



TOWNSHIP BOARD MEETING
LOCATION: 7527 HIGHLAND ROAD, WHITE LAKE - ANNEX BOARD ROOM
TUESDAY, JULY 19, 2022 – 7:00 PM

White Lake Township | 7525 Highland Rd | White Lake, MI 48383 | Phone: (248) 698-3300 | www.whitelaketwp.com

AGENDA

1. **CALL TO ORDER**
2. **PLEDGE OF ALLEGIANCE**
3. **ROLL CALL**
4. **APPROVAL OF AGENDA**
5. **PUBLIC COMMENT**
6. **CONSENT AGENDA**
 - A. [REVENUE AND EXPENSES](#)
 - B. [CHECK DISBURSEMENTS](#)
 - C. [DEPARTMENT REPORT - POLICE](#)
 - D. [DEPARTMENT REPORT - FIRE](#)
 - E. [DEPARTMENT REPORT - COMMUNITY DEVELOPMENT](#)
 - F. [DEPARTMENT REPORT – TREASURER](#)
7. **PRESENTATIONS**
 - A. CITIZEN LIFE SAVING AWARD
 - B. SWEARING IN OF NEW POLICE OFFICER - NATALIE UHAZIE
 - C. PROMOTION TO SERGEANT - TOM SARASIN
 - D. PROMOTION TO LIEUTENANT - JEFF WAY
8. **OLD BUSINESS**
 - A. [SECOND READING; 1392 S. WILLIAMS LAKE ROAD REZONING](#)
 - B. [SECOND READING; COMFORT CARE REZONING](#)
 - C. [DANGEROUS BUILDING - REVISIT DEMOLITION ORDER - 9910 HIGHLAND ROAD](#)
9. **NEW BUSINESS**
 - A. [REQUEST TO PURCHASE NEW PHONE RECORDING SYSTEM FOR POLICE DEPARTMENT](#)
 - B. [CONSIDERATION OF PRELIMINARY SITE PLAN APPROVAL - AVALON](#)
 - C. FIRST READING; AVALON REZONING
 - D. [REQUEST TO APPROVE PERFORMANCE GUARANTEE AGREEMENT - CARTER'S PLUMBING](#)
 - E. [RESOLUTION # 22-024; WHITE LAKE TOWNSHIP TENTATIVELY DECLARING ITS INTENTION TO ESTABLISH A SPECIAL ASSESSMENT DISTRICT TO BE KNOWN AS EMERGENCY SEWER HOOK-UP 2022-02](#)
 - F. [REQUEST FOR ONE YEAR EXTENSION FOR PEERLESS MIDWEST WELL MAINTENANCE CONTRACT](#)



AGENDA (CONT'D)

- G. [FIRST READING; FEE ORDINANCE AMENDMENT - ORD #129](#)
- H. [RESOLUTION # 22-025; TO APPROVE THE PURCHASE OF TAX FORECLOSED PROPERTIES FROM OAKLAND COUNTY - GALE ISLAND](#)

CLOSED SESSION

APPROVAL TO RECESS INTO CLOSED SESSION TO CONSIDER ATTORNEY/CLIENT PRIVILEGED COMMUNICATIONS, IN ACCORDANCE WITH MCL 15.268(1)(h)

- I. [REQUEST TO APPROVE AMENDED EMPLOYMENT AGREEMENT - AARON POTTER](#)

11. TRUSTEE COMMENTS

12. ADJOURNMENT

Procedures for accommodations for persons with disabilities: The Township will follow its normal procedures for individuals with disabilities needing accommodations for effective participation in this meeting. **Please contact the Township Clerk's office at (248) 698-3300 X-113 at least two days in advance of the meeting.** An attempt will be made to make reasonable accommodations.

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR	YTD BALANCE	2022	AVAILABLE	% BDTG
		MONTH	06/30/2022	AMENDED BUDGET	BALANCE	USED
		06/30/2022	06/30/2022			
Fund 101 - GENERAL FUND						
Revenues						
TAX COLLECTIONS						
101-000-402.000	CURRENT PROPERTY TAX	0.00	1,186,401.74	1,183,595.00	(2,806.74)	100.24
101-000-403.001	SPECIAL ASSMT STREET LIGHTS	0.00	17,127.43	17,130.00	2.57	99.98
101-000-405.000	TRAILER PARK TAX	849.00	5,105.00	7,500.00	2,395.00	68.07
101-000-412.000	DELINQUENT PROPERTY TAX	750.17	4,342.11	0.00	(4,342.11)	100.00
101-000-445.000	PENALTIES	0.00	16,460.79	15,000.00	(1,460.79)	109.74
101-000-445.001	PRIN RESIDENCE DENIALS	0.00	945.19	2,000.00	1,054.81	47.26
TAX COLLECTIONS		1,599.17	1,230,382.26	1,225,225.00	(5,157.26)	100.42
OTHER LICENSE & PERMITS						
101-000-458.000	OTHER PERMITS	0.00	300.00	0.00	(300.00)	100.00
101-000-459.000	SOLICITOR PERMIT	0.00	130.00	500.00	370.00	26.00
101-000-481.000	DOG LICENSES	746.00	1,896.00	1,200.00	(696.00)	158.00
OTHER LICENSE & PERMITS		746.00	2,326.00	1,700.00	(626.00)	136.82
TRANSPORTATION						
101-000-651.000	SENIOR ACTIVITIES	1,273.00	7,578.00	20,000.00	12,422.00	37.89
101-000-652.001	SENIOR CENTER REVENUE	0.00	2,202.00	0.00	(2,202.00)	100.00
TRANSPORTATION		1,273.00	9,780.00	20,000.00	10,220.00	48.90
PLANNING REVENUE						
101-000-608.000	ZONING BOARD OF APPEALS	385.00	6,600.00	6,500.00	(100.00)	101.54
101-000-609.000	PLANNING COMMISSION FEES	0.00	4,955.00	4,250.00	(705.00)	116.59
101-000-622.000	ZONING APPLICATION FEES	0.00	0.00	4,500.00	4,500.00	0.00
101-000-622.002	PLANNING DEPARTMENT REVIEWS	850.00	3,912.00	2,500.00	(1,412.00)	156.48
101-000-622.003	LANDSCAPING INSPECTION FEES	0.00	2,063.00	750.00	(1,313.00)	275.07
101-000-622.004	PUNCH LIST ADMIN FEES	0.00	7,502.04	2,000.00	(5,502.04)	375.10
101-000-622.005	FINAL BACK CHECK FEES	0.00	0.00	500.00	500.00	0.00
101-000-625.000	SPECIAL MEETING FEES	0.00	0.00	500.00	500.00	0.00
PLANNING REVENUE		1,235.00	25,032.04	21,500.00	(3,532.04)	116.43
STATE SHARED						
101-000-576.000	STATE SHARED REV-CONSTITUTIONA	559,835.00	1,685,746.00	2,500,000.00	814,254.00	67.43
STATE SHARED		559,835.00	1,685,746.00	2,500,000.00	814,254.00	67.43
FEES FOR SERVICES						
101-000-621.000	PLATTING & LOT SPLIT FEES	55.00	385.00	2,000.00	1,615.00	19.25
101-000-623.000	N S F FEE	75.00	375.00	500.00	125.00	75.00
101-000-627.000	DUPLICATING & PHOTOSTAT	42.19	359.99	350.00	(9.99)	102.85
101-000-643.000	CEMETERY LOTS	1,800.00	5,800.00	15,000.00	9,200.00	38.67
101-000-644.000	GRAVESITE OPENINGS/CLOSINGS	1,000.00	12,900.00	20,000.00	7,100.00	64.50
101-000-644.001	MONUMENT FOUNDATIONS/BRICK PAVERS	624.00	4,675.00	10,000.00	5,325.00	46.75
101-000-650.000	OTHER MAPS, CODES, ETC	0.00	36.00	50.00	14.00	72.00
101-000-652.000	FIELD RENTAL	0.00	0.00	1,500.00	1,500.00	0.00
101-000-654.000	OC ENHANCED REVENUE	0.00	3,527.83	2,000.00	(1,527.83)	176.39
101-000-689.000	SUMMER TAX COLLECTION REIMB	0.00	0.00	75,000.00	75,000.00	0.00
101-000-695.001	OTHER CABLE TV	0.00	255,302.65	500,000.00	244,697.35	51.06
101-000-695.002	ADMINISTRATIVE FEES	0.00	32.00	1,200.00	1,168.00	2.67
101-000-695.003	ADMIN FEES - GARBAGE FUND	0.00	0.00	96,076.00	96,076.00	0.00
101-000-695.004	ADMIN FEES - TRUST & AGENCY	855.00	17,714.98	25,000.00	7,285.02	70
101-000-695.005	ADMIN FEES	0.00	344.90	0.00	(344.90)	100
101-000-695.007	ADMIN FEE SPECIAL ASSESSMENTS	0.00	368.00	5,000.00	4,632.00	7

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 101 - GENERAL FUND						
Revenues						
101-000-695.008	ADMIN FEES	156.06	156.06	0.00	(156.06)	100.00
FEES FOR SERVICES		4,607.25	301,977.41	753,676.00	451,698.59	40.07
ORDINANCE FINES						
101-000-656.000	ORDINANCE FINES	100.00	1,345.00	0.00	(1,345.00)	100.00
ORDINANCE FINES		100.00	1,345.00	0.00	(1,345.00)	100.00
MISCELLANEOUS						
101-000-393.000	FUND BALANCE - DESIGNATED	0.00	0.00	559,530.00	559,530.00	0.00
101-000-531.000	OTHER GRANTS	0.00	0.00	5,527.00	5,527.00	0.00
101-000-575.001	METRO ACT REVENUE	25,511.30	25,511.30	16,000.00	(9,511.30)	159.45
101-000-590.000	CASH BONDS CONTRIBUTIONS	0.00	0.00	600,000.00	600,000.00	0.00
101-000-590.001	GRINDERS-CONTRIBUTIONS	0.00	0.00	300,000.00	300,000.00	0.00
101-000-664.000	INTEREST INCOME	0.00	21,288.93	20,000.00	(1,288.93)	106.44
101-000-664.001	INTEREST - TRUST AND AGENCY	0.00	162.91	2,000.00	1,837.09	8.15
101-000-673.000	SALE OF FIXED ASSETS	0.00	61.00	0.00	(61.00)	100.00
101-000-677.000	POSTAGE REVENUE	0.00	24.03	100.00	75.97	24.03
101-000-678.000	MISCELLANEOUS	2,766.41	14,337.08	2,000.00	(12,337.08)	716.85
101-000-695.000	OTHER SUNDRY	0.00	5,854.99	500.00	(5,354.99)	1,171.00
MISCELLANEOUS		28,277.71	67,240.24	1,505,657.00	1,438,416.76	4.47
REFUNDS & REBATES						
101-000-690.000	INSURANCE REBATES/CLAIMS	0.00	850.00	0.00	(850.00)	100.00
REFUNDS & REBATES		0.00	850.00	0.00	(850.00)	100.00
RENTS						
101-000-667.001	RENT COMMUNITY HALL	75.00	2,195.00	500.00	(1,695.00)	439.00
101-000-667.005	RENT-ORMOND RD TOWER	1,217.57	7,214.40	12,000.00	4,785.60	60.12
RENTS		1,292.57	9,409.40	12,500.00	3,090.60	75.28
TOTAL REVENUES		598,965.70	3,334,088.35	6,040,258.00	2,706,169.65	55.20
Expenditures						
TOWNSHIP BOARD						
101-101-703.000	SALARIES TRUSTEES	0.00	16,905.52	40,000.00	23,094.48	42.26
101-101-710.000	FEES & PER DIEM	4,125.95	8,025.90	10,000.00	1,974.10	80.26
101-101-715.000	SOCIAL SECURITY	261.68	1,554.84	3,060.00	1,505.16	50.81
101-101-716.000	HOSPITAL & OPTICAL INS	0.00	0.00	150.00	150.00	0.00
101-101-717.000	GROUP LIFE INSURANCE	0.00	125.60	500.00	374.40	25.12
101-101-719.000	WORKERS' COMP INSURANCE	0.00	19.50	120.00	100.50	16.25
101-101-801.000	PROFESSIONAL FEES - ACTUARIAL	0.00	8,832.50	8,000.00	(832.50)	110.41
101-101-801.001	PROFESSIONAL FEES	0.00	0.00	10,000.00	10,000.00	0.00
101-101-807.000	AUDIT FEES	0.00	38,292.50	35,000.00	(3,292.50)	109.41
101-101-860.000	CONFERENCES & MILEAGE	66.12	1,813.20	4,000.00	2,186.80	45.33
101-101-957.000	SUBSCRIPTIONS	0.00	0.00	500.00	500.00	0.00
101-101-958.000	MEMBERSHIPS & DUES	10,980.74	11,720.74	17,000.00	5,279.26	68.95
101-101-962.000	MISCELLANEOUS	0.00	0.00	13,000.00	13,000.00	0.00
TOWNSHIP BOARD		15,434.49	87,290.30	141,330.00	54,039.70	61
SUPERVISOR						

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR	YTD BALANCE	2022	AVAILABLE	% BDGT
		MONTH 06/30/2022	06/30/2022	AMENDED BUDGET	BALANCE	USED
Fund 101 - GENERAL FUND						
Expenditures						
101-171-703.000	SALARIES SUPERVISOR	7,246.80	46,682.12	91,465.00	44,782.88	51.04
101-171-704.000	SALARIES, ADMIN ASSISTANT	5,158.65	34,281.69	65,110.00	30,828.31	52.65
101-171-706.000	SALARIES CLERICAL	3,852.15	25,758.49	49,395.00	23,636.51	52.15
101-171-708.000	SALARIES HR WAGES	6,415.64	46,731.85	83,055.00	36,323.15	56.27
101-171-709.000	OVERTIME	0.00	1,023.70	500.00	(523.70)	204.74
101-171-715.000	SOCIAL SECURITY	1,697.98	11,448.17	22,150.00	10,701.83	51.68
101-171-716.000	HOSP & OPTICAL INSURANCE	6,313.09	39,202.35	101,750.00	62,547.65	38.53
101-171-717.000	GROUP LIFE INSURANCE	0.00	125.60	435.00	309.40	28.87
101-171-718.000	PENSION	9,767.23	63,689.36	121,000.00	57,310.64	52.64
101-171-718.001	HEALTH CARE SAVINGS PROGRAM	200.00	1,200.00	2,400.00	1,200.00	50.00
101-171-719.000	WORKERS COMP INSURANCE	0.00	137.50	1,085.00	947.50	12.67
101-171-722.000	UNEMPLOYMENT INSURANCE	0.00	575.83	810.00	234.17	71.09
101-171-724.000	DENTAL INSURANCE	0.00	1,125.04	4,625.00	3,499.96	24.33
101-171-853.000	CELLULAR PHONE	50.51	252.71	800.00	547.29	31.59
101-171-864.000	CONFERENCES & MEETINGS	0.00	1,107.64	1,400.00	292.36	79.12
101-171-931.000	HR SERVICES ALLOCATION	0.00	0.00	(120,360.00)	(120,360.00)	0.00
101-171-957.000	SUBSCRIPTIONS	0.00	0.00	100.00	100.00	0.00
101-171-958.000	MEMBERSHIPS & DUES	0.00	100.00	400.00	300.00	25.00
101-171-959.000	COMMUNITY COMMUNICATIONS	0.00	0.00	20,000.00	20,000.00	0.00
101-171-960.000	TRAINING	0.00	0.00	300.00	300.00	0.00
101-171-960.001	TRAINING-HR	0.00	0.00	2,000.00	2,000.00	0.00
101-171-962.000	MISCELLANEOUS	0.00	237.75	500.00	262.25	47.55
SUPERVISOR		40,702.05	273,679.80	448,920.00	175,240.20	60.96
ELECTIONS						
101-191-706.000	PART TIME ELECTIONS	877.24	877.24	18,000.00	17,122.76	4.87
101-191-709.001	OVERTIME ELECTIONS	250.94	2,777.32	18,000.00	15,222.68	15.43
101-191-710.000	FEES & PER DIEM	0.00	3,172.50	40,010.00	36,837.50	7.93
101-191-715.000	SOCIAL SECURITY	67.12	1,051.42	2,750.00	1,698.58	38.23
101-191-722.000	UNEMPLOYMENT INSURANCE	18.42	18.42	700.00	681.58	2.63
101-191-730.000	POSTAGE-ELECTIONS	987.53	9,350.80	14,300.00	4,949.20	65.39
101-191-740.000	OPERATING SUPPLIES	95.25	9,070.53	10,100.00	1,029.47	89.81
101-191-860.000	MILEAGE	0.00	0.00	800.00	800.00	0.00
101-191-903.000	LEGAL NOTICES	0.00	870.68	2,700.00	1,829.32	32.25
101-191-934.000	EQUIPMENT MAINTENANCE	0.00	0.00	20,630.00	20,630.00	0.00
101-191-962.000	MISCELLANEOUS	0.00	0.00	1,850.00	1,850.00	0.00
101-191-977.000	EQUIPMENT ACQUISITIONS	0.00	0.00	2,200.00	2,200.00	0.00
ELECTIONS		2,296.50	27,188.91	132,040.00	104,851.09	20.59
ACCOUNTING						
101-192-701.000	SALARIES SENIOR ACCOUNT MANAGER	7,606.20	49,178.45	83,230.00	34,051.55	59.09
101-192-702.000	SALARIES BOOKKEEPER	5,329.51	35,408.11	67,270.00	31,861.89	52.64
101-192-709.000	OVERTIME	0.00	676.94	600.00	(76.94)	112.82
101-192-715.000	SOCIAL SECURITY	981.93	5,464.74	11,560.00	6,095.26	47.27
101-192-716.000	HOSP & OPTICAL INSURANCE	1,332.88	8,586.48	17,600.00	9,013.52	48.79
101-192-717.000	GROUP LIFE INSURANCE	0.00	62.80	220.00	157.20	28.55
101-192-718.000	PENSION	3,785.58	23,629.34	41,300.00	17,670.66	57.21
101-192-719.000	WORKERS COMP INSURANCE	0.00	126.75	660.00	533.25	19.20
101-192-722.000	UNEMPLOYMENT INSURANCE	0.00	381.16	540.00	158.84	70.59
101-192-724.000	DENTAL INSURANCE	0.00	248.16	800.00	551.84	31.02
101-192-957.000	SUBSCRIPTIONS	0.00	0.00	75.00	75.00	0.00
101-192-958.000	MEMBERSHIPS & DUES	275.00	275.00	450.00	175.00	61.11
101-192-960.000	TRAINING	0.00	0.00	300.00	300.00	0
101-192-962.000	MISCELLANEOUS	0.00	0.00	200.00	200.00	0

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 101 - GENERAL FUND						
Expenditures						
ACCOUNTING		19,311.10	124,037.93	224,805.00	100,767.07	55.18
ASSESSING						
101-209-706.001	SALARIES ASSESSOR	41,265.76	93,210.65	98,080.00	4,869.35	95.04
101-209-706.002	SALARIES PROPERTY APPRAISER	9,424.81	62,031.10	118,955.00	56,923.90	52.15
101-209-706.003	SALARIES CLERICAL	3,653.71	22,038.86	53,250.00	31,211.14	41.39
101-209-707.000	SALARIES PART TIME	3,003.04	18,739.59	10,000.00	(8,739.59)	187.40
101-209-709.000	OVERTIME	0.00	3,849.88	1,500.00	(2,349.88)	256.66
101-209-715.000	SOCIAL SECURITY	4,349.92	15,069.17	21,550.00	6,480.83	69.93
101-209-716.000	HOSP & OPTICAL INSURANCE	8,478.92	47,292.60	91,250.00	43,957.40	51.83
101-209-717.000	GROUP LIFE INSURANCE	0.00	102.05	435.00	332.95	23.46
101-209-718.000	PENSION	5,842.92	24,540.46	45,200.00	20,659.54	54.29
101-209-718.001	HEALTH CARE SAVINGS PROGRAM	300.00	1,600.00	2,400.00	800.00	66.67
101-209-719.000	WORKERS COMP INSURANCE	0.00	377.50	2,950.00	2,572.50	12.80
101-209-722.000	UNEMPLOYMENT INSURANCE	156.91	1,540.82	1,080.00	(460.82)	142.67
101-209-724.000	DENTAL INSURANCE	0.00	1,146.14	3,475.00	2,328.86	32.98
101-209-801.000	PROFESSIONAL SERVICES	0.00	0.00	30,000.00	30,000.00	0.00
101-209-818.000	OC SOFTWARE SUPPORT FEES	0.00	1,832.34	2,000.00	167.66	91.62
101-209-820.000	LEGAL FEES	525.00	(675.00)	8,000.00	8,675.00	(8.44)
101-209-864.000	CONFERENCES & MEETINGS	0.00	50.00	200.00	150.00	25.00
101-209-903.000	LEGAL NOTICES	0.00	0.00	1,500.00	1,500.00	0.00
101-209-957.000	SUBSCRIPTIONS	0.00	0.00	200.00	200.00	0.00
101-209-958.000	MEMBERSHIPS & DUES	0.00	190.00	1,500.00	1,310.00	12.67
101-209-960.000	TRAINING	0.00	0.00	1,000.00	1,000.00	0.00
101-209-962.000	MISCELLANEOUS	135.00	545.73	1,000.00	454.27	54.57
ASSESSING		77,135.99	293,481.89	495,525.00	202,043.11	59.23
LEGAL FEES						
101-210-826.000	LEGAL FEES	6,440.00	30,197.00	80,000.00	49,803.00	37.75
101-210-826.001	TAX TRIBUNAL REFUNDS	0.00	0.00	2,000.00	2,000.00	0.00
101-210-826.002	LEGAL FEES-ORDINANCE	0.00	3,780.00	30,000.00	26,220.00	12.60
LEGAL FEES		6,440.00	33,977.00	112,000.00	78,023.00	30.34
CLERK						
101-215-703.000	SALARIES CLERK	6,731.86	43,364.97	84,970.00	41,605.03	51.04
101-215-704.000	SALARIES DEPUTY CLERK	5,611.06	36,774.08	70,819.00	34,044.92	51.93
101-215-706.001	SALARIES CLERICAL	7,989.31	58,814.03	105,573.00	46,758.97	55.71
101-215-709.000	OVERTIME	0.00	100.37	500.00	399.63	20.07
101-215-715.000	SOCIAL SECURITY	1,517.04	10,445.48	20,100.00	9,654.52	51.97
101-215-716.000	HOSP & OPTICAL INSURANCE	4,313.31	35,090.75	83,800.00	48,709.25	41.87
101-215-717.000	GROUP LIFE INSURANCE	0.00	125.60	435.00	309.40	28.87
101-215-718.000	PENSION	10,084.30	65,235.69	125,200.00	59,964.31	52.11
101-215-718.001	HEALTH CARE SAVINGS PROGRAM	732.02	3,578.67	6,660.00	3,081.33	53.73
101-215-719.000	WORKERS COMP INSURANCE	0.00	155.25	1,090.00	934.75	14.24
101-215-722.000	UNEMPLOYMENT INSURANCE	97.50	753.28	810.00	56.72	93.00
101-215-724.000	DENTAL INSURANCE	(57.98)	820.76	3,725.00	2,904.24	22.03
101-215-853.000	CELLULAR PHONE	102.30	511.58	0.00	(511.58)	100.00
101-215-860.000	MILEAGE	272.61	272.61	0.00	(272.61)	100.00
101-215-864.000	CONFERENCES & MEETINGS	0.00	3,864.94	6,000.00	2,135.06	64.42
101-215-903.000	LEGAL NOTICES	2,018.61	4,954.85	5,500.00	545.15	90.09
101-215-957.000	SUBSCRIPTIONS	0.00	0.00	630.00	630.00	0.00
101-215-958.000	MEMBERSHIPS & DUES	0.00	165.00	790.00	625.00	20
101-215-960.000	TRAINING	0.00	1,251.75	1,100.00	(151.75)	113
101-215-962.000	MISCELLANEOUS	140.00	148.52	400.00	251.48	37

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 101 - GENERAL FUND						
Expenditures						
CLERK		39,551.94	266,428.18	518,102.00	251,673.82	51.42
BOARD OF REVIEW						
101-247-710.000	FEES & PER DIEM	0.00	1,250.00	2,500.00	1,250.00	50.00
101-247-864.000	CONFERENCES & MEETINGS	0.00	0.00	150.00	150.00	0.00
101-247-903.000	LEGAL PUBLICATIONS	0.00	167.73	500.00	332.27	33.55
BOARD OF REVIEW		0.00	1,417.73	3,150.00	1,732.27	45.01
POSTAGE & MAILING						
101-248-730.000	POSTAGE	3,253.14	11,338.52	25,000.00	13,661.48	45.35
101-248-934.000	EQUIPMENT MAINTENANCE-POSTAGE METER	0.00	996.53	2,000.00	1,003.47	49.83
101-248-946.000	POSTAGE METER RENTAL	0.00	0.00	800.00	800.00	0.00
POSTAGE & MAILING		3,253.14	12,335.05	27,800.00	15,464.95	44.37
OFFICE SUPPLIES						
101-249-727.000	OFFICE SUPPLIES	2,283.09	17,484.26	40,000.00	22,515.74	43.71
OFFICE SUPPLIES		2,283.09	17,484.26	40,000.00	22,515.74	43.71
TREASURER						
101-253-703.000	SALARIES TREASURER	6,731.86	43,364.97	84,970.00	41,605.03	51.04
101-253-704.000	SALARIES DEPUTY TREASURER	5,611.05	35,740.15	70,820.00	35,079.85	50.47
101-253-706.001	SALARIES CLERICAL FT	8,832.69	56,582.95	104,575.00	47,992.05	54.11
101-253-709.000	OVERTIME	0.00	143.57	500.00	356.43	28.71
101-253-715.000	SOCIAL SECURITY	1,582.43	10,021.63	19,960.00	9,938.37	50.21
101-253-716.000	HOSP & OPTICAL INSURANCE	7,683.20	46,612.84	101,600.00	54,987.16	45.88
101-253-717.000	GROUP LIFE INSURANCE	0.00	125.60	435.00	309.40	28.87
101-253-718.000	PENSION	8,879.98	56,123.78	110,600.00	54,476.22	50.74
101-253-718.001	HEALTH CARE SAVINGS PROGRAM	396.40	2,424.66	3,600.00	1,175.34	67.35
101-253-719.000	WORKERS COMP INSURANCE	0.00	165.00	1,085.00	920.00	15.21
101-253-722.000	UNEMPLOYMENT INSURANCE	0.00	578.82	810.00	231.18	71.46
101-253-724.000	DENTAL INSURANCE	0.00	1,175.76	4,625.00	3,449.24	25.42
101-253-818.000	OC SOFTWARE SUPPORT FEES	0.00	2,254.78	2,500.00	245.22	90.19
101-253-860.000	MILEAGE	0.00	111.50	300.00	188.50	37.17
101-253-864.000	CONFERENCES & MEETINGS	784.25	1,142.11	2,500.00	1,357.89	45.68
101-253-903.000	LEGAL NOTICES	0.00	0.00	100.00	100.00	0.00
101-253-958.000	MEMBERSHIPS & DUES	0.00	0.00	1,000.00	1,000.00	0.00
101-253-960.000	TRAINING	0.00	0.00	500.00	500.00	0.00
101-253-962.000	MISCELLANEOUS	0.00	0.00	1,000.00	1,000.00	0.00
TREASURER		40,501.86	256,568.12	511,480.00	254,911.88	50.16
TOWNSHIP HALL & GROUNDS						
101-265-706.000	SALARIES MAINTENANCE	3,534.76	30,532.25	56,000.00	25,467.75	54.52
101-265-707.000	SALARIES CUSTODIAN	3,454.32	23,036.27	43,900.00	20,863.73	52.47
101-265-709.000	OVERTIME	543.04	3,988.69	8,000.00	4,011.31	49.86
101-265-715.000	SOCIAL SECURITY	549.09	4,283.91	8,300.00	4,016.09	51.61
101-265-716.000	HOSP & OPTICAL INSURANCE	2,289.72	17,220.60	30,300.00	13,079.40	56.83
101-265-717.000	GROUP LIFE INSURANCE	0.00	62.80	220.00	157.20	28.55
101-265-718.000	PENSION	1,193.56	9,197.48	15,000.00	5,802.52	61.32
101-265-718.001	HEALTH CARE SAVINGS PROGRAM	100.00	600.00	0.00	(600.00)	100.00
101-265-719.000	WORKERS COMP INSURANCE	0.00	865.75	5,400.00	4,534.25	16.03
101-265-722.000	UNEMPLOYMENT INSURANCE	0.00	522.77	540.00	17.23	96.7
101-265-724.000	DENTAL INSURANCE	0.00	356.00	1,125.00	769.00	31.0
101-265-853.000	TELEPHONE	1,873.81	6,066.56	12,000.00	5,933.44	50.55

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 101 - GENERAL FUND						
Expenditures						
101-265-863.000	VEHICLE MAINTENANCE	951.00	2,854.16	8,000.00	5,145.84	35.68
101-265-867.000	GASOLINE	0.00	4,190.85	6,000.00	1,809.15	69.85
101-265-910.000	INSURANCE	14,593.38	58,197.72	58,000.00	(197.72)	100.34
101-265-921.001	ELECTRIC TWP HALL	2,455.81	15,134.47	40,000.00	24,865.53	37.84
101-265-922.000	UTILITIES-TWP HALL	0.00	3,153.36	6,000.00	2,846.64	52.56
101-265-923.000	HEAT TWP HALL	382.33	4,334.58	6,200.00	1,865.42	69.91
101-265-931.001	BLDG MAINTENANCE & SUPPLIES	3,218.61	21,959.08	17,000.00	(4,959.08)	129.17
101-265-931.002	GROUNDS MAINTENANCE	637.83	7,340.95	25,000.00	17,659.05	29.36
101-265-931.003	BLDG EQUIP MAINTENANCE	342.83	17,477.19	6,000.00	(11,477.19)	291.29
101-265-933.000	GROUNDS EQUIP MAINTENANCE	235.32	5,212.47	1,500.00	(3,712.47)	347.50
101-265-934.000	OFFICE EQUIP MAINTENANCE	0.00	216.39	3,000.00	2,783.61	7.21
101-265-940.000	TOWNSHIP RECORD RETENTION COSTS	115.46	775.29	3,000.00	2,224.71	25.84
101-265-971.000	TECHNOLOGY EQUIPMENT	15,331.38	33,004.04	110,000.00	76,995.96	30.00
101-265-974.000	IMPROVEMENTS & BETTERMENTS	0.00	17,290.42	165,000.00	147,709.58	10.48
101-265-977.000	EQUIPMENT ACQUISITIONS	31,263.50	41,763.50	110,000.00	68,236.50	37.97
TOWNSHIP HALL & GROUNDS		83,065.75	329,637.55	745,485.00	415,847.45	44.22
CEMETERY						
101-276-910.000	INSURANCE	15.57	62.41	200.00	137.59	31.21
101-276-921.000	ELECTRIC OXBOW	15.41	74.68	200.00	125.32	37.34
101-276-921.001	ELECTRIC WHITE LAKE	31.33	194.15	300.00	105.85	64.72
101-276-932.000	CEMETERY MAINT	4,644.37	6,967.26	30,000.00	23,032.74	23.22
101-276-935.000	CEMETERY-GRAVESITE OPENING/CLOSINGS	0.00	11,600.00	18,000.00	6,400.00	64.44
101-276-936.000	CEMETERY FOUNDATIONS/MONUMENTS EXPENSE	0.00	2,780.40	9,000.00	6,219.60	30.89
101-276-962.000	MISCELLANEOUS	0.00	0.00	400.00	400.00	0.00
101-276-974.000	LAND IMPROVEMENTS	0.00	0.00	5,000.00	5,000.00	0.00
CEMETERY		4,706.68	21,678.90	63,100.00	41,421.10	34.36
OTHER TOWNSHIP PROPERTIES						
101-269-853.001	TELEPHONE FISK FARM	57.65	177.77	360.00	182.23	49.38
101-269-910.001	INSURANCE COMM HALL	141.00	564.90	1,000.00	435.10	56.49
101-269-910.004	INSURANCE FISK	482.30	1,931.63	2,800.00	868.37	68.99
101-269-910.008	INSURANCE-ANNEX	1,517.57	6,080.56	7,500.00	1,419.44	81.07
101-269-921.001	ELECTRIC COMM HALL	95.46	452.73	700.00	247.27	64.68
101-269-921.004	ELECTRIC FISK	77.95	657.24	1,800.00	1,142.76	36.51
101-269-921.006	M59/BOGIE PROP STREET LIGHT	175.12	913.62	1,300.00	386.38	70.28
101-269-921.011	ELECTRIC-TWP ANNEX	633.10	3,489.79	10,000.00	6,510.21	34.90
101-269-922.004	UTILITIES FISK	0.00	825.12	1,800.00	974.88	45.84
101-269-922.010	UTILITIES-TWP ANNEX	0.00	749.12	4,000.00	3,250.88	18.73
101-269-923.001	HEAT COMM HALL	113.86	1,248.13	2,000.00	751.87	62.41
101-269-923.004	HEAT FISK	86.54	1,193.08	1,200.00	6.92	99.42
101-269-923.011	GAS-TWP ANNEX	260.08	3,871.10	5,000.00	1,128.90	77.42
101-269-931.001	BLDG MAINT COMM HALL	0.00	1,165.00	3,000.00	1,835.00	38.83
101-269-931.004	BLDG EQUIPMENT MAINT COMM HALL	0.00	0.00	500.00	500.00	0.00
101-269-931.007	BLDG MAINT FISK	0.00	0.00	7,000.00	7,000.00	0.00
101-269-931.008	EQUIP MAINT FISK	58.50	327.00	1,000.00	673.00	32.70
101-269-931.010	BLDG MAINTENANCE - 2444 PORTER RD	0.00	0.00	10,000.00	10,000.00	0.00
101-269-931.013	BUILDING MAINTENANCE-TWP ANNEX	431.77	7,183.86	0.00	(7,183.86)	100.00
101-269-931.014	10895 ELIZABETH LK PROPERTY MAINTENANCE	0.00	0.00	5,000.00	5,000.00	0.00
101-269-932.000	ANNEX GROUND MAINTENANCE	0.00	0.00	2,500.00	2,500.00	0.00
101-269-962.000	MISCELLANEOUS	476.54	476.54	500.00	23.46	95.31
OTHER TOWNSHIP PROPERTIES		4,607.44	31,307.19	68,960.00	37,652.81	45
HEALTH & WELFARE						

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDTG USED
Fund 101 - GENERAL FUND						
Expenditures						
101-285-801.000	ENVIRONMENTAL PROFESSIONAL SERVICES	8,450.70	8,450.70	12,000.00	3,549.30	70.42
HEALTH & WELFARE		8,450.70	8,450.70	12,000.00	3,549.30	70.42
PLANNING						
101-402-706.001	COMMUNITY DEVELOPMENT DIRECTOR	7,915.96	52,088.48	93,295.00	41,206.52	55.83
101-402-706.002	SALARIES CLERICAL	4,394.06	28,740.39	53,251.00	24,510.61	53.97
101-402-707.000	SALARIES STAFF PLANNER	5,718.00	37,544.16	72,160.00	34,615.84	52.03
101-402-709.000	OVERTIME	343.08	1,429.35	6,000.00	4,570.65	23.82
101-402-710.000	PLANNING/ZBA BOARD FEES	200.00	4,600.00	11,000.00	6,400.00	41.82
101-402-715.000	SOCIAL SECURITY	1,434.27	9,235.26	17,900.00	8,664.74	51.59
101-402-716.000	HOSP & OPTICAL INSURANCE	2,973.59	10,863.33	26,550.00	15,686.67	40.92
101-402-717.000	GROUP LIFE INSURANCE	0.00	94.20	325.00	230.80	28.98
101-402-718.000	PENSION	2,945.58	18,151.06	34,540.00	16,388.94	52.55
101-402-718.001	HEALTH CARE SAVINGS PROGRAM	200.00	1,200.00	2,400.00	1,200.00	50.00
101-402-719.000	WORKERS COMP INSURANCE	0.00	264.75	2,110.00	1,845.25	12.55
101-402-722.000	UNEMPLOYMENT INSURANCE	0.00	573.04	810.00	236.96	70.75
101-402-724.000	DENTAL INSURANCE	0.00	638.24	725.00	86.76	88.03
101-402-729.000	PRINTING	0.00	0.00	1,500.00	1,500.00	0.00
101-402-757.000	OPERATING SUPPLIES	0.00	0.00	600.00	600.00	0.00
101-402-801.000	PROFESSIONAL FEES	0.00	7,813.00	46,000.00	38,187.00	16.98
101-402-853.000	CELLULAR PHONE	101.84	508.76	1,300.00	791.24	39.14
101-402-864.000	CONFERENCES & MEETINGS	0.00	0.00	3,900.00	3,900.00	0.00
101-402-903.000	LEGAL NOTICES	1,510.85	4,307.50	3,750.00	(557.50)	114.87
101-402-910.000	INSURANCE	1,431.57	5,611.03	4,200.00	(1,411.03)	133.60
101-402-957.000	SUBSCRIPTIONS	0.00	0.00	700.00	700.00	0.00
101-402-958.000	MEMBERSHIPS & DUES	0.00	930.00	2,200.00	1,270.00	42.27
101-402-960.000	TRAINING	0.00	0.00	4,100.00	4,100.00	0.00
101-402-962.000	MISCELLANEOUS	0.00	87.00	500.00	413.00	17.40
PLANNING		29,168.80	184,679.55	389,816.00	205,136.45	47.38
HIGHWAYS & STREETS						
101-446-930.000	TRAFFIC SIGNAL MAINTENANCE	15.06	35.14	1,000.00	964.86	3.51
101-448-926.000	STREET LIGHTING	3,405.71	16,040.65	65,000.00	48,959.35	24.68
101-451-970.000	ROAD CONSTRUCTION/TRI PARTY	0.00	116,131.00	150,000.00	33,869.00	77.42
HIGHWAYS & STREETS		3,420.77	132,206.79	216,000.00	83,793.21	61.21
TRANSPORTATION						
101-672-880.000	WOTA PARTICIPATION	0.00	220,000.00	185,000.00	(35,000.00)	118.92
TRANSPORTATION		0.00	220,000.00	185,000.00	(35,000.00)	118.92
SENIOR CENTER						
101-757-703.000	SALARIES SENIOR DIRECTOR	4,459.21	29,734.76	56,285.00	26,550.24	52.83
101-757-704.000	SALARIES PROGRAM DEVELOPER	3,913.36	26,186.82	49,400.00	23,213.18	53.01
101-757-709.000	OVERTIME	0.00	0.00	500.00	500.00	0.00
101-757-715.000	SOCIAL SECURITY	629.04	4,203.48	8,125.00	3,921.52	51.74
101-757-716.000	HOSP & OPTICAL INSURANCE	5,107.41	19,811.00	43,000.00	23,189.00	46.07
101-757-717.000	GROUP LIFE INSURANCE	0.00	62.80	220.00	157.20	28.55
101-757-718.000	PENSION	1,474.42	9,275.84	17,540.00	8,264.16	52.88
101-757-718.001	HEALTH CARE SAVINGS PROGRAM	100.00	600.00	1,200.00	600.00	50.00
101-757-719.000	WORKERS COMP INSURANCE	0.00	89.75	680.00	590.25	13.20
101-757-722.000	UNEMPLOYMENT INSURANCE	0.00	386.80	540.00	153.20	71.14
101-757-724.000	DENTAL INSURANCE	0.00	463.84	1,450.00	986.16	31.18
101-757-751.000	SENIOR ACTIVITIES	2,056.65	9,457.24	33,000.00	23,542.76	28.63

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 101 - GENERAL FUND						
Expenditures						
101-757-757.000	OPERATING SUPPLIES	0.00	826.02	2,000.00	1,173.98	41.30
101-757-853.000	TELEPHONE	376.77	1,055.93	3,000.00	1,944.07	35.20
101-757-864.000	CONFERENCES & MEETINGS	0.00	0.00	500.00	500.00	0.00
101-757-910.000	INSURANCE	623.71	2,498.53	3,350.00	851.47	74.58
101-757-921.000	ELECTRIC	904.42	2,812.59	5,000.00	2,187.41	56.25
101-757-922.000	UTILITIES	0.00	825.12	2,000.00	1,174.88	41.26
101-757-923.000	HEAT	149.07	1,614.82	2,300.00	685.18	70.21
101-757-931.000	BUILDING MAINTENANCE	2,128.82	5,072.10	10,000.00	4,927.90	50.72
101-757-957.000	SUBSCRIPTIONS	0.00	0.00	150.00	150.00	0.00
101-757-958.000	MEMBERSHIPS & DUES	0.00	0.00	150.00	150.00	0.00
101-757-962.000	MISCELLANEOUS	0.00	0.00	1,500.00	1,500.00	0.00
101-757-976.000	ADD & IMPROVEMENTS	0.00	0.00	7,000.00	7,000.00	0.00
SENIOR CENTER		21,922.88	114,977.44	248,890.00	133,912.56	46.20
RETIREE BENEFITS						
101-863-730.000	RETIREE HEALTH INSURANCE	11,226.31	52,253.32	100,000.00	47,746.68	52.25
101-863-730.003	OPEB FUNDING	270,000.00	270,000.00	270,000.00	0.00	100.00
RETIREE BENEFITS		281,226.31	322,253.32	370,000.00	47,746.68	87.10
OTHER						
101-299-956.000	UNALLOCATED MISCELLANEOUS	215.47	8,399.77	15,000.00	6,600.23	56.00
101-863-801.000	PAYROLL SERVICE	1,076.62	12,023.39	25,000.00	12,976.61	48.09
101-906-991.000	PRINCIPAL-CAPITAL LEASE	509.70	3,034.14	6,200.00	3,165.86	48.94
101-906-995.000	INTEREST-CAPITAL LEASE	43.30	283.86	750.00	466.14	37.85
OTHER		1,845.09	23,741.16	46,950.00	23,208.84	2.51
ORDINANCE						
101-372-706.001	SALARIES ORDINANCE OFFICER	4,764.45	31,718.70	60,135.00	28,416.30	52.75
101-372-706.002	PART-TIME ORDINANCE	60.00	900.00	0.00	(900.00)	100.00
101-372-709.000	OVERTIME	0.00	0.00	1,000.00	1,000.00	0.00
101-372-715.000	SOCIAL SECURITY	347.26	2,319.35	6,800.00	4,480.65	34.11
101-372-716.000	HOSP & OPTICAL INSURANCE	2,014.28	11,092.19	26,750.00	15,657.81	41.47
101-372-717.000	GROUP LIFE INSURANCE	0.00	31.40	110.00	78.60	28.55
101-372-718.000	PENSION	1,394.30	8,733.95	17,900.00	9,166.05	48.79
101-372-719.000	WORKERS COMP INSURANCE	0.00	87.75	890.00	802.25	9.86
101-372-722.000	UNEMPLOYMENT INSURANCE	0.00	192.57	270.00	77.43	71.32
101-372-724.000	DENTAL INSURANCE	0.00	406.32	1,300.00	893.68	31.26
101-372-744.000	UNIFORMS-ORDINANCE	0.00	0.00	500.00	500.00	0.00
101-372-757.000	OPERATING SUPPLIES	0.00	0.00	200.00	200.00	0.00
101-372-853.000	CELLULAR PHONE	51.12	255.76	800.00	544.24	31.97
101-372-863.000	VEHICLE MAINTENANCE	188.00	1,256.00	3,000.00	1,744.00	41.87
101-372-864.000	CONFERENCE & MEETINGS	0.00	0.00	750.00	750.00	0.00
101-372-867.000	GASOLINE	0.00	44.20	1,700.00	1,655.80	2.60
101-372-910.000	INSURANCE	219.54	868.17	900.00	31.83	96.46
101-372-955.000	ORDINANCE ENFORCEMENTS COSTS	1,442.00	2,688.00	5,000.00	2,312.00	53.76
101-372-958.000	MEMBERSHIPS & DUES	0.00	0.00	150.00	150.00	0.00
101-372-960.000	TRAINING	0.00	0.00	500.00	500.00	0.00
101-372-962.000	MISCELLANEOUS	0.00	0.00	250.00	250.00	0.00
101-372-963.000	DANGEROUS BLDG DEMOLITIONS	0.00	0.00	10,000.00	10,000.00	0.00
ORDINANCE		10,480.95	60,594.36	138,905.00	78,310.64	43.62
OTHER						
101-000-934.000	CASH BONDS DEDUCTIONS	0.00	0.00	600,000.00	600,000.00	

REVENUE AND EXPENDITURE REPORT FOR WHITE LAKE TOWNSHIP
 PERIOD ENDING 06/30/2022

Section 6, Item A.

