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2026-04-30
Project: 260106

James Thoume Construction Ltd.
7270 Sideroad 14
Ariss, ON N0B 1B0
c/o
Rob Stovel Jr.
Stovel and Associates Inc.

RE: PROPOSED LICHTY GRAVEL PIT, 5999 8TH LINE EAST, ARISS, ONTARIO TRANSPORTATION IMPACT BRIEF

James Thoume Construction Ltd. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Brief (TIB) for a proposed gravel pit at 5999 8th Line East in the Township of Centre Wellington (Ariss), Ontario. **Figure 1** (attached) illustrates the site location on the east side of 8th Line East. The site comprises two land parcels, with one parcel on the north side of Sideroad 12 and the other parcel on the south side of Sideroad 12.

Purpose and Scope

The purpose of this study is to estimate the potential impact(s) of the site-related traffic on the adjacent road network. This study includes a description of the proposed gravel pit and its operational characteristics, estimates of the site trip generation, and a review of sight distance at each proposed driveway connection in accordance with Wellington County and industry guidelines.

Road Characteristics

The roads adjacent to the site include 8th Line East and Sideroad 12, each of which is described as follows:

- **8th Line East** is a two-lane local road[1] with a two-lane rural cross-section comprising one travel lane per direction. Sidewalks are not provided on either side of the road, and the road operates with a posted speed limit of 60 km/h.

[1] WSP, *Township of Centre Wellington Transportation Master Plan Figure 11. Principal roadway classification in Centre Wellington,* (Elora: Township of Centre Wellington, 2019).

- **Sideroad 12** is a two-lane local road with a rural cross-section. The speed limit is not posted and is assumed to be 80 km/h. The road is unpaved and sidewalks are not provided on either side of the road. The segment of Sideroad 12 between Weisenberg Road and 6th Line East forms part of the Trans Canada Trail, known locally as the Cottontail Road Trail. The trail connects the community of Elora with the Kissing Bridge Trailway.

Development Concept

Development Description

The subject site is on the northeast and southeast corners of 8th Line East and Sideroad 12 in the Township of Centre Wellington (Ariss), Ontario. Development of the site proposes an aggregate extraction pit with an annual extraction limit of 100,000 tonnes. Vehicle access is proposed via two full moves driveways (one per parcel) to Sideroad 12, approximately 100 metres east of 8th Line East, and directly opposite of each other. **Figure 2** (attached) illustrates the proposed concept plan.

Figure 3 (attached) illustrates the proposed haul route to and from the site, which encompasses 8th Line East, north to Wellington Road 21 and south to Wellington Road 86. Little to no truck traffic is expected to/from the east via Sideroad 12, except for local deliveries of aggregate material.

Transportation Impact Assessment

Trip Generation

The estimated trip generation is based on a first principles approach, using the following information provided by the property owner:

- **Licenced Extraction Limit**: The maximum amount of tonnage applied for the aggregate licence is 100,000 tonnes per year. This rate represents the maximum amount of material that can be extracted from the site on a yearly basis;
- **Operating Times**: Trucks entering and exiting the gravel pit will be loaded only on weekdays during a 10-hour operating window for a duration of 12 months. It is expected that the proposed gravel pit will be operational for 230 days per year (approximately 19 days per month); and
- **Vehicle Size**: Each truck entering and exiting the site has a payload of 22 tonnes.

Table 1 summarizes the expected facility operations for the gravel pit and the estimated daily and hourly trip generation activity. Cells highlighted in yellow represent assumed values and non-highlighted cells represent calculated values. Calculations are provided based on both the maximum monthly and average monthly extraction limits to account for potential seasonal variation in extraction activity on the site.

Based on the planned site operations, the site is forecast to generate 23 to 34 inbound daily truck trips, equivalent to 46 to 68 daily trips, assuming each truck enters and exits in the same hour. Assuming an equal distribution of truck traffic throughout the day, this daily trip activity corresponds to three to four hourly inbound trips, equivalent to six to eight total trips, assuming each truck enters and exits in the same hour.

