WILLS

PARTNERS IN ENGINEERING

May 27, 2022

Mr. Tom Jakobek c/o RIC (Moore Drive) Inc. & RIC (Highway 28) Inc.
162 Cumberland St., Suite 300
Toronto, ON
M5R 3N5

Re: Conceptual Design for County Road 28 (CR 28)
Intersection of CR 28 and Moore Drive/Moncrief Line
County of Peterborough – Township of Cavan-Monaghan
D. M. Wills Project No. 21-85152

D.M. Wills Associates (Wills) was retained by RIC (Moore Drive) Inc. and RIC (Highway 28) Inc., on behalf of Mr. Tom Jakobek, to undertake the conceptual design of the intersection of County Road 28 and Moore Drive/Moncrief Line in the Township of Cavan-Monaghan, as well as investigate the profile of Moore Drive in the vicinity of two proposed subdivision entrances. A major redevelopment of the adjacent properties, namely the Kawartha Downs Racetrack and adjacent lands, is planned for the near future. Through various recent studies for the development, and the most up to date site plan, we understand two entrances to a new residential subdivision are proposed onto Moore Drive as part of the development which are within the scope of this this study. In particular, the east entrance to the subdivision is situated at the crest of a substantial vertical curve on Moore Drive where sightlines are deemed to be poor. This study further examines the reconfiguration of the County Road 28/Moore Drive/Moncrief Line (County Road 11) intersection, as we also understand that the reviewing authority has requested that alternatives for properly aligning the intersection be examined. This study is limited to a conceptual realignment and profile adjustment and discusses the various opportunities and constraints of each.

Moncrief Line (County Road 11) is currently classified by the County of Peterborough (County) as a Class C Road (County Collector) and Moore Drive is currently unclassified according to the Township of Cavan-Monaghan and are considered to be low volume roads. County Road 28 is classified by the County as a Class A Road (Major County Arterial).

Existing Conditions

D. M. Wills conducted a topographic survey of Moore Drive from right of way to right of way in April of 2022 to assist in the evaluation of alternatives. The survey forms the basis of the conceptual drawings that accompany this letter.

All roads under consideration within this study have a posted speed of 80 km/h. County Road 28 generally runs north-south and Moore Drive/Moncreif Line generally runs east-west at the study location. The intersection is offset by about 60 m, with Moncreif Line connecting to the south of Moore Drive. There are currently residences in the northeast and southewest quadrants of the intersection, and there is also one residence at the crest of the hill in question on the north side of Moore Drive.

Upon closer examination, the existing profile of Moore Drive within the area in question has a crest curve K-value of 3.5 and meets a 40 km/h design speed, with an associated stopping sight distance of about 50 m. Although there are no known safety or operational concerns with this site, this is not desirable with a posted speed of 80 km/h and an entrance located essentially at the crest of the hill.

The criteria used in this evaluation is derived from the Transportation Association of Canada's Geometric Design Guide for Canadian Roads, and assumes a driver's eye height of 1.08 m and a perceived object height of 0.38 m.

Moore Drive Profile Alternatives

As seen in the attached conceptual plan, three alternatives for grade lowering were examined, and include 50 km/h, 60 km/h and an 80 km/h design speed options. The design and posted speed limit should be reviewed in more detail as a part of the detailed design and is not included in this study, however this study provides alternatives for consideration to support detailed design.

For the 80 km/h design speed option (shown in magenta), a vertical curve with a K-value of 26 is required, which will provide 130 m of stopping sight distance. To achieve this, a grade lowering of 6.8 m is required, and would be the most invasive treatment of this area. Property acquisition is required and the driveway to the residential property to the north would need to be relocated. The conceptual cut lines are shown in the plan and are assumed

to be sloped back at 2:1. There is an existing aerial hydro line and buried bell lines on the south side of the road that would also be affected and require relocation.

