

JOHN COLLINS ENGINEERS, P.C.

TRAFFIC • TRANSPORTATION ENGINEERS

===== 11 BRADHURST AVENUE • HAWTHORNE, N.Y. • 10532 • (914) 347-7500 • FAX (914) 347-7266 =====

July 19, 2012

Pastor Carmine Zottoli
3500 Mohegan Avenue
Mohegan Lake, NY 10547

RE: Faith Bible Church Expansion and Renovation
Mohegan Avenue
Town of Yorktown, New York

Dear Pastor Zottoli:

John Collins Engineers, P.C. has completed our preliminary review and analysis of the traffic and parking operations for the above referenced project. The existing site is located at the intersection of Mohegan Avenue and Sagamore Avenue Town of Yorktown, New York (See Figure No.1). The following is a summary our evaluation:

1. 2012 Existing Traffic Volumes (Figures No. 2, 3 and 4)

Representatives of John Collins Engineers, P.C. have collected existing turning movement traffic counts during the weekday afternoon and evening and Sunday peak hours at the site driveways and intersection of Sagamore Avenue and Mohegan Avenue. These counts included a Sunday and Wednesday observation. These counts are summarized on Figure No. 2, 3 and 4 and identify the existing traffic conditions. In addition, it was also confirmed that these would cover the peak periods identified by the church based on the typical schedule of events as summarized in the attached table of operations.

2. 2015 No-Build Traffic Volumes (Figures No. 5, 6, and 7)

The 2012 Existing Traffic Volumes were projected the 2015 Design Year using a 2% per year growth factor. The growth factor accounts for normal traffic growth on the study area roadways as

well as other potential developments in the area. The resulting 2015 No-Build Traffic Volumes are shown on Figures No. 5, 6 and 7 for the Weekday PM Highway Hour, PM Evening Hour and Sunday Peak Hour, respectively.

3. Site Generated Traffic Volumes (Table No. 1)

Estimates of the amount of traffic to be generated by Expansion of the Church during each of the peak hours were developed based on data published by the Institute of Transportation Engineers (ITE) as contained in their publication entitled, Trip Generation, 8th Edition, 2008. Table No. 1 provides the Hourly Trip Generation Rates and Anticipated Site Generated Traffic Volumes for each of the Peak Hours based on a maximum capacity of 344 seats. Note that these volumes are conservatively high for the Sunday conditions because the ITE database is based on a church with multiple services. Faith Bible has a single service and it was found that the exiting period was spread out more over a longer period. In any event, the higher ITE volumes were used for the analysis contained herein.

4. Arrival and Departure Distributions (Figures No. 8 and 9)

Arrival and departure distributions were established based on the existing traffic volume patterns at the site to assign the additional site generated traffic volumes to the roadway network. Separate arrival and departure distributions were developed for the site parking areas. The resulting arrival and departure distributions are shown on Figures No. 8 and 9, respectively.

5. 2015 Build Traffic Volumes (Figures No. 10, 11, 12, 13, 14 and 15)

The site generated traffic volumes shown on Table No. 1 were assigned to the roadway network utilizing the above referenced arrival and departure distributions. The resulting site generated traffic volumes are shown on Figures No. 10, 11 and 12 for each of the Peak Hours. These site generated traffic volumes were then added to the 2015 No-Build Traffic Volumes resulting in the 2015 Build Traffic Volumes which are shown on Figures No. 13, 14 and 15 for the Peak Hours, respectively.

6. Description of Analysis Procedures

It was necessary to perform capacity analyses based on procedures from the 2010 Highway Capacity Manual in order to determine existing and future traffic operating conditions at the study area intersections. The unsignalized intersection capacity analysis method utilized in this report was also performed in accordance with the procedures described in the 2010 Highway Capacity Manual. The procedure is based on total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. The average total delay for any particular critical movement is a function of the service rate or capacity of the approach and the degree of saturation. In order to identify the Level of Service, the average amount of vehicle delay is computed for each critical movement to the intersection. Additional information concerning unsignalized Levels of Service can be found in Appendix "D" of this report.

7. Capacity Analysis Results (Table No. 2)

Capacity analyses were performed at the adjacent intersections and site driveways utilizing the procedures described above in order to evaluate current and future operating conditions. Summarized below is a brief description of the existing geometrics, traffic control and a summary of the existing and future Levels of Service and any recommended improvements.

Table No. 2 summarizes the results of the capacity analysis (Levels of Service and delays) for the Year 2012 Existing, Year 2015 No-Build and Year 2015 Build Conditions. Copies of the capacity analysis for each of the individual intersections are contained in Appendix "C" of this report. The geometry of the intersection of Sagamore Avenue and Mohegan Avenue currently results in confusing operations due to the open uncontrolled conditions. As part of the proposed development, this intersection is proposed to be improved to a more conventional "T" type intersection with "stop sign" control. (See Site Design site plan drawing.) In addition, vegetative clearing, intersection – ahead warning signs, and striping including "stop" bars should also be added to the intersection. Additionally based on a review of the current volumes, it would be appropriate to provide "All Way Stop" control at the intersection in conformance with the signing and striping based on the Manual on Uniform Traffic Control Devices (MUTCD). This "All Way Stop" would also accommodate future volumes at acceptable Levels of Service.

8. Parking Considerations

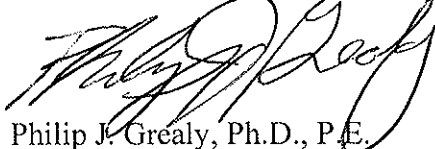
Under current conditions, the church congregants park in the adjacent lot as well as the unstriped lot across the street and parking monitors are used to accommodate this. Parking is also available at the lake during peak times. The site plan prepared by Site Design Consultants indicates that a total of 63 striped parking spaces will be provided on the site and adjacent ancillary parking areas. The total number of parking spaces provided on the plan satisfies the Town requirements for 252 seats and is consistent with the peak parking ratios recommended by the Institute of Transportation Engineers as contained in their report entitled Parking Generation, 4th Edition. The provision of the 63 spaces will help accommodate the existing shortfall during peak periods and serve the expanded building under normal conditions. In order to handle peak conditions and accommodate a seating capacity of in excess of 300 seats, a “stacked” parking plan which would function similar to a “valet” system and controlled by the church monitors would be implemented. This would provide parking for up to 86 cars. Also, the use of the lake parking for peak Sundays should also be maintained and the use of a shuttle during these peak times for this remote parking should be provided so that congregants do not have to walk to the church to and from this location.

9. Summary and Conclusion

Based on the results of the capacity analysis contained herein, the proposed Expansion of the Faith Bible Church can be accommodated by the study area intersections and surrounding area roadway network and that the proposed improvements to the Sagamore Avenue and Mohegan Avenue intersection will improve the safety and efficiency of the operation. Furthermore, the proposed parking addition will help accommodate existing and expected demands for the expanded church and the recommendations above should be implemented.

Respectfully submitted,

JOHN COLLINS ENGINEERS, P.C.



Philip J. Grealy, Ph.D., P.E.

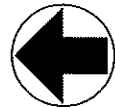
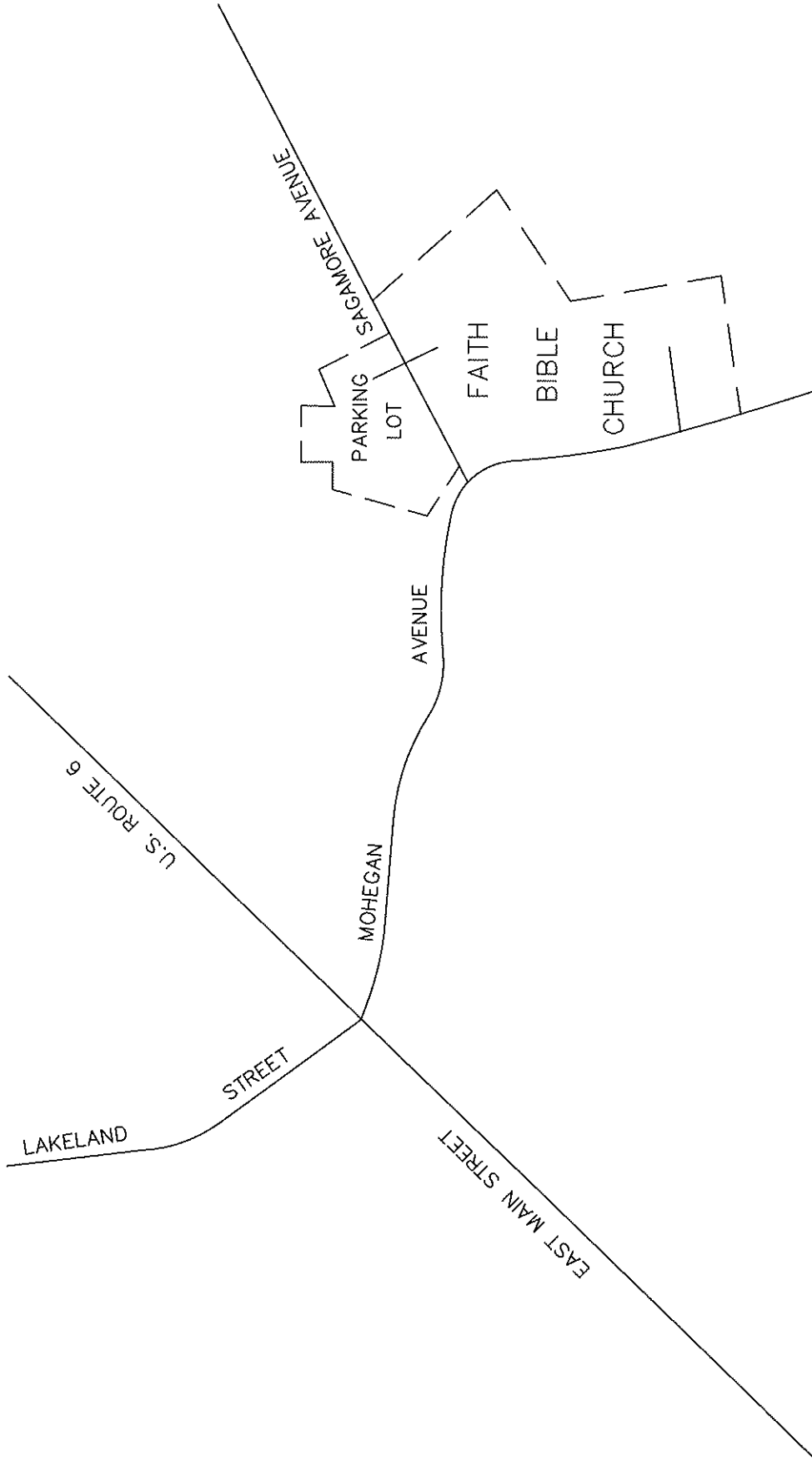
7/13/2012 – Faith Bible Church – Current status

Weekday/Season	Day/Evening	Activity	Attendance
Monday – Tuesday	Day/Evening	No formal activity	3-4 people
Wednesday	Day	No formal activity	
Wednesday	Evening 6:45 – 7:45 (entering) 9:00 – 9:30 (exiting)	Bible Study Worship & Prayer	20-30 people
Thursday	Day	No formal activity	
Thursday	Evening	Worship Team Practice	15-20 people
Friday	Evening 6:30 (entering) 9:30 (exiting)	Youth Night	50-60 teens 10 adults 10-20 cars stay
Saturday	Day/Evening	Misc. activity Funerals Weddings Women’s Fellowship (7 times/year)	30 women
Sunday	Day 8:45 (entering) 9:45 – 10:00 (entering) 12:30 – 1:30 (exiting)	Worship team Parishioners Team & Parishioners	150 people (summer) 200 people (outside of summer)
September - June	Day	Sunday School prior to service	Children/Adults
Summer (one week)	Day (entering/exiting)	Vacation Bible School	30 to 50 (mostly drop-offs) Children/Adults

Notes: There are no rentals or use of the facility for private parties and catering.