TABLE 1: GRAVEL PIT FACILITY OPERATIONS

Variable	Value[1]	Units
Annual Rate of Extraction	**100,000**	Tonnes per Year
Maximum Monthly Rate of Extraction	**14,000**	Tonnes per Month
Average Monthly Rate of Extraction	**9,500**	Tonnes per Month
Operating Days in a Year	**230**	Days per Year
Operating Days in a Month	**19**	Days per Month
Maximum Daily Rate of Extraction	737	Tonnes per Day
Average Daily Rate of Extraction	500	Tonnes per Day
Expected Payload per Truck	**22**	Tonnes per Truck
Maximum Number of Daily Trucks	34	Trucks per Day
Average Number of Daily Trucks	23	Trucks per Day
Operating Hours within a Day	**10**	Hours per Day
Maximum Number of Hourly Trucks	4	Trucks per Hour
Average Number of Hourly Trucks	3	Trucks per Hour

Notes:
1. Cells highlighted in yellow represent assumed values. Non-highlighted cells represent calculated values.

The calculations summarized in **Table 1** assume a uniform distribution of site traffic throughout the day; however, the distribution of traffic to and from the site will ultimately depend on the demand for aggregate material and the rate at which material can be extracted and loaded into trucks. Assuming a daily maximum of 34 inbound trucks with a non-uniform distribution of hourly truck traffic and two peak periods (for example, the weekday AM peak hour and weekday PM peak hour of the adjacent roads) the maximum number of trucks per hour (as indicated by the client) could increase to nine, equivalent to 18 total trips (that is, nine inbound and nine outbound). For the remaining eight hours of the operating day, the average number of trucks per hour would be four (that is, two inbound and two outbound).

Sight Distance Assessment

Vehicle access to the site is proposed via two all-moves driveway connections to Sideroad 12, approximately 100 metres east of 8th Line East. Each driveway connection is intended to serve each parcel of the site. Paradigm has assessed the available sight distance at each

driveway in accordance with guidance published in both the Wellington County *Entrance Policy*[2] and the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads (*TAC *GDGCR)*.[3]

The Wellington County *Entrance By-law* defines minimum sight distances based on the posted speed limit of a road. For a new entrance onto a road with a posted speed limit of 80 km/h, the *Entrance Policy* requires a minimum sight distance of 200 metres. This measurement applies to both vehicles exiting the site (intersection sight distance) and vehicles on Sideroad 12 approaching the driveways (stopping sight distance).

The TAC *GDGCR* defines minimum sight distances based on the design speed of the road; typically 10 km/h to 20 km/h above the speed limit. TAC publishes both stopping sight distance (representing that for vehicles on Sideroad 12 approaching the driveway) and intersection sight distance (for vehicles exiting the site). Intersection sight distances are based on applicable time gaps for both the specific movement (left-turn, right-turn, crossing road) and design vehicle (passenger car, single unit truck, and combination truck). **Table 2** summarizes the respective design parameters used in the sight distance assessments and **Table 3** summarizes the minimum sight distances published by TAC (at a design speed of 90 km/h) and by the Wellington County *Entrance Policy* (at a posted speed limit of 80 km/h).

TABLE 2: SIGHT DISTANCE PARAMETERS

Parameter	TAC GDGCR	Wellington County
Vehicle Tail or Brake Light Height	0.60 m	Not Defined
Top of Passenger Car	1.30 m	1.30 m
Driver Eye Height – Passenger Car	1.08 m	1.05 m
Driver Eye Height – Single Unit Truck	1.80 m	Not Defined
Driver Eye Height – Combination Truck	2.30 m	Not Defined

Paradigm staff conducted a site visit on Wednesday, March 18, 2026 to determine the profile of Sideroad 12 and document the available sight distance at each driveway. Sideroad 12 is relatively straight and flat but does feature some minor vertical curvature along the site's frontage. East of the site (near the site's eastern property line) a more significant sag vertical curve is present.

