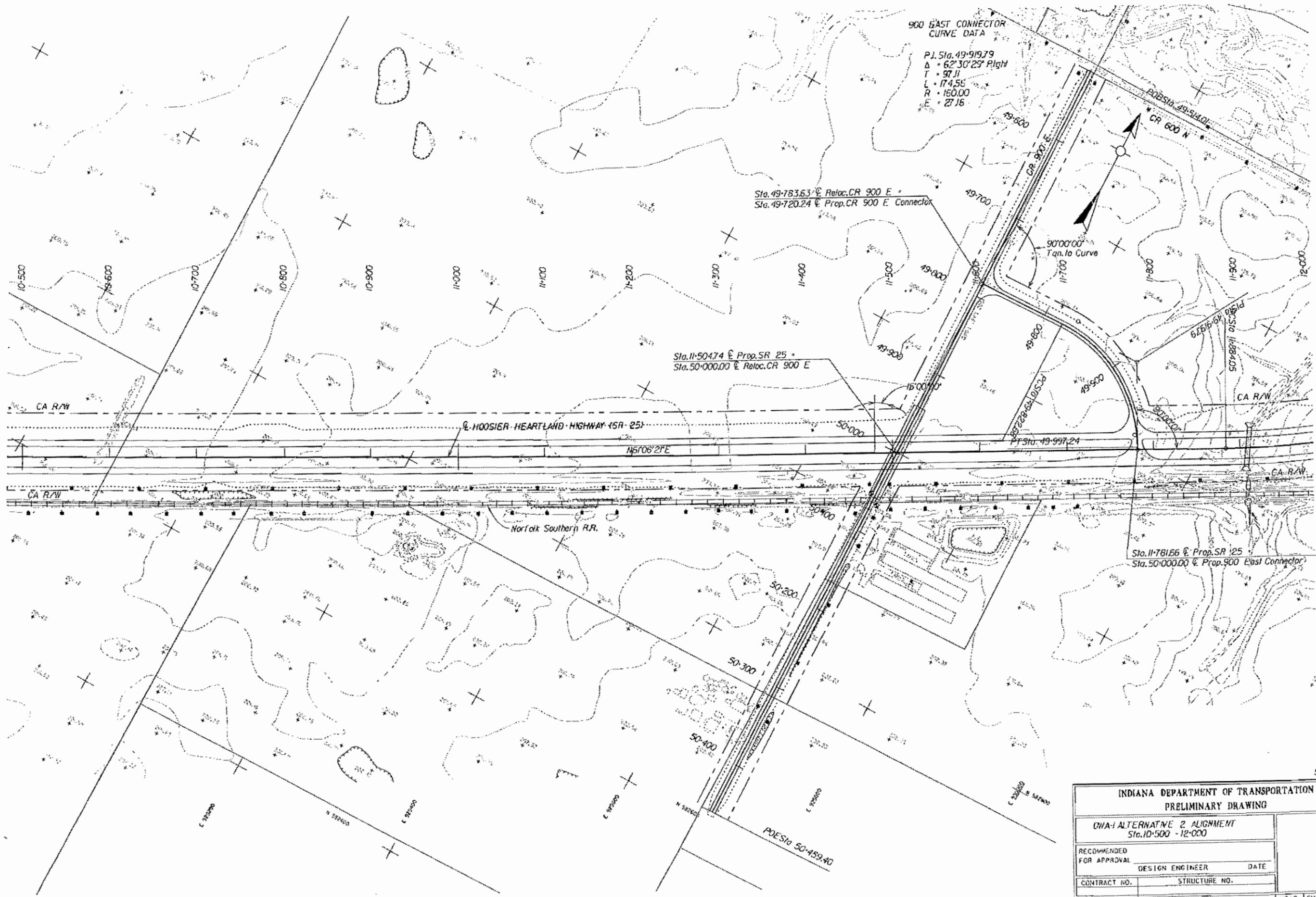
INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 9+000 - 10+500				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXX		W-20	

900 EAST CONNECTOR  
 CURVE DATA  
 P.I. Sta. 49-919.79  
 $\Delta = 62^{\circ}30'25"$  Right  
 T = 97.11  
 L = 174.56  
 R = 150.00  
 E = 27.16

Sta. 49-783.53 @ Reloc. CR 900 E  
 Sta. 49-720.24 @ Prop. CR 900 E Connector

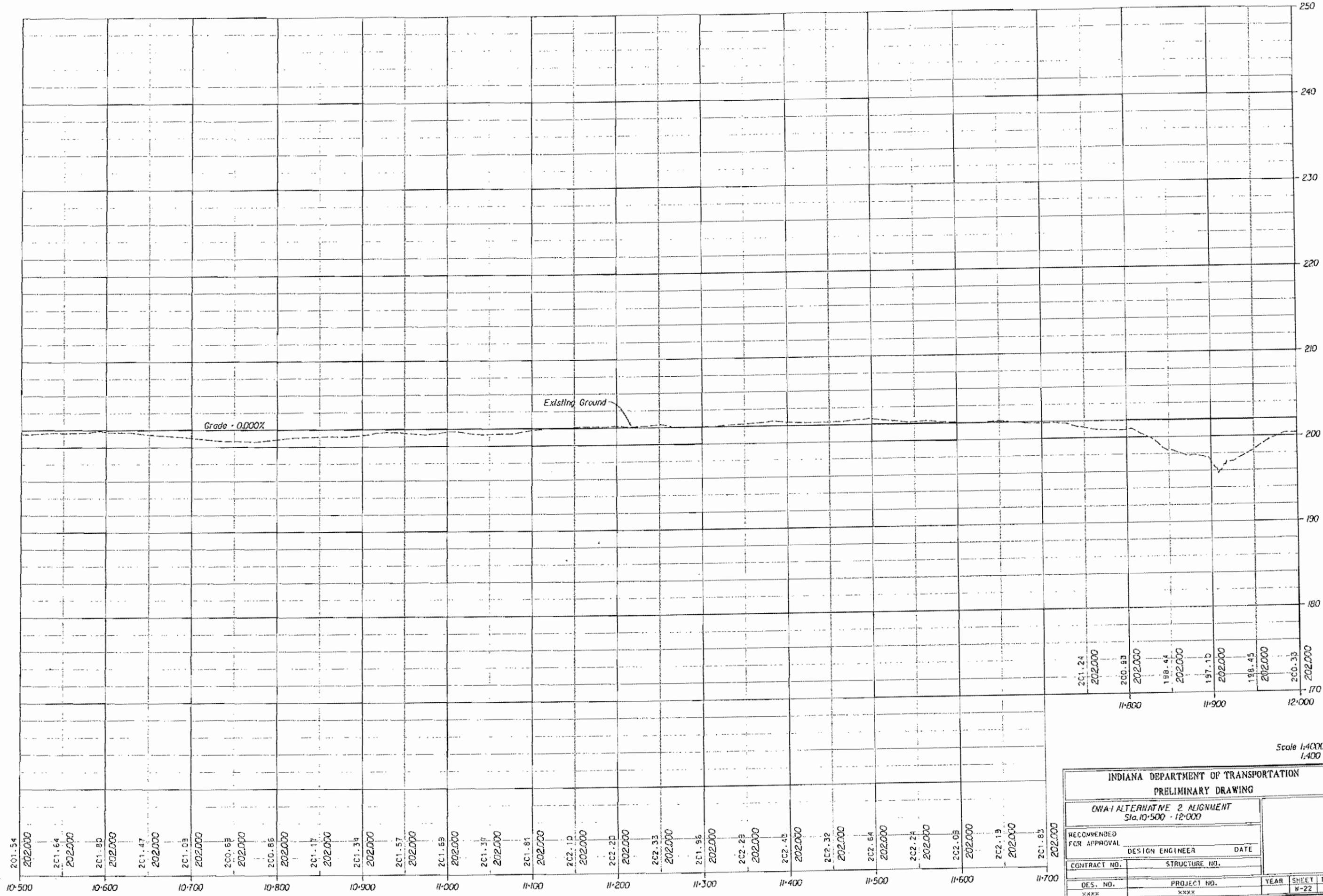
Sta. 11-50474 @ Prop. SR 25  
 Sta. 50-000.00 @ Reloc. CR 900 E

Sta. 11-78166 @ Prop. SR 25  
 Sta. 50-000.00 @ Prop. 900 East Connector



Scale 1:1000

INDIANA DEPARTMENT OF TRANSPORTATION PRELIMINARY DRAWING				
OHA-1 ALTERNATIVE 2 ALIGNMENT Sta. 10-500 - 12-000				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXXX		#-21	