APPENDIX "A"

FIGURES

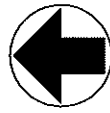
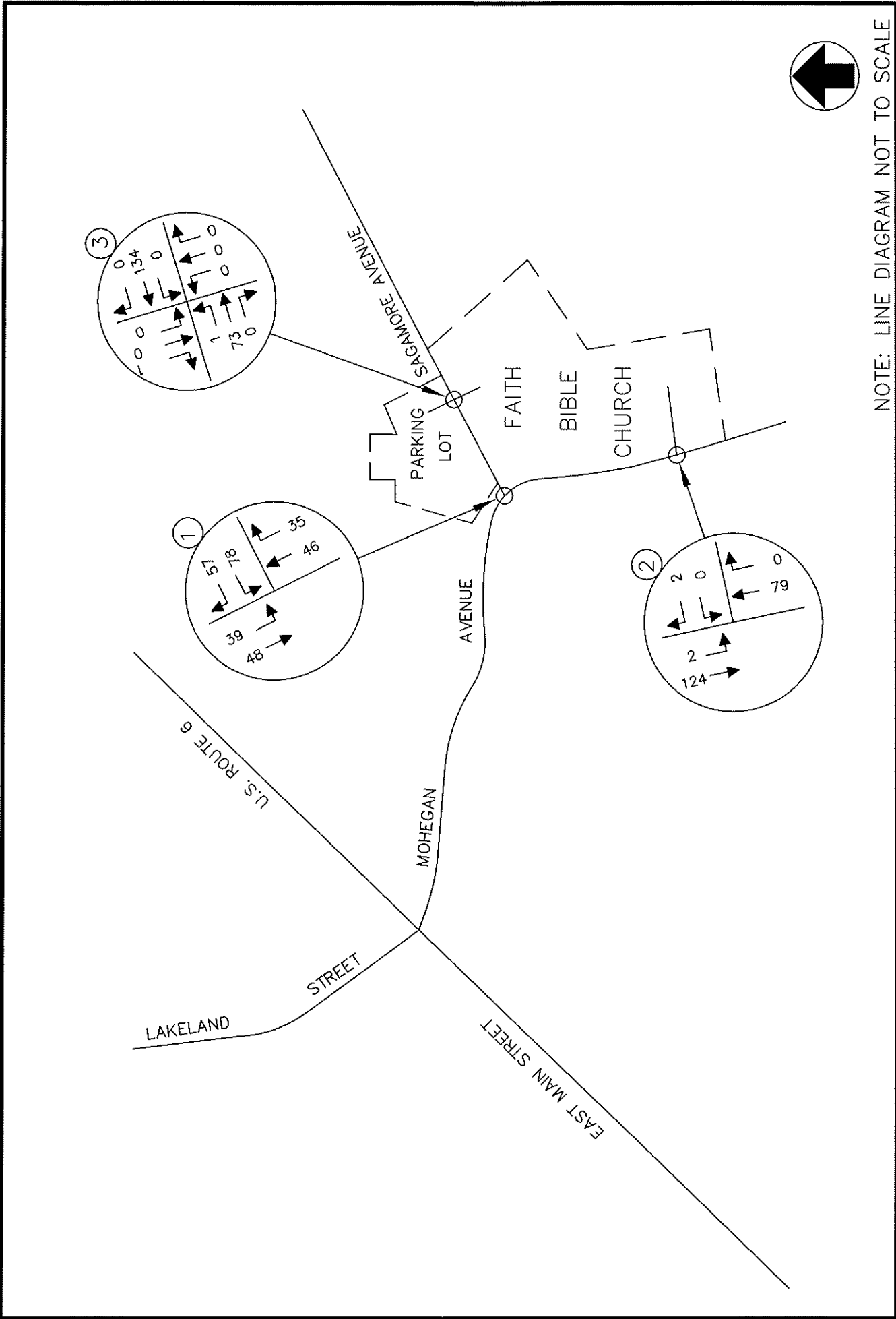


NOTE: LINE DIAGRAM NOT TO SCALE

SITE LOCATION MAP

FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK

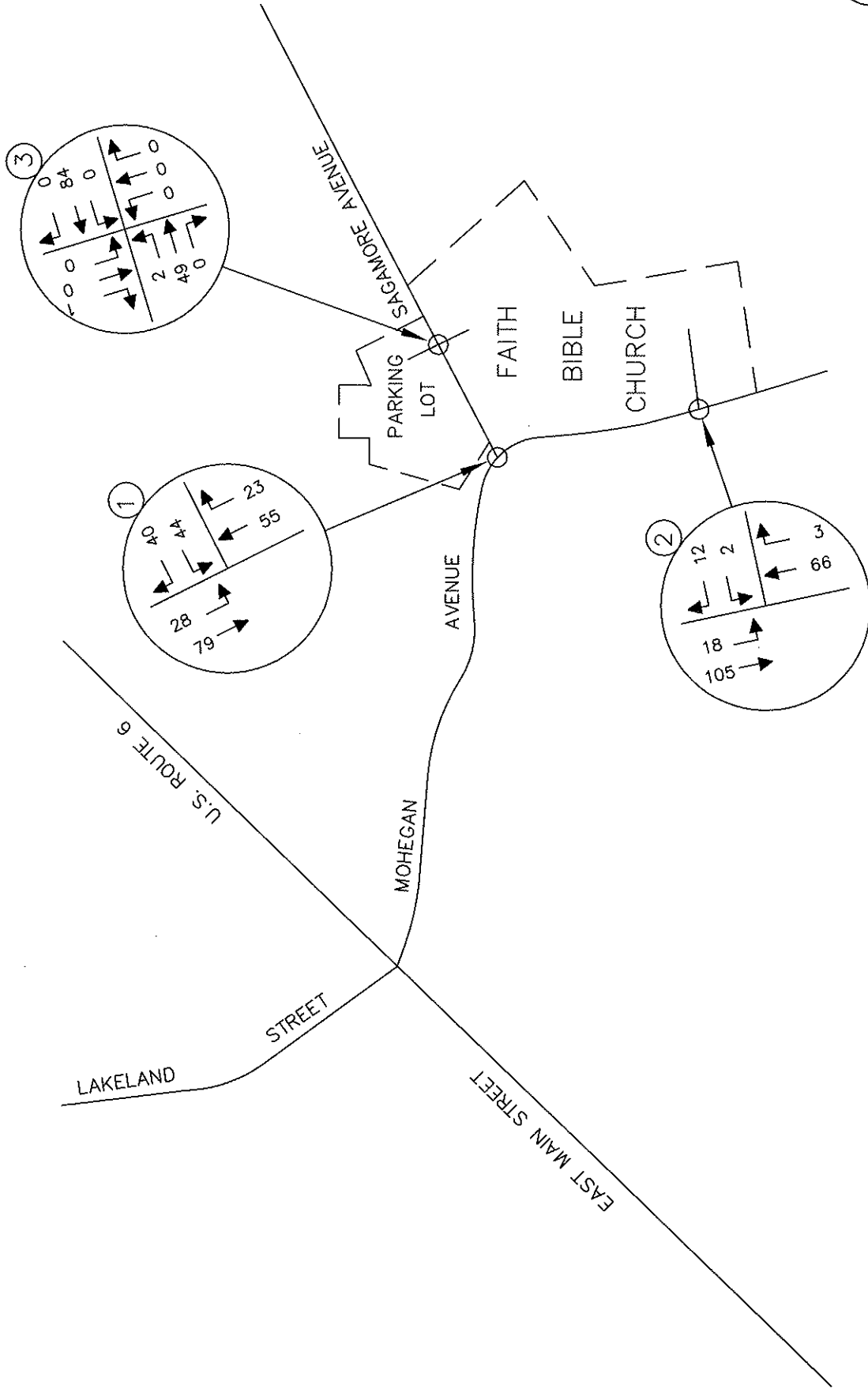
JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK



NOTE: LINE DIAGRAM NOT TO SCALE

2012 EXISTING TRAFFIC VOLUMES
WEEKDAY PEAK PM HIGHWAY HOUR

FAITH BIBLE CHURCH
YORKTOWN, NEW YORK
JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK

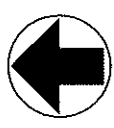
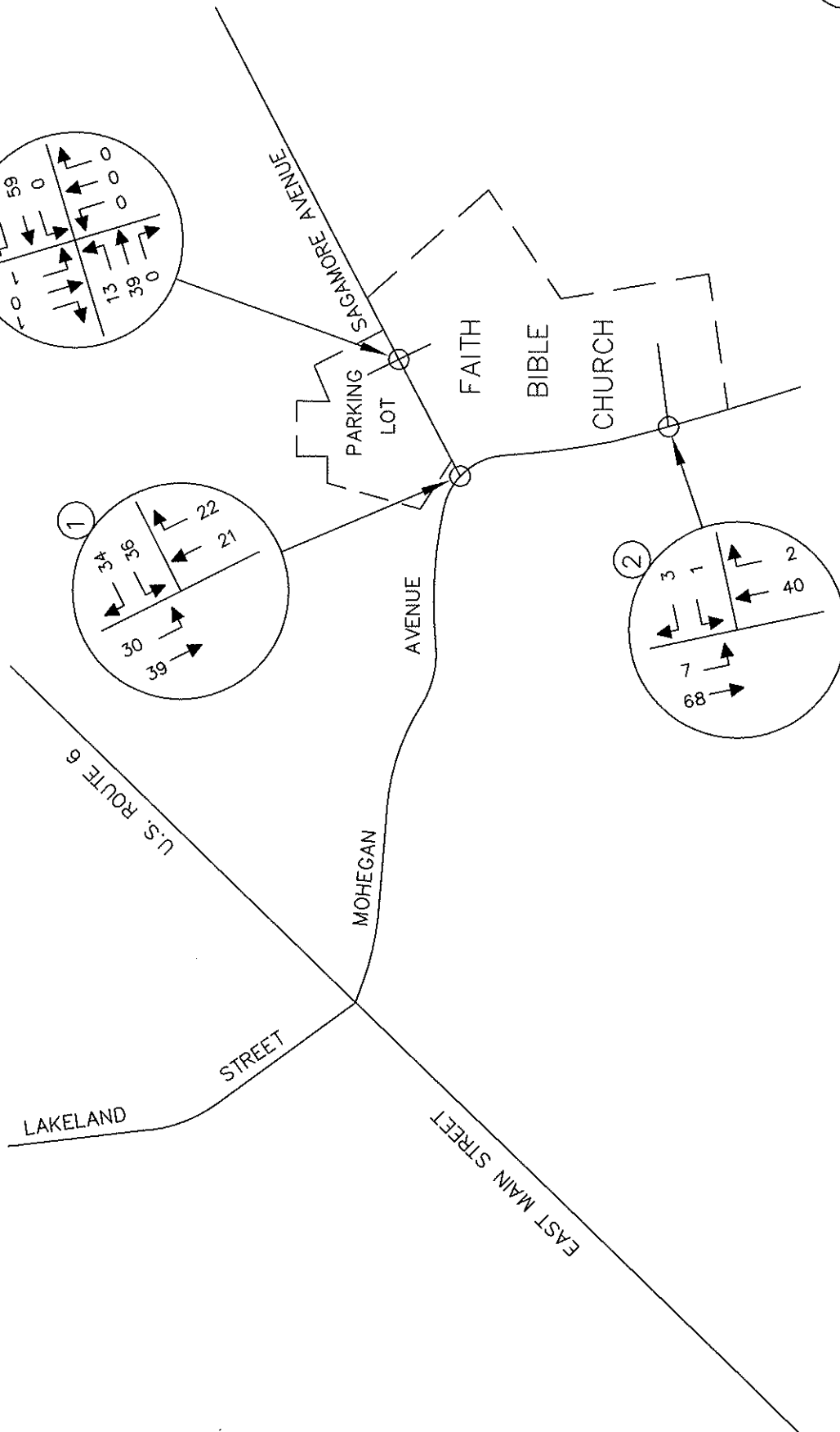


NOTE: LINE DIAGRAM NOT TO SCALE

2012 EXISTING TRAFFIC VOLUMES
WEEKDAY PEAK PM CHURCH HOUR

FAITH BIBLE CHURCH
YORKTOWN, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK

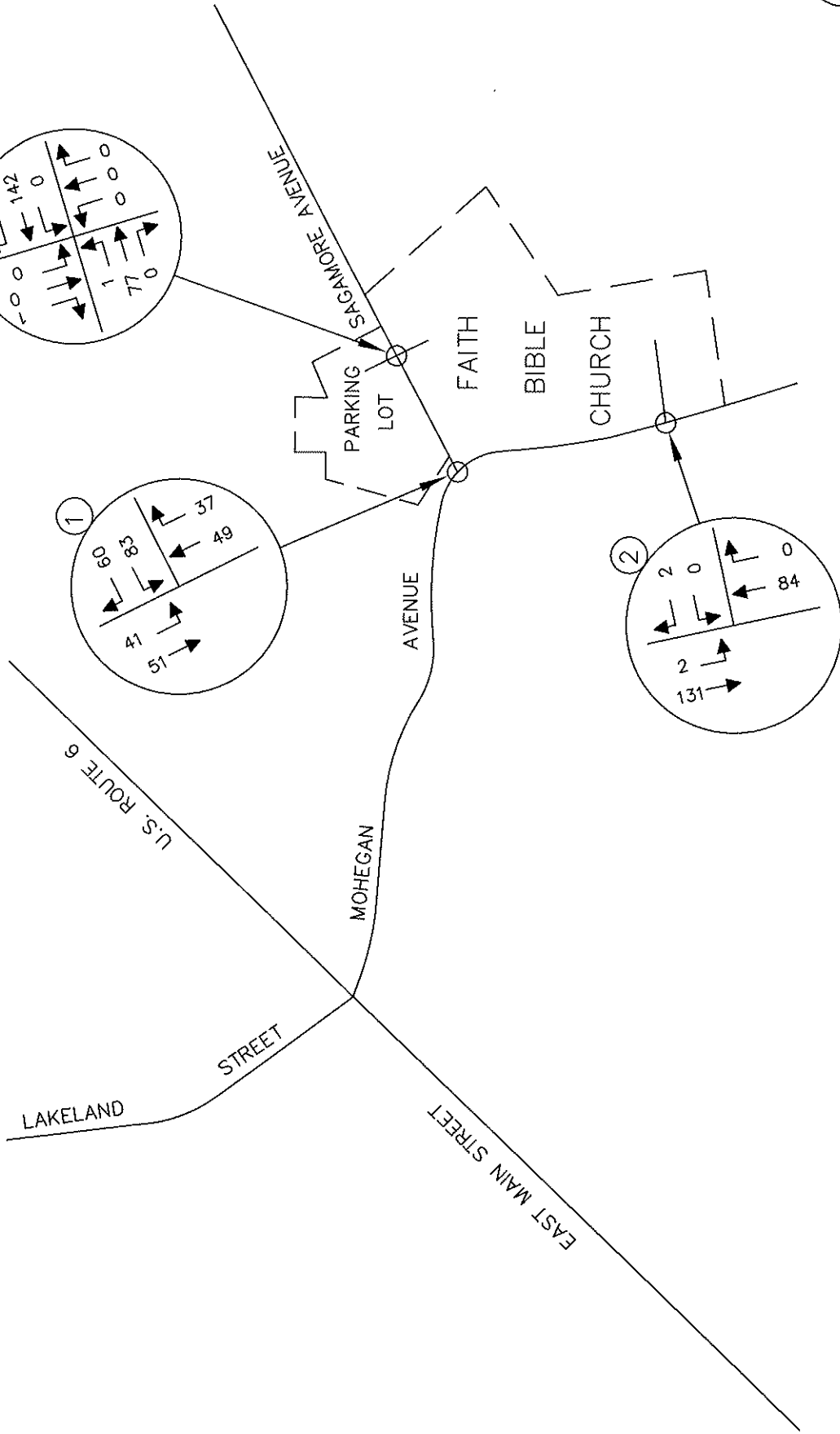


NOTE: LINE DIAGRAM NOT TO SCALE

2012 EXISTING TRAFFIC VOLUMES
WEEKEND PEAK SUNDAY HOUR

FAITH BIBLE CHURCH
YORKTOWN, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK

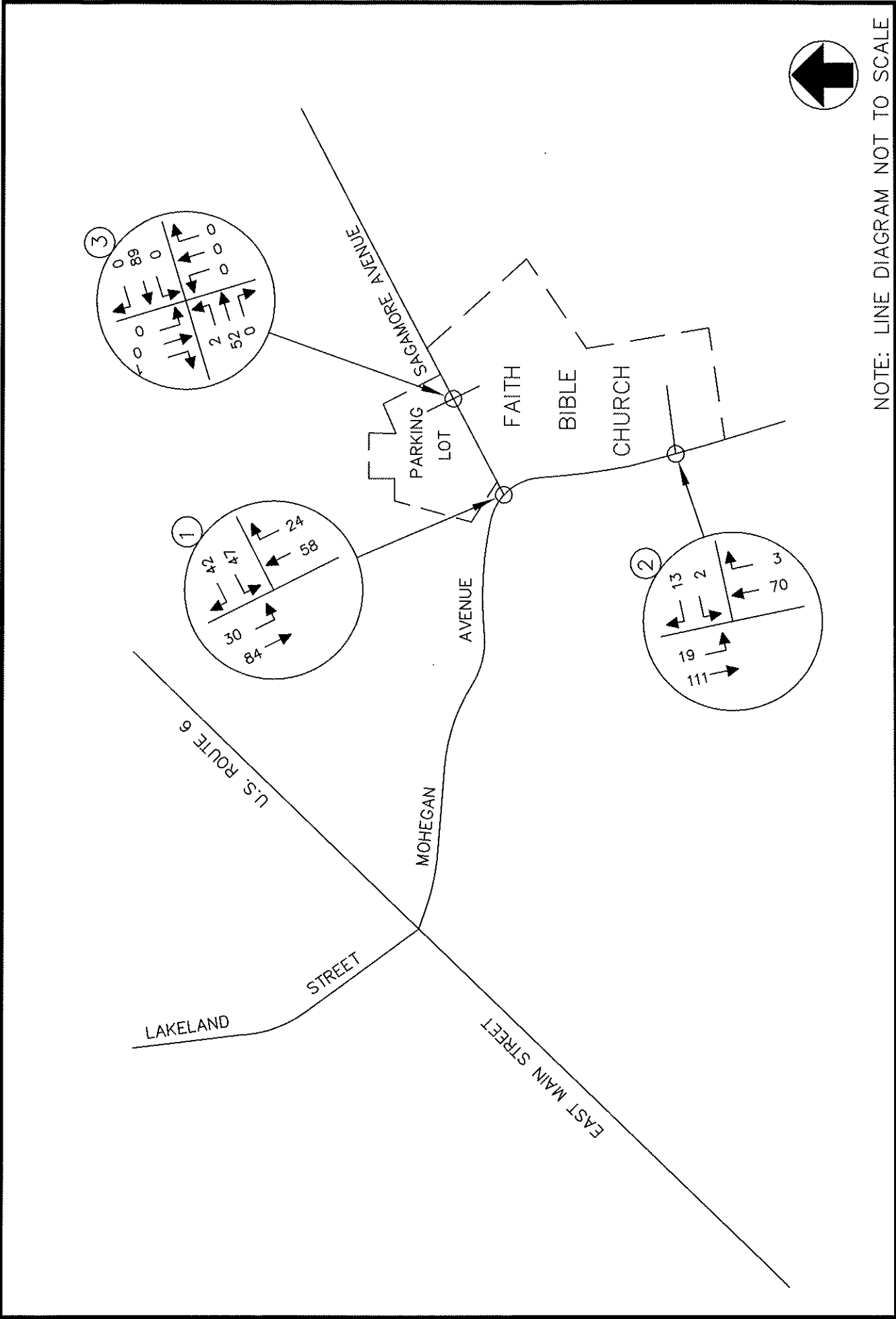


NOTE: LINE DIAGRAM NOT TO SCALE

2015 NO-BUILD TRAFFIC VOLUMES
WEEKDAY PEAK PM HIGHWAY HOUR

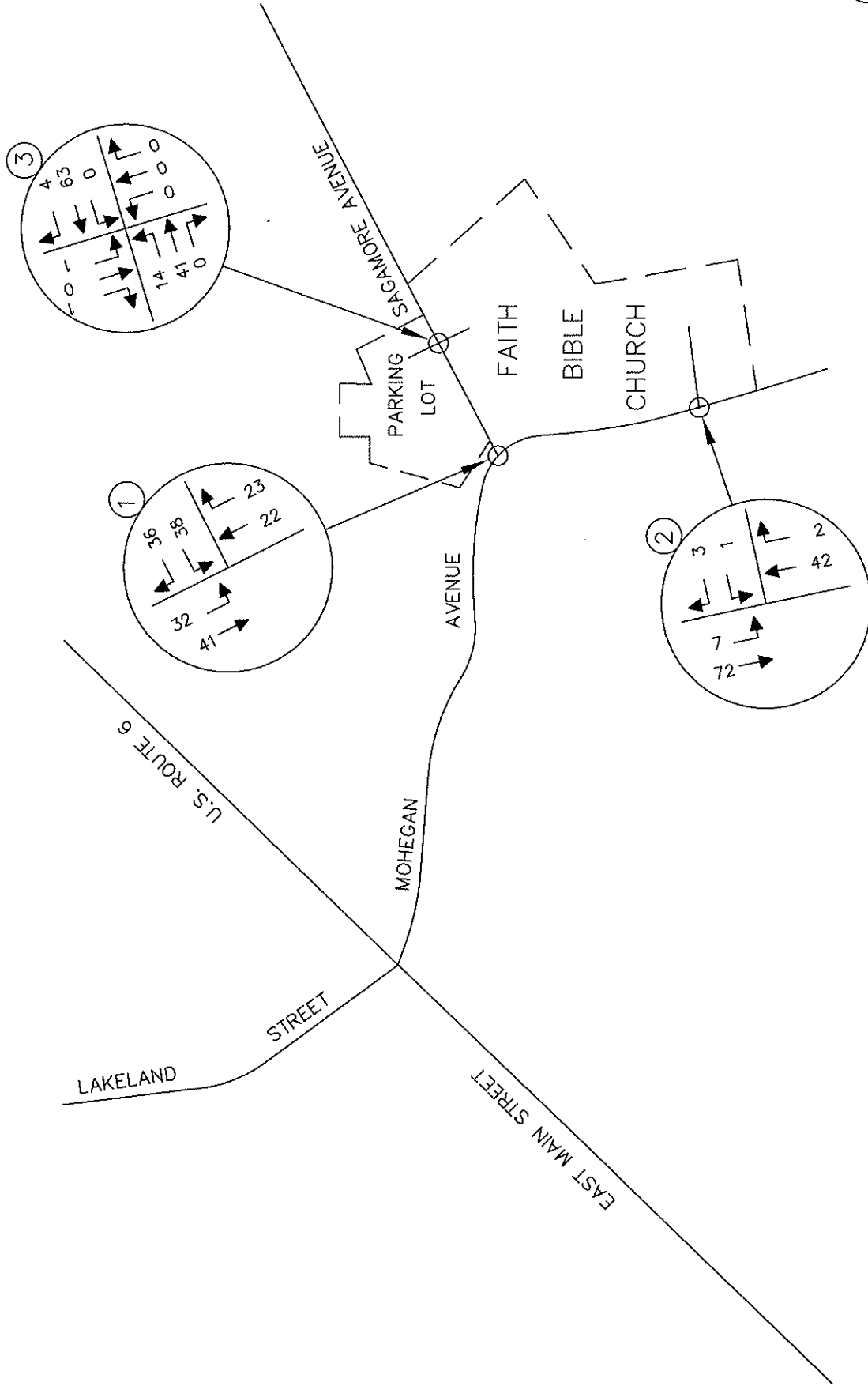
FAITH BIBLE CHURCH
YORKTOWN, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK

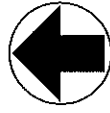


2015 NO-BUILD TRAFFIC VOLUMES
WEEKDAY PEAK PM CHURCH HOUR

FAITH BIBLE CHURCH
YORKTOWN, NEW YORK
JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK

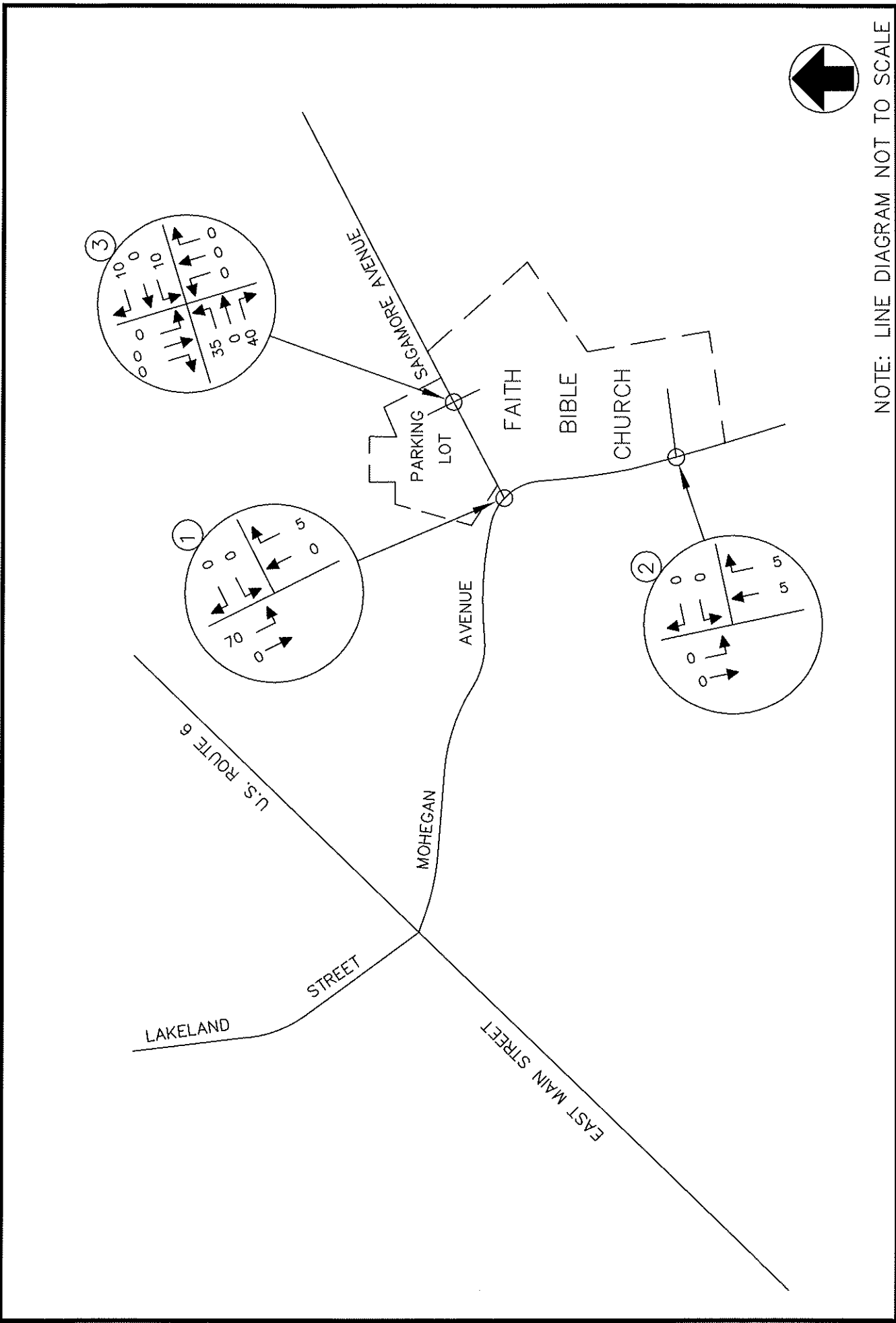


NOTE: LINE DIAGRAM NOT TO SCALE



2015 NO-BUILD TRAFFIC VOLUMES
WEEKEND PEAK SUNDAY HOUR

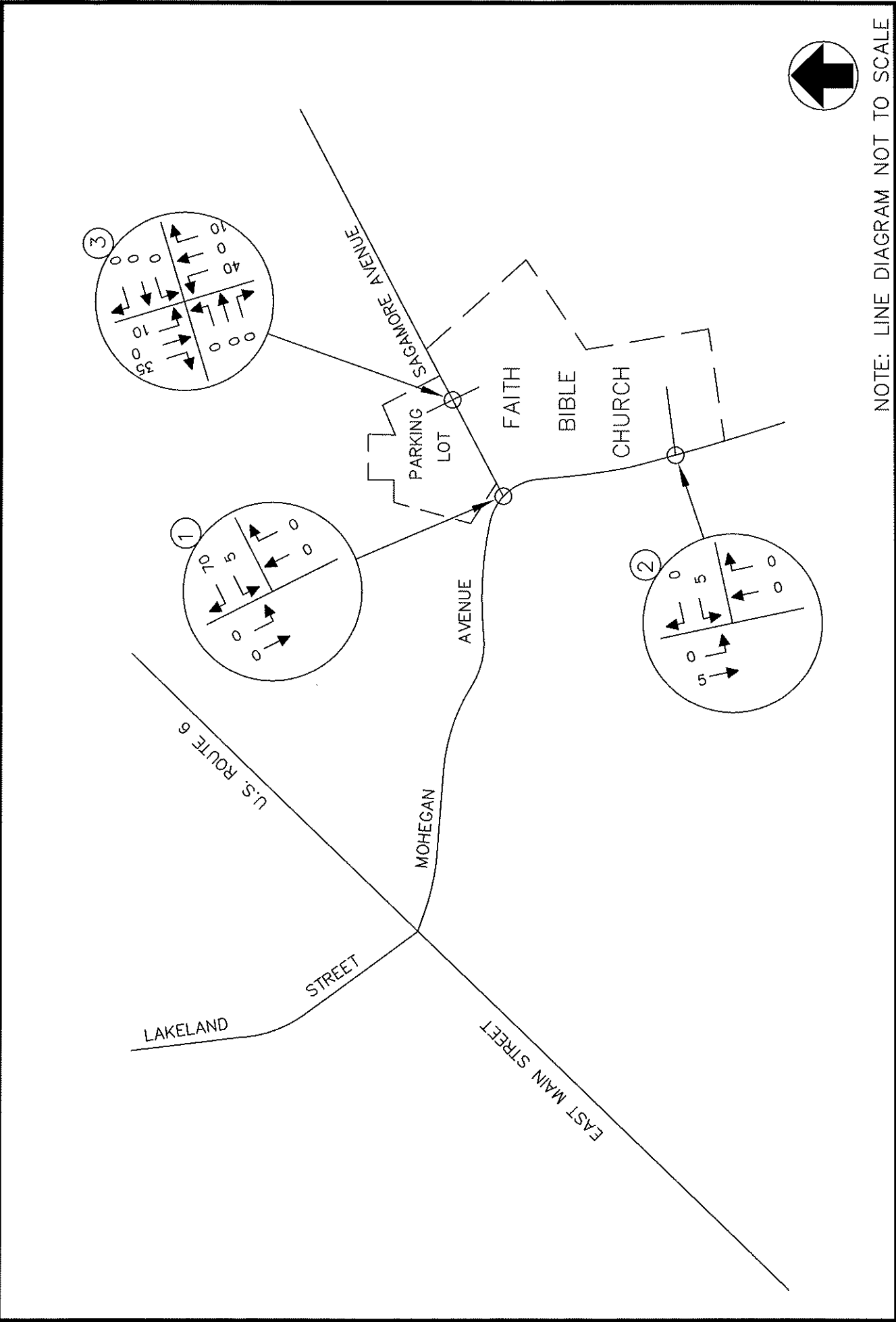
FAITH BIBLE CHURCH
YORKTOWN, NEW YORK
JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK



NOTE: LINE DIAGRAM NOT TO SCALE

ARRIVAL DISTRIBUTION
(ALL VALUES EXPRESSED AS A %)

FAITH BIBLE CHURCH
YORKTOWN, NEW YORK
JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK

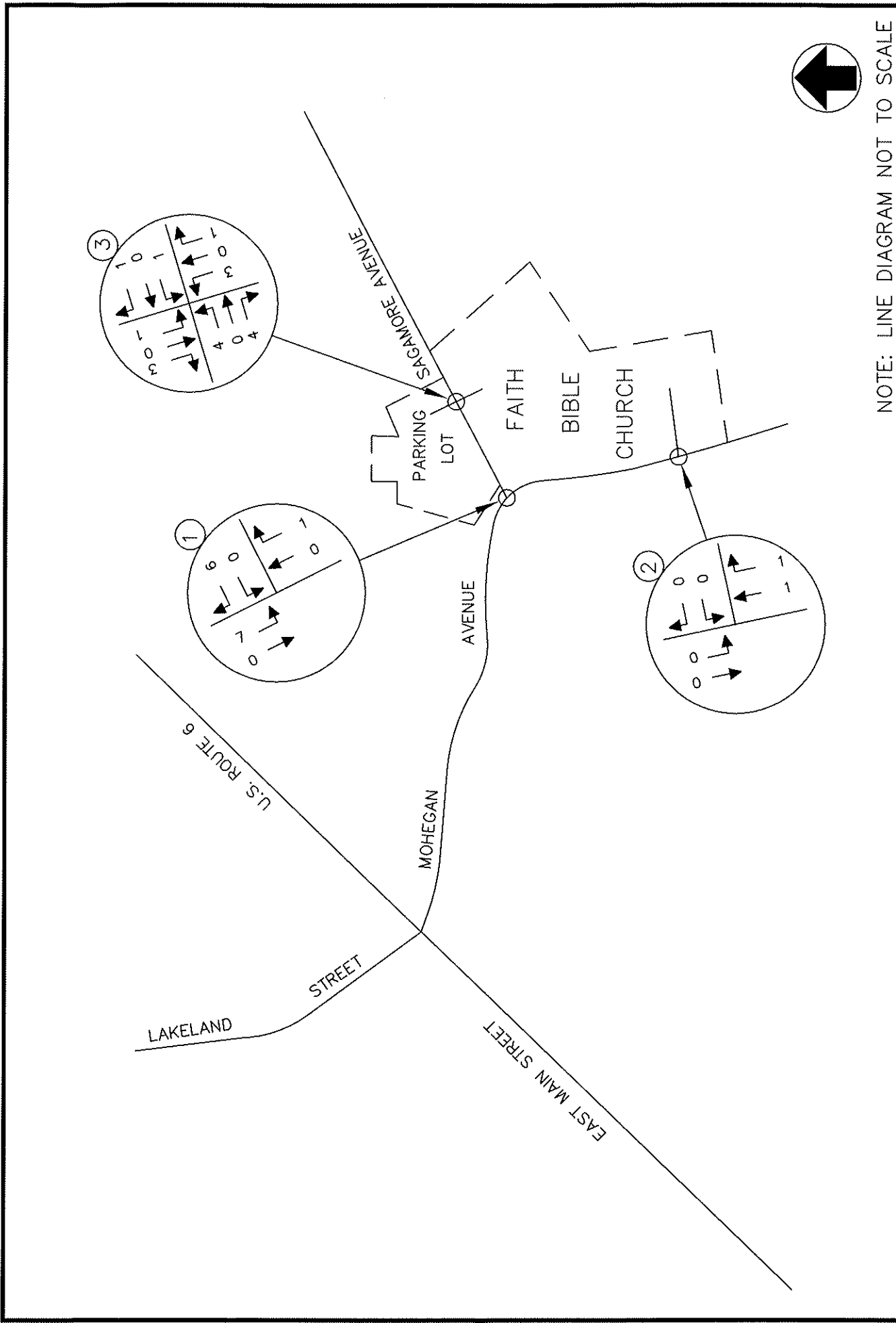


NOTE: LINE DIAGRAM NOT TO SCALE



FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK
 DEPARTURE DISTRIBUTION
 (ALL VALUES EXPRESSED AS A %)

JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK
 PROJECT NO. 1897 DATE: JUNE 2012 FIG. NO. 9



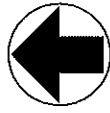
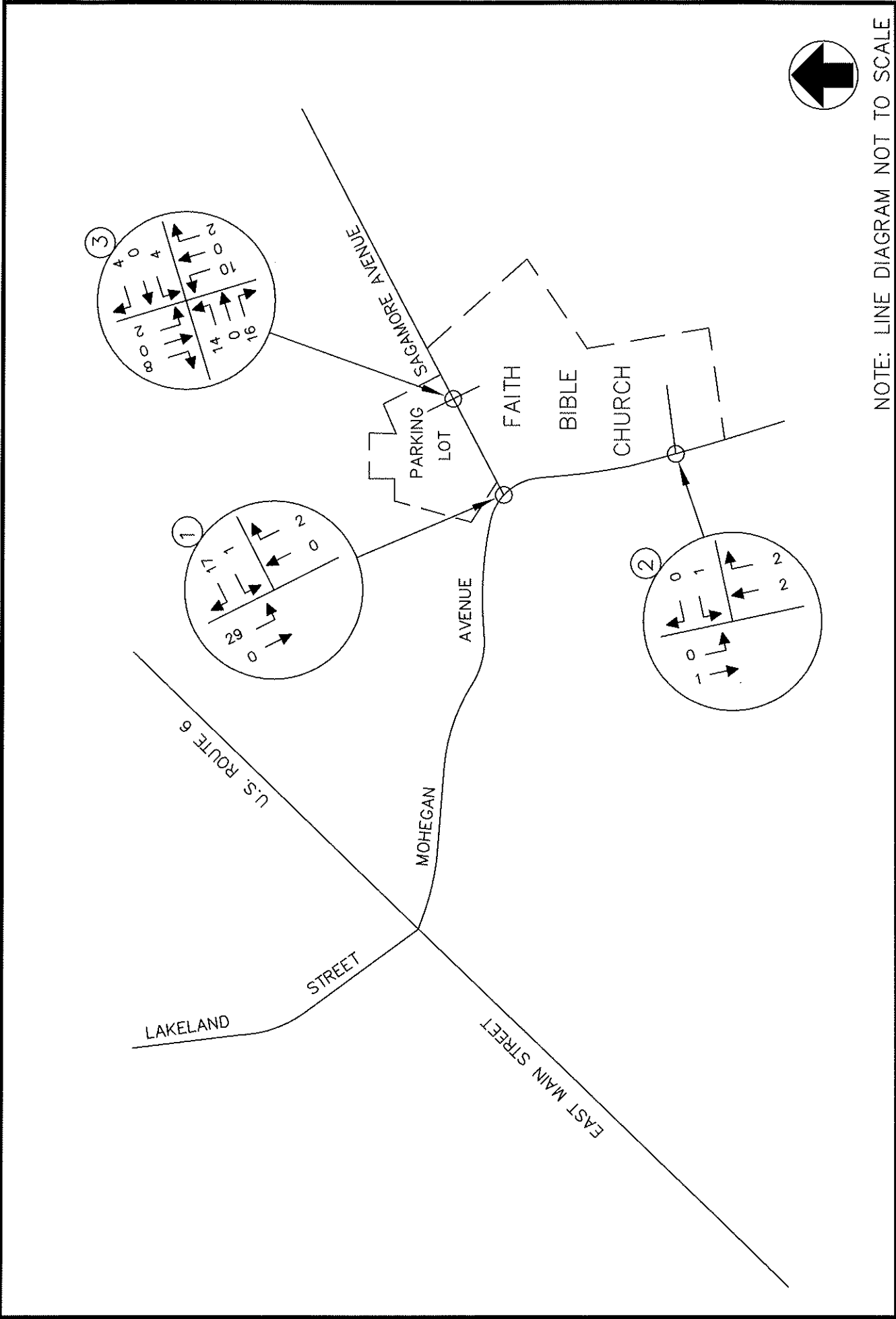
NOTE: LINE DIAGRAM NOT TO SCALE

FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK

SITE GENERATED TRAFFIC VOLUMES
 WEEKDAY PEAK PM HIGHWAY HOUR

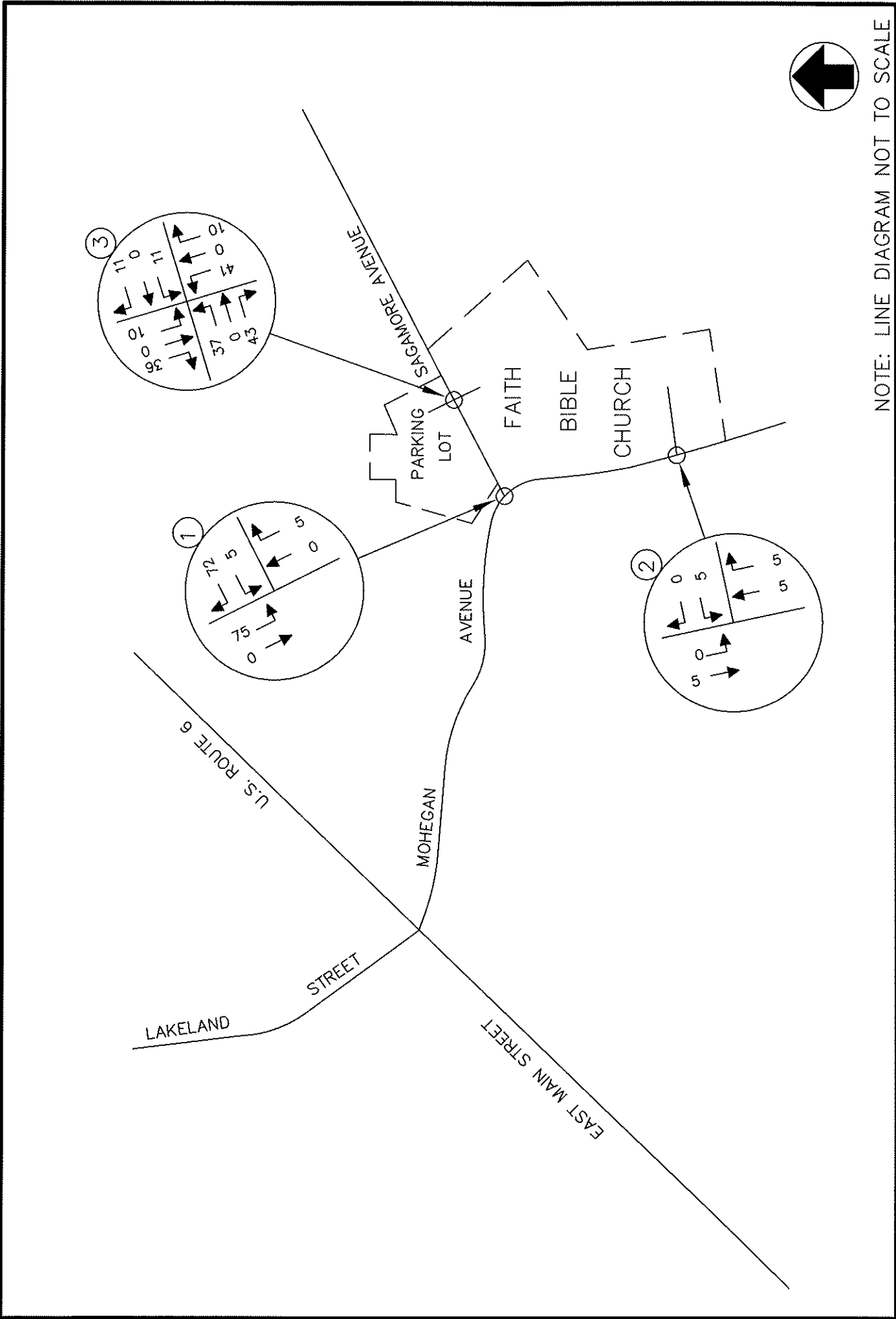
PROJECT NO. 1897 DATE: JUNE 2012 FIG. NO. 10



NOTE: LINE DIAGRAM NOT TO SCALE

FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK
 JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK

NOTE: LINE DIAGRAM NOT TO SCALE
 SITE GENERATED TRAFFIC VOLUMES
 WEEKDAY PEAK PM CHURCH HOUR
 PROJECT NO. 1897 DATE: JUNE 2012 FIG. NO. 11



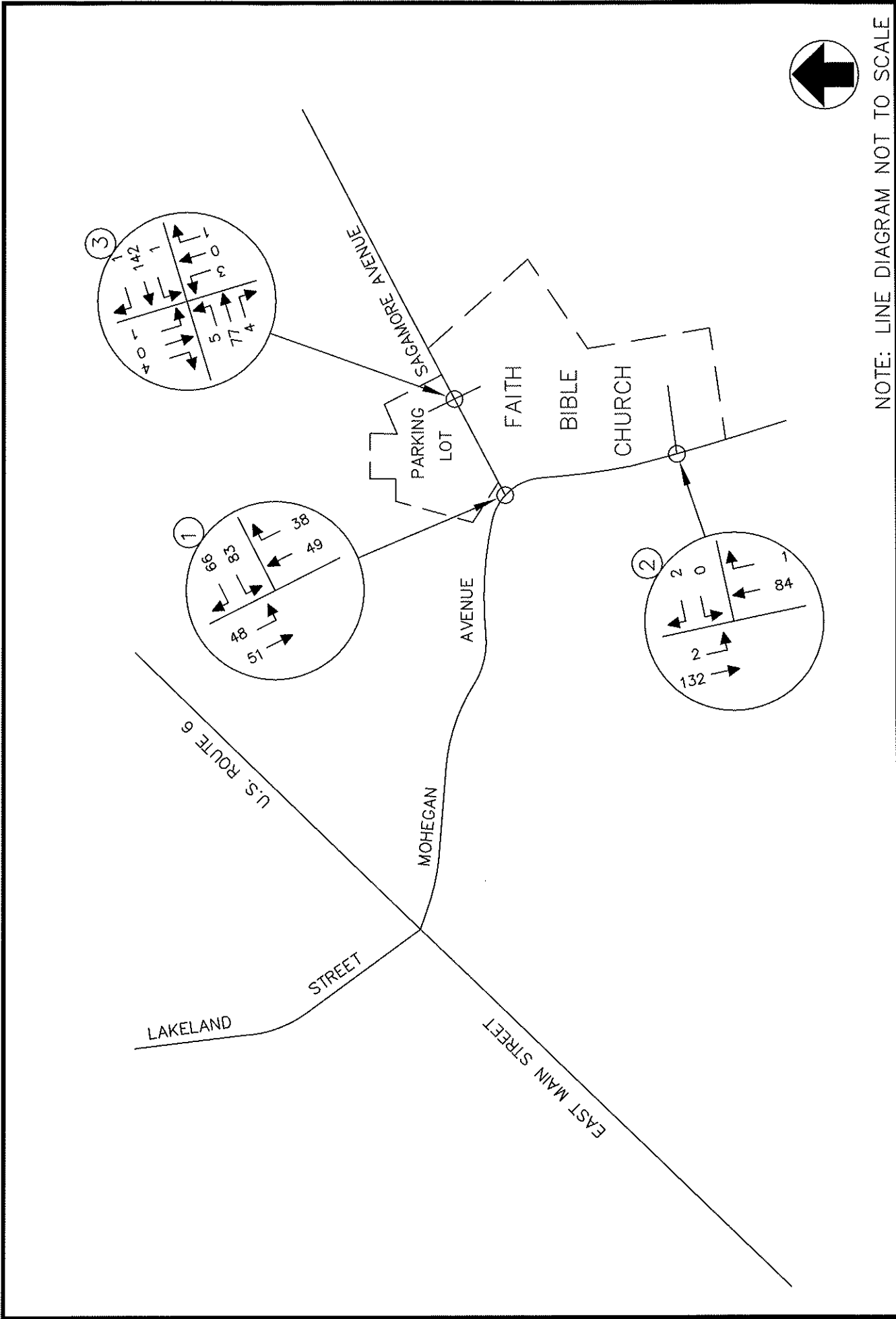
FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK

NOTE: LINE DIAGRAM NOT TO SCALE

SITE GENERATED TRAFFIC VOLUMES
 WEEKEND PEAK SUNDAY HOUR

PROJECT NO. 1897 DATE: JUNE 2012 FIG. NO. 12

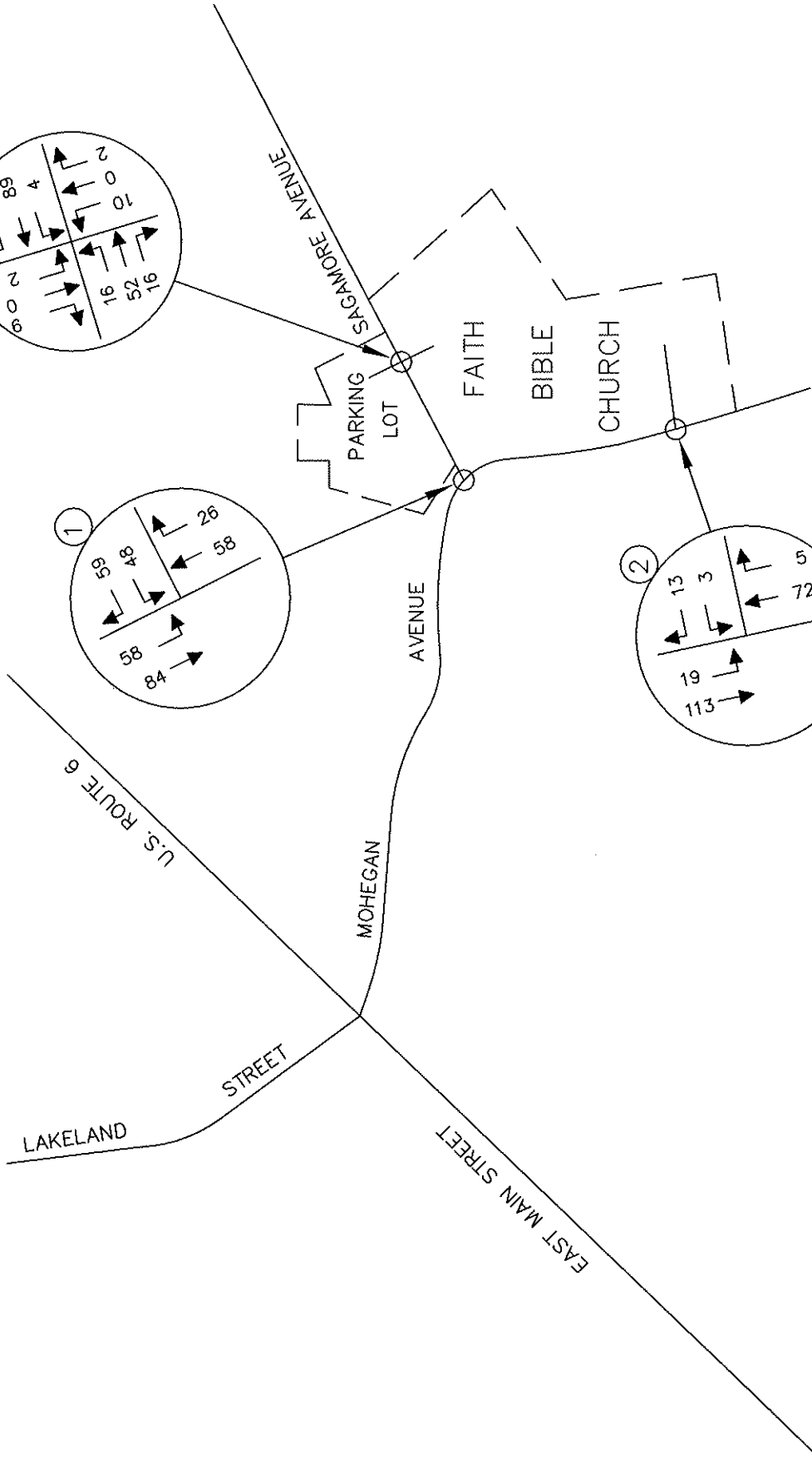
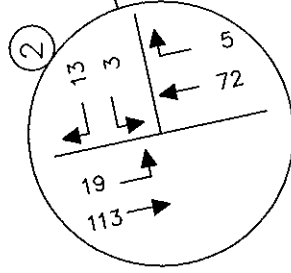
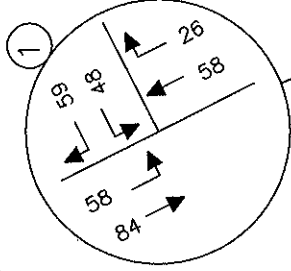
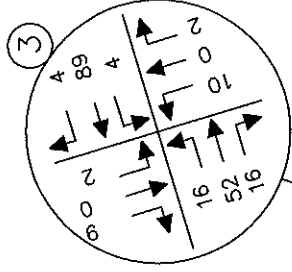
JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK



NOTE: LINE DIAGRAM NOT TO SCALE

FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK
 2015 BUILD TRAFFIC VOLUMES
 WEEKDAY PEAK PM HIGHWAY HOUR

JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK

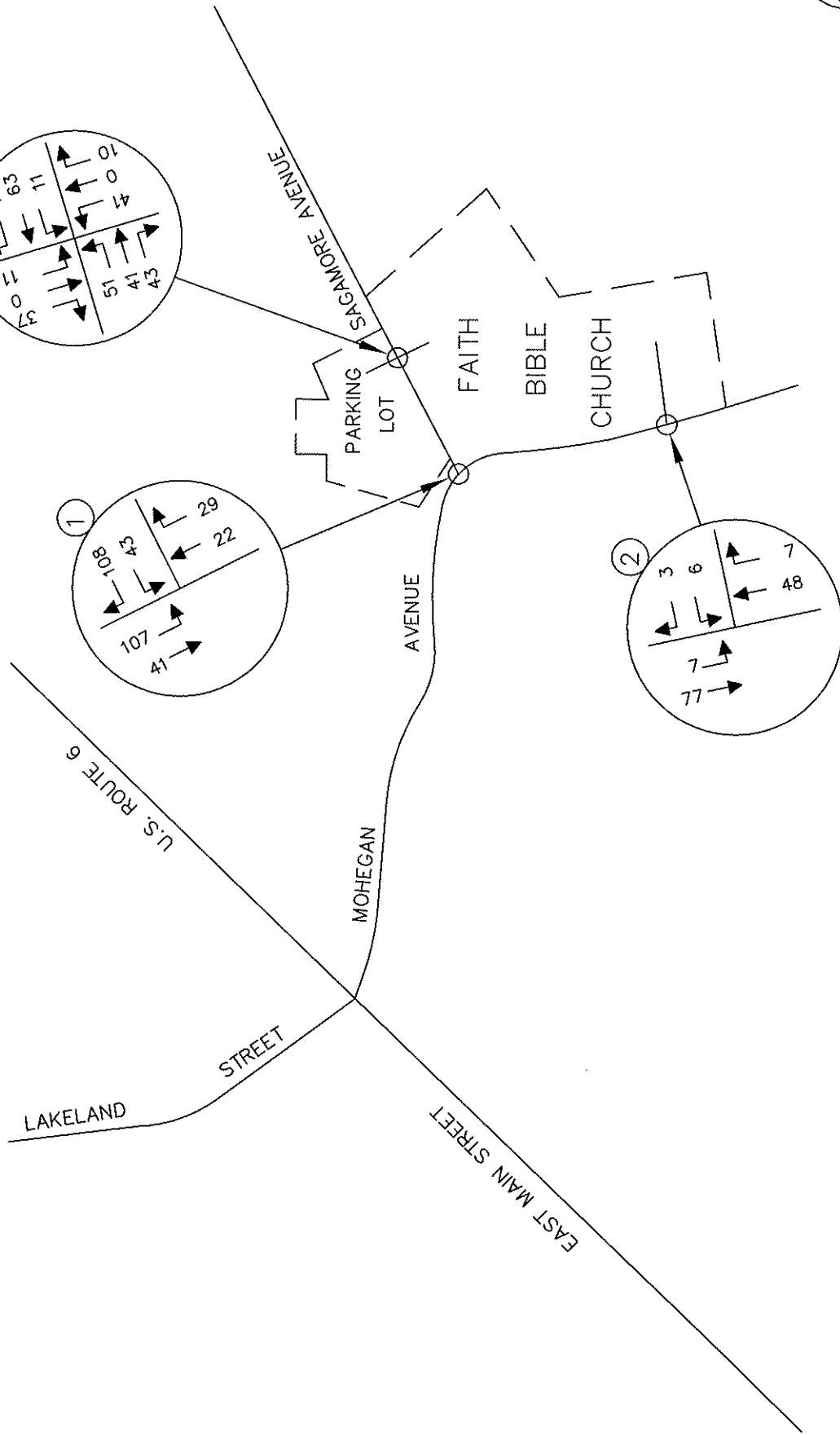


NOTE: LINE DIAGRAM NOT TO SCALE

2015 BUILD TRAFFIC VOLUMES
WEEKDAY PEAK PM CHURCH HOUR

FAITH BIBLE CHURCH
YORKTOWN, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE, NEW YORK



