Professional Traffic Engineers Texas Registered Firm F-5333 2631 Lakecrest Drive Pearland, Texas 77584 832.264.0429 tony@voigtassociates.com

April 24, 2022

Mr. Dinh V. Ho, P.E. Adico Consulting Engineers 2114 El Dorado Blvd., Suite 400 Friendswood, Texas 77546

RE: Traffic Engineering Study Addendum 2: Proposed Mulberry Fields Residential Development; State Highway 35 at Proposed Lilly View Drive (West of South Walker Street), Angleton, Texas

Dear Mr. Ho:

Per your request, we have conducted a trip generation estimate of an alternative development scenario for the Mulberry Fields residential project. The original traffic study dated April 2, 2022 investigated impacts of the development as a 44-dwelling unit single family detached residential development. A memo dated April 4 documented trip generation changes expected with 28 duplexes. Changes contemplated for the development now include 82 dwelling units of attached housing.

Exhibit A1 (attached in Appendix A) shows the project location. The proposed single-family detached site plan is shown as Exhibit A2 (from the original traffic study). Exhibit A3 shows the duplex option site layout. The proposed street tie-ins to the development have not changed.

Trip Generation Projections, Single-Family Detached vs. Attached

The Institute of Transportation Engineers' *Trip Generation Manual (11th Edition)* was used to estimate trips to the site. The original land plan used ITE Land Use #210 – Single Family Detached Housing with 44 units. The new land plan trip estimates use ITE Land Use #215 – Single-Family Attached Housing with 82 units.

A comparison of the estimated trips generated by the development are shown in Table 1. Detailed calculations are found in in Appendix B.

Table 1. Estimated New Trips for the Proposed Development.

Development Description	Weekday, 24-Hours	AM Peak Hour of Adjacent Roadway	PM Peak Hour of Adjacent Roadway
<u> </u>		Adjacent Roadway	Adjacent Roadway
Single Family			
<u>Detached</u> Residential	414 vehicles	31 vehicles	41 vehicles
Development (44	(207 entering /	(8 entering /	(26 entering /
dwelling units) –	207 exiting)	23 exiting)	15 exiting)
original land plan			
Single Family			
Attached Residential	590 vehicles	39 vehicles	47 vehicles
Development (82	(295 entering /	(10 entering /	(29 entering /
dwelling units) –	295 exiting)	29 exiting)	17 exiting)
modified land plan			
Percent Difference:	+42.3%	+27.8%	+13.0%
Change in Trips:	+176 trips	+8 trips	+6 trips

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Conclusions & Discussion

While the percentage changes shown in Table 1 may seem large, the magnitude of changes in the trip numbers are relative small (+8 AM trips and +6 PM trips). With this small change in trip generation, the conclusions and recommendations of the April 2022 traffic study would not change. The findings and overall recommendations to mitigate the impacts of the proposed multifamily development would remain:

- Site access to SH 35:
 - A westbound right turn lane is not warranted (less than 60 turns per hour);
 - An eastbound left turn lane is provided by the existing two-way left turn lane (with minor pavement marking modifications as described below); and
 - The street tie-in should be stop-controlled on approach to SH 35 (place a standard R1-1 sign per TxDOT standards);
 - The existing center turn lane on SH 35 ends about 55' west of the proposed street tie-in and transitions down to an undivided four-lane section just west of South Walker Street. The center turn lane should be extended through the proposed intersection of Lilly View Drive and pavement markings modified to allow full access for the new street tie-in.
- Site access to North Walker Street:
 - A northbound left turn lane is not warranted;
 - A southbound right turn lane is not warranted; and
 - The street tie-in should be stop-controlled on approach to North Walker Street (place standard R1-1 sign per City of Angleton standards).

VOIGT ASSOCIATES, INC

Voigt Associates appreciates the opportunity to assist you with this project. If you have any questions about the analysis or the results of this report, please feel free to contact me at 832-264-0429.

Sincerely,

Anthony Voigt, P.E., PTOE

Principal

Attachments:

Appendix A. Exhibits

Appendix B. Trip Generation/Distribution Calculations

Appendix A. Exhibits

Exhibit A1.