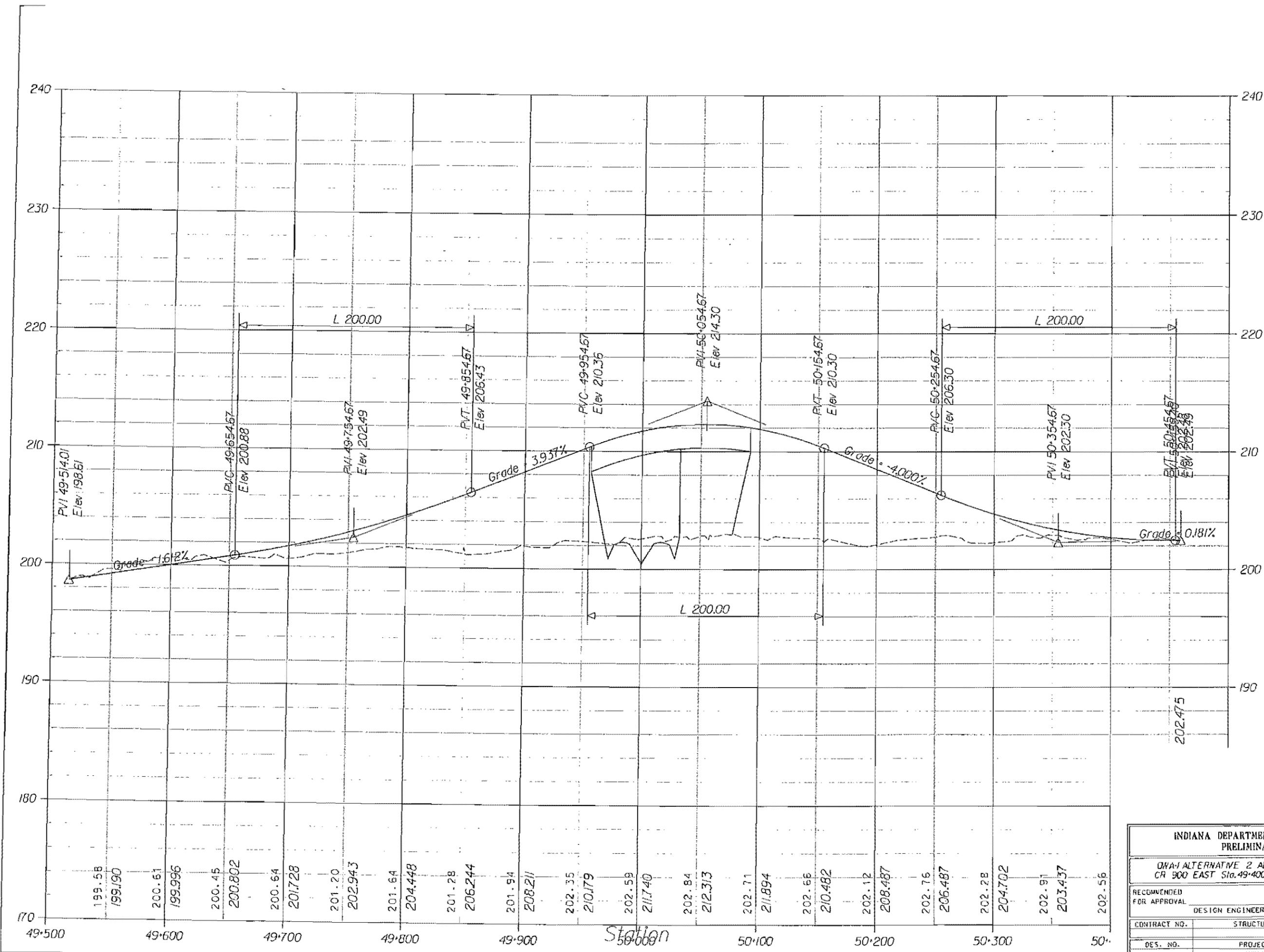


10+500 201.54 202.000  
 201.54 202.000  
 10+600 201.80 202.000  
 201.80 202.000  
 10+700 201.47 202.000  
 201.47 202.000  
 201.03 202.000  
 201.03 202.000  
 200.69 202.000  
 200.69 202.000  
 200.66 202.000  
 200.66 202.000  
 10+800 201.17 202.000  
 201.17 202.000  
 201.34 202.000  
 201.34 202.000  
 201.57 202.000  
 201.57 202.000  
 11+000 201.59 202.000  
 201.59 202.000  
 201.37 202.000  
 201.37 202.000  
 201.81 202.000  
 201.81 202.000  
 202.12 202.000  
 202.12 202.000  
 202.20 202.000  
 202.20 202.000  
 202.33 202.000  
 202.33 202.000  
 201.96 202.000  
 201.96 202.000  
 202.29 202.000  
 202.29 202.000  
 202.45 202.000  
 202.45 202.000  
 202.32 202.000  
 202.32 202.000  
 202.64 202.000  
 202.64 202.000  
 202.24 202.000  
 202.24 202.000  
 202.09 202.000  
 202.09 202.000  
 202.19 202.000  
 202.19 202.000  
 201.85 202.000  
 201.85 202.000

201.24 202.000  
 200.93 202.000  
 198.41 202.000  
 197.15 202.000  
 198.45 202.000  
 200.33 202.000  
 11+800 11+900 12+000

Scale 1:4000 H  
1:400 V

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OH-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 10+500 - 12+000				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXX		W-22	



Scale 1:3000 H  
1:300 V

INDIANA DEPARTMENT OF TRANSPORTATION PRELIMINARY DRAWING			
DRAWING ALTERNATIVE 2 ALIGNMENT CR 900 EAST Sta. 49+400 - 50+500			
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.		
DES. NO.	PROJECT NO.	YEAR	SHEET TOTAL
XXXX	XXXX		N-23

SR 25 CURVE DATA

P.I. Sta. 13+255.70  
 $\Delta = 15^{\circ}44'21''$  Right  
 T = 138.22  
 L = 274.70  
 R = 1000.00  
 E = 9.51  
 e = 5.50%