For the 60 km/h design speed option (shown in blue), a vertical curve with a K-value of 11 is required, which will provide 85 m of stopping sight distance. To achieve this, a grade lowering of 3.5 m is required, and would again be an invasive treatment of this area. Property acquisition is still required, but in a lesser extent then the 80 km/h design speed option, and the driveway to the residential property to the north would still need to be relocated. The conceptual cut lines are shown in the plan and are assumed to be sloped back at 2:1. Impacts the existing utilities still exist as mentioned above.

For the 50 km/h design speed option (shown in green), a vertical curve with a K-value of 7 is required, which will provide 65 m of stopping sight distance. To achieve this, a grade lowering of about 2.0 m is required, and would be less invasive than any other alternative discussed. Marginal property acquisition would be required and it may be possible to retain the existing location of the residential driveway to the north (to be confirmed in detailed design). The conceptual cut lines are shown in the plan and are assumed to be sloped back at 2:1. Impacts the existing utilities still exist as mentioned above.

Based on the alternatives discussed herein, adjusting the profile of Moore Drive to suit the existing design speed is unreasonable (i.e. grade lowering of almost 7 m). Therefore, if the posted speed is not revised to suit the existing profile constraints (i.e. 40 km/h), then it is recommended that a combination grade lowering and posted speed reduction be considered as a solution for the currently substandard Moore Drive profile.

It should be noted that there are multiple arrangements and configurations that can be considered with respect to the assumed cut backslopes, etc.

Alternatively, or in combination with any permutations of the above options, a regulatory speed reduction could also be considered. Significant grading work is required on Moore Drive to satisfy the sightline requirements.

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Moncreif Line (County Road 11) Realignment

As seen in the attached, second conceptual plan, three alternatives for realignment are presented, and have been developed using an 80 km/h design speed to match the posted speed on the roadway. Accordingly, horizontal curve radii to realign the road can be a minimum of 250 m.

An alternative contemplating the relocation of Moore Drive to the south, as opposed to a relocation of Moncreif Line to the north, is included for reference, however given the presence of an environmentally sensitive wetland, this alternative is not deemed as favorable compared to the other alternatives.

Since there are residences at the location of the realignment for all options, two alternatives were considered for the realignment of Moncrief Line which contemplate the purchase of one of the residences, as well as realignment around both residences to minimize impacts to the residential properties. For each alternative, the purchase of private property, as well as utility relocations will be required. The extent of either will be commensurate with the extent of the grade lowering on Moore Drive.

We recognize that there are various options to consider, however we trust the above provides adequate documentation to present several reasonable alternatives.

Please don't hesitate to contact our office if anything further is required.