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 101 - GENERAL FUND						
Expenditures						
101-000-934.001	GRINDERS-DEDUCTIONS	0.00	0.00	300,000.00	300,000.00	0.00
OTHER		0.00	0.00	900,000.00	900,000.00	2.51
TOTAL EXPENDITURES		695,805.53	2,843,416.13	6,040,258.00	3,196,841.87	47.07
Fund 101 - GENERAL FUND:						
TOTAL REVENUES		598,965.70	3,334,088.35	6,040,258.00	2,706,169.65	55.20
TOTAL EXPENDITURES		695,805.53	2,843,416.13	6,040,258.00	3,196,841.87	47.07
NET OF REVENUES & EXPENDITURES		(96,839.83)	490,672.22	0.00	(490,672.22)	100.00

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 206 - FIRE						
Revenues						
REVENUES						
206-000-393.000	FUND BALANCE - DESIGNATED	0.00	0.00	40,619.00	40,619.00	0.00
206-000-402.000	TAX COLLECTIONS	0.00	3,561,453.80	3,552,981.00	(8,472.80)	100.24
206-000-607.000	PERMIT AND INSPECTION FEES	55.00	555.00	1,000.00	445.00	55.50
206-000-626.000	COST RECOVERY REVENUE	0.00	2,015.00	0.00	(2,015.00)	100.00
206-000-630.000	AMBULANCE TRANSPORTATION REVENUE	1,034.76	2,312.06	0.00	(2,312.06)	100.00
206-000-665.000	INTEREST	0.00	5,449.16	17,000.00	11,550.84	32.05
206-000-673.000	SALE OF FIXED ASSETS	(7,750.00)	(7,750.00)	0.00	7,750.00	100.00
206-000-695.000	MISC REVENUE	10.00	332.37	2,000.00	1,667.63	16.62
206-336-977.002	USE OF FUND BALANCE	0.00	0.00	570,000.00	570,000.00	0.00
REVENUES		(6,650.24)	3,564,367.39	4,183,600.00	619,232.61	85.20
TOTAL REVENUES		(6,650.24)	3,564,367.39	4,183,600.00	619,232.61	85.20
Expenditures						
OTHER						
206-336-801.001	HR SERVICES	0.00	0.00	42,700.00	42,700.00	0.00
OTHER		0.00	0.00	42,700.00	42,700.00	45.88
CIVIL SERVICE						
206-220-710.000	FEES & PER DIEM	0.00	0.00	1,000.00	1,000.00	0.00
206-220-727.000	SUPPLIES	0.00	0.00	500.00	500.00	0.00
206-220-903.000	LEGAL NOTICES	0.00	0.00	500.00	500.00	0.00
CIVIL SERVICE		0.00	0.00	2,000.00	2,000.00	0.00
SALARIES						
206-336-705.000	SALARIES CHIEF	7,873.92	51,058.54	92,330.00	41,271.46	55.30
206-336-705.001	SALARIES CAPTAIN	20,552.00	137,722.61	259,100.00	121,377.39	53.15
206-336-706.001	SALARIES FIRE SERGEANT	31,994.44	229,062.63	378,170.00	149,107.37	60.57
206-336-706.003	SALARIES CLERICAL	4,219.05	4,219.05	0.00	(4,219.05)	100.00
206-336-706.005	SALARIES FIREFIGHTERS	36,458.47	266,841.38	782,200.00	515,358.62	34.11
206-336-706.007	FIRE MARSHAL/DEPUTY CHIEF	6,772.80	46,098.62	85,475.00	39,376.38	53.93
206-336-709.000	OVERTIME	9,358.53	38,698.70	70,000.00	31,301.30	55.28
206-336-710.000	PART TIME STAFF	3,813.18	16,843.03	50,000.00	33,156.97	33.69
206-336-720.000	HOLIDAY/PERSONAL PAY	231.66	72,272.44	212,600.00	140,327.56	33.99
SALARIES		121,274.05	862,817.00	1,929,875.00	1,067,058.00	44.71
PAYROLL BENEFITS						
206-336-715.000	SOCIAL SECURITY	9,513.88	64,947.84	148,000.00	83,052.16	43.88
206-336-716.000	HOSP & OPTICAL INSURANCE	28,712.10	155,742.51	459,725.00	303,982.49	33.88
206-336-716.002	RETIREE HEALTH CARE PREMIUMS	5,197.20	31,585.53	30,000.00	(1,585.53)	105.29
206-336-717.000	GROUP LIFE INSURANCE	0.00	573.05	2,500.00	1,926.95	22.92
206-336-718.000	PENSION	29,140.76	177,079.57	316,900.00	139,820.43	55.88
206-336-718.002	HEALTH CARE SAVINGS PLAN	1,492.70	9,758.66	22,500.00	12,741.34	43.37
206-336-718.003	OPEB FUNDING	150,000.00	150,000.00	150,000.00	0.00	100.00
206-336-719.000	WORKERS COMP INSURANCE	0.00	17,142.00	90,000.00	72,858.00	19.05
206-336-722.000	UNEMPLOYMENT INSURANCE	80.08	4,342.00	6,250.00	1,908.00	69.47
206-336-724.000	DENTAL INSURANCE	(57.98)	4,868.26	20,500.00	15,631.74	23.75
PAYROLL BENEFITS		224,078.74	616,039.42	1,246,375.00	630,335.58	49.75

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 206 - FIRE						
Expenditures						
OTHER						
206-336-727.000	OFFICE SUPPLIES	223.99	1,669.31	2,000.00	330.69	83.47
206-336-730.000	POSTAGE, SHIPPING	0.00	36.65	200.00	163.35	18.33
206-336-744.000	UNIFORMS	1,615.81	13,241.76	20,000.00	6,758.24	66.21
206-336-744.002	FOOD ALLOWANCE	2,559.35	4,407.54	11,050.00	6,642.46	39.89
206-336-757.000	OPERATING SUPPLIES	1,603.84	20,206.44	30,000.00	9,793.56	67.35
206-336-758.000	OXYGEN & AIR	89.96	843.46	2,500.00	1,656.54	33.74
206-336-767.000	MEDICAL SUPPLIES	1,542.67	5,956.56	20,000.00	14,043.44	29.78
206-336-801.000	CONSULTANT/PROFESSIONAL SERVICES	0.00	680.41	1,500.00	819.59	45.36
206-336-807.000	AUDIT FEES	0.00	5,000.00	5,000.00	0.00	100.00
206-336-826.000	LEGAL FEES	56.00	3,023.50	10,000.00	6,976.50	30.24
206-336-826.002	TAX TRIBUNAL REFUNDS	0.00	0.00	4,000.00	4,000.00	0.00
206-336-835.000	MEDICAL SERVICES	0.00	4,236.54	4,000.00	(236.54)	105.91
206-336-851.000	RADIO MAINTENANCE	0.00	0.00	2,000.00	2,000.00	0.00
206-336-853.000	CELL PHONES	315.22	1,286.16	3,500.00	2,213.84	36.75
206-336-853.001	TELEPHONE STATION 1	247.31	981.86	2,000.00	1,018.14	49.09
206-336-853.002	TELEPHONE STATION 2	25.00	330.89	1,200.00	869.11	27.57
206-336-853.003	TELEPHONE STATION 3	52.28	360.16	1,000.00	639.84	36.02
206-336-863.001	VEHICLE MAINTENANCE	11,077.06	17,661.59	60,000.00	42,338.41	29.44
206-336-863.002	TIRES	0.00	0.00	10,000.00	10,000.00	0.00
206-336-864.000	CONFERENCES & MEETINGS	0.00	3,528.90	1,500.00	(2,028.90)	235.26
206-336-867.000	GASOLINE	197.38	13,130.40	25,000.00	11,869.60	52.52
206-336-903.000	LEGAL NOTICES	0.00	0.00	200.00	200.00	0.00
206-336-910.000	INSURANCE	11,719.13	46,780.89	60,000.00	13,219.11	77.97
206-336-921.001	ELECTRIC STATION 1	926.14	6,031.92	13,500.00	7,468.08	44.68
206-336-921.002	ELECTRIC STATION 2	402.58	2,213.39	5,500.00	3,286.61	40.24
206-336-921.003	ELECTRIC STATION 3	148.95	1,002.93	2,500.00	1,497.07	40.12
206-336-923.001	HEAT STATION 1	470.05	2,956.54	5,000.00	2,043.46	59.13
206-336-923.002	HEAT STATION 2	110.77	1,455.30	3,000.00	1,544.70	48.51
206-336-923.003	HEAT STATION 3	87.99	1,202.85	3,000.00	1,797.15	40.10
206-336-931.001	MAINTENANCE STATION 1	493.75	9,459.28	15,000.00	5,540.72	63.06
206-336-931.002	MAINTENANCE STATION 2	266.63	10,429.05	10,000.00	(429.05)	104.29
206-336-931.003	MAINTENANCE STATION 3	39.00	1,218.98	5,000.00	3,781.02	24.38
206-336-933.000	EQUIPMENT MAINTENANCE	800.47	4,751.18	18,000.00	13,248.82	26.40
206-336-957.000	SUBSCRIPTIONS	0.00	89.00	4,500.00	4,411.00	1.98
206-336-958.000	MEMBERSHIPS & DUES	0.00	2,594.30	8,000.00	5,405.70	32.43
206-336-960.000	TRAINING	3,983.56	12,317.03	20,000.00	7,682.97	61.59
206-336-962.000	MISCELLANEOUS	315.00	645.00	3,000.00	2,355.00	21.50
OTHER		39,369.89	199,729.77	392,650.00	192,920.23	45.88
AQUISTITIONS						
206-336-977.000	EQUIPMENT ACQUISITIONS 04M	23,967.00	58,121.83	545,000.00	486,878.17	10.66
206-336-977.001	SUPPLY ACQUISITIONS 04M	844.99	14,029.72	25,000.00	10,970.28	56.12
AQUISTITIONS		24,811.99	72,151.55	570,000.00	497,848.45	12.66
<hr/>						
TOTAL EXPENDITURES		409,534.67	1,750,737.74	4,183,600.00	2,432,862.26	41.85
<hr/>						
Fund 206 - FIRE:						
TOTAL REVENUES		(6,650.24)	3,564,367.39	4,183,600.00	619,232.61	85
TOTAL EXPENDITURES		409,534.67	1,750,737.74	4,183,600.00	2,432,862.26	41
NET OF REVENUES & EXPENDITURES		(416,184.91)	1,813,629.65	0.00	(1,813,629.65)	100.00

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR	YTD BALANCE	2022	AVAILABLE	% BDGT
		MONTH	06/30/2022	AMENDED BUDGET	BALANCE	USED

REVENUE AND EXPENDITURE REPORT FOR WHITE LAKE TOWNSHIP

Section 6, Item A.

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BGD USED
Fund 207 - POLICE						
Revenues						
REVENUES						
207-000-393.000	DESIGNATED FUND BALANCE	0.00	0.00	575,772.00	575,772.00	0.00
207-000-402.000	TAX COLLECTIONS	0.00	5,803,692.87	5,789,808.00	(13,884.87)	100.24
207-000-530.001	GRANTS - OTHER	11,371.11	23,486.36	0.00	(23,486.36)	100.00
207-000-546.000	CRIMINAL JUSTICE TRNG 302 FUNDS	0.00	1,588.16	4,500.00	2,911.84	35.29
207-000-577.000	LIQUOR LICENSES	0.00	68.75	11,000.00	10,931.25	0.63
207-000-601.000	LIASON OFFICER REIMBURSEMENT	51,049.20	51,049.20	30,000.00	(21,049.20)	170.16
207-000-607.000	SEX OFFENDERS REGISTRY FEE	900.00	2,600.00	1,500.00	(1,100.00)	173.33
207-000-608.001	WARRANT PROCESSING FEES	110.00	440.00	1,000.00	560.00	44.00
207-000-627.000	DUPLICATING & PHOTOSTAT	365.63	801.94	2,500.00	1,698.06	32.08
207-000-656.000	ORDINANCE FINES & COSTS	27,158.80	80,497.78	110,000.00	29,502.22	73.18
207-000-665.000	INTEREST	0.00	5,483.49	14,000.00	8,516.51	39.17
207-000-665.002	INTEREST INCOME-TAX FUND	0.00	(689.15)	1,500.00	2,189.15	(45.94)
207-000-673.000	SALE OF FIXED ASSETS	0.00	9,900.00	20,000.00	10,100.00	49.50
207-000-684.000	CROSSING GUARDS REIMBURSEMENT	0.00	0.00	4,000.00	4,000.00	0.00
207-000-685.000	OAKLAND CTY 911 REIMBURSEMENT	0.00	3,731.00	5,500.00	1,769.00	67.84
207-000-690.000	INSURANCE REBATES	0.00	320.57	0.00	(320.57)	100.00
207-000-695.000	MISCELLANEOUS REVENUE	5,285.38	21,619.88	1,000.00	(20,619.88)	2,161.99
REVENUES		96,240.12	6,004,590.85	6,572,080.00	567,489.15	91.37
TOTAL REVENUES						
		96,240.12	6,004,590.85	6,572,080.00	567,489.15	91.37
Expenditures						
OTHER						
207-301-801.001	HR SERVICES	0.00	0.00	64,000.00	64,000.00	0.00
OTHER		0.00	0.00	64,000.00	64,000.00	47.60
CIVIL SERVICE						
207-220-710.000	FEES & PER DIEM-CIVIL SVC	0.00	0.00	1,000.00	1,000.00	0.00
207-220-727.000	SUPPLIES-CIVIL SVC	0.00	0.00	1,000.00	1,000.00	0.00
207-220-903.000	LEGAL NOTICES-CIVIL SVC	0.00	0.00	1,000.00	1,000.00	0.00
CIVIL SERVICE		0.00	0.00	3,000.00	3,000.00	0.00
SALARIES						
207-301-705.000	SALARIES CHIEF	8,141.12	53,667.28	102,755.00	49,087.72	52.23
207-301-706.001	SALARIES LIEUTENANTS	15,124.75	94,779.49	277,518.00	182,738.51	34.15
207-301-706.002	SALARIES SERGEANTS	29,153.62	180,313.31	345,800.00	165,486.69	52.14
207-301-706.003	SALARIES POLICE OFFICERS	110,529.30	718,450.41	1,535,893.00	817,442.59	46.78
207-301-706.004	SALARIES DISPATCHERS	24,569.01	164,047.70	300,100.00	136,052.30	54.66
207-301-706.005	SALARIES CLERICAL	15,050.80	104,274.56	198,454.00	94,179.44	52.54
207-301-706.006	SALARIES CADET	3,000.00	22,387.50	46,800.00	24,412.50	47.84
207-301-709.001	OVERTIME	18,523.20	74,541.57	165,000.00	90,458.43	45.18
207-301-709.002	COURT TIME	703.34	3,957.46	45,000.00	41,042.54	8.79
207-301-709.003	SHIFT PREMIUM	0.00	0.00	25,000.00	25,000.00	0.00
207-301-720.000	HOLIDAY PAY	0.00	0.00	121,200.00	121,200.00	0.00
SALARIES		224,795.14	1,416,419.28	3,163,520.00	1,747,100.72	44.77
PAYROLL BENEFITS						
207-301-715.000	SOCIAL SECURITY	16,675.14	104,273.45	241,000.00	136,726.55	44.71
207-301-716.000	HOSP & OPTICAL INSURANCE	54,770.21	322,918.05	747,000.00	424,081.95	44.71
207-301-716.001	RETIREE HOSP & OPTICAL INSURANCE	26,532.58	160,719.72	359,750.00	199,030.28	44.71

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 207 - POLICE						
Expenditures						
207-301-717.000	GROUP LIFE INSURANCE	0.00	1,153.95	4,320.00	3,166.05	26.71
207-301-718.000	PENSION	55,570.63	338,855.55	712,000.00	373,144.45	47.59
207-301-718.001	HEALTH CARE SAVINGS PROGRAM	4,500.04	27,126.65	57,200.00	30,073.35	47.42
207-301-718.003	OPEB FUNDING	250,000.00	250,000.00	250,000.00	0.00	100.00
207-301-719.000	WORKERS COMP INSURANCE	0.00	13,546.25	87,300.00	73,753.75	15.52
207-301-722.000	UNEMPLOYMENT INSURANCE	200.77	7,935.10	11,340.00	3,404.90	69.97
207-301-724.000	DENTAL INSURANCE	0.00	10,302.02	34,000.00	23,697.98	30.30
PAYROLL BENEFITS		408,249.37	1,236,830.74	2,503,910.00	1,267,079.26	49.40
OTHER						
207-301-727.000	OFFICE SUPPLIES	1,167.24	4,336.21	11,000.00	6,663.79	39.42
207-301-729.000	PRINTING	0.00	0.00	500.00	500.00	0.00
207-301-741.000	FIRE ARMS, TRNG & RANGE SUPPLIES	66.15	2,634.10	7,000.00	4,365.90	37.63
207-301-744.000	UNIFORMS	1,731.77	5,312.07	6,000.00	687.93	88.53
207-301-744.004	UNIFORM ALLOWANCE PAYOUT	0.00	20,400.00	24,000.00	3,600.00	85.00
207-301-757.000	OPERATING SUPPLIES	351.40	2,735.44	12,000.00	9,264.56	22.80
207-301-805.000	SEX OFFENDERS REGISTRY FEE	540.00	1,560.00	1,500.00	(60.00)	104.00
207-301-807.000	AUDIT FEES	0.00	4,000.00	4,500.00	500.00	88.89
207-301-818.000	COMPUTER SERVICES	0.00	5,629.24	10,000.00	4,370.76	56.29
207-301-826.000	LEGAL FEES-PROSECUTIONS	7,500.00	37,500.00	91,000.00	53,500.00	41.21
207-301-826.001	TAX TRIBUNAL REFUNDS	0.00	0.00	8,000.00	8,000.00	0.00
207-301-826.002	LEGAL FEES - LABOR RELATED	0.00	2,887.50	30,000.00	27,112.50	9.63
207-301-851.000	EQUIPMENT REPAIRS	0.00	0.00	3,000.00	3,000.00	0.00
207-301-853.000	TELEPHONE	1,253.35	4,200.78	15,000.00	10,799.22	28.01
207-301-860.000	MILEAGE	0.00	0.00	1,000.00	1,000.00	0.00
207-301-861.000	WITNESS FEES	14.00	41.30	1,000.00	958.70	4.13
207-301-863.001	VEHICLE MAINTENANCE	3,703.85	19,308.33	45,000.00	25,691.67	42.91
207-301-863.002	TIRES	0.00	1,768.91	4,000.00	2,231.09	44.22
207-301-864.000	CONFERENCES	0.00	1,934.27	7,000.00	5,065.73	27.63
207-301-867.000	GASOLINE	0.00	33,099.26	60,000.00	26,900.74	55.17
207-301-903.000	LEGAL NOTICES	0.00	0.00	500.00	500.00	0.00
207-301-910.000	INSURANCE	32,661.68	131,169.71	155,000.00	23,830.29	84.63
207-301-931.001	BLDG MAINTENANCE & SUPPLIES	5,274.61	7,738.01	11,000.00	3,261.99	70.35
207-301-933.000	EQUIP LEASE/ MAINT CONTRACTS	131.79	15,430.97	55,000.00	39,569.03	28.06
207-301-934.000	OFFICE EQUIP MAINTENANCE	0.00	80.00	6,000.00	5,920.00	1.33
207-301-958.000	MEMBERSHIPS & DUES	260.00	2,075.00	2,000.00	(75.00)	103.75
207-301-960.000	TRAINING	0.00	14,965.54	16,000.00	1,034.46	93.53
207-301-960.001	CRIMINAL JUSTICE TRNG 302 FUNDS	0.00	0.00	5,700.00	5,700.00	0.00
207-301-960.002	SNC (STATE 911) TRAINING FUNDS	0.00	0.00	5,400.00	5,400.00	0.00
207-301-962.001	MISCELLANEOUS	210.00	1,121.00	8,000.00	6,879.00	14.01
207-301-962.003	EVIDENCE COLLECTION	563.52	963.52	4,000.00	3,036.48	24.09
OTHER		55,429.36	320,891.16	610,100.00	289,208.84	47.60
AQUISITIONS						
207-301-977.000	EQUIPMENT ACQUISITIONS	2,801.13	127,822.70	200,000.00	72,177.30	63.91
207-301-977.003	ACCREDITATION, SOFTWARE, MTCE	0.00	5,876.37	8,000.00	2,123.63	73.45
AQUISITIONS		2,801.13	133,699.07	208,000.00	74,300.93	64.28
CROSSING GUARDS						
207-316-707.000	SALARIES PT - CROSSING GUARDS	1,260.00	9,120.00	16,800.00	7,680.00	54.29
207-316-715.000	SOCIAL SECURITY-CROSSING GUARDS	96.40	488.88	1,285.00	796.12	38.05
207-316-719.000	WORKERS COMP -CROSSING GUARDS	0.00	110.25	960.00	849.75	11.00
207-316-722.000	UNEMPLOYMENT INSUR CROSSING GUARDS	26.48	133.56	505.00	371.44	26.00
CROSSING GUARDS		1,382.88	9,852.69	19,550.00	9,697.31	50.40

REVENUE AND EXPENDITURE REPORT FOR WHITE LAKE TOWNSHIP
 PERIOD ENDING 06/30/2022

Section 6, Item A.

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 207 - POLICE Expenditures						
TOTAL EXPENDITURES		692,657.88	3,117,692.94	6,572,080.00	3,454,387.06	47.44
Fund 207 - POLICE:						
TOTAL REVENUES		96,240.12	6,004,590.85	6,572,080.00	567,489.15	91.37
TOTAL EXPENDITURES		692,657.88	3,117,692.94	6,572,080.00	3,454,387.06	47.44
NET OF REVENUES & EXPENDITURES		(596,417.76)	2,886,897.91	0.00	(2,886,897.91)	100.00

REVENUE AND EXPENDITURE REPORT FOR WHITE LAKE TOWNSHIP

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 208 - PARKS AND RECREATION FUND						
Revenues						
REVENUES						
208-000-393.000	FUND BALANCE - DESIGNATED	0.00	0.00	917,889.00	917,889.00	0.00
208-000-402.000	PARKS AND RECREATION TAX COLLECTIONS	0.00	373,452.45	372,611.00	(841.45)	100.23
208-000-530.000	GRANT REVENUES	20.00	20.00	0.00	(20.00)	100.00
208-000-652.000	FIELD RENTAL	240.00	6,755.00	6,000.00	(755.00)	112.58
208-000-665.000	INTEREST	0.00	1,898.83	3,500.00	1,601.17	54.25
208-000-695.000	MISCELLANEOUS REVENUE	0.00	500.00	0.00	(500.00)	100.00
REVENUES		260.00	382,626.28	1,300,000.00	917,373.72	29.43
<hr/>						
TOTAL REVENUES		260.00	382,626.28	1,300,000.00	917,373.72	29.43
<hr/>						
Expenditures						
EXPENSES						
208-000-710.000	FEE'S AND PER DIEM	0.00	753.87	2,250.00	1,496.13	33.51
208-000-715.000	SOC SEC & MEDICARE TAX	0.00	27.81	250.00	222.19	11.12
208-000-720.000	EVENT EXPENSES	2,575.00	2,575.00	3,000.00	425.00	85.83
208-000-722.000	MI UNEMPLOYMENT TAX	0.00	3.15	50.00	46.85	6.30
208-000-801.000	PROFESSIONAL SERVICES	0.00	1,050.00	35,000.00	33,950.00	3.00
208-000-903.000	LEGAL PUBLICATIONS	0.00	0.00	250.00	250.00	0.00
208-000-910.000	INSURANCE	1,160.11	4,614.61	5,000.00	385.39	92.29
208-000-921.000	ELECTRIC JUDY HAWLEY PARK	15.41	114.20	1,000.00	885.80	11.42
208-000-921.001	ELECTRIC - VETTER PARK	25.89	79.94	1,000.00	920.06	7.99
208-000-922.000	UTILITIES- PARKS	330.00	1,980.00	3,400.00	1,420.00	58.24
208-000-931.001	GROUNDS MAINTENANCE	3,095.00	11,276.98	60,000.00	48,723.02	18.79
208-000-932.000	PARK EQUIPMENT	0.00	0.00	25,000.00	25,000.00	0.00
208-000-958.000	MEMBERSHIPS AND DUES	0.00	0.00	800.00	800.00	0.00
208-000-962.000	MISCELLANEOUS	0.00	0.00	3,000.00	3,000.00	0.00
208-000-972.000	PATHWAY PROJECTS	0.00	29,957.50	600,000.00	570,042.50	4.99
208-000-973.000	BLOOMER PARK IMPROVEMENTS	0.00	0.00	10,000.00	10,000.00	0.00
208-000-974.000	PARK IMPROVEMENTS	0.00	0.00	550,000.00	550,000.00	0.00
EXPENSES		7,201.41	52,433.06	1,300,000.00	1,247,566.94	4.03
<hr/>						
TOTAL EXPENDITURES		7,201.41	52,433.06	1,300,000.00	1,247,566.94	4.03
<hr/>						
Fund 208 - PARKS AND RECREATION FUND:						
TOTAL REVENUES		260.00	382,626.28	1,300,000.00	917,373.72	29.43
TOTAL EXPENDITURES		7,201.41	52,433.06	1,300,000.00	1,247,566.94	4.03
NET OF REVENUES & EXPENDITURES		(6,941.41)	330,193.22	0.00	(330,193.22)	100.00

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR	YTD BALANCE	2022	AVAILABLE	% BDGT
		MONTH	06/30/2022	AMENDED BUDGET	BALANCE	USED
		06/30/2022	06/30/2022			
Fund 249 - BUILDING DEPARTMENT FUND						
Revenues						
REVENUES						
249-000-393.000	FUND BALANCE - DESIGNATED	0.00	0.00	120,638.00	120,638.00	0.00
REVENUES		0.00	0.00	120,638.00	120,638.00	0.00
BUILDING REVENUE						
249-000-452.000	CONTRACTORS GENERAL LICENSES	260.00	2,360.00	4,000.00	1,640.00	59.00
249-000-453.000	ELECTRICAL LICENSES	260.00	1,460.00	2,200.00	740.00	66.36
249-000-454.000	HEATING LICENSES	150.00	705.00	1,200.00	495.00	58.75
249-000-455.000	PLUMBING LICENSES	9.00	640.00	100.00	(540.00)	640.00
249-000-477.000	BUILDING PERMITS	34,843.00	219,797.96	350,000.00	130,202.04	62.80
249-000-478.000	ELECTRICAL PERMITS	5,960.00	43,446.50	72,000.00	28,553.50	60.34
249-000-479.000	HEATING PERMITS	12,200.00	60,310.00	105,000.00	44,690.00	57.44
249-000-480.000	PLUMBING PERMITS	4,474.00	24,892.00	45,000.00	20,108.00	55.32
249-000-482.000	PLOT PLAN REVIEWS	0.00	0.00	15,000.00	15,000.00	0.00
249-000-484.000	BUILDING PLAN REVIEWS	0.00	0.00	20,000.00	20,000.00	0.00
249-000-484.001	FIRE SAFETY REVIEWS	0.00	1,249.50	4,000.00	2,750.50	31.24
249-000-665.000	INTEREST	0.00	1,405.04	0.00	(1,405.04)	100.00
249-000-695.000	MISCELLANEOUS REVENUE	700.00	16,950.00	5,000.00	(11,950.00)	339.00
BUILDING REVENUE		58,856.00	373,216.00	623,500.00	250,284.00	59.86
TOTAL REVENUES		58,856.00	373,216.00	744,138.00	370,922.00	50.15
Expenditures						
SALARIES						
249-000-706.001	SALARIES BLDG OFFICIAL	6,444.30	42,519.43	81,335.00	38,815.57	52.28
249-000-706.002	SALARIES CLERICAL	8,132.41	54,578.53	102,643.00	48,064.47	53.17
249-000-706.003	CONTRACT BLDG INSPECTORS	5,790.00	25,500.00	60,000.00	34,500.00	42.50
249-000-706.005	BUILDING INSPECTOR	0.00	0.00	60,000.00	60,000.00	0.00
249-000-707.000	ELECTRICAL INSPECTOR	4,167.00	22,263.30	50,000.00	27,736.70	44.53
249-000-707.001	PLUMBING/MECHANICAL INSPECTOR	7,853.70	44,642.10	100,000.00	55,357.90	44.64
249-000-709.000	OVERTIME	0.00	0.00	10,000.00	10,000.00	0.00
SALARIES		32,387.41	189,503.36	463,978.00	274,474.64	40.84
PAYROLL BENEFITS						
249-000-715.000	SOCIAL SECURITY	1,121.57	7,271.11	20,200.00	12,928.89	36.00
249-000-716.000	HOSP & OPTICAL INSURANCE	2,655.72	15,862.56	62,115.00	46,252.44	25.54
249-000-717.000	GROUP LIFE INSURANCE	0.00	94.20	435.00	340.80	21.66
249-000-718.000	PENSION	793.81	4,830.11	10,565.00	5,734.89	45.72
249-000-718.001	HEALTH CARE SAVINGS PROGRAM	300.00	1,800.00	4,800.00	3,000.00	37.50
249-000-718.002	OPEB FUNDING	50,000.00	50,000.00	50,000.00	0.00	100.00
249-000-719.000	WORKERS COMP INSURANCE	0.00	499.75	4,220.00	3,720.25	11.84
249-000-722.000	UNEMPLOYMENT INSURANCE	0.00	574.43	685.00	110.57	83.86
249-000-724.000	DENTAL INSURANCE	0.00	594.64	4,240.00	3,645.36	14.02
PAYROLL BENEFITS		54,871.10	81,526.80	157,260.00	75,733.20	51.84
EXPENSES						
249-000-727.000	OFFICE SUPPLIES	112.41	2,041.18	2,000.00	(41.18)	102.06
249-000-730.000	POSTAGE	0.00	359.32	100.00	(259.32)	359.32
249-000-757.000	OPERATING SUPPLIES	0.00	184.99	2,500.00	2,315.01	50.00
249-000-801.000	PROFESSIONAL FEES	400.00	17,695.62	35,000.00	17,304.38	50.00
249-000-801.001	HR SERVICES	0.00	0.00	4,600.00	4,600.00	0.00

REVENUE AND EXPENDITURE REPORT FOR WHITE LAKE TOWNSHIP
 PERIOD ENDING 06/30/2022

Section 6, Item A.

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 249 - BUILDING DEPARTMENT FUND						
Expenditures						
249-000-807.000	AUDIT FEES	0.00	3,500.00	3,500.00	0.00	100.00
249-000-853.000	CELLULAR PHONE	84.00	420.00	1,000.00	580.00	42.00
249-000-863.000	VEHICLE MAINTENANCE	208.00	208.00	1,500.00	1,292.00	13.87
249-000-864.000	CONFERENCES & MEETINGS	0.00	0.00	2,000.00	2,000.00	0.00
249-000-867.000	GASOLINE	0.00	296.43	1,500.00	1,203.57	19.76
249-000-910.000	INSURANCE	858.13	3,410.88	3,700.00	289.12	92.19
249-000-957.000	SUBSCRIPTIONS	0.00	0.00	1,000.00	1,000.00	0.00
249-000-958.000	MEMBERSHIPS & DUES	0.00	390.00	2,000.00	1,610.00	19.50
249-000-960.000	TRAINING	0.00	0.00	2,000.00	2,000.00	0.00
249-000-962.000	MISCELLANEOUS	158.00	541.30	500.00	(41.30)	108.26
249-000-971.000	TECHNOLOGY EQUIPMENT	216.64	1,300.82	15,000.00	13,699.18	8.67
249-000-977.000	EQUIPMENT ACQUISITIONS	0.00	0.00	45,000.00	45,000.00	0.00
EXPENSES		2,037.18	30,348.54	122,900.00	92,551.46	24.69
<hr/>						
TOTAL EXPENDITURES		89,295.69	301,378.70	744,138.00	442,759.30	40.50
<hr/>						
Fund 249 - BUILDING DEPARTMENT FUND:						
TOTAL REVENUES		58,856.00	373,216.00	744,138.00	370,922.00	50.15
TOTAL EXPENDITURES		89,295.69	301,378.70	744,138.00	442,759.30	40.50
NET OF REVENUES & EXPENDITURES		(30,439.69)	71,837.30	0.00	(71,837.30)	100.00

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 591 - WATER						
Revenues						
REVENUES						
591-000-393.000	FUND BALANCE - DESIGNATED	0.00	0.00	510,170.00	510,170.00	0.00
591-000-445.000	PENALTIES	0.00	4,649.11	10,314.00	5,664.89	45.08
591-000-530.000	GRANT REVENUE	0.00	5,043.75	13,524.00	8,480.25	37.29
591-000-626.000	METERS	685.44	20,166.23	16,910.00	(3,256.23)	119.26
591-000-627.000	METER INSTALLATIONS	75.00	3,525.00	4,000.00	475.00	88.13
591-000-642.000	WATER	929.44	460,809.91	1,008,401.00	547,591.09	45.70
591-000-650.000	MISC SERVICE CHARGES	75.00	4,707.86	5,591.00	883.14	84.20
591-000-650.001	SPRINKLER SYSTEM	2,657.00	29,898.08	1,710.00	(28,188.08)	1,748.43
591-000-665.000	INTEREST EARNED	0.00	1,794.21	2,000.00	205.79	89.71
591-000-665.004	INTEREST - CAPITAL FUND	0.00	4,949.58	8,000.00	3,050.42	61.87
591-000-665.011	INTEREST INCOME M59 EAST (7)	0.00	458.91	0.00	(458.91)	100.00
591-000-665.015	INTEREST INCOME SIGNED AGREEMENTS	0.00	44.75	0.00	(44.75)	100.00
591-000-673.000	SALE OF FIXED ASSETS	0.00	0.00	25,000.00	25,000.00	0.00
591-000-674.001	CONNECTION FEES	0.00	75,075.00	107,432.00	32,357.00	69.88
591-000-695.000	MISCELLANEOUS INCOME	20.00	3,758.68	5,000.00	1,241.32	75.17
591-000-696.002	DWRP LOAN REIMBURSEMENTS	0.00	608,774.00	0.00	(608,774.00)	100.00
591-000-699.000	SEWER ADMIN FEES	0.00	0.00	155,000.00	155,000.00	0.00
REVENUES		4,441.88	1,223,655.07	1,873,052.00	649,396.93	65.33
TOTAL REVENUES		4,441.88	1,223,655.07	1,873,052.00	649,396.93	65.33
Expenditures						
OFFICE SUPPLIES						
591-000-727.000	OFFICE SUPPLIES	416.28	2,074.20	6,000.00	3,925.80	34.57
591-000-730.000	POSTAGE	0.00	1,272.02	3,000.00	1,727.98	42.40
OFFICE SUPPLIES		416.28	3,346.22	9,000.00	5,653.78	37.18
OTHER						
591-000-958.000	DUES & MISC	1,015.00	1,015.00	5,000.00	3,985.00	20.30
591-000-960.000	EDUCATION & TRAINING	6,000.00	6,837.65	5,000.00	(1,837.65)	136.75
591-000-962.000	MISCELLANEOUS	292.00	327.00	1,000.00	673.00	32.70
591-000-968.000	DEPRECIATION WATER SYSTEM	0.00	0.00	325,000.00	325,000.00	0.00
591-000-969.000	DEPRECIATION & AMORTIZATION	0.00	0.00	70,000.00	70,000.00	0.00
591-000-976.000	BOND INTEREST-DWRP	0.00	7,437.50	15,150.00	7,712.50	49.09
591-000-991.001	PRINCIPAL COPIER LEASE	141.13	828.00	1,650.00	822.00	50.18
591-000-995.000	MISC SERVICE CHARGES	0.00	968.70	0.00	(968.70)	100.00
591-000-995.001	WELL HEAD PROTECTION PROGRAM	600.00	12,395.50	33,000.00	20,604.50	37.56
591-000-995.002	INTEREST COPIER LEASE	6.87	60.00	135.00	75.00	44.44
OTHER		8,055.00	29,869.35	455,935.00	426,065.65	6.64
SALARIES						
591-000-703.000	MANAGER SALARIES	7,104.00	46,926.14	89,665.00	42,738.86	52.33
591-000-706.000	WAGES CLERICAL	7,704.46	50,970.32	95,700.00	44,729.68	53.26
591-000-707.000	WAGES MAINTENANCE	6,690.01	41,896.49	145,825.00	103,928.51	28.73
591-000-707.001	WAGES PART TIME	7,330.03	11,404.14	10,000.00	(1,404.14)	114.04
591-000-707.002	WEEKEND ON CALL WATER OPERATOR	200.70	665.10	4,000.00	3,334.90	16.63
591-000-709.000	WAGES OVERTIME	881.20	5,378.52	5,000.00	(378.52)	107.57
SALARIES		29,910.40	157,240.71	350,190.00	192,949.29	4
PAYROLL BENEFITS						

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR	YTD BALANCE	2022	AVAILABLE	% BGD
		MONTH	06/30/2022	AMENDED BUDGET	BALANCE	USED
		06/30/2022	06/30/2022			
Fund 591 - WATER						
Expenditures						
591-000-715.000	SOCIAL SECURITY	2,262.53	11,890.88	26,790.00	14,899.12	44.39
591-000-716.000	HOSP & OPTICAL INSURANCE	6,496.50	31,352.95	129,820.00	98,467.05	24.15
591-000-717.000	GROUP LIFE INSURANCE	0.00	133.45	650.00	516.55	20.53
591-000-718.000	PENSION	1,262.64	7,990.33	15,550.00	7,559.67	51.38
591-000-718.001	HEALTH CARE SAVINGS PLAN	500.00	2,900.00	7,200.00	4,300.00	40.28
591-000-719.000	WORKERS COMP INSURANCE	0.00	1,584.50	12,220.00	10,635.50	12.97
591-000-720.000	OTHER POST RETIREMENT BENEFITS	70,000.00	70,000.00	70,000.00	0.00	100.00
591-000-722.000	UNEMPLOYMENT INSURANCE	232.08	1,364.61	1,890.00	525.39	72.20
591-000-724.000	DENTAL INSURANCE	0.00	855.38	4,600.00	3,744.62	18.60
PAYROLL BENEFITS		80,753.75	128,072.10	268,720.00	140,647.90	47.66
OTHER						
591-000-976.005	BOND INTEREST NORDIC DR MAIN	0.00	489.60	950.00	460.40	51.54
OTHER		0.00	489.60	950.00	460.40	6.64
OPERATING EXPENSES						
591-000-740.000	OPERATING SUPPLIES	849.28	7,127.71	9,000.00	1,872.29	79.20
591-000-744.000	SAFETY GEAR AND CLOTHING	865.48	13,029.53	4,000.00	(9,029.53)	325.74
591-000-745.000	SYSTEM CHEMICALS	4,096.80	18,671.68	50,000.00	31,328.32	37.34
591-000-748.000	TESTING WATER SYSTEMS	2,592.00	6,125.60	13,800.00	7,674.40	44.39
591-000-748.004	TESTING VILL ACRES	0.00	892.00	0.00	(892.00)	100.00
591-000-750.000	OPERATING SUPPLIES METERS	0.00	15,765.77	100,000.00	84,234.23	15.77
591-000-750.001	OPERATING SUPP METER TRANSMITT	0.00	0.00	40,000.00	40,000.00	0.00
591-000-755.000	OPERATING SUPPLIES TOOLS	1,125.71	1,751.78	8,000.00	6,248.22	21.90
591-000-801.000	FINANCIAL CONSULT FEES	2,300.00	2,300.00	5,000.00	2,700.00	46.00
591-000-801.001	HR SERVICES	0.00	0.00	9,150.00	9,150.00	0.00
591-000-802.000	ENG & ARCH FEES	9,672.50	38,982.75	50,000.00	11,017.25	77.97
591-000-803.000	IRON FILTRATION EXPENSES	0.00	8,719.30	16,400.00	7,680.70	53.17
591-000-807.000	ACCOUNTING & AUDITING	0.00	4,000.00	4,000.00	0.00	100.00
591-000-818.000	CONTRACTED SERVICES	2,460.23	10,266.07	40,000.00	29,733.93	25.67
591-000-826.000	ATTORNEY FEES	98.00	1,458.00	6,000.00	4,542.00	24.30
591-000-853.000	TELEPHONE/CELL PHONE SERVICES	712.75	2,910.21	6,000.00	3,089.79	48.50
591-000-867.000	GASOLINE/FUEL	0.00	3,605.37	5,000.00	1,394.63	72.11
591-000-903.000	LEGAL NOTICES	370.50	370.50	2,000.00	1,629.50	18.53
591-000-911.000	GENERAL LIAB INSURANCE	7,901.57	31,572.63	35,000.00	3,427.37	90.21
OPERATING EXPENSES		33,044.82	167,548.90	403,350.00	235,801.10	41.54
MAINTENANCE						
591-000-863.000	REPAIRS & MAINT VEHICLES	16.72	3,647.38	3,200.00	(447.38)	113.98
591-000-931.000	REPAIR & MAINT BLDG & EQUIP	14,410.21	25,719.05	50,000.00	24,280.95	51.44
591-000-931.001	GROUND MAINTENANCE	0.00	775.00	15,000.00	14,225.00	5.17
591-000-934.000	REPAIR & MAINT WATER SYSTEM	2,359.88	12,065.53	50,000.00	37,934.47	24.13
591-000-934.001	REPAIR & MAINT TOWER 1	0.00	856.00	25,000.00	24,144.00	3.42
591-000-934.002	REPAIR & MAINT TOWER 2	0.00	0.00	140,000.00	140,000.00	0.00
591-000-935.000	REPAIR METERS	0.00	0.00	1,000.00	1,000.00	0.00
MAINTENANCE		16,786.81	43,062.96	284,200.00	241,137.04	15.15
UTILITIES						
591-000-921.000	ELECTRICITY TOWER	41.06	350.17	1,000.00	649.83	35.02
591-000-921.001	ELECTRICITY TL	5,880.17	8,910.83	4,000.00	(4,910.83)	222.77
591-000-921.002	ELECTRICITY HILLVIEW	720.99	2,584.74	18,107.00	15,522.26	14.10
591-000-921.004	ELECTRICITY VILLAGE ACRES	0.00	12,695.20	46,000.00	33,304.80	21.15
591-000-921.005	ELECTRICITY SUBURBAN KNOLLS	0.00	50.56	0.00	(50.56)	100.00

REVENUE AND EXPENDITURE REPORT FOR WHITE LAKE TOWNSHIP

Section 6, Item A.

PERIOD ENDING 06/30/2022

GL NUMBER	DESCRIPTION	ACTIVITY FOR MONTH 06/30/2022	YTD BALANCE 06/30/2022	2022 AMENDED BUDGET	AVAILABLE BALANCE	% BDGT USED
Fund 591 - WATER						
Expenditures						
591-000-921.006	ELECTRICITY GRASS LAKE	514.38	5,368.77	23,000.00	17,631.23	23.34
591-000-921.007	ELECTRICITY TOWER #2	34.45	903.68	1,300.00	396.32	69.51
591-000-921.008	ELECTRICITY-HURONDALE	46.63	876.57	2,500.00	1,623.43	35.06
591-000-921.010	ELECTRICITY 933 WILLIAMS-HURONDALE	17.80	167.75	300.00	132.25	55.92
591-000-923.001	GAS TWIN LAKES	69.87	679.14	1,000.00	320.86	67.91
591-000-923.002	GAS HILLVIEW	28.46	485.50	1,000.00	514.50	48.55
591-000-923.004	GAS GRASS LAKE	72.98	581.31	1,000.00	418.69	58.13
591-000-923.005	GAS VILLAGE ACRES-SATELITE RD	75.05	790.26	1,500.00	709.74	52.68
UTILITIES		7,501.84	34,444.48	100,707.00	66,262.52	34.20
TOTAL EXPENDITURES		176,468.90	564,074.32	1,873,052.00	1,308,977.68	30.12
Fund 591 - WATER:						
TOTAL REVENUES		4,441.88	1,223,655.07	1,873,052.00	649,396.93	65.33
TOTAL EXPENDITURES		176,468.90	564,074.32	1,873,052.00	1,308,977.68	30.12
NET OF REVENUES & EXPENDITURES		(172,027.02)	659,580.75	0.00	(659,580.75)	100.00
TOTAL REVENUES - ALL FUNDS						
TOTAL EXPENDITURES - ALL FUNDS		752,113.46	14,882,543.94	20,713,128.00	5,830,584.06	71.85
NET OF REVENUES & EXPENDITURES		2,070,964.08	8,629,732.89	20,713,128.00	12,083,395.11	41.66
NET OF REVENUES & EXPENDITURES		(1,318,850.62)	6,252,811.05	0.00	(6,252,811.05)	100.00

WHITE LAKE TWP.
 JUNE 2022 CHECK DISBURSEMENTS

Section 6, Item B.