NOTE: LINE DIAGRAM NOT TO SCALE

FAITH BIBLE CHURCH
 YORKTOWN, NEW YORK

2015 BUILD TRAFFIC VOLUMES
 WEEKEND PEAK SUNDAY HOUR

JOHN COLLINS ENGINEERS, P.C.
 HAWTHORNE, NEW YORK

PROJECT NO. 1897 DATE: JUNE 2012 FIG. NO. 15

APPENDIX "B"

TABLES

TABLE NO. 1

**HOURLY TRIP GENERATION RATES (HTGR) AND ANTICIPATED
SITE GENERATED TRAFFIC VOLUMES**

FAITH BIBLE CHURCH YORKTOWN, NY	ENTRY		EXIT	
	HTGR*	VOLUME	HTGR*	VOLUME
CHURCH (344 SEATS)				
PEAK PM HOUR	0.03	10	0.02	8
PEAK PM CHURCH HOUR	0.12	41	0.07	24
PEAK SUNDAY HOUR	0.31	107	0.30	103

NOTES:

- 1) * THE HOURLY TRIP GENERATION RATES (HTGR) ARE BASED ON DATA PUBLISHED BY THE INSTITUTE OF TRANSPORTATION ENGINEERS (ITE) AS CONTAINED IN THE TRIP GENERATION HANDBOOK, 8TH EDITION, 2008. ITE LAND USE CODE - 560 - CHURCH.

TABLE NO. 1A

**HOURLY TRIP GENERATION RATES (HTGR) AND ANTICIPATED
SITE GENERATED TRAFFIC VOLUMES**

FAITH BIBLE CHURCH YORKTOWN, NY	ENTRY		EXIT	
	HTGR*	VOLUME	HTGR*	VOLUME
CHURCH (252 SEATS)				
PEAK PM HOUR	0.03	7	0.02	6
PEAK PM CHURCH HOUR	0.16	41	0.10	24
PEAK SUNDAY HOUR	0.31	79	0.30	75

NOTES:

- 1) * THE HOURLY TRIP GENERATION RATES (HTGR) ARE BASED ON DATA PUBLISHED BY THE INSTITUTE OF TRANSPORTATION ENGINEERS (ITE) AS CONTAINED IN THE TRIP GENERATION HANDBOOK, 8TH EDITION, 2008. ITE LAND USE CODE - 560 - CHURCH.

TABLE NO. 2
LEVEL OF SERVICE SUMMARY TABLE

		2012 EXISTING			2015 NO-BUILD			2015 BUILD		
		PM	PM CHURCH	SUNDAY	PM	PM CHURCH	SUNDAY	PM	PM CHURCH	SUNDAY
1	MOHEGAN AVENUE & SAGAMORE AVENUE	B[10.0] A[7.5]	A[9.6] A[7.4]	A[9.2] A[7.4]	B[10.2] A[7.5]	A[9.7] A[7.4]	A[9.2] A[7.4]	B[10.3] A[7.5]	B[10.0] A[7.5]	A[10.0] A[7.5]
2	MOHEGAN AVENUE & CHURCH DRIVEWAY	A[8.7] A[7.4]	A[8.9] A[7.4]	A[8.7] A[7.3]	A[8.7] A[7.4]	A[8.9] A[7.4]	A[8.7] A[7.3]	A[8.7] A[7.4]	A[9.0] A[7.4]	A[9.1] A[7.3]
3	SAGAMORE AVENUE & CHURCH PARKING LOT	A[7.5] - - A[9.0]	A[7.4] - - A[8.7]	A[7.4] - - A[8.9]	A[7.5] - - A[9.1]	A[7.4] - - A[8.8]	A[7.4] - - A[9.0]	A[7.5] A[7.4] A[9.9] A[9.3]	A[7.4] A[7.4] A[9.8] A[9.0]	A[7.5] A[7.4] B[11.1] A[9.4]

NOTES:
THE ABOVE REPRESENTS THE LEVEL OF SERVICE AND VEHICLE DELAY IN SECONDS, C [16.2], FOR EACH KEY APPROACH AS WELL AS FOR THE OVERALL INTERSECTION FOR THE SIGNALIZED INTERSECTION.

APPENDIX "C"

CAPACITY ANALYSIS

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2012 EXISTING TRAFFIC VOLUMES
 Project ID: 1897PMEX1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

		Vehicle Volumes and Adjustments							
Major Street:	Approach Movement	Northbound				Southbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume			46	35	39	48			
Peak-Hour Factor, PHF			0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR			51	39	43	53			
Percent Heavy Vehicles			--	--	2	--	--		
Median Type/Storage		Undivided				/			
RT Channelized?									
Lanes			1	0		0	1		
Configuration				TR		LT			
Upstream Signal?			No			No			

Minor Street:	Approach Movement	Westbound				Eastbound			
		7 L	8 T	9 R	10 L	11 T	12 R		
Volume		78		57					
Peak Hour Factor, PHF		0.89		0.89					
Hourly Flow Rate, HFR		87		64					
Percent Heavy Vehicles		2		2					
Percent Grade (%)			-4			0			
Flared Approach: Exists?/Storage				No	/		/		
Lanes		0		0					
Configuration			LR						

		Delay, Queue Length, and Level of Service							
Approach Movement	Lane Config	NB	SB	Westbound				Eastbound	
		1	4 LT	7	8 LR	9	10	11	12
v (vph)			43		151				
C(m) (vph)			1505		869				
v/c			0.03		0.17				
95% queue length			0.09		0.63				
Control Delay			7.5		10.0+				
LOS			A		B				
Approach Delay					10.0+				
Approach LOS					B				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2012 EXISTING TRAFFIC VOLUMES
 Project ID: 1897PMCHEX1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound	
		1 L	2 T	3 R	4 L	5 T	6 R

Volume		55	23		28	79
Peak-Hour Factor, PHF		0.89	0.89		0.89	0.89
Hourly Flow Rate, HFR		61	25		31	88
Percent Heavy Vehicles		--	--		2	--
Median Type/Storage		Undivided			/	
RT Channelized?						
Lanes		1	0		0	1
Configuration			TR			LT
Upstream Signal?		No				No

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R

Volume		44		40		
Peak Hour Factor, PHF		0.89		0.89		
Hourly Flow Rate, HFR		49		44		
Percent Heavy Vehicles		2		2		
Percent Grade (%)			-4			0
Flared Approach: Exists?/Storage				No	/	/
Lanes		0		0		
Configuration			LR			

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
			7	8	9	10	11	12

Lane Config		LT		LR		
v (vph)		31		93		
C(m) (vph)		1510		874		
v/c		0.02		0.11		
95% queue length		0.06		0.36		
Control Delay		7.4		9.6		
LOS		A		A		
Approach Delay				9.6		
Approach LOS				A		

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2012 EXISTING TRAFFIC VOLUMES
 Project ID: 1897SUNEX1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

		Vehicle Volumes and Adjustments							
Major Street:	Approach Movement	Northbound				Southbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume			21	22	30	39			
Peak-Hour Factor, PHF			0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR			23	24	33	43			
Percent Heavy Vehicles			--	--	2	--	--		
Median Type/Storage		Undivided				/			
RT Channelized?									
Lanes			1	0		0	1		
Configuration				TR		LT			
Upstream Signal?			No			No			

Minor Street:	Approach Movement	Westbound				Eastbound			
		7 L	8 T	9 R	10 L	11 T	12 R		
Volume		36		34					
Peak Hour Factor, PHF		0.89		0.89					
Hourly Flow Rate, HFR		40		38					
Percent Heavy Vehicles		2		2					
Percent Grade (%)			-4			0			
Flared Approach: Exists?/Storage				No	/			/	
Lanes		0		0					
Configuration			LR						

		Delay, Queue Length, and Level of Service							
Approach Movement	Lane Config	NB	SB	Westbound				Eastbound	
		1	4 LT	7	8 LR	9	10	11	12
v (vph)			33		78				
C(m) (vph)			1560		938				
v/c			0.02		0.08				
95% queue length			0.06		0.27				
Control Delay			7.4		9.2				
LOS			A		A				
Approach Delay					9.2				
Approach LOS					A				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897PMNB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Major Street:	Approach Movement	Vehicle Volumes and Adjustments							
		Northbound				Southbound			
		1	2	3	4	5	6		
		L	T	R	L	T	R		
Volume			49	37	41	51			
Peak-Hour Factor, PHF			0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR			55	41	46	57			
Percent Heavy Vehicles			--	--	2	--	--		
Median Type/Storage		Undivided				/			
RT Channelized?									
Lanes			1	0		0	1		
Configuration				TR		LT			
Upstream Signal?			No			No			

Minor Street:	Approach Movement	Vehicle Volumes and Adjustments							
		Westbound				Eastbound			
		7	8	9	10	11	12		
		L	T	R	L	T	R		
Volume		83		60					
Peak Hour Factor, PHF		0.89		0.89					
Hourly Flow Rate, HFR		93		67					
Percent Heavy Vehicles		2		2					
Percent Grade (%)			-4			0			
Flared Approach: Exists?/Storage				No	/			/	
Lanes		0		0					
Configuration			LR						

Approach Movement	Delay, Queue Length, and Level of Service							
	NB	SB	Westbound				Eastbound	
	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		46		160				
C(m) (vph)		1498		855				
v/c		0.03		0.19				
95% queue length		0.09		0.69				
Control Delay		7.5		10.2				
LOS		A		B				
Approach Delay				10.2				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897PMCHNB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		58	24		30	84		
Peak-Hour Factor, PHF		0.89	0.89		0.89	0.89		
Hourly Flow Rate, HFR		65	26		33	94		
Percent Heavy Vehicles		--	--		2	--	--	
Median Type/Storage		Undivided			/			
RT Channelized?								
Lanes		1	0			0	1	
Configuration			TR			LT		
Upstream Signal?			No			No		

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		47		42			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		52		47			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			-4			0	
Flared Approach: Exists?/Storage				No	/		/
Lanes		0		0			
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound				Eastbound		
			4	7	8	9	10	11	12
Lane Config	1	LT			LR				
v (vph)		33			99				
C(m) (vph)		1504			864				
v/c		0.02			0.11				
95% queue length		0.07			0.39				
Control Delay		7.4			9.7				
LOS		A			A				
Approach Delay					9.7				
Approach LOS					A				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897SUNNB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	

Volume		22	23	32	41		
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89		
Hourly Flow Rate, HFR		24	25	35	46		
Percent Heavy Vehicles		--	--	2	--	--	
Median Type/Storage		Undivided		/			
RT Channelized?							
Lanes		1	0		0	1	
Configuration			TR		LT		
Upstream Signal?		No			No		

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R

Volume		38	36				
Peak Hour Factor, PHF		0.89	0.89				
Hourly Flow Rate, HFR		42	40				
Percent Heavy Vehicles		2	2				
Percent Grade (%)			-4		0		
Flared Approach: Exists?/Storage			No	/		/	
Lanes		0	0				
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB 1	SB 4	Westbound			Eastbound		
			7	8	9	10	11	12

Lane Config		LT		LR			
v (vph)		35		82			
C(m) (vph)		1558		933			
v/c		0.02		0.09			
95% queue length		0.07		0.29			
Control Delay		7.4		9.2			
LOS		A		A			
Approach Delay				9.2			
Approach LOS				A			

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	

Volume		49	38		48		
Peak-Hour Factor, PHF		0.89	0.89		0.89	0.89	
Hourly Flow Rate, HFR		55	42		53	57	
Percent Heavy Vehicles		--	--		2	--	--
Median Type/Storage		Undivided			/		
RT Channelized?							
Lanes		1	0		0	1	
Configuration			TR			LT	
Upstream Signal?		No				No	

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R

Volume		83		66			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		93		74			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			-4			0	
Flared Approach: Exists?/Storage				No	/		/
Lanes		0		0			
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB 1	SB 4	Westbound			Eastbound		
			7	8	9	10	11	12