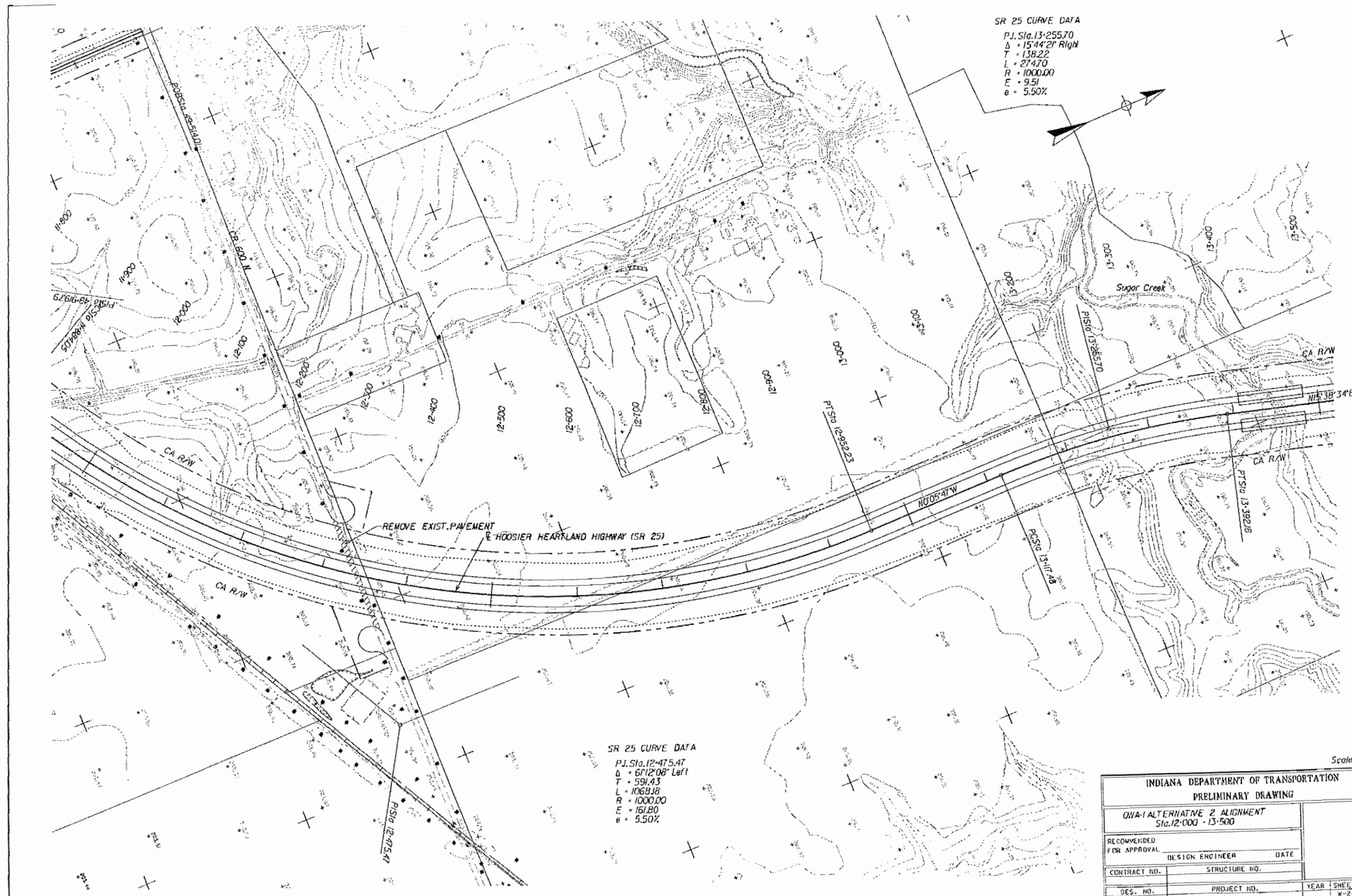


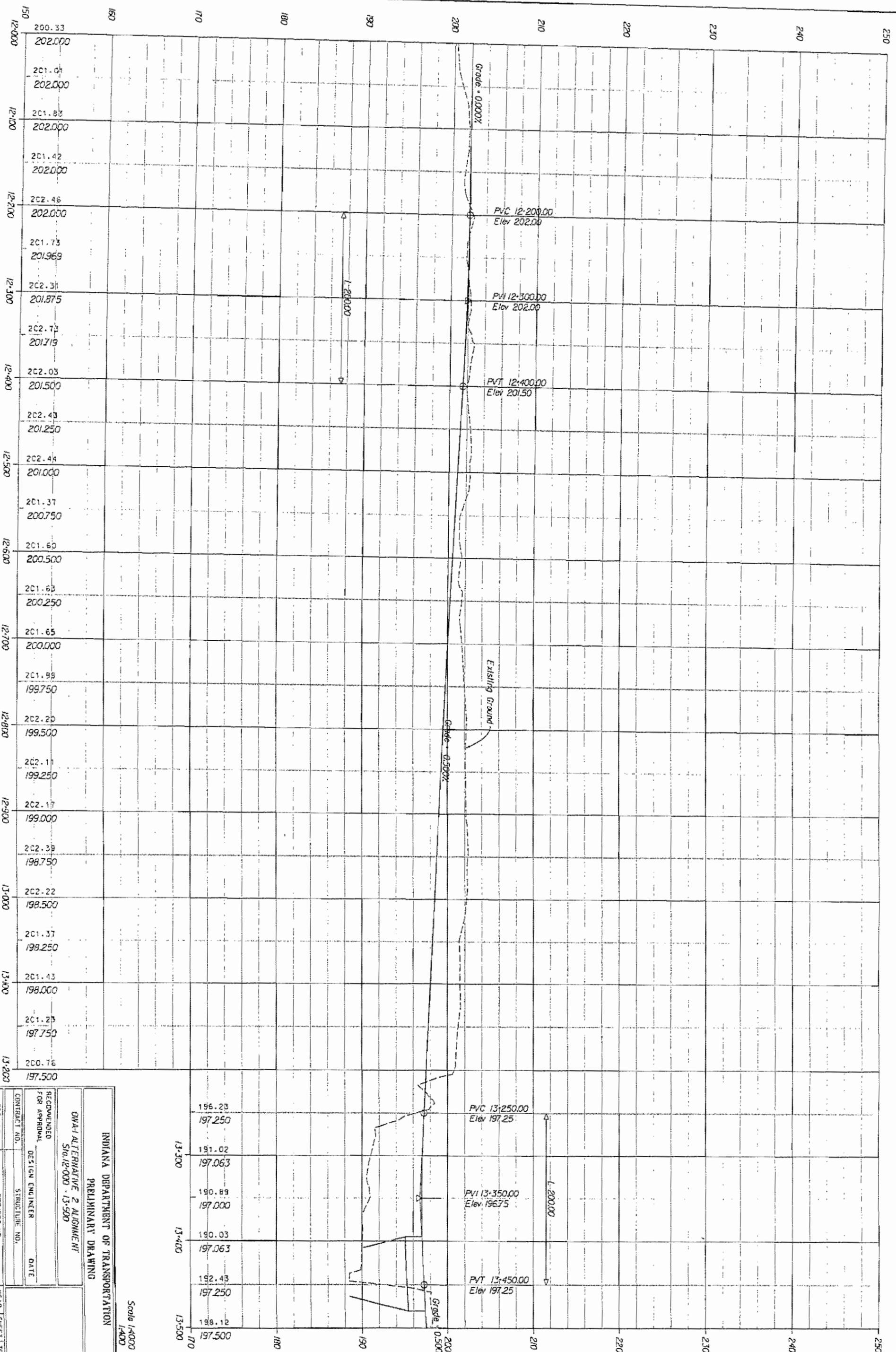
SR 25 CURVE DATA

P.I. Sta. 12+475.47  
 $\Delta = 61^{\circ}12'08''$  Left  
 T = 591.43  
 L = 1068.18  
 R = 1000.00  
 E = 161.80  
 e = 5.50%

Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OHA-ALTERNATIVE 2 ALIGNMENT Sta. 12+000 - 13+500				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXXXX	XXXXX	W-24		





150  
 12-000 200.33  
 202.00  
 201.04  
 202.00  
 12-100 201.83  
 202.00  
 201.42  
 202.00  
 12-200 202.46  
 202.00  
 201.73  
 201.969  
 12-300 202.31  
 201.875  
 202.73  
 201.719  
 12-400 202.03  
 201.500  
 202.43  
 201.250  
 12-500 202.44  
 201.000  
 201.37  
 200.750  
 12-600 201.60  
 200.500  
 201.63  
 200.250  
 12-700 201.65  
 200.000  
 201.98  
 199.750  
 12-800 202.29  
 199.500  
 202.11  
 199.250  
 12-900 202.17  
 199.000  
 202.39  
 198.750  
 13-000 202.22  
 198.500  
 201.37  
 199.250  
 13-100 201.43  
 198.000  
 201.23  
 197.750  
 13-200 200.76  
 197.500

INDIANA DEPARTMENT OF TRANSPORTATION  
 PRELIMINARY DRAWING  
 GRADE ALTERNATIVE 2 ALIGNMENT  
 Sta. 12+000 - 13+500  
 RECOMMENDED FOR APPROVAL  
 DESIGN ENGINEER DATE  
 CONTRACT NO. STRUCTURE NO.  
 RES. NO. PROJECT NO.  
 YEAR SHEET TOTAL  
 R-29

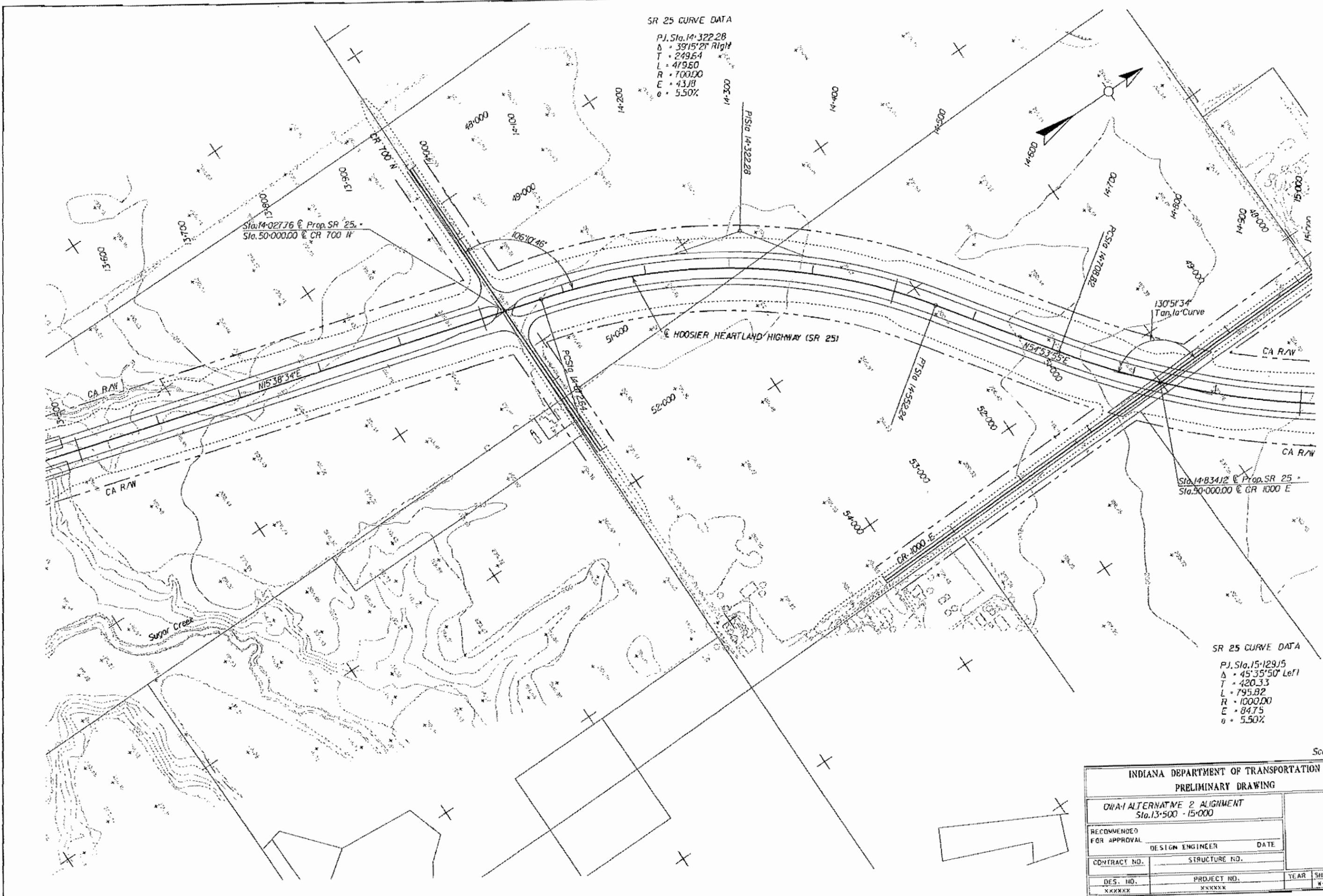
Scale 1/4000 H  
 1/400 V

SR 25 CURVE DATA

PJ. Sta. 14+322.28  
 $\Delta = 39^{\circ}15'21''$  Right  
 T = 249.64  
 L = 479.60  
 R = 700.00  
 E = 43.78  
 e = 5.50%