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-000-080.962	DUE FROM WATER MISCELLAN	500.00
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-000-232.005	PAY DEDUCT HOSP	538.63
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-171-718.001	HEALTH CARE SAVINGS PROGR,	200.00
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-209-718.001	HEALTH CARE SAVINGS PROGR,	300.00
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-215-718.001	HEALTH CARE SAVINGS PROGR,	532.02
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-253-718.001	HEALTH CARE SAVINGS PROGR,	396.40
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-265-718.001	HEALTH CARE SAVINGS PROGR,	100.00
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-402-718.001	HEALTH CARE SAVINGS PROGR,	200.00
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	101-757-718.001	HEALTH CARE SAVINGS PROGR,	100.00
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	206-000-232.005	PAY DEDUCT HOSP	1,279.46
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	206-336-718.002	HEALTH CARE SAVINGS PLAN	1,492.70
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	207-000-232.005	PAY DEDUCT HOSP	3,614.74
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	207-301-718.001	HEALTH CARE SAVINGS PROGR,	4,217.20
06/02/2022	GEN	89953	ALERUS FINANCIAL	05/01/22-05/31/22 HCSP CONTRIBUTIONS	249-000-718.001	HEALTH CARE SAVINGS PROGR,	300.00
06/02/2022	GEN	89954	AMAZON	2022 WALL CALENDAR (PLANNING)	101-249-727.000	OFFICE SUPPLIES	55.46
06/02/2022	GEN	89954	AMAZON	RETURN DESK ORGANIZER	206-336-727.000	OFFICE SUPPLIES	(22.48)
06/02/2022	GEN	89954	AMAZON	SETTECERRI, BOOTS	206-336-744.000	UNIFORMS	155.62
06/02/2022	GEN	89954	AMAZON	MAGNETIC PAPER TOWEL HOLDER, CUPS	206-336-757.000	OPERATING SUPPLIES	236.64
06/02/2022	GEN	89954	AMAZON	FOGWORX FOG JUICE, FOG MACHINE	206-336-960.000	TRAINING	89.49
06/02/2022	GEN	89954	AMAZON	PENS, CRDG, DVDS, HIGHLIGHTERS, FINGER TIPS	207-301-727.000	OFFICE SUPPLIES	466.25
06/02/2022	GEN	89955	AT & T	APR 20 - MAY 19, 2022 MONTHLY CHARGES	101-000-036.000	DUE FROM OTHERS	(1,309.99)
06/02/2022	GEN	89955	AT & T	APR 20 - MAY 19, 2022 MONTHLY CHARGES	101-000-080.853	DUE FROM WATER PHONE BILL	193.04
06/02/2022	GEN	89955	AT & T	APR 20 - MAY 19, 2022 MONTHLY CHARGES	101-265-853.000	TELEPHONE	906.72
06/02/2022	GEN	89955	AT & T	APR 20 - MAY 19, 2022 MONTHLY CHARGES	101-269-853.001	TELEPHONE FISK FARM	30.01
06/02/2022	GEN	89955	AT & T	DUBLIN FAX, APR 20 - MAY 19, 2022 MONTHLY CH/	101-757-853.000	TELEPHONE	152.33
06/02/2022	GEN	89955	AT & T	STA #2, APR 20 - MAY 19, 2022 MONTHLY CHARGE!	206-336-853.000	CELL PHONES	72.22
06/02/2022	GEN	89955	AT & T	STA #1, APR 20 - MAY 19, 2022 MONTHLY CHARGE!	206-336-853.001	TELEPHONE STATION 1	180.04
06/02/2022	GEN	89955	AT & T	APR 20 - MAY 19, 2022 MONTHLY CHARGES	207-301-853.000	TELEPHONE	590.45
06/02/2022	GEN	89956	CDW GOVERNMENT	(3) LOGITECH WRLS COMBO	101-265-971.000	TECHNOLOGY EQUIPMENT	164.61
06/02/2022	GEN	89957	CLOUSER MOBIL DETAILING	CAR DETAILING SERVICES	101-265-863.000	VEHICLE MAINTENANCE	938.00
06/02/2022	GEN	89957	CLOUSER MOBIL DETAILING	CAR DETAILING SERVICES	101-372-863.000	VEHICLE MAINTENANCE	188.00
06/02/2022	GEN	89957	CLOUSER MOBIL DETAILING	CAR DETAILING SERVICES	249-000-863.000	VEHICLE MAINTENANCE	208.00
06/02/2022	GEN	89958	COMCAST	685 UNION 06/01/22-06/30/22 CHARGES	101-757-751.000	SENIOR ACTIVITIES	265.45
06/02/2022	GEN	89958	COMCAST	06/06/22-07/05/22 STA #2 CHARGES	206-336-757.000	OPERATING SUPPLIES	258.74
06/02/2022	GEN	89959	CONSUMERS ENERGY	7525 HIGHLAND 04/23/22-05/23/22 CHARGES	101-265-923.000	HEAT TWP HALL	276.55
06/02/2022	GEN	89959	CONSUMERS ENERGY	7500 HIGHLAND 04/23/22-05/23/22 CHARGES	101-269-923.001	HEAT COMM HALL	95.76
06/02/2022	GEN	89959	CONSUMERS ENERGY	9180 HIGHLAND 04/23/22-05/23/22 CHARGES	101-269-923.004	HEAT FISK	69.64
06/02/2022	GEN	89959	CONSUMERS ENERGY	7527 HIGHLAND 04/23/22-05/23/22 CHARGES	101-269-923.011	GAS-TWP ANNEX	236.49
06/02/2022	GEN	89959	CONSUMERS ENERGY	685 UNION 04/23/22-05/23/22 CHARGES	101-757-923.000	HEAT	120.61
06/02/2022	GEN	89959	CONSUMERS ENERGY	7420 HIGHLAND 04/23/22-05/23/22 CHARGES	206-336-923.001	HEAT STATION 1	2

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/02/2022	GEN	89959	CONSUMERS ENERGY	860 ROUND LK 04/23/22-05/23/22 CHARGES	206-336-923.002	HEAT STATION 2	80.24
06/02/2022	GEN	89959	CONSUMERS ENERGY	4870 ORMOND 04/23/22-05/24/22 CHARGES	206-336-923.003	HEAT STATION 3	64.70
06/02/2022	GEN	89960	DARWEL ENTERPRISES LLC	FD, MONTHLY CHARGES	206-336-931.001	MAINTENANCE STATION 1	68.03
06/02/2022	GEN	89960	DARWEL ENTERPRISES LLC	MONTHLY CHARGES	207-301-931.001	BLDG MAINTENANCE & SUPPLI	104.82
06/02/2022	GEN	89961	DLZ MICHIGAN, INC.	1932 S WILLIAMS TRAFFIC IMPACT STUDY	101-402-801.000	PROFESSIONAL FEES	150.00
06/02/2022	GEN	89961	DLZ MICHIGAN, INC.	1160 SUGDEN LK RD PLOT PLAN	249-000-801.000	PROFESSIONAL FEES	1,750.00
06/02/2022	GEN	89962	DTE ENERGY	685 UNION 04/22/22-05/20/22 CHARGES	101-757-921.000	ELECTRIC	426.30
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-000-080.962	DUE FROM WATER MISCELLAN	633.23
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-101-710.000	FEES & PER DIEM	14.99
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-101-860.000	CONFERENCES & MILEAGE	583.08
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-171-864.000	CONFERENCES & MEETINGS	689.64
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-191-740.000	OPERATING SUPPLIES	346.90
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-215-864.000	CONFERENCES & MEETINGS	626.94
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-215-960.000	TRAINING	(16.00)
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-249-727.000	OFFICE SUPPLIES	29.66
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-265-863.000	VEHICLE MAINTENANCE	34.75
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-265-931.001	BLDG MAINTENANCE & SUPPLI	79.70
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-265-931.002	GROUNDS MAINTENANCE	30.00
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-265-977.000	EQUIPMENT ACQUISITIONS	600.00
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-299-956.000	UNALLOCATED MISCELLANEOU	10.00
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	101-757-751.000	SENIOR ACTIVITIES	356.78
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	206-336-727.000	OFFICE SUPPLIES	229.98
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	206-336-757.000	OPERATING SUPPLIES	534.95
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	206-336-863.001	VEHICLE MAINTENANCE	40.81
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	206-336-864.000	CONFERENCES & MEETINGS	823.99
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	206-336-933.000	EQUIPMENT MAINTENANCE	20.46
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	206-336-958.000	MEMBERSHIPS & DUES	75.00
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	207-301-727.000	OFFICE SUPPLIES	206.16
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	207-301-863.001	VEHICLE MAINTENANCE	100.07
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	207-301-864.000	CONFERENCES	159.91
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	207-301-977.000	EQUIPMENT ACQUISITIONS	575.68
06/02/2022	GEN	89963	FLAGSTAR BANK	04/13/22-05/12/22 CHARGES	249-000-958.000	MEMBERSHIPS & DUES	150.00
06/02/2022	GEN	89964	FRONTIER	MONTHLY CHARGES STA 3	206-336-853.003	TELEPHONE STATION 3	52.28
06/02/2022	GEN	89965	GLOBAL OFFICE SOLUTIONS	(2) MESH CHAIRS	101-249-727.000	OFFICE SUPPLIES	782.60
06/02/2022	GEN	89965	GLOBAL OFFICE SOLUTIONS	BINDERS, DIVIDERS	206-336-727.000	OFFICE SUPPLIES	8.46
06/02/2022	GEN	89965	GLOBAL OFFICE SOLUTIONS	CRTDGS, BOOK RECEIPT	207-301-727.000	OFFICE SUPPLIES	48.11
06/02/2022	GEN	89966	HOUSTON'S LAWN SERVICE	CEMETERY MOWING FOR MAY 2022	101-276-932.000	CEMETERY MAINT	3,090.00
06/02/2022	GEN	89967	JODI MCCLURE	REIMBURSE FOR SMITH RECOGNITION/RETIREMEN	101-299-956.000	UNALLOCATED MISCELLANEOU	36.98
06/02/2022	GEN	89968	KENNEDY INDUSTRIES	BARNES, CABLE (3)	101-000-110.000	GRINDER PUMP INVENTORY CC	453.16
06/02/2022	GEN	89969	KIESLER POLICE SUPPLY	(3) MAGPUL PMAG 30AR	207-301-741.000	FIRE ARMS, TRNG & RANGE SUI	

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/02/2022	GEN	89970	MEI TOTAL ELEVATOR SOLUTIONS	ELEVATOR SERVICE CALL	101-269-931.013	BUILDING MAINTENANCE-TWP	431.77
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-000-036.000	DUE FROM OTHERS	1,274.50
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-000-080.910	DUE FROM WATER LIABILITY IN	7,901.57
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-000-084.590	DUE FROM SEWER FUND	901.74
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-265-910.000	INSURANCE	14,593.38
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-269-910.001	INSURANCE COMM HALL	141.00
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-269-910.004	INSURANCE FISK	482.30
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-269-910.008	INSURANCE-ANNEX	1,517.57
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-276-910.000	INSURANCE	15.57
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-372-910.000	INSURANCE	219.54
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-402-910.000	INSURANCE	1,431.57
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	101-757-910.000	INSURANCE	623.71
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	206-336-910.000	INSURANCE	11,719.13
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	207-301-910.000	INSURANCE	32,661.68
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	208-000-910.000	INSURANCE	1,160.11
06/02/2022	GEN	89971	MICHIGAN MUNICIPAL RISK MAN.	3RD INSTALLMENT	249-000-910.000	INSURANCE	858.13
06/02/2022	GEN	89972	MUNICIPAL EMERGENCY SERVICES	FIRE BOOTS (2)	206-336-977.001	SUPPLY ACQUISITIONS 04M	844.99
06/02/2022	GEN	89973	PETER'S TRUE VALUE HARDWARE	FILTER, FUEL LINE, REPAIR CHARGES	206-336-933.000	EQUIPMENT MAINTENANCE	147.47
06/02/2022	GEN	89974	R & R FIRE TRUCK REPAIR INC.	R-1, BUTT CONNECTOR, LABOR	206-336-863.001	VEHICLE MAINTENANCE	1,268.16
06/02/2022	GEN	89975	R. J. HOFFMAN MANAGEMENT IN	REFUND BOND FOR 288 TOWER	101-000-283.001	DEPOSITS - CASH BONDS	8,900.00
06/02/2022	GEN	89976	SAFEWAY SHREDDING	MONTHLY CHARGES	101-249-727.000	OFFICE SUPPLIES	74.95
06/02/2022	GEN	89976	SAFEWAY SHREDDING	MONTHLY CHARGES	207-301-727.000	OFFICE SUPPLIES	50.00
06/02/2022	GEN	89977	SPINAL COLUMN NEWSWEEKLY &	05/25/22 CHAPTER 36 TRAFFIC CODE AMENDENT	101-215-903.000	LEGAL NOTICES	2,018.61
06/02/2022	GEN	89977	SPINAL COLUMN NEWSWEEKLY &	05/11/22 WHITE LAKE ZBA	101-402-903.000	LEGAL NOTICES	1,009.62
06/02/2022	GEN	89978	SUBURBAN FORD	21-8 OIL CHANGE, FILTER, INSPECT	207-301-863.001	VEHICLE MAINTENANCE	39.95
06/02/2022	GEN	89979	SZOTT M59 DODGE	2022 DODGE DURANGO 136748	207-301-977.000	EQUIPMENT ACQUISITIONS	35,110.00
06/02/2022	GEN	89980	TRANSUNION RISK AND ALTERNA	05/01/22-05/31/22 MONTHLY CHARGES	207-301-962.001	MISCELLANEOUS	75.00
06/02/2022	GEN	89981	UNITED PARCEL SERVICE	MONTHLY POSTAGE	101-248-730.000	POSTAGE	13.48
06/02/2022	GEN	89982	WALMART - CAPITAL ONE	04/25/22-05/12/22 MONTHLY CHARGES	206-336-757.000	OPERATING SUPPLIES	530.54
06/02/2022	GEN	89983	WEINGARTZ	SWITCH IGNITION	101-265-933.000	GROUNDS EQUIP MAINTENANC	34.99
06/02/2022	GEN	89984	WEX BANK	MAY 2022 FUEL CHARGES	101-000-080.867	DUE FROM WATER GASOLINE	994.03
06/02/2022	GEN	89984	WEX BANK	MAY 2022 FUEL CHARGES	101-265-867.000	GASOLINE	1,005.96
06/02/2022	GEN	89984	WEX BANK	MAY 2022 FUEL CHARGES	206-336-867.000	GASOLINE	2,595.68
06/02/2022	GEN	89984	WEX BANK	MAY 2022 FUEL CHARGES	207-301-867.000	GASOLINE	8,746.38
06/02/2022	GEN	89984	WEX BANK	MAY 2022 FUEL CHARGES	249-000-867.000	GASOLINE	110.47
06/02/2022	GEN	89985	AXON ENTERPRISE, INC.	TECH ASSURANCE PLAN, BASIC EVIDENCE.COM	265-302-700.001	STATE EXPENDITURES	16,046.40
06/02/2022	GEN	89986	JEANNE EAGEN	INSTRUCTOR FEES	101-757-751.000	SENIOR ACTIVITIES	178.00
06/02/2022	GEN	89987	LEISURE UNLIMITED LLC	INSTRUCTOR'S FEE	101-757-751.000	SENIOR ACTIVITIES	129.00
06/02/2022	GEN	89988	MARGURITE DOUGLAS	INSTRUCTOR FEE	101-757-751.000	SENIOR ACTIVITIES	125.00
06/02/2022	GEN	89989	MARLENE TURNER	INSTRUCTOR FEE	101-757-751.000	SENIOR ACTIVITIES	

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	
06/03/2022	GEN	89990	RIVER CADDIS DEVELOPMENT, LLC	3RD-30 DAY EXTENSION PERIOD CONSULTING FEE	246-000-970.005	CAPITAL OUTLAY-NEW TWP HA	30,000.00
06/09/2022	GEN	89991	ABC PRINTING	(80) CERTIFICATES	206-336-727.000	OFFICE SUPPLIES	31.20
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	101-000-231.001	PAY DEDUCT PENSION	2,934.03
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	101-171-718.000	PENSION	38.52
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	101-209-718.000	PENSION	48.61
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	101-402-718.000	PENSION	57.18
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	206-000-231.001	PAY DEDUCT PENSION	2,109.66
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	206-336-718.000	PENSION	234.03
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	207-000-231.001	PAY DEDUCT PENSION	974.32
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	207-301-718.000	PENSION	41.58
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	249-000-231.001	PAY DEDUCT PENSION	350.00
06/09/2022	GEN	89992	ALERUS FINANCIAL	06/08/22 MERS 457 CONTRIBUTIONS	249-000-718.000	PENSION	39.13
06/09/2022	GEN	89993	AMAZON	14" TABLET BAG	206-336-727.000	OFFICE SUPPLIES	101.50
06/09/2022	GEN	89993	AMAZON	MILLS, FLASHLIGHT	206-336-744.000	UNIFORMS	31.97
06/09/2022	GEN	89993	AMAZON	FD, RETURN EAR PLUGS	206-336-757.000	OPERATING SUPPLIES	(8.99)
06/09/2022	GEN	89993	AMAZON	PD, LABELS, MARKERS	207-301-727.000	OFFICE SUPPLIES	103.18
06/09/2022	GEN	89994	ANTHONY SORGE INSPECTIONS, L	05/23/22-06/05/22 BUILDING INSPECTIONS/RENTA	249-000-706.003	CONTRACT BLDG INSPECTORS	2,790.00
06/09/2022	GEN	89994	ANTHONY SORGE INSPECTIONS, L	05/23/22-06/05/22 BUILDING INSPECTIONS/RENTA	249-000-801.002	RENTAL INSPECTIONS	90.00
06/09/2022	GEN	89995	AUDIO SENTRY CORPORATION	07/01/22-09/30/22 CHARGES	101-269-931.008	EQUIP MAINT FISK	58.50
06/09/2022	GEN	89996	BADGE AND WALLET	SMITH WARREN CUSTOM BADGE (1)	207-301-757.000	OPERATING SUPPLIES	130.00
06/09/2022	GEN	89997	BERESFORD CO	(20) BADGE CREDITS	101-249-727.000	OFFICE SUPPLIES	160.00
06/09/2022	GEN	89998	BETTER MAID SERVICES, LLC	04/11/22-05/03/22 CLEANING SERVICES	101-265-931.001	BLDG MAINTENANCE & SUPPLI	1,600.00
06/09/2022	GEN	89999	BOUND TREE MEDICAL LLC.	MEGAMOVER TRANSPORT, GLOVES, NASAL CANNL	206-336-767.000	MEDICAL SUPPLIES	486.26
06/09/2022	GEN	90000	CARS INC.	M-1 REPAIRS AXEL SHAFT AND U JOINTS	206-336-863.001	VEHICLE MAINTENANCE	6,847.55
06/09/2022	GEN	90001	CLARKE MOSQUITO CONTROL PR	NATULAR SRT TABLET	101-285-801.000	ENVIRONMENTAL PROFESSION	2,693.10
06/09/2022	GEN	90002	DARWEL ENTERPRISES LLC	PD, MONTHLY CHARGES	207-301-931.001	BLDG MAINTENANCE & SUPPLI	104.82
06/09/2022	GEN	90003	DTE ENERGY	05/01/22-05/31/22 MONTHLY CHARGES	101-448-926.000	STREET LIGHTING	3,405.71
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-000-080.716	DUE FROM WATER HOSPITALIZ	68.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-171-716.000	HOSP & OPTICAL INSURANCE	68.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-192-716.000	HOSP & OPTICAL INSURANCE	34.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-209-716.000	HOSP & OPTICAL INSURANCE	68.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-215-716.000	HOSP & OPTICAL INSURANCE	51.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-253-716.000	HOSP & OPTICAL INSURANCE	90.27
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-265-716.000	HOSP & OPTICAL INSURANCE	34.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-372-716.000	HOSP & OPTICAL INSURANCE	17.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-402-716.000	HOSP & OPTICAL INSURANCE	34.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-757-716.000	HOSP & OPTICAL INSURANCE	1,905.23
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	101-863-730.000	RETIREE HEALTH INSURANCE	85.00
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	206-336-716.000	HOSP & OPTICAL INSURANCE	1,332.52
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE M	JUNE ADMIN FEES	206-336-716.002	RETIREE HEALTH CARE PREMIU	

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE	M JUNE ADMIN FEES	207-301-716.000	HOSP & OPTICAL INSURANCE	836.68
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE	M JUNE ADMIN FEES	207-301-716.001	RETIREE HOSP & OPTICAL INSU	250.85
06/09/2022	GEN	90004	EMPLOYEE HEALTH INSURANCE	M JUNE ADMIN FEES	249-000-716.000	HOSP & OPTICAL INSURANCE	34.00
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-000-080.716	DUE FROM WATER HOSPITALIZ	45.13
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-171-716.000	HOSP & OPTICAL INSURANCE	44.06
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-192-716.000	HOSP & OPTICAL INSURANCE	10.38
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-209-716.000	HOSP & OPTICAL INSURANCE	63.24
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-215-716.000	HOSP & OPTICAL INSURANCE	44.06
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-253-716.000	HOSP & OPTICAL INSURANCE	53.37
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-265-716.000	HOSP & OPTICAL INSURANCE	20.25
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-372-716.000	HOSP & OPTICAL INSURANCE	14.50
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-402-716.000	HOSP & OPTICAL INSURANCE	9.87
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-757-716.000	HOSP & OPTICAL INSURANCE	19.74
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	101-863-730.000	RETIREE HEALTH INSURANCE	72.15
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	206-336-716.000	HOSP & OPTICAL INSURANCE	201.12
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	206-336-716.002	RETIREE HEALTH CARE PREMIU	24.93
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	207-301-716.000	HOSP & OPTICAL INSURANCE	337.42
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	207-301-716.001	RETIREE HOSP & OPTICAL INSU	271.94
06/09/2022	GEN	90005	FIDELITY SECURITY LIFE INS/EYEM	JUNE 2022 PREMIUMS	249-000-716.000	HOSP & OPTICAL INSURANCE	19.69
06/09/2022	GEN	90006	FIRST CHOICE COFFEE SERVICES	MONTHLY CHARGES	206-336-931.001	MAINTENANCE STATION 1	39.00
06/09/2022	GEN	90006	FIRST CHOICE COFFEE SERVICES	MONTHLY CHARGES	206-336-931.002	MAINTENANCE STATION 2	39.00
06/09/2022	GEN	90006	FIRST CHOICE COFFEE SERVICES	MONTHLY CHARGES	206-336-931.003	MAINTENANCE STATION 3	39.00
06/09/2022	GEN	90007	FLINT WELDING SUPPLY COMPAN	OXYGEN AND AIR	206-336-758.000	OXYGEN & AIR	42.00
06/09/2022	GEN	90008	GLOBAL OFFICE SOLUTIONS	CRTDGS	101-249-727.000	OFFICE SUPPLIES	455.65
06/09/2022	GEN	90009	SCOTT HERZBERG	05/23/22-06/05/22 BUILDING INSPECTIONS/RENTA	249-000-707.001	PLUMBING/MECHANICAL INSPI	4,455.60
06/09/2022	GEN	90010	HOUSTON'S LAWN SERVICE	MAY 25, 2022 SERVICES	101-276-932.000	CEMETERY MAINT	950.00
06/09/2022	GEN	90011	HURON VALLEY GUNS	HANIFEN, JACKET/SHIRT	206-336-744.000	UNIFORMS	203.51
06/09/2022	GEN	90011	HURON VALLEY GUNS	SHPATI, FLEX RS COV (5)	207-301-744.000	UNIFORMS	992.87
06/09/2022	GEN	90012	KYLE PAVLISH	PAVLISH, REIMBURSE FOR DRUG SCREEN	101-000-080.962	DUE FROM WATER MISCELLAN	17.00
06/09/2022	GEN	90013	MARK CARLSON	05/23/22-06/05/22 ELECTRICAL/RENTAL INSPECTIC	249-000-707.000	ELECTRICAL INSPECTOR	1,606.50
06/09/2022	GEN	90013	MARK CARLSON	05/23/22-06/05/22 ELECTRICAL/RENTAL INSPECTIC	249-000-801.002	RENTAL INSPECTIONS	90.00
06/09/2022	GEN	90014	MICPA	2022/23 MICPA MEMBERSHIP DUES, HOMEISTER	101-192-958.000	MEMBERSHIPS & DUES	275.00
06/09/2022	GEN	90015	MOBIL OF WHITE LAKE	FD, GAS CHARGES	206-336-867.000	GASOLINE	197.38
06/09/2022	GEN	90016	OAKLAND COUNTY MEDICAL CON	2022 WEBSITE SUPPORT FEES	206-336-757.000	OPERATING SUPPLIES	75.00
06/09/2022	GEN	90017	POSTMASTER	TEMPORAY/NEW LOCATION POLLING CARDS	101-191-730.000	POSTAGE-ELECTIONS	987.53
06/09/2022	GEN	90018	PRO COMM INC	21-7 REPLACE REAR ION-J LIGHT WHELAN ION SURI	207-301-863.001	VEHICLE MAINTENANCE	270.00
06/09/2022	GEN	90019	ROSA LEE DONALDSON	OXBOW SECTION EAST LOT 72 B&C BUY BACK	101-000-643.000	CEMETERY LOTS	400.00
06/09/2022	GEN	90020	STATE OF MICHIGAN (FEDERAL ID	ENDING REGISTRATION DATE 05/31/22	207-301-805.000	SEX OFFENDERS REGISTRY FEE	540.00
06/09/2022	GEN	90021	SUBURBAN FORD	21-51DB OIL CHANGE, FILTER, INSPECT	207-301-863.001	VEHICLE MAINTENANCE	48.88
06/09/2022	GEN	90022	TENDER CORPORATION	NATRAPEL, BEN'S SPRAY	101-285-801.000	ENVIRONMENTAL PROFESSION	5,7

WHITE LAKE TWP.
 JUNE 2022 CHECK DISBURSEMENTS

Section 6, Item B.

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/09/2022	GEN	90023	THE UPS STORE #2109	NOBLE, BUSINESS CARDS	101-215-962.000	MISCELLANEOUS	** VOIDED **
06/09/2022	GEN	90024	TRINITY HEALTH EPIC	PAYNE/ASHLEY DRUG SCREENS	207-301-757.000	OPERATING SUPPLIES	51.75
06/09/2022	GEN	90025	TRUSTMARK VOLUNTARY BENEFIT	MAY 2022 CONTRIBUTIONS	101-000-232.002	PAY DEDUCT VOLUNTARY INSU	298.04
06/09/2022	GEN	90025	TRUSTMARK VOLUNTARY BENEFIT	MAY 2022 CONTRIBUTIONS	206-000-232.002	PAY DEDUCT LIFE INS	174.56
06/09/2022	GEN	90025	TRUSTMARK VOLUNTARY BENEFIT	MAY 2022 CONTRIBUTIONS	207-000-232.002	PAY DEDUCT LIFE INS	358.66
06/09/2022	GEN	90025	TRUSTMARK VOLUNTARY BENEFIT	MAY 2022 CONTRIBUTIONS	249-000-232.008	PAY DEDUCT VOL INS	86.88
06/09/2022	GEN	90026	U.S. BANK EQUIPMENT FINANCE	DUBLIN, MONTHLY COPIER PAYMENT	101-757-931.000	BUILDING MAINTENANCE	129.00
06/09/2022	GEN	90026	U.S. BANK EQUIPMENT FINANCE	BLDG MONTHLY COPIER PAYMENT	249-000-971.000	TECHNOLOGY EQUIPMENT	135.00
06/09/2022	GEN	90027	WATER DEPOT	BOTTLED WATER (13)	101-265-931.001	BLDG MAINTENANCE & SUPPLI	91.75
06/09/2022	GEN	90027	WATER DEPOT	BOTTLED WATER (10)	207-301-931.001	BLDG MAINTENANCE & SUPPLI	79.50
06/09/2022	GEN	90028	BRENDEL'S SEPTIC TANK SERVICE	HIDDEN PINES 05/22/22-06/18/22 CHARGES	208-000-922.000	UTILITIES- PARKS	330.00
06/09/2022	GEN	90029	JAIME GREAVES	REFUND HAWLEY PARK PAVILION DEPOSIT	208-000-652.000	FIELD RENTAL	105.00
06/09/2022	GEN	90030	THE HUNTINGTON NATIONAL BANK	3584213600/LIBRARY BOND ADMIN FEE	302-000-992.000	LIBRARY BOND INTEREST	500.00
06/09/2022	GEN	90031	WILLIAMS, WILLIAMS, RATTNER &	LEGAL SERVICES THRU 05/31/22-NEW FACILITIES	246-000-970.005	CAPITAL OUTLAY-NEW TWP HA	2,982.98
06/09/2022	GEN	90032	CAROL KEHOE	KEHOE, REIMBURSE FOR WHITE HORSE INN	101-757-751.000	SENIOR ACTIVITIES	29.37
06/09/2022	GEN	90033	FIRE SYSTEMS OF MICHIGAN	DUBLIN, YEARLY FIRE EXT INSPECTION	101-757-931.000	BUILDING MAINTENANCE	314.55
06/09/2022	GEN	90034	WOTA	(11) TRIP TO ALEX'S GOURMET MARKET	101-757-751.000	SENIOR ACTIVITIES	110.00
06/09/2022	GEN	90035	THE UPS STORE #2109	PRINTED CARDS TO DIRECT PEOPLE TO WEBSITE	101-249-727.000	OFFICE SUPPLIES	55.00
06/16/2022	GEN	90036	TPC LAWN & LANDSCAPE	HIDDEN PINES 04/25/22-05/13/22 SERVICES	208-000-931.001	GROUNDS MAINTENANCE	1,975.00
06/16/2022	GEN	90037	THERESA NIMS	MONTHLY COBRA ADMIN	207-301-861.000	WITNESS FEES	14.00
06/16/2022	GEN	90038	AMAZON	WEBCAM/CHARGER	101-249-727.000	OFFICE SUPPLIES	67.96
06/16/2022	GEN	90038	AMAZON	FD, CRTDG	206-336-727.000	OFFICE SUPPLIES	41.19
06/16/2022	GEN	90038	AMAZON	PD, EARBUDS, LABELS, BLACKOUT FARADAY CAGE E	207-301-727.000	OFFICE SUPPLIES	86.91
06/16/2022	GEN	90039	APPLIED IMAGING	06/16/22 - 07/15/22 MONTHLY CHARGES	101-000-080.727	DUE FROM WATER OFFICE SUP	57.28
06/16/2022	GEN	90039	APPLIED IMAGING	06/16/22 - 07/15/22 MONTHLY CHARGES	101-249-727.000	OFFICE SUPPLIES	258.76
06/16/2022	GEN	90039	APPLIED IMAGING	06/16/22 - 07/15/22 MONTHLY CHARGES	101-757-931.000	BUILDING MAINTENANCE	65.27
06/16/2022	GEN	90039	APPLIED IMAGING	06/16/22 - 07/15/22 MONTHLY CHARGES	249-000-727.000	OFFICE SUPPLIES	112.41
06/16/2022	GEN	90040	BASIC	06/01/22-06/30/22 FSA PLAN ADMIN	101-299-956.000	UNALLOCATED MISCELLANEOU	122.00
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-000-080.716	DUE FROM WATER HOSPITALIZ	5,831.75
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-171-716.000	HOSP & OPTICAL INSURANCE	6,526.03
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-192-716.000	HOSP & OPTICAL INSURANCE	1,388.50
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-209-716.000	HOSP & OPTICAL INSURANCE	8,747.68
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-215-716.000	HOSP & OPTICAL INSURANCE	4,443.25
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-253-716.000	HOSP & OPTICAL INSURANCE	7,914.56
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-265-716.000	HOSP & OPTICAL INSURANCE	2,360.47
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-372-716.000	HOSP & OPTICAL INSURANCE	2,082.78
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-402-716.000	HOSP & OPTICAL INSURANCE	3,054.72
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	101-757-716.000	HOSP & OPTICAL INSURANCE	3,332.44
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	206-336-716.000	HOSP & OPTICAL INSURANCE	2,082.78
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	207-301-716.000	HOSP & OPTICAL INSURANCE	2,082.78

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/16/2022	GEN	90041	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION ACTIVE PF	249-000-716.000	HOSP & OPTICAL INSURANCE	2,082.78
06/16/2022	GEN	90042	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 FIRE RETIREE PREMIUMS	206-336-716.002	RETIREE HEALTH CARE PREMIU	3,054.72
06/16/2022	GEN	90043	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION RETIREE P	101-863-730.000	RETIREE HEALTH INSURANCE	6,109.44
06/16/2022	GEN	90043	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION RETIREE P	207-301-716.000	HOSP & OPTICAL INSURANCE	2,082.78
06/16/2022	GEN	90043	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 MAPE & NONUNION RETIREE P	249-000-716.000	HOSP & OPTICAL INSURANCE	694.25
06/16/2022	GEN	90044	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 CMD ACTIVE PREMIUMS	207-301-716.000	HOSP & OPTICAL INSURANCE	12,357.81
06/16/2022	GEN	90045	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 CMD RETIREE PREMIUMS	207-301-716.001	RETIREE HOSP & OPTICAL INSU	6,664.88
06/16/2022	GEN	90046	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 PATROL ACTIVE PREMIUMS	207-301-716.000	HOSP & OPTICAL INSURANCE	39,572.74
06/16/2022	GEN	90047	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 PATROL RETIREE PREMIUMS	207-301-716.001	RETIREE HOSP & OPTICAL INSU	12,218.94
06/16/2022	GEN	90048	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 PATROL RETIREE PREMIUMS	207-301-716.001	RETIREE HOSP & OPTICAL INSU	1,768.87
06/16/2022	GEN	90049	BRINDLEE MOUNTAIN FIRE APPAF	COMMISSION ON SALE OF 2006 PIERCE TRUCK	206-000-673.000	SALE OF FIXED ASSETS	7,750.00
06/16/2022	GEN	90050	BROWNING SURVEILLANCE COMF	(3) AXIS M3115 2MP TURRET CAMERA AND REPAIR	207-301-977.000	EQUIPMENT ACQUISITIONS	2,039.00
06/16/2022	GEN	90051	CDW GOVERNMENT	BROTHER PRINTER, CABLE, CAR ADAPT, DOCK	207-301-977.000	EQUIPMENT ACQUISITIONS	762.13
06/16/2022	GEN	90052	CINTAS	UNIFORM CHARGES	101-000-080.962	DUE FROM WATER MISCELLAN	95.88
06/16/2022	GEN	90052	CINTAS	UNIFORM CHARGES	101-265-931.001	BLDG MAINTENANCE & SUPPLI	52.12
06/16/2022	GEN	90053	CIVICPLUS	MUNICODE WEB OPEN BUILD/PREM SUBSCRIPTION	101-265-971.000	TECHNOLOGY EQUIPMENT	10,025.00
06/16/2022	GEN	90054	DARWEL ENTERPRISES LLC	GEN, MONTHLY CHARGES	101-265-931.001	BLDG MAINTENANCE & SUPPLI	178.59
06/16/2022	GEN	90055	DTE ENERGY	860 ROUND LAKE 05/10/22-06/09/22 CHARGES	206-336-921.002	ELECTRIC STATION 2	402.58
06/16/2022	GEN	90056	FLINT WELDING SUPPLY COMPAN	OXYGEN AND AIR	206-336-758.000	OXYGEN & AIR	47.96
06/16/2022	GEN	90057	GLOBAL OFFICE SOLUTIONS	LTR OPENERS	101-249-727.000	OFFICE SUPPLIES	105.36
06/16/2022	GEN	90058	GRAINGER	FLEXIBLE METAL HOSE	101-000-110.000	GRINDER PUMP INVENTORY CC	367.30
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	101-000-080.863	DUE FROM WATER VEHICLE M/	16.72
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	101-000-080.962	DUE FROM WATER MISCELLAN	371.67
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	101-265-931.003	BLDG EQUIP MAINTENANCE	8.93
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	101-265-933.000	GROUND'S EQUIP MAINTENANC	29.97
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	101-299-956.000	UNALLOCATED MISCELLANEOU	29.00
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	206-336-757.000	OPERATING SUPPLIES	19.87
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	206-336-931.001	MAINTENANCE STATION 1	274.36
06/16/2022	GEN	90059	HOME DEPOT CREDIT SERVICES	04/20/22-05/17/22 MONTHLY CHARGES	206-336-931.002	MAINTENANCE STATION 2	227.63
06/16/2022	GEN	90060	HOWLAND'S TRAILER & TRUCK AC	TRAILER REPAIRS	207-301-863.001	VEHICLE MAINTENANCE	1,852.90
06/16/2022	GEN	90061	HURON RIVER WATERSHED COUN	2022 HRWC MEMBERSHIP DUES	101-101-958.000	MEMBERSHIPS & DUES	3,002.15
06/16/2022	GEN	90062	HURON VALLEY GUNS	MORELLI, SHIRTS	206-336-744.000	UNIFORMS	629.91
06/16/2022	GEN	90063	HURON VALLEY-SINAI HOSPITAL	NALOXONE KITS (6), EPINEPHRINE KITS (6)	206-336-767.000	MEDICAL SUPPLIES	360.00
06/16/2022	GEN	90064	J&B MEDICAL SUPPLY INC	CODIUM CHL IRRIGATION	206-336-767.000	MEDICAL SUPPLIES	14.62
06/16/2022	GEN	90065	JENNIFER EDENS	06/14/22 - SPECIAL TWP BOARD MEETING	101-101-710.000	FEES & PER DIEM	175.00
06/16/2022	GEN	90066	LOWES BUSINESS ACCOUNT	05/07/22-05/13/22 MONTHLY CHARGES	101-265-931.002	GROUND'S MAINTENANCE	303.04
06/16/2022	GEN	90066	LOWES BUSINESS ACCOUNT	05/07/22-05/13/22 MONTHLY CHARGES	101-265-933.000	GROUND'S EQUIP MAINTENANC	5.48
06/16/2022	GEN	90067	ALERUS FINANCIAL	2023 OPEB FUNDING	101-000-080.962	DUE FROM WATER MISCELLAN	70,000.00
06/16/2022	GEN	90067	ALERUS FINANCIAL	2023 OPEB FUNDING	101-863-730.003	OPEB FUNDING	270,000.00
06/16/2022	GEN	90067	ALERUS FINANCIAL	2023 OPEB FUNDING	206-336-718.003	OPEB FUNDING	150,000.00

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/16/2022	GEN	90067	ALERUS FINANCIAL	2023 OPEB FUNDING	207-301-718.003	OPEB FUNDING	250,000.00
06/16/2022	GEN	90067	ALERUS FINANCIAL	2023 OPEB FUNDING	249-000-718.002	OPEB FUNDING	50,000.00
06/16/2022	GEN	90068	MICHIGAN CAT	PURCHASE USED CAT APS100 2014 XRB00180	101-265-977.000	EQUIPMENT ACQUISITIONS	22,393.50
06/16/2022	GEN	90069	MICHIGAN TOWNSHIPS ASSOCIAT	07/01/21-06/30/22 MEMBERSHIP DUES	101-101-958.000	MEMBERSHIPS & DUES	7,978.59
06/16/2022	GEN	90070	MILL VALLEY VACUUM & SEWING	CORD, PLUG END, FILTER, CHECKUP	101-265-931.003	BLDG EQUIP MAINTENANCE	63.90
06/16/2022	GEN	90071	PITNEY BOWES INC	POSTAGE	101-248-730.000	POSTAGE	3,200.00
06/16/2022	GEN	90072	PROGRESSIVE IRRIGATION INC.	OXBOW CEMETARY - SPRINKLER SERVICE CALL	101-276-932.000	CEMETERY MAINT	265.00
06/16/2022	GEN	90073	R & R FIRE TRUCK REPAIR INC.	R-1, 2006 PIERCE, BATTERY ISSUES	206-336-863.001	VEHICLE MAINTENANCE	2,940.93
06/16/2022	GEN	90074	RICHARD KOWALL	REIMBURSEMENT FOR REFRIGERATOR FOR ANNEX	101-269-962.000	MISCELLANEOUS	476.54
06/16/2022	GEN	90075	ROSATI, SCHULTZ, JOPPICH	TAX TRIBUNAL SERVICES THRU 05/31/22	101-209-820.000	LEGAL FEES	525.00
06/16/2022	GEN	90075	ROSATI, SCHULTZ, JOPPICH	GENERAL TWP, SERVICES THRU 05/31/22	101-210-826.000	LEGAL FEES	6,440.00
06/16/2022	GEN	90075	ROSATI, SCHULTZ, JOPPICH	ORDINANCE ENF SERVICES THRU 05/31/22	101-372-955.000	ORDINANCE ENFORCEMENTS C	1,442.00
06/16/2022	GEN	90075	ROSATI, SCHULTZ, JOPPICH	FD, SERVICES THRU 05/31/22	206-336-826.000	LEGAL FEES	56.00
06/16/2022	GEN	90075	ROSATI, SCHULTZ, JOPPICH	MAY PROSECUTIONS	207-301-826.000	LEGAL FEES-PROSECUTIONS	7,500.00
06/16/2022	GEN	90076	SPRINGFIELD URGENT CARE PLLC	04/12/22-04/26/22 SERVICES	101-000-080.962	DUE FROM WATER MISCELLAN	140.00
06/16/2022	GEN	90076	SPRINGFIELD URGENT CARE PLLC	04/12/22-04/26/22 SERVICES	101-209-962.000	MISCELLANEOUS	135.00
06/16/2022	GEN	90076	SPRINGFIELD URGENT CARE PLLC	04/12/22-04/26/22 SERVICES	101-215-962.000	MISCELLANEOUS	140.00
06/16/2022	GEN	90076	SPRINGFIELD URGENT CARE PLLC	04/12/22-04/26/22 SERVICES	207-301-962.001	MISCELLANEOUS	135.00
06/16/2022	GEN	90077	STATE OF MICHIGAN	04/01/22-06/30/22 AMBULANCE ASSESSMENT	206-336-757.000	OPERATING SUPPLIES	2.23
06/16/2022	GEN	90078	TELEGATION INC.	MAY 2022 SERVICES	101-000-080.853	DUE FROM WATER PHONE BILL	12.92
06/16/2022	GEN	90078	TELEGATION INC.	MAY 2022 SERVICES	101-265-853.000	TELEPHONE	72.84
06/16/2022	GEN	90078	TELEGATION INC.	MAY 2022 SERVICES	101-757-853.000	TELEPHONE	3.76
06/16/2022	GEN	90078	TELEGATION INC.	MAY 2022 SERVICES	206-336-853.001	TELEPHONE STATION 1	6.05
06/16/2022	GEN	90078	TELEGATION INC.	MAY 2022 SERVICES	207-301-853.000	TELEPHONE	50.49
06/16/2022	GEN	90079	THE PLUMBING COMPANY	CANCEL PERMIT 5266 JENNIE	249-000-480.000	PLUMBING PERMITS	90.00
06/16/2022	GEN	90080	TRACTOR SUPPLY CO.	05/03/22-05/23/22 MONTHLY CHARGES	101-000-080.962	DUE FROM WATER MISCELLAN	139.96
06/16/2022	GEN	90080	TRACTOR SUPPLY CO.	05/03/22-05/23/22 MONTHLY CHARGES	101-265-931.002	GROUNDS MAINTENANCE	94.97
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-000-080.853	DUE FROM WATER PHONE BILL	322.00
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-000-214.016	DUE TO OTHERS	6.03
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-171-853.000	CELLULAR PHONE	50.51
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-215-853.000	CELLULAR PHONE	102.30
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-265-853.000	TELEPHONE	41.12
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-372-853.000	CELLULAR PHONE	51.12
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	101-402-853.000	CELLULAR PHONE	101.84
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	206-336-853.000	CELL PHONES	243.00
06/16/2022	GEN	90081	VERIZON WIRELESS	05/02/22-06/01/22 MONTHLY CHARGES	249-000-853.000	CELLULAR PHONE	84.00
06/16/2022	GEN	90082	ANDREA VOORHEIS	REIMBURSE FOR MILEAGE	101-101-860.000	CONFERENCES & MILEAGE	66.12
06/16/2022	GEN	90083	ANYONE CAN PAINT LLC	INSTRUCTOR'S FEE	101-757-751.000	SENIOR ACTIVITIES	240.00
06/16/2022	GEN	90084	DIANE FUNK	REFUND CERAMIC TILE CLASS	101-000-651.000	SENIOR ACTIVITIES	25.00
06/16/2022	GEN	90085	JEANNE EAGEN	INSTRUCTOR FEES	101-757-751.000	SENIOR ACTIVITIES	1

WHITE LAKE TWP.
 JUNE 2022 CHECK DISBURSEMENTS

Section 6, Item B.

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/16/2022	GEN	90086	LEISURE UNLIMITED LLC	INSTRUCTOR'S FEE	101-757-751.000	SENIOR ACTIVITIES	129.00
06/16/2022	GEN	90087	MARGURITE DOUGLAS	INSTRUCTOR'S FEE	101-757-751.000	SENIOR ACTIVITIES	200.00
06/16/2022	GEN	90088	MARLENE TURNER	INSTRUCTORS FEE	101-757-751.000	SENIOR ACTIVITIES	60.00
06/16/2022	GEN	90089	VIPER IMAGING, LLC	(3) FLIR K65 320X320 THERMAL CAMERA KITS, CHA	206-336-977.000	EQUIPMENT ACQUISITIONS 04I	23,967.00
06/23/2022	GEN	90090	GUY SFERLAZZA	FAMILY FUN DAY - FAMILY MUSIC	208-000-720.000	EVENT EXPENSES	700.00
06/23/2022	GEN	90091	HURON-CLINTON METROPARKS	FAMILY FUN DAY - MOBILE LEARNING CTR	208-000-720.000	EVENT EXPENSES	175.00
06/23/2022	GEN	90092	JIM CANN	FAMILY FUN DAY - 2 1/2 CLASSIC ROCK MUSIC	208-000-720.000	EVENT EXPENSES	500.00
06/23/2022	GEN	90093	KRISTIN GRAHAM	FAMILY FUN DAY - HAPPY THE CLOWN	208-000-720.000	EVENT EXPENSES	250.00
06/23/2022	GEN	90094	OAKLAND COUNTY PARKS AND RE	FAMILY FUN DAY - ROCK CLIMBING TOWER	208-000-720.000	EVENT EXPENSES	750.00
06/23/2022	GEN	90095	THOMAS PERCHA	FAMILY FUN DAY - 2 1/2 CLASSIC ROCK MUSIC	208-000-720.000	EVENT EXPENSES	200.00
06/23/2022	GEN	90096	1ST HEATING & COOLING CO	FD, SERVICE CALL STA #1	206-336-933.000	EQUIPMENT MAINTENANCE	155.00
06/23/2022	GEN	90097	ABC PRINTING	BUSINESS CARDS, BROTHERTON, SPENCER	249-000-962.000	MISCELLANEOUS	158.00
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	101-000-231.001	PAY DEDUCT PENSION	2,016.74
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	101-171-718.000	PENSION	38.52
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	101-209-718.000	PENSION	48.61
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	101-402-718.000	PENSION	57.18
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	206-000-231.001	PAY DEDUCT PENSION	2,060.13
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	206-336-718.000	PENSION	234.03
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	207-000-231.001	PAY DEDUCT PENSION	990.89
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	207-301-718.000	PENSION	41.58
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	249-000-231.001	PAY DEDUCT PENSION	350.00
06/23/2022	GEN	90098	ALERUS FINANCIAL	06/22/22 MERS 457 CONTRIBUTIONS	249-000-718.000	PENSION	39.13
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-000-080.962	DUE FROM WATER MISCELLAN	500.00
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-000-232.005	PAY DEDUCT HOSP	538.64
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-171-718.001	HEALTH CARE SAVINGS PROGR,	200.00
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-209-718.001	HEALTH CARE SAVINGS PROGR,	300.00
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-215-718.001	HEALTH CARE SAVINGS PROGR,	732.02
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-253-718.001	HEALTH CARE SAVINGS PROGR,	396.40
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-265-718.001	HEALTH CARE SAVINGS PROGR,	100.00
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-402-718.001	HEALTH CARE SAVINGS PROGR,	200.00
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	101-757-718.001	HEALTH CARE SAVINGS PROGR,	100.00
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	206-000-232.005	PAY DEDUCT HOSP	1,279.46
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	206-336-718.002	HEALTH CARE SAVINGS PLAN	1,492.70
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	207-000-232.005	PAY DEDUCT HOSP	3,685.75
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	207-301-718.001	HEALTH CARE SAVINGS PROGR,	4,500.04
06/23/2022	GEN	90099	ALERUS FINANCIAL	06/01/22-06/30/22 HCSP CONTRIBUTIONS	249-000-718.001	HEALTH CARE SAVINGS PROGR,	300.00
06/23/2022	GEN	90100	ANTHONY SORGE INSPECTIONS, L	06/06/22-06/17/22 BUILDING INSPECTIONS	101-372-706.002	PART-TIME ORDINANCE	60.00
06/23/2022	GEN	90100	ANTHONY SORGE INSPECTIONS, L	06/06/22-06/17/22 BUILDING INSPECTIONS	249-000-706.003	CONTRACT BLDG INSPECTORS	3,000.00
06/23/2022	GEN	90100	ANTHONY SORGE INSPECTIONS, L	06/06/22-06/17/22 BUILDING INSPECTIONS	249-000-801.002	RENTAL INSPECTIONS	30.00
06/23/2022	GEN	90101	AT & T	STA #2 MAY CHARGES	206-336-853.002	TELEPHONE STATION 2	

WHITE LAKE TWP.
 JUNE 2022 CHECK DISBURSEMENTS

Section 6, Item B.