Site Location Map
Proposed Site Plan – Detached Single-Family Option (from 4/2/22 traffic study)
Proposed Site Plan – Attached Single-Family Option Exhibit A2.

Exhibit A3.



Exhibit A1. Site Location Map – Regional Aerial.

North to top of page. Not to scale.

METES AND BOUNDS

A FIELD NOTE DESCRIPTION of a 13.0044 acre (566,471 square feet) tract of land in the in the J. De J. Valderas Survey, Abstract No. 380, in the M. C. Tobin Survey, Abstract No. 699, and in the H. H. Cornwall Survey, Abstract No. 180, City of Angleton, Brazoria County, Texas; said 13.0044 acre tract being that same tract of land conveyed to Mulberry Field LLC, as recorded in Brazoria County Clerk's File No. 2021037827; said tract being more particularly described by metes—and—bounds as follows with the bearings being based on Texas State Plane Coordinate System, South Central Zone (NAD83) per GPS Observations using National Geodetic Survey Continuously Operating Reference Stations:

BEGINNING at a 1/2-inch iron rod found in the northeast right-of-way line of Heritage Drive (width varies), according to the map or plat recorded in Volume 20, Page 211 of the Brazoria County Plat Records for the northwest corner of an original 20.751 acre tract of land, as recorded in Volume 1090, Page 796 of the Brazoria County Deed Records, for the southwest corner of a 13.203 acre tract of land conveyed to Community Public Service Company, as recorded in Volume 1467, Page 234 of the Brazoria County Deed Records, and for the northwest corner of this tract; from which a 1/2-inch iron rod found bears North 46° 52′ 31″ West -332.07 feet (called North 45° 00′ 18″ West -332.03 feet per Volume 1467, Page 234 of the Brazoria County Deed Records);

THENCE, North 85° 46° 46" East — 807.91 feet (called North 88° 04' East —808.25 feet per Brazoria County Clerk's File No. 2021037827) with the north line of said 20.751 acre tract and with the south line of said 13.203 acre tract to a 5/8—inch iron rod with aluminum cap stamped "TNP" found for the northwest corner of a 1.1478 acre tract of land conveyed to Texas—New Mexico Power Company, as recorded in Volume 362, Page 838 of the Brazoria County Deed Records and for a northeast corner of this tract:

THENCE, South 02° 26' 18" East — 99.83 feet (called South 00° 06' 57" East — 99.86 feet per Brazoria County Clerk's File No. 2021037827) (called South 00° 04' 00" East —100.05 feet per Volume 362, Page 838 of the Brazoria County Deed Records) with the west line of said 1.1478 acre tract to a 5/8—inch iron rod with aluminum cap stamped "TNP" found for the southwest corner of said 1.1478 acre tract and for an interior corner of this tract;

THENCE, North 85° 44′ 50″ East — 499.94 feet (called North 88° 03′ 44″ East — 499.92 feet per Brazoria County Clerk's File No. 2021037827) (called North 88° 04′ 00″ East -500.00 feet per Volume 362, Page 838 of the Brazoria County Deed Records) with the south line of said 1.1478 acre tract to a 5/8—inch iron rod with aluminum cap stamped "TNP" found in the west right—of—way line of Walker Street (width varies) and in the east line of said 20.751 acre tract for the southeast corner of said 1.1478 acre tract and for a northeast corner of this tract:

THENCE, South 02° 20' 40" East — 164.41 feet (called South 00° 04' 17" East — 164.36 feet per Brazoria County Clerk's File No. 2021037827) with the west right—of—way line of said Walker Street and with the east line of said 20.751 tract to a 1/2—inch iron pipe found inside a 2—inch PVC pipe for the northeast corner of Reserve "B", Block 1, Short Form Plat Communication Tower, according to the map or plat recorded in Volume 21, Page 189 of the Brazoria County Plat Records and for a southeast corner of

THENCE, South 87° 41′ 11″ West — 350.24 feet (called North 89° 58′ 33″ West —350.50 feet per Brazoria County Clerk's File No. 2021037827) (called West —350.54 feet per Volume 21, Page 189 of the Brazoria County Plat Records) with the north line of said Reserve "B" to a 1/2—inch iron rod found for the northwest corner of said Reserve "B" and for an interior corner of this tract;

