

MEMO

VIA EMAIL jordan@alrigusa.com

To: ALRIG USA Acquisitions, LLC

From: Julie M. Kroll, PE, PTOE
Mary Ollis, EIT
Fleis & VandenBrink

Date: February 17, 2023

Re: Proposed Chick-Fil-A
Town of Plainfield, Indiana
Traffic Impact Assessment

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Assessment (TIA) for the proposed development project in the Town of Plainfield, Indiana. The project site is located at 6102 Cambridge Way, as shown on the attached **Figure 1**. The property is currently occupied by vacant “Bob Evans” restaurant, which will be razed with the construction of the proposed development which includes construction of a Chick-fil-A fast food restaurant with drive-through. Site access is proposed via the two (2) existing site access points on Cambridge Way. Cambridge Way is under the jurisdiction of the Town of Plainfield, Indiana and as part of the site plan approval, the Town has requested a TIA for this project.

This TIA has been completed to evaluate the potential impact of the proposed development on the adjacent roadway network and address the following items noted through discussions with the Town:

- A. Evaluate the site driveway offset from Manchester Drive
- B. Potential for a dedicated southbound right-turn lane on Cambridge Way at the site driveway.
- C. Consider restriping Cambridge Way to accommodate the existing and proposed uses.
- D. Review pedestrian crossing improvements and additional pedestrian crossing facilities

The scope of the study was developed based on Fleis & VandenBrink’s (F&V) understanding of the development program and accepted traffic engineering practice. Sources of data for this study include the Institute of Transportation Engineers (ITE), the Federal Highway Administration (FHWA), the Indiana Department of Transportation (INDOT), and the Town of Plainfield.

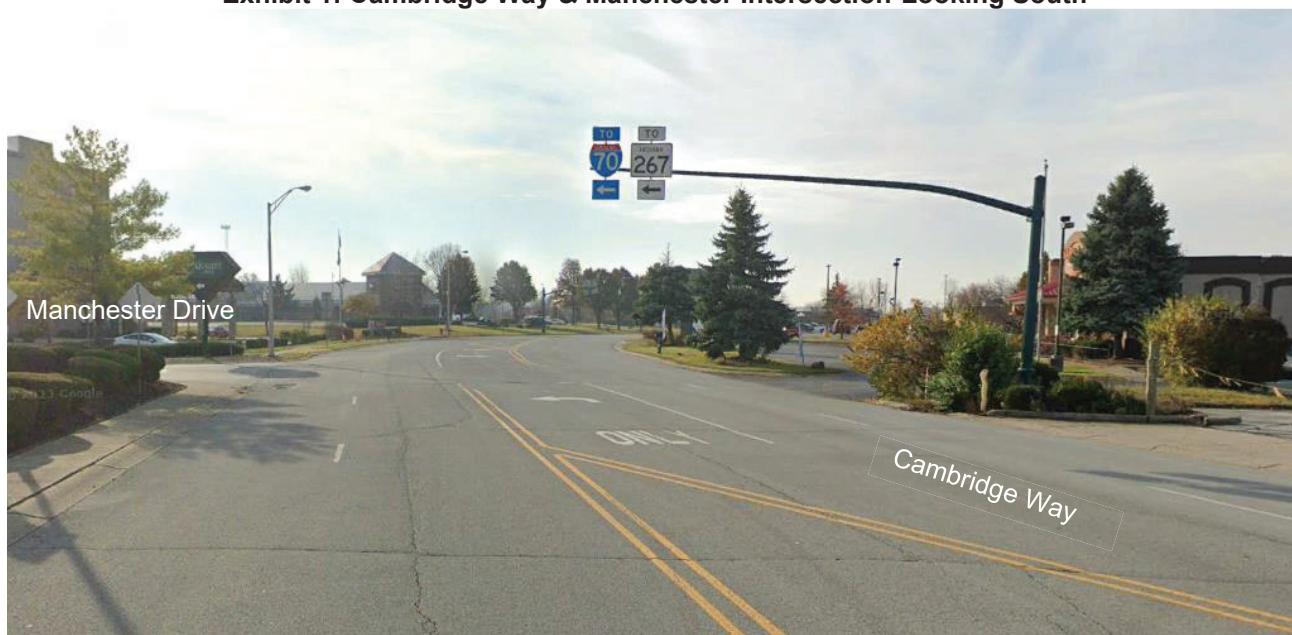
2 BACKGROUND DATA

The lane uses and traffic control at the study intersections are shown on the attached **Figure 2** and the study roadways are further described below. For the purposes of this study, residential streets and site driveways were assumed to have an operating speed of 25 miles per hour (mph) unless otherwise noted.