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/23/2022	GEN	90102	AT&T MOBILITY	05/07/22-06/06/22 PD MONTHLY CHARGES	207-301-853.000	TELEPHONE	49.41
06/23/2022	GEN	90103	BACKFLOW PREVENTION SERVICE	BACKFLOW REPAIR	101-265-931.001	BLDG MAINTENANCE & SUPPLI	563.13
06/23/2022	GEN	90104	BCBS OF MICHIGAN	07/01/22-07/31/22 MEDICARE ADVANTAGE	101-000-080.716	DUE FROM WATER HOSPITALIZ	826.62
06/23/2022	GEN	90104	BCBS OF MICHIGAN	07/01/22-07/31/22 MEDICARE ADVANTAGE	101-863-730.000	RETIREE HEALTH INSURANCE	4,959.72
06/23/2022	GEN	90104	BCBS OF MICHIGAN	07/01/22-07/31/22 MEDICARE ADVANTAGE	206-336-716.002	RETIREE HEALTH CARE PREMIU	2,066.55
06/23/2022	GEN	90104	BCBS OF MICHIGAN	07/01/22-07/31/22 MEDICARE ADVANTAGE	207-301-716.001	RETIREE HOSP & OPTICAL INSU	6,612.96
06/23/2022	GEN	90105	BLUE CROSS BLUE SHIELD OF MIC	07/01/22-07/31/22 FIRE ACTIVE PREMIUMS	206-336-716.000	HOSP & OPTICAL INSURANCE	26,520.68
06/23/2022	GEN	90106	BOUND TREE MEDICAL LLC.	GLOVES, CAT, GAUZE	206-336-767.000	MEDICAL SUPPLIES	531.84
06/23/2022	GEN	90107	BRUCE FLORES	FLORES/REIMBURSE EMS LICENSE RENEWAL	206-336-757.000	OPERATING SUPPLIES	25.00
06/23/2022	GEN	90108	COMCAST	06/22/22-07/21/22 TWP WIDE CHGES	101-000-080.962	DUE FROM WATER MISCELLAN	81.65
06/23/2022	GEN	90108	COMCAST	06/22/22-07/21/22 TWP WIDE CHGES	101-265-971.000	TECHNOLOGY EQUIPMENT	110.77
06/23/2022	GEN	90108	COMCAST	06/22/22-07/21/22 TWP WIDE CHGES	206-336-757.000	OPERATING SUPPLIES	349.27
06/23/2022	GEN	90108	COMCAST	06/22/22-07/21/22 TWP WIDE CHGES	207-301-757.000	OPERATING SUPPLIES	105.17
06/23/2022	GEN	90108	COMCAST	06/22/22-07/21/22 TWP WIDE CHGES	249-000-971.000	TECHNOLOGY EQUIPMENT	81.64
06/23/2022	GEN	90109	CORRIGAN RECORD STORAGE	JUNE STORGAE FEES	101-265-940.000	TOWNSHIP RECORD RETENTIOI	115.46
06/23/2022	GEN	90110	DARWEL ENTERPRISES LLC	FD, MONTHLY CHARGES	206-336-931.001	MAINTENANCE STATION 1	68.03
06/23/2022	GEN	90110	DARWEL ENTERPRISES LLC	PD, MONTHLY CHARGES	207-301-931.001	BLDG MAINTENANCE & SUPPLI	104.82
06/23/2022	GEN	90111	DTE ENERGY	05/12/22-06/10/22 TWP HALL	101-265-921.001	ELECTRIC TWP HALL	2,455.81
06/23/2022	GEN	90111	DTE ENERGY	05/12/22-06/10/22 FISK FARM	101-269-921.004	ELECTRIC FISK	56.21
06/23/2022	GEN	90111	DTE ENERGY	05/12/22-06/10/22 M59/BOGIE STREET LIGHT	101-269-921.006	M59/BOGIE PROP STREET LIGH	175.12
06/23/2022	GEN	90111	DTE ENERGY	05/12/22-06/10/22 ANNEX	101-269-921.011	ELECTRIC-TWP ANNEX	633.10
06/23/2022	GEN	90111	DTE ENERGY	05/12/22-06/10/22 OXBOW CEMETERY	101-276-921.000	ELECTRIC OXBOW	15.41
06/23/2022	GEN	90112	E.D. LOCKS & SECURITY LLC	TRAKA 21 HIGH SECURITY ELECTRONIC KEY MGT	207-301-931.001	BLDG MAINTENANCE & SUPPLI	1,805.00
06/23/2022	GEN	90113	FIRE SAVVY CONSULTANTS	NEW HOPE (7) WET CHEMICAL SUPP REVIEW	249-000-801.000	PROFESSIONAL FEES	400.00
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-000-080.962	DUE FROM WATER MISCELLAN	2,768.80
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-101-710.000	FEES & PER DIEM	14.99
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-248-730.000	POSTAGE	39.66
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-249-727.000	OFFICE SUPPLIES	69.93
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-253-864.000	CONFERENCES & MEETINGS	425.25
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-265-863.000	VEHICLE MAINTENANCE	13.00
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-265-931.001	BLDG MAINTENANCE & SUPPLI	208.69
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-265-931.002	GROUNDS MAINTENANCE	239.82
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	101-757-751.000	SENIOR ACTIVITIES	79.77
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	206-336-727.000	OFFICE SUPPLIES	64.12
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	206-336-757.000	OPERATING SUPPLIES	115.54
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	206-336-863.001	VEHICLE MAINTENANCE	20.42
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	206-336-960.000	TRAINING	3,894.07
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-727.000	OFFICE SUPPLIES	162.16
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-744.000	UNIFORMS	498.93
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-757.000	OPERATING SUPPLIES	

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-863.001	VEHICLE MAINTENANCE	128.22
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-931.001	BLDG MAINTENANCE & SUPPLI	505.65
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-958.000	MEMBERSHIPS & DUES	260.00
06/23/2022	GEN	90114	FLAGSTAR BANK	05/13/22-06/10/22 CHARGES	207-301-962.003	EVIDENCE COLLECTION	363.52
06/23/2022	GEN	90115	SCOTT HERZBERG	06/06/22-06/17/22 MECHANICAL PAYROLL	249-000-707.001	PLUMBING/MECHANICAL INSPI	3,398.10
06/23/2022	GEN	90116	INTERNATIONAL MINUTE PRESS	GEN TWP BACK DOOR SIGN	101-265-931.001	BLDG MAINTENANCE & SUPPLI	300.00
06/23/2022	GEN	90117	JOHN HANCOCK-70482-00-5	JUNE 2022 PREMIUM CONTRIBUTIONS	101-000-080.718	DUE FROM WATER PENSION	639.36
06/23/2022	GEN	90117	JOHN HANCOCK-70482-00-5	JUNE 2022 PREMIUM CONTRIBUTIONS	101-000-231.001	PAY DEDUCT PENSION	355.20
06/23/2022	GEN	90117	JOHN HANCOCK-70482-00-5	JUNE 2022 PREMIUM CONTRIBUTIONS	101-209-718.000	PENSION	1,034.87
06/23/2022	GEN	90117	JOHN HANCOCK-70482-00-5	JUNE 2022 PREMIUM CONTRIBUTIONS	206-336-718.000	PENSION	337.88
06/23/2022	GEN	90118	LISA MARIE KANE	06/16/22 PLANNING COMMISSION MTG	101-402-710.000	PLANNING/ZBA BOARD FEES	200.00
06/23/2022	GEN	90119	MARK CARLSON	06/06/22-06/17/22 ELECTRICAL PAYROLL	249-000-707.000	ELECTRICAL INSPECTOR	2,560.50
06/23/2022	GEN	90119	MARK CARLSON	06/06/22-06/17/22 ELECTRICAL PAYROLL	249-000-801.002	RENTAL INSPECTIONS	30.00
06/23/2022	GEN	90120	MERGE LIVE	REGULAR TWP BOARD MEETING 6/21/22	101-101-710.000	FEES & PER DIEM	265.00
06/23/2022	GEN	90121	MMTA	2022 MMTA FALL CONF/PATTON	101-253-864.000	CONFERENCES & MEETINGS	359.00
06/23/2022	GEN	90122	OAKLAND COUNTY ROAD COMM	2ND, 3RD, 4TH QTR CHARGES	101-446-930.000	TRAFFIC SIGNAL MAINTENANCI	15.06
06/23/2022	GEN	90123	SPINAL COLUMN NEWSWEEKLY &	06/01/22 PLANNING COMMISSION	101-402-903.000	LEGAL NOTICES	501.23
06/23/2022	GEN	90124	SPRINGFIELD URGENT CARE PLLC	DPS, SHELTON, DURAND, BILOTTA DRUG TEST	101-000-080.962	DUE FROM WATER MISCELLAN	135.00
06/23/2022	GEN	90125	STAR EMS	GRIFFITHS BLOOD DRAW	207-301-962.003	EVIDENCE COLLECTION	200.00
06/23/2022	GEN	90126	STAR EMS	MAY CHARGES	206-000-630.000	AMBULANCE TRANSPORTATIOI	7.10
06/23/2022	GEN	90127	SUBURBAN FORD	21-6 2019 FORD TRUCK OIL CHGE	207-301-863.001	VEHICLE MAINTENANCE	79.90
06/23/2022	GEN	90128	WELLS FARGO VENDOR FINANCI	PD COPIER	207-301-933.000	EQUIP LEASE/ MAINT CONTRAC	131.79
06/23/2022	GEN	90129	WHITE LAKE TOWNSHIP	TO CORRECT PAYLOCITY ISSUE WITH AGENCY CK (D	101-000-036.000	DUE FROM OTHERS	105.00
06/23/2022	GEN	90129	WHITE LAKE TOWNSHIP	TO CORRECT PAYLOCITY ISSUE WITH AGENCY CK (D	206-000-067.005	DUE FROM OTHERS	216.66
06/23/2022	GEN	90129	WHITE LAKE TOWNSHIP	TO CORRECT PAYLOCITY ISSUE WITH AGENCY CK (D	207-000-067.005	DUE FROM FED GOV'T	41.66
06/23/2022	GEN	90130	DTE ENERGY	05/12/22-06/10/22 HAWLEY PARK	208-000-921.000	ELECTRIC JUDY HAWLEY PARK	15.41
06/23/2022	GEN	90130	DTE ENERGY	05/12/22-06/10/22 VETTER PARK	208-000-921.001	ELECTRIC - VETTER PARK	25.89
06/23/2022	GEN	90131	GFL	10014 UNITS - CURBSIDE SERVICE	226-528-801.000	RUBBISH EXPENDITURE	158,003.67
06/30/2022	GEN	90132	1ST HEATING & COOLING CO	ANNEX AIR CONDITIONER REPAIR	101-265-931.003	BLDG EQUIP MAINTENANCE	270.00
06/30/2022	GEN	90132	1ST HEATING & COOLING CO	AIR CONDITIONER FOR ANNEX	101-265-977.000	EQUIPMENT ACQUISITIONS	8,870.00
06/30/2022	GEN	90133	AMAZON	AVERY LABELS	207-301-727.000	OFFICE SUPPLIES	195.68
06/30/2022	GEN	90134	AT & T	MAY 20 - JUN 19, 2022 CHARGES	101-000-080.853	DUE FROM WATER PHONE BILL	184.79
06/30/2022	GEN	90134	AT & T	MAY 20 - JUN 19, 2022 CHARGES	101-265-853.000	TELEPHONE	853.13
06/30/2022	GEN	90134	AT & T	MAY 20 - JUN 19, 2022 CHARGES	101-269-853.001	TELEPHONE FISK FARM	27.64
06/30/2022	GEN	90134	AT & T	MAY 20 - JUN 19, 2022 CHARGES	101-757-853.000	TELEPHONE	220.68
06/30/2022	GEN	90134	AT & T	MAY 20 - JUN 19, 2022 CHARGES	206-336-853.001	TELEPHONE STATION 1	61.22
06/30/2022	GEN	90134	AT & T	MAY 20 - JUN 19, 2022 CHARGES	207-301-853.000	TELEPHONE	563.00
06/30/2022	GEN	90135	BOB B'S PARTY RENTALS	50% DOWN - 09/18/22 FIRE DEPT OPEN HOUSE	206-336-962.000	MISCELLANEOUS	315.00
06/30/2022	GEN	90136	BOUND TREE MEDICAL LLC.	COMBAT APPLICATION TOURNIQUET	206-336-767.000	MEDICAL SUPPLIES	119.95
06/30/2022	GEN	90137	BRILLIANT SYSTEMS LLC	REMOVE RADIO FROM R1	206-336-933.000	EQUIPMENT MAINTENANCE	4

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/30/2022	GEN	90138	COMCAST	07/01/22-07/31/22 DUBLIN MONTHLY CHARGES	101-757-751.000	SENIOR ACTIVITIES	281.06
06/30/2022	GEN	90139	CONSUMERS ENERGY	7525 HIGHLAND 05/24/22-06/21/22 CHARGES	101-265-923.000	HEAT TWP HALL	105.78
06/30/2022	GEN	90139	CONSUMERS ENERGY	7500 HIGHLAND 05/24/22-06/21/22 CHARGES	101-269-923.001	HEAT COMM HALL	18.10
06/30/2022	GEN	90139	CONSUMERS ENERGY	9180 HIGHLAND 05/24/22-06/21/22 CHARGES	101-269-923.004	HEAT FISK	16.90
06/30/2022	GEN	90139	CONSUMERS ENERGY	7527 HIGHLAND 05/24/22-06/21/22 CHARGES	101-269-923.011	GAS-TWP ANNEX	23.59
06/30/2022	GEN	90139	CONSUMERS ENERGY	685 UNION 05/24/22-06/21/22 CHARGES	101-757-923.000	HEAT	28.46
06/30/2022	GEN	90139	CONSUMERS ENERGY	7420 HIGHLAND 05/24/22-06/21/22 CHARGES	206-336-923.001	HEAT STATION 1	188.80
06/30/2022	GEN	90139	CONSUMERS ENERGY	860 ROUND LK 05/24/22-06/21/22 CHARGES	206-336-923.002	HEAT STATION 2	30.53
06/30/2022	GEN	90139	CONSUMERS ENERGY	05/25/22-06/23/22 STA 3	206-336-923.003	HEAT STATION 3	23.29
06/30/2022	GEN	90140	DENISE SANTIAGO	SANTIAGO, REIMURSE FOR 466 MILES	101-215-860.000	MILEAGE	272.61
06/30/2022	GEN	90141	DTE ENERGY	7500 HIGHLAND 05/1/22-06/17/22 CHARGES	101-269-921.001	ELECTRIC COMM HALL	95.46
06/30/2022	GEN	90141	DTE ENERGY	9180 HIGHLAND 05/1/22-06/17/22 CHARGES	101-269-921.004	ELECTRIC FISK	21.74
06/30/2022	GEN	90141	DTE ENERGY	6190 WHITE LAKE 05/1/22-06/17/22 CHARGES	101-276-921.001	ELECTRIC WHITE LAKE	31.33
06/30/2022	GEN	90141	DTE ENERGY	685 UNION 05/1/22-06/17/22 CHARGES	101-757-921.000	ELECTRIC	478.12
06/30/2022	GEN	90141	DTE ENERGY	7422 HIGHLAND 05/1/22-06/17/22 CHARGES	206-336-921.001	ELECTRIC STATION 1	926.14
06/30/2022	GEN	90141	DTE ENERGY	4870 ORMOND 05/1/22-06/17/22 CHARGES	206-336-921.003	ELECTRIC STATION 3	148.95
06/30/2022	GEN	90142	GLOBAL OFFICE SOLUTIONS	PRESSBRD COVERS	101-191-740.000	OPERATING SUPPLIES	95.25
06/30/2022	GEN	90142	GLOBAL OFFICE SOLUTIONS	PENS	101-249-727.000	OFFICE SUPPLIES	112.47
06/30/2022	GEN	90143	HOME DEPOT CREDIT SERVICES	05/23/22-06/18/22 CHARGES	101-265-931.001	BLDG MAINTENANCE & SUPPLI	224.33
06/30/2022	GEN	90143	HOME DEPOT CREDIT SERVICES	05/23/22-06/18/22 CHARGES	101-276-932.000	CEMETERY MAINT	339.37
06/30/2022	GEN	90143	HOME DEPOT CREDIT SERVICES	05/23/22-06/18/22 CHARGES	101-299-956.000	UNALLOCATED MISCELLANEOU	64.47
06/30/2022	GEN	90143	HOME DEPOT CREDIT SERVICES	05/23/22-06/18/22 CHARGES	206-336-931.001	MAINTENANCE STATION 1	44.33
06/30/2022	GEN	90144	HURON VALLEY GUNS	HANNEMAN, TSHIRTS	206-336-744.000	UNIFORMS	594.80
06/30/2022	GEN	90144	HURON VALLEY GUNS	UHAZIE, NAME PLATE	207-301-744.000	UNIFORMS	239.97
06/30/2022	GEN	90145	HURON VALLEY-SINAI HOSPITAL	(6) NALOXONE KITS	206-336-767.000	MEDICAL SUPPLIES	30.00
06/30/2022	GEN	90146	HUTCHINSON'S ELECTRIC INC.	NEW WIRING AND CIRCUITS TO IT RACK	207-301-931.001	BLDG MAINTENANCE & SUPPLI	2,570.00
06/30/2022	GEN	90147	JENNIFER EDENS	06/21/22 REGULAR BOARD MEETING	101-101-710.000	FEES & PER DIEM	250.00
06/30/2022	GEN	90148	MUNETRIX LLC	TRANSPARENCY EDITION LICENSE	101-265-971.000	TECHNOLOGY EQUIPMENT	4,131.00
06/30/2022	GEN	90149	PETER'S TRUE VALUE HARDWARE	HUSKVARNA CHAINSAW MTCE	101-265-933.000	GROUNDS EQUIP MAINTENANC	164.88
06/30/2022	GEN	90150	SAFEWAY SHREDDING	SHREDDING, MEDIA SHREDDING	101-249-727.000	OFFICE SUPPLIES	84.95
06/30/2022	GEN	90150	SAFEWAY SHREDDING	SHREDDING PD	207-301-727.000	OFFICE SUPPLIES	54.95
06/30/2022	GEN	90151	SMARTSHEET INC	05/31/22-05/30/23 SUBSCRIPTION SMARTSHEET	101-265-971.000	TECHNOLOGY EQUIPMENT	900.00
06/30/2022	GEN	90152	STEED'S LAWN & LANDSCAPE LLC	DUBLIN, INSTALL COBBLESTONE, WEED BARRIER, B	101-757-931.000	BUILDING MAINTENANCE	1,620.00
06/30/2022	GEN	90153	SUBURBAN FORD	21-2 2019 INTERCEPTOR SUSPENSION,	207-301-863.001	VEHICLE MAINTENANCE	1,203.25
06/30/2022	GEN	90154	SZOTT M59 CHRYSLER JEEP	21-8 21 DODGE DURANGO OIL CHANGE, FILTER, IN:	207-301-863.001	VEHICLE MAINTENANCE	80.75
06/30/2022	GEN	90155	U.S. BANK EQUIPMENT FINANCE	GEN TWP COPIER LEASE PMT	101-906-991.000	PRINCIPAL-CAPITAL LEASE	509.70
06/30/2022	GEN	90155	U.S. BANK EQUIPMENT FINANCE	GEN TWP COPIER LEASE PMT	101-906-995.000	INTEREST-CAPITAL LEASE	43.30
06/30/2022	GEN	90156	GFL	6/11/22 HOUSEHOLD HAZARDOUS WASTE EVENT	226-528-801.000	RUBBISH EXPENDITURE	17,000.00
06/30/2022	GEN	90157	CAROL SINZHEIMER	SINZHEIMER, RETURN PAVILION DEPOSIT	208-000-652.000	FIELD RENTAL	80.00
06/30/2022	GEN	90158	TPC LAWN & LANDSCAPE	P/R-HIDDEN PINES JUNE MOWINGS	208-000-931.001	GROUNDS MAINTENANCE	1,1

WHITE LAKE TWP.
JUNE 2022 CHECK DISBURSEMENTS

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-000-080.718	DUE FROM WATER PENSION	587.07
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-000-231.001	PAY DEDUCT PENSION	10,691.86
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-171-718.000	PENSION	9,952.23
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-192-718.000	PENSION	4,286.90
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-209-718.000	PENSION	2,996.93
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-215-718.000	PENSION	11,145.31
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-253-718.000	PENSION	8,796.02
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-265-718.000	PENSION	1,292.95
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-372-718.000	PENSION	1,567.64
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-402-718.000	PENSION	3,034.84
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	101-757-718.000	PENSION	1,636.65
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	206-000-231.001	PAY DEDUCT PENSION	7,316.00
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	206-336-718.000	PENSION	28,113.70
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	207-000-231.001	PAY DEDUCT PENSION	12,513.03
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	207-301-718.000	PENSION	54,424.59
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	249-000-231.001	PAY DEDUCT PENSION	728.84
06/07/2022	GEN	1230083(E)	MERS	05/01/22-05/31/22 MERS CONTRIBUTIONS	249-000-718.000	PENSION	631.17
GEN Total							1,772,330.89
06/02/2022	PA-CK	1874	DLZ MICHIGAN, INC.	1266 CASTLEWOOD INSPECTION FEE	245-900-972.006	SAD SEWER CONNECTS	330.00
06/02/2022	PA-CK	1875	WHITE LAKE TOWNSHIP	1266 CASTLEWOOD GRINDER STA & TWP ADMIN FI	245-900-972.006	SAD SEWER CONNECTS	3,277.26
06/02/2022	PA-CK	1876	WHITE LAKE TOWNSHIP	1266 CASTLEWOOD EASEMENT FILING	245-900-972.006	SAD SEWER CONNECTS	30.00
06/08/2022	PA-CK	1877	OAKLAND COUNTY	9387 STEEP HOLLOW/GRINDER PUMP EASEMENT	245-900-972.006	SAD SEWER CONNECTS	30.00
06/08/2022	PA-CK	1878	OAKLAND COUNTY	1266 CASTLEWOOD, SEWER CONNECTION AGREEM	245-900-972.006	SAD SEWER CONNECTS	30.00
PA-CK Total							3,697.26
06/02/2022	SEWFD	4013	DLZ MICHIGAN, INC.	OAK RIDGE PARK SANITARY SEWER	245-000-214.590	DUE TO SEWER FUND	(85.00)
06/02/2022	SEWFD	4013	DLZ MICHIGAN, INC.	OAK RIDGE PARK SANITARY SEWER	245-000-965.999	TRANSFER TO SEWER FUND	85.00
06/02/2022	SEWFD	4013	DLZ MICHIGAN, INC.	OAK RIDGE PARK SANITARY SEWER	590-000-087.245	DUE FROM PA 188	85.00
06/02/2022	SEWFD	4013	DLZ MICHIGAN, INC.	OAK RIDGE PARK SANITARY SEWER	590-000-158.000	CONSTRUCTION IN PROGRESS	85.00
06/02/2022	SEWFD	4013	DLZ MICHIGAN, INC.	OAK RIDGE PARK SANITARY SEWER	590-000-699.000	TRANSFER IN FROM PA-188	(85.00)
06/02/2022	SEWFD	4013	DLZ MICHIGAN, INC.	GENERAL SEWER SERVICES	590-000-801.000	PROFESSIONAL FEES	587.50
06/09/2022	SEWFD	4014	COMMERCE TOWNSHIP	MAY SEWER HOOK UPS	590-000-969.000	CONNECTION EXPENSE-COMM	58,752.00
06/09/2022	SEWFD	4015	JENNIFER EDENS	05/17/22-PUBLIC HEARING TRANSCRIPT SEWER RE:	590-000-801.000	PROFESSIONAL FEES	225.00
06/16/2022	SEWFD	4016	EGANIX INC.	NITROGEN SUPPLEMENT	590-000-930.000	REPAIRS & MAINTENANCE	2,300.00
06/23/2022	SEWFD	4017	UNITED PARCEL SERVICE	SHIPPING TO REGISTER OF DEEDS	590-000-962.000	MISCELLANEOUS	13.42
06/30/2022	SEWFD	4018	UNITED PARCEL SERVICE	POSTAGE CHARGES	590-000-807.000	ADMINISTRATIVE COSTS	13.42
SEWFD Total							61,976.34
06/01/2022	TNA	14740	OAKLAND COUNTY	9460 BUCKINGHAM GRINDER PUMP EASEMENT	701-000-284.006	GRINDER PUMP INSTALLS	30.00
06/02/2022	TNA	14741	BIG BARNEY'S	SUNSET DUST CONTROL (4) APPLICATION	701-000-250.004	SUNSET ROAD	3,000.00
06/02/2022	TNA	14742	BREEN'S LANDSCAPE & SUPPLY CE	SUNSET LIMESTONE/CRUSHED CONCRET3E	701-000-250.004	SUNSET ROAD	2,045.80
06/02/2022	TNA	14743	C & E CONSTRUCTION CO INC	9460 BUCKINGHAM GRINDER INSTALL	701-000-284.006	GRINDER PUMP INSTALLS	5,3

WHITE LAKE TWP.
 JUNE 2022 CHECK DISBURSEMENTS

Section 6, Item B.

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	9460 BUCKINGHAM INSPECTION	701-000-284.006	GRINDER PUMP INSTALLS	1,630.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	PRE CON MEETING AND FINAL PLAN APPROVAL	701-000-286.396	4 CORNERS SQUARE, LLC	510.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	PHASE 4 CONSTRUCTION INSPECT, POND CONCERN	701-000-286.407	PRESERVE AT HIDDEN LAKE	6,445.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	PDA AMENDMENT, MASTER DEED REVIEW, ASBUIL	701-000-286.412	TRAILSIDE MEADOWS	4,207.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	MASTER DEED REVIEW AND PRE CONST	701-000-286.418	EAGLES LANDING/BOGIE LAKE !	1,081.25
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	FSP/FEP REVIEW	701-000-286.420	PONTIAC LAKEVIEW APTS	627.50
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	AS BUILT REVIEWS	701-000-286.442	NEW HOPE WHITE LAKE	690.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	FSP REVIEW AND PC MEETING	701-000-286.448	OAKLAND WEED HARVESTERS	730.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	SERVICES RELATING TO PSP REVIEW	701-000-286.453	COMFORT CARE ASSISTED LIVIN	571.25
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	PROFESSIONAL SERVICES RELATING TO PC MEETIN	701-000-286.455	WHITE LAKE HILL/AVALON	595.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	PROFESSIONAL SERVICES RELATING TO PSP REVIEW	701-000-286.457	HYPERSHINE CAR WASH	255.00
06/02/2022	TNA	14744	DLZ MICHIGAN, INC.	PROFESSIONAL SERVICES RELATING TO PSP REVIEW	701-000-286.460	BLACK ROCK	800.00
06/02/2022	TNA	14745	MCKENNA ASSOCIATES	ELIZABETH ROAD RETAIL PRELIM PLAN	701-000-286.421	ELIZABETH LAKE RETAIL/WHITE	460.00
06/03/2022	TNA	14746	52-3RD DISTRICT COURT	BOND-SAVANNAH DANIELLE-ROQUEL SMITH	701-000-287.002	DUE TO COURTS	120.00
06/03/2022	TNA	14747	52-3RD DISTRICT COURT	BOND-RACHELLE LYNN IRONS	701-000-287.002	DUE TO COURTS	600.00
06/09/2022	TNA	14748	DLZ MICHIGAN, INC.	FSP/FEP, ACCESS EASEMENT AND PBD REVIEW	701-000-286.451	TACO BELL- BOGIE & M59	1,620.00
06/09/2022	TNA	14749	DTE ENERGY	9600 GARFORTH/MANDON LAKE-(3) MONTHS	701-000-250.013	MANDON LAKE	44.28
06/09/2022	TNA	14750	OAKLAND COUNTY ANIMAL CONT	04/26/22-06/03/22 DOG TAGS	701-000-285.011	DUE TO OAKLAND CO DOG LICE	6,289.00
06/09/2022	TNA	14751	OAKLAND COUNTY TREASURER	MAY 2022 TRAILER TAX	701-000-287.003	DUE TO OAKLAND CO TR TAX	4,245.00
06/09/2022	TNA	14752	OAKLAND COUNTY WATER RESOL	MAY 2022 SEWER PERMITS	701-000-287.005	DUE TO OAKLAND CO SEWER P	2,400.00
06/09/2022	TNA	14753	WHITE LAKE TOWNSHIP TREASUR	MAY 2022 TRAILER TAX	701-000-285.013	DUE TO G/F TRAILER PARK FEE	849.00
06/09/2022	TNA	14754	WHITE LAKE TREASURER	04/26/22-06/03/22 DOG TAGS	701-000-285.012	DUE TO G/F DOG LICENSE	746.00
06/10/2022	TNA	14755	67TH DISTRICT COURT	BOND FOR ANTHONY EDWARD HOLLOWAY	701-000-287.002	DUE TO COURTS	485.00
06/10/2022	TNA	14756	81ST DISTRICT COURT	BOND FOR ANTHONY EDWARD HOLLOWAY	701-000-287.002	DUE TO COURTS	500.00
06/15/2022	TNA	14757	52-1 DISTRICT COURT	BOND-ELIZABETH ELAINE FULGENZI	701-000-287.002	DUE TO COURTS	250.00
06/16/2022	TNA	14758	AQUA -WEED CONTROL INC.	ROUND LAKE, MAY TREATMENTS	701-000-250.006	ROUND LAKE IMPROVEMENT B	5,778.75
06/16/2022	TNA	14759	AQUA -WEED CONTROL INC.	GRASS LAKE WEED TREATMENT	701-000-250.005	GRASS LAKE SAD	12,853.50
06/16/2022	TNA	14760	FAITH CHATTERSON	CHATTERSON, RETURN HALL DEPOSIT	701-000-283.000	DEPOSITS FOR HALLS	200.00
06/16/2022	TNA	14761	ROSATI, SCHULTZ, JOPPICH	SPECIAL ASSESSMENT APPEALS - PONT LAKE	701-000-250.008	PONTIAC LAKE WEED	1,747.35
06/16/2022	TNA	14761	ROSATI, SCHULTZ, JOPPICH	PRESERVE AT HIDDEN PINES	701-000-286.407	PRESERVE AT HIDDEN LAKE	378.00
06/16/2022	TNA	14761	ROSATI, SCHULTZ, JOPPICH	TRAILSIDE MEADOWS	701-000-286.412	TRAILSIDE MEADOWS	224.00
06/16/2022	TNA	14761	ROSATI, SCHULTZ, JOPPICH	EAGLES LANDING	701-000-286.418	EAGLES LANDING/BOGIE LAKE !	630.00
06/16/2022	TNA	14761	ROSATI, SCHULTZ, JOPPICH	SONIC REDEVEL-SERVICES THRU 04/30/22	701-000-286.452	SONIC REDEVELOPMENT/9328	154.00
06/16/2022	TNA	14762	WHITE LAKE TOWNSHIP	REIMBURSE GEN 3 UNION LAKE	701-000-286.461	3 UNION LAKE	350.00
06/23/2022	TNA	14763	AQUA -WEED CONTROL INC.	COLEDALE BAY-SEASON TREATMENT PLAN	701-000-250.002	COLEDALE BAY	3,050.00
06/23/2022	TNA	14764	DTE ENERGY	05/12/22-06/10/22 LAKE ONA	701-000-250.001	LAKE ONA AERATION	377.77
06/23/2022	TNA	14765	DTE ENERGY	05/12/22-06/10/22 LAKE NEVA	701-000-250.011	LAKE NEVA IMPROVEMENT BO.	21.92
06/23/2022	TNA	14766	DTE ENERGY	05/12/22-06/10/22 GRASS LAKE	701-000-250.005	GRASS LAKE SAD	14.76
06/23/2022	TNA	14767	DTE ENERGY	05/13/22-06/13/22 ROUND LAKE	701-000-250.006	ROUND LAKE IMPROVEMENT B	14.76
06/28/2022	TNA	14768	20TH DISTRICT COURT	BOND-SAMUEL P DONNELLY	701-000-287.002	DUE TO COURTS	1

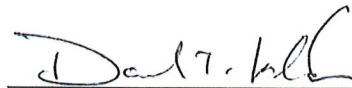
Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/28/2022	TNA	14769	OAKLAND COUNTY	1255 PINECREST, GRINDER PUMP EASEMENT	701-000-284.006	GRINDER PUMP INSTALLS	30.00
06/30/2022	TNA	14770	LAKES HARVESTING, INC.	PONTIAC LK, FIRST 300 ACRES COMPLETE	701-000-250.008	PONTIAC LAKE WEED	56,991.00
06/30/2022	TNA	14771	ROSATI, SCHULTZ, JOPPICH	TACO BELL #4 DEVELOPMENT AGREEMENT	701-000-286.451	TACO BELL- BOGIE & M59	196.00
TNA Total							130,311.89
06/02/2022	WAT	7690	DLZ MICHIGAN, INC.	BOGIE LAKE RD DWRF	591-000-160.000	CONST IN PROGRESS	30,960.00
06/02/2022	WAT	7690	DLZ MICHIGAN, INC.	2023 WLT CWSRF PROJECT PLAN	591-000-801.000	FINANCIAL CONSULT FEES	2,300.00
06/02/2022	WAT	7690	DLZ MICHIGAN, INC.	2022 GEN WATER SERVICES	591-000-802.000	ENG & ARCH FEES	9,672.50
06/02/2022	WAT	7690	DLZ MICHIGAN, INC.	FY22 WHPP GRANT SVCS	591-000-995.001	WELL HEAD PROTECTION PROC	600.00
06/02/2022	WAT	7691	DTE ENERGY	6260 GRASS LK 04/20/22-05/18/22 CHARGES	591-000-921.006	ELECTRICITY GRASS LAKE	514.38
06/02/2022	WAT	7692	HYDROCORP	MAY 2022 INSPECTION AND REPORTING SERVICES	591-000-818.000	CONTRACTED SERVICES	159.50
06/02/2022	WAT	7693	SHERWIN-WILLIAMS	ASPEN MEADOWS IRON FILTRATION	591-000-934.000	REPAIR & MAINT WATER SYSTE	243.52
06/02/2022	WAT	7694	STATE OF MICHIGAN	WATER TESTING	591-000-748.000	TESTING WATER SYSTEMS	207.00
06/09/2022	WAT	7695	AIR CENTER INC.	CPR SERVICES	591-000-931.000	REPAIR & MAINT BLDG & EQUI	850.00
06/09/2022	WAT	7696	AQUATEST	BACTERIA TESTING	591-000-748.000	TESTING WATER SYSTEMS	280.00
06/09/2022	WAT	7697	CONSUMERS ENERGY	9164 STEEPHOLLOW 04/26/22-05/23/22 CHARGES	591-000-923.001	GAS TWIN LAKES	69.87
06/09/2022	WAT	7697	CONSUMERS ENERGY	8208 FOX BAY 04/26/22-05/23/22 CHARGES	591-000-923.002	GAS HILLVIEW	28.46
06/09/2022	WAT	7697	CONSUMERS ENERGY	6260 GRASS LKAE 04/26/22-05/23/22 CHARGES	591-000-923.004	GAS GRASS LAKE	72.98
06/09/2022	WAT	7697	CONSUMERS ENERGY	8935 SATELITE 04/26/22-05/23/22 CHARGES	591-000-923.005	GAS VILLAGE ACRES-SATELITE F	75.05
06/09/2022	WAT	7698	JCI JONES CHEMICALS, INC.	CHORINE	591-000-745.000	SYSTEM CHEMICALS	2,309.00
06/09/2022	WAT	7699	MWEA	04/01/22-04/01/23 POTTER, MEMBERSHIP DUES	591-000-958.000	DUES & MISC	80.00
06/09/2022	WAT	7700	SPINAL COLUMN NEWSWEEKLY &	05/18/22-PUBLIC HEARING DWRF 2023	591-000-903.000	LEGAL NOTICES	370.50
06/09/2022	WAT	7701	USIC LOCATING SERVICES, LLC	05/01/22-05/31/22 CHARGES	591-000-818.000	CONTRACTED SERVICES	2,040.01
06/16/2022	WAT	7702	DLZ MICHIGAN, INC.	ASPEN MEADOWS SERVICES THRU 04/15/22	591-000-160.000	CONST IN PROGRESS	6,286.25
06/16/2022	WAT	7703	EJ USA, INC	BR BRK FLG REPAIR KIT	591-000-934.000	REPAIR & MAINT WATER SYSTE	914.85
06/16/2022	WAT	7704	ELHORN ENGINEERING CO	EL-CHLOR	591-000-745.000	SYSTEM CHEMICALS	1,787.80
06/16/2022	WAT	7705	MRWA	07/01/22-06/30/23 MEMBERSHIP DUES	591-000-958.000	DUES & MISC	935.00
06/16/2022	WAT	7706	ROSATI, SCHULTZ, JOPPICH	WATER, SERVICES THRU MAY 31, 2022	591-000-826.000	ATTORNEY FEES	98.00
06/16/2022	WAT	7707	RS TECHNICAL SERIVCES, INC.	DIAFLEX KIT, VRTD VALVES, ORINGS	591-000-931.000	REPAIR & MAINT BLDG & EQUI	687.26
06/16/2022	WAT	7708	U.S. BANK EQUIPMENT FINANCE	WATER, COPIER CHARGES	591-000-991.001	PRINCIPAL COPIER LEASE	141.13
06/16/2022	WAT	7708	U.S. BANK EQUIPMENT FINANCE	WATER, COPIER CHARGES	591-000-995.002	INTEREST COPIER LEASE	6.87
06/16/2022	WAT	7709	ULLIANCE, INC	TRAINING-3 MTH PACKET	591-000-960.000	EDUCATION & TRAINING	6,000.00
06/16/2022	WAT	7710	WHITE LAKE TOWNSHIP	REIMBURSE FOR MAY 2022 SERVICES	591-000-214.101	DUE TO GENERAL FUND	37,990.79
06/23/2022	WAT	7711	ABC PRINTING	WINDOW ENVELOPES	591-000-727.000	OFFICE SUPPLIES	359.00
06/23/2022	WAT	7712	CUMMINS INC	EMERG REPAIR, GENERATOR	591-000-931.000	REPAIR & MAINT BLDG & EQUI	12,407.63
06/23/2022	WAT	7713	DTE ENERGY	05/10/22-06/09/22 TOWER WOODSEGE	591-000-921.000	ELECTRICITY TOWER	41.06
06/23/2022	WAT	7713	DTE ENERGY	05/10/22-06/09/22 TWIN LAKES	591-000-921.001	ELECTRICITY TL	5,880.17
06/23/2022	WAT	7713	DTE ENERGY	05/10/22-06/09/22 HILLVIEW	591-000-921.002	ELECTRICITY HILLVIEW	720.99
06/23/2022	WAT	7713	DTE ENERGY	05/12/22-06/10/22 TOWER 2	591-000-921.007	ELECTRICITY TOWER #2	34.45
06/23/2022	WAT	7713	DTE ENERGY	05/10/22-06/09/22 HURONDALE	591-000-921.008	ELECTRICITY-HURONDALE	46.63
06/23/2022	WAT	7713	DTE ENERGY	05/10/22-06/09/22 WILLIMAS - HURONDALE	591-000-921.010	ELECTRICITY 933 WILLIAMS-HU	

Check Date	Bank	Check #	Payee	Description	GL #	Account Name	Amount
06/23/2022	WAT	7714	HARRINGTON INDUSTRIAL PLASTI	1/2" VALVE BALL CHECK	591-000-740.000	OPERATING SUPPLIES	293.26
06/23/2022	WAT	7715	LOTUS ELECTRIC INC.	MEANWELL AC TO DC	591-000-740.000	OPERATING SUPPLIES	195.00
06/23/2022	WAT	7716	PREMIER SAFETY	VEST,SURVEYOR, LIME, MESH	591-000-744.000	SAFETY GEAR AND CLOTHING	81.80
06/23/2022	WAT	7717	STEED'S LAWN & LANDSCAPE LLC	642 PLAINFIELD TOPSOIL, SEED, STRAW	591-000-934.000	REPAIR & MAINT WATER SYSTE	300.00
06/30/2022	WAT	7718	LOTUS ELECTRIC INC.	VFD FAIL	591-000-931.000	REPAIR & MAINT BLDG & EQUII	440.00
06/30/2022	WAT	7719	PARAGON LABORATORIES INC	WATER TESTING	591-000-748.000	TESTING WATER SYSTEMS	665.00
06/30/2022	WAT	7720	STATE OF MICHIGAN	WATER TESTS	591-000-748.000	TESTING WATER SYSTEMS	1,440.00
WAT Total							128,603.51
Grand Total							2,096,919.89

WHITE LAKE TOWNSHIP POLICE DEPARTMENT

JUNE 2022

DETECTIVE BUREAU SUMMARY						
	Jun-22	Jun-21	% CHG.	YTD 22	YTD 21	% CHG
ARRESTS	0	0	0.0%	0	2	-100.0%
WARRANTS ISSUED	18	21	-14.3%	152	121	25.6%
JUVENILE PETITIONS	10	0	1000.0%	28	8	250.0%
COURT CASES	3	10	-70.0%	62	46	34.8%
PRISONERS ASSIGNED	9	20	-55.0%	42	49	-14.3%
CASES ASSIGNED	20	43	-53.5%	127	193	-34.2%
CASES CLOSED BY ARREST	44	62	-29.0%	302	338	-10.7%
CASES CLOSED OTHER	11	15	-26.7%	97	115	-15.7%
UNIFORM DIVISION SUMMARY						
	Jun-22	Jun-21	% CHG.	YTD 22	YTD 21	% CHG
ARRESTS	75	83	-9.6%	468	456	2.6%
TRAFFIC WARNINGS	246	292	-15.8%	1,598	2,299	-30.5%
TICKETS ISSUED	253	368	-31.3%	2,035	2,165	-6.0%
ACCIDENT - PROPERTY DAMAGE	40	39	2.6%	222	185	20.0%
ACCIDENT - PERSONAL INJURY	8	15	-46.7%	42	45	-6.7%
ACCIDENT - FATAL	0	0	0.0%	0	0	0.0%
ACCIDENT - PRIVATE PROPERTY	15	12	25.0%	74	61	21.3%
CALLS FOR SERVICE	1,695	1,951	-13.1%	11,863	12,352	-4.0%
DISPATCH RUNS	858	1,062	-19.2%	4,611	5,514	-16.4%



Daniel T. Keller, Chief of Police

Monthly Summary of Offenses

All Offenses that were Attempted or Completed

CLASS	Description	Jun-22	Jun-21	YTD 2022	YTD 2021	YTD % CHG	ARRESTS			
							ADULT		JUV	
							Jun-22	YTD	Jun-22	YTD
100	Murder / Manslaughter	0	0	1	0	100.0%	0	2	0	0
200	Forcible Sexual Offenses	0	0	3	2	50.0%	0	0	0	0
300	Robbery	0	0	0	1	-100.0%	0	0	0	0
400	Assault Offenses	11	4	39	29	34.5%	7	24	1	1
500	Burglary/Home Invasion	3	0	10	2	400.0%	1	4	1	1
600	Larceny Violations	6	6	39	24	62.5%	0	1	0	1
700	Motor Vehicle Theft	1	0	3	3	0.0%	0	2	0	0
800	Arson	0	0	0	0	0.0%	0	0	0	0
900	Kidnapping / Abduction	0	0	0	0	0.0%	0	0	0	0
GROUP A TOTALS		21	10	95	61	55.7%	8	33	2	3



Fire Department

Charter Township of White Lake

7420 Highland Road, White Lake, MI 48383 Tel 248-698-3993

2022 June Incident / Activity Summary

Incident Response breakdown

Medical/Rescue..... 174

Hostile Fires (Structure, Vehicle, Brush, and Other)..... 05

Hazardous Conditions..... 16

Public Service / Other..... 45

Mutual Aid –

- Given..... 02
- Received..... 02

Total Calls for Service: **240**

Activity Summary

Key box / safe access program..... 02

EMS - Hospital Transports by the Fire Department..... 03

Car seat Inspection..... 01

Additional Comments..... The 2007 Pierce (Heavy Rescue) has been officially sold to the Arapahoe Fire Department in North Carolina. Representatives from their Department took possession of the truck on June 26th.

Report was processed on 06/30/22



John Holland
Fire Chief



June 2022 Incident Summary

Fire Incidents:	June 2022	YTD 2022	YTD 2021
Structure Fire	03	11	11
Outside Structures	00	00	00
Vehicle	00	06	06
Brush	01	05	08
Refuse	01	02	00
Other	00	02	06
Total Fire Incidents:	05	26	31 (-16%)

Non-Fire Incidents:	June 2022	YTD 2022	YTD 2021
Overpressure/Excessive Heat	00	01	00
Medical/Rescue	174	1,072	1,070
Hazardous Condition	16	44	39
Public Service	27	177	176
Good Intent	12	64	86
False Alarms	06	60	50
System Malfunction	00	03	01
Weather Emergencies	00	00	00
Other Non-Fire	00	04	06
Total Non-Fire Incidents:	235	1,425	1,428 (-0.2)

Total Alarms:	240	1,451	1,459 (-0.5)
----------------------	------------	--------------	---------------------

Mutual Aid	June 2022	YTD 2022	YTD 2021
Given	02	12	10
Received	02	11	19

Summary of Fire Value Saved/Loss:			
Situation	Dollar Value	Dollar Loss	\$ Saved
Building Fire	1,200,000	6,000	1,194,000
Mobile Property Fire	000	000	000
Other Fire	000	000	000
Totals (June 2022):	1,200,000	6,000	1,194,000
Totals (June 2021):	220,000	21,500	198,500

Firefighter Andrew Morelli
06/30/2022

Rik Kowall, Supervisor
Anthony L. Noble, Clerk
Mike Roman, Treasurer



Section 6, Item E.

Scott Ruggles
Liz Fessler Smith
Andrea C. Voorheis
Michael Powell

WHITE LAKE TOWNSHIP

7525 Highland Road • White Lake, Michigan 48383-2900 • (248) 698-3300 • www.whitelaketwp.com

Community Development Department Report

July 2022

Dear Township Board Members,

During the month of June, the department continued working on various projects. The Parks & Recreation Master update is underway and the Land Use Master Plan update will begin later this year. We still plan to submit a grant application for the construction of the Triangle Trail this summer. The annual update of the Capital Improvement Plan (CIP) is underway and that finished product will be presented to the Board in September. We look forward to beginning work on the Corridor Improvement Authority (CIA) Plan as well.

