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December 8, 2017

Ms. Jennifer Schumacher, P. E., LEED-AP
Chief Design Manager
Hammontree & Associates
5233 Stoneham Road
North Canton, OH 44720

**Re: UPDATED-Trip Generation and Turn Lane Warrants Letter Report for
Proposed Barlow Road Retirement Community, 1221 Barlow Road, Hudson,
Ohio**

Dear Ms. Schumacher:

IBI Group is pleased to provide the following calculations and analysis for the proposed Barlow Road Retirement Community to be located north of Barlow Road in the City of Hudson, Ohio. The proposed 130-dwelling unit development is aimed at a senior, 55-yrs old and up, market. Single occupancy is anticipated for these units. The development is proposed on an 11.55-acre site north of Barlow Road with one access point at 1221 Barlow Road, approximately 300 feet east of the railroad grade crossing.

The ITE Trip Generation Manual was consulted to determine to most appropriate land use type. ITE **Land Use 255 Continuing Care Retirement Community (CCRC)** is the land use which is most similar to the proposed Barlow Road Retirement Community. Land Use Code 255 Continuing Care Retirement Community (CCRC) is a land use which provides multiple elements of senior adult living, combining independent living with increased care options as needs change with time. Various combinations of senior adult living, congregate care, assisted living and/or skilled nursing care may be present to allow seniors to live and stay in one community as their needs change. CCRC communities may also contain special services such as medical, dining, recreational and limited supporting retail facilities. CCRCs are often self-contained villages.

Table 1 below shows the results of trip generation calculations for this development for Land Use 255. **Rate** is *trips per unit*. The **unit** is *occupied Dwelling Unit*. 100% occupancy is assumed even though this type of facility frequently has

vacant units. A **trip** is defined as the *one-way movement of a vehicle from the point of origin to the point of destination.*

Table 1.

BARLOW ROAD RETIREMENT COMMUNITY TRIP GENERATION

ITE Land Use	ITE Code	Weekday Trip Ends			AM Peak Hour Trip Ends			PM Peak Hour Trip Ends		
		Total	In	Out	Total	In	Out	Total	In	Out
Continuing Care Retirement Community (CCRC)	255	478	239	239	38	24	14	76	30	46

Table 2.

TRIP DISTRIBUTION

Assumed Directional Distribution based upon November 30, 2017 traffic count at Heritage of Hudson driveway, 1212 Barlow Road:	Land Use 255			
	Entering Traffic			
	Right Turns		Left Turns	
	AM	PM	AM	PM
70% from East = Right Turns	17	21		
30% from West = Left Turns			7	9
	Exiting Traffic			
	AM	PM	AM	PM
70% to East = Left Turns			10	32
30% to West = Right Turns	4	14		

Video-based traffic counts were taken on Thursday, November 30, 2017 on Barlow Road at the Heritage of Hudson driveway at 1212 Barlow Road for the 6:00-8:00 AM and 3:00-6:00 PM time periods in order to capture the morning and afternoon peak hours on Barlow Road. The morning peak hour was determined to be 7:00-8:00 AM with 101 vehicles eastbound and 67 vehicles westbound at the proposed driveway location. The afternoon peak hour was determined to be 3:15-4:15 PM with 115 vehicles eastbound and 101 vehicles westbound at the proposed driveway location.

The directional trip distribution for inbound and outbound trips to the proposed Barlow Road Retirement Community in Table 2 was assumed to be 70% to/from the east and 30% to/from the west based upon the 11-30-2017 driveway counts at

Heritage of Hudson. All trips to and from the site are assumed to be new trips on Barlow Road.

Site generated traffic for the proposed Barlow Road Memory Care Facility which will share the Heritage of Hudson driveway was taken from the September 8, 2017 letter report from TMS Engineers, Inc.: 8 trip ends during the AM peak and 11 trip ends during the PM peak. All trips were assumed to be new trips.