Cambridge Way generally runs in the north and south directions, adjacent to the east side of the project site. The study section of Cambridge Way is classified as a local road and has a posted speed limit of 30 mph. The study section of Cambridge Way, adjacent to the project site, generally provides a four-lane cross-section, with two (2) southbound through lanes, one (1) northbound through lane, and a center Two-Way Left-Turn Lane (TWLTL).

Manchester Drive generally runs in the east and west directions, east of the project site. Manchester Drive is classified as a local road and has a posted speed limit of 30 mph. Manchester Drive provides access for the adjacent land uses to access Perry Road to/from the east and to the west. The existing wayfinding at the intersection is shown on **Exhibit 1** below.

Exhibit 1: Cambridge Way & Manchester Intersection-Looking South



3 SITE TRIP GENERATION

The proposed development includes an approximately 5,028 SF Chick-fil-A fast-food restaurant with drive-through. The number of midday (MD) and afternoon (PM) peak hour vehicle trips that would be generated by the proposed Chick-fil-A development was forecast based on data from three (3) proportionally sized Chick-fil-A facilities in Michigan located in Caledonia, Kalamazoo, and Okemos; trip generation data attached for reference. The trip generation used in this analysis is summarized in **Table 1**.

Table 1: Site Trip Generation

Land Use	Amount	Units	MD Peak Hour (vph)			PM Peak Hour (vph)		
			In	Out	Total	In	Out	Total
Chick-fil-A	5,028	SF	194	194	388	162	161	323

The project site was previously occupied by a Bob Evans restaurant. The building will be razed with the addition of the proposed development. Therefore, the trips generated by the restaurant were compared to the trips generated by the proposed development as shown in **Table 2**.

Table 2: Trip Generation Comparison

Land Use	ITE Code	Amount	Units	MD Peak Hour (vph)			PM Peak Hour (vph)		
				In	Out	Total	In	Out	Total
Chick-fil-A	N/A	5,028	SF	194	194	388	162	161	323
High-Turnover Sit Down Restaurant (Bob Evans)	932	5,417	SF	41	33	74	30	19	49
Difference				153	161	314	132	142	274

The results of the trip generation comparison indicates that the proposed development will generate a greater volume of trips, as compared to the previous land use.

4 SITE CIRCULATION AND DRIVE-THROUGH QUEUEING

A queueing analysis was performed to evaluate the projected operations of this site to determine the peak drive-through queueing for the development. F&V collected data at the existing Chick-fil-A restaurant located in Novi, near the Twelve-Oaks Mall, on Wednesday August 24th, 2022, and Saturday August 27th, 2022. The data collection result summary is attached and summarized below.

The data collection included:

- Order time, Chick-fil-A employees take patrons orders while vehicles are in line, rather than the traditional order board. During peak times, the vehicles roll through the ordering process and do not stop at an order board.
- Service rate calculations for the pick-up window: Time to pull up to the drive-through window, receive order, and pull away.
- Customer data collected and verified through orders showed 70% percentage of site generated trips use drive-through.
- Drive-through queue lengths were observed and recorded in order to provide a comparison between the calculated vehicle queueing and the actual restaurant operations. A summary of the site-generated drive-through queueing information observed during the weekday mid-day (11:00 AM to 1:00 PM), weekday afternoon (5:00 PM to 6:00 PM) peak periods is summarized in **Table 3**.

Table 3: Weekday Field Review Drive-Through Queueing Summary

Queue Length (cars)	Mid-Day	PM
50% Percentile	14	13
85% Percentile	21	18
95% Percentile	24	27
Average	15	13
Maximum (Veh)	29	28
Maximum (ft)	725	700

The results of the drive-through queueing observations made during the field review indicates an 85th percentile vehicle queue length of approximately 525 feet (21 vehicles) during the weekday operations. Therefore, the operations calculated for the proposed Plainfield site are expected to be representative of the operations observed for similar Chick-fil-A sites located in Michigan.