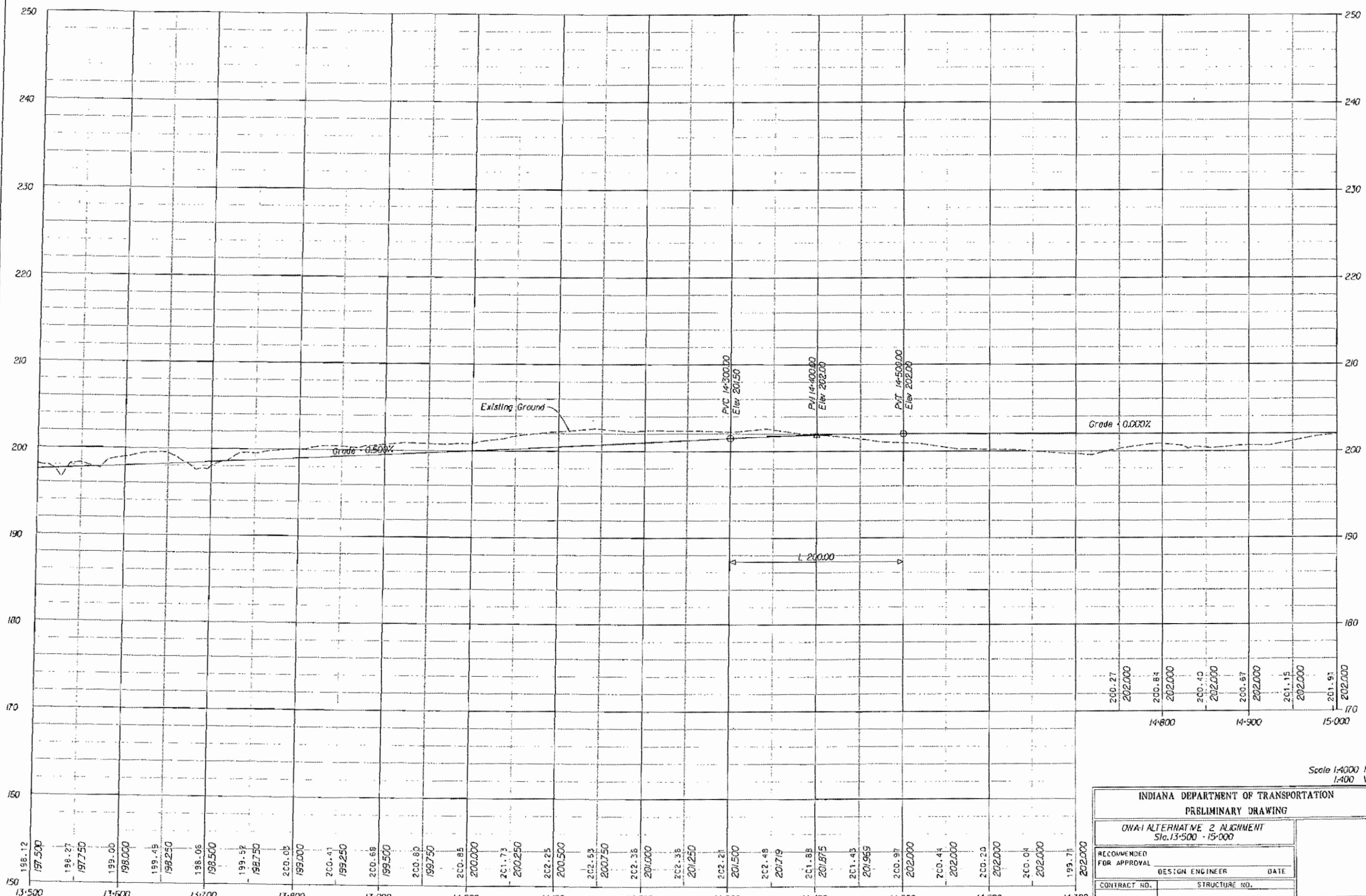
SR 25 CURVE DATA

PJ. Sta. 15+129.15  
 $\Delta = 45^{\circ}35'50''$  Left  
 T = 420.33  
 L = 795.82  
 R = 1000.00  
 E = 84.75  
 e = 5.50%



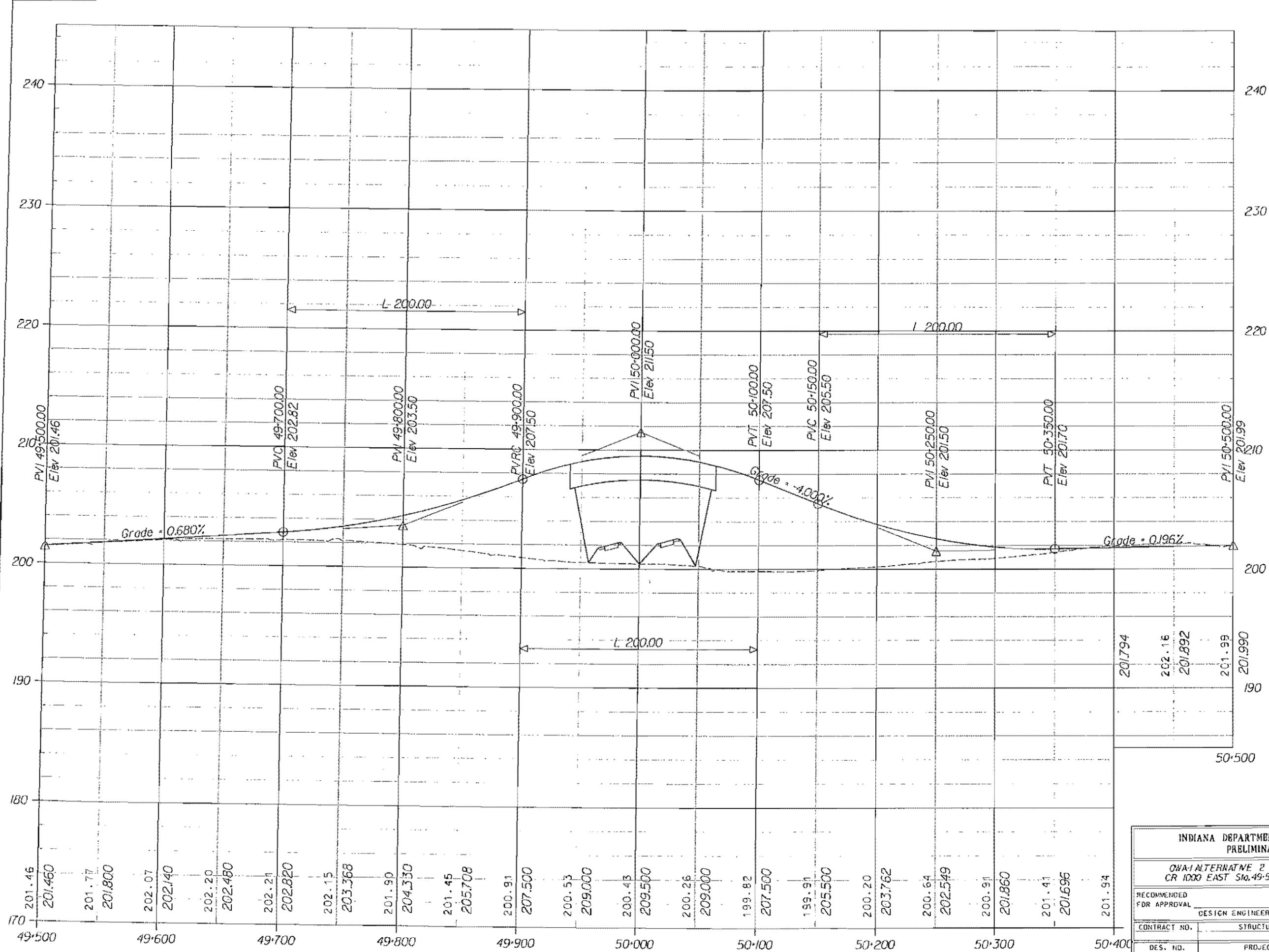
Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 13+500 - 15+000				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE		
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXXXX	XXXXXX		N-26	