THENCE, South 02° 13' 37" East — 249.99 feet (called South 00° 02' 04" West -250.00 feet per Brazoria County Clerk's File No. 2021037827) (called South -249.96 feet per Volume 21, Page 189 of the Brazoria County Plat Records) with the west line of said Reserve "B" and with the west line of Reserve "A" (Communication Tower Tract) of said Short Form Plat Communication Tower to a 5/8—inch iron rod with cap stamped "COTTON" found for the southwest corner of said Reserve "A" and for an interior corner of this tract:

THENCE, North 87° 41′ 44″ East — 142.02 feet (called South 89° 57′ 11″ East — 141.97 feet per Brazoria County Clerk's File No. 2021037827) with the south line of said Reserve "A" to a 1/2—inch iron rod with cap stamped "PINPOINT" found for an interior corner of said 20.751 acre tract, for the northwest corner of a 1.00 acre tract of land conveyed to HED Properties, LLC, as recorded in Brazoria County Clerk's File No. 2010004582. and for a northeast corner of this tract;

THENCE, South 02° 20' 54" East — 233.55 feet (called South 00° 03' 51" East — 233.72 feet per Brazoria County Clerk's File No. 2021037827) with the east line of said 20.751 acre tract, with the west line of said 1.00 acre HED Properties, LLC tract, and with the west line of a 1.00 acre tract of land conveyed to J. Angel Hernandez, et ux, as recorded in Brazoria County Clerk's File No. 2013050912 to a 1/2—inch iron rod with cap stamped "RPLS 2112" found for a southeast corner of this tract; from which a 1/2—inch iron rod with cap stamped "RPLS 2112" found in the north right—of—way line of State Highway 35 (West Mulberry Street) (width varies) for a southeast corner of said 20.751 acre tract and for the southwest corner of said 1.00 acre Hernandez tract bears South 02° 20' 54" East -183.36 feet;

THENCE, South 87° 03' 34" West — 392.00 feet (called South 89° 14' 32" West — 392.09 feet per Brazoria County Clerk's File No. 2021037827) to a 1/2-inch iron rod with cap stamped "2112" found for an interior corner of this tract:

THENCE, South 02° 10' 40" East — 178.81 feet (called South 00° 02' 09" West — 178.77 feet per Brazoria County Clerk's File No. 2021037827) to a 1/2—inch iron rod with cap stamped "RPLS 2112" found in the north right—of—way line of said State Highway 35 and in the south line of said 20.751 acre tract for the southeast corner of this tract:

THENCE, South 87° 43′ 31″ West -60.00 feet (called North 89° 57′ 50″ West -60.00 feet per Brazoria County Clerk's File No. 2021037827) with the north right—of—way line of said State Highway 35 and with the south line of said 20.751 acre tract to a 4—inch by 4—inch concrete monument found for a southwest corner of said 20.751 acre tract and for a southwest corner of this tract;