The proposed site plan includes enough vehicle queueing storage for approximately **800-LF**, which exceeds the maximum queue length observed at similar sites.. Therefore, the proposed development can adequately accommodate the expected vehicle queueing operations. The drive-through queueing plan is shown on the attached site plan.

In order to insure that the Chick-fil-A operations are efficient, during peak time periods, Chick-fil-A utilizes employees stationed outside along the drive-through queue, with menu tablets to take patrons orders, eliminating the need for the menu kiosk and providing additional queueing storage space. This also helps to expedite the ordering and payment process, thus increasing the service rate.

Therefore, the projected potential drive-through queue lengths can be adequately accommodated on site without impacting operations on the adjacent roadway network.

5 KEY FINDINGS

A. Site driveway offset from Manchester Drive

- During the field review it was observed that the majority of traffic on both Cambridge Way and Manchester Drive is generated by hotels. The peak period for hotel traffic is typically during the AM (7-9AM) and PM (6-9PM) peak periods. During the field review, very little traffic was observed utilizing either Cambridge Way or Manchester Drive that would create a conflict for vehicles turning into and out of the site.

B. Potential for a dedicated southbound right-turn lane on Cambridge Way at the site driveway

- The southbound approach on Cambridge Way provides two-through lanes, which narrow to one-through lane south of Manchester Drive. The additional southbound through lane could be restriped to provide a dedicated southbound through lane for the proposed Chick-fil-A. It is anticipated that this lane will be utilized as a de facto right-turn lane and by designating the lane accordingly, reduces the potential for rear-end and side-swipe crashes.

C. Consider restriping Cambridge Way to accommodate the existing and proposed uses

- The Cambridge Way cross section adjacent to the project site between Manchester Drive and Perry Road provides approximately 60ft of pavement. The existing cross section and pavement markings were reviewed to determine if the existing roadway width could be restriped to better accommodate the existing and proposed land uses. The recommended pavement markings and signage are shown on the attached **Figure 3**. The recommendations include extending the existing center left-turn lanes to provide side-by-side left-turn lanes and increase the queuing capacity to accommodate left-turn movements.

D. Review pedestrian crossing improvements and additional pedestrian crossing facilities

- It is anticipated that with the addition of the Chick-fil-A, pedestrian activity will increase, especially with the with numerous hotels in the area. Therefore, it is recommended to provide an E/W pedestrian crossing across the south leg of Cambridge Way, south of Manchester Drive. The recommended pedestrian crossing is shown on **Figure 3**.

6 RECOMMENDATIONS

The recommendations of this TIA are as follows:

- Restripe Cambridge Way adjacent to the project site to provide a dedicated southbound right-turn lane and a dedicated northbound left-turn lane into the project site.
- Provide a marked pedestrian crosswalk on the south leg of Cambridge Way at Manchester Drive.

Any questions related to this memorandum, study, analysis, and results should be addressed to Fleis & VandenBrink.



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Indiana.

Julie M. Kroll

Digitally signed by Julie M. Kroll
 Date: 2023.02.17 10:00:50 -05'00'

Attached: Figures 1-3
 Proposed Site/Concept Plan
 Chick-fil-A Trip Generation Memo (ROWE)