Respectfully Submitted,

Wes Kingdon, P.Eng.
Project Engineer

cc Gord Krieger – D.M. Wills Associates Limited – Manager, Transportation

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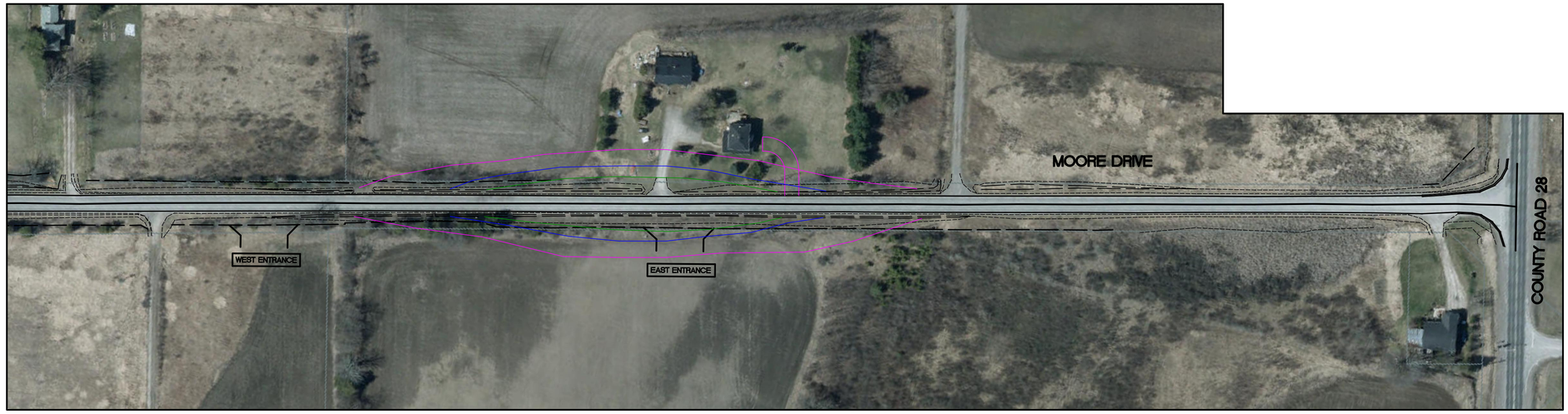
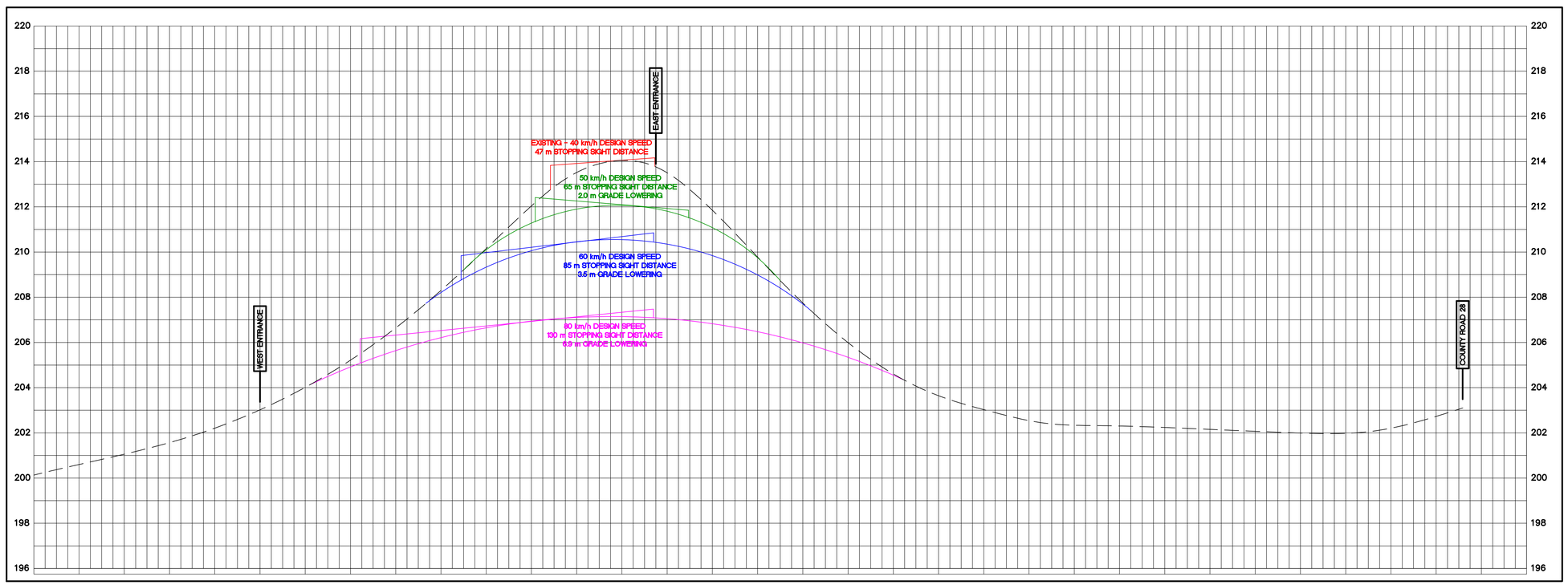
CONCEPTUAL ONLY



PLAN - MOORE DRIVE



PROFILE - MOORE DRIVE

TRUE NORTH

1	DRAFT FOR CLIENT REVIEW	APR 2022

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LEGEND

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KAWARTHA DOWNS REDEVELOPMENT

MOORE DRIVE PROFILE SIGHT LINES AND CONCEPT PLANS

DRAWN BY:	WK	SCALE: Horiz. NTS Vert. NTS	
DESIGNED BY:		PLOT DATE APRIL 26, 2022	
CHECKED BY:		PROJECT No. 85152	1
ENGINEER:		DWG FILE No.	