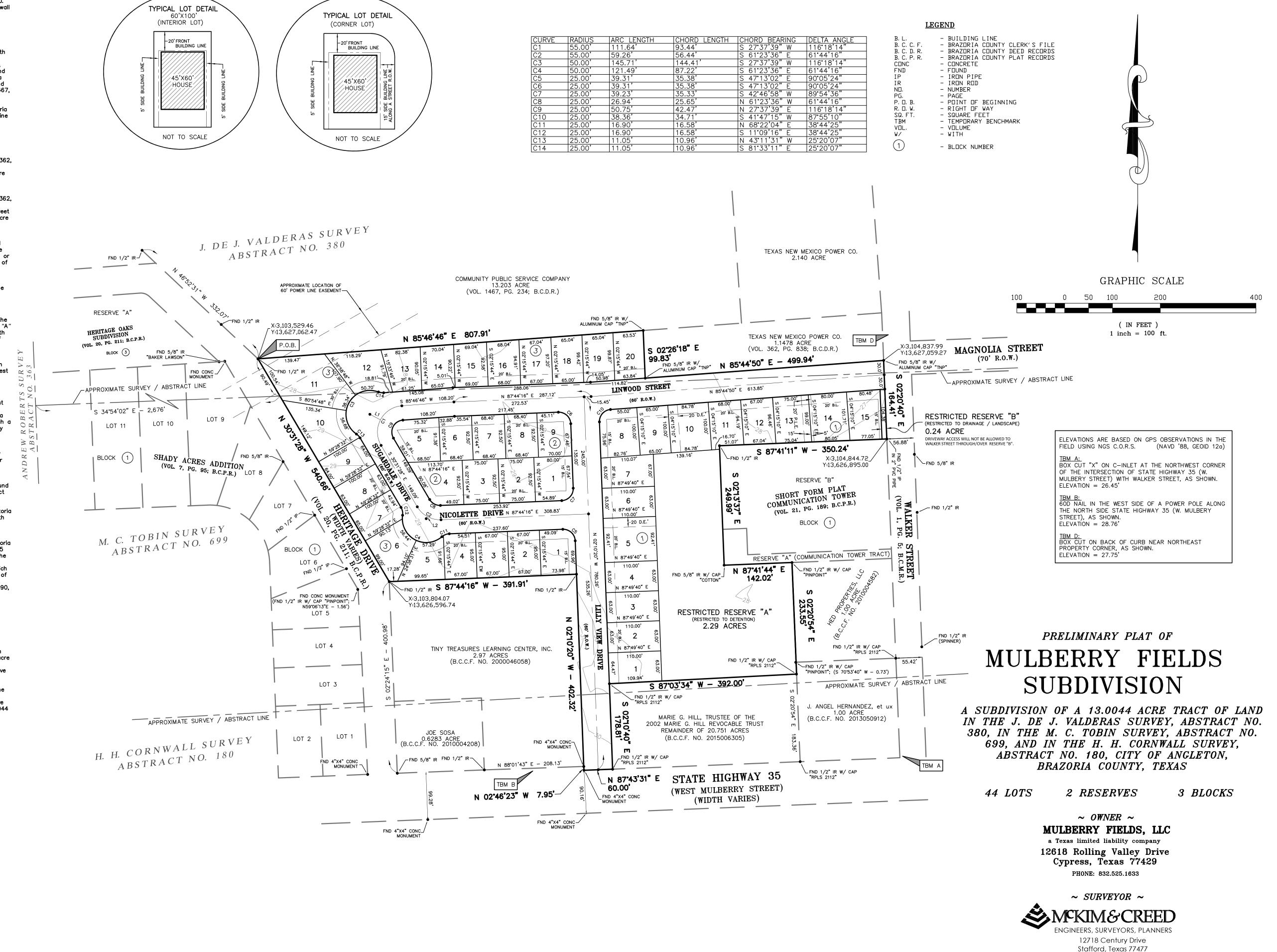
THENCE, North 02° 46′ 23″ West — 7.95 feet (called North 00° 21′ 33″ West — 7.81 feet per Brazoria County Clerk's File No. 2021037827) with a jog in the north right—of—way line of said State Highway 35 and with a west line of said 20.751 acre tract to a 4—inch by 4—inch concrete monument found for the southeast corner of a 2.97 acre tract of land conveyed to Tiny Treasures Learning Center, Inc., as recorded in Brazoria County Clerk's File No. 2000046058 and for an angle point of this tract; from which a 1/2—inch iron rod found for a southwest corner of said 2.97 acre tract and for a southwest corner of said 20.751 acre tract bears South 88° 01′ 43″ West —208.13 feet (called North 89° 36′ 58″ West — 208.35 feet per Brazoria County Clerk's File No. 2000046058) (called West —208.56 feet per Volume 1090, Page 796 of the Brazoria County Deed Records);

THENCE, North 02° 10' 20" West - 402.32 feet (called North 00° 02' 44" East - 402.37 feet per Brazoria County Clerk's File No. 2021037827) (called North 0° 02' 13" East - 402.41 feet per Brazoria County Clerk's File No. 2000046058) with the east line of said 2.97 acre tract to a 1/2-inch iron rod found for the northeast corner of said 2.97 acre tract and for an interior corner of this tract;