Appendix A (attached) contains the sight distance profiles for the proposed driveway connections to Sideroad 12. The findings of the assessment indicate the proposed access locations meet the minimum sight distances defined in the TAC *GDGCR* (for all three vehicle driver heights) and in the Wellington County *Entrance Policy*,

[2] Wellington County Engineering Services – Roads Division, *Entrance Policy,* (Guelph: Wellington County, 2024).
[3] TAC, "Intersections," Chap. 9 in *Geometric Design Guide for Canadian Roads,* (Ottawa: TAC, 2017).

It is noted that the spacing between the site driveways and the stop sign on Sideroad 12 at 8th Line East (approximately 112 meters) is less than the stopping sight distance published by TAC and in the *Entrance Policy.* While this distance does not satisfy the minimum sight distances defined in **Table 3**, the reader is cautioned that the sight distance methodologies are intended for driveways on a free-flow segment of road where vehicles on the major road (in this case, vehicles on Sideroad 12) are travelling at the design speed in advance of, at, and beyond the intersecting driveway or intersection. The methodologies do not account for the potential influence of nearby intersections which may impact operating speeds upstream or downstream of the driveway.

Within the context of this analysis, operating speeds for eastbound motorists on Sideroad 12 would be expected to be lower than the analyzed design speeds because eastbound vehicles would be accelerating away from 8th Line East after turning onto Sideroad 12, or crossing 8th Line East from a stopped position. It is noted that visibility to the west (for outbound vehicles from the site) is unobstructed beyond 8th Line East, and visibility for eastbound motorists on Sideroad 12 approaching either driveway is also unobstructed from 8th Line East.

TABLE 3: MINIMUM SIGHT DISTANCES

Sight Distance Measurement	TAC *GDGCR*	Wellington County Entrance Policy
	90 km/h (Design)	80 km/h (Posted)
Minimum Stopping Sight Distance[4]	160 metres	200 metres
Intersection Sight Distance[5] (Left Turn from Stop – Passenger Car)	190 metres	200 metres
Intersection Sight Distance[6] (Right Turn from Stop – Passenger Car)	165 metres	200 metres
Intersection Sight Distance (Left Turn from Stop – Single Unit Truck)	240 metres	200 metres
Intersection Sight Distance (Right Turn from Stop – Single Unit Truck)	215 metres	200 metres
Intersection Sight Distance (Left Turn from Stop – Combination Truck)	290 metres	200 metres
Intersection Sight Distance (Right Turn from Stop – Combination Truck)	265 metres	200 metres

[4] Ibid. *Table 2.5.2: Stopping Sight Distance on Level Roadways for Automobiles.*
[5] Ibid. *Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn from Stop.*
[6] Ibid. *Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop.*

Findings, Conclusions, and Recommendations

Based on the investigations carried out, the findings of this study are as follows:

- The site is forecast to generate 23 to 34 daily inbound truck trips, equivalent to 46 to 68 daily trips, assuming each truck enters and exits in the same hour.
- Assuming an equal distribution of site traffic throughout a typical operating day, the site is estimated to generate three to four hourly inbound trips, equivalent to six to eight total trips, assuming each truck enters and exits in the same hour.
- Assuming a non-uniform distribution of site traffic throughout the day, the site is estimated to generate nine hourly inbound trips, equivalent to 18 total trips, assuming each truck enters and exits the site in the same hour.
- The proposed driveway locations satisfy the sight distance guidelines published in both the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* and the Wellington County *Entrance Policy*.

Based on the findings of this study it is concluded that the proposed site is forecast to have a negligible impact on traffic operations near the site. The forecast trip generation activity equates to one trip every three minutes, assuming the maximum monthly extraction limit. It is also concluded that the proposed driveway locations meet and exceed the sight distance guidance published in both the TAC *Geometric Design Guide for Canadian Roads* and the Wellington County *Entrance Policy*.

Based on the conclusions of this study, it is recommended the site be considered for approval.