Scale 1:4000 H  
1:400 V

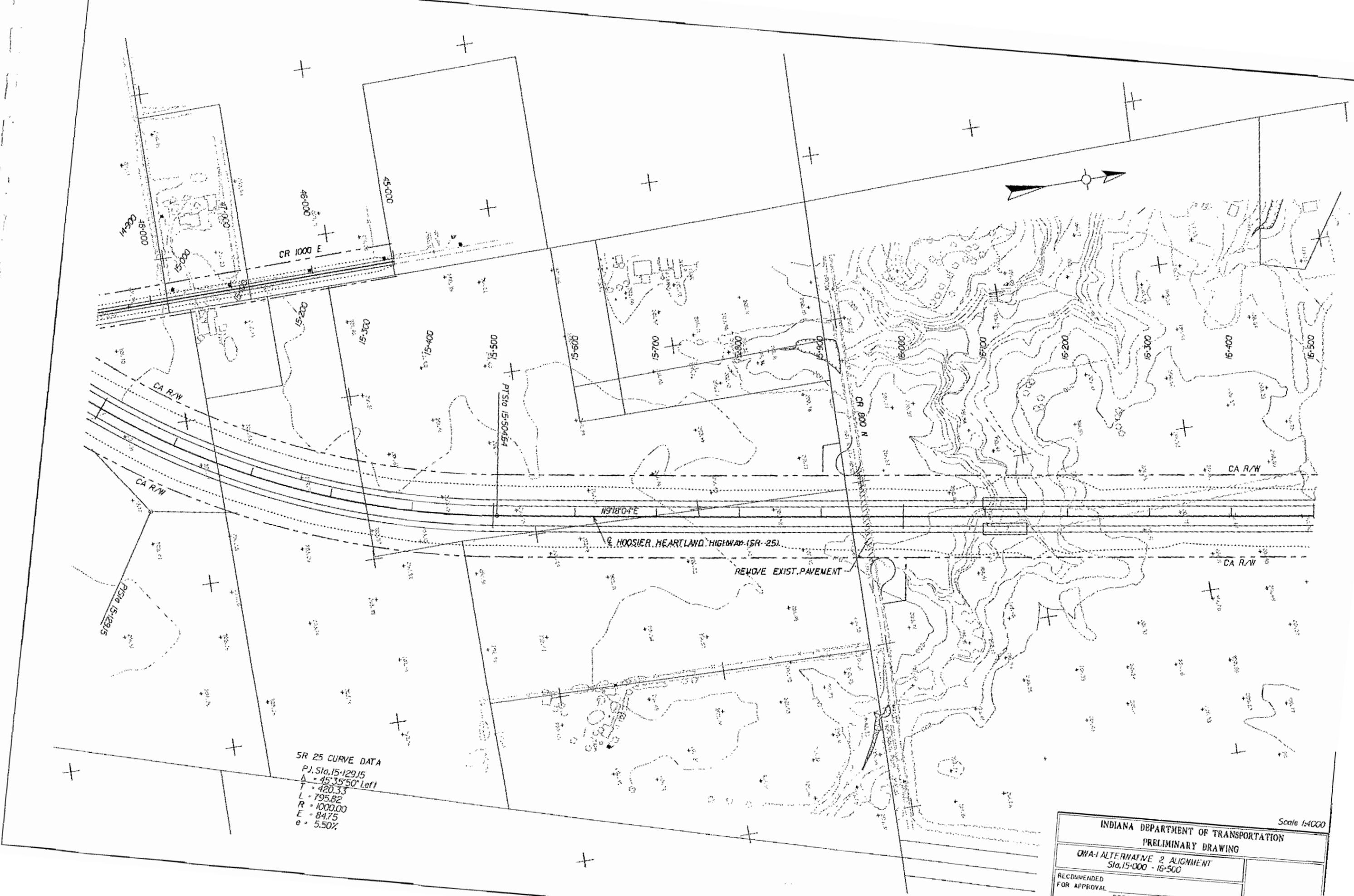
INDIANA DEPARTMENT OF TRANSPORTATION			
PRELIMINARY DRAWING			
OWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 13+500 - 15+000			
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.		
DES. NO.	PROJECT NO.	YEAR	SHEET TOTAL
XXXX	XXXXX		#-21



Scale 1:3000 H  
1:300 V

INDIANA DEPARTMENT OF TRANSPORTATION PRELIMINARY DRAWING				
QWA-1 ALTERNATIVE 2 ALIGNMENT CR 1000 EAST Sta. 49+500 - 50+500				
RECOMMENDED FOR APPROVAL		DESIGN ENGINEER	DATE	
CONTRACT NO.		STRUCTURE NO.		
DES. NO. XXXXX	PROJECT NO. XXXXX	YEAR	SHEET W-28	TOTAL

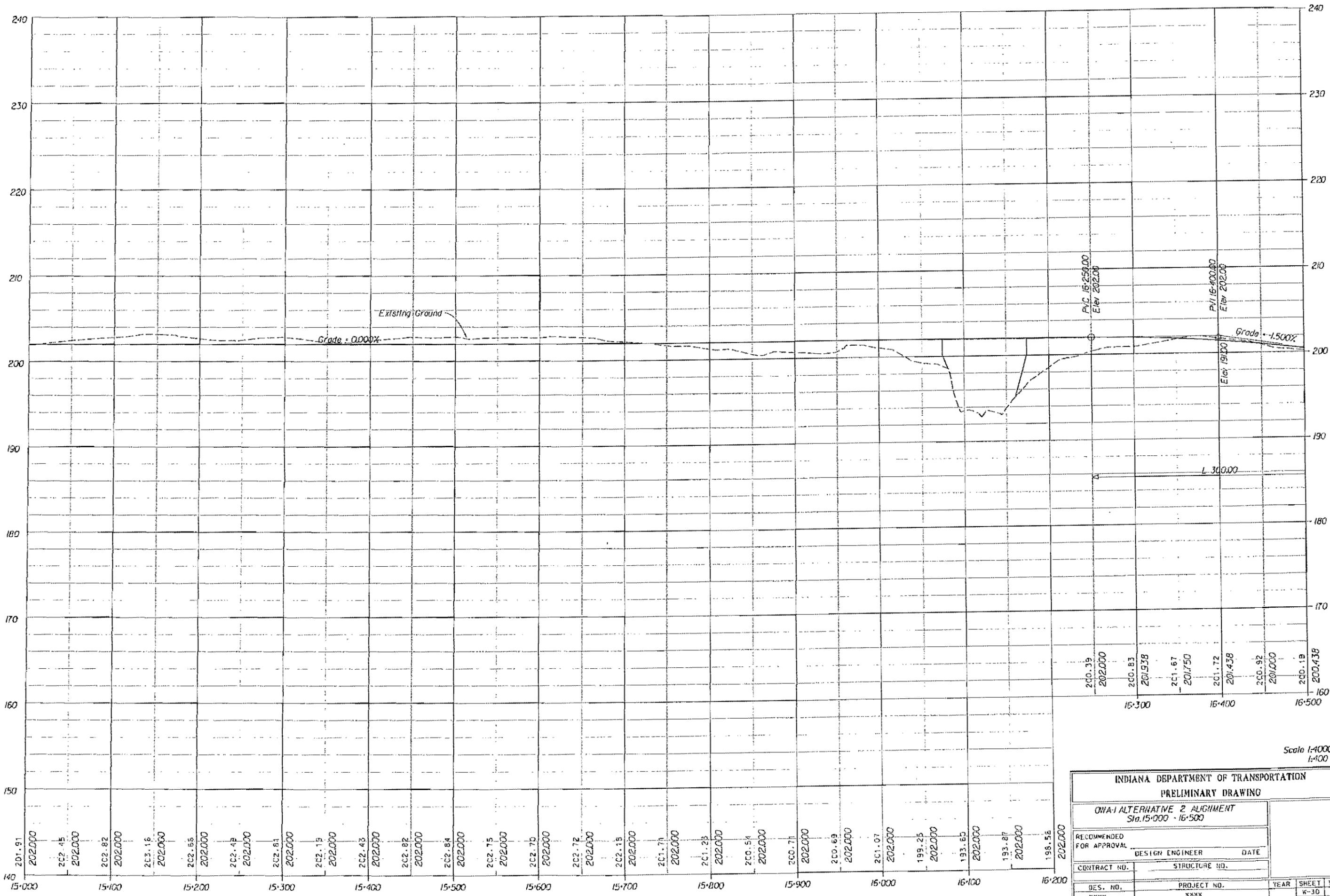
201.794  
202.16  
201.892  
201.99  
201.990  
50+500



SR 25 CURVE DATA  
 P.I. Sta. 15+129.16  
 $\Delta = 45^{\circ}35'50''$  Left  
 T = 420.33  
 L = 795.82  
 R = 1000.00  
 E = 84.75  
 e = 5.50%

Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION		
PRELIMINARY DRAWING		
CWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 15+000 - 15+500		
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE
CONTRACT NO.	STRUCTURE	