Right turn lane and left turn lane warrants were investigated using the methodology from ODOT's State Highway Access Management Manual using the Barlow Road Retirement Community (255-CCRC) trip generation figures in combination with the peak hour directional volumes on Barlow Road and with the Memory Care peak hour trips. A right turn lane is not warranted at the proposed site driveway based upon the 2017 count and calculated right turns and will never be warranted solely by Barlow Road Retirement Community trips because the curve separating "*required*" from "*not required*" never drops below 25 right turns and the development will generate only 21 right turns during the PM peak hour.

A left turn lane is not warranted at the proposed site driveway based upon the 2017 count and calculated left turns because the point of intersection falls well below the warranting curves for both AM and PM peak hours. See attached Exhibits A and B for turn lane warrant graphical exhibits.

It is noted that the turn lane warrants were prepared using the November 2017 traffic count peak hour data and new trips from the proposed Memory Care and retirement community. Because the 2017 peak hour volumes on Barlow Road are so low, even if the Barlow traffic were to double within the next several years, turn lane warrants would still not be met.

IBI Group was also asked to perform a "worst case" investigation of the amount of traffic that would be generated by other land uses permitted in the City's District 8 language. Exhibit C shows various permitted land uses along with the daily and peak hour trip generation figures for appropriately sized developments which might reasonably be located at the 35-acre site. Please note that Land Use 255 Continuing Care Retirement Center and Land Use 720 Medical Office Building are highlighted in Exhibit C. Land Use 255 CCRC is what is currently proposed. Land Use 720 MOB represents a much higher traffic generating 75,000 SF medical office building which could also be proposed at the site. See Tables 3 and 4 below.

Table 3.

MEDICAL OFFICE BUILDING - 720

TRIP GENERATION

ITE Land Use	ITE Code	Weekday Trip Ends			AM Peak Hour Trip Ends			PM Peak Hour Trip Ends		
		Total	In	Out	Total	In	Out	Total	In	Out
Medical Office Building	720	2852	1426	1426	179	142	38	225	63	162

Table 4.

TRIP DISTRIBUTION

Assumed Directional Distribution based upon November 30, 2017 traffic count at Heritage of Hudson driveway:	Land Use 255			
	Entering Traffic			
	Right Turns		Left Turns	
	AM	PM	AM	PM
70% from East = Right Turns	99	44		
30% from West = Left Turns			42	19
	Exiting Traffic			
	AM	PM	AM	PM
70% to East = Left Turns			26	113
30% to West = Right Turns	11	49		

Turn lane warrants for Land Use 720, assumed 75,000 SF medical office building, were also investigated by IBI Group. This turn lane warrant analysis also included the November 2017 peak hour volumes on Barlow Road and accounted for the peak hour trips from the Memory Care facility as well. All development trips were assumed to be new trips on Barlow Road.

Exhibits D and E show the results of the turn lane analyses. A right turn lane is not warranted and a left turn lane is not warranted. Because the data intersection points fall so far below the warranting curves on the charts, there is ample room for Barlow Road traffic to grow over a period of years before turn lane warrants would be met.

The calculations and analyses referenced in this letter report demonstrate that the proposed Barlow Road Retirement Community is expected to generate daily and peak hour trips at a rate far below other permitted District 8 land uses. The peak

hour trips from the proposed Barlow Road Retirement Community included with the current peak hour volumes on Barlow Road at the driveway location are not sufficient to trigger the need for right turn or left turn lanes on Barlow Road at the driveway location.

IBI Group is pleased to provide this data and opinion based upon the site plan and other information that has been furnished to us by Hammontree & Associates and others.

Respectfully,

A handwritten signature in black ink that reads "James E. Brenneman". The signature is fluid and cursive, with the first name "James" and last name "Brenneman" clearly legible.