THENCE, South 87° 44′ 16″ West — 391.91 feet (called North 89° 59′ 46″ West — 391.46 feet per Brazoria County Clerk's File No. 2021037827) (called North 89° 59′ 38″ West — 391.46 feet per per Brazoria County Clerk's File No. 2000046058) with the north line of said 2.97 acre tract to a 1/2—inch iron rod found in the east right—of—way line of said Heritage Drive for an angle point of said 20.751 acre tract, for the northwest corner of said 2.97 acre tract, and for a southwest corner of this tract; from which a 5/8—inch iron rod found at the intersection of the east right—of—way line of said Heritage Drive with the north right—of—way line of said State Highway 35 bears South 02° 24′ 15″ East -400.98 feet;

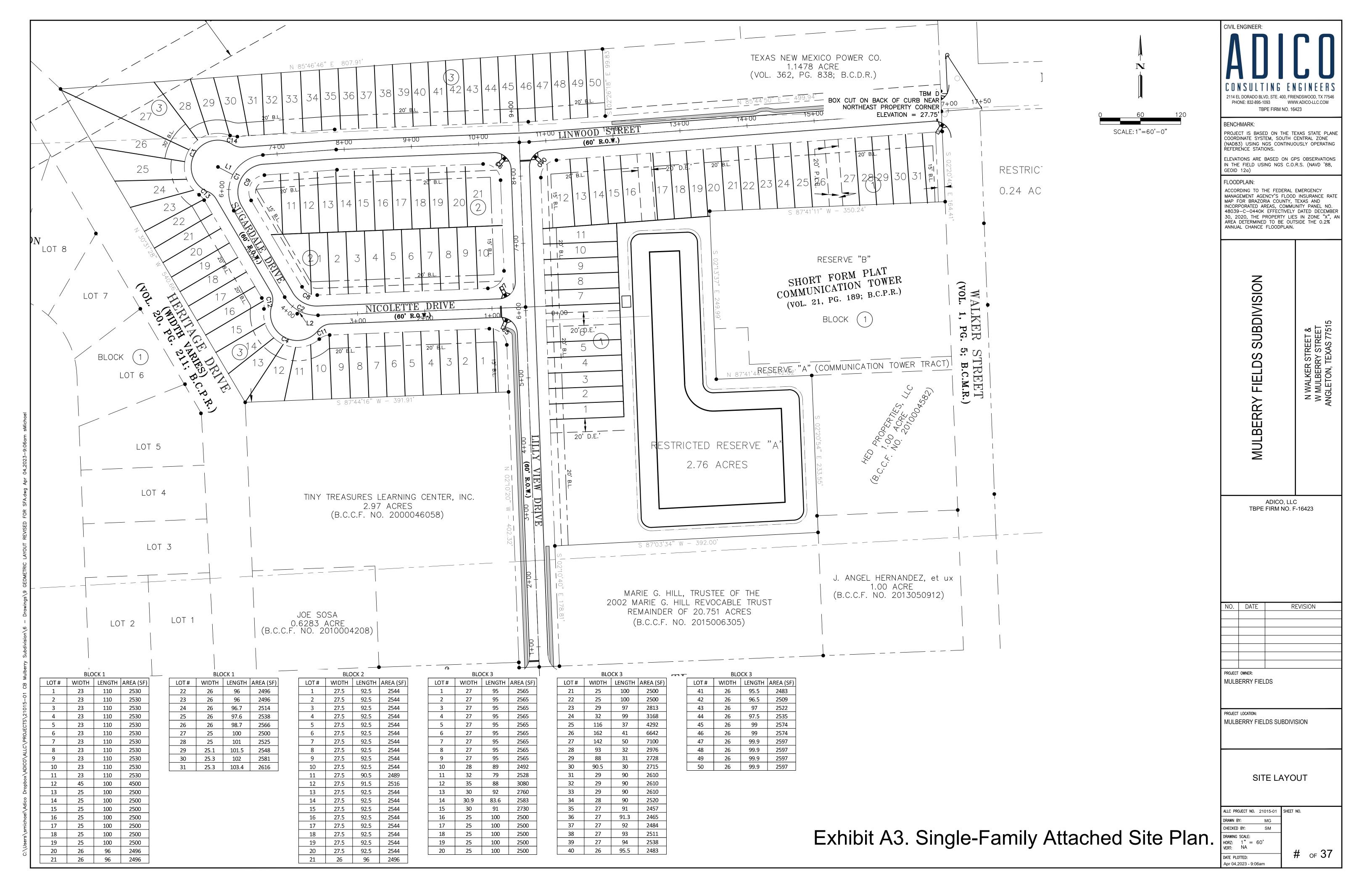
THENCE, North 30° 31' 28" West — 540.66 feet (called North 28° 17' West —541.04 feet per Volume 1090, Page 796 of the Brazoria County Deed Records) (called North 28° 15' 19" West —540.89 feet per Brazoria County Clerk's File No. 2021037827) with the northeast right—of—way line of said Heritage Drive and with the southwest line of said 20.751 acre tract to the POINT OF BEGINNING and containing 13.0044 acres (566,471 square feet) of land.