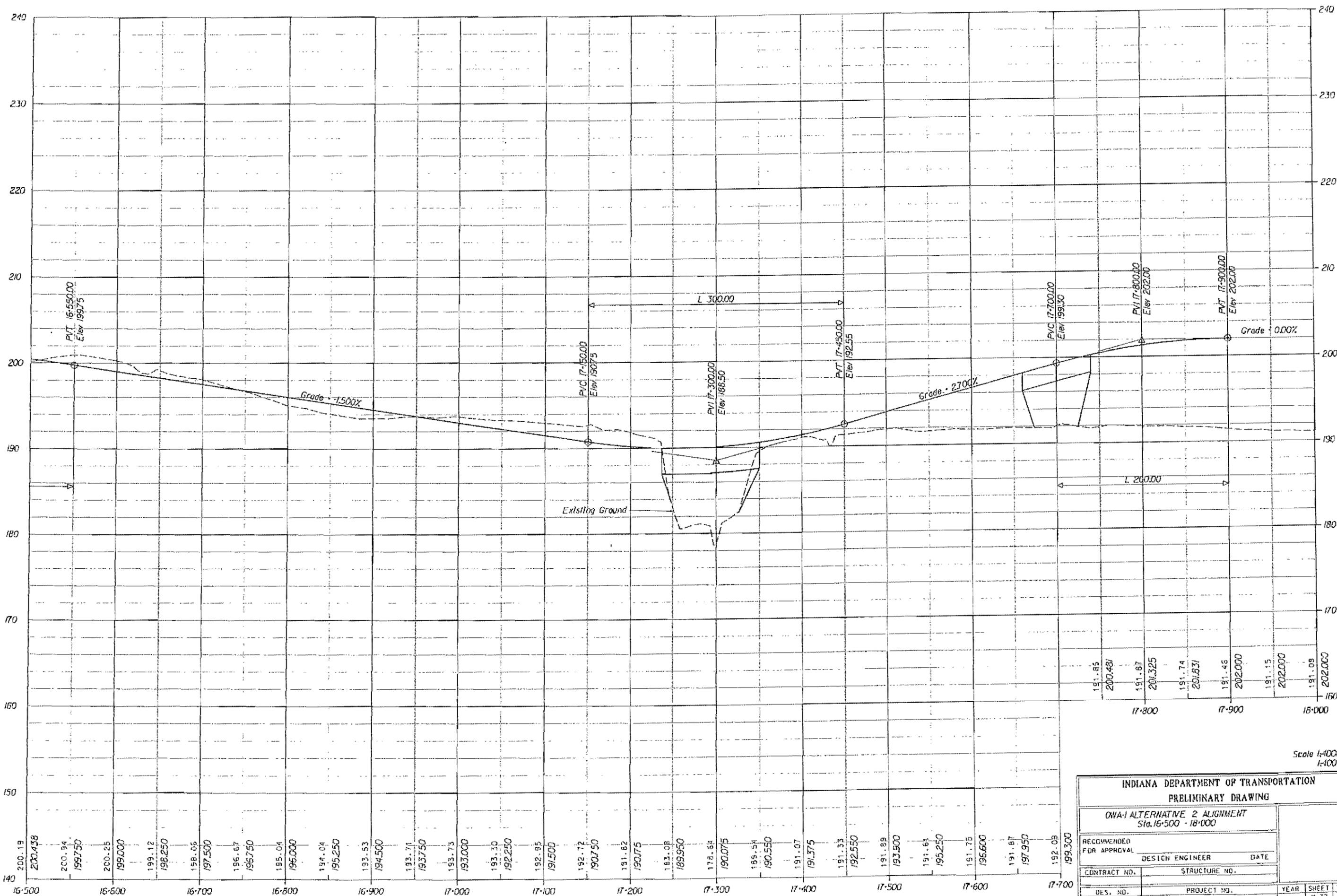
Scale 1:4000 H  
1:100 V

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
ONA-1 ALTERNATIVE 2 ALIGNMENT Sta. 15+000 - 16+500				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER		DATE	
CONTRACT NO.	STRUCTURE NO.			
RES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXX		K-30	



Scale 1:4000

INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 16+500 - 18+000				
RECOMMENDED FOR APPROVAL		DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXX		#-31	

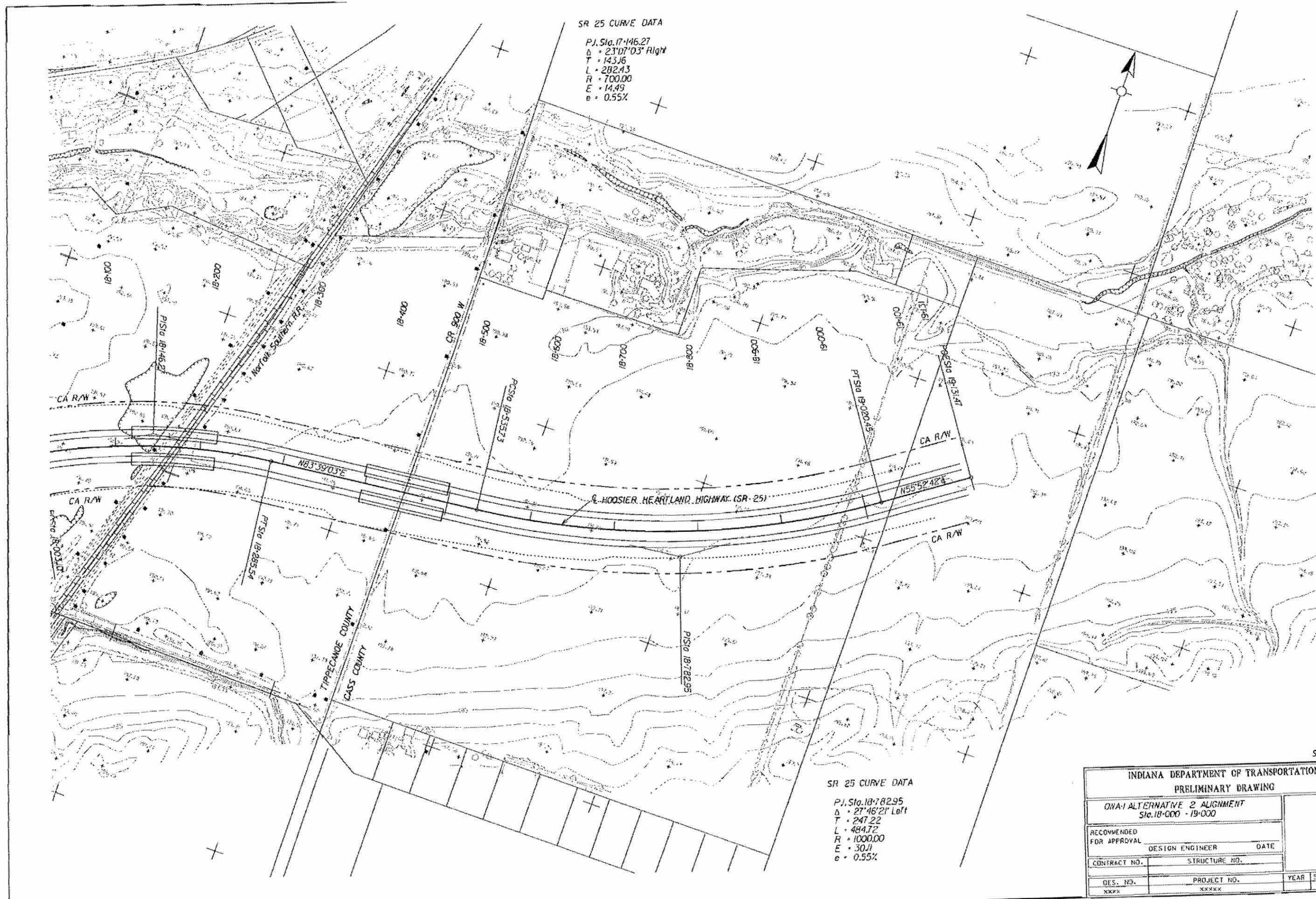


Scale 1:4000 H  
1:400 V

INDIANA DEPARTMENT OF TRANSPORTATION			
PRELIMINARY DRAWING			
OWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 16+500 - 18+000			
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.		
DES. NO.	PROJECT NO.	YEAR	SHEET TOTAL
XXXX	XXXX		W-32

SR 25 CURVE DATA

P.I. Sta. 17+146.27  
 $\Delta = 23^{\circ}07'03''$  Right  
 T = 143.16  
 L = 282.43  
 R = 700.00  
 E = 14.49  
 e = 0.55%



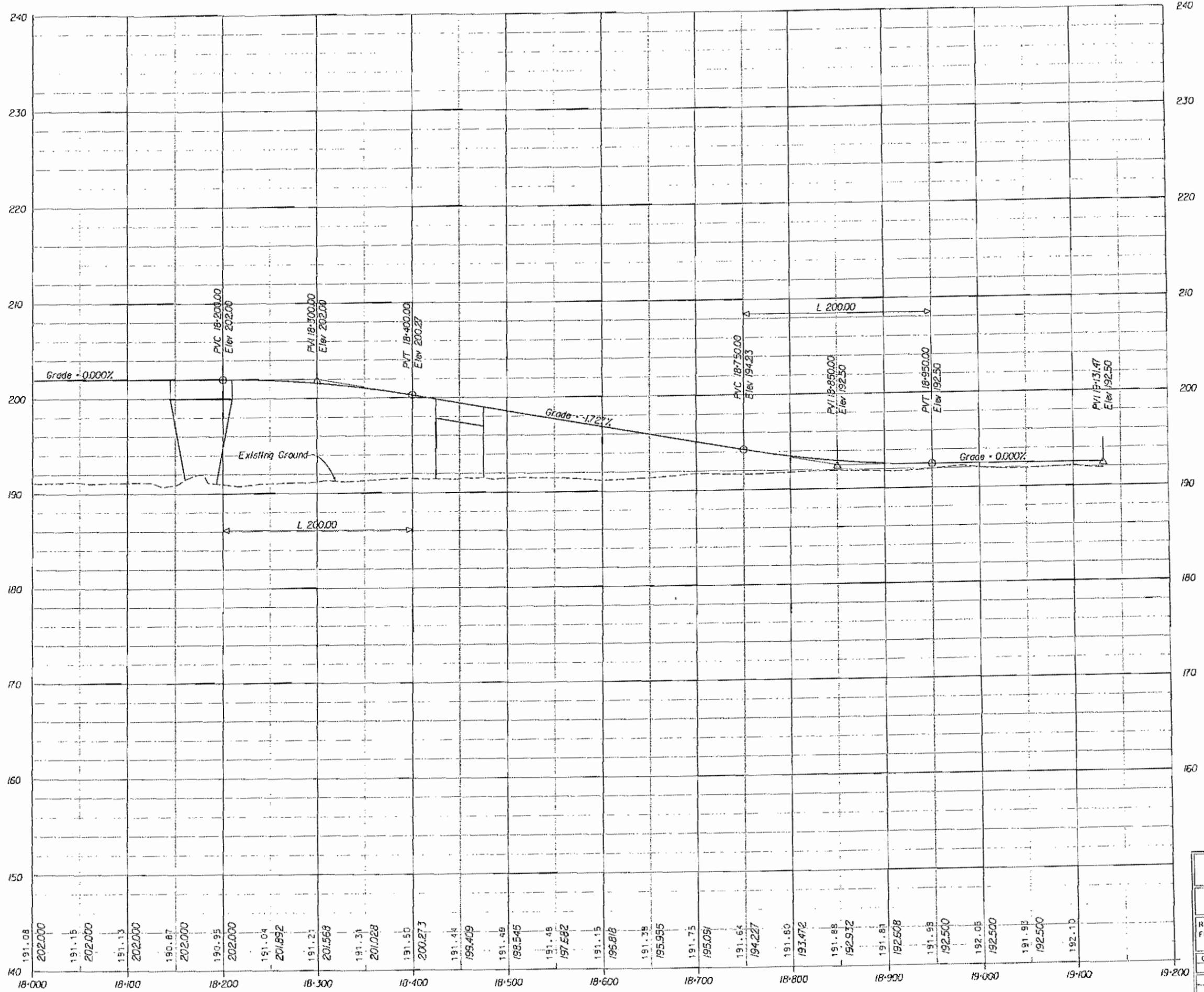
SR 25 CURVE DATA

P.I. Sta. 18+782.95  
 $\Delta = 27^{\circ}46'21''$  Left  
 T = 247.22  
 L = 484.72  
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 e = 0.55%