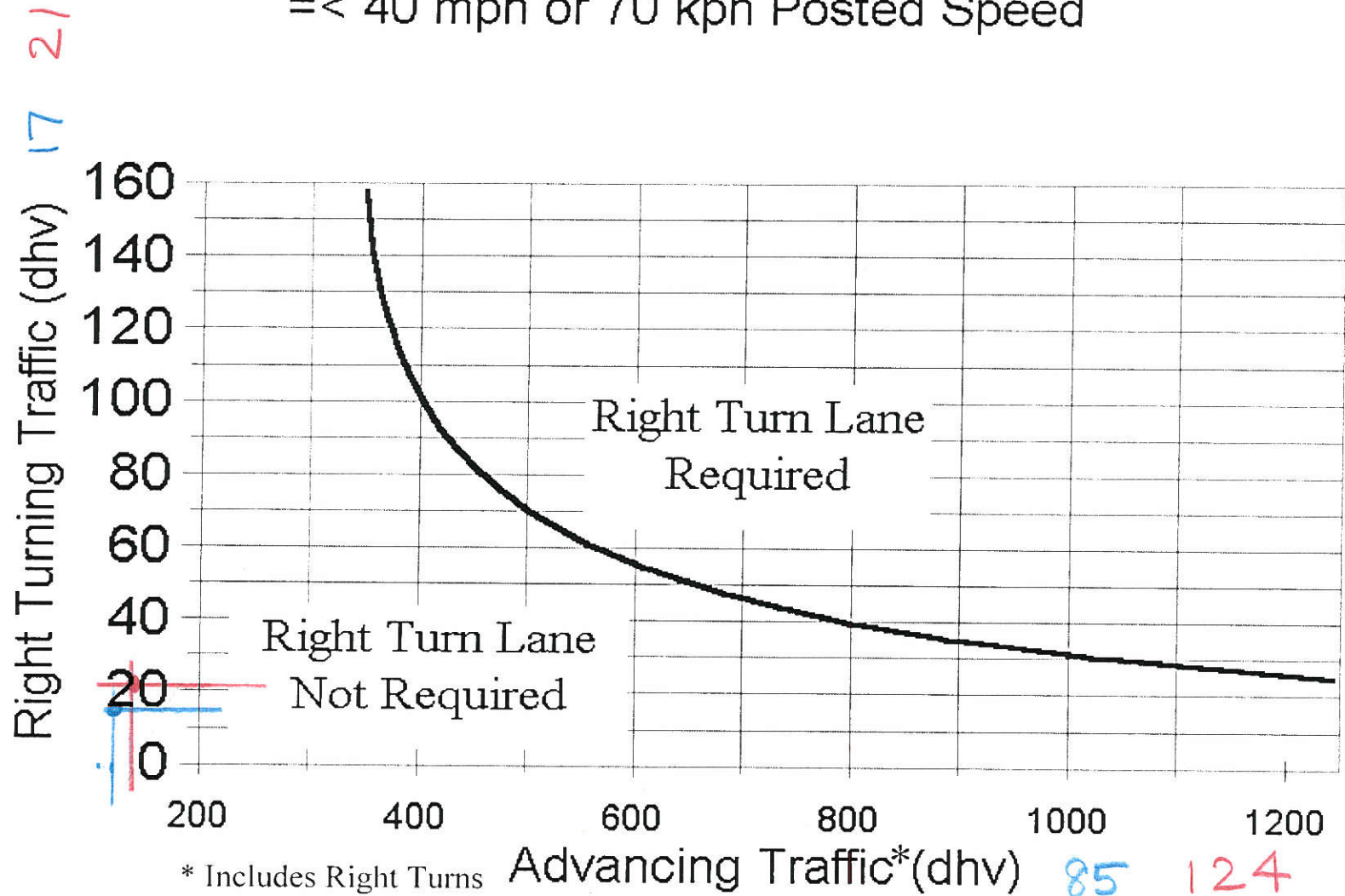
James E. Brenneman, P. E.
#40680, State of Ohio
Senior Project Manager

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BARLOW RD RETIREMENT COMMUNITY - 255 CCRC
2017 AM PM

2-Lane Highway Right Turn Lane Warrant

=< 40 mph or 70 kph Posted Speed



BARLOW RD RETIREMENT COMMUNITY - 255 CCRC
 2017 AM & PM
 6% 7%

2-Lane Highway Left Turn Lane Warrant (= < 40 mph or 70 kph Posted Speed)