PERRY ROAD

CAMBRIDGE WAY

N. SITE DRIVE

SITE

S. SITE DRIVE

QUAKER BOULEVARD

MANCHESTER DRIVE



FIGURE 1 SITE LOCATION MAP

CHICK-FIL-A TIA - PLAINFIELD, IN

LEGEND

 SITE LOCATION



NORTH
SCALE: NOT TO SCALE

LANE USE & TRAFFIC CONTROL

SITE-GENERATED VOLUMES

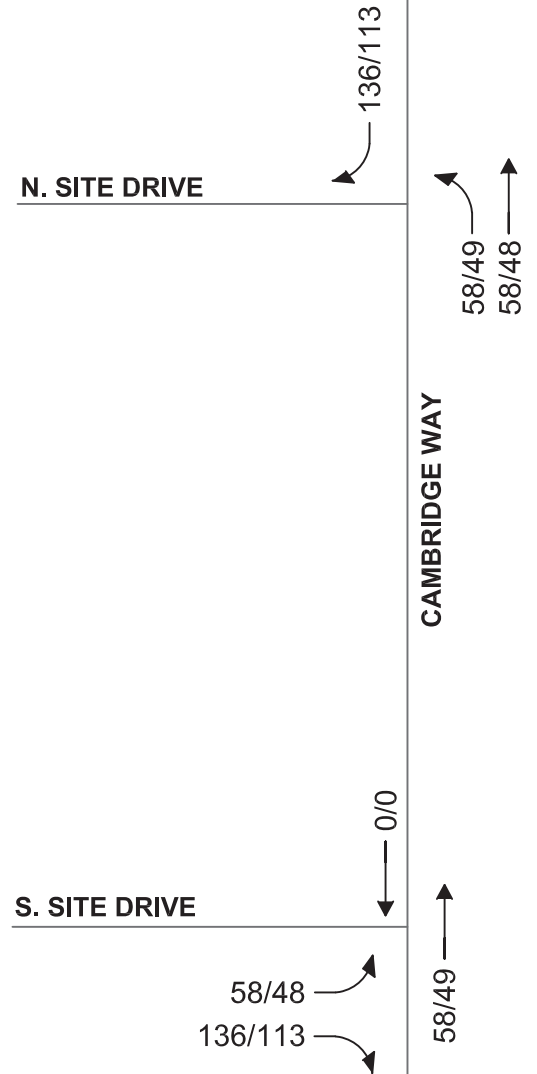
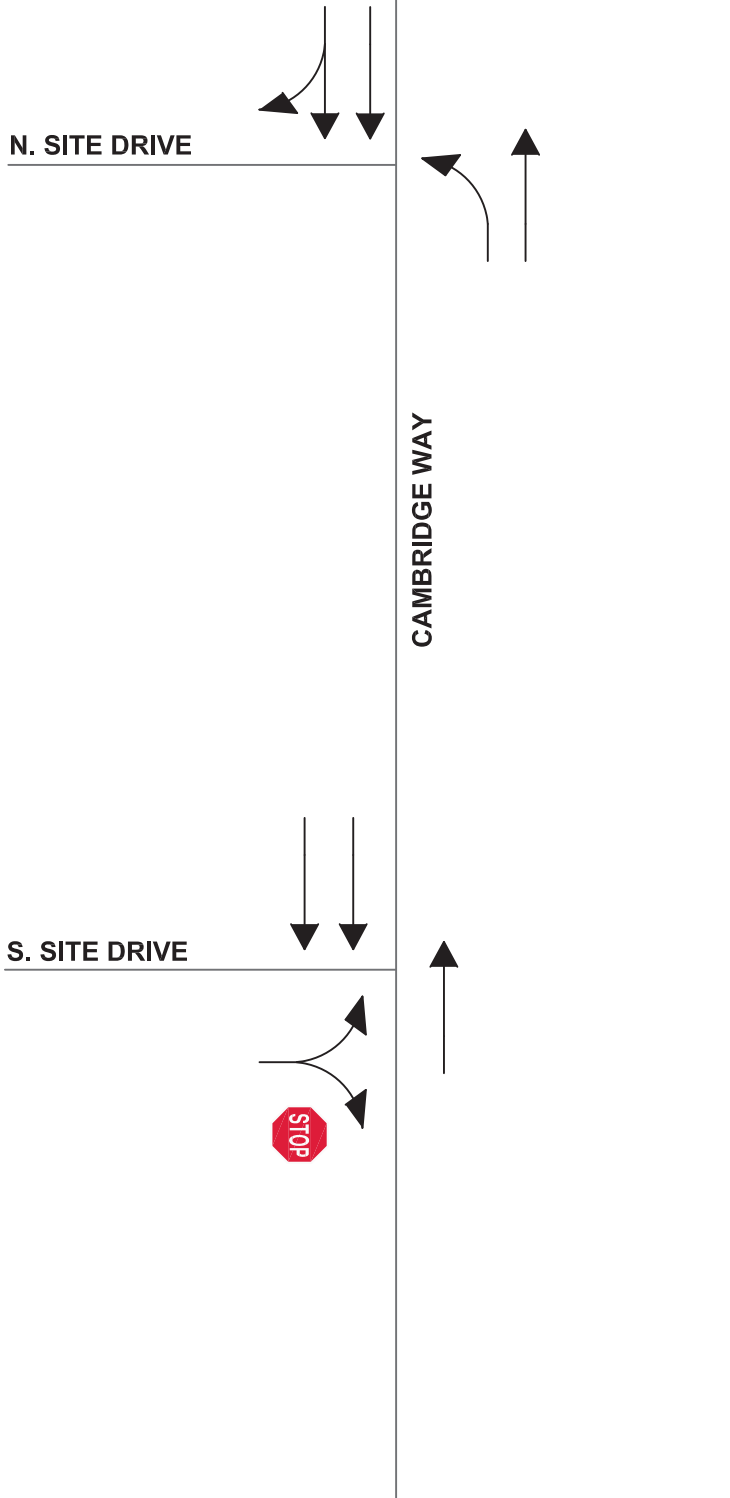