Scale 1:4000

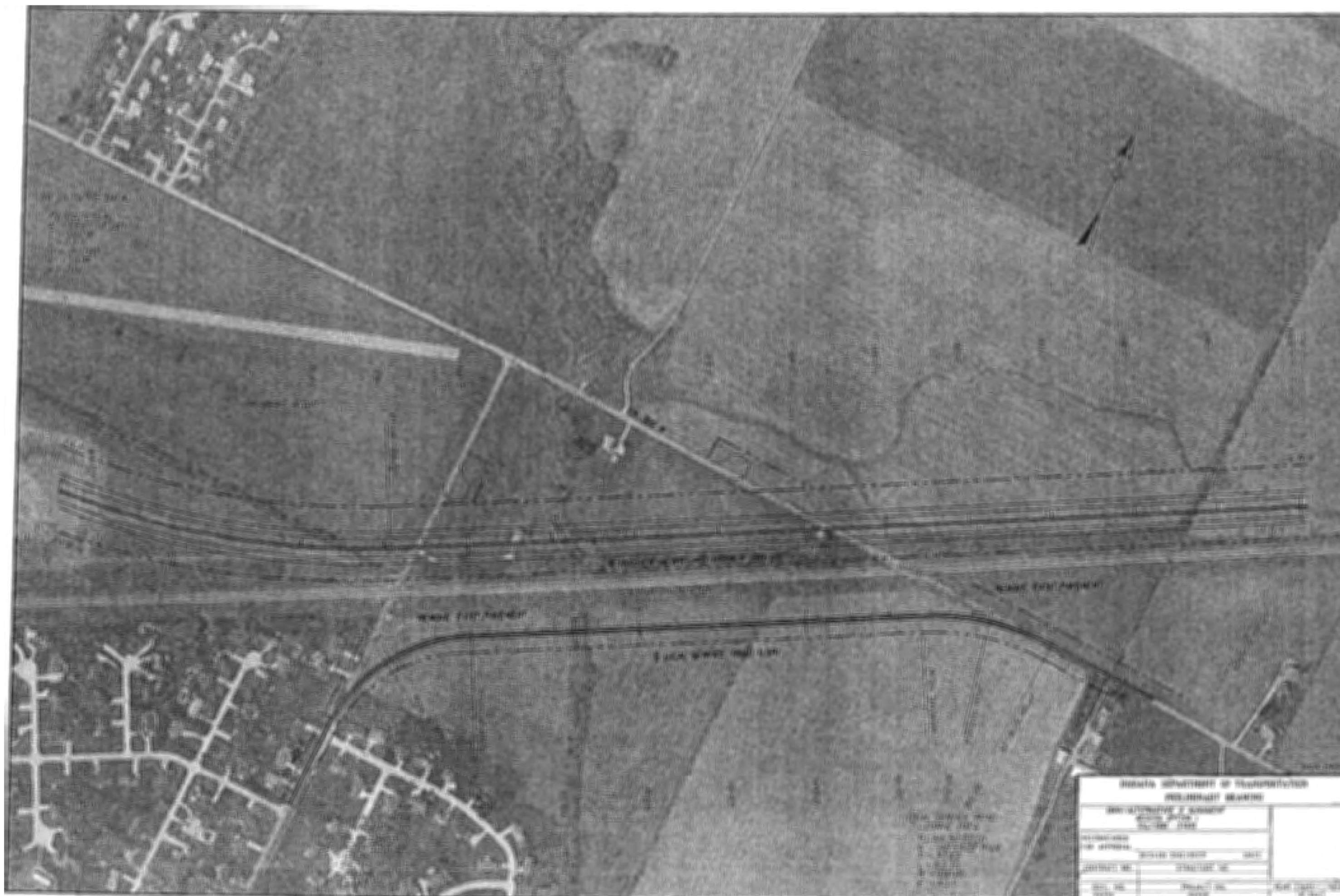
INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT				
Sta. 18+000 - 19+000				
RECOMMENDED FOR APPROVAL		DESIGN ENGINEER	DATE	
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXXX		W-33	



Scale 1:4000 H  
1:400 V

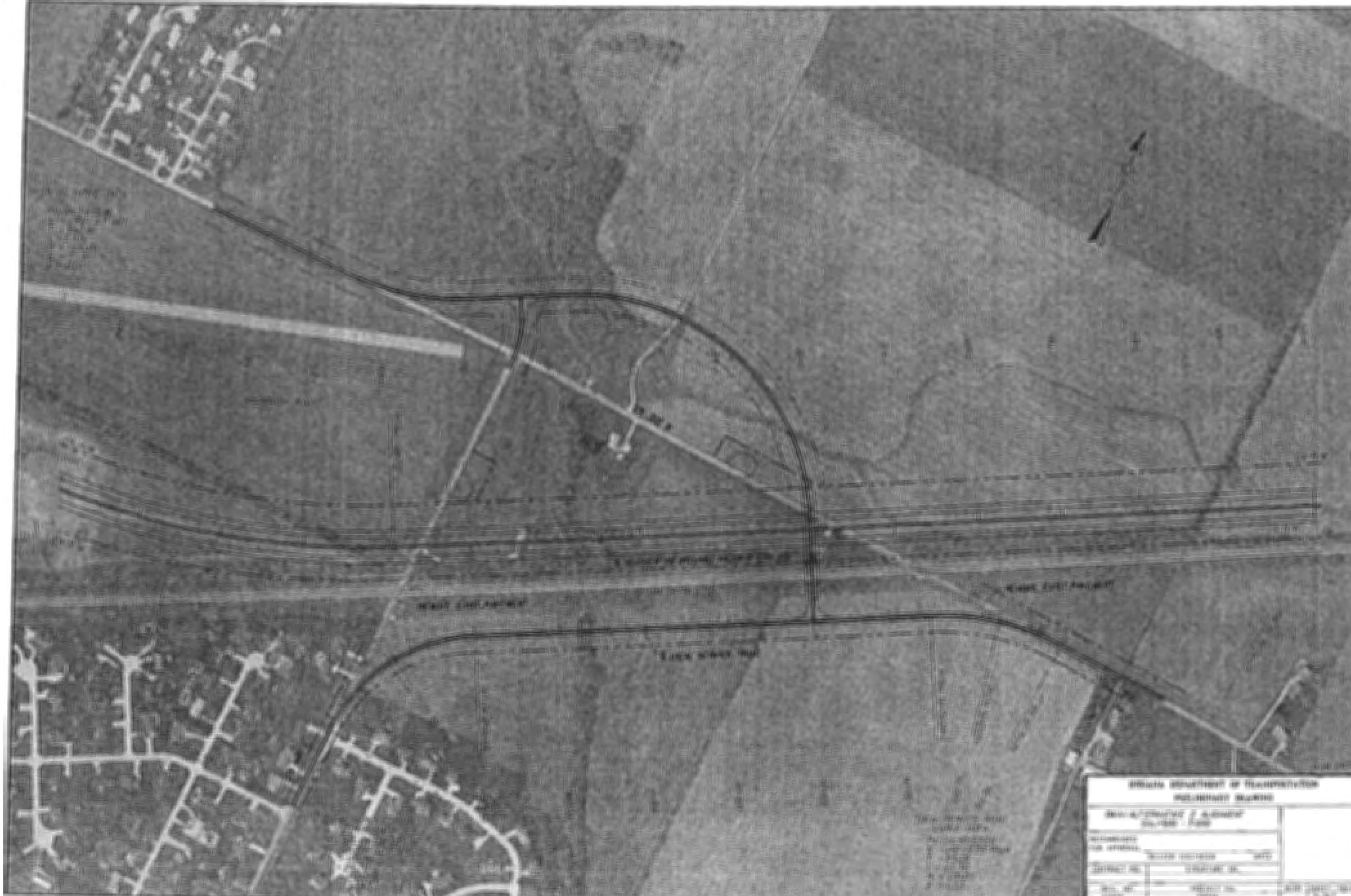
INDIANA DEPARTMENT OF TRANSPORTATION				
PRELIMINARY DRAWING				
OWA-1 ALTERNATIVE 2 ALIGNMENT Sta. 18+000 - 19+000				
RECOMMENDED FOR APPROVAL	DESIGN ENGINEER		DATE	
CONTRACT NO.	STRUCTURE NO.			
DES. NO.	PROJECT NO.	YEAR	SHEET	TOTAL
XXXX	XXXX		W-34	