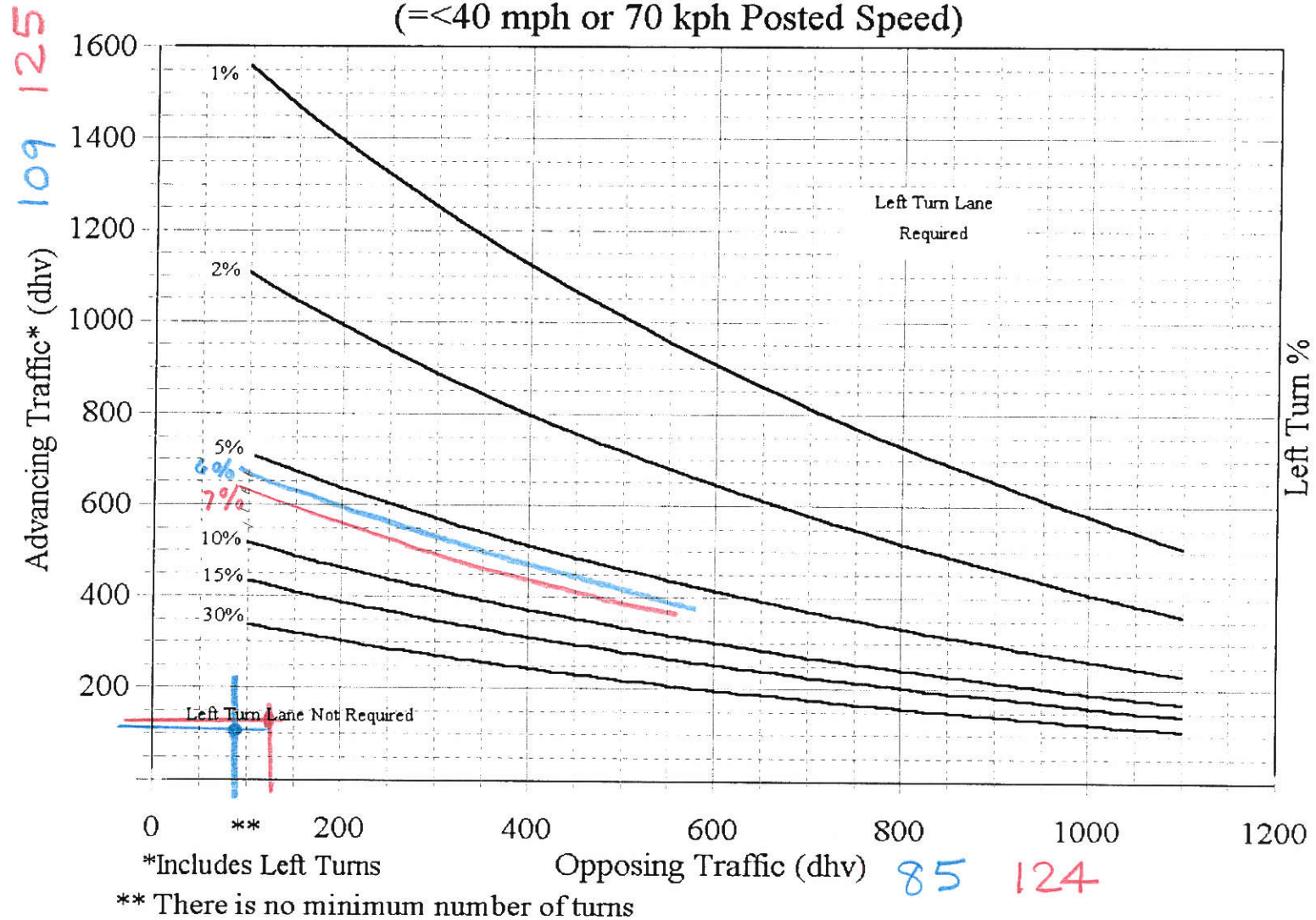