		LOT ARE	ea table		
	LOT #	AREA	LOT #	AREA	
	LOT 1	7011 Sq. Feet	LOT 1	6900 Sq. Feet	
	LOT 2	6930 Sq. Feet	LOT 2	6365 Sq. Feet	
	LOT 3	6930 Sq. Feet	LOT 3	6365 Sq. Feet	
	LOT 4	6930 Sq. Feet	LOT 4	6365 Sq. Feet	
	LOT 5	10165 Sq. Feet	LOT 5	7217 Sq. Feet	
	LOT 6	6930 Sq. Feet	LOT 6	8246 Sq. Feet	
	LOT 7	7150 Sq. Feet	LOT 7	6300 Sq. Feet	
BLOCK 1—	LOT 8	7971 Sq. Feet	LOT 8	6300 Sq. Feet	
	LOT 9	6500 Sq. Feet	LOT 9	6911 Sq. Feet	
	LOT 10	8478 Sq. Feet	LOT 10	10657 Sq. Feet	
	LOT 11	6459 Sq. Feet	LOT 11	19619 Sq. Feet	
	LOT 12	6387 Sq. Feet	LOT 12	8466 Sq. Feet	
	LOT 13	7330 Sq. Feet	LOT 13	6473 Sq. Feet	BLOCK 3
	LOT 14	8029 Sq. Feet	LOT 14	6304 Sq. Feet	
	LOT 15	7072 Sq. Feet	LOT 15	6307 Sq. Feet	
	LOT 1	7260 Sq. Feet	LOT 16	6375 Sq. Feet	
	LOT 2	6938 Sq. Feet	LOT 17	6436 Sq. Feet	
	LOT 3	6938 Sq. Feet	LOT 18	6390 Sq. Feet	
	LOT 4	8180 Sq. Feet	LOT 19	6490 Sq. Feet	
BLOCK 2 —	LOT 5	7899 Sq. Feet	LOT 20	6356 Sq. Feet	
	LOT 6	6309 Sq. Feet			
	LOT 7	6327 Sq. Feet			
	LOT 8	6327 Sq. Feet			
	LOT 9	6347 Sq. Feet			



281.491.2525
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Job No. 1486-3
DECEMBER 6, 2021



Appendix B. Trip Generation Calculations

Table C1. Trip Generation Calculations - Original Study (Single Family Detached)