FIGURE 2
LANE USE AND TRAFFIC VOLUMES

CHICK-FIL-A TIA - PLAINFIELD, IN

LEGEND

- ROADS
- PROPOSED ROADS
- LANE USE
- PROPOSED LANE USE
- UNSIGNALIZED INTERSECTION
- TRAFFIC VOLUMES (MD/PM)

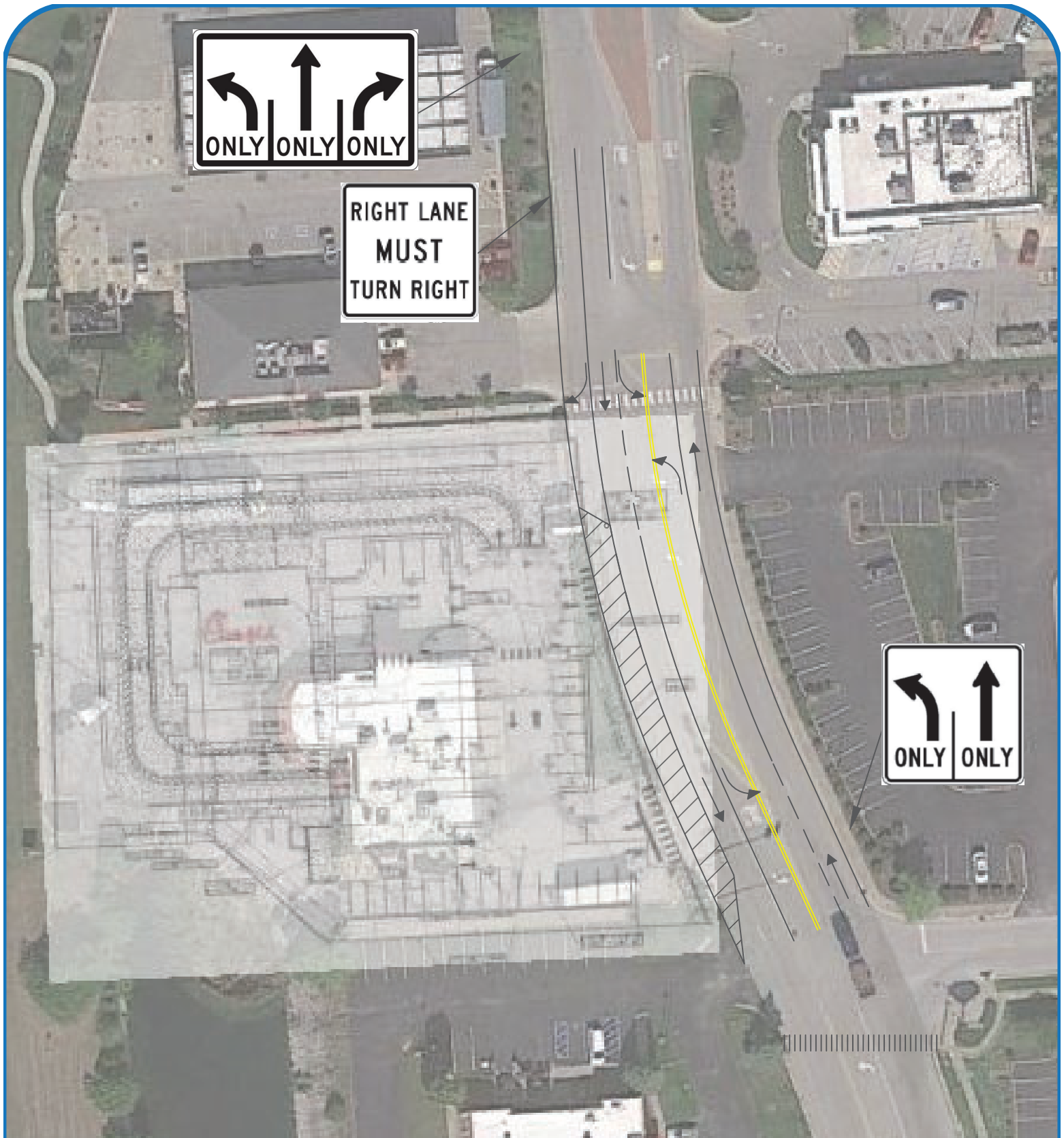


FIGURE 3
FUTURE IMPROVEMENTS



CHICK-FIL-A TIA - PLAINFIELD, IN

LEGEND



NORTH
 SCALE: NOT TO SCALE

LAND DESCRIPTION

LOT NUMBERED TWO (2) IN CAMBRIDGE SQUARE WEST, PHASE 1, A SUBDIVISION IN THE TOWN OF PLAINFIELD, HENDRICKS COUNTY, INDIANA, AS PER PLAT THEREOF AS RECORDED MARCH 4, 1988 IN PLAT BOOK 13, PAGES 34-35 AND SURVEYOR'S CERTIFICATE OF ERROR RECORDED MARCH 22, 1988 AS BOOK 114, PAGE 66 IN THE OFFICE OF THE RECORDER OF HENDRICKS COUNTY, INDIANA.

BENCHMARK INFORMATION

ORIGINATING BENCHMARK
L-61 (PID: KA0040)
1.2 MILES SOUTHEAST FROM PLAINFIELD
ABOUT 1.2 MILES ALONG STATE HIGHWAY 267 FROM ITS JUNCTION WITH U.S. HIGHWAY 40 AT PLAINFIELD, AT A CROSS ROAD, 45 FEET WEST OF AND ABOUT LEVEL WITH THE CENTER LINE OF THE HIGHWAY, 26 FEET NORTH OF THE CENTER LINE OF THE ENTRANCE TO THE EDWARD CUMMINGS FARM, 14 FEET NORTHWEST OF THE NORTH END OF A 12-INCH