Yours very truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

<< Original Signed By >>

Andrew Steinsky, P.Eng., PTOE, PTP, RSP1
Operations Principal, Southwestern Ontario

Attachments

NTS
Image Source: “Explore Wellington,” County of Wellington, https://sgis.wellington.ca/Maps/index.html?viewer=WellingtonCountyExternal.

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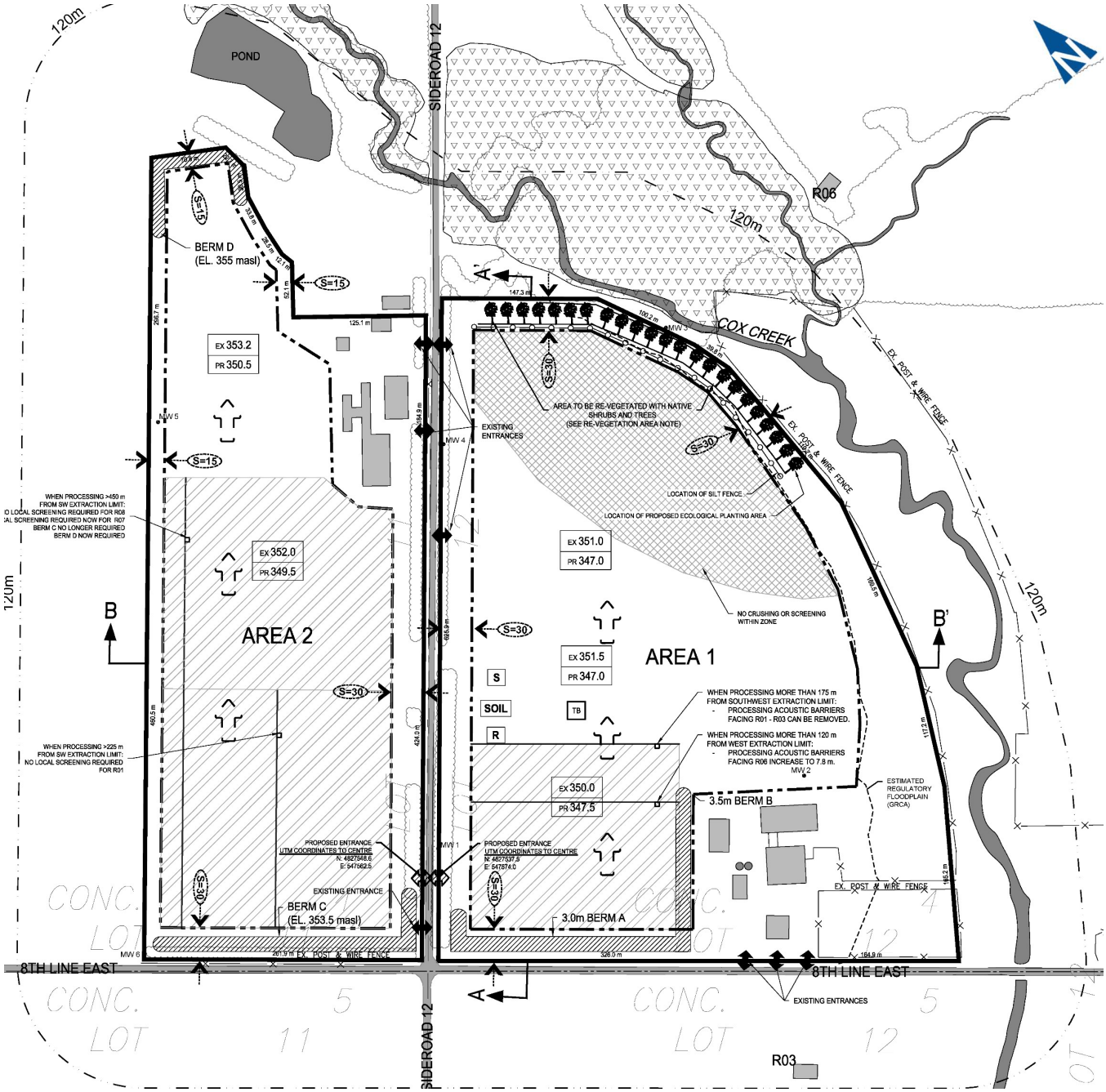
Site Location