There are several active projects under review. The Elizabeth Lake Retail (M-59 & Elizabeth Lake Rd.) had their request for preliminary site plan and rezoning approval tabled by the Planning Commission in June. The Comfort Care plan (Union Lake Rd & Carpathian) received preliminary approval in June and will be on your July agenda for final consideration of their rezoning request. The Avalon project (M-59 & Hill Rd) is requesting Preliminary Site Plan and rezoning approval for both single and multiple family dwellings on their land. This project will be placed on the July Board agenda for consideration. The Black Rock restaurant (M-59 & White Banks) submitted their Preliminary Site Plan for review and will likely be on a Planning Commission agenda in August. Lastly, the rezoning request at 1392 S. Williams Lake Road will be on your July agenda for final consideration.

As for approved projects, the Preserve at Hidden Lake and Trailside Meadow projects continue to progress on their projects. The New Hope White Lake assisted living project (Williams Lake Rd.) is nearing completion on their site work and building construction. The Eagles Landing project (Bogie Lake Rd.) began their site construction this month. The West Valley and Lakepointe projects (near Bocovina on either side of Union Lake Rd.) intend to begin construction this summer. The Pontiac Lake Overlook apartment project (Pontiac Lake Rd.) is moving forward with their site construction. The redevelopment of the former Sonic restaurant (at Fisk Corners) is continuing to move forward. The Oxbow Lake Private Launch (Lakeside Dr. & M-59) will begin work late this summer. The Oakland Harvesters (White Lake Rd.) project received final site plan approval and will hopefully begin construction this fall. The Taco Bell project (Meijer out lot) has received Final Site Plan and Development Agreement approval, and will begin construction this summer. Finally, the Hypershine car wash (M-59 & Fisk) had their Final Site Plan approved by the Planning Commission on July 7th.

Please find included in this monthly report the parks and recreation update as well as the permit and inspection activity report for building. If you have any questions or require any additional information from the Community Development Department, please contact us.

Respectfully,

Sean O'Neil

Rik Kowall, Supervisor
Anthony L. Noble, Clerk
Mike Roman, Treasurer



Section 6, Item E.

Scott Huggles
Liz Fessler Smith
Andrea C. Voorheis
Michael Powell

WHITE LAKE TOWNSHIP

7525 Highland Road • White Lake, Michigan 48383-2900 • (248) 698-3300 • www.whitelaketwp.com

Parks and Recreation July 2022

Dear Township Board,

The Stanley Park biological assessment (BA) was received by the National Park Service (NPS), and its Land and Water Conservation Fund (LWCF) compliance staff will review the document. Once the BA is reviewed by NPS, the U.S. Fish and Wildlife Service (USFWS) must review the document to issue its opinion and permit. It is questionable if the USFWS review of the BA will be complete prior to the closing of the current submission window with the Michigan Department of Natural Resources (MDNR). Staff was informed by MDNR the next opportunity to receive a project agreement if the current window is missed is summer 2023. There are factors outside of the Township's control, such as actions and timelines of the NPS and USFWS. For example, the USFWS indicated once receiving a BA it had 135 days to review and issue a determination.

Staff continues to work with Groya Consulting, the group hired to assist the Township with the 5-Year Parks and Recreation Master Plan update. As the project moves along, staff will keep the Board updated on the progress. The consultant will likely be in attendance at the Committee's August meeting. Public engagement is part of the project, and some sort of event to gather public input will be planned in the coming months. An online survey will also be utilized to gather information from residents.

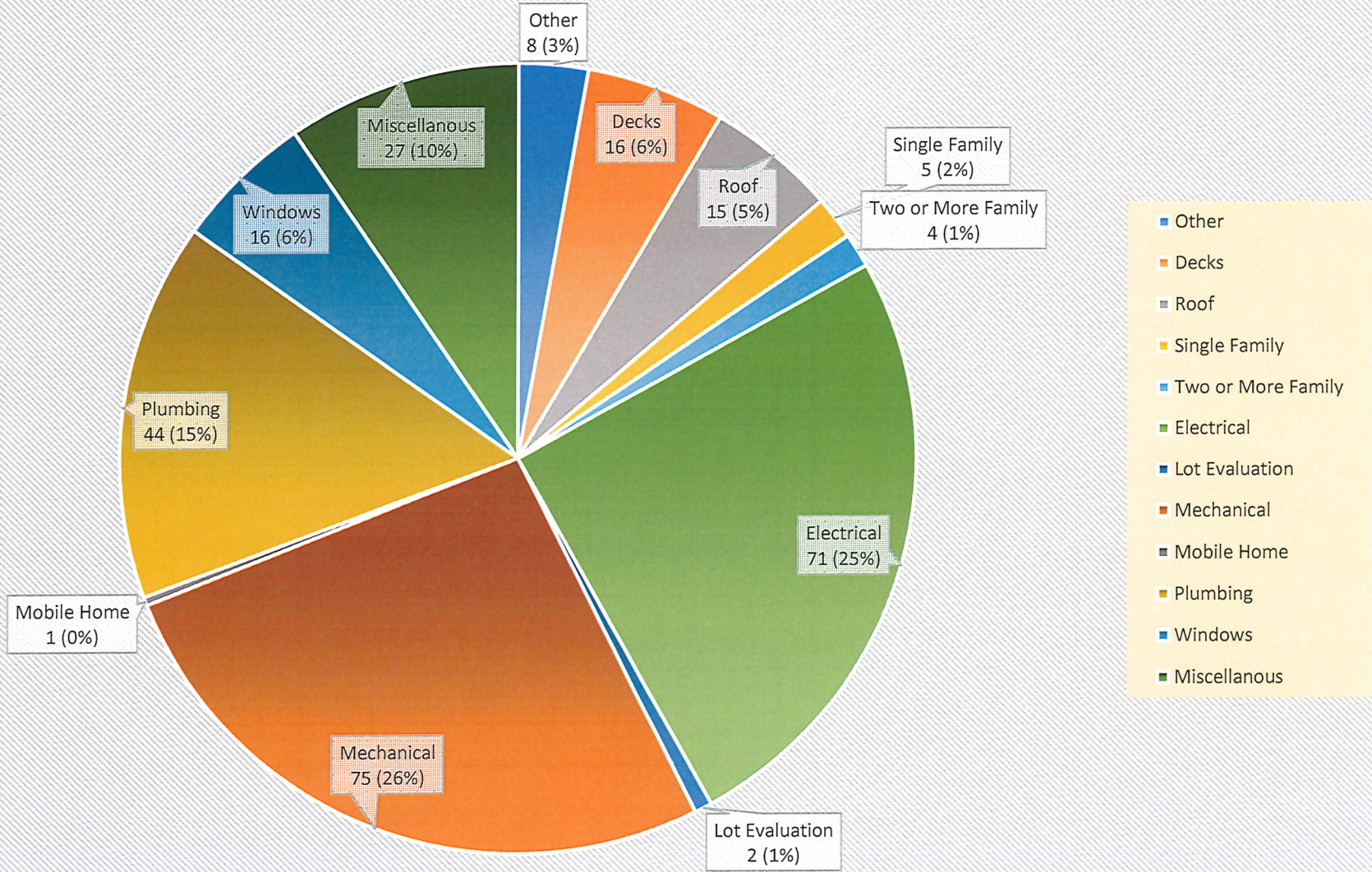
The Committee held a Family Fun Day at Hawley Park on June 25, 2022. White Lake Police Foundation donated hot dogs and bottled water for the event. Approximately 125+ people attended over the course of the afternoon. As this was the first event of its kind planned by the Committee, improvements will be made to build on the success for next year. As White Lake builds traction with its events, the Committee will continue planning other events throughout the year, and, if possible, will work in conjunction with the Historical Society on certain events.

If you have any questions, please contact me.

Sincerely,

Justin Quagliata
Staff Planner

BUILDING PERMITS FOR JUNE 2022



**WHITE LAKE TOWNSHIP TREASURER'S REPORT
GENERAL FUND
ENDING JUNE 30, 2022**

BALANCE AS OF MAY 31, 2022 28,668,480.05

White Lake Water		37,990.79	
Building:	Building Licenses	260.00	
	Building Permits	34,843.00	
	Electrical Licenses	260.00	
	Electrical Permits	5,960.00	
	Maintenance and Supplies		
	Mechanical Licenses	150.00	
	Mechanical Permits	12,200.00	
	Rental Fee/Misc. Revenue	1,828.00	
	Plumbing Licenses	9.00	
	Plumbing Permits	4,564.00	
	Fire Safety Reviews	0.00	
Admin Fees		156.06	
Cash Bonds			
CDBG			
Cemetery Lots		2,200.00	
Conference & Meetings			
Delinquent Property Tax		522,239.68	
Dog License		746.00	
Dental Ins / Optical Ins		57.98	
Deferred Inflows			
Duplicating & Photostat/Maps		42.19	
Due From Others			
Due to Others			
Franchise Fees/Cable TV			
Grinder Pump Inventory		3,121.20	
Gravesite Openings/ Closings		1,000.00	
Landscaping Inspection Fees			
Metro Act Revenue		25,511.30	
Miscellaneous		2,766.41	
Monument Foundations/Brick Pav		624.00	
NSF Fees		75.00	
Other Maps, Codes			
Ordinance Fines		100.00	
Other Sundry			
Postage & Misc. Revenue			
Planning Fees			
Planning Department Reviews		850.00	
Platting/Lot Split		55.00	
Punch List Admin Fees			
Payroll Service			
PRE Denials			
Road Construction/Tri-Party			
Rent Community Hall & Fields		75.00	
Rent- Ormond Tower		1,217.57	
Rubbish			
Senior Activities		1,298.00	
Senior Center Revenue			
Solicitor Permits			
State Shared Revenue		559,835.00	
Trailer Park Tax		849.00	
Zoning Board of Appeals		385.00	
CASH RECEIPTS - Subtotal		<u>1,221,269.18</u>	
Fire Cash Receipts		79,407.25	
Police Cash Receipts		97,495.98	
Due From Other Funds			
American Rescue Plan Act		1,647,562.17	
Voided Checks		30,000.00	
June Interest		14,426.57	
TOTAL RECEIPTS		<u>3,090,161.15</u>	3,090,161.15
			31,758,641.20
Cash Disbursements			(2,331,988.23)
Transfers In			228,334.35
Transfers Out			(30.00)
Deposit Adjustment/Bank Service Chg			6,191.55
Balance as of June 30, 2022			<u><u>29,661,148.87</u></u>

RECONCILIATION OF CASH ON HAND

Checking		2,488,294.58	
Investment		27,172,854.29	
Balance as of June 30, 2022		<u><u>29,661,148.87</u></u>	

**WHITE LAKE TOWNSHIP TREASURER'S REPORT
OTHER FUNDS
June 30, 2022**

CONSTRUCTION	Checking		\$	100.00
DRUG FORFEITURE	Savings		\$	115,929.35
	Interest	\$	5.07	
EMPLOYEE FLEXIBLE SPENDING	Checking		\$	18,207.38
IMPROVEMENT REVOLVING FUND	Savings		\$	671,598.02
	Interest	\$	414.75	
	OC Pool		\$	7,076,130.04
	Interest	\$	3,095.93	
LIBRARY DEBT	Savings		\$	153,429.21
	Interest	\$	91.44	
PARKS & RECREATION	Savings		\$	112,991.47
	Interest	\$	17.98	
	OC Pool		\$	1,197,750.05
	Interest	\$	359.97	
PUBLIC ACT 188	Checking		\$	107,589.19
	Savings		\$	443,156.46
	Interest	\$	18.08	
SEWER FUND	Checking		\$	243,447.17
SEWER MAINTENANCE	General Savings (3148)		\$	1,434,797.90
	Interest	\$	58.53	
SPECIAL ASSESSMENTS	Rubbish Savings (1134)		\$	1,067,662.39
	Interest	\$	49.15	
	SAD - Non sewer (8959)		\$	153,757.92
	Interest	\$	91.40	
T & A ESCROW	Checking		\$	52,194.45
	Savings		\$	721,994.75
	Interest	\$	29.46	
	OC Pool		\$	432,775.16
	Interest	\$	189.35	
WATER	Operating Checking-HVSB		\$	118,123.94
	Operating MM-HVSB (515)		\$	1,781,757.98
	Interest	\$	478.95	
	Water Capital OC Pool		\$	2,148,566.73
	Interest	\$	940.04	
	Water Capital-Flagstar (7744)		\$	85,253.47
	Interest	\$	50.68	
	Water Capital-HVSB (309)		\$	550,689.32
	Interest	\$	69.32	
			\$	18,687,902.35
CURRENT TAX	Checking		\$	4,085.15
	CDARS		\$	-
			\$	5,960.10
			\$	18,691,987.50

Respectfully submitted,

Mike Roman
Treasurer

**WHITE LAKE TOWNSHIP
INTER-OFFICE MEMORANDUM
COMMUNITY DEVELOPMENT DEPARTMENT**

DATE: June 13, 2022

TO: Rik Kowall, Supervisor
Township Board of Trustees

FROM: Sean O’Neil, AICP
Community Development Director

**SUBJECT: 1392 S. Williams Lake
Rezoning Request**

Property described as parcel number 12-36-476-002 (1392 S. Williams Lake Road), located on the west side of Williams Lake Road, north of Cooley Lake Road and contains approximately 386.60 feet of frontage on Williams Lake Road. Consisting of approximately 2.50 acres. Applicant requests to rezone the parcel from AG (Agricultural) to RM-1 (Attached Single Family).

The above request is now ready for Township Board Consideration. The matter was considered by the Planning Commission at their regular meeting of May 19, 2022 at which time the **Planning Commission recommended approval** of rezoning request.

Please find enclosed the following related documents:

- Draft minutes from the Planning Commission meeting held on May 19th, 2022.
- Review letter prepared by Justin Quagliata, Staff Planner, dated April 14, 2022.
- Traffic study review prepared by Leigh Merrill, P.E., DLZ, dated April 22, 2022.
- Traffic study submitted by the applicant.
- Letter from Oakland County Coordinating Zoning Committee.
- Rezoning application from the applicant.
- Authorization from the property owner.
- Public hearing notice.

Please place this matter on the next available Township Board agenda. Do not hesitate to contact me should you require additional information.

**WHITE LAKE TOWNSHIP
PLANNING COMMISSION**

Township Annex, 7527 Highland Road
White Lake, MI 48383
May 19, 2022 @ 7:00 PM

CALL TO ORDER

Commissioner Anderson called the meeting to order at 7:00 PM and led the Pledge of Allegiance. Roll was called.

ROLL CALL

Debby Dehart
Scott Ruggles
Mark Fine
Steve Anderson
Merrie Carlock
Pete Meagher
Matt Slicker
T. Joseph Seward

Absent: Robert Seeley

Also Present: Sean O’Neil, Community Development Director
Justin Quagliata, Staff Planner
Mike Leuffgen, DLZ
Lisa Kane, Recording Secretary

Visitors: 14 members of the public were present

APPROVAL OF AGENDA

Director O’Neil asked to amend the agenda, adding *8B. Elizabeth Lake Retail Conceptual Discussion.*

Commissioner Dehart moved to approve the amended agenda of the May 19, 2022 Planning Commission Meeting.

Commissioner Fine supported and the MOTION CARRIED with a voice vote: 8 yes votes.

APPROVAL OF MINUTES

- a. Regular meeting minutes of May 5, 2022
- b. Correction of minutes as noted by Commissioner Seward of a typographical error.

Commissioner Fine moved to approve the amended Minutes of May 5, 2022.

Commissioner Seward supported and the MOTION CARRIED with a voice vote: 8 yes votes.

CALL TO THE PUBLIC (FOR ITEMS NOT ON THE AGENDA)

John Hunt of 871 Oxhill Drive had concerns about snow removal at the proposed Black Rock site and made suggestions on how to accommodate snow removal in the parking lot.

PUBLIC HEARING

A. 1392 S. Williams Lake

Property described as parcel number 12-36-476-002 (1392 S. Williams Lake Road) located on the west side of Williams Lake Road, north of Cooley Lake Road and contains approximately 386.60 feet of frontage on Williams Lake Road. Consisting of approximately 2.50 acres.

Request: **Applicant requests to rezone the parcel from AG (Agricultural) to RM-1 (Attached Single-Family).**

Applicant: Justin Jundy
1392 S. Williams Lake Road
White Lake, MI 48386

Applicant Present: Justin Jundy of 1392 S. Williams Lake Rd, Azher Matty and Andrew Markell of J & D Architectural Engineering

Director O'Neil stated the rezoning request was consistent with the Master Plan. This property could be served by public utilities would have no access to Whetherstone's roads, storm sewer, or other utilities. The concept drawing, which was not reviewed for compliance with the zoning ordinance and not under consideration by the Planning Commission, indicated the only road access being on Williams Lake Road. DLZ did not have any objections to the rezoning traffic study submitted. Staff recommends approval of the rezoning.

Commissioner Slicker asked staff if Stony Court met the standards for a dead-end road.

Director O'Neil explained Stony Court was compliant 19 years ago and was considered an extended driveway. There was an ongoing issue of traffic cutting through Whetherstone and adding another access point to Williams Lake Road would have a negative impact.

Commissioner Dehart asked staff about RM-1 zoning density and if units had to be owner-occupied.

Director O'Neil stated the density for RM-1 was 6 to 8 units per acre and any development of this site would be expected to present 6 to 8 units per acre.

Mr. Matty presented the conceptual drawing and discussed the rezoning traffic study.

Mr. Jundy stated they would like to bring more families to the area.

Commissioner Carlock stated natural vegetation was preferred over new, young trees.

Mr. Matty stated they intend on having an arborist visit the site and give recommendations.

Commissioner Slicker confirmed the Commission was only considering the rezoning request at this time and inquired about the conceptual drawing.

Commissioner Anderson opened the public hearing at 7:26 p.m.

Bruce Scarcella of 8052 Stony Court inquired about the density proposed and the zoning of his neighborhood.

Director O'Neil answered the resident and encouraged him to contact the Community Development Department for more information regarding the zoning of his neighborhood.

Joellen Bennett of 1357 Waverly Drive inquired about the utilities available to this development and if this would be accessible through her neighborhood.

Commissioner Anderson explained those matters were not considered during a rezoning request.

Director O'Neil explained a new development would not be allowed to access any utilities or roads without the consent of Whetherstone.

Christine Grimes of 1373 Waverly Drive was concerned about traffic and asked when the traffic study was completed.

Mr. Quagliata stated the rezoning traffic study utilized traffic count information from July 2021 and December 2021.

Michael Bennett of 1357 Waverly Drive was also concerned about traffic.

Corey Fowler of 8624 Newport co-owns a unit on Waverly Drive and was concerned about the animals in the nearby wooded area.

Marilyn Waltz of 1365 S. Williams Lake Road (Waterford) had concerns about the increase of traffic.

Commissioner Anderson closed the public hearing at 7:39 p.m.

Commissioner Anderson asked the applicants to take the feedback from the public hearing into consideration when preparing their site plan.

Commissioner Seward moved to recommend approval to the Township Board of the rezoning from AG (Agricultural) to RM-1 (Attached Single Family), for parcel number 12-36-476-002.

Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

B. VCA

Property described as parcel number 12-21-276-023 (7755 Highland Road) located on the north side of Highland Road, west of Elizabeth Lake Road. Consisting of approximately 1.27 acres.

Request: **1) Amended final site plan**

2) Special land use to establish and operate a veterinary clinic

Applicant: VCA Animal Hospitals, Inc

12401 West Olympic Blvd

Los Angeles, CA 90064

Applicant Present: Rebecca Wilson of 5434 Mancelona Dr., Grand Blanc

Director O'Neil introduced the request and explained how the zoning ordinance was previously amended to allow for the special land use of a veterinary clinic in the LB (Local Business) zoning district. The applicant requested an amendment to the final site plan for the outdoor pet areas. The site was already on municipal water and sewer. Staff recommended approval of the special land use and the amended final site plan, and suggested to include hours of operation as a condition of the special land use approval.

Commissioner Seward asked staff if the neighboring business, Auto Zone, operated 24 hours a day.

Director O'Neil stated it did not.

Commissioner Carlock asked staff about the other tenants in the building.

Director O'Neil explained there would be a second tenant occupying one unit and an unoccupied unit in between the veterinary clinic and the carry out restaurant on the opposing end of the building.

Commissioner Slicker inquired about the turf used in the outdoor pet areas and cleaning of the areas.

Ms. Wilson stated the VCA needed two exterior areas for walking dogs, one for those who had communicable illnesses and a separate area for dogs that had a medical procedure. The artificial turf would be cleaned every day. The facility would not offer grooming, or boarding besides surgical stays. No after-hours emergency services would be offered; the VCA referred patients to 24-hour veterinary hospitals in the area. Ms. Wilson stated the requested hours of operation were Monday through Friday from 9 a.m. to 7 p.m. and Saturday from 9 a.m. to 1 p.m. The clinic was closed Sundays.

Commissioner Anderson opened the public hearing at 8:00 p.m.

No members of the audience spoke during the public hearing.

Commissioner Anderson closed public hearing at 8:02 p.m.

Commissioner Meagher moved to approve the amendment of the final site plan subject to all staff and consultants' review comments being addressed, for Parcel Number 12-21-276-023 (7755 Highland Road).

Commissioner Dehart supported, and the **MOTION CARRIED** with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

Commissioner Meagher moved to approve the Special Land Use subject to the stipulated hours of operation to establish and operate a veterinary clinic, for Parcel Number 12-21-276-023 (7755 Highland Road).

Commissioner Dehart supported, and the MOTION CARRIED with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

CONTINUING BUSINESS

A. Comfort Care White Lake

Property described as parcel number 12-36-176-002, located on the west side of Union Lake Road, between Hutchins Road and Cooley Lake Road, consisting of approximately 8.7 acres.

Request: **i) Rezoning (from (LB) Local Business to Planned Development (PD)**

ii) Preliminary site plan approval

Applicant: Comfort Care, LLC

4180 Tittabawassee Road

Saginaw, MI 48604

Applicant Present: Doug Boehm, Owner & Executive Director of Comfort Care
John Costa, Architect and Rudy Quaderer, Site Engineer

Mr. Quagliata stated the size of the building and density were reduced from the previous plan. The secondary access to Union Lake Road had been removed; an emergency/secondary access through the West Valley site (if the project was constructed) was proposed. Staff recommended posting 'No Parking' signs and designating the secondary access as a fire lane. A public benefit of \$20,000 to the Parks and Recreation fund was offered by the applicant. Five waivers (deviations from the zoning ordinance) were requested. The facade of the building had been changed with improved quality of materials used. A screen wall had been added to provide screening at the rear property line. Staff recommended approval subject to all comments being addressed and the Commission discussing the community benefit with the applicant.

Commissioner Meagher asked staff what the difference was between a waiver and a variance.

Director O'Neil explained Planned Development zoning allowed for deviations from the zoning ordinance through the development agreement.

Commissioner Ruggles asked staff about the proposed public benefit.

Mr. Quagliata referenced the waivers requested and stated a community benefit must be for the use and enjoyment of the public-at-large.

Commissioner Fine had concerns about the amount of greenbelt landscaping.

Commissioner Dehart asked staff about the number of waivers requested and if there were any comparable developments that could help them determine the public benefit.

Mr. Quagliata answered five waivers were requested.

The Commission discussed the proposed public benefit.

Commissioner Slicker noted the plan indicated a retaining wall and stated that could increase the adjacent homeowner's potential for drainage issues.

Mr. Quagliata stated screening of the neighbor's property had been increased compared to the previous plan and screen wall details would need to be clarified on the final site plan.

Mr. Leuffgen noted the plans had not changed significantly from an engineering standpoint and this project's feasibility remained entirely dependent on the West Valley project being redesigned and constructed.

Mr. Boehm stated he spoke with the resident of 900 Union Lake Road regarding the retaining wall.

Mr. Quaderer reviewed the landscaping on the plan.

The Commission reviewed the renderings provided by the applicant, and deliberated the waivers requested and required setbacks.

Commissioner Dehart inquired about the size of the Comfort Care Clarkston facility.

Commissioner Meagher asked Commissioner Dehart her opinion about how the Zoning Board of Appeals would respond if the Board had to hear this case.

The Commission discussed the proposed public benefit.

Mr. Boehm stated he had discussed the public benefit with his team and increased the proposed amount from \$5,000 to \$20,000.

Commissioner Meagher moved to recommend approval to the Township Board the rezoning of Parcel Number 12-36-176-002 from LB (Local Business) to PD (Planned Development), subject to the applicant obtaining preliminary site plan approval from the Township Board. Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

Commissioner Meagher moved to recommend approval to the Township Board approval of the preliminary site plan for Parcel Number 12-36-176-002, subject to the applicant addressing all of the staff and consultant comments and recommendations, West Valley being redesigned and constructed, no parking signs being placed in the secondary access drive, landscaping meeting all zoning ordinance requirements, and an increased public benefit commensurate with the waivers requested.

Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (7 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/no, Slicker/yes, Ruggles/yes)

B. Elizabeth Lake Retail Conceptual Discussion

Commissioner Ruggles recused himself from the case and left the meeting.

Commissioner Anderson explained the applicant had fifteen minutes to present and for the Commission to discuss the matter.

Director O'Neil provided an update on the project.

Joe Maynard of Washtenaw Engineering presented the project. The applicant was seeking Planning Commission input on the residential aspect of the project and indicated a wetland permit had been applied for through EGLE.

Nazir Jawich explained the history of the project and the concerns about the future demand of mixed use.

Discussion by the Commission regarding appropriate zoning and the residential component of the project.

NEW BUSINESS

None.

OTHER BUSINESS

None.

LIAISON'S REPORT

Commissioner Dehart: On behalf of the Zoning Board of Appeals thanked the Planning Commission for its input on a project brought before them.

Commissioner Carlock: Ms. Carlock was not able to attend the last Parks and Recreation Committee meeting and asked Mr. Quagliata to provide an update. Mr. Quagliata stated the National Parks Service required a biological assessment for the Stanley Park grant application. The 5-Year Parks & Recreation Master Plan would be updated this year. A community event was planned for June 25, 2022 – a family fun day at Hawley Park from 3 p.m. to 9 p.m.

DIRECTOR'S REPORT

The Capital Improvements Plan (CIP) update would begin in June. The draft would be presented to the Planning Commission in August followed by a public hearing in September. Ultimately the CIP would be presented to the Township Board for approval.

Implementation of Corridor Improvement Authority was upcoming.

The contract with River Caddis expired and the Township was reconsidering its options.

COMMUNICATIONS

No meeting on June 2, 2022.

NEXT MEETING DATES: June 16, 2022

ADJOURNMENT

Commissioner Fine moved to adjourn the meeting at 9:21 PM
Commissioner Carlock supported and the MOTION CARRIED with a voice vote: 7 yes votes

DRAFT

WHITE LAKE TOWNSHIP PLANNING COMMISSION

REPORT OF THE COMMUNITY DEVELOPMENT DEPARTMENT

TO: Planning Commission

FROM: Sean O’Neil, AICP, Community Development Director
Justin Quagliata, Staff Planner

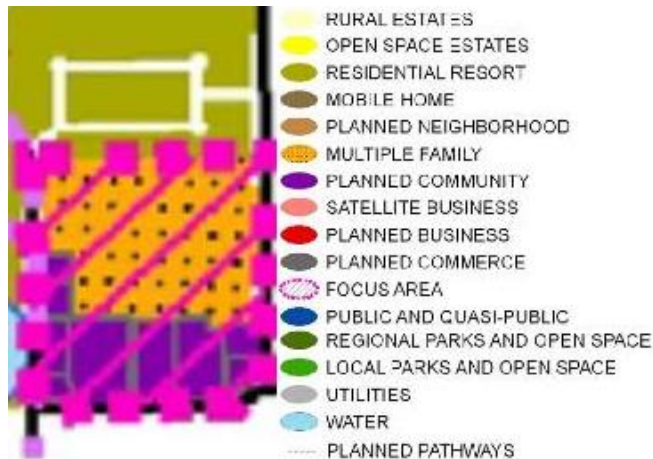
DATE: April 14, 2021

RE: 1392 S. Williams Lake Road (Parcel Number 12-36-476-002)
Rezoning – Review #1

Justin Jundy has requested the rezoning of approximately 2.50 acres located at 1392 S. Williams Lake Road from AG (Agricultural) to RM-1 (Attached Single-Family). The site is located on the west side of Williams Lake Road, north of Cooley Lake Road and contains approximately 386.60 feet of frontage on Williams Lake Road.

The Future Land Use Map from the Master Plan designates the subject site in the Multiple Family category. This category may be characterized by owner-occupied duplexes, townhomes, stacked ranches, and flats, as well as traditional multi-family rental apartments. Densities are expected to range between 6.0 and 10.0 units per acre, based upon the product type, zoning classification, and approved development plan.

FUTURE LAND USE MAP



Zoning

The subject site is currently zoned AG, which requires a minimum of 300 feet of lot width and five (5) acres of lot area. The requested RM-1 zoning district requires a minimum of 100 feet of lot width, 10,000 square feet of lot area for the first unit with each additional unit requiring additional lot area (as promulgated by Article 3, Section 1.8.E of the zoning ordinance). With approximately 386.60 feet of lot width on Williams Lake Road and 2.50 acres of lot area, the site does not comply with the lot area requirement of the AG district. However, the site meets the minimum standards for both lot area and lot width of the proposed RM-1 zoning district. The following table illustrates the lot width and lot area standards for the existing AG and proposed RM-1 zoning districts:

ZONING DISTRICT	LOT WIDTH	LOT AREA
AG	300 feet	5 acres
RM-1	100 feet	10,000 square feet, plus additional area based on the number of units

ZONING MAP



Physical Features

A single-family house occupies the center portion of the parcel, and topography of the site is generally level. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wetland Map and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map indicate neither wetlands nor floodplain are present on or near the site.

Access

The site fronts on Williams Lake Road, which along the subject property is a three-lane (center turn lane) public road with curb and gutter designated a principal arterial by the National Functional Classification System (NFCS) utilized by the Road Commission for Oakland County (RCOC). The most recent (2016) traffic count information from the Southeast Michigan Council of Governments (SEMCOG) Regional Traffic Count Database for Williams Lake Road, from Cooley Lake Road to Elizabeth Lake Road, showed a total of 16,400 vehicles in a 24-hour period.

Utilities

Municipal water and sanitary sewer are available to serve the site. The location and capacity of utilities for any proposed development will be reviewed in detail by the Township Engineering Consultant at the time of a development submittal.

Staff Analysis

In considering any petition for an amendment to the zoning map, the Planning Commission and Township Board must consider the following criteria from Article 7, Section 13 of the zoning ordinance in making its findings, recommendations, and decision:

- A. *Consistency with the goals, policies and future land use map of the White Lake Township Master Plan, including any subarea or corridor studies. If conditions have changed since the Master Plan was adopted, the consistency with recent development trends in the area. The Future Land Use Map from the Master Plan designates the subject site in the Multiple Family category, which aligns with the proposed RM-1 zoning district.*
- B. *Compatibility of the site's physical, geological, hydrological and other environmental features with the host of uses permitted in the proposed zoning district. If the property is rezoned to RM-1, it would not directly or indirectly have a substantial adverse impact on the natural resources of the Township.*
- C. *Evidence the applicant cannot receive a reasonable return on investment through developing the property with one (1) of the uses permitted under the current zoning. No such evidence has been submitted.*
- D. *The compatibility of all the potential uses allowed in the proposed zoning district with surrounding uses and zoning in terms of land suitability, impacts on the environment, density, nature of use, traffic impacts, aesthetics, infrastructure and potential influence on property values. The majority of the permitted and special land uses in the RM-1 district are compatible with the surrounding uses and the nature of the uses anticipated in the Township Master Plan. Only the Township Assessor may provide comment on property values.*

- E. *The capacity of Township utilities and services sufficient to accommodate the uses permitted in the requested district without compromising the "health, safety and welfare" of the Township. The site is in an area intended to be serviced by public water and sanitary sewer. The Community Development Department defers to the Director of Public Services and Township Engineering Consultant on this matter.*
- F. *The capability of the street system to safely and efficiently accommodate the expected traffic generated by uses permitted in the requested zoning district. **A revised rezoning traffic study shall be prepared as described in Article 6, Section 3 of the zoning ordinance.***
- G. *The apparent demand for the types of uses permitted in the requested zoning district in relation to the amount of land in the township currently zoned and available to accommodate the demand. Evidence of the demand in the Township for additional multiple-family rental units has not been submitted. However, the location is appropriate for owner-occupied attached single-family, given the traffic, residential units, and general density in the area.*
- H. *The boundaries of the requested rezoning district are reasonable in relationship to its surroundings, and construction on the site will be able to meet the dimensional regulations for the zoning district listed in the Schedule of Regulations. The subject property is adjacent to RM-1 zoned property on all sides. The applicant provided a concept plan showing one, 16-unit building (two bedrooms per unit) on the east side of the site. Parking is shown on the west side of the building, with two driveways accessing Williams Lake Road at the north and south ends of the site. The applicant did not volunteer conditions on the rezoning related to the concept plan. Site plan review and approval would be required from the Planning Commission and Township Board to construct the building. The concept plan is not under consideration by the Township, and it was not reviewed for compliance with applicable zoning ordinance requirements. Other factors that may impact future development of the site, such as, but not limited to, soils, topography, site layout, stormwater/drainage, and utilities would be considered at the time of a development proposal.*
- I. *The requested zoning district is considered to be more appropriate from the township's perspective than another zoning district. The uses allowed in the RM-1 district are appropriate for the site.*
- J. *If the request is for a specific use, is rezoning the land more appropriate than amending the list of permitted or special land uses in the current zoning district to allow the use? Rezoning would be the most appropriate way to allow for the proposed use. Amending the AG zoning district to allow attached single-family would not be advised.*
- K. *The requested rezoning will not create an isolated and unplanned spot zone. The site is entirely surrounded by RM-1 zoning.*

- L. The request has not previously been submitted within the past one (1) year, unless conditions have changed or new information has been provided. This request is a new application. The applicant previously proposed rezoning the subject property to RM-2 (Multiple Family). After consultation with staff and consultants, the applicant amended their application to request RM-1 zoning.*
- M. An offer of conditions submitted as part of a conditional rezoning request shall bear a reasonable and rational relationship to the property for which rezoning is requested. This standard is not applicable.*
- N. Other factors deemed appropriate by the Planning Commission and Township Board. The Planning Commission and Township Board could also consider other factors which may be relevant to the rezoning request.*

Rezoning the property from AG to RM-1 will render the current single-family use of the property nonconforming, as detached single-family dwellings are not permitted in the RM-1 district. Nonconforming uses of land and nonconforming structures cannot be altered, enlarged/increased, or extended. If a nonconforming structure or portion of a structure containing a nonconforming use becomes physically unsafe or unlawful due to lack of repairs and maintenance, and is declared by the Building Official to be unsafe or unlawful by reason of physical condition, it may be structurally altered as permitted by the Building Official to restore it to a safe condition provided the cost of such work does not exceed 50 percent of the State Equalized Valuation of such building or structure at the time such work is done.

Planning Commission Options

The Planning Commission may recommend approval or denial of the rezoning request, or it may recommend a different zoning designation than proposed by the applicant to the Township Board. **Staff recommends approval of the rezoning from AG to RM-1. Prior to scheduling a public hearing on the request, a revised rezoning traffic study shall be prepared as described in Article 6, Section 3 of the zoning ordinance.**



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

April 22, 2022

Sean O’Neil, Director
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

**Re: 1392 Williams Lake Road
Traffic Study Review**

Ref: DLZ File No. 2245-7382-01

Date of Study: 4/2022

Design Professional: Ahmad M Fawaz, PE

The applicant has submitted a revised Traffic Study for P.I. 12-36-476-002, located along the west side of S. Williams Lake Road opposite Allan Court and approximately 1,000 feet north of Cooley Lake Road. The proposed development in the study is a multi-family development with 56 proposed dwelling units. The study utilized a combination of the SEMCOG traffic count database, using the Oakland County Sydney Coordinated Adaptive Traffic System (SCATS), and a tube traffic volume counter to evaluate the existing traffic volumes along S. Williams Lake Road, Cooley Lake Road, and Elizabeth Lake Road. The latest traffic counts present in the SEMCOG database were from 2015-2021, the SCATS data was collected on December 8 and 9, 2021. The tube traffic volume counter collected data on July 8, 2021. The study also calculated the anticipated quantity of additional traffic generated by the site and compared it with potential traffic generated by the site, should it remain zoned agricultural (AG).

We have reviewed the analysis; the methodology is in line with standard practices, and the findings are supported by the data provided. Based on data from the Multi-Family (Low Rise) section of the 10th edition of the “ITE Trip Generation Manual”, the additional daily trips are 400 trips per day. Additionally, 26 AM Peak Hour trips per day and 32 PM Peak Hour trips per day are anticipated to be added to the existing traffic volumes. Based on the White Lake Zoning Ordinance, the number of daily trips generated by the site falls below the minimum thresholds for requiring either a Traffic Impact Assessment (500-750 daily trips) or a Traffic Impact Study (750+ daily trips). Therefore, the study asserts that the development will have no negative impact to traffic operations on the surrounding roadway network.

The study also evaluated the need for turn lanes or tapers at the proposed site drive. Due to the existing center left turn lane on Williams Lake Road, it was determined a passing lane on the east side of Williams Lake Road is not warranted. Based on the volume of traffic on Williams Lake Road and the low number of anticipated right turns into the development, it was determined that a right turn deceleration lane or taper is also not



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

1392 S. Williams Lake Road
Traffic Impact Analysis Review
Page 2 of 2

warranted. However, the Road Commission for Oakland County (RCOC) often requires right turn tapers on developments of this nature along their roadways. An RCOC permit will be required prior to construction. If you have any questions, please feel free to contact to me.

Respectfully,
DLZ, Inc.

Leigh Merrill, P.E.
Project Manager

Cc: Michael Leuffgen, P.E., DLZ *via email*
Justin Quagliata, Community Development *via e-mail*
Hannah Micallef, Community Development *via e-mail*

TRAFFIC STUDY
FOR PROPOSED MULTIFAMILY RESIDENTIAL
DEVELOPMENT LOCATED AT 1392 S
WILLIAMS LAKE RD
WHITE LAKE TOWNSHIP, MICHIGAN 48386

Prepared for
WHITE LAKE TOWNSHIP
PLANNING DEPARTMENT

By
Ahmad M Fawaz, P.E.
Revised April 2022

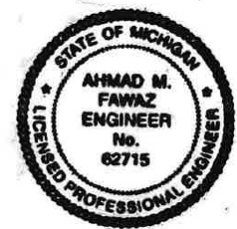


TABLE OF CONTENTS

INTRODUCTION 1

SITE DESCRIPTION AND ACCESS..... 1

ROAD NETWORK 3

EXISTING TRAFFIC VOLUME 4

VEHICLE TRIP GENERATION 4

ADJUSTMENTS TO TRIP GENERATION RATES 6

TRIP GENERATION DISTRIBUTION AND ASSIGNMENT..... 6

WARRANT STUDY FOR TURN LANES..... 11

COMPARISON OF TRIP GENERATION BETWEEN EXISTING AND PROPOSED DEVELOPMENTS 11

DEVELOPMENT IMPACTS 13

CONCLUSION..... 13

APPENDICES 14

INTRODUCTION

This study examines the potential traffic impacts on the adjacent streets of a proposed multifamily residential development located at 1392 S Williams Lake Rd between Elizabeth Lake Rd and Cooley Lake Rd in White Lake Township, Michigan. The development includes four multifamily residential buildings. The intent of this report is to present traffic volumes likely generated by the proposed development and consider potential impacts to the adjacent roadway network. In addition to this introductory paragraph, the report includes the following sections:

- A Site Description and Access
- Road Network
- Existing Traffic Volume
- Vehicle Trip Generation
- Adjustments To Trip Generation Rates
- Trip Generation Distribution And Assignment
- Development Impacts
- Conclusion

SITE DESCRIPTION AND ACCESS

Land for the development has currently one ranch house which will be demolished to construct the four buildings. The site of proposed development is approximately 2.47 acres, and it is surrounded by residential subdivisions. It will include eighty-one parking spaces while the required are seventy-seven parking spaces. The residential development consists of 56 dwelling units distributed on four buildings:

Building 'A' is two stories and has an area of 7,996 square feet per each floor. It consists of eight (1) bedroom units and eight (2) bedroom units.

Building 'B' is two stories and has an area of 4,605 square feet per each floor. It consists of eight (2) bedroom units.



Figure 1: General site plan and access location point

Building 'C' is two stories and has an area of 6,802 square feet per each floor. It consists of sixteen (1) bedroom units.

Building 'D' is two stories and has an area of 8,000 square feet per each floor. It consists of eight (1) bedroom units and eight (2) bedroom units.

Development site traffic is accommodated by two full movement access points from S Williams Lake Rd. The proposed driveways are 24 ft wide, and they operate as stop-controlled intersections. The adjacent driveways are access roads for residential subdivisions and single houses.

ROAD NETWORK

According to SEMCOG database, all the streets leading to the development are under Oakland County jurisdiction. S Williams Lake Rd is classified as a principal arterial. It is a three lanes road, one travel lane in each direction and a center left turn lane. It has a posted speed limit of 50 mph and an annual average daily traffic (AADT) of 16,180 vpd as per traffic volume data collected in 2016. Cooley Lake Rd is classified as a principal arterial located around 1000 feet south of the development. It is a three lanes road, one travel lane in each direction and a center left turn lane. It has a posted speed limit of 40 mph and an annual average daily traffic (AADT) of 20,321 vpd as per traffic volume data collected in 2021. Elizabeth Lake Rd is classified as a minor arterial located around 1.82 mile north of the development. It is a two lanes road, one travel lane in each direction. It has a posted speed limit of 45 mph and an annual average daily traffic (AADT) of 7,310 vpd as per traffic volume data collected in 2015.

The intersection of S Williams Lake Rd and Cooley Lake Rd is controlled by box span-wire traffic signal with a protected left turn phase for eastbound direction. The intersection between S Williams Lake Rd and Elizabeth Lake Rd is controlled by two diagonal span wire traffic signals.

EXISTING TRAFFIC VOLUME

The source of the traffic volumes used in this report is from SEMCOG database and it is adjusted in this report by applying the recommended SEMCOG annual growth rate.

The most up to date traffic counts reported on SEMCOG traffic count database system were for data collected on December 8 and 9, 2021 by Oakland County Sydney Coordinated Adaptive Traffic System (SCATS) and they are presented in table 1. The southbound traffic volume was obtained from SCATS system at the intersection between Cooley Lake Rd and S Williams Lake Rd and the northbound traffic volume was obtained from SCATS system at the intersection between Elizabeth Lake Rd and S Williams Lake Rd. The data was compared to traffic volume collected by tube traffic volume counter on July 08, 2021. It was found that there is no major difference in the results. There was no need to apply an annual growth rate to the collected traffic volume data because it is up to date. The hourly traffic volume counts presented in table 1 show that the AM peak hour is between 8:00 am and 9:00 am and the PM peak hour is between 4:00 pm and 5:00 pm.

VEHICLE TRIP GENERATION

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation, 10th Edition, were applied to the proposed land use in order to estimate the average daily traffic (ADT) and peak hour vehicle trips. A vehicle trip is defined as a one-way vehicle movement from point of origin to point of destination.

Table 2 presents average trip generation rates for the proposed development. Use of average trip generation rates presents a conservative analysis. ITE land use code 220 Multifamily Housing (Low-Rise) was used for analysis because of its best fit to the proposed land use.

Table 3 summarizes the projected average daily traffic (ADT) and peak hour traffic volumes likely generated by the proposed land use. As Table 3 shows, the proposed development area has the potential to generate approximately 410 daily trips with 26 of those occurring during the morning peak hour and 32 during the afternoon peak hour.