Printed On: April 26, 2022 5:15:23 PM
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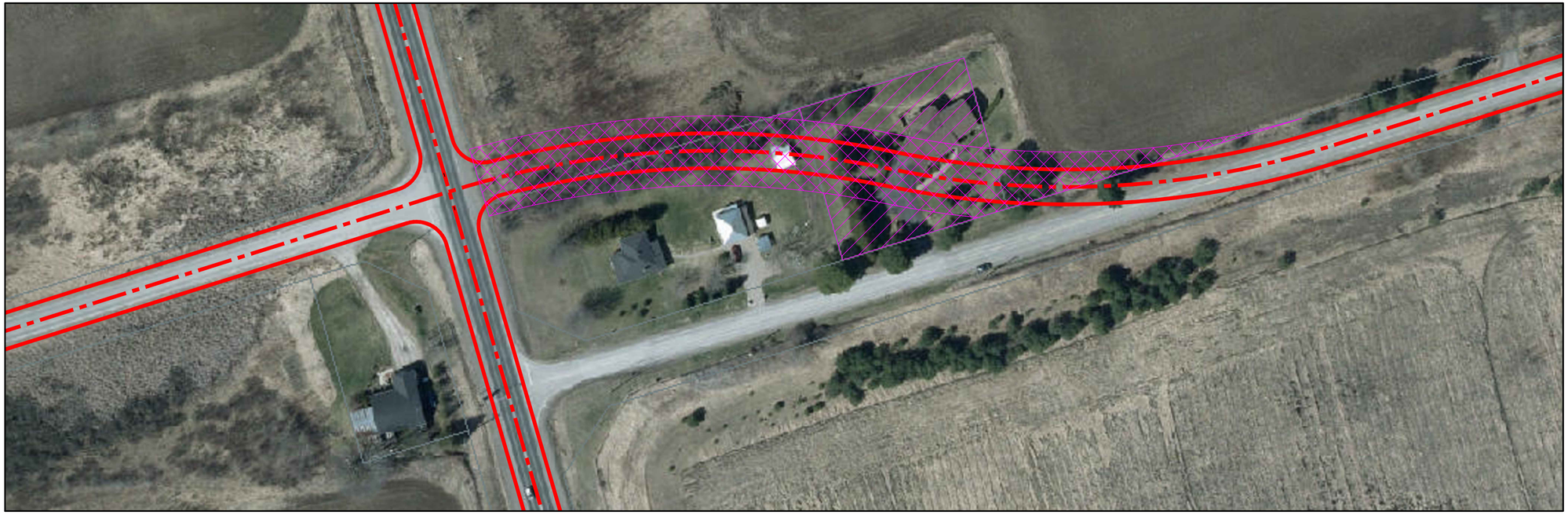

OPTION A
MINIMIZE NEW ALIGNMENT REQUIREMENTS ON COUNTY ROAD 11

OPTION B
MINIMIZE IMPACTS TO RESIDENTIAL PROPERTIES ON COUNTY ROAD 11

CONCEPTUAL ONLY

TRUE NORTH

1	DRAFT FOR CLIENT REVIEW	APR 2022

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LEGEND

CONCEPTUAL 20m RIGHT OF WAY

ADDITIONAL LAND REQUIRED

DESIGN CRITERIA

1. DESIGN SPEED PER TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS = 80 km/h
2. CURVE RADII = 250m

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KAWARTHA DOWNS REDEVELOPMENT

COUNTY ROAD 28 AT MOORE DRIVE CONCEPT PLANS

DRAWN BY:	WK	SCALE: Horiz. NTS Vert. NTS	
DESIGNED BY:		PLOT DATE APRIL 26, 2022	
CHECKED BY:		PROJECT No. 85152	1
ENGINEER:		DWG FILE No.	