5999 8th Line East, Township of Centre Wellington (Ariss) TIB
260106

Figure 1



Site Plan

5999 8th Line East, Township of Centre Wellington (Ariss) TIB
260106

Figure 2

NTS
Image Source: “Explore Wellington,” County of Wellington, https://sgis.wellington.ca/Maps/index.html?viewer=WellingtonCountyExternal.

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Haul Route

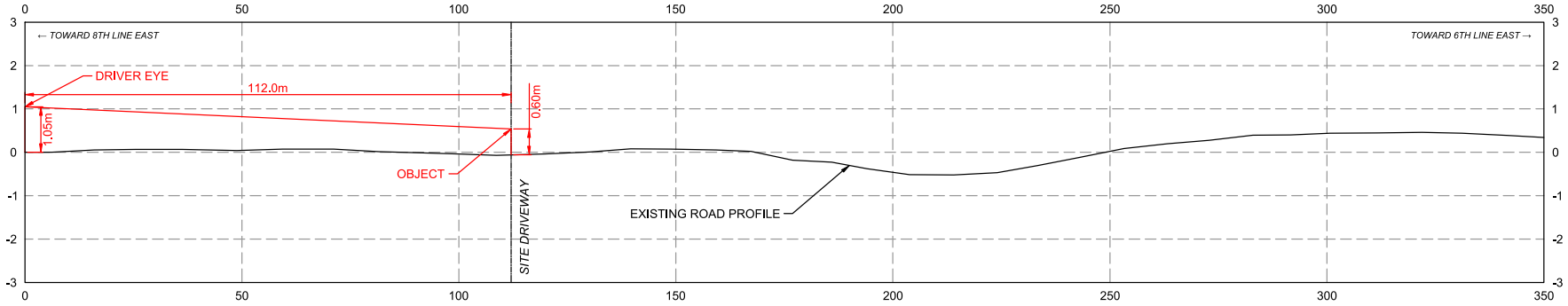
5999 8th Line East, Township of Centre Wellington (Ariss) TIB
260106

Figure 3

Appendix A

Sight Distance Profiles

MINIMUM STOPPING SIGHT DISTANCE
EASTBOUND
(VEHICLE APPROACHING SITE DRIVEWAY)



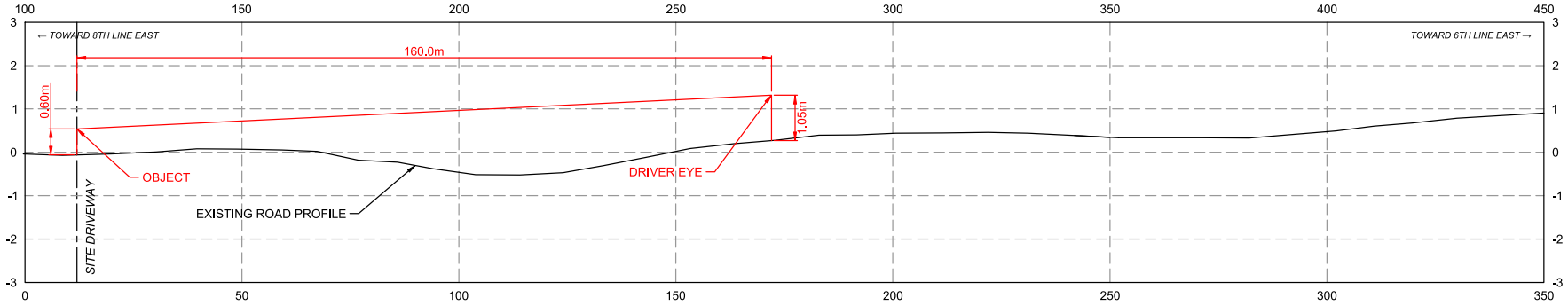
ROAD PROFILE DATE COLLECTED BY:
PARADIGM TRANSPORTATION SOLUTIONS LIMITED
USING MOASURE DATA COLLECTED ON 2026-03-18

NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 01
	DESIGN: DC	DRAWN: DC	CHECK: AS	

MINIMUM STOPPING SIGHT DISTANCE
WESTBOUND
(VEHICLE APPROACHING SITE DRIVEWAY)



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NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 02
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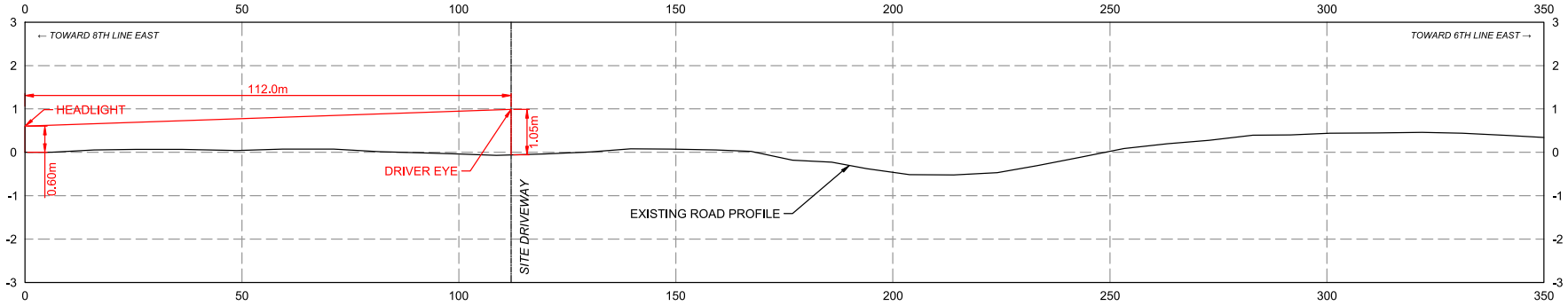
INTERSECTION SIGHT DISTANCE
LEFT-TURN FROM STOP
(DRIVER LOOKING RIGHT TO TURN LEFT)
DIM CONDITIONS - PASSENGER CAR



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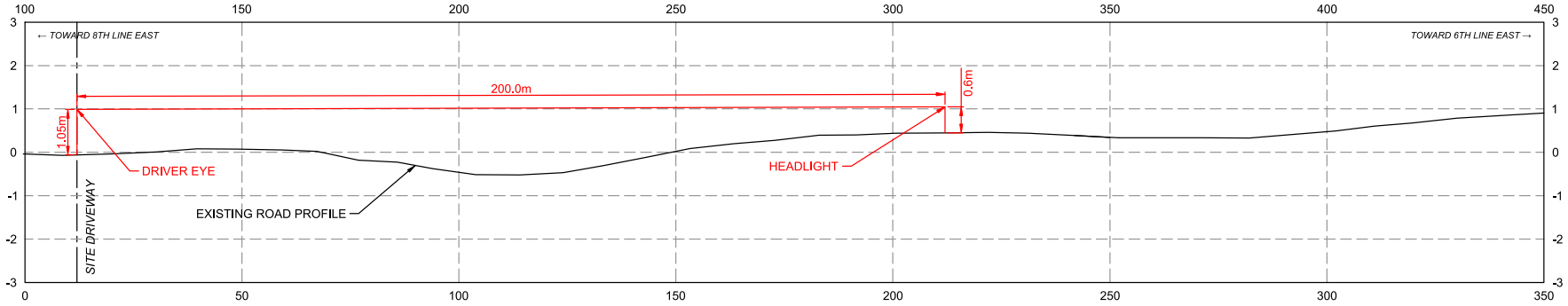
NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 03
	DESIGN: DC	DRAWN: DC	CHECK: AS	