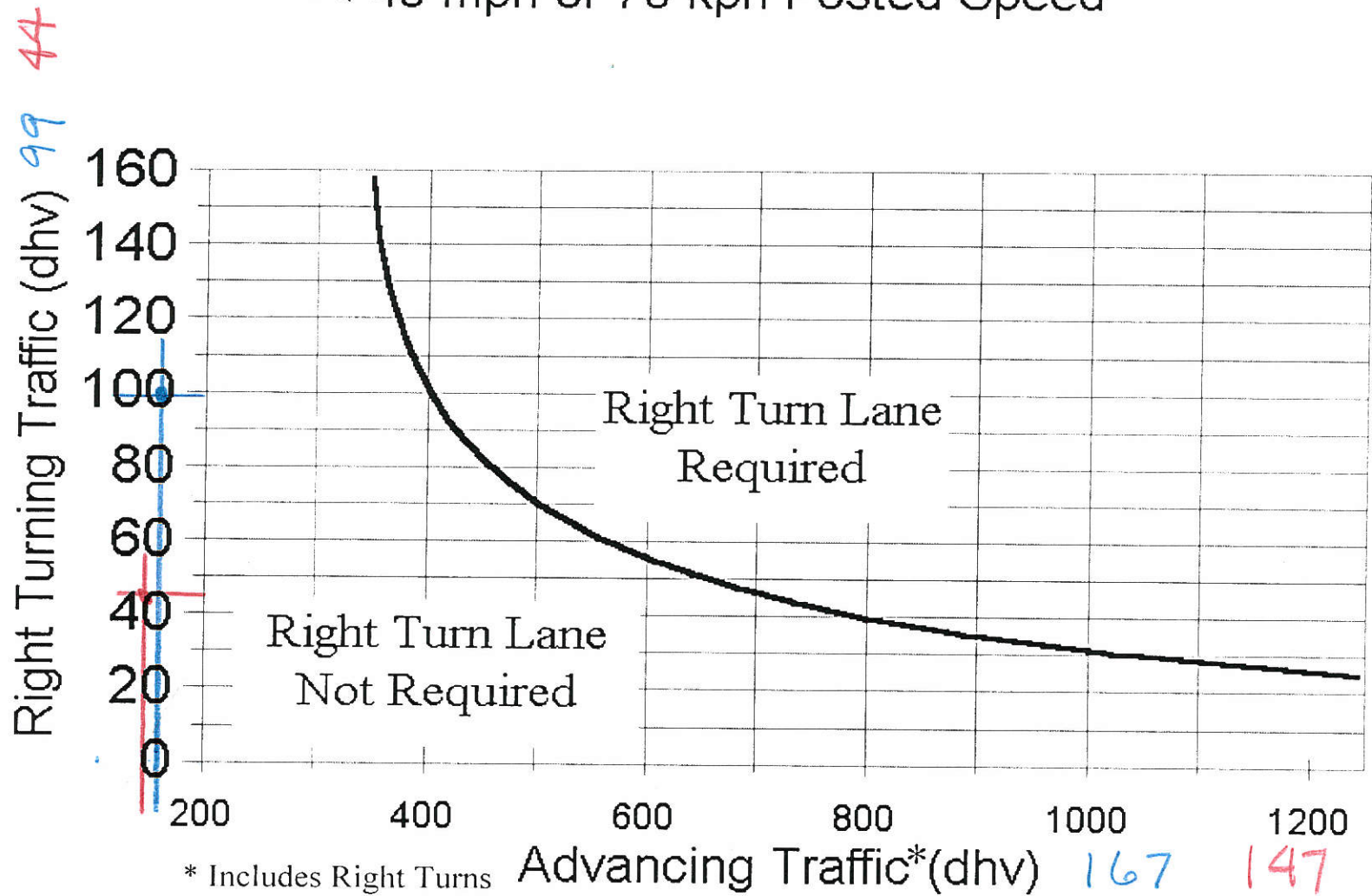