Table 1: Hourly Traffic Volume Counts from SEMCOG Database for Williams Lake Rd

WILLIAMS LAKE TRAFFIC COUNT BETWEEN COOLEY LAKE AND ELIZABETH LAKE			
INTERVAL:60-MIN (Wed 12/8/2021 and Thu 12/9/2021)			
Time	SB Hourly Count	NB Hourly Count	Two Way Hourly Count
0:00-1:00	42	64	106
1:00-2:00	18	25	43
2:00-3:00	31	44	75
3:00-4:00	69	32	101
4:00-5:00	124	134	258
5:00-6:00	296	419	715
6:00-7:00	408	318	726
7:00-8:00	417	525	942
8:00-9:00	506	561	1067
9:00-10:00	432	533	965
10:00-11:00	428	546	974
11:00-12:00	408	583	991
12:00-13:00	364	568	932
13:00-14:00	352	574	926
14:00-15:00	379	644	1023
15:00-16:00	440	812	1252
16:00-17:00	438	874	1312
17:00-18:00	407	896	1303
18:00-19:00	290	768	1058
19:00-20:00	210	493	703
20:00-21:00	194	392	586
21:00-22:00	181	315	496
22:00-23:00	112	208	320
23:00-24:00	70	121	191
Total	6,616	10,449	17,065

Table 2: Trip Generation Rates									
ITE Code	Land Use	Unit	24 Hour	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
220	Multifamily Housing (Low-Rise)	DU	7.32	0.11 (23%)	0.35 (77%)	0.46	0.35 (63%)	0.21 (37%)	0.56

Key : DU = Dwelling Unit

Table 3: Trip Generation Summary									
ITE Code	Land Use	Unit	24 Hour	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
220	Multifamily Housing (Low-Rise)	56 DU	410	6	20	26	20	12	32

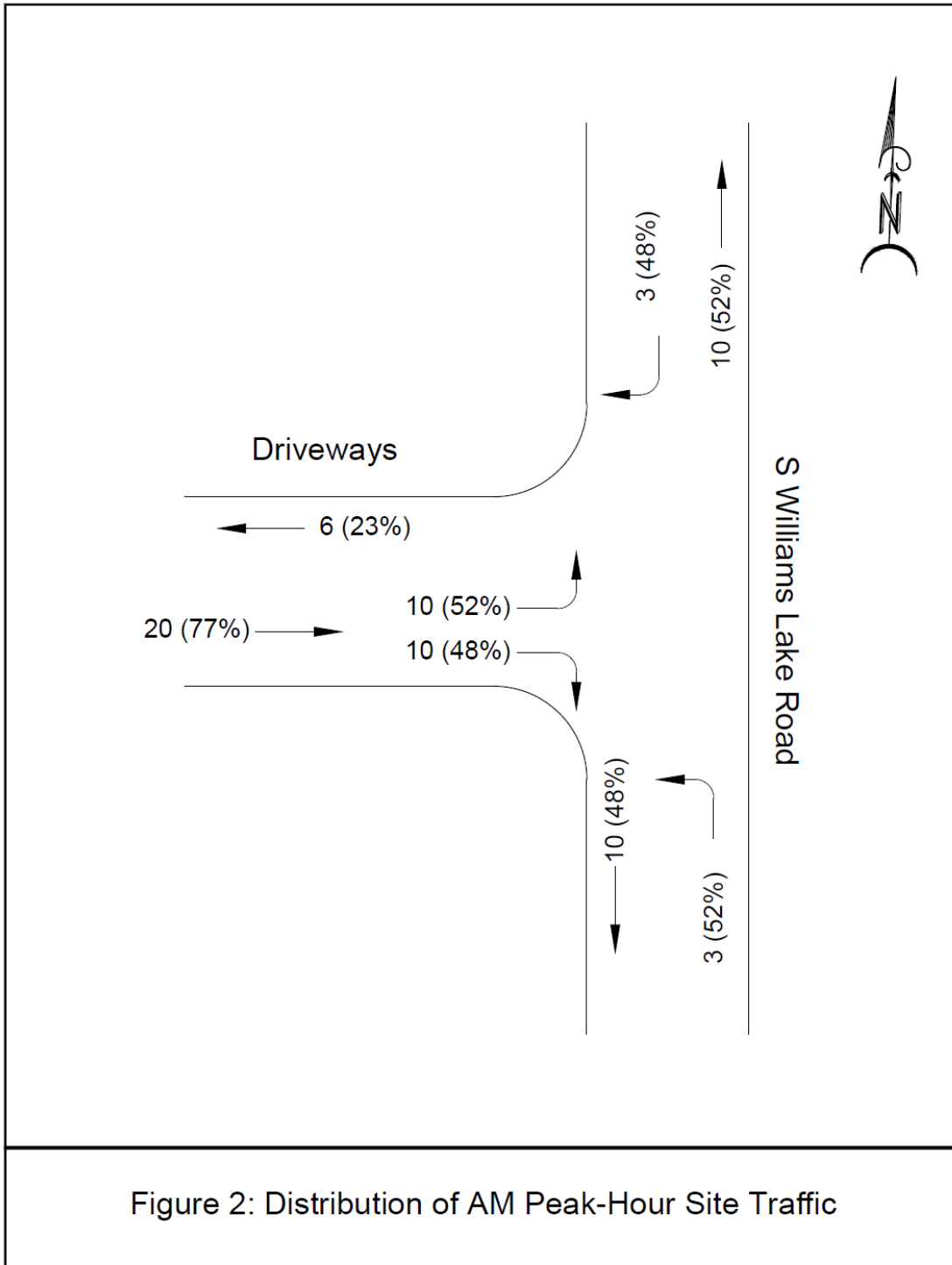
Adjustments to Trip Generation Rates

A development of this type is not likely to attract trips from within area land uses nor pass-by or diverted link trips from the adjacent roadway system, therefore no trip reduction/adjustment was taken in this analysis.

Trip Generation Distribution and Assignment

Overall directional distribution of site-generated traffic was determined by examining current traffic patterns in the study area and assessing how well those patterns can be expected to represent the new site traffic, subject to the site access plan and professional judgment. Site-generated traffic is anticipated to be distributed through the access points along S Williams Lake Road. Traffic assignment is how the site-generated and distributed trips are expected to be loaded on the roadway network. For this development, the existing traffic volumes were used to develop a trip distribution model for the AM and PM peak hours for traffic generated by the proposed development. The trips were assigned to northbound and southbound S Williams Lake Road. Figure 2 through 5 in the next pages present the distribution of the site traffic in the AM

and PM peak hours. They also present the total projected traffic volumes at the main access points of the development.



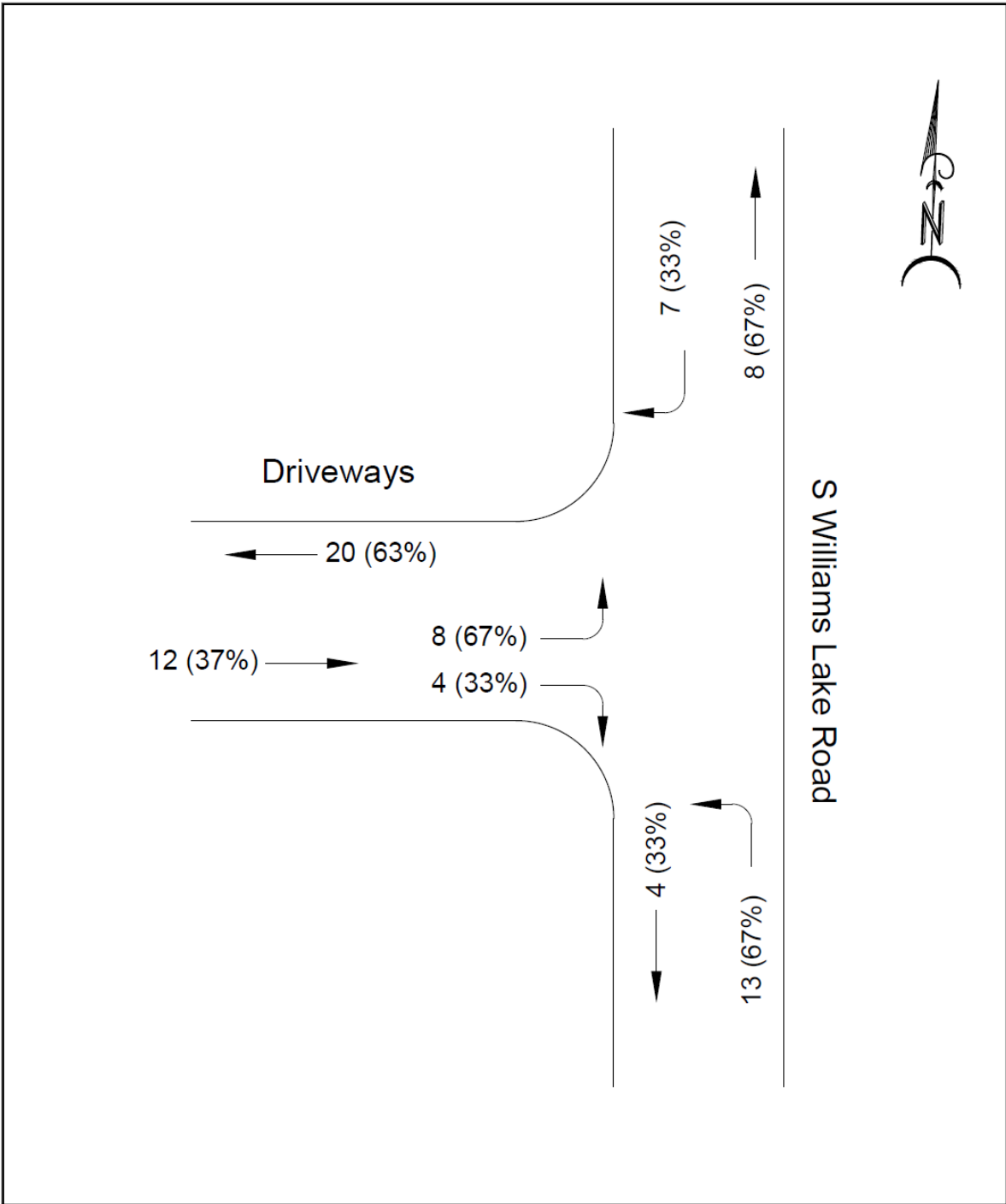


Figure 3: Distribution of PM Peak-Hour Site Traffic

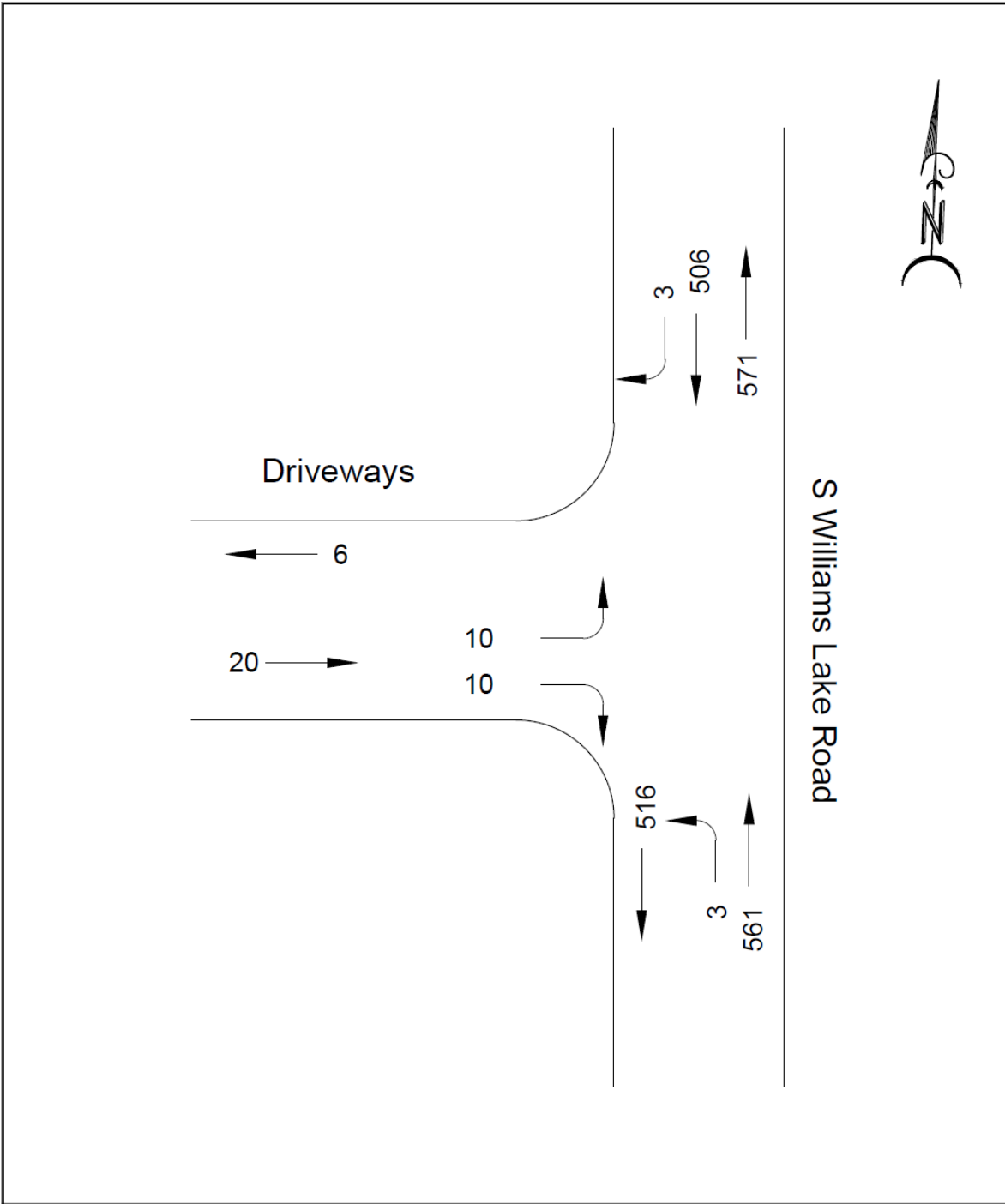


Figure 4: Total AM Peak-Hour Traffic Volume

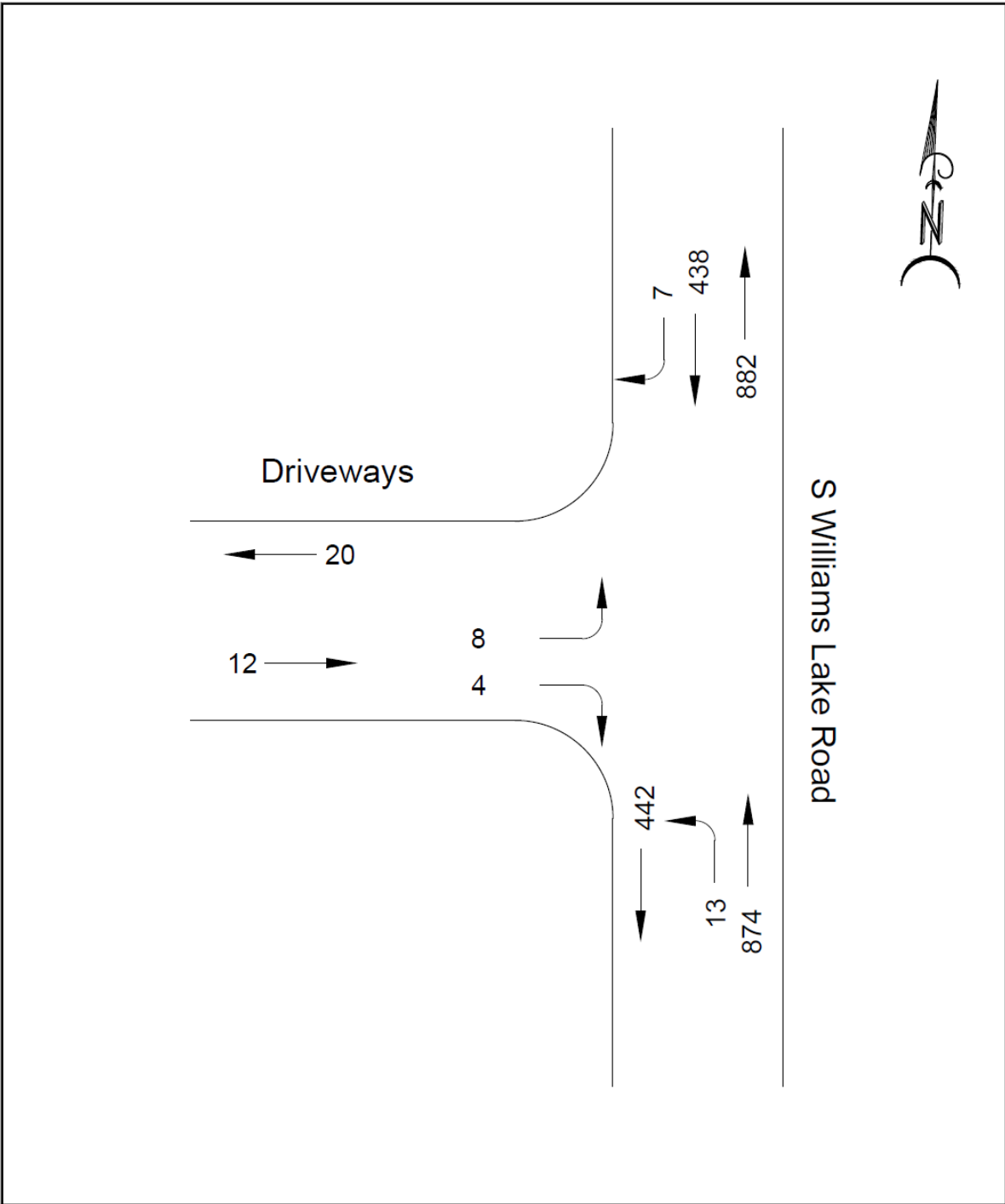


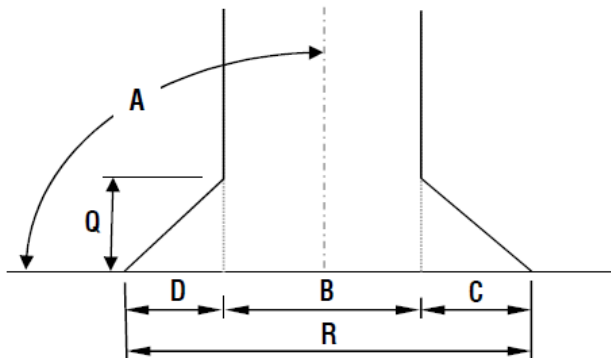
Figure 5: Total PM Peak-Hour Traffic Volume

Warrant Study for Turn Lanes

The section of Williams Lake Rd has a center left turn lane where the development is located. The maximum peak hour right turns are 10 vph and they are divided on two driveways. Around 5 right turns per hour per driveway. According to the Road Commission for Oakland County (RCOC) permit rules, specifications and guidelines, warrant for right turn deceleration lane or taper is presented in Figure 6-3 of the guidelines. Because, the peak hour right turns are less than 10 vph per driveway and the two-way traffic volume is 17,065 vpd, adding taper or right turn lane/deceleration lane are not warranted. The driveway will be designed according to table 6-3 of the guidelines which is presented below:

**Table 6-3:
Residential Driveway - Subdivision
Design Features**

		<u>Typical</u>	<u>Range</u>
Intersecting Angle	A	90°	60° to 90°
Driveway Width	B	16'	10' to 25'
Entering Taper Width	C	6'	2' to 15'
Exiting Taper Width	D	6'	2' to 15'
Taper Depth	Q	10'	10' to 20'
Total Opening	R	24'	14' to 55'
B+C+D=			



NOTE:
The TYPICAL dimension shall be used unless the Permits Division specifies or the Applicant shows cause for, and the Permits Division approves, a different value. The RANGE in dimensions indicates the working value for each design feature.

Comparison of Trip Generation Between Existing and Proposed Developments

The current zoning of the parcel is agricultural (AG). The parcel currently has a one ranch style home (1,551 sq ft) on a 2.5 acres land. ITE land use code 210 Single-family Housing was used for analysis because of its best fit to the existing land use. The proposed zoning is attached single family residential (RM-1). ITE land use code 220 Multifamily Housing (Low-Rise) was used for

analysis because of its best fit to the proposed land use. Table 4 presents average trip generation rates for the existing and proposed developments. Table 5 presents a comparison of trip generation between the existing and proposed developments.

Table 4: Trip Generation Rates									
ITE Code	Land Use	Unit	24 Hour	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
210	Existing Development Single-Family Detached Housing	DU	9.44	0.19 25%	0.55 75%	0.74	0.63 63%	0.37 37%	0.99
220	Proposed Development Multifamily Housing (Low-Rise)	DU	7.32	0.11 23%	0.35 77%	0.46	0.35 63%	0.21 37%	0.56

Key : DU = Dwelling Unit

Table 5: Comparison of Trip Generation Between Existing and Proposed Developments									
ITE Code	Land Use	Unit	24 Hour	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
210	Single-Family Detached Housing	1 DU	9.4	0.1	0.6	0.7	0.6	0.4	1
220	Multifamily Housing (Low-Rise)	56 DU	409.9	5.9	19.8	25.8	19.8	11.6	31.4
Difference of Trip Generation Between Existing and Proposed Developments			400	6	19	25	19	11	30

Development Impacts

According to White Lake Township Zoning Ordinance, a Traffic Impact Assessment (TIA) is required if the proposed use(s) would generate 500-749 driveway trips per day, or 50-99 peak-hour, peak-direction driveway trips. A Traffic Impact Statement (TIS) is required if the proposed use(s) would generate 750 or more driveway trips per day, or 100 or more peak-hour, peak direction driveway trips. The trips generated by the development are less than the threshold for TIA or TIS requirements. As Figures 2 through 5 show, there is an increase in peak hour traffic volumes anticipated from the proposed development, but they are considered minor. These minor volumes are not likely to negatively impact traffic operations in the area. The level of service and the delay of the nearby intersections will have unnoticeable change.

CONCLUSION

This analysis assessed traffic generation for the proposed multifamily residential development located at 1392 S Williams Lake Rd and potential impacts to the adjacent roadway network. It is our professional opinion that the proposed site-generated traffic is expected to create no negative impact to traffic operations for the surrounding roadway network. Analysis of site-generated traffic concludes that proposed development traffic volumes are minor. We trust that our findings will assist in the planning and approval of this proposed development.

APPENDICES

WILLIAMS LAKE SB TRAFFIC COUNT NORTH OF COOLEY LAKE					
INTERVAL:15-MIN (Wed 12/8/2021 and Thu 12/9/2021)					
Time	15-min Interval				Hourly Count
	1st	2nd	3rd	4th	
0:00-1:00	12	15	3	12	42
1:00-2:00	8	6	3	1	18
2:00-3:00	9	7	6	9	31
3:00-4:00	14	13	33	9	69
4:00-5:00	29	28	32	35	124
5:00-6:00	61	80	76	79	296
6:00-7:00	109	112	96	91	408
7:00-8:00	92	90	117	118	417
8:00-9:00	126	130	135	115	506
9:00-10:00	98	111	113	110	432
10:00-11:00	89	127	111	101	428
11:00-12:00	98	95	109	106	408
12:00-13:00	111	72	78	103	364
13:00-14:00	56	89	106	101	352
14:00-15:00	101	91	94	93	379
15:00-16:00	115	102	96	127	440
16:00-17:00	109	101	120	108	438
17:00-18:00	114	96	111	86	407
18:00-19:00	77	80	82	51	290
19:00-20:00	58	55	48	49	210
20:00-21:00	39	37	59	59	194
21:00-22:00	45	44	43	49	181
22:00-23:00	34	25	30	23	112
23:00-24:00	19	17	26	8	70
Total					6,616

WILLIAMS LAKE NB TRAFFIC COUNT SOUTH ELIZABETH LAKE					
INTERVAL:15-MIN (Wed 12/8/2021 and Thu 12/9/2021)					
Time	15-min Interval				Hourly Count
	1st	2nd	3rd	4th	
0:00-1:00	18	17	15	14	64
1:00-2:00	7	5	10	3	25
2:00-3:00	3	8	19	14	44
3:00-4:00	6	6	3	17	32
4:00-5:00	11	23	27	73	134
5:00-6:00	110	115	121	73	419
6:00-7:00	58	84	76	100	318
7:00-8:00	105	149	130	141	525
8:00-9:00	119	125	158	159	561
9:00-10:00	121	160	125	127	533
10:00-11:00	146	123	132	145	546
11:00-12:00	138	131	147	167	583
12:00-13:00	140	129	165	134	568
13:00-14:00	168	131	147	128	574
14:00-15:00	167	139	165	173	644
15:00-16:00	195	196	204	217	812
16:00-17:00	209	198	246	221	874
17:00-18:00	244	220	210	222	896
18:00-19:00	210	222	183	153	768
19:00-20:00	132	134	114	113	493
20:00-21:00	120	113	90	69	392
21:00-22:00	80	78	94	63	315
22:00-23:00	81	48	37	42	208
23:00-24:00	38	39	16	28	121
Total					10,449

1392 S WILLIAMS LAKE

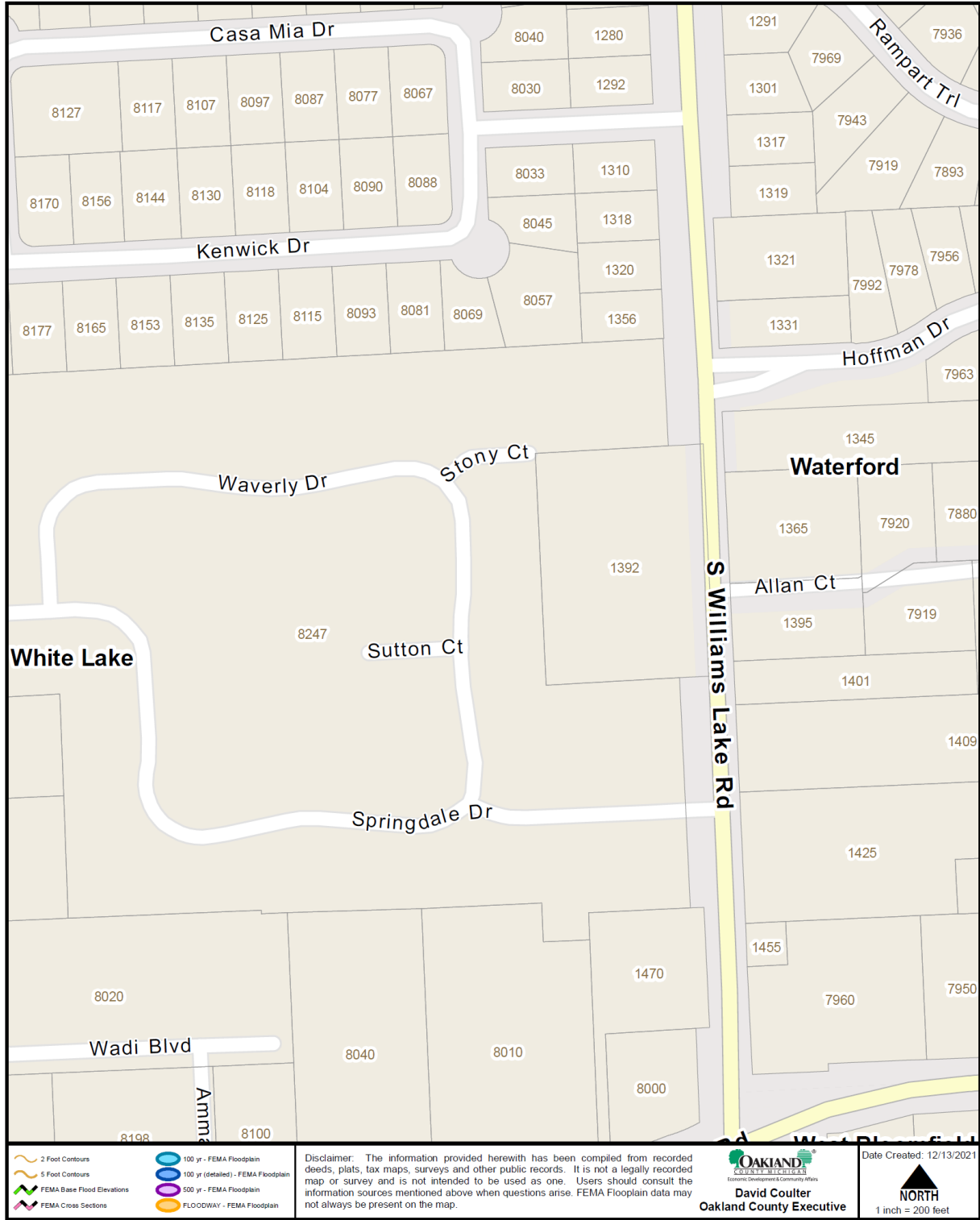
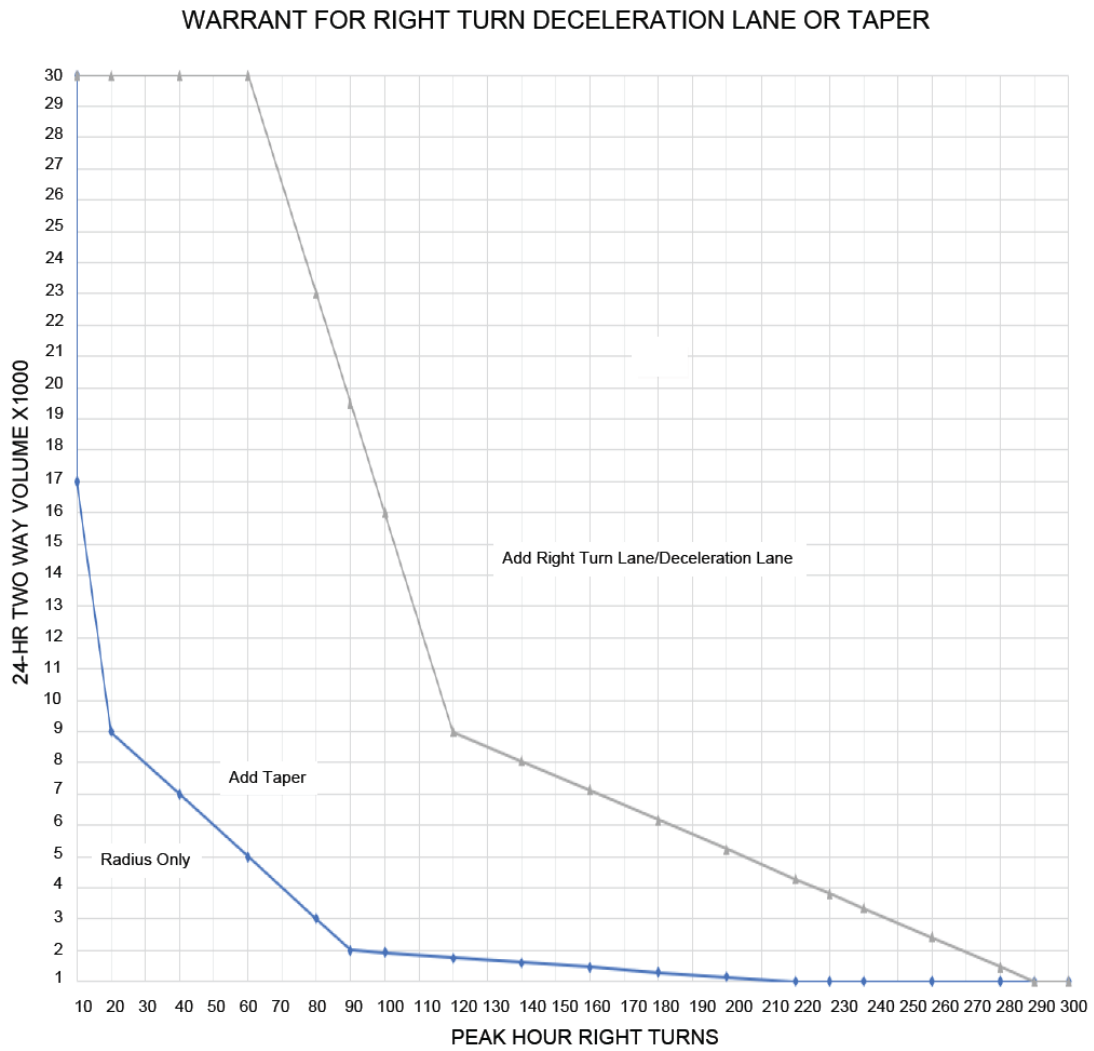


FIGURE 6-3



Single-Family Detached Housing (210)

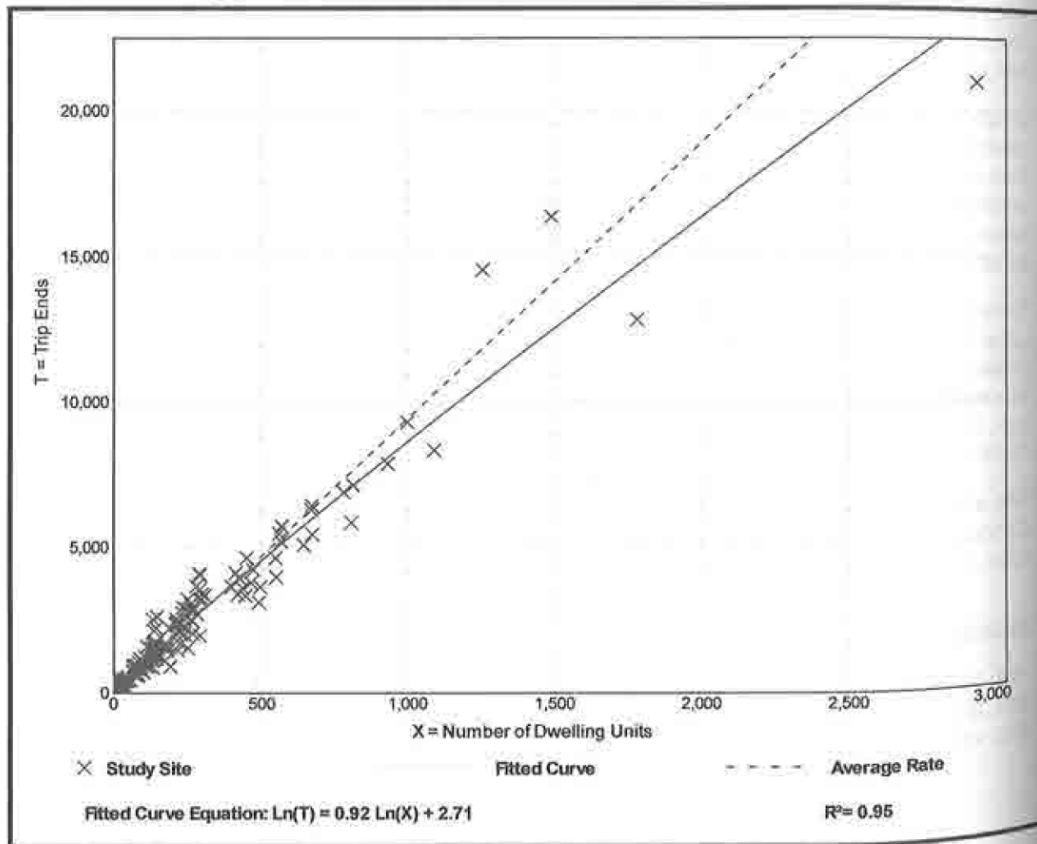
Vehicle Trip Ends vs: Dwelling Units
On a: **Weekday**

Setting/Location: General Urban/Suburban
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



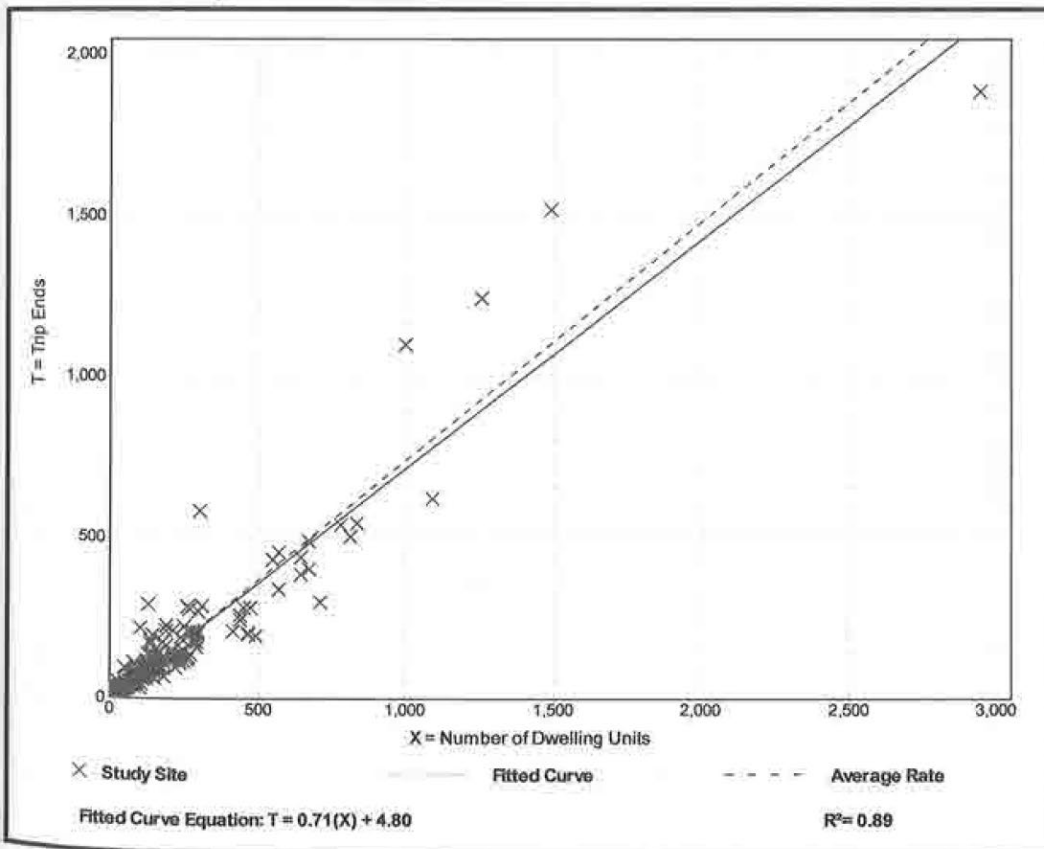
Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 173
 Avg. Num. of Dwelling Units: 219
 Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



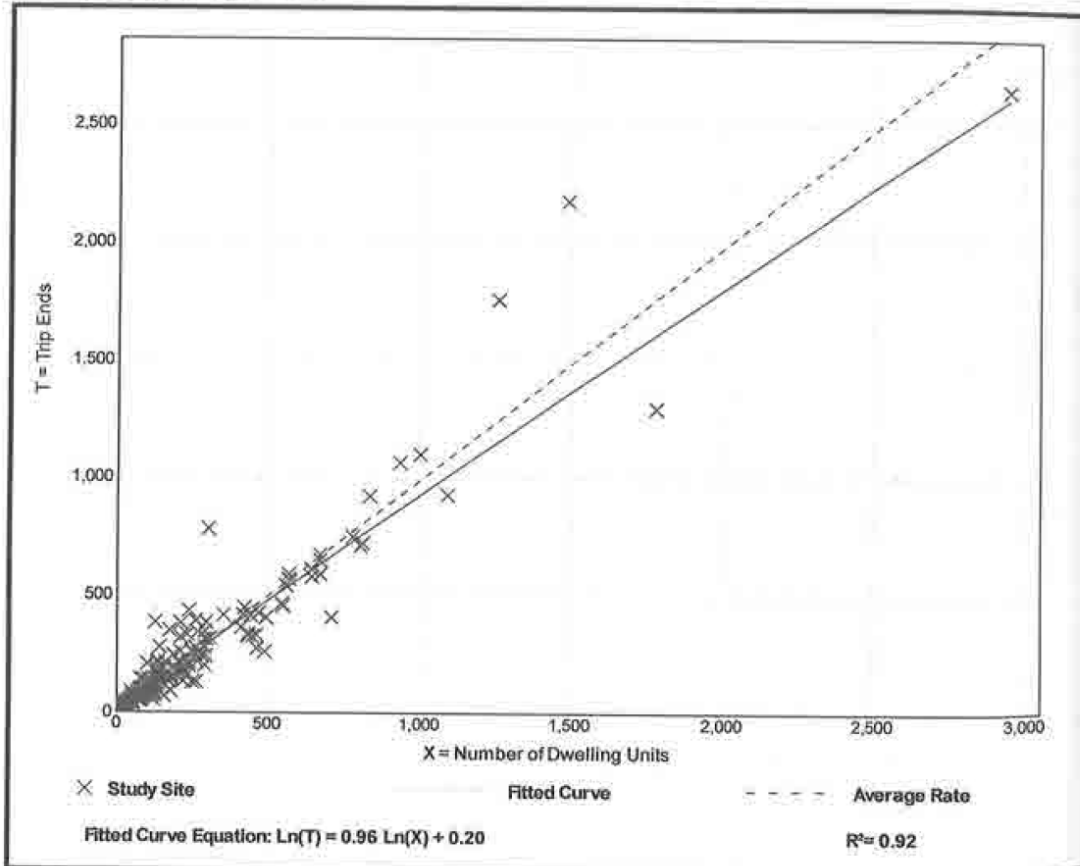
Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 190
 Avg. Num. of Dwelling Units: 242
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Multifamily Housing (Low-Rise) (220)

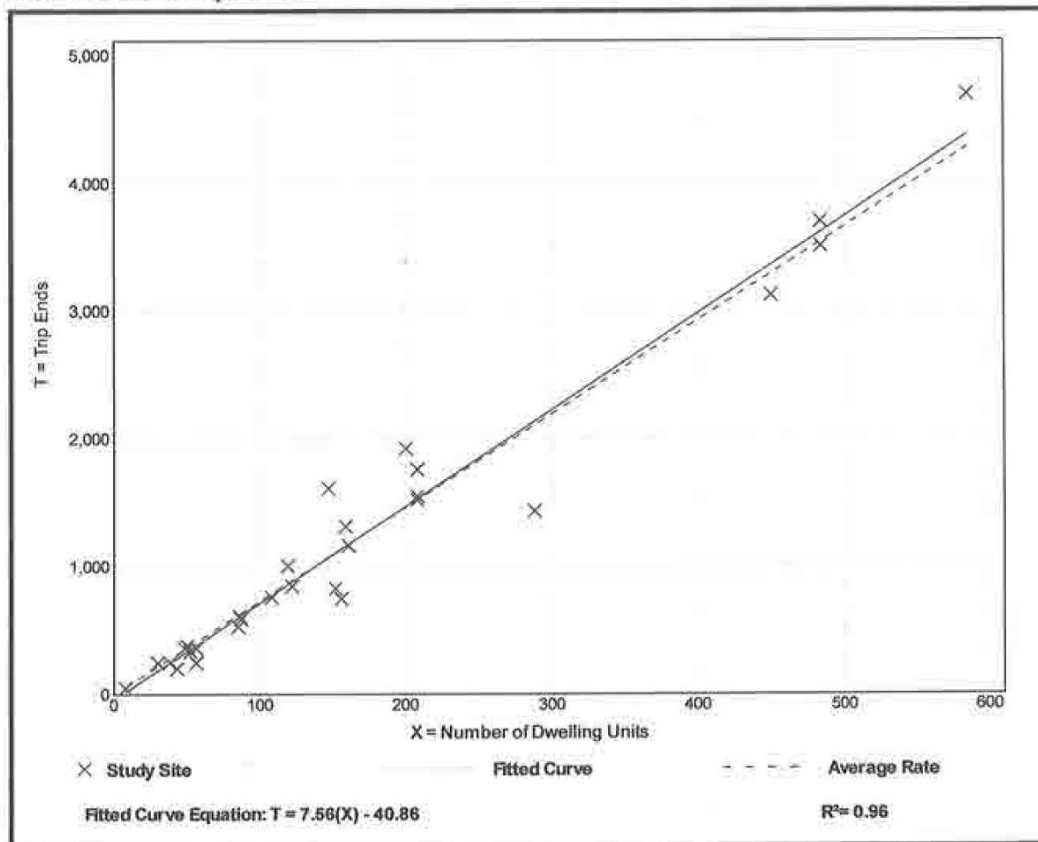
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



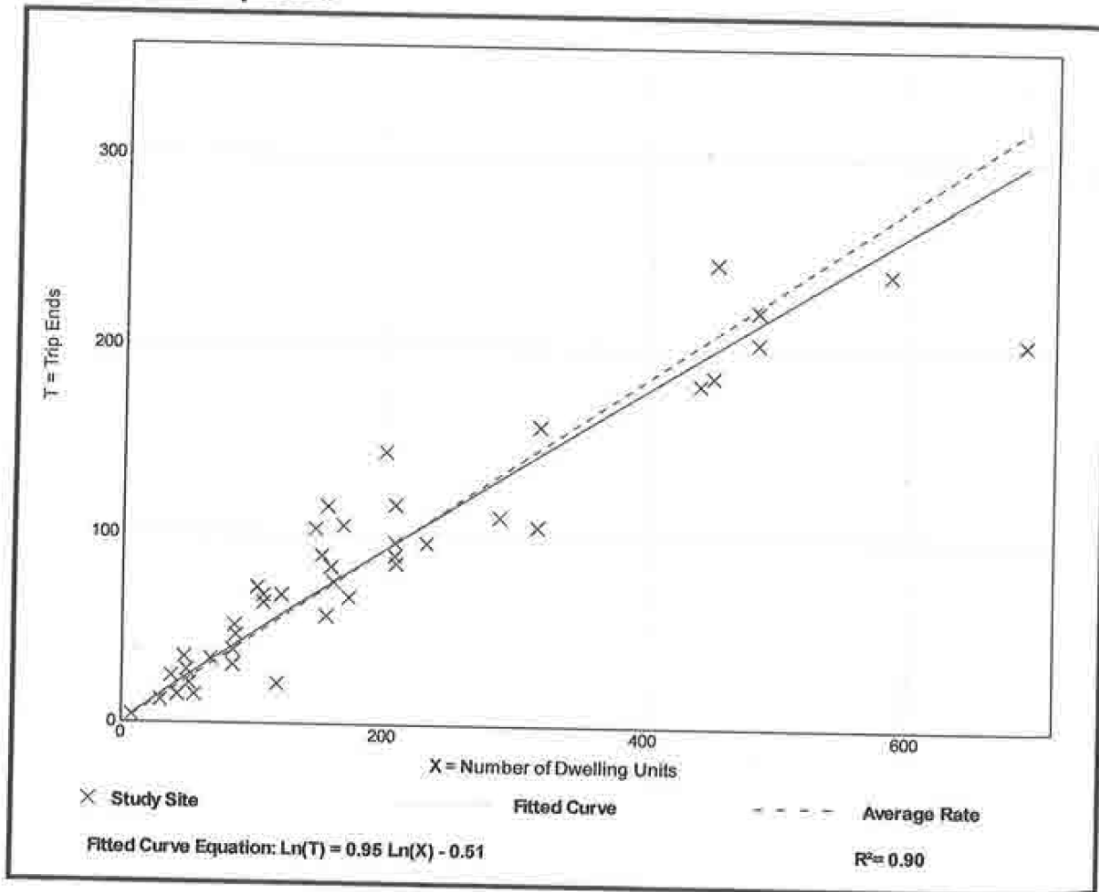
Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 42
 Avg. Num. of Dwelling Units: 199
 Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



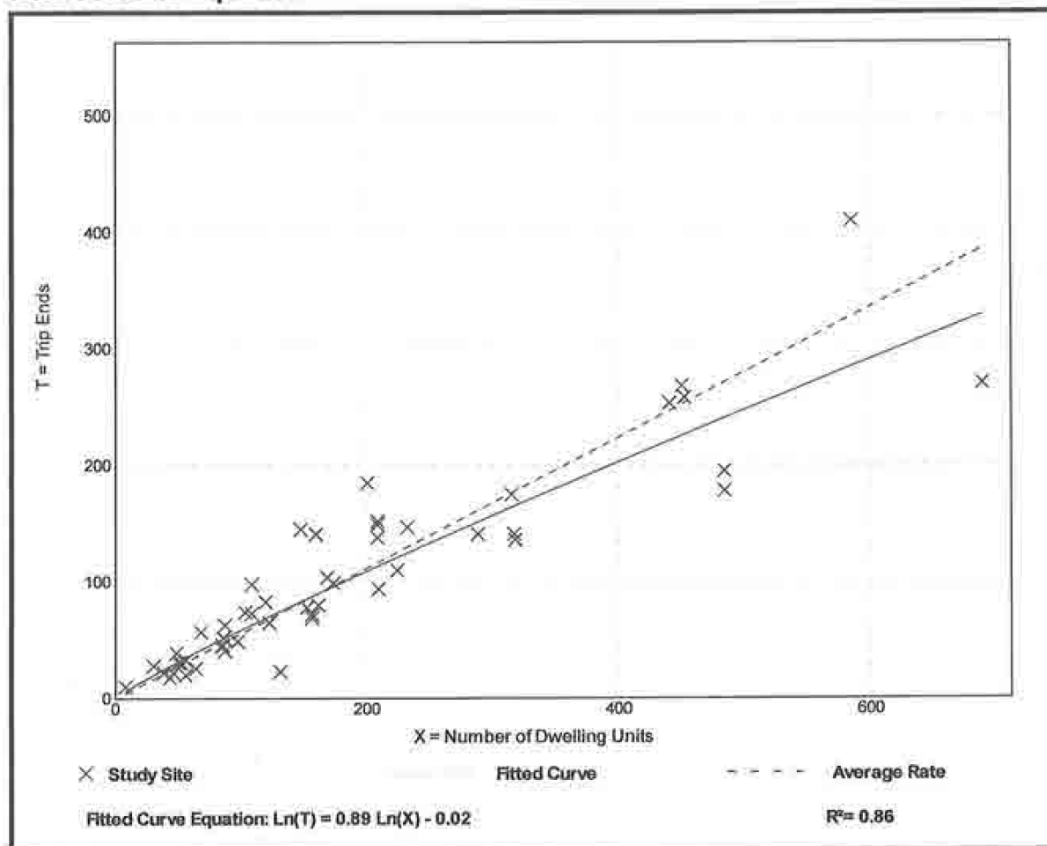
Multifamily Housing (Low-Rise) (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 50
 Avg. Num. of Dwelling Units: 187
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation





BOARD OF COMMISSIONERS

**1200 N. Telegraph Road
Pontiac, MI 48341-0475**
Phone: (248) 858-0100
Fax: (248) 858-1572

June 8, 2022

Sean O'Neil, Community Development Director
Charter Township of White Lake
7525 Highland Road
White Lake, MI 48383

Dear Mr. O'Neil:

On Tuesday, June 7, 2022, the Oakland County Coordinating Zoning Committee (CZC) held a meeting and considered the following boundary case for the proposed rezoning of 1392 S. Williams Lake Road (parcel ID# 12-36-476-002) in section 36 of White Lake Township:

County Code No. RZ 22-01 Summary: The proposal is a rezoning of a property, as described above, from Agriculture (AG) to Attached Single Family Residential (RM-1) which borders Waterford Township.