INTERSECTION SIGHT DISTANCE
LEFT-TURN FROM STOP
(DRIVER LOOKING RIGHT TO TURN LEFT)
DIM CONDITIONS - PASSENGER CAR



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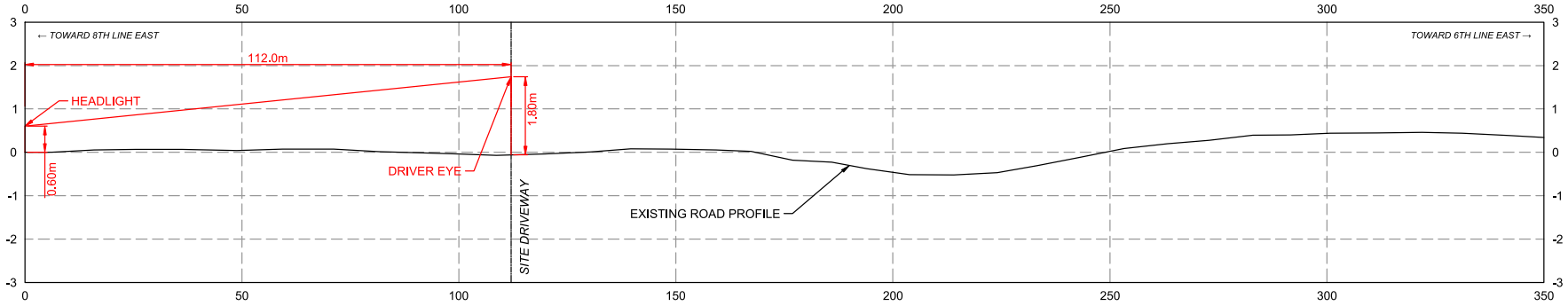
NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 04
	DESIGN: DC	DRAWN: DC	CHECK: AS	

INTERSECTION SIGHT DISTANCE
LEFT-TURN FROM STOP
(DRIVER LOOKING RIGHT TO TURN LEFT)
DIM CONDITIONS - SINGLE UNIT TRUCK



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NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 05
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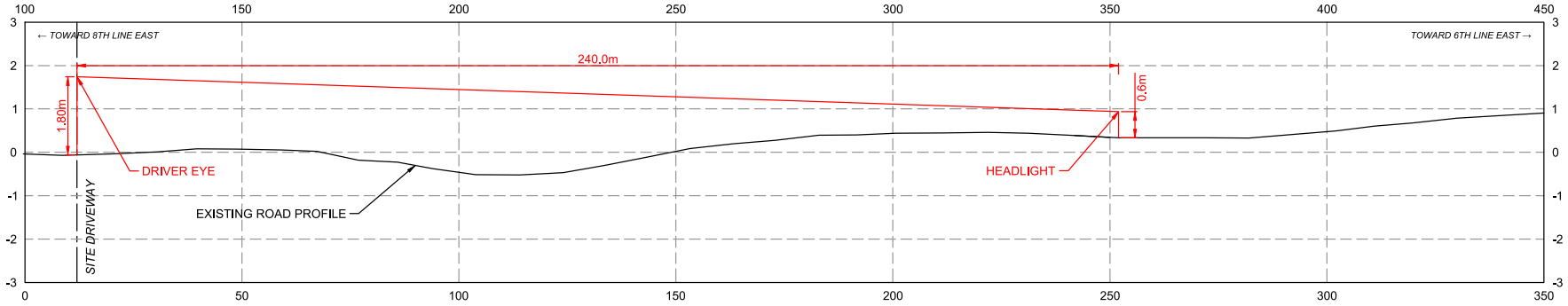
INTERSECTION SIGHT DISTANCE
LEFT-TURN FROM STOP
(DRIVER LOOKING RIGHT TO TURN LEFT)
DIM CONDITIONS - SINGLE UNIT TRUCK