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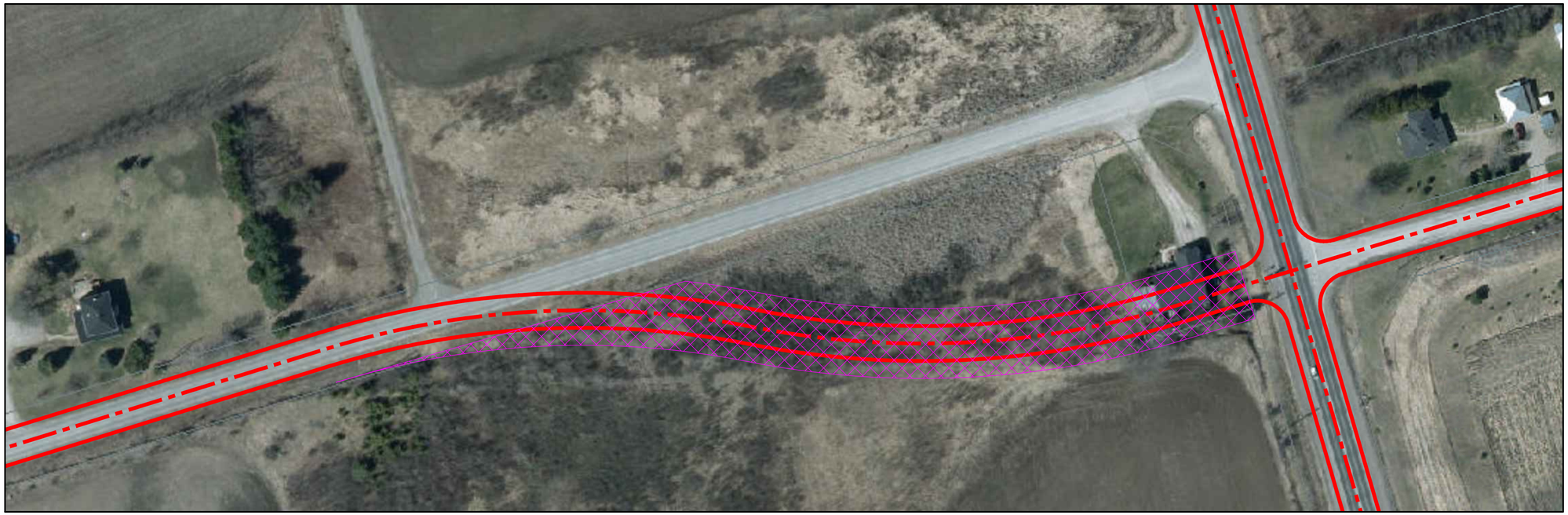

HORIZONTAL REALIGNMENT OF MOORE DRIVE TO ALIGN WITH EXISTING CO. RD. 11 INTERSECTION

TRUE NORTH

1	DRAFT FOR CLIENT REVIEW	MAY 2022

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LEGEND

CONCEPTUAL 20m RIGHT OF WAY

DESIGN CRITERIA

1. DESIGN SPEED PER TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS = 80 km/h
2. CURVE RADII = 250m

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KAWARTHA DOWNS REDEVELOPMENT

COUNTY ROAD 28 AT MOORE DRIVE CONCEPT PLANS

DRAWN BY: SR	SCALE: Horiz. N.T.S Vert. N.T.S		
DESIGNED BY:	PLOT DATE May 18, 2022		
CHECKED BY:	PROJECT No. 85152	1	
ENGINEER:	DWG FILE No.		