Trip Rates		,																	
	ITE Trip		l		ē	Ve	Weekday		Weekdov		Weekday AM Peak Hour of		Weekday PM Peak Hour of		Hour of				
	Generation				Rai	3		vveekuay		Adja	acent Roady	vay	Adja	acent Roady	way				
	Land Use		Independent		e	Φ	24-Hr	Perc			Perd			Perd					
Development Description		Trip Generation Land Use	Variable	Value	ñ	<u> </u>	Trip Rate*	Entering	Exiting	Trip Rate*	Entering	J			Exiting				
Mulberry Fields Subdivision	210	Single Family Detached Housing	Dwelling Unit	44.000	24/AM/PM	-	9.43	50%	50%	0.70	26%	74%	0.94	63%	37%				
Trip End Calculations																			
	ITE Trip		l		e	۸ م	Weekday		Weekday AM Peak Hour of			Weekday PM Peak Hour of							
	Generation				Zat	ā	Weekuay		Adjacent Roadway		Adjacent Roadway		way						
	Land Use		Independent		e e	9	24-Hr	Tri		Peak Hour			Peak Hour	Tri					
Development Description	Number	Trip Generation Land Use	Variable	Value	ñ	ñ	Trip Ends	Entering	Exiting	Trips	Entering	Exiting	Trips	Entering	Exiting				
Mulberry Fields Subdivision	210	Single Family Detached Housing	Dwelling Unit	44.000	24/AM/PM		415	207	207	31	8	23	41	26	15				
Trip End Totals																			
							Wlad		Weekday		M/s steeless		Weekday AM Peak Hour of			Weekday PM Peak Hour of			
							vveekday		vveekday		vveekday		vveenudy		Adjacent Roadway		Adjacent Roadway		way
						24-Hr	Trij	os	Peak Hour	Tri	ps	Peak Hour	Tri	ps					
							Trip Ends	Entering	Exiting	Trips	Entering	Exiting	Trips	Entering	Exiting				
Trip Totals							415	207	207	31	8	23	41	26	15				

*trip rates shown for information only, fitted curves used for trip generation

Trip Adjustment	Factors	
Adjustment Fact	tor Time Period	Factor
Internal Capture	Rates: Weekday	0.0%
	Weekday AM Peak Hour of Adjacent Roadway	0.0%
	Weekday PM Peak Hour of Adjacent Roadway	0.0%
Pass-By Trips:	Weekday	0.0%
	Weekday AM Peak Hour of Adjacent Roadway	0.0%
	Weekday PM Peak Hour of Adjacent Roadway	0.0%

Trip Totals							
		ay AM Peak		Weekday PM Pea Adjacent Roa			
	Adj	acent Road				<i>N</i> ay	
	Total Trips		ps*	Total Trips	Trip		
Trip Type	rotal Impo	Entering	Exiting	rotal Impo	Entering	Exiting	
Total Trips, Pre-Capture/Pass-By:	31	8	23	41	26	15	
Total Trips, Captured Within Development:	-	-	-	-	-	-	
Total Trips, New & Pass-By	31	8	23	41	26	15	
Total Trips, Pass-By, Existing on Roadway Network:	-	-	-	-	-	-	
Total Trips, New on Roadway Network:	31	8	23	41	26	15	