EXHIBIT C
DISTRICT 8 PERMITTED LAND USES & TRIP GENERATION

LAND USE	ITE CODE	UNITS	SIZE	Daily Trip Ends		AM Peak Hour Trip Ends		PM Peak Hour Trip Ends	
				Rate	Trip Ends	Rate	Trip Ends	Rate	Trip Ends
General Light Industrial	110	acre	16	$T = 42.22(X) + 263.11$	939	$T = 7.51(X)$	120	$T = 3.68(X) + 116.82$	176
General Heavy Industrial	120	acre	16	$T = 6.75(X)$	108	$T = 1.98(X)$	32	$T = 2.16(X)$	35
Industrial Park	130	acre	16	$T = 47.82(X) + 520.18$	1,285	$\ln(T) = 0.78\ln(X) + 2.82$	146	$\ln(T) = 0.72\ln(X) + 3.06$	157
Senior Adult Housing - Attached	252	occ. units	130	$T = 2.98(X) + 21.05$	408	$T = 0.20(X) - 1.66$	24	$T = 0.24(X) - 2.11$	29
Assisted Living	254	beds	130	$\ln(T) = 0.56\ln(X) + 3.07$	329	$T = 0.14(X)$	18	$T = 0.22(X)$	29
Continuing Care Retirement Comm.	255	occ. units	130	$T = 2.32(X) + 176.28$	478	$T = 0.13(X) + 21.28$	38	$T = 0.13(X) + 59.19$	76
Hospitals, incl heliport	610	1,000 SF	100	$T = 6.91(X) + 2923.63$	3,615	$\ln(T) = 0.66\ln(X) + 2.11$	172	$\ln(T) = 0.64\ln(X) + 2.22$	175
Corporate Headquarters Building	714	1,000 SF	100	$\ln(T) = 0.97\ln(X) + 2.23$	810	$\ln(T) = 0.96\ln(X) + 0.60$	152	$\ln(T) = 0.88\ln(X) + 0.98$	153
Medical Office Building	720	1,000 SF	75	$T = 40.89(X) - 214.97$	2,852	$T = 2.39(X)$	179	$\ln(T) = 0.90\ln(X) + 1.53$	225
Government offices	733	1,000 SF	75	$T = 27.92(X)$	2,094	$T = 2.21(X)$	166	$T = 2.85(X)$	214
Office Business Park	750	1,000 SF	75	$T = 10.42(X) + 409.04$	1,191	$T = 1.37(X) + 124.36$	227	$T = 1.22(X) + 95.83$	187
Research and Development Center	760	1,000 SF	75	$\ln(T) = 0.83\ln(X) + 3.09$	791	$\ln(T) = 0.87\ln(X) + 0.86$	101	$\ln(T) = 0.83\ln(X) + 1.06$	104
Variety Store	814	1,000 SF	40	$T = 64.03(X)$	2,561	$T = 3.81(X)$	152	$T = 6.82(X)$	273
Bank w/ Drive Through	912	1,000 SF	5	$T = 148.15(X)$	741	$T = 12.08(X)$	60	$T = 24.30(X)$	122