Lane Config		LT		LR			
v (vph)		53		167			
C(m) (vph)		1496		850			
v/c		0.04		0.20			
95% queue length		0.11		0.73			
Control Delay		7.5		10.3			
LOS		A		B			
Approach Delay				10.3			
Approach LOS				B			

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMCHB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume		58	26	58	84				
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89				
Hourly Flow Rate, HFR		65	29	65	94				
Percent Heavy Vehicles		--	--	2	--	--			
Median Type/Storage		Undivided		/					
RT Channelized?									
Lanes		1	0		0	1			
Configuration			TR		LT				
Upstream Signal?		No			No				

Minor Street:	Approach Movement	Westbound				Eastbound			
		7 L	8 T	9 R	10 L	11 T	12 R		
Volume		48	59						
Peak Hour Factor, PHF		0.89	0.89						
Hourly Flow Rate, HFR		53	66						
Percent Heavy Vehicles		2	2						
Percent Grade (%)			-4			0			
Flared Approach: Exists?/Storage			No	/		/			
Lanes		0	0						
Configuration			LR						

Delay, Queue Length, and Level of Service

Approach Movement	NB 1	SB 4	Westbound			Eastbound		
			7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		65		119				
C(m) (vph)		1500		838				
v/c		0.04		0.14				
95% queue length		0.14		0.49				
Control Delay		7.5		10.0+				
LOS		A		B				
Approach Delay				10.0+				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVEN
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897SUNB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		22	29	107	41			
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR		24	32	120	46			
Percent Heavy Vehicles		--	--	2	--	--		
Median Type/Storage		Undivided		/				
RT Channelized?								
Lanes		1	0		0	1		
Configuration			TR		LT			
Upstream Signal?		No				No		

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		43		108			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		48		121			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			-4			0	
Flared Approach: Exists?/Storage				No	/		/
Lanes		0		0			
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound						Eastbound	
			1	4	7	8	9	10	11	12
Movement			LT			LR				
Lane Config										
v (vph)		120				169				
C(m) (vph)		1549				893				
v/c		0.08				0.19				
95% queue length		0.25				0.69				
Control Delay		7.5				10.0-				
LOS		A				A				
Approach Delay						10.0-				
Approach LOS						A				

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2012 EXISTING TRAFFIC VOLUMES
 Project ID: 1897PMEX2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		79	0	2	124			
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR		88	0	2	139			
Percent Heavy Vehicles		--	--	2	--	--		
Median Type/Storage		Undivided			/			
RT Channelized?								
Lanes		1	0		0	1		
Configuration			TR		LT			
Upstream Signal?		No			No			

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		0		2			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		0		2			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			0			0	
Flared Approach: Exists?/Storage				No	/		/
Lanes		0		0			
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound			
			7	8	9	10	11	12	
Movement	1	4		7	8		10	11	12
Lane Config		LT		LR					
v (vph)		2		2					
C(m) (vph)		1508		970					
v/c		0.00		0.00					
95% queue length		0.00		0.01					
Control Delay		7.4		8.7					
LOS		A		A					
Approach Delay				8.7					
Approach LOS				A					

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2012 EXISTING TRAFFIC VOLUMES
 Project ID: 1897PMCHEX2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume			66	3	18	105		
Peak-Hour Factor, PHF			0.89	0.89	0.89	0.89		
Hourly Flow Rate, HFR			74	3	20	117		
Percent Heavy Vehicles			--	--	2	--	--	
Median Type/Storage		Undivided		/				
RT Channelized?								
Lanes			1	0	0	1		
Configuration				TR		LT		
Upstream Signal?			No			No		

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		2		12			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		2		13			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			0			0	
Flared Approach: Exists?/Storage				No	/	/	
Lanes		0		0			
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		20		15				
C(m) (vph)		1522		944				
v/c		0.01		0.02				
95% queue length		0.04		0.05				
Control Delay		7.4		8.9				
LOS		A		A				
Approach Delay				8.9				
Approach LOS				A				

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2012 EXISTING TRAFFIC VOLUMES
 Project ID: 1897SUNEX2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Major Street:	Approach Movement	Vehicle Volumes and Adjustments					
		Northbound			Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R
Volume		40	2	7	68		
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89		
Hourly Flow Rate, HFR		44	2	7	76		
Percent Heavy Vehicles		--	--	2	--	--	
Median Type/Storage		Undivided			/		
RT Channelized?							
Lanes		1	0		0	1	
Configuration			TR		LT		
Upstream Signal?		No				No	

Minor Street:	Approach Movement	Vehicle Volumes and Adjustments					
		Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		1		3			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		1		3			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			0			0	
Flared Approach: Exists?/Storage				No	/		/
Lanes		0		0			
Configuration			LR				

Approach Movement	Delay, Queue Length, and Level of Service							
	NB	SB	Westbound			Eastbound		
	1	4 LT	7	8 LR	9	10 	11	12
v (vph)		7		4				
C(m) (vph)		1562		976				
v/c		0.00		0.00				
95% queue length		0.01		0.01				
Control Delay		7.3		8.7				
LOS		A		A				
Approach Delay				8.7				
Approach LOS				A				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897PMNB2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		84	0	2	131			
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR		94	0	2	147			
Percent Heavy Vehicles		--	--	2	--	--		
Median Type/Storage		Undivided			/			
RT Channelized?								
Lanes		1	0		0	1		
Configuration			TR		LT			
Upstream Signal?		No			No			

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		0	2				
Peak Hour Factor, PHF		0.89	0.89				
Hourly Flow Rate, HFR		0	2				
Percent Heavy Vehicles		2	2				
Percent Grade (%)		0			0		
Flared Approach: Exists?/Storage		No	/		/		
Lanes		0	0				
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB 1	SB 4	Westbound			Eastbound		
			7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		2				
C(m) (vph)		1500		963				
v/c		0.00		0.00				
95% queue length		0.00		0.01				
Control Delay		7.4		8.7				
LOS		A		A				
Approach Delay				8.7				
Approach LOS				A				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897PMCHNB2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	

Volume		70	3	19	111		
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89		
Hourly Flow Rate, HFR		78	3	21	124		
Percent Heavy Vehicles		--	--	2	--	--	
Median Type/Storage		Undivided		/			
RT Channelized?							
Lanes		1	0		0	1	
Configuration			TR		LT		
Upstream Signal?		No			No		

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R

Volume		2	13			
Peak Hour Factor, PHF		0.89	0.89			
Hourly Flow Rate, HFR		2	14			
Percent Heavy Vehicles		2	2			
Percent Grade (%)		0		0		
Flared Approach: Exists?/Storage		No	/	No	/	
Lanes		0	0			
Configuration			LR			

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
			4	7	8	9	10	11

Lane Config		LT		LR			
v (vph)		21		16			
C(m) (vph)		1517		940			
v/c		0.01		0.02			
95% queue length		0.04		0.05			
Control Delay		7.4		8.9			
LOS		A		A			
Approach Delay				8.9			
Approach LOS				A			

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897SUNNB2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		42	2	7	72			
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR		47	2	7	80			
Percent Heavy Vehicles		--	--	2	--	--		
Median Type/Storage		Undivided		/				
RT Channelized?								
Lanes		1	0		0	1		
Configuration			TR		LT			
Upstream Signal?		No			No			

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		1	3				
Peak Hour Factor, PHF		0.89	0.89				
Hourly Flow Rate, HFR		1	3				
Percent Heavy Vehicles		2	2				
Percent Grade (%)		0		0			
Flared Approach: Exists?/Storage		No	/	/			
Lanes		0	0				
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB 1	SB 4	Westbound			Eastbound		
			7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		7		4				
C(m) (vph)		1558		971				
v/c		0.00		0.00				
95% queue length		0.01		0.01				
Control Delay		7.3		8.7				
LOS		A		A				
Approach Delay				8.7				
Approach LOS				A				

HCS+: Unsignalized Intersections Release 5.6

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMB2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume			84	1	2	132		
Peak-Hour Factor, PHF			0.89	0.89	0.89	0.89		
Hourly Flow Rate, HFR			94	1	2	148		
Percent Heavy Vehicles			--	--	2	--	--	
Median Type/Storage		Undivided				/		
RT Channelized?								
Lanes			1	0		0	1	
Configuration				TR		LT		
Upstream Signal?			No			No		

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		0		2			
Peak Hour Factor, PHF		0.89		0.89			
Hourly Flow Rate, HFR		0		2			
Percent Heavy Vehicles		2		2			
Percent Grade (%)			0			0	
Flared Approach: Exists?/Storage				No	/		/
Lanes		0		0			
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound		
	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		2				
C(m) (vph)		1499		963				
v/c		0.00		0.00				
95% queue length		0.00		0.01				
Control Delay		7.4		8.7				
LOS		A		A				
Approach Delay				8.7				
Approach LOS				A				

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMCHB2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		72	5	19	113			
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89			
Hourly Flow Rate, HFR		80	5	21	126			
Percent Heavy Vehicles		--	--	2	--	--		
Median Type/Storage		Undivided		/				
RT Channelized?								
Lanes		1	0		0	1		
Configuration			TR		LT			
Upstream Signal?		No			No			

Minor Street:	Approach Movement	Westbound			Eastbound		
		7 L	8 T	9 R	10 L	11 T	12 R
Volume		3	13				
Peak Hour Factor, PHF		0.89	0.89				
Hourly Flow Rate, HFR		3	14				
Percent Heavy Vehicles		2	2				
Percent Grade (%)		0		0			
Flared Approach: Exists?/Storage			No	/		/	
Lanes		0	0				
Configuration			LR				

Delay, Queue Length, and Level of Service

Approach Movement	NB	SB	Westbound			Eastbound				
			7	8	9	10	11	12		
Lane Config	1	4 LT		7 LR	8		9 	10	11	12
v (vph)		21		17						
C(m) (vph)		1512		922						
v/c		0.01		0.02						
95% queue length		0.04		0.06						
Control Delay		7.4		9.0						
LOS		A		A						
Approach Delay				9.0						
Approach LOS				A						

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & CHURCH
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897SUNB2
 East/West Street: CHURCH DRIVEWAY
 North/South Street: MOHEGAN AVENUE
 Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Northbound				Southbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume		48	7	7	77				
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89				
Hourly Flow Rate, HFR		53	7	7	86				
Percent Heavy Vehicles		--	--	2	--	--			
Median Type/Storage		Undivided		/					
RT Channelized?									
Lanes		1	0		0	1			
Configuration			TR		LT				
Upstream Signal?		No			No				

Minor Street:	Approach Movement	Westbound				Eastbound			
		7 L	8 T	9 R	10 L	11 T	12 R		
Volume		6		3					
Peak Hour Factor, PHF		0.89		0.89					
Hourly Flow Rate, HFR		6		3					
Percent Heavy Vehicles		2		2					
Percent Grade (%)			0			0			
Flared Approach: Exists?/Storage				No	/			/	
Lanes		0		0					
Configuration			LR						

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound				Eastbound			
			1	4 7	8	9 10	11	12		
Movement			LT		LR					
Lane Config										
v (vph)		7			9					
C(m) (vph)		1544			883					
v/c		0.00			0.01					
95% queue length		0.01			0.03					
Control Delay		7.3			9.1					
LOS		A			A					
Approach Delay					9.1					
Approach LOS					A					

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: SAGAMORE AVENUE & CHURCH PARKI
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 NO-BUILD TRAFFIC VOLUMES
 Project ID: 1897PMNB3
 East/West Street: CHURCH PARKING LOT
 North/South Street: SAGAMORE AVENUE
 Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Eastbound				Westbound			
		1 L	2 T	3 R	4 L	5 T	6 R		
Volume		1	77			142	0		
Peak-Hour Factor, PHF		0.89	0.89			0.89	0.89		
Hourly Flow Rate, HFR		1	86			159	0		
Percent Heavy Vehicles		2	--	--		--	--		
Median Type/Storage		Undivided				/			
RT Channelized?									
Lanes		0	1			1	0		
Configuration		LT				TR			
Upstream Signal?		No				No			

Minor Street:	Approach Movement	Northbound				Southbound			
		7 L	8 T	9 R	10 L	11 T	12 R		
Volume					0		1		
Peak Hour Factor, PHF					0.89		0.89		
Hourly Flow Rate, HFR					0		1		
Percent Heavy Vehicles					2		2		
Percent Grade (%)		0				0			
Flared Approach: Exists?/Storage					/		No /		
Lanes					0		0		
Configuration						LR			

Delay, Queue Length, and Level of Service

Approach Movement	EB	WB	Northbound				Southbound			
			1	4	7	8	9	10	11	12
Lane Config	LT									LR
v (vph)	1							1		
C(m) (vph)	1420							886		
v/c	0.00							0.00		
95% queue length	0.00							0.00		
Control Delay	7.5							9.1		
LOS	A							A		
Approach Delay								9.1		
Approach LOS								A		

HCS+: Unsignalized Intersections Release 5.5

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HIGHWAY HOUR
 Intersection: SAGAMORE AVENUE & CHURCH PARKI
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMB3
 East/West Street: CHURCH PARKING LOT
 North/South Street: SAGAMORE AVENUE
 Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Eastbound				Westbound		
		1 L	2 T	3 R		4 L	5 T	6 R
Volume		5	77	4		1	142	1
Peak-Hour Factor, PHF		0.89	0.89	0.89		0.89	0.89	0.89
Hourly Flow Rate, HFR		5	86	4		1	159	1
Percent Heavy Vehicles		2	--	--		2	--	--
Median Type/Storage		Undivided			/			
RT Channelized?					/			
Lanes		0	1	0		0	1	0
Configuration		LTR				LTR		
Upstream Signal?		No				No		