^{*}trip estimates subject to roundoff error

Table C1-A. Trip Generation Calculations, Single Family Attached Option

ITE Trip				ē	Ne	Weekday		Weekda	Weekday AM Peak Hour of		of Weekday PM Pea			
Generation				ä	ng.		vveekday		Adjacent Roadway		way Adjacent Roadwa		<i>v</i> ay	
Land Use		Independent		Θ.	9	24-Hr							Perc	
Number	Trip Generation Land Use			ñ	ñ	Trip Rate*	Entering	Exiting	Trip Rate*	Entering		Trip Rate*		Exiting
215	Single Family Attached Housing	Dwelling Unit	82.000	24/AM/PM	-	7.20	50%	50%	0.48	26%	74%	0.57	63%	37%
ITE Trip				ø	Ye.		Weekday							
Generation				-Sat	ā		Weekday		Adjacent Roadway		y	Adjacent Roadway		<i>v</i> ay
Land Use		Independent		9	e e	24-Hr	Trij	os	Peak Hour	Trips		Peak Hour	Trip	
Number	Trip Generation Land Use	Variable	Value	š	ŝ	Trip Ends	Entering	Exiting	Trips	Entering	Exiting	Trips	Entering	Exiting
215	Single Family Attached Housing	Dwelling Unit	82.000	24/AM/PM	-	590	295	295	39	10	29	47	29	17
							Wookdoy		Weekday AM Peak Hour of		our of	Weekday PM Peak Hour of		Hour of
						vveekday		Ac		Adjacent Roadway		Adja	acent Roadw	vay
						24-Hr	Tri		Peak Hour			Peak Hour	Trip	
						Trip Ends	Entering	Exiting	Trips	Entering	Exiting	Trips	Entering	Exiting
						590	295	295	39	10	29	47	29	17
	Generation Land Use Number 215 ITE Trip Generation Land Use Number	Generation Land Use Number 215 Single Family Attached Housing ITE Trip Generation Land Use Number Trip Generation Land Use	Generation Land Use Number Trip Generation Land Use Trip Generation Land Use 215 Single Family Attached Housing Dwelling Unit ITE Trip Generation Land Use Number Trip Generation Land Use Number Variable Variable	Generation Land Use Number Trip Generation Land Use Trip Generation Land Use Trip Generation Land Use Trip Generation Land Use Number Trip Generation Land Use Number Trip Generation Land Use Number Variable Value Value	Generation Land Use Number Trip Generation Land Use 215 Single Family Attached Housing Independent Variable Value 2 Dwelling Unit 82.000 24/AM/PM ITE Trip Generation Land Use Number Trip Generation Land Use Number Variable Value 2 Variable Value 2 Variable Value 3	Generation Land Use Number Trip Generation Land Use 215 Single Family Attached Housing Dwelling Unit ETrip Generation Land Use Number Trip Generation Land Use Number Trip Generation Land Use Number Trip Generation Land Use Number Number Trip Generation Land Use Number Number Trip Generation Land Use Number	Generation Land Use Number 215 Single Family Attached Housing Independent Variable Value 2	Generation Land Use Number Trip Generation Land Use Trip Generation Land Use Trip Generation Land Use Trip Generation Trip Gen	Generation Land Use Number Trip Generation Land Use 1Independent Variable Value 2 24-Hr Trip Rate* Trip Rate* Entering Exiting 1ITE Trip Generation Land Use Number Trip Generation Land Use Number Trip Generation Land Use Number 1ITE Trip Seneration Land Use Number 1ITE Trip Single Family Attached Housing Dwelling Unit Value 2 2 24-Hr Trip Rate* Entering Exiting 2 24-Hr Trip Ends Entering Exiting Veekday Very Veekday Entering Exiting Exiting Exiting Exiting Exiting Veekday Veekday Veekday Veekday Veekday Veekday Entering Exiting	Generation Land Use Number Trip Generation Land Use Trip Generation Lan	Comparation Land Use Number Trip Generation Land Use Value 2	Reperation Land Use Number Trip Generation Land Use Trip Rate* Trip Rate* Entering Exiting Exiting Trip Rate*	Separation Land Use Number Trip Generation Land Use Trip Generati	Separation Land Use Number Trip Generation Land Use Trip Generati

Percent change vs. single family trip generation: 42.3%

	normation only, nited curves used for trip generation	
Trip Adjustment F	Factors	
Adjustment Factor	r Time Period	Factor
Internal Capture I	Rates: Weekday	0.0%
	Weekday AM Peak Hour of Adjacent Roadway	0.0%
	Weekday PM Peak Hour of Adjacent Roadway	0.0%
Pass-By Trips:	Weekday	0.0%
	Weekday AM Peak Hour of Adjacent Roadway	0.0%
	Weekday PM Peak Hour of Adjacent Roadway	0.0%

Trip Totals						
		ay AM Peak				
	Adjacent Roadway			Adjacent Roadway		
	Total Trips	Tri		Total Trips	Tri	
Trip Type	Total Trips	Entering	Exiting	Total Trips	Entering	Exiting
Total Trips, Pre-Capture/Pass-By:	39	10	29	47	29	17
Total Trips, Captured Within Development:	-	-	-	-		
Total Trips, New & Pass-By	39	10	29	47	29	17
Total Trips, Pass-By, Existing on Roadway Network:	-	-	-	-	-	-
Total Trips, New on Roadway Network:	39	10	29	47	29	17

^{*}trip estimates subject to roundoff error