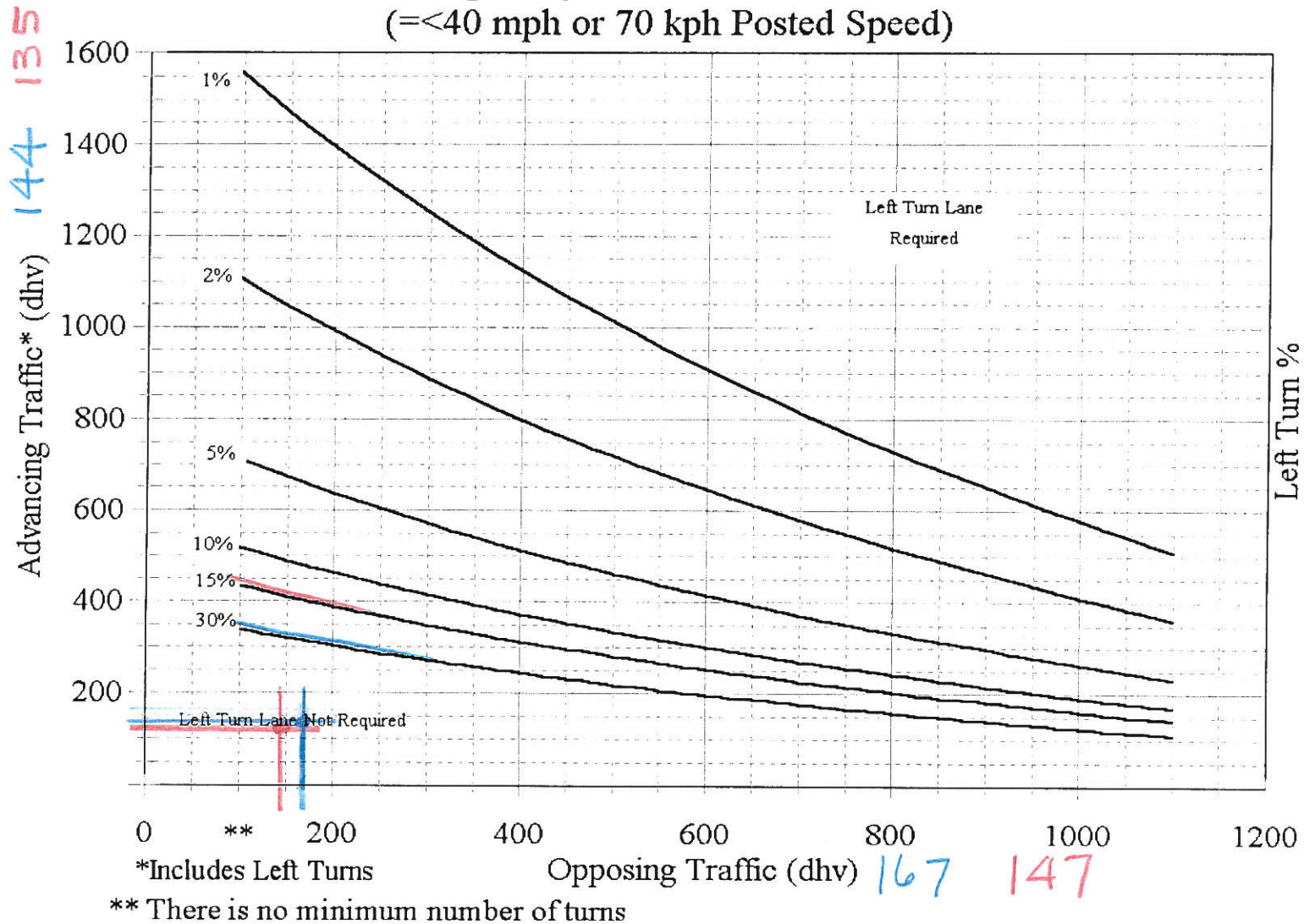
BARLOW RD MEDICAL OFFICE BUILDING 720
AM PM