Minor Street:	Approach Movement	Northbound				Southbound		
		7 L	8 T	9 R		10 L	11 T	12 R
Volume		3	0	1		1	0	4
Peak Hour Factor, PHF		0.89	0.89	0.89		0.89	0.89	0.89
Hourly Flow Rate, HFR		3	0	1		1	0	4
Percent Heavy Vehicles		2	2	2		2	2	2
Percent Grade (%)		0				0		
Flared Approach: Exists?/Storage		No			/	No		
Lanes		0	1	0		0	1	0
Configuration		LTR				LTR		

Delay, Queue Length, and Level of Service

Approach Movement	EB 1	WB 4	Northbound				Southbound		
			7	8	9		10	11	12
Lane Config	LTR	LTR		LTR		LTR		LTR	
v (vph)	5	1		4		5			
C(m) (vph)	1419	1505		740		838			
v/c	0.00	0.00		0.01		0.01			
95% queue length	0.01	0.00		0.02		0.02			
Control Delay	7.5	7.4		9.9		9.3			
LOS	A	A		A		A			
Approach Delay				9.9		9.3			
Approach LOS				A		A			

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM CHURCH HOUR
 Intersection: SAGAMORE AVENUE & CHURCH PARKI
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMCHB3
 East/West Street: CHURCH PARKING LOT
 North/South Street: SAGAMORE AVENUE
 Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Eastbound				Westbound		
		1 L	2 T	3 R	4 L	5 T	6 R	
Volume		16	52	16	4	89	4	
Peak-Hour Factor, PHF		0.89	0.89	0.89	0.89	0.89	0.89	
Hourly Flow Rate, HFR		17	58	17	4	100	4	
Percent Heavy Vehicles		2	--	--	2	--	--	
Median Type/Storage		Undivided				/		
RT Channelized?								
Lanes		0	1	0		0	1	0
Configuration		LTR				LTR		
Upstream Signal?		No				No		

Minor Street:	Approach Movement	Northbound			Southbound				
		7 L	8 T	9 R	10 L	11 T	12 R		
Volume		10	0	2	2	0	9		
Peak Hour Factor, PHF		0.89	0.89	0.89	0.89	0.89	0.89		
Hourly Flow Rate, HFR		11	0	2	2	0	10		
Percent Heavy Vehicles		2	2	2	2	2	2		
Percent Grade (%)		0			0				
Flared Approach: Exists?/Storage		No			/			No	/
Lanes		0	1	0		0	1	0	
Configuration		LTR				LTR			

Delay, Queue Length, and Level of Service

Approach Movement	EB 1	WB 4	Northbound			Southbound		
			7	8	9	10	11	12
Lane Config	LTR	LTR		LTR		LTR		LTR
v (vph)	17	4		13				12
C(m) (vph)	1488	1524		758				908
v/c	0.01	0.00		0.02				0.01
95% queue length	0.03	0.01		0.05				0.04
Control Delay	7.4	7.4		9.8				9.0
LOS	A	A		A				A
Approach Delay				9.8				9.0
Approach LOS				A				A

TWO-WAY STOP CONTROL SUMMARY

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: SAGAMORE AVENUE & CHURCH PARKI
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897SUNB3
 East/West Street: CHURCH PARKING LOT
 North/South Street: SAGAMORE AVENUE
 Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street:	Approach Movement	Eastbound				Westbound		
		1 L	2 T	3 R		4 L	5 T	6 R
Volume		51	41	43		11	63	15
Peak-Hour Factor, PHF		0.89	0.89	0.89		0.89	0.89	0.89
Hourly Flow Rate, HFR		57	46	48		12	70	16
Percent Heavy Vehicles		2	--	--		2	--	--
Median Type/Storage		Undivided			/			
RT Channelized?					/			
Lanes		0	1	0		0	1	0
Configuration		LTR				LTR		
Upstream Signal?		No				No		

Minor Street:	Approach Movement	Northbound				Southbound		
		7 L	8 T	9 R		10 L	11 T	12 R
Volume		41	0	10		11	0	37
Peak Hour Factor, PHF		0.89	0.89	0.89		0.89	0.89	0.89
Hourly Flow Rate, HFR		46	0	11		12	0	41
Percent Heavy Vehicles		2	2	2		2	2	2
Percent Grade (%)		0				0		
Flared Approach: Exists?/Storage		No			/	No		
Lanes		0	1	0		0	1	0
Configuration		LTR				LTR		

Delay, Queue Length, and Level of Service

Approach Movement	EB	WB	Northbound				Southbound			
			1	4	7		8	9	10	11
Lane Config	LTR	LTR				LTR				LTR
v (vph)	57	12				57				53
C(m) (vph)	1510	1500				646				872
v/c	0.04	0.01				0.09				0.06
95% queue length	0.12	0.02				0.29				0.19
Control Delay	7.5	7.4				11.1				9.4
LOS	A	A				B				A
Approach Delay						11.1				9.4
Approach LOS						B				A

HCS+: Unsignalized Intersections Release 5.6

Phone:
E-Mail:

Fax:

ALL-WAY STOP CONTROL (AWSC) ANALYSIS

Analyst: R.H.
Agency/Co.: JCE
Date Performed: JUNE 2012
Analysis Time Period: PEAK PM HOUR
Intersection: MOHEGAN AVENUE & SAGAMORE AVE.
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2015 BUILD TRAFFIC VOLUMES
Project ID: 1897PMB1
East/West Street: SAGAMORE AVENUE
North/South Street: MOHEGAN AVENUE

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	0	0	83	0	66	0	49	38	48	51	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			LR		TR		LT	
PHF			0.89		0.89		0.89	
Flow Rate			167		97		110	
% Heavy Veh			2		2		2	
No. Lanes				1		1		1
Opposing-Lanes				0		1		1
Conflicting-lanes				1		1		1
Geometry group				1		1		1
Duration, T	0.25	hrs.						

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane			167		97		110	
Left-Turn			93		0		53	
Right-Turn			74		42		0	
Prop. Left-Turns			0.6		0.0		0.5	
Prop. Right-Turns			0.4		0.4		0.0	
Prop. Heavy Vehicle			0.0		0.0		0.0	
Geometry Group				1		1		1
Adjustments Exhibit 17-33:								
hLT-adj				0.2		0.2		0.2

hRT-adj	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7
hadj, computed	-0.1	-0.2	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate			167		97		110	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial			0.15		0.09		0.10	
hd, final value			4.25		4.19		4.52	
x, final value			0.20		0.11		0.14	
Move-up time, m				2.0		2.0		2.0
Service Time			2.3		2.2		2.5	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate			167		97		110	
Service Time			2.3		2.2		2.5	
Utilization, x			0.20		0.11		0.14	
Dep. headway, hd			4.25		4.19		4.52	
Capacity			417		347		360	
Delay			8.29		7.72		8.24	
LOS			A		A		A	
Approach:								
Delay			8.29		7.72		8.24	
LOS			A		A		A	
Intersection Delay 8.13			Intersection LOS A					

HCS+: Unsignalized Intersections Release 5.6

Phone:
E-Mail:

Fax:

ALL-WAY STOP CONTROL (AWSC) ANALYSIS

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK PM HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVE.
 Jurisdiction: (CHURCH HOURS)
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897PMCHB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	0	0	48	0	59	0	58	26	58	84	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			LR		TR		LT	
PHF			0.89		0.89		0.89	
Flow Rate			119		94		159	
% Heavy Veh			2		2		2	
No. Lanes				1		1		1
Opposing-Lanes				0		1		1
Conflicting-lanes				1		1		1
Geometry group				1		1		1
Duration, T	0.25 hrs.							

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane			119		94		159	
Left-Turn			53		0		65	
Right-Turn			66		29		0	
Prop. Left-Turns			0.4		0.0		0.4	
Prop. Right-Turns			0.6		0.3		0.0	
Prop. Heavy Vehicle			0.0		0.0		0.0	
Geometry Group				1		1		1
Adjustments Exhibit 17-33:								
hLT-adj				0.2		0.2		0.2

hRT-adj	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7
hadj, computed	-0.2	-0.2	0.1

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate			119		94		159	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial			0.11		0.08		0.14	
hd, final value			4.26		4.20		4.39	
x, final value			0.14		0.11		0.19	
Move-up time, m				2.0		2.0		2.0
Service Time			2.3		2.2		2.4	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate			119		94		159	
Service Time			2.3		2.2		2.4	
Utilization, x			0.14		0.11		0.19	
Dep. headway, hd			4.26		4.20		4.39	
Capacity			369		344		409	
Delay			7.96		7.71		8.44	
LOS			A		A		A	
Approach:								
Delay			7.96		7.71		8.44	
LOS			A		A		A	
Intersection Delay 8.10			Intersection LOS A					

HCS+: Unsignalized Intersections Release 5.6

Phone:
E-Mail:

Fax:

ALL-WAY STOP CONTROL (AWSC) ANALYSIS

Analyst: R.H.
 Agency/Co.: JCE
 Date Performed: JUNE 2012
 Analysis Time Period: PEAK SUNDAY HOUR
 Intersection: MOHEGAN AVENUE & SAGAMORE AVE.
 Jurisdiction:
 Units: U. S. Customary
 Analysis Year: 2015 BUILD TRAFFIC VOLUMES
 Project ID: 1897SUNB1
 East/West Street: SAGAMORE AVENUE
 North/South Street: MOHEGAN AVENUE

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	0	0	0	43	0	108	0	22	29	107	41	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			LR		TR		LT	
PHF			0.89		0.89		0.89	
Flow Rate			169		56		166	
% Heavy Veh			2		2		2	
No. Lanes				1		1		1
Opposing-Lanes				0		1		1
Conflicting-lanes				1		1		1
Geometry group				1		1		1
Duration, T	0.25 hrs.							

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane			169		56		166	
Left-Turn			48		0		120	
Right-Turn			121		32		0	
Prop. Left-Turns			0.3		0.0		0.7	
Prop. Right-Turns			0.7		0.6		0.0	
Prop. Heavy Vehicle			0.0		0.0		0.0	
Geometry Group				1		1		1
Adjustments Exhibit 17-33:								
hLT-adj				0.2		0.2		0.2

hRT-adj	-0.6	-0.6	-0.6
hHV-adj	1.7	1.7	1.7
hadj, computed	-0.3	-0.3	0.2

Worksheet 4 - Departure Headway and Service Time

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate			169		56		166	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial			0.15		0.05		0.15	
hd, final value			4.08		4.15		4.51	
x, final value			0.19		0.06		0.21	
Move-up time, m				2.0		2.0		2.0
Service Time			2.1		2.2		2.5	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate			169		56		166	
Service Time			2.1		2.2		2.5	
Utilization, x			0.19		0.06		0.21	
Dep. headway, hd			4.08		4.15		4.51	
Capacity			419		306		416	
Delay			8.04		7.44		8.70	
LOS			A		A		A	
Approach:								
Delay			8.04		7.44		8.70	
LOS			A		A		A	
Intersection Delay	8.23		Intersection LOS		A			

APPENDIX "D"

LEVEL OF SERVICE STANDARDS

APPENDIX "D"
STANDARDS

LEVEL OF SERVICE STANDARDS

LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection or an approach. Control delay and volume-to-capacity (v/c) ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a measure of driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phase's capacity is utilized by a lane group.

LOS A describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate.

LOS D describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long.

LOS E describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long.

A lane group can incur a delay less than 80 s/veh when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 s/veh represents failure from a delay perspective).

The Level of Service Criteria for signalized intersections are given in Exhibit 18-4 from the *2010 Highway Capacity Manual* published by the Transportation Research Board.

Exhibit 18-4

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10-20	B	F
> 20-35	C	F
> 35-55	D	F
> 55-80	E	F
> 80	F	F

For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

LEVEL OF SERVICE CRITERIA

FOR TWO-WAY STOP-CONTROLLED (TWSC) UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) for a two-way stop-controlled (TWSC) intersection is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. LOS is not defined for the intersection as a whole or for major-street approaches.

The Level of Service Criteria for TWSC unsignalized intersections are given in Exhibit 19-1 from the *2010 Highway Capacity Manual* published by the Transportation Research Board.

Exhibit 19-1

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤1.0	v/c >1.0
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

The LOS criteria apply to each lane on a given approach and to each approach on the minor street.
LOS is not calculated for major-street approaches or for the intersection as a whole.

As Exhibit 19-1 notes, LOS F is assigned to the movement if the volume-to-capacity ratio for the movement exceeds 1.0, regardless of the control delay.

The Level of Service Criteria for unsignalized intersections are somewhat different from the criteria for signalized intersections.

LEVEL OF SERVICE CRITERIA

FOR ALL-WAY STOP-CONTROLLED (AWSC) UNSIGNALIZED INTERSECTIONS

The Levels of Service (LOS) for all-way stop-controlled (AWSC) intersections are given in Exhibit 20-2. As the exhibit notes, LOS F is assigned if the volume-to-capacity (v/c) ratio of a lane exceeds 1.0, regardless of the control delay. For assessment of LOS at the approach and intersection levels, LOS is based solely on control delay.

The Level of Service Criteria for AWSC unsignalized intersections are given in Exhibit 20-2 from the *2010 Highway Capacity Manual* published by the Transportation Research Board.

Exhibit 20-2

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤1.0	v/c >1.0
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

For approaches and intersectionwide assessment, LOS is defined solely by control delay.