FEDERAL DEPARTMENT OF TRANSPORTATION DISTRICT OFFICE WASHINGTON, D. C. 20590		
PROJECT TITLE ROAD IMPROVEMENT PROJECT		
CONTRACT NO. DISTRICT NO.	PROJECT NO. DISTRICT NO.	SHEET NO. TOTAL SHEETS

ROAD IMPROVEMENT PROJECT  
 DISTRICT NO. 1  
 PROJECT NO. 12345  
 SHEET NO. 10  
 TOTAL SHEETS 20



<b>OFFICIAL DOCUMENT OF TRANSPORTATION</b>	
<b>INDUSTRIAL DISTRICT</b>	
<b>CONTRACT NO. 1000000000000000</b>	
<b>SECTION 1000000000000000</b>	
DATE:	SCALE:
BY:	FOR:
APPROVED:	APPROVED:
DATE:	DATE:

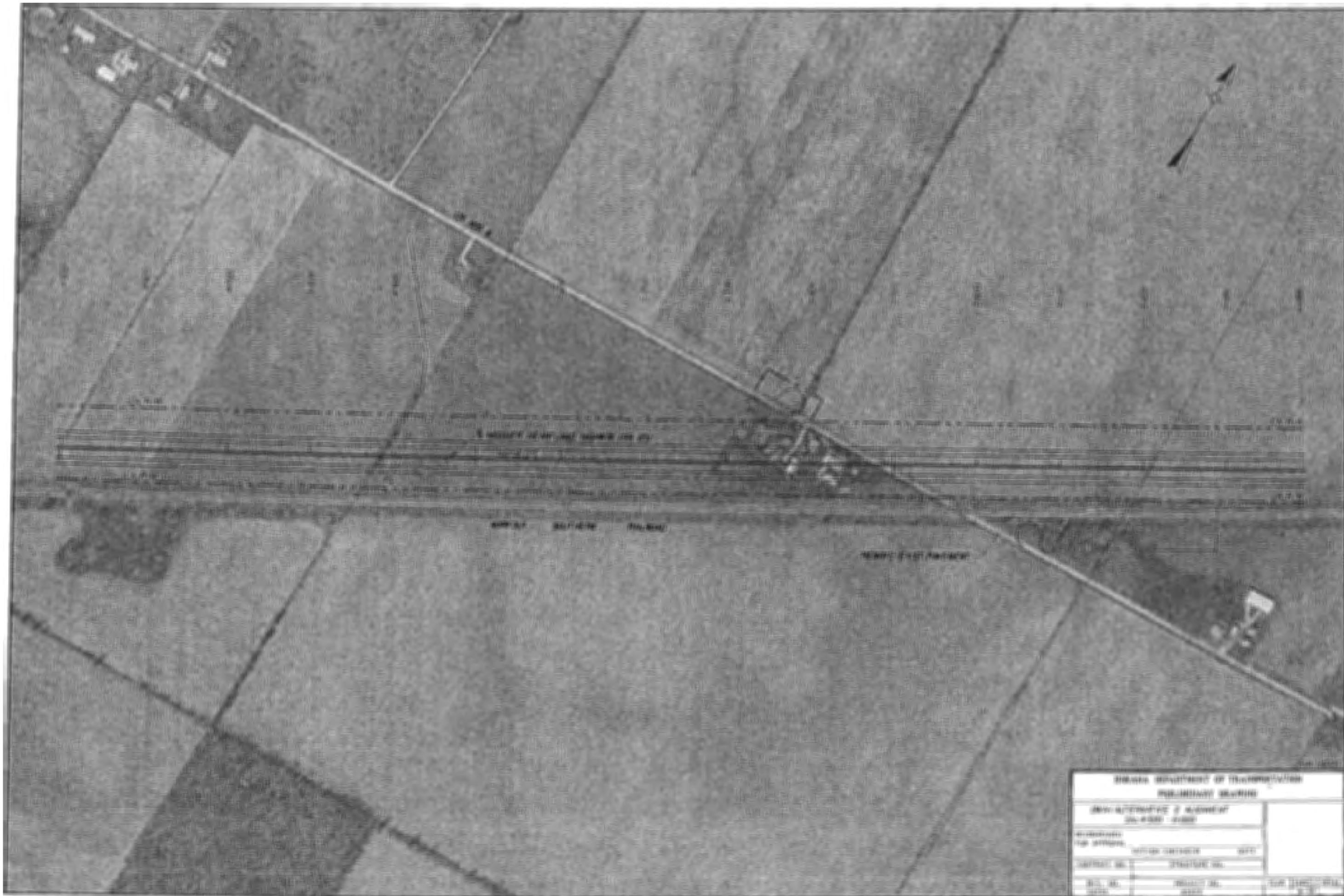
1. ALL DIMENSIONS ARE IN FEET AND DECIMALS THEREOF.  
 2. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 3. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.  
 4. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.  
 5. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.



GENERAL INFORMATION OF DISSEMINATION	
RESTRICTED SOURCE	
CLASSIFICATION & CONTROL	
CLASSIFICATION	CONTROL
GROUP NO.	CONTROL NO.
FILE NO.	PROJECT NO.
DATE	DATE



<b>BRIDGE DEPARTMENT OF TRANSPORTATION</b>	
<b>INDUSTRIAL DISTRICT</b>	
<b>DEVELOPMENT OF A BRIDGE</b>	
<b>INDUSTRIAL DISTRICT</b>	
PROJECT NO.	DATE
SCALE	BY
APP. NO.	REV. NO.
DATE	BY



<b>FEDERAL BUREAU OF INVESTIGATION</b>		
<b>MEMORANDUM FOR THE DIRECTOR</b>		
SUBJECT: <b>Investigation of [illegible]</b>		
TO: <b>Director</b>	FROM: <b>[illegible]</b>	DATE: <b>[illegible]</b>
RE: <b>[illegible]</b>	CHARACTER: <b>[illegible]</b>	CLASS: <b>[illegible]</b>
STATUS: <b>[illegible]</b>	STRUCTURE: <b>[illegible]</b>	
NO. <b>[illegible]</b>	NO. <b>[illegible]</b>	NO. <b>[illegible]</b>

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GENERAL INFORMATION OF THE PROJECT		
PROJECT NAME & NUMBER		
PROJECT NO.	DATE	
DISTRICT NO.	DISTRICT NAME	
SECTION NO.	SECTION NAME	
DATE	SCALE	BY



100' WIDE EASEMENT FROM 100'

100' WIDE EASEMENT

100'

MINNESOTA DEPARTMENT OF TRANSPORTATION		
PROPOSED HIGHWAY		
CONSTRUCTION / ALIGNMENT		
SHEET NO. 100		
DATE	SCALE	DATE
PROJECT NO.	SECTION NO.	
DATE	SCALE	DATE

100' WIDE EASEMENT FROM 100'



1. 25.0000 2000  
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3. 25.0000 2000  
4. 25.0000 2000  
5. 25.0000 2000



1. 25.0000 2000

INDIAN MINISTRY OF TRANSPORTATION		
RAILWAY BOARD		
RAILWAY BOARD		
RAILWAY BOARD		
NO. OF SHEETS	1	
SHEET NO.	1	
DATE		
SCALE		
PROJECT NO.		
SECTION NO.		
DATE		



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GENERAL INFORMATION		
PROJECT NAME & LOCATION		
PROJECT NO.	DATE	
DRAWN BY	CHECKED BY	
SCALE	DATE	



REAR LOT, PARCEL 1  
& ADJACENT LOTS, MAP NUMBER 100-20

100-20-100-20  
100-20-100-20  
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GENERAL INFORMATION OF EXAMINATION		
PROPERTY MAP		
DATE OF EXAMINATION	10/10/2010	
BY WHOM	JOHN J. BROWN	DATE
PROJECT NO.	100-20-100-20	
SCALE	AS SHOWN	

ON 20 JUNE 1954  
 AREA OF 1000  
 1. 1000  
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ON 20 JUNE 1954  
 AREA OF 1000  
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<b>ARMY DEPARTMENT OF TRANSPORTATION</b> <b>REGIMENTAL HEADQUARTERS</b>	
<b>ENGINEERING &amp; CONSTRUCTION</b> <b>SECTION 1000 - 1000</b>	
DRAWING NO. _____ PROJECT NO. _____	SHEET NO. _____ DATE _____
DESIGNED BY _____ CHECKED BY _____	DRAWN BY _____ DATE _____



ROAD EXTENSION

MINNESOTA DEPARTMENT OF TRANSPORTATION		
ROADWAY DESIGN		
PROJECT NAME & LOCATION		
DATE	SCALE	
DESIGNED BY	CHECKED BY	
DRAWN BY	APPROVED BY	
DATE	DATE	





2. ROADWAY (12.00' - 14.00' WIDE) WITH 10' PA

STATE GOVERNMENT OF TEXAS		
DEPARTMENT OF TRANSPORTATION		
DIVISION OF HIGHWAYS		
PROJECT NO. _____		
SECTION NO. _____		
DATE	BY	SCALE
_____	_____	_____