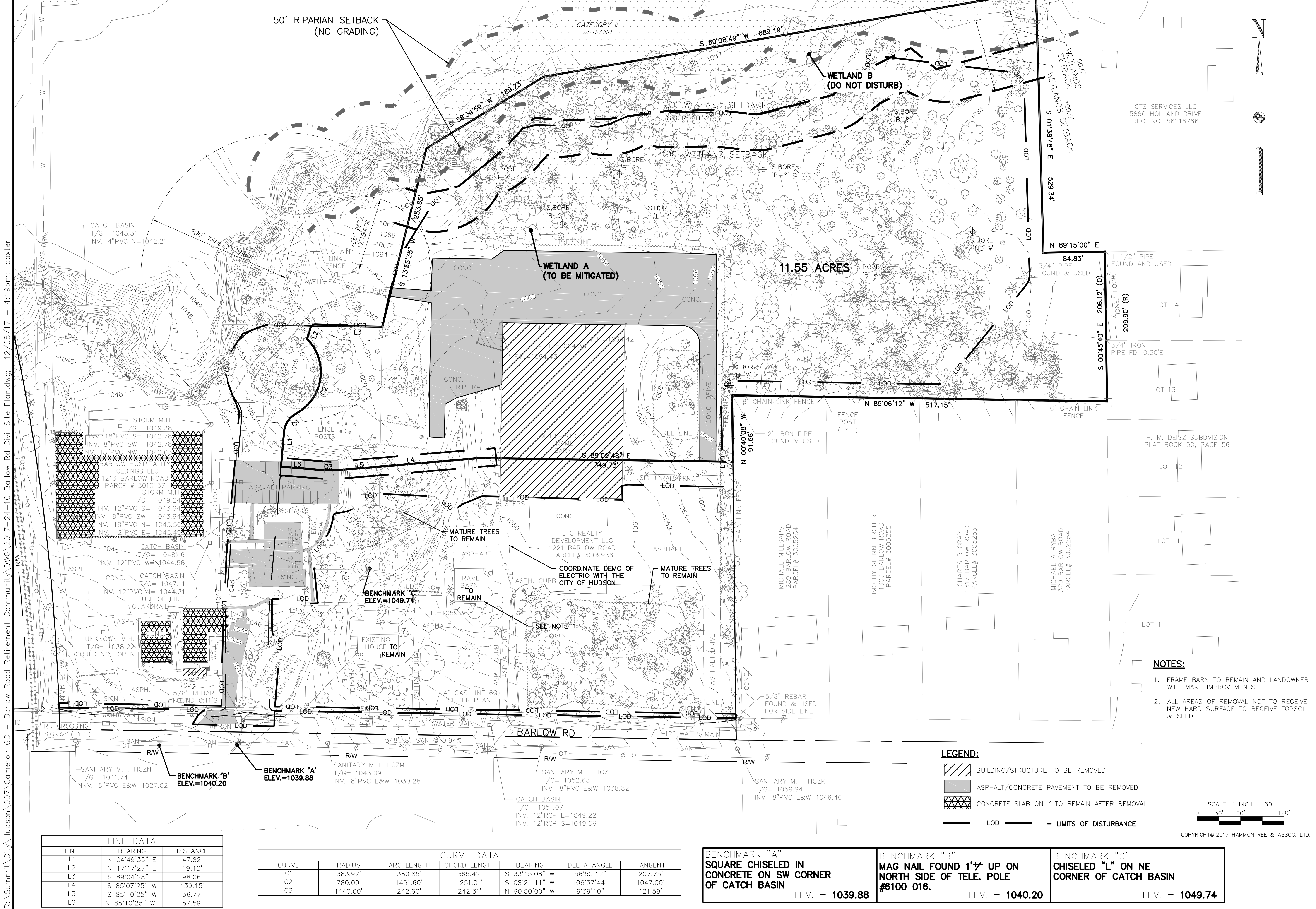
2-Lane Highway Right Turn Lane Warrant
=< 40 mph or 70 kph Posted Speed



BARLOW RD MEDICAL OFFICE BUILDING - 720
 2017 AM 29% PM 14%

2-Lane Highway Left Turn Lane Warrant (= < 40 mph or 70 kph Posted Speed)





LINE DATA		
LINE	BEARING	DISTANCE
L1	N 04°49'35" E	47.82'
L2	N 17°17'27" E	19.10'
L3	S 89°04'28" E	98.06'
L4	S 85°07'25" W	139.15'
L5	S 85°10'25" W	56.77'
L6	N 85°10'25" W	57.59'

CURVE DATA						
CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	BEARING	DELTA ANGLE	TANGENT
C1	383.92'	380.85'	365.42'	S 33°15'08" W	56°50'12"	207.75'
C2	780.00'	1451.60'	1251.01'	S 08°21'11" W	106°37'44"	1047.00'
C3	1440.00'	242.60'	242.31'	N 90°00'00" W	9°39'10"	121.59'

BENCHMARK "A"
SQUARE CHISELED IN
CONCRETE ON SW CORNER
OF CATCH BASIN
ELEV. = 1039.88

BENCHMARK "B"
MAG NAIL FOUND 1' 1/2" UP ON
NORTH SIDE OF TELE. POLE
#6100 016.
ELEV. = 1040.20

BENCHMARK "C"
CHISELED "L" ON NE
CORNER OF CATCH BASIN
ELEV. = 1049.74