Recommendation: Based on the Master Plan interpretation and reasonable boundary coordination along with the proposed zoning being recommended for approval by the White Lake Township Planning Commission, Oakland County Department of Economic Development, Planning & Local Business Development (PLBD) staff recommended **Approval** of County Code #RZ 22-01 a rezoning request from AG to RM-1 in Sections 36 of White Lake Township for 1392 S. Williams Lake Road, parcel ID# 12-36-476-002.

Outcome: Upon studying the findings and facts of this proposal and review, the Oakland County Coordinating Zoning Committee, by a 3-0 vote, **Recommends Approval** of this rezoning request.

A copy of the review has been attached and will accompany all copied parties of this letter. The approved minutes of the June 7, 2022, Oakland County Coordinating Zoning Committee meeting will be available following the next meeting. If you have any questions, please do not hesitate to contact me at (248) 858-0389 or by email at krees@oakgov.com.

Sincerely,


Scott E. Kree
Senior Planner

- CC: Anthony L. Noble, White Lake Township Clerk
- Hanna Micallef, Executive Secretary
- Gwen Markham, O.C. Commissioner for District 9, CZC Board Chair
- Gary R. McGillivray, O.C. Commissioner for District 20, CZC Board Vice-Chair
- Phil Weipert, O.C. Commissioner for District 8, CZC Board Member
- Eileen Kowall, Oakland County Commissioner for District 6
- Oakland County Board of Commissioners/CZC Staff
- Jeffrey M. Polkowski, Waterford Township Superintendent of Planning & Zoning



OAKLAND COUNTY EXECUTIVE DAVID COULTER

Scott E. Kree | Senior Planner – Planning Division
Office: (248) 858 0389 | krees@oakgov.com

COORDINATING ZONING COMMITTEE (CZC)

Township: White Lake Township

County Code: RZ 22-01

Section: 36

Consistent with the modifications to the review of township zoning proposals adopted April 22, 1982, by the Planning and Building Committee of the Oakland County Board of Commissioners, the zoning review summary sheets have been modified accordingly.

DESCRIPTION OF REZONING PROPOSAL

1. **CZC reasoning for review of this case:** The proposed rezoning request involves property within White Lake Township that shares a border with Waterford Township along Williams Lake Road.
2. **Proposed map change:** The property to be rezoned is currently classified as *Agricultural (AG)* and is proposing a rezoning to *Attached Single Family Residential (RM-1)*.
3. **Size, location, and ownership:** Property Tax ID #12-36-476-002 currently holds an address of 1392 S. Williams Lake Road. The existing size of property is 2.50 (or 2.48) acres and is owned by Piro Hysa per the submitted application and Oakland County's records. The rezoning proposal has been filed by Justin Jundy with Piro Hysa's permission.
4. **Site and surrounding land use:** The existing site currently has a 1950's style ranch single family residents in the center of the property. The physical features are consistent with that of an older single family residential yard consisting of a maintained lawn, a few mature trees and unkempt brush areas buffering the parameters of the lot. The surrounding land uses are as follows:
 - North, West, & South (White Lake Township): Bordering the subject property on three (3) sides is a condo development known as Whetherstone which occupies roughly 22.24 acres and is currently zoned RM-1 *Attached Single Family*. Per an interpretation of the County's aerial data, the Whetherstone development was constructed sometime between 2002 and 2005 and consists of 33 structures providing approximately 114 attached units.
 - East (Waterford Township): The eastern property lines of the proposed rezoning site consists of approximately 386.60 feet of frontage along Williams Lake Road. The adjacent properties (4 total) to the east are single family dwellings built in the 1940's through the 1950's on roughly 1-acre lots. The existing adjacent structures are all comparable to the existing single-family structure currently on the subject property to be rezoned. The current zoning for these properties in Waterford Township is R-1A, *Single Family Residential*.

- 5. **Principle permitted uses under the existing zoning:** Under Section 3.1.1 of the White Lake Township Zoning Ordinance, the following uses are permitted for AG, *Agricultural District*:
 - i. *Adult foster care family home*
 - ii. *Family day care homes*
 - iii. *Farms*
 - iv. *Home occupation*
 - v. *Outdoor recreation uses, other public and private parks and similar outdoor recreation uses not listed in §4.38*
 - vi. *Single-family detached dwellings*
 - vii. *Vegetable, fruit, flower and herb gardening*
 - viii. *Tree and shrub nurseries, not including landscape contractors*

- 6. **Minimum lot size of existing zoning:** AG zoning allows for a minimum lot size of 5 acres. The subject property does not currently meet the current requirement, being approximately 2.5 acres.

- 7. **Principle permitted uses under proposed zoning:** The proposed zoning is *Attached Single Family Residential (RM-1)*. Under Section 3.1.8, the following is a list of use types permitted in the RM-1 district:
 - i. *Attached single-family dwellings*
 - ii. *Two family dwellings*
 - iii. *Outdoor recreation uses, other public and private parks and similar outdoor recreation uses not listed in §4.38*
 - iv. *Adult foster care family home in detached dwelling*
 - v. *Adult foster care small group home § 4.7*
 - vi. *Adult foster care large group home § 4.7*
 - vii. *Family day care home in detached dwelling*

- 8. **Minimum lot size of proposed zoning:** There is a 10,000 square foot (0.23-acre) minimum for property under the RM-1 zoning classification. The subject property currently meets the criteria as the site is roughly 108,900 Square feet (2.5 acres).

- 9. **Zoning in Adjacent Communities:** Waterford Township's adjacent properties have a zoning classification of R-1A, *Single Family Residential*

- 10. **Local Planning Commission recommendation:** The White Lake Township Planning Commission, recommended approval of the proposed rezoning to the White Lake Township Board following the public hearing for the rezoning on May 19, 2020.

ANALYSIS AND RECOMMENDATION OF PLANNING AND ECONOMIC DEVELOPMENT SERVICES

The Oakland County Economic Development (OCED), Planning and Local Business Development (PLBD) Division staff received, via the United States Postal Service, a "Notice of Public Hearing" on May 5, 2022. A review of the requested proposed rezoning of the property at 1392 S. Williams Lake Road (Parcel ID# 12-36-476-002) from AG zoning to a RM-1 was started following the White Lake Township's Planning Commission's recommendation (by a vote of 8 to 0 with one member absent) on May 19, 2022, to the White Lake Township Board. A formal submission for a 30-day review to go before the Oakland County Coordinating Zoning Committee (CZC) was made on May 23, 2022, to our office via email. The following is an analysis/review of the rezoning proposal:

Site Location: The property is located in a residential area within White Lake Township. The area has a mix of older single family residential dwelling units, built between the 1940's and late 1950's, and newer multi-family dwelling units, built between 2002 and 2005. The property fronts Williams Lake Road, a north/south road that is maintained by the Road Commission for Oakland County (RCOC). Williams Lake Road is a two-lane road with a designated turn lane. The corridor is utilized as a main thoroughfare which is part of a multi-linkage road system connecting the Clarkston, Pontiac, Waterford areas to the Commerce, Novi, Union Lake area.



Image #01: Site Location - Parcel ID #12-36-476-002

Existing Site Features: The property's history, as analyzed through Oakland County aerial photography, shows that the property was once part of a larger property and farmed through the 1940's but was subdivided for a single-family dwelling sometime in the 1950's. The lot, being approximately 2.5 acres was larger than most having over 300 feet of frontage on Williams Lake Road.



Image #02: Google Earth – Street view: October of 2021

The Proposal: The application makes mention of a “16-unit apartment” development, however, no plans were submitted and the rezoning is not conditional. It is assumed that the applicant’s definition of “apartment” follows that of a permitted use within the proposed district. Once zoned RM-1, any one of the permitted uses allowed in the RM-1 district (see item #7 on page 2 of this review) could be built on the property regardless of the intentions of the applicant.

Natural Resource Information: In 2017, Michigan Natural Features Inventory (MNFI) staff conducted an inventory of high-quality, sensitive natural areas in Oakland County. These sites identified represent the least disturbed natural areas remaining in Oakland County. The borderline between White Lake Township and Waterford Township has a few identified “priority” natural areas and/or natural features. Our office has provided a MNFI map of the area showing the highly sensitive areas in the White Lake-Waterford Township area as it relates to the location of the subject property (see Image #02 below). There are no designated naturally significant areas on or adjacent to the property that were identified in the 2017 MNFI data.

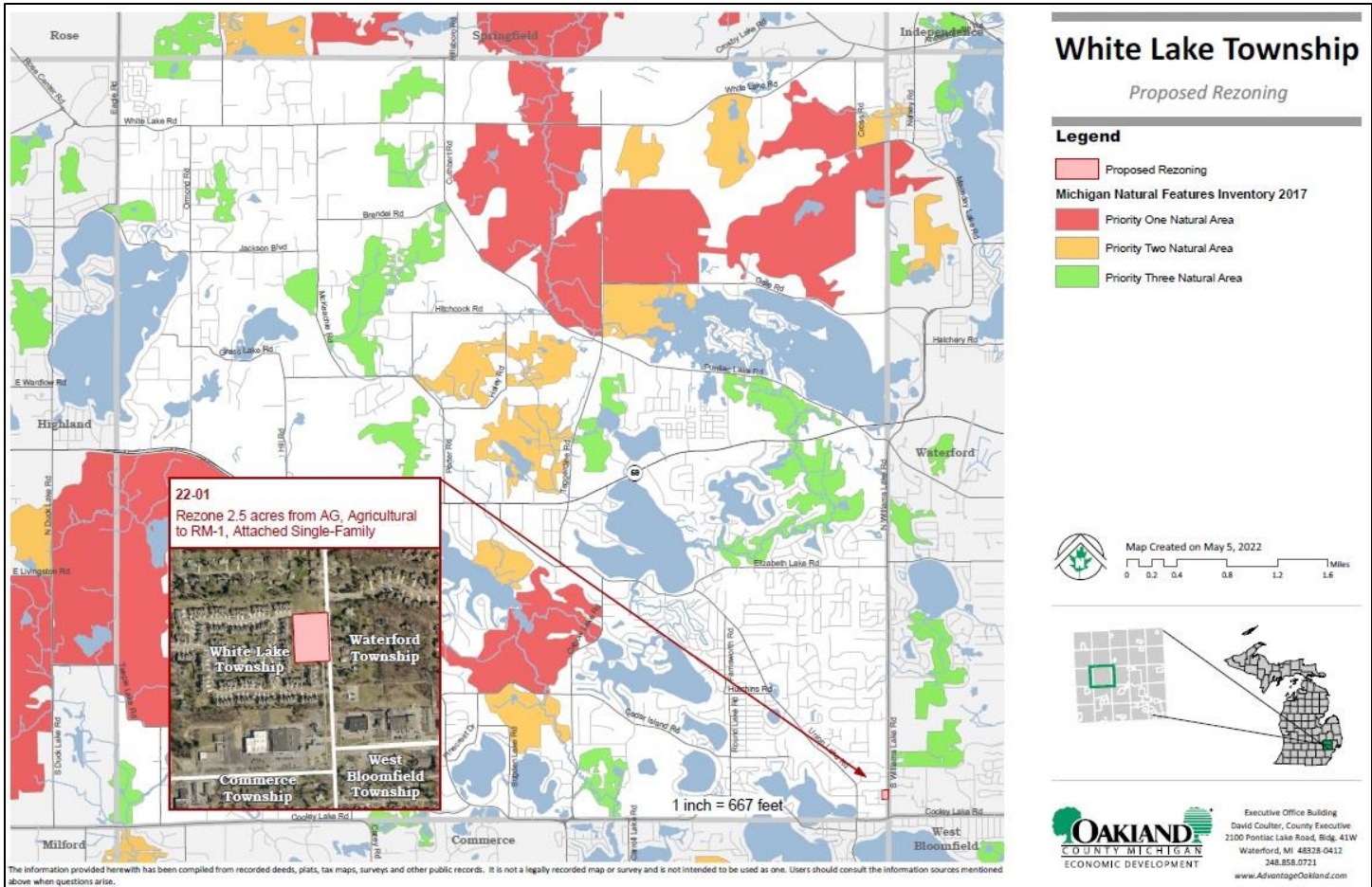


Image #03: Michigan Natural Features Inventory map for White Lake Township – Parcel ID #12-36-476-002

Master Plan Review: The White Lake Township Master Plan was adopted in October of 2011 and per our records there has not been any amendments or updates to the document since its adoption. Within the current Master Plan, the Future Land Use (FLU) Plan and map (Image #05) show the subject property in an area designated as the “Four Towns Hamlet” focus area as shown on the “Planning Areas” Map (Image #4). This area is split between uses. The southern portion is *Planned Community* along Cooley Lake Road between Union Lake Road and Williams Lake Road which makes up a portion of the Union Lake settlement that is a small commercial node at Cooley Lake Road and Union Lake Road. The northern half is planned for *Multiple Family* which includes the existing Whetherstone Condo development and the subject property proposed for rezoning. The proposed rezoning and surrounding development, in this area, remain consistent with the Township’s Master Plan.

FLU designation of the property
 Area of Subject property
 Portion of Planning Area Map

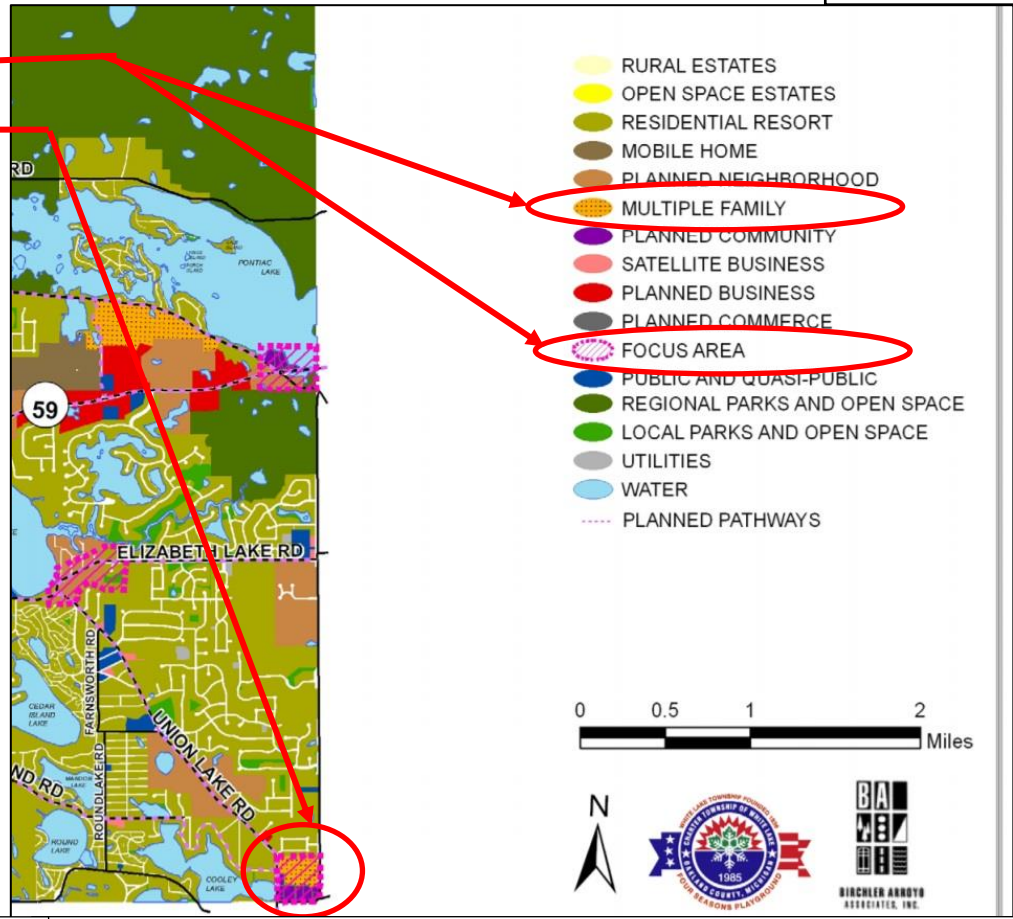
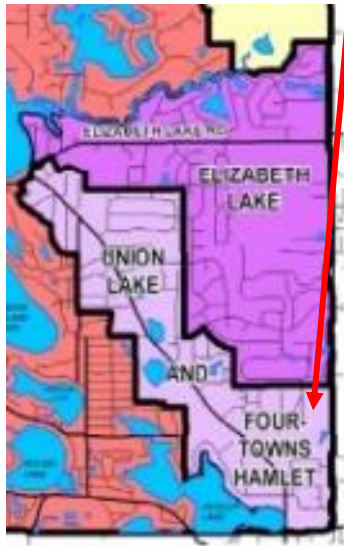


Image #04: Portion of Planning Areas

Image #05: Portion of Future Land Use Plan – White Lake Twp. Master Plan

Zoning Review: The current zoning of the property is *Agricultural (AG)*, but the site is nonconforming to the dimensional requirements for the AG district. The site is surrounded by *Attached Single Family (RM-1)* which is the rezoning classification being proposed for the property. Across Williams Lake Road (east side) is Waterford Township which has a large area of *Single Family Residential (R-1A)*. Other comparable zoning districts that are

within 1,000 feet of the subject property are shown to the left of this page (image #06).

White Lake Twp. current zoning map:

R1-C, Single Family Residential
 RM-1, Attached Single Family Residential
 Subject site location in White Lake Twp.
 Current zoning: AG, Agricultural

RB, Restricted Business

Waterford Twp. current Zoning map:

R-1A, Single-Family Residential
 R-M2, Multiple-Family Residential
 C-UL, Union Lake Business

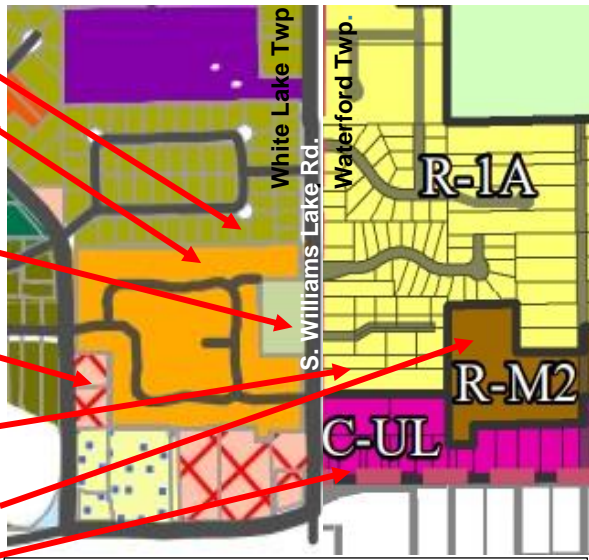


Image #06: Portions of Waterford & White Lake Townships' Zoning Maps

Boundary Community Review:

As mentioned earlier within this review, Waterford Township has a total of four (4) properties that are adjacent to the proposed rezoning, which are located across Williams Lake Road. All are well established existing single-family residences that were

built between 1940s-1950s that range from 0 .68 to 2.5-acre sites. The age and architectural style of the existing housing structures on the Waterford Township side of Williams Lake Road are similar to the existing dwelling of the subject property, however, on smaller lot sizes.

Analysis: Given the location in the "Four Towns" area, proximity to the Union Lake settlement and the surrounding land uses promoting density and walkability, the rezoning is acceptable and fits with the residential growth patterns of the area. From a borderline analysis, there are only four (4) single family residential properties that share a border of the Township which are located across Williams Lake Road. Similar growth in residential density has been promoted in this area by both Townships. The proposed rezoning remains to be that of a residential use and therefore, adjacent residences in Waterford Township should not be significantly impacted by any permitted uses allowed in the RM-1 district.

With the approval of the proposed rezoning request, it is recommended that the White Lake Township Master Plan be updated to reflect such changes within the Future Land Use map and plan in the next review cycle.

Staff Recommendation: Based on the County's knowledge of the Master Plan, interpretation of the zoning ordinance, boundary coordination with the adjacent municipality, the Oakland County Economic Development Department's Planning and Local Business Development Division staff recommends **Approval** of County Code No. RZ 22-01, a rezoning request from AG to RM-1 in Sections 26 of White Lake Township for parcel 12-36-476-002.

Waterford Township will be sent a copy of this analysis upon request in accordance with the notification process. If you have any questions, please do not hesitate to contact me at (248) 858-0389 or email me at krees@oakgov.com.

Respectfully Submitted,



Scott E. Kree
Senior Planner

- CC: Sean O'Neil, White Lake Township Planning & Zoning Director
- Jeffrey M. Polkowski, Waterford Township Superintendent of Planning & Zoning
- Eileen Kowall, Oakland County Commissioner, District 6
- Gwen Markham, Oakland County Commissioner, CZC Chair
- Gary McGillivray, Oakland County Commissioner, CZC Vice-Chair
- Phil Weipert, Oakland County Commissioner, CZC Member

CHARTER TOWNSHIP OF WHITE LAKE
COMMUNITY DEVELOPMENT DEPARTMENT
7525 Highland Road, White Lake, Michigan 48383-2900
248-698-3300, Ext. 163

APPLICATION TO REZONE PROPERTY

Date: 03-08-2022

Applicant: Justin Judy

Address: 1392 S Williams Lake Rd

Phone No.: 248-417-8050 Fax No.: _____

E-mail: Justin@ApexBuildCo.com

Applicant's Interest in Property: 16 unit apartment

Property Owner: PICO HYSA

Owner's Address: 1392 S Williams Lake Rd

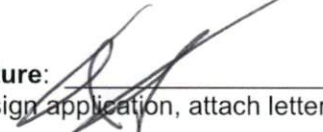
Phone No.: 248-417-8050 Fax No.: _____

Location of Property: 1392 S. Williams Lake Road

Sidwell No(s): 1236476002

Total area of change: 2.5 acres

I, the undersigned (owner, attorney, or option holder) hereby request that this property now classified as AG Agricultural District, be reclassified as RM-1 Attached Single Family District.

Applicant's Signature: 
(If owner does not sign application, attach letter signed by owner, requesting zoning change.)

Please Print Name: Justin Judy

- Required Attachments:
- _____ 1. Legal description of the property proposed to be rezoned.
 - _____ 2. Location map
 - _____ 3. Rezoning sign location map
 - _____ 4. Statement indicating why change is requested
 - _____ 5. Review fee (check payable to the Charter Township of White Lake)

3-25-22

To whom it may concern,

I Piro Hysa, give Justin Jundy permission to act on my behalf and apply for a rezoning application for the property located at 1392 S Williams Lake Rd White Lake Michigan, and any other applications needed by the city for this property.

Piro Hysa

X Piro Hysa

STATE OF Michigan
COUNTY OF Oakland

This instrument was acknowledged before me this 25 day of March, 2022, by Piro Hysa

[Signature] Notary Public's Signature Steven Dzierwa Jr Notary Name
My Commission Expires 03/16/2028

STEVEN DZIERWA JR
Notary Public, State of Michigan
County of Livingston
My Commission Expires 03-16-2028
Acting in the County of Oakland





Section 8, Item A.
J&A ARCHITECTURAL ENGINEERING
3250 w. Big Beaver Road
Suite 510
Troy, MI 48084
248-282-6475
eafegley.arch@gmail.com

March 8, 2022

To: City of White Lake
Planning Department
c/o Justin Quagliata
7525 Highland Road
White Lake, MI 48383

**RE: 1392 4S. Williams Lake Road
White Lake, MI 48386**

Dear Justin Quagliata,

We are applying to rezone the above property from AG (Agricultural) to RM-1 (Attached Single Family). The property is surrounded by RM-1 zoning at the North, South, and West. The development will consist of a single building with (16) 2-Bedroom dwelling units. The majority of the site will remain open green space for the residences to use. The return on investment for the property to remain as an Agricultural zoning is relatively low. This project will bring additional high quality rental units to the City of White Lake. S. Williams Lake Road will be able to handle the increased traffic generated by the additional residences for the site. The development will meet all City requirements in terms of Utility and Services for the Site.

Thank you,

E. Ashley Fegley, RA

eafegley.arch@gmail.com
313.600.1373

1392 S WILLIAMS LAKE RD WHITE LAKE, MI 48386

DESIGNER OF RECORD:

J & A ARCHITECTURAL ENGINEERING
3250 W. Big Beaver
Suite 510
Troy, MI 48084
248.282.6475



J & A ARCHITECTURAL
ENGINEERING
3250 W. BIG BEAVER RD.
SUITE 510
TROY, MI 48084
P. 248.282.6475
F. 248.590.0257
azhematly@gmail.com

PROJECT
1392 S WILLIAMS LAKE RD
WHITE LAKE, MI 48386

ISSUED FOR	DATE
RE-ZONING	03-08-2022

NOTES:
1.

Statement of Intellectual Property
The ideas, concepts, drawings and thoughts conveyed herein are the intellectual property of J & A ARCHITECTURAL ENGINEERING
3250 W. Big Beaver Road
Troy, MI 48064
This set of drawings, in whole or in part, may not be reproduced, without the written consent of J & A ARCHITECTURAL ENGINEERING.
This information is protected under U.S. Copyright Law, all rights reserved.
©Copyright 2021

DESIGN PROFESSIONAL IN CHARGE:

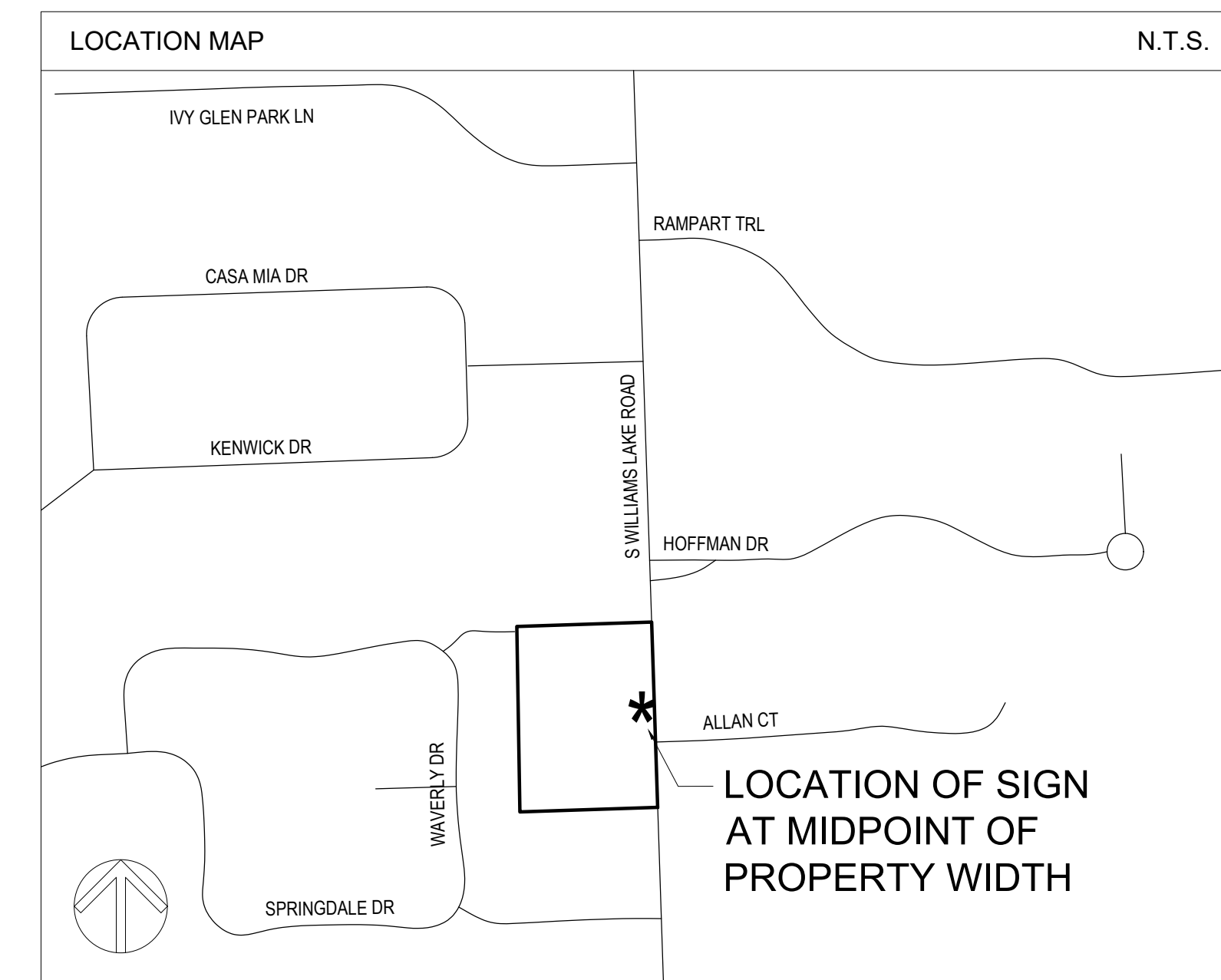
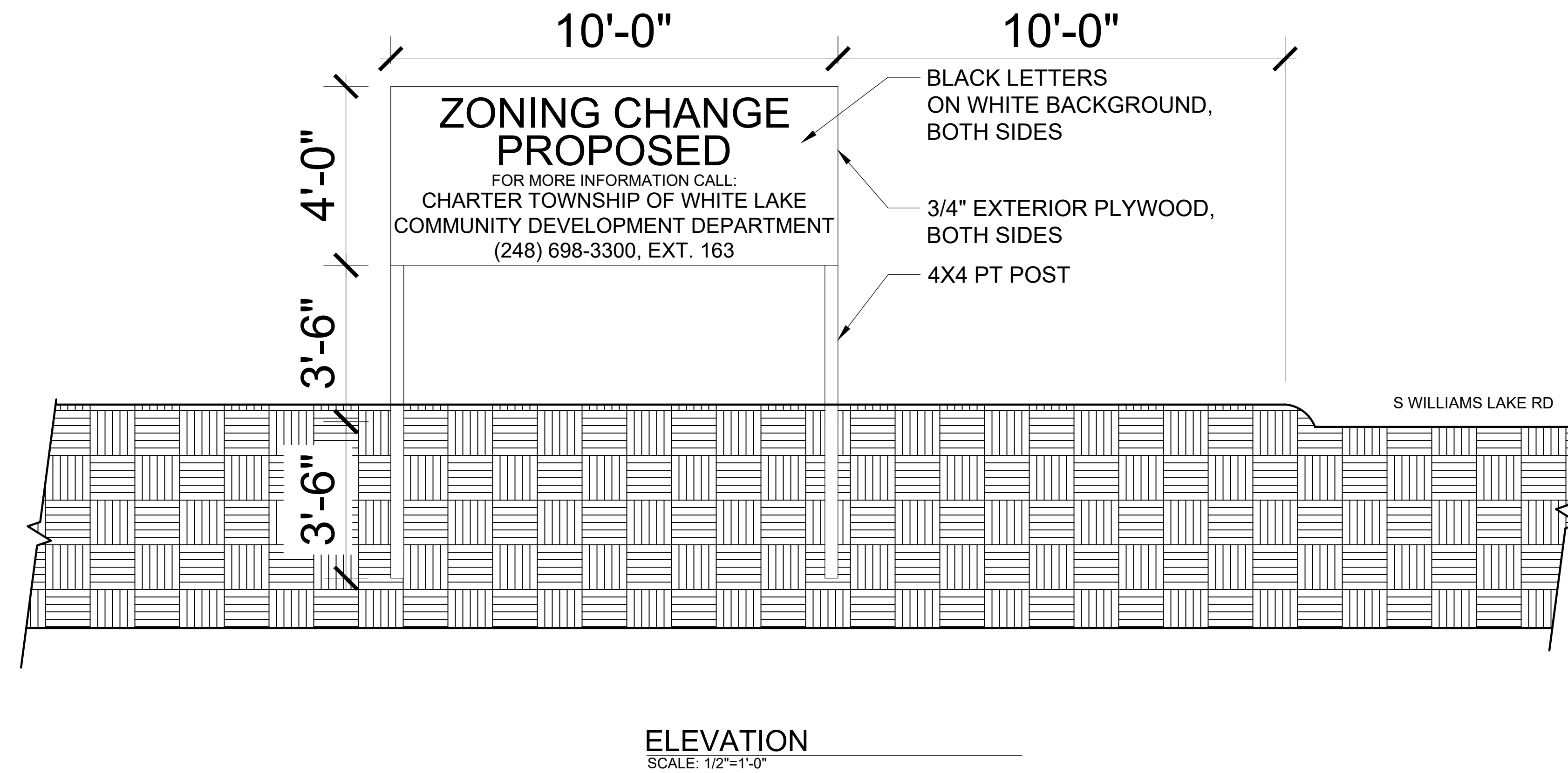


SHEET NAME:
REZONING
SIGNAGE

DATE :	11-1-2021
DRAWN BY :	CBB
CHECKED BY :	AM
JOB NO :	21-171
SHEET:	

RS

SCALE: AS SHOWN



SIGN SPECIFICATIONS:

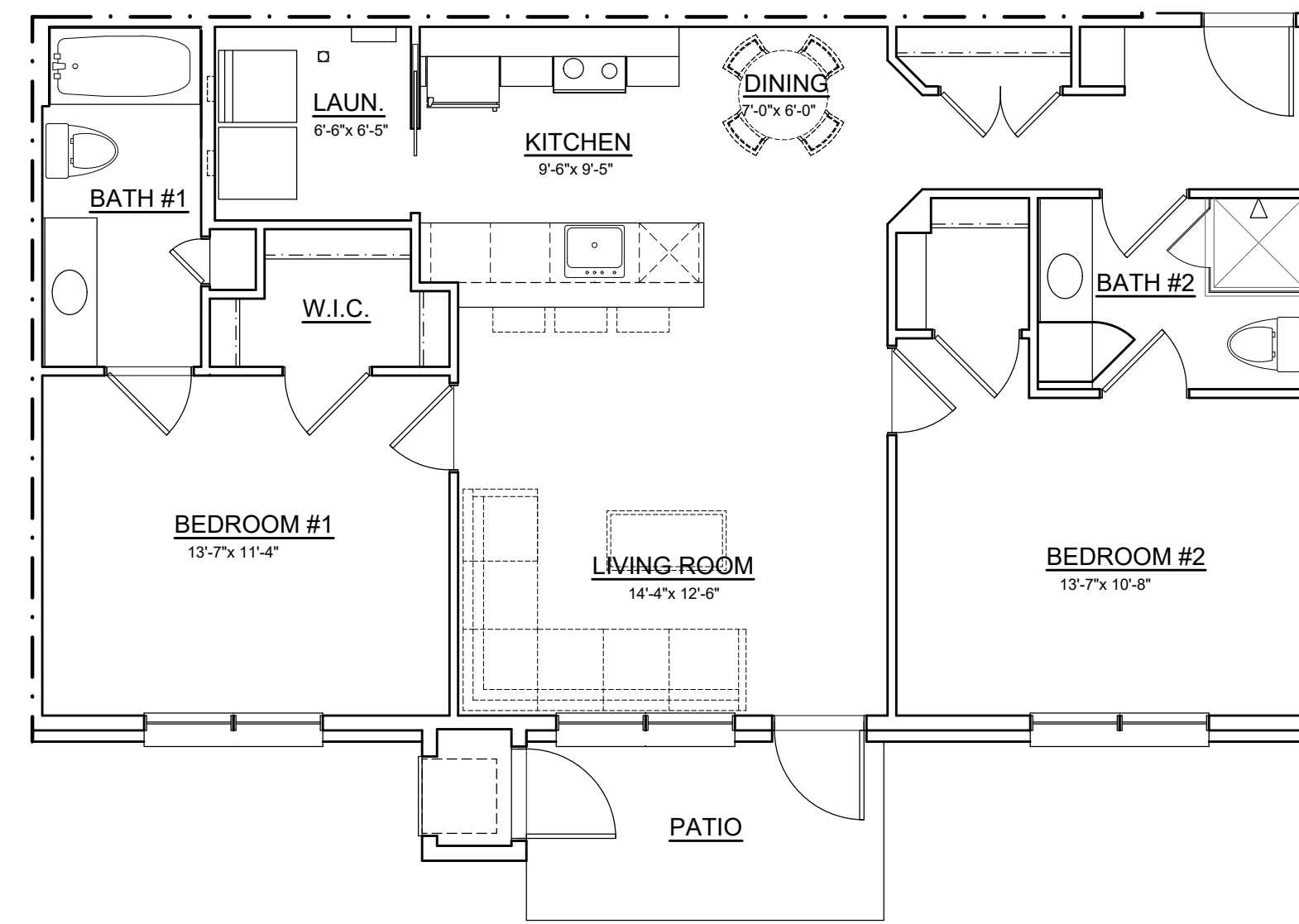
- Black letters on a white background
- Size of sign - 4 ft. (vertical) by 10 ft. (horizontal)
- Sign face shall be exterior plywood
- Wording shall be as follows:

ZONING CHANGE PROPOSED	(8" high letters)
FOR MORE INFORMATION CALL:	(3" high letters)
CHARTER TOWNSHIP OF WHITE LAKE	(4" high letters)
COMMUNITY DEVELOPMENT DEPARTMENT	(4" high letters)
(248) 698-3300, EXT. 163	

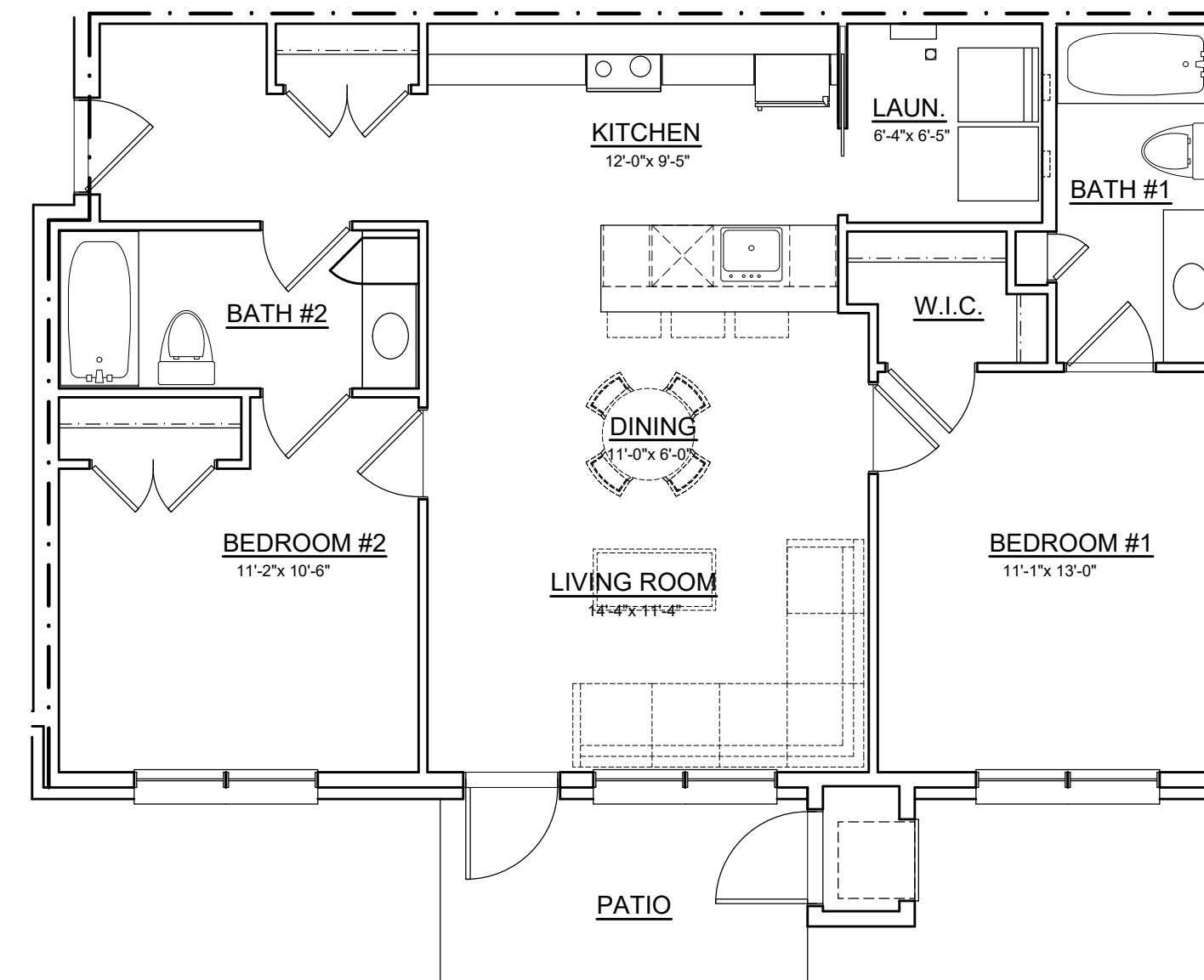
-Sign shall be installed 42" above the ground

ZONING

CURRENT ZONING:	AG	AGRICULTURAL
PROPOSED ZONING:	RM-1	ATTACHED SINGLE FAMILY RESIDENTIAL



3 UNIT 202 1,061 S.F.
A2.0 SCALE: 1/4" = 1'-0"



2 UNIT 201 996 S.F.
A2.0 SCALE: 1/4" = 1'-0"

CODE SUMMARY

GOVERNING CODES
 2015 MICHIGAN BUILDING CODE (MBC)
 2015 MICHIGAN MECHANICAL CODE (MMC)
 2015 MICHIGAN PLUMBING CODE (MPC)
 2015 MICHIGAN UNIFORM ENERGY CODE (MUEC)
 2017 NATIONAL ELECTRICAL CODE (NEC)

ACCESSIBILITY
 MICHIGAN BARRIER FREE DESIGN LAW
 P.A. 1966 AS AMENDED
 2009 ICC / ANSI A117.1 STANDARD AS REFERENCED FROM
 CHAPTER 11 OF THE MICHIGAN BUILDING CODE

PROPOSED USE: APARTMENTS

OCCUPANCY GROUP : R-2
TYPE OF CONSTRUCTION : VB
FIRE SUPPRESSION: NFPA 13R

ALLOWABLE BUILDING HEIGHT : 60'-0"
ACTUAL BUILDING HEIGHT : 50'-0"

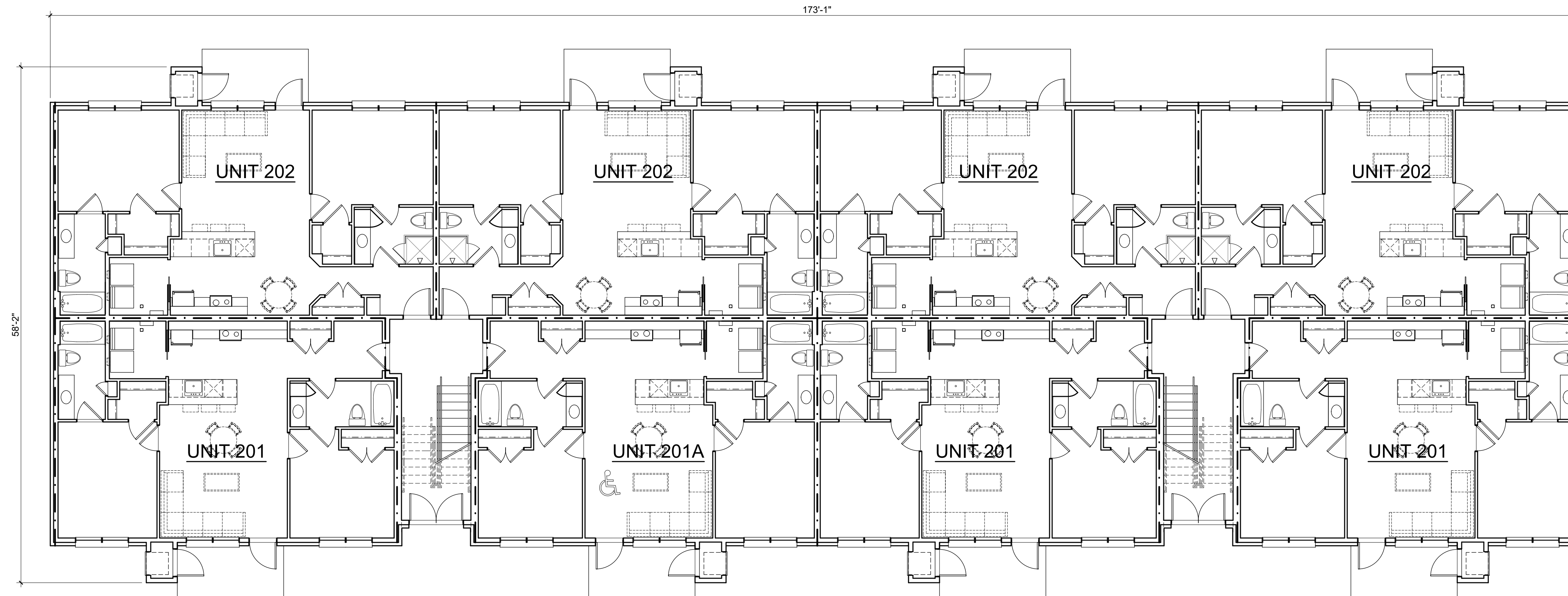
ALLOWABLE NUMBER OF STORIES: 3
ACTUAL NUMBER OF STORIES : 2

ALLOWABLE AREA : 7,000 S.F.