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PARADIGM TRANSPORTATION SOLUTIONS LIMITED
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NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 06
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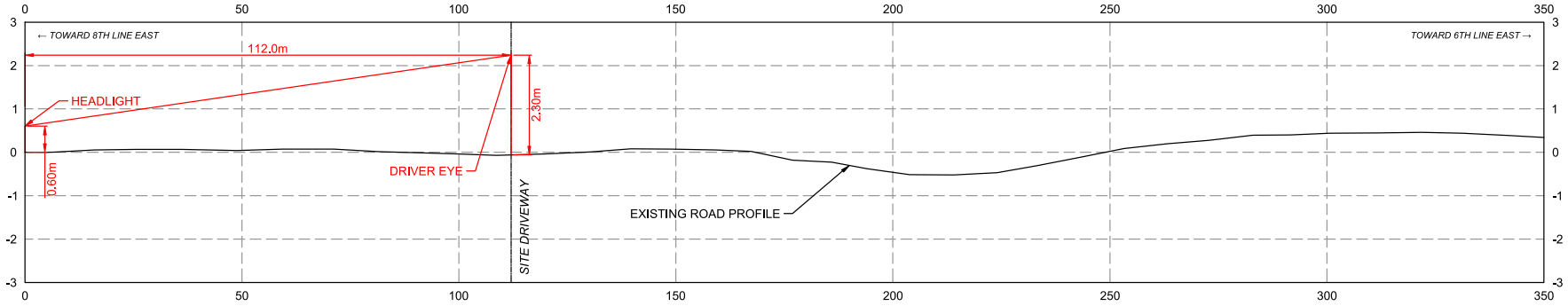
INTERSECTION SIGHT DISTANCE
LEFT-TURN FROM STOP
(DRIVER LOOKING RIGHT TO TURN LEFT)
DIM CONDITIONS - COMBINATION TRUCK



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USING MOASURE DATA COLLECTED ON 2026-03-18

NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 07
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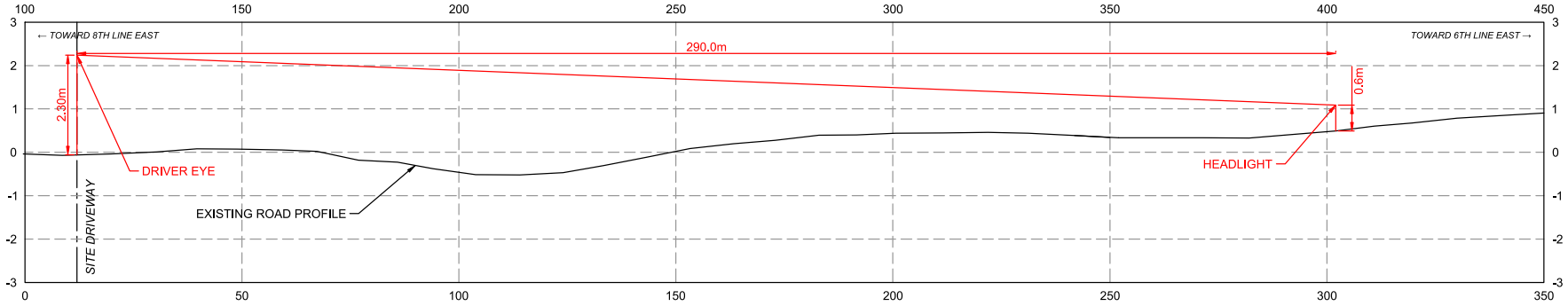
INTERSECTION SIGHT DISTANCE
LEFT-TURN FROM STOP
(DRIVER LOOKING RIGHT TO TURN LEFT)
DIM CONDITIONS - COMBINATION TRUCK



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NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCE ASSESSMENT
5999 8th LINE EAST
TOWNSHIP OF CENTRE WELLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED	PROJECT NO.: 260106	DATE: MAR 2026	SCALE: 1:1000 SCALE: VERTICAL 10:1	DRAWING NO.: 08
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