CORRUGATED PIPE CULVERT, 7 FEET WEST OF TELEPHONE POLE NO. 36-H 62, 4 FEET WEST OF A CONCRETE FENCE CORNER POST, AND 2 FEET EAST OF A WHITE WOODEN WITNESS POST, A STANDARD DISK, STAMPED L 61 1946 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 8 INCHES ABOVE GROUND.
ELEV: 715.41 (NAVD 88)

SITE DATA TABLE:

SITE AREA: 1.30 ACRES (56,844 SQ.FT.) NET AND GROSS
ZONING: GC (GENERAL COMMERCIAL)
PROPOSED USE: RESTAURANT (5,028 S.F.)
BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 75 FEET
PROPOSED BUILDING HEIGHT = 1 STORY
BUILDING FOOTPRINT AREA = 5,028 SQ.FT.
BUILDING LOT COVERAGE = 5,028 / 56,844 = 8.8%
BUILDING SETBACK REQUIREMENTS:
FRONT (EAST/WEST): REQUIRED: 30'/30' PROPOSED: 130.95'/53.80'
SIDE (NORTH): 10' 54.07'
REAR (SOUTH): 10' 45.87'
LANDSCAPE SETBACK REQUIREMENTS:
FRONT (EAST/WEST): REQUIRED: 10'/20' PROPOSED: 10.47'/20'
SIDE (NORTH): 10' 10'
REAR (SOUTH): 10' 10'
PARKING CALCULATIONS:
RESTAURANTS REQUIRED PARKING = 1 SPACE PER 5 SEATS
PROPOSED SEATS = 98 SEATS
PARKING REQUIRED = 98/5 = 20 SPACES REQUIRED
PARKING PROVIDED = 48 SPACES INCLUDING 2 BARRIER FREE SPACES

LEGEND

● IRON FOUND	● BRASS PLUG SET	● SEC. CORNER FOUND
⊗ IRON SET	⊗ MONUMENT FOUND	⊗ R RECORDED
⊗ NAIL FOUND	⊗ MONUMENT SET	⊗ M MEASURED
⊗ NAIL & CAP SET		⊗ C CALCULATED

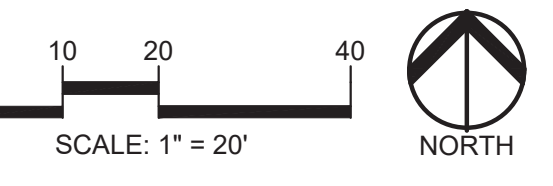
—OH—ELEC—VV—	ELEC. PHONE OR CABLE TV OH. LINE, POLE & GUY WIRE
—UG—CATV—	UNDERGROUND CABLE TV CATV PRESTAL
—UG—PHONE—	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
—UG—ELEC—	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
—	GAS MAIN, VALVE & GAS LINE MARKER
—	WATER MAIN, VALVE, TAPPING SLEEVE & VALVE
—	SANITARY SEWER, CLEANOUT & MANHOLE
—	STORM SEWER, CLEANOUT & MANHOLE
—	COMBINED SEWER & MANHOLE
—	SQUARE, ROUND & REEFIVE CATCH BASIN, YARD DRAIN
—	POST INDICATOR VALVE
—	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
—	MAIL BOX, TRANSFORMER, IRRIGATION CONTROL VALVE
—	UNIDENTIFIED STRUCTURE
—	SPOT ELEVATION
—	CONTOUR LINE
—	FENCE
—	GUARD RAIL
—	STREET LIGHT
—	SIGN
—	CONCRETE
—	ASPHALT
—	GRAVEL SHOULDER
—	WETLAND



Chick-fil-A

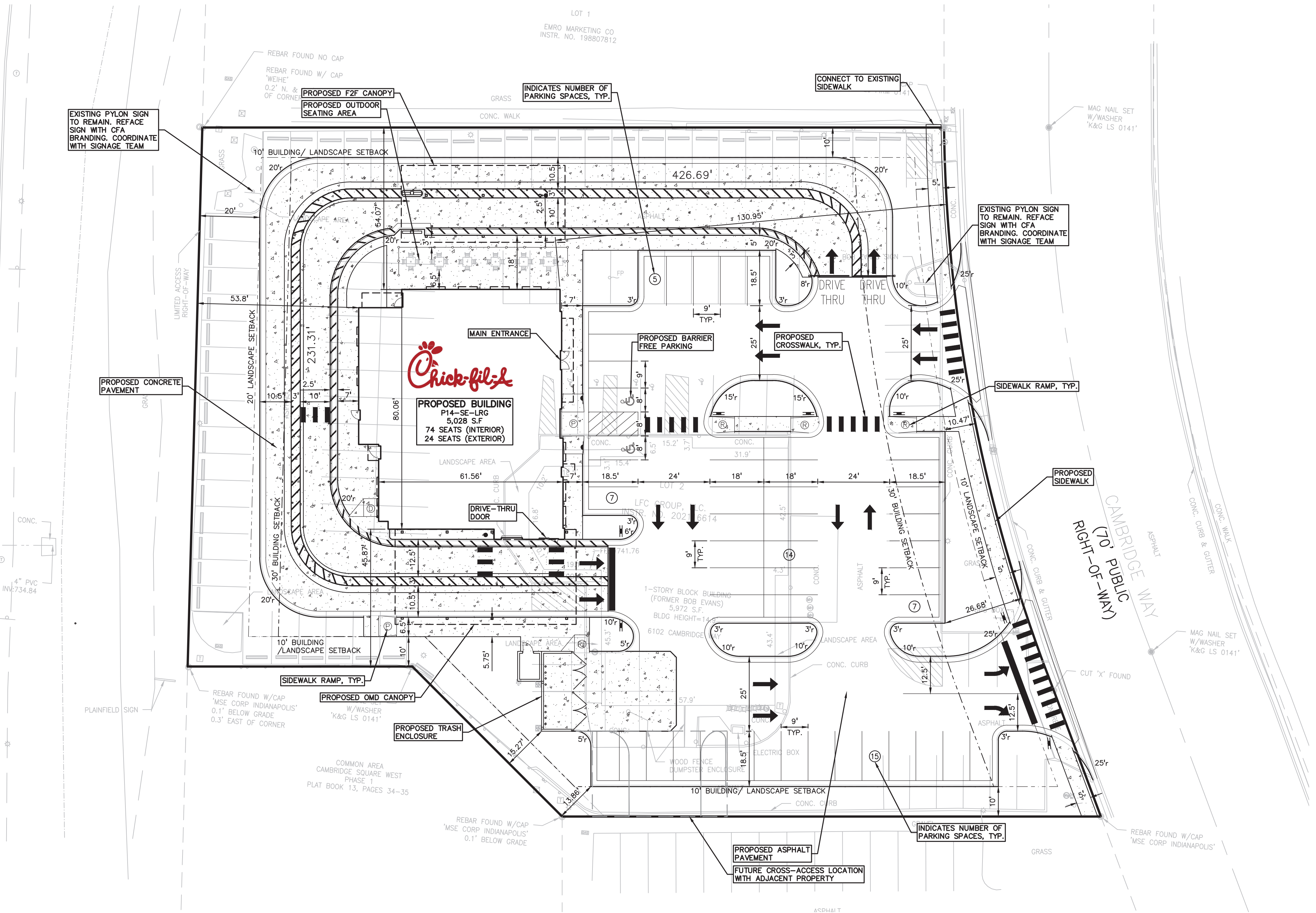
Chick-fil-A
5200 Buffington Road
Atlanta, Georgia 30349-2998

PEA GROUP
t: 844.813.2949
www.peagroup.com



File Path
3/15/2021
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STATE ROAD 267
(PUBLIC RIGHT-OF-WAY)
ASPHALT



CHICK-FIL-A
PLAINFIELD
6102 CAMBRIDGE WAY
PLAINFIELD, IN 46168

FSR#05219

BUILDING TYPE / SIZE: P14-SE-LRG
RELEASE: AUGUST 2022

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CONSULTANT PROJECT #	2022-1054
PRINTED FOR	CONCEPT
DATE	SEPTEMBER 14, 2022
DRAWN BY	AJM

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SHEET
CONCEPT PLAN

SHEET NUMBER

SK-1.0

Trip Generation													
		Caledonia			Kalamazoo ¹			Okemos			Average ²		
		In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday (8-26-21)	7a-8a	76	68	144	18	7	25	37	35	72	44	37	80
	8a-9a	79	77	156	34	28	62	40	45	85	51	50	101
	AM Peak	84	87	171	34	28	62	40	45	85	53	53	106
	4p-5p	121	122	243	136	127	263	125	144	269	127	131	258
	5p-6p	163	148	311	142	146	288	170	177	347	158	157	315
	PM Peak	163	148	311	142	146	288	170	177	347	158	157	315
Weekend (8-28-21)	12p-1p	157	157	314	170	157	327	197	202	399	175	172	347
	1p-2p	164	171	335	164	169	333	215	219	434	181	186	367
	MD Peak	171	168	339	168	173	341	218	229	447	186	190	376
	5p-6p	106	100	206	125	139	264	200	201	401	144	147	290
	6p-7p	109	108	217	121	135	256	178	200	378	136	148	284
	PM Peak	118	115	233	138	140	278	200	201	401	152	152	304

¹Location does not open until 8a

²Straight Average

	Weekday		Weekend		Size (SF)
	AM Peak	PM Peak	MD Peak	PM Peak	
Caledonia	7:30a-8:30a	5p-6p	12:45p-1:45p	5:45p-6:45p	4,877
Okemos	8a-9a	5p-6p	12:45p-1:45p	5p-6p	4,730
Kalamazoo	8a-9a	5p-6p	12:45p-1:45p	5:30p-6:30p	4,996