TYPE 'B' DWELLING UNITS: ALL FIRST FLOOR UNITS EXCLUDING TYPE 'A'
TYPE 'A' DWELLING UNITS: 2% OF 24 UNITS = 1 UNIT
 (1) 2 BEDROOM UNIT

PROPOSED No. OF UNITS: 16 UNITS

(16) 2 BEDROOM UNITS
ACTUAL HEIGHT & AREA = 2 STORIES/8,728 S.F.
AREA INCREASE REQUIRED



1 OVERALL FIRST FLOOR BUILDING PLAN
A2.0 SCALE: 1/8" = 1'-0"

SECOND FLOOR SIM.



J & A ARCHITECTURAL ENGINEERING
 3250 W. BIG BEAVER RD.
 SUITE 510
 TROY, MI 48064
 P. 248.282.6475
 F. 248.590.0257
 azhematty@gmail.com

PROJECT
 1392 S WILLIAMS LAKE RD
 WHITE LAKE, MI 48386

ISSUED FOR	DATE
RE-ZONING	03-08-2022

NOTES:
1.

Statement of Intellectual Property
 The ideas, concepts, drawings and thoughts conveyed herein are the intellectual property of
 J & A ARCHITECTURAL ENGINEERING
 3250 W. Big Beaver Road
 Troy, MI 48064
 This set of drawings, in whole or in part, may not be reproduced, without the written consent of
 J & A ARCHITECTURAL ENGINEERING.
 This information is protected under U.S. Copyright Law, all rights reserved.
 ©Copyright 2021

DESIGN PROFESSIONAL IN CHARGE:



SHEET NAME:
 UNIT PLANS &
 OVERALL BUILDING
 PLANS

DATE :	11-1-2021
DRAWN BY :	CBB
CHECKED BY :	AM
JOB NO. :	21-171
SHEET:	

A2.0

SCALE: SEE SCALE

**WHITE LAKE TOWNSHIP
NOTICE OF PUBLIC HEARING**

Notice is hereby given of a public hearing by the White Lake Township Planning Commission on **Thursday, May 19, 2022 at 7:00 P.M.** at the Township Annex, 7527 Highland Road, White Lake, Michigan 48383, to consider the following changes to the zoning map:

Property described as 1392 S. Williams Lake Road, identified as parcel number 12-36-476-002, located on the west side of Williams Lake Road, north of Cooley Lake Road, consisting of approximately 2.50 acres.

Applicant requests to rezone the property from **(AG) Agricultural to (RM-1) Attached Single-Family** or any other appropriate zoning district.

Persons interested are requested to be present. Pertinent information relative to this rezoning request is on file at the Community Development Department and may be examined at any time during regular business hours of 8:00 a.m. to 5:00 p.m. Persons interested may visit the Community Development Department, contact the Community Development Department by telephone at 248-698-3300, ext. 5, or attend the Public Hearing on the date specified. Written comments are also welcome at 7525 Highland Road, White Lake, MI 48383. Individuals with disabilities requiring auxiliary aids or services should contact the Clerk's Office at least 5 days before the hearing.

Sean O'Neil, AICP
Community Development Director

**WHITE LAKE TOWNSHIP
INTER-OFFICE MEMORANDUM
COMMUNITY DEVELOPMENT DEPARTMENT**

DATE: June 13, 2022

TO: Rik Kowall, Supervisor
Township Board of Trustees

FROM: Sean O'Neil, AICP
Community Development Director

**SUBJECT: Comfort Care White Lake
Rezoning request and preliminary site plan approval**
Property described as parcel number 12-36-176-002, located on the west side of Union Lake Road, between Hutchins Road and Cooley Lake Road, consisting of approximately 8.7 acres. Applicant requests to rezone the property from (LB) Local Business to (PD) Planned Development or any other appropriate zoning district.

The above request is now ready for Township Board Consideration. The matter was considered by the Planning Commission at their regular meeting of May 19, 2022 at which time the **Planning Commission recommended approval** of the rezoning request and preliminary site plan approval. The requests are now ready to be considered by the Township Board.

Please find enclosed the following related documents:

- Draft minutes from the Planning Commission meeting held on May 19, 2022.
- Review letter prepared by Michael Leuffgen, Township Engineer, dated May 12, 2022.
- Review letter prepared by Justin Quagliata, Staff Planner, dated May 11, 2022.
- Review letter prepared by Jason Hanifen, White Lake Township Fire Marshal, dated May 11, 2022.
- Memo prepared by Jeanine Smith, Assessor, dated April 27, 2022.
- Plans and elevations submitted by the applicant.

Please place this matter on the next available Township Board agenda. Do not hesitate to contact me should you require additional information.

**WHITE LAKE TOWNSHIP
PLANNING COMMISSION**

Township Annex, 7527 Highland Road
White Lake, MI 48383
May 19, 2022 @ 7:00 PM

CALL TO ORDER

Commissioner Anderson called the meeting to order at 7:00 PM and led the Pledge of Allegiance. Roll was called.

ROLL CALL

Debby Dehart
Scott Ruggles
Mark Fine
Steve Anderson
Merrie Carlock
Pete Meagher
Matt Slicker
T. Joseph Seward

Absent: Robert Seeley

Also Present: Sean O’Neil, Community Development Director
Justin Quagliata, Staff Planner
Mike Leuffgen, DLZ
Lisa Kane, Recording Secretary

Visitors: 14 members of the public were present

APPROVAL OF AGENDA

Director O’Neil asked to amend the agenda, adding *8B. Elizabeth Lake Retail Conceptual Discussion.*

Commissioner Dehart moved to approve the amended agenda of the May 19, 2022 Planning Commission Meeting.

Commissioner Fine supported and the MOTION CARRIED with a voice vote: 8 yes votes.

APPROVAL OF MINUTES

- a. Regular meeting minutes of May 5, 2022
- b. Correction of minutes as noted by Commissioner Seward of a typographical error.

Commissioner Fine moved to approve the amended Minutes of May 5, 2022.

Commissioner Seward supported and the MOTION CARRIED with a voice vote: 8 yes votes.

CALL TO THE PUBLIC (FOR ITEMS NOT ON THE AGENDA)

John Hunt of 871 Oxhill Drive had concerns about snow removal at the proposed Black Rock site and made suggestions on how to accommodate snow removal in the parking lot.

PUBLIC HEARING

A. 1392 S. Williams Lake

Property described as parcel number 12-36-476-002 (1392 S. Williams Lake Road) located on the west side of Williams Lake Road, north of Cooley Lake Road and contains approximately 386.60 feet of frontage on Williams Lake Road. Consisting of approximately 2.50 acres.

Request: **Applicant requests to rezone the parcel from AG (Agricultural) to RM-1 (Attached Single-Family).**

Applicant: Justin Jundy
1392 S. Williams Lake Road
White Lake, MI 48386

Applicant Present: Justin Jundy of 1392 S. Williams Lake Rd, Azher Matty and Andrew Markell of J & D Architectural Engineering

Director O'Neil stated the rezoning request was consistent with the Master Plan. This property could be served by public utilities would have no access to Whetherstone's roads, storm sewer, or other utilities. The concept drawing, which was not reviewed for compliance with the zoning ordinance and not under consideration by the Planning Commission, indicated the only road access being on Williams Lake Road. DLZ did not have any objections to the rezoning traffic study submitted. Staff recommends approval of the rezoning.

Commissioner Slicker asked staff if Stony Court met the standards for a dead-end road.

Director O'Neil explained Stony Court was compliant 19 years ago and was considered an extended driveway. There was an ongoing issue of traffic cutting through Whetherstone and adding another access point to Williams Lake Road would have a negative impact.

Commissioner Dehart asked staff about RM-1 zoning density and if units had to be owner-occupied.

Director O'Neil stated the density for RM-1 was 6 to 8 units per acre and any development of this site would be expected to present 6 to 8 units per acre.

Mr. Matty presented the conceptual drawing and discussed the rezoning traffic study.

Mr. Jundy stated they would like to bring more families to the area.

Commissioner Carlock stated natural vegetation was preferred over new, young trees.

Mr. Matty stated they intend on having an arborist visit the site and give recommendations.

Commissioner Slicker confirmed the Commission was only considering the rezoning request at this time and inquired about the conceptual drawing.

Commissioner Anderson opened the public hearing at 7:26 p.m.

Bruce Scarcella of 8052 Stony Court inquired about the density proposed and the zoning of his neighborhood.

Director O'Neil answered the resident and encouraged him to contact the Community Development Department for more information regarding the zoning of his neighborhood.

Joellen Bennett of 1357 Waverly Drive inquired about the utilities available to this development and if this would be accessible through her neighborhood.

Commissioner Anderson explained those matters were not considered during a rezoning request.

Director O'Neil explained a new development would not be allowed to access any utilities or roads without the consent of Whetherstone.

Christine Grimes of 1373 Waverly Drive was concerned about traffic and asked when the traffic study was completed.

Mr. Quagliata stated the rezoning traffic study utilized traffic count information from July 2021 and December 2021.

Michael Bennett of 1357 Waverly Drive was also concerned about traffic.

Corey Fowler of 8624 Newport co-owns a unit on Waverly Drive and was concerned about the animals in the nearby wooded area.

Marilyn Waltz of 1365 S. Williams Lake Road (Waterford) had concerns about the increase of traffic.

Commissioner Anderson closed the public hearing at 7:39 p.m.

Commissioner Anderson asked the applicants to take the feedback from the public hearing into consideration when preparing their site plan.

Commissioner Seward moved to recommend approval to the Township Board of the rezoning from AG (Agricultural) to RM-1 (Attached Single Family), for parcel number 12-36-476-002.

Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

B. VCA

Property described as parcel number 12-21-276-023 (7755 Highland Road) located on the north side of Highland Road, west of Elizabeth Lake Road. Consisting of approximately 1.27 acres.

Request: **1) Amended final site plan**

2) Special land use to establish and operate a veterinary clinic

Applicant: VCA Animal Hospitals, Inc

12401 West Olympic Blvd

Los Angeles, CA 90064

Applicant Present: Rebecca Wilson of 5434 Mancelona Dr., Grand Blanc

Director O'Neil introduced the request and explained how the zoning ordinance was previously amended to allow for the special land use of a veterinary clinic in the LB (Local Business) zoning district. The applicant requested an amendment to the final site plan for the outdoor pet areas. The site was already on municipal water and sewer. Staff recommended approval of the special land use and the amended final site plan, and suggested to include hours of operation as a condition of the special land use approval.

Commissioner Seward asked staff if the neighboring business, Auto Zone, operated 24 hours a day.

Director O'Neil stated it did not.

Commissioner Carlock asked staff about the other tenants in the building.

Director O'Neil explained there would be a second tenant occupying one unit and an unoccupied unit in between the veterinary clinic and the carry out restaurant on the opposing end of the building.

Commissioner Slicker inquired about the turf used in the outdoor pet areas and cleaning of the areas.

Ms. Wilson stated the VCA needed two exterior areas for walking dogs, one for those who had communicable illnesses and a separate area for dogs that had a medical procedure. The artificial turf would be cleaned every day. The facility would not offer grooming, or boarding besides surgical stays. No after-hours emergency services would be offered; the VCA referred patients to 24-hour veterinary hospitals in the area. Ms. Wilson stated the requested hours of operation were Monday through Friday from 9 a.m. to 7 p.m. and Saturday from 9 a.m. to 1 p.m. The clinic was closed Sundays.

Commissioner Anderson opened the public hearing at 8:00 p.m.

No members of the audience spoke during the public hearing.

Commissioner Anderson closed public hearing at 8:02 p.m.

Commissioner Meagher moved to approve the amendment of the final site plan subject to all staff and consultants' review comments being addressed, for Parcel Number 12-21-276-023 (7755 Highland Road).

Commissioner Dehart supported, and the **MOTION CARRIED** with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

Commissioner Meagher moved to approve the Special Land Use subject to the stipulated hours of operation to establish and operate a veterinary clinic, for Parcel Number 12-21-276-023 (7755 Highland Road).

Commissioner Dehart supported, and the MOTION CARRIED with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

CONTINUING BUSINESS

A. Comfort Care White Lake

Property described as parcel number 12-36-176-002, located on the west side of Union Lake Road, between Hutchins Road and Cooley Lake Road, consisting of approximately 8.7 acres.

Request: **i) Rezoning (from (LB) Local Business to Planned Development (PD)**

ii) Preliminary site plan approval

Applicant: Comfort Care, LLC

4180 Tittabawassee Road

Saginaw, MI 48604

Applicant Present: Doug Boehm, Owner & Executive Director of Comfort Care
John Costa, Architect and Rudy Quaderer, Site Engineer

Mr. Quagliata stated the size of the building and density were reduced from the previous plan. The secondary access to Union Lake Road had been removed; an emergency/secondary access through the West Valley site (if the project was constructed) was proposed. Staff recommended posting 'No Parking' signs and designating the secondary access as a fire lane. A public benefit of \$20,000 to the Parks and Recreation fund was offered by the applicant. Five waivers (deviations from the zoning ordinance) were requested. The facade of the building had been changed with improved quality of materials used. A screen wall had been added to provide screening at the rear property line. Staff recommended approval subject to all comments being addressed and the Commission discussing the community benefit with the applicant.

Commissioner Meagher asked staff what the difference was between a waiver and a variance.

Director O'Neil explained Planned Development zoning allowed for deviations from the zoning ordinance through the development agreement.

Commissioner Ruggles asked staff about the proposed public benefit.

Mr. Quagliata referenced the waivers requested and stated a community benefit must be for the use and enjoyment of the public-at-large.

Commissioner Fine had concerns about the amount of greenbelt landscaping.

Commissioner Dehart asked staff about the number of waivers requested and if there were any comparable developments that could help them determine the public benefit.

Mr. Quagliata answered five waivers were requested.

The Commission discussed the proposed public benefit.

Commissioner Slicker noted the plan indicated a retaining wall and stated that could increase the adjacent homeowner's potential for drainage issues.

Mr. Quagliata stated screening of the neighbor's property had been increased compared to the previous plan and screen wall details would need to be clarified on the final site plan.

Mr. Leuffgen noted the plans had not changed significantly from an engineering standpoint and this project's feasibility remained entirely dependent on the West Valley project being redesigned and constructed.

Mr. Boehm stated he spoke with the resident of 900 Union Lake Road regarding the retaining wall.

Mr. Quaderer reviewed the landscaping on the plan.

The Commission reviewed the renderings provided by the applicant, and deliberated the waivers requested and required setbacks.

Commissioner Dehart inquired about the size of the Comfort Care Clarkston facility.

Commissioner Meagher asked Commissioner Dehart her opinion about how the Zoning Board of Appeals would respond if the Board had to hear this case.

The Commission discussed the proposed public benefit.

Mr. Boehm stated he had discussed the public benefit with his team and increased the proposed amount from \$5,000 to \$20,000.

Commissioner Meagher moved to recommend approval to the Township Board the rezoning of Parcel Number 12-36-176-002 from LB (Local Business) to PD (Planned Development), subject to the applicant obtaining preliminary site plan approval from the Township Board. Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (8 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/yes, Slicker/yes, Ruggles/yes)

Commissioner Meagher moved to recommend approval to the Township Board approval of the preliminary site plan for Parcel Number 12-36-176-002, subject to the applicant addressing all of the staff and consultant comments and recommendations, West Valley being redesigned and constructed, no parking signs being placed in the secondary access drive, landscaping meeting all zoning ordinance requirements, and an increased public benefit commensurate with the waivers requested.

Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (7 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seward/no, Slicker/yes, Ruggles/yes)

B. Elizabeth Lake Retail Conceptual Discussion

Commissioner Ruggles recused himself from the case and left the meeting.

Commissioner Anderson explained the applicant had fifteen minutes to present and for the Commission to discuss the matter.

Director O'Neil provided an update on the project.

Joe Maynard of Washtenaw Engineering presented the project. The applicant was seeking Planning Commission input on the residential aspect of the project and indicated a wetland permit had been applied for through EGLE.

Nazir Jawich explained the history of the project and the concerns about the future demand of mixed use.

Discussion by the Commission regarding appropriate zoning and the residential component of the project.

NEW BUSINESS

None.

OTHER BUSINESS

None.

LIAISON'S REPORT

Commissioner Dehart: On behalf of the Zoning Board of Appeals thanked the Planning Commission for its input on a project brought before them.

Commissioner Carlock: Ms. Carlock was not able to attend the last Parks and Recreation Committee meeting and asked Mr. Quagliata to provide an update. Mr. Quagliata stated the National Parks Service required a biological assessment for the Stanley Park grant application. The 5-Year Parks & Recreation Master Plan would be updated this year. A community event was planned for June 25, 2022 – a family fun day at Hawley Park from 3 p.m. to 9 p.m.

DIRECTOR'S REPORT

The Capital Improvements Plan (CIP) update would begin in June. The draft would be presented to the Planning Commission in August followed by a public hearing in September. Ultimately the CIP would be presented to the Township Board for approval.

Implementation of Corridor Improvement Authority was upcoming.

The contract with River Caddis expired and the Township was reconsidering its options.

COMMUNICATIONS

No meeting on June 2, 2022.

NEXT MEETING DATES: June 16, 2022

ADJOURNMENT

**Commissioner Fine moved to adjourn the meeting at 9:21 PM
Commissioner Carlock supported and the MOTION CARRIED with a voice vote: 7 yes votes**

DRAFT



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

May 12, 2022

Sean O’ Neil
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

RE: Comfort Care Assisted Living- Preliminary Site Plan Review – 4th Review

Ref: DLZ No. 2145-7233-19 Design Professional: Griggs Quaderer Inc.

Dear Mr. O’ Neil,

Our office has performed the above mentioned Preliminary Site Plan review of the revised plan dated April 12, 2022. The plans were reviewed for feasibility based on general conformance with the Township Engineering Design Standards.

General Site Information

This site is located on the west side of Union Lake Road between Hutchins and Cooley Lake Roads. The property abuts the existing Preserve at Hidden Lake residential development just to the north and the future West Valley residential development to the southwest. Total site acreage is approximately 8.6977 acres.

Site Improvement Information:

- Construction of a (1) one story assisted living and memory care building totaling 57,443 square feet.
- Associated paved and curbed parking including ADA accessible parking spaces and maneuvering aisles.
- Site to be serviced by watermain and sanitary sewer.
- Storm water runoff is proposed to be detained in a proposed detention basin located on the south side of the parcel. Discharge is proposed to the future West Valley development’s storm sewer located to the southwest.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-Comfort Care Assisted Living- PSP Review.04

May 12, 2022

Page 2 of 7

Comments from our previous review letter dated January 27, 2022 are in *italics*. Responses to those comments are in **bold**. New comments are in standard typeface.

The following items should be noted with respect to Planning Commission review:

- a) *The plan proposes a future emergency access drive with connection to the emergency access drive stub for the West Valley development. DLZ notes the West Valley development is not constructed, thus rendering the proposed stub with no connection should the West Valley site not move forward. In addition, the proposed location of the Comfort Care stub as shown on the plan does not align with the proposed stub location shown on the previously approved West Valley Final Engineering Plan which would require modification of the West Valley plans and easement documents. We request a turning radius profile be provided for this proposed access route utilizing a 40-foot vehicle to demonstrate feasibility. Comment outstanding. While a turnaround radius profile for a 40' vehicle has been provided for the emergency access route, the design engineer still proposes the emergency access drive in a location that does not align with the stub shown on the approved West Valley engineering plan. Revisions to the West Valley plans/easements will be required for use of this access route. Comment addressed. The design engineer in their response letter has stated that they are working with the designer of West Valley; West Valley is flexible on the final location of the emergency access drive. We find this acceptable at the Preliminary Site Plan level of review. However, final details shall be required at the time of Final Site Plan/Final Engineering Plan submittal. We also note that consideration of the emergency access drive location proposed on the West Valley site should be evaluated to determine if there are any setback requirements relative to the proposed adjacent residential structure.*
- b) *Should the proposed plan not be able to achieve emergency access to the future West Valley development, a means of secondary access to the proposed facility should be considered due to the nature of the use of the facility. In addition, there is the concern that only one means of access to the site could pose access issues for the existing residence that would also utilize the sole entrance to Comfort Care. Should this entrance become blocked, the existing residence would have no other means of egress from their property. We also question whether the language for the existing 60' access easement allows for multiple users of this easement for access. An alternate emergency access drive is now shown on the plans with connection to Union Lake Road, presumably in the event the West Valley Development is not available for connection. Details regarding proposed alternate emergency access drive width and turning radius profile for a 40' emergency vehicle shall be provided. Provide details on whether this access drive would also be utilized for site access and if not,*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-Comfort Care Assisted Living- PSP Review.04

May 12, 2022

Page 3 of 7

*how would the drive be blocked off from use. Note also that the existing and proposed steep grades in the area of the alternate drive may pose a difficulty in placement of such drive with respect to emergency vehicle access. Provide details to demonstrate the angle of approach will not pose an issue for fire trucks. Comment partially addressed. The design engineer has stated that either emergency access through West Valley or off Union Lake Road will be provided. Drive width and a turning radius profile for a 40' emergency vehicle has been provided for the proposed emergency access drive off Union Lake Road. The access drive would be gated with a Knox Box provided for emergency vehicle access only. The concern regarding the existing and proposed steep grades for this drive has not been addressed but can be further clarified at the time of Final Site Plan. **Comment rescinded. The applicant is no longer pursuing an emergency access off Union Lake Road and the secondary access is entirely dependent upon West Valley being developed.***

- c) *Developer for Comfort Care will need to ensure that a means of access to the existing house to the west is maintained at all times during construction, especially during construction of the proposed drive and drive approach. A separate construction entrance for construction vehicles is recommended. Comment addressed and remains as a notation. A separate construction entrance is proposed. DLZ notes the existing grades in this area are steep and additional details will be required at the time of Final Site Plan/Final Engineering Plan submittal to demonstrate temporary grading. **Comment addressed. A separate construction entrance is now shown in an area of less steep grades. Additional details can be provided at the time of Final Site Plan/Final Engineering Plan.***
- d) *It will need to be clarified as to how the proposed retaining wall adjacent to the three existing trees on the residential property to the west shall be installed without damage (particularly root damage) to these trees. The proposed wall location is extremely close to these trees. Plans do not appear to address this concern; it should be noted by the Planning Department and Planning Commission that damage/loss of these trees is likely. **Comment addressed at this level of review and remains as a notation. Design engineer has stated that wall has been moved back toward the curb to line up with back of curb, which will provide an additional 3' of separation for a total of 12' of separation between the wall and the existing trees. A note indicating that any existing damaged trees shall be replaced by the responsible party shall be added to the Final Site/Final Engineering Plan.***
- e) *There is a concern regarding the proximity of the proposed storm sewer along the southwestern side of the site relative to the proposed retaining wall; the storm sewer will need to be located outside of the influence of the wall (at a minimum of 10' horizontal separation) with respect to lateral and vertical stresses. The storm sewer location has been adjusted slightly. There is still a concern near*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-Comfort Care Assisted Living- PSP Review.04

May 12, 2022

Page 4 of 7

*the south building corner where the proposed storm sewer is shown approximately 3' off of the decorative retaining wall. **The proposed wall has been moved further west and away from the proposed storm sewer. Note that off-site grading easements from the property to the west and from West Valley may be required for construction of the retaining wall as the proposed retaining wall is now shown 3' from the west property line. This item can be considered addressed for this level of review; however further revisions may be required at the time of Final Site/Final Engineering Plan review.***

- f) *The design for the detention basin proposes discharge into the future West Valley storm sewer. The existing West valley storm system will need to be redesigned to accommodate this additional discharge as the proposed West Valley system was at hydraulic capacity prior to accounting for these discharges. This additional discharge will require modification to the West Valley storm water discharge permit. Design engineer has stated the following in their response letter dated January 11, 2022: "West Valley will revise their storm water system to incorporate the additional runoff from this site. Should West Valley not be able to incorporate the additional runoff, we will revise the storm water management utilizing a retention basin. The soils for this site are sandy and suitable for a retention basin based on initial conversation with the geotechnical consultant. We will have the final soils report during final site plan review." DLZ notes that the change from detention to retention will require additional pond area and relocation of proposed landscaping. We defer to the Township as to whether such a change with respect to stormwater management on the Final Site/ Final Engineering Plan would require a revised Preliminary Site Plan to be submitted for administrative review. **Comment remains as a notation. Design engineer has stated in their April 11, 2022 response letter that West Valley will revise their storm sewer system and incorporate the restricted runoff from the Comfort Care detention basin.***
- g) *The layout for the water main proposes a second connection to the watermain stub to the southwest provided by the future West Valley development. Note that West Valley has not been constructed so a second connection point for the watermain will not be feasible until West Valley has been constructed. This would result in a dead end main >600' in length which is not allowable per WLT Engineering and Design Standards. Note watermain easements are required to be 20' wide; plan currently proposes 15' wide easements. Wording on plan should also be revised on the Site Utility Plan from existing West Valley stub to proposed stub. Comment partially addressed. The proposed watermain is now shown in a 20' wide easement. The remaining portion of this comment remains outstanding. If the West Valley development is not available for connection, the proposed watermain extension would be a dead end of approximately 1,000 feet with the last 400 feet being stagnant, which is undesirable from a water quality standpoint. An alternate layout may need to be considered*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-Comfort Care Assisted Living- PSP Review.04

May 12, 2022

Page 5 of 7

in the event West Valley is not constructed. An alternate route has been provided showing a secondary water main connection to the existing water main along Union Lake Road in the event that connection to the West Valley water main is not feasible. Further analysis will be required at the time of Final Site Plan submittal to determine pressure reducing valve requirements if the connection to West Valley is not feasible. The applicant needs to be prepared for the need for a second pressure reducing valve and vault at the second watermain connection. **Comment addressed. The design engineer has indicated that this site will tie into West Valley's watermain system as a secondary watermain connection.**

The following comments can be addressed on the Final Site Plan/Final Engineering Plan:

Final Site Plan/Final Engineering Plan Comments-

General

1. *Plan shall contain notes per White Lake Township Engineering Design Standards Section A. 8. a.-d.* **Comment outstanding.**

Paving/Grading

1. *ADA accessible ramps will be required on sidewalk adjacent to ADA parking spaces. Ramp slopes shall meet ADA requirements.* **Comment remains as a notation. A ramp detail shall be required on the Final Site Plan/Final Engineering Plan.**
2. *Structural wall calculations, that have been signed and sealed by a Registered Structural Engineer, verifying the wall integrity and the ability to support lateral and vertical stresses will need to be provided for retaining walls over 30" tall.* **Comment outstanding.**
3. *A retaining wall may be required in the greenspace area between the proposed sidewalk along Union Lake Road and the southeast corner of the building; the grades will need to be verified in this area to ensure they do not exceed 33%.* **Comment outstanding.**

Watermain

1. *We defer to the Fire Department regarding items related to fire suppression and hydrant coverage.* **Comment remains as a notation.**
2. *Remove all references to Genessee County on the water main notes on Sheet C400- Site Utility Plan. Note that all notes regarding proposed utilities shall be per White Lake Township standards.* **Comment addressed.**



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-Comfort Care Assisted Living- PSP Review.04

May 12, 2022

Page 6 of 7

Sanitary Sewer

1. *Additional details regarding the sanitary lead and connection will be required; a monitoring manhole shall be provided as well as a wye in the lead line which will bypass the oil and grease separator. The line with the oil and grease separator shall be directly connected only and to all kitchen/food prep areas. **Comment partially addressed. The monitoring manhole shall be located downstream of the proposed oil and grease separator.***

Stormwater Management

1. *The design engineer will need to demonstrate that the proposed storm sewer material (ADS HD) will maintain its integrity when located under proposed pavement, otherwise use CLIV Reinforced Concrete pipe within pavement influence. **Comment outstanding.***
2. *Sheet C300 – Site Grading Plan indicates a 15' wide storm sewer easement for West Valley; easement width is 12'. **Comment addressed. Easement now shown as 12' wide.***
3. *Clarify on the Soil Erosion Plan as to why the OCS structure in the basin is to be temporary. **Comment outstanding.***
4. *Clarify reference to South Pond on OCS#2 detail on Site Details sheet. **Comment addressed.***

Landscape Plan

1. *Landscaping shall be revised such that proposed trees are located a minimum of 10' horizontal separation from all watermain, sanitary sewer, and storm sewer. Note that proposed trees appear too close to storm sewer along the western property line. **Comment outstanding.***

Recommendation

Engineering feasibility for the proposed site is entirely dependent on the West Valley development being modified and constructed before the Comfort Care development in order to have utility access and secondary emergency access. DLZ recommends approval contingent upon successful modification to the West Valley plans and completion of the West Valley Watermain, Storm Sewer, and roads for beneficial use of the Comfort Care development.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-Comfort Care Assisted Living- PSP Review.04

May 12, 2022

Page 7 of 7

Please feel free to contact our office should you have any questions.

Sincerely,

DLZ Michigan

Michael Leuffgen, P.E.
Department Manager

Victoria Loemker, P.E.
Senior Engineer

Cc: Justin Quagliata, Community Development, *via email*
Hannah Micallef, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township, *via email*
John Holland, Fire Chief, White Lake Township, *via email*
Jason Hanifen, Fire Marshal, White Lake Township, *via email*

X:\Projects\2021\2145\723319 WLT Comfort Care A\PSP- Review.04\Review.04.docx

WHITE LAKE TOWNSHIP PLANNING COMMISSION

REPORT OF THE COMMUNITY DEVELOPMENT DEPARTMENT

TO: Planning Commission

FROM: Sean O’Neil, AICP, Community Development Director
Justin Quagliata, Staff Planner

DATE: May 11, 2022

RE: Comfort Care
Rezoning and Preliminary Site Plan – Review #4

Staff reviewed the revised site plan prepared by Griggs Quaderer Inc. (revision date April 12, 2022). At its February 3, 2022 meeting the Planning Commission tabled the rezoning and preliminary site plan (PSP) applications to provide the Developer an opportunity to address issues raised with the prior proposal. Comfort Care has requested rezoning to PD (Planned Development) and PSP approval to construct an independent living, assisted living, and memory care facility at Parcel Number 12-36-176-002, located on the west side of Union Lake Road, south of Preserve at Hidden Lake. The subject site is approximately 7.49-acres in size (net area) and currently zoned LB (Local Business).

The building was reduced in size from 66,842 square feet and 70 units to 57,443 square feet and 60 units (9,399 square foot and 10-unit reduction). With the reduction of area, the building width was reduced from 497’-8” to 420’-8” (77-foot reduction). Overall, there would 40 assisted living units consisting of 10 studio units, 10 one-bedroom units, four two-bedroom units, 16 memory care studio units and 20 independent living units (apartments) consisting of two, 918 square foot studio units, ten, 685 square foot one-bedroom units, and eight, 1,038 square foot two-bedroom units. Each apartment unit would contain a porch (if at the exterior of the building) or a patio (for interior (courtyard facing) units). Apartments accessed from the exterior of the building would also have a door provided to a common hallway circulating through the wing of the building. Near the center of the building, the conceptual floor plan shows a theater and salon. Common areas would be provided for each section of the building, with dining areas centrally located within the assisted living and memory care areas.

Access

The previously proposed alternate emergency access onto Union Lake Road is no longer shown on the site plan. A 20-foot-wide asphalt emergency access drive is proposed to connect to the adjacent parcel to the south, which was previously granted site plan approval for a 69-unit ranch-style apartment complex known as West Valley, which has not yet commenced construction. **The curb and gutter across the north end of the emergency access drive shall be removed. Additionally, curb and gutter shall be installed on each side of the secondary access drive. Furthermore, staff recommends the Planning Commission require the posting of ‘No Parking’ signs within the drive (designation of fire lane).**

Community / Public Benefit

A public benefit must be provided, in part, to offset the impact(s) of development on the Township. When Comfort Care was last before the Planning Commission, the Developer verbally offered \$5,000 to the Parks and Recreation Fund as a community/public benefit. Commissioners expressed the amount of the proposed contribution was not adequate and suggested adding a zero to the contribution amount initially proposed. The Developer previously indicated this was an approximately \$12,000,000 project. If Comfort Care offered \$50,000 as suggested by the Planning Commission, close to 0.5% of the overall project cost would be provided as a public benefit. Without a community/public benefit to justify allowing a Planned Development (PD), staff would not recommend rezoning the property to PD, but rather RM-1 (Attached Single Family) or RM-2 (Multiple Family). If the property is not rezoned to PD but rather RM-1 or RM-2, then there would be no public benefit required and the Developer could request variances from the Zoning Board of Appeals to deviate from the ordinance. Staff supports the suggestion of the Planning Commission; if the proposed public benefit is materially different, staff recommends RM-1 or RM-2 zoning for this property.

Density

Per the Master Plan, in Planned Neighborhood net residential densities are anticipated to range between 2.0 and 8.0 units per acre. As requested by the Planning Commission, the number of units was reduced by ten (10), from 70 to 60. With 60 total units on approximately 7.49-acres, density of the proposed project is eight (8) dwelling units per acre (du/a).

Building Architecture and Design

Starting with the first PSP review, staff recommended the front facade of the building be divided vertically into segments no greater than 60 feet wide and relief of the facade be achieved by utilizing varying high-quality building materials, with each of the articulated segments recessed/off-set (change in the building plane) at least two and no more than five feet across the front facade. The conceptual floor plan and exterior elevations incorporate the above-mentioned design features. The public entrance to the building (where the porte cochere projects outward) is 55’–8” wide, with said segment off-set seven (7) feet from the main plane of the front facade. There are also two, 47’–4” wide building segments, located east and west of the public entrance to the building, which off-sets 2’–6” from the main plane of the front facade.

Landscape and Screening

A 20-foot greenbelt is now proposed along the future Union Lake Road right-of-way; therefore, the previously requested waiver from the minimum greenbelt width is no longer necessary. A retaining/screen wall is now proposed along the drive aisle/maneuvering lane parallel to the rear property line. The zoning ordinance requires a screen wall be six feet in height, eight inches in width (faced with a decorative masonry product), with a five-foot greenbelt adjacent to the screen wall for its entire length planted with one large deciduous or evergreen tree and eight shrubs for every 30 linear feet. The masonry wall cross sections on Sheet C600 show the wall is 8-inch split-face block (color to match building) with 2-inch high, 1'-4" wide precast concrete or sandstone cap. The wall detail said the height varies; **the detail shall be revised to indicate a minimum six-foot wall height.**

Other initial landscape plan comments include:

- The 980 square foot landscape area is not considered parking lot landscaping and shall be removed from said calculation. **Revise accordingly.**
- Trees shall not be planted closer than four feet to a property line. **Add note to landscape plan at final site plan.**
- All required landscape areas in excess of 200 square feet shall be irrigated to assist in maintaining a healthy condition for all plantings and lawn areas. **An irrigation plan shall be provided at final site plan.**
- All required site irrigation systems shall include a rain sensor or similar measure to ensure irrigation does not occur during or shortly after precipitation events. All site plans shall note installation of required irrigation. **Add note to plans at final site plan.**
- Note 9 on the landscape plan mentions mulch. Sheet C500 also contains a mulch and edging detail. The zoning ordinance states the mulch product itself shall be at least doubled-shredded quality. **Revise accordingly.**
- The Planting Requirements table on Sheet C500 shall be revised to indicate the screen wall requirements for the 'Residential Buffer (west side)' minimum requirement.
- Trees identified for protection during construction and the means of protection shall be identified at final site plan. No construction shall occur until tree protection has been installed and approved by the Community Development Director.

Parking

Additional parking is shown on the revised site plan. Previously, 56 parking spaces were provided (56 spaces are required to serve the development). On the revised plan, 62 parking spaces are provided.

Waivers

Based on the submitted site plan, the following waivers are required:

- Building setback: 19-foot front canopy setback (56-foot waiver)
- Building setback: 45-foot rear building setback (30-foot waiver)
- The zoning ordinance requires three loading spaces for a development of this size. A waiver to eliminate two of the three required loading spaces is requested.
- For a majority of its length, the screen wall is three feet from the rear property line. Therefore, a two-foot waiver from the required screen wall greenbelt width is required.
- 766 shrubs are required for interior landscaping, and 722 interior shrubs are proposed. Therefore, a 44-shrub waiver from the required interior landscaping is requested.

An updated list of all requested waivers shall be provided on Sheet C200 of the site plan.

Other miscellaneous comments and/or notations

- The Developer’s architect previously indicated there would be bay windows across the front of the building. **Bay windows are not labeled on Sheet A1 or Sheet A2; clarify if bay windows are proposed and revise accordingly.**
- A sample board of building materials to be displayed at the Planning Commission meeting and elevations in color are required by the zoning ordinance and must be submitted at final site plan. Additionally, the address (street number) location shall be shown on the building. Six-inch-tall numbers visible from the street shall be required. The address location is subject to approval of the Township Fire Marshal.
 - **Comment remains as a notation – must be addressed at final site plan.**
- Details for the items to be located on the patio...shall be provided at final site plan.
 - **Comment remains as a notation – must be addressed at final site plan.**
- Accessory items such as railings, benches, trash receptacles, outdoor seating (such as tables and chairs), or sidewalk planters located in the vicinity of sidewalks and/or outdoor seating areas are required to be of commercial quality and complement the building design and style. These details shall be provided at final site plan.
 - **Comment remains as a notation – must be addressed at final site plan.**
- If units revert to general occupancy, then two parking spaces per unit shall be provided.
 - **Comment remains as a notation.**
- Information on site lighting will be reviewed in detail during final site plan review.
 - **Comment remains as a notation.**
- The frontage sidewalk along Union Lake Road shall be constructed through the driveway (concrete sections through the approach). **Revise accordingly.**

Planning Commission Options / Recommendation

The Planning Commission may recommend approval or denial of the rezoning request, or it may recommend a different zoning designation than proposed by the applicant to the Township Board. The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board. **Staff recommends approval of the rezoning, and approval of the preliminary site plan subject to the items identified in this memorandum being addressed at final site plan.**

The following notations summarize the preliminary site plan review:

- Recommendation of approval is in accordance with the plans prepared by Griggs Quaderer Inc. (revision date ~~October 28, 2021~~ ~~December 13, 2021~~ ~~January 12, 2022~~ **April 12, 2022**), subject to revisions as required. The utility, grading, and storm drainage plans for the site are subject to the approval of the Township Engineering Consultant and shall be completed in accordance with the Township Engineering Design Standards.
- Recommendation of approval is in accordance with the exterior elevations and floor plan prepared by John K. Costa, AIA dated June 1, 2021 (revision date ~~December 8, 2021~~ ~~January 7, 2022~~ **February 14, 2022**), subject to revisions as required.



Fire Department
Charter Township
of White Lake

Site / Construction Plan Review

To: Sean O'Neil, Planning Department Director

Date: 05/11/2022

Project: Comfort Care Senior Living

Job #: 210303

Date on Plans: 04/12/2022

The Fire Department has the following comments with regards to the 4th review of preliminary site plans for the project known as Comfort Care Senior Living.

The Fire Department has no further comments at this time.

Jason Hanifen
Fire Marshal
Charter Township of White Lake
(248)698-3993
jhanifen@whitelaketwp.com

Plans are reviewed using the International Fire Code (IFC), 2015 Edition and Referenced NFPA Standards.

Assessing Department

Memo

To: Sean O'Neil, Planning
From: Jeanine A Smith
Date: April 27, 2022
Re: Project Name: Comfort Care Assisted Living File No: Parcel Number: 12-36-176-002

Comments: No comment

COMFORT CARE

NEW ASSISTED LIVING & MEMORY CARE

SITE PLAN APPROVAL PACKAGE

UNION LAKE ROAD
 WHITE LAKE TWP., MI 48386

PART OF THE NORTHWEST 1/4 OF SECTION 36
 TOWNSHIP 3 NORTH, RANGE 8 EAST
 WHITE LAKE TOWNSHIP, COUNTY OF OAKLAND, STATE OF MICHIGAN

PROPERTY DESCRIPTION (MEASURED): (PARCEL ID# 12-36-176-002)

PART OF THE NORTHWEST 1/4 OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST, WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT A POINT DISTANT NORTH 00 DEGREES 12 MINUTES 01 SECONDS WEST 892.33 FEET AND DUE EAST 424.46 FEET AND SOUTH 84 DEGREES 30 MINUTES 00 SECONDS EAST 280.00 FEET AND NORTH 68 DEGREES 00 MINUTES 00 SECONDS EAST 270.00 FEET AND NORTH 46 DEGREES 30 MINUTES 00 SECONDS EAST 310.00 FEET FROM THE WEST 1/4 CORNER OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST; SAID POINT OF BEGINNING ALSO BEING THE SOUTHEAST CORNER OF THE "PRESERVE AT HIDDEN LAKE" CONDOMINIUM AS RECORDED AT THE OAKLAND COUNTY REGISTER OF DEEDS;

THENCE FROM SAID POINT OF BEGINNING AND ALONG THE SOUTH EAST LINE OF SAID CONDOMINIUM, NORTH 14 DEGREES 38 MINUTES 35 SECONDS EAST 445.59 FEET TO A POINT OF THE CENTERLINE OF UNION LAKE ROAD; THENCE ALONG SAID CENTERLINE ON A CURVE TO THE RIGHT WITH RADIUS 2,852.97 FEET, A CENTRAL ANGLE OF 02 DEGREES 53 MINUTES 04 SECONDS AND WHOLE CHORD BEARS SOUTH 38 DEGREES 57 MINUTES 59 SECONDS EAST A DISTANCE OF 143.61 FEET; THENCE CONTINUING ALONG SAID CENTERLINE SOUTH 37 DEGREES 31 MINUTES 27 SECONDS EAST, 170.04 FEET; THENCE CONTINUING ALONG SAID CENTERLINE SOUTH 36 DEGREES 58 MINUTES 19 SECONDS EAST, 473.41 FEET; THENCE CONTINUING ALONG SAID CENTERLINE SOUTH 36 DEGREES 31 MINUTES 19 SECONDS EAST, 395.43 FEET; THENCE SOUTH 52 DEGREES 47 MINUTES 19 SECONDS WEST, 347.60 FEET; THENCE NORTH 37 DEGREES 19 MINUTES 50 SECONDS WEST, 340.64 FEET; THENCE SOUTH 89 DEGREES 54 MINUTES 33 SECONDS EAST, 4.87 FEET; THENCE NORTH 37 DEGREES 41 MINUTES 37 SECONDS WEST, 559.50 FEET TO SAID POINT OF BEGINNING; SAID PARCEL CONTAINS 8.37 GROSS ACRES OF LAND.

DRAWING INDEX:

●	04-12-2022	C000 — COVER SHEET
○	04-12-2022	C100 — BOUNDARY & TOPOGRAPHIC SURVEY
○	04-12-2022	C101 — SITE REMOVAL PLAN
○	04-12-2022	C200 — SITE LAYOUT PLAN
○	04-12-2022	C300 — SITE GRADING PLAN
○	04-12-2022	C301 — SOIL EROSION CONTROL PLAN
○	04-12-2022	C302 — DRAINAGE AREA MAP & STORM CALCULATIONS
○	04-12-2022	C400 — SITE UTILITY PLAN
○	04-12-2022	C401 — SITE PHOTOMETRIC PLAN
○	04-12-2022	C500 — SITE LANDSCAPE PLAN
○	04-12-2022	C501 — SITE LANDSCAPE PLAN (NORTH DETAIL)
○	04-12-2022	C502 — SITE LANDSCAPE PLAN (SOUTH DETAIL)
○	04-12-2022	C600 — SITE DETAILS
○	04-12-2022	A1 — FLOOR PLAN
○	04-12-2022	A2 — EXTERIOR ELEVATIONS
○	-	— SANITARY SEWER DETAILS (WHITE LAKE TWP.)
○	-	— WATER MAIN DETAILS (WHITE LAKE TWP.)
○	-	— STORM SEWER DETAILS (WHITE LAKE TWP.)
○	-	— WRC SOIL EROSION CONTROL DETAILS

DATE MOST RECENT ISSUE / REVISION DATE
 FILLED CIRCLE INDICATES SUBMITTED DRAWING

BENCHMARKS (NAVD88 DATUM):

- BM #1 TOP ARROW ON FIRE HYDRANT LOCATED APPROXIMATELY 5' EAST OF SAWGRASS LANE, 230' SOUTH OF HOUSE #8605 SAWGRASS LN AND 380' WEST OF UNION LAKE ROAD. ELEVATION = 964.69
- BM #2 TOP ARROW ON FLANGE OF FIRE HYDRANT LOCATED APPROXIMATELY 75' SOUTH OF CONCORD DRIVE AND 52' EAST OF UNION LAKE ROAD. ELEVATION = 966.21
- BM #3 TOP BENCHMARK MARKER ON WEST FACE OF UTILITY POLE LOCATED APPROXIMATELY 650' SOUTH OF INDEPENDENCE CIRCLE, 34' EAST OF UNION LAKE ROAD AND 107' SOUTH OF FIRE HYDRANT. ELEVATION = 983.51

NPDES STATEMENT:

THE OWNER WILL NEED TO OBTAIN AN NPDES STORM WATER DISCHARGE PERMIT FROM EGLE. TOTAL DISTURBED AREA: 7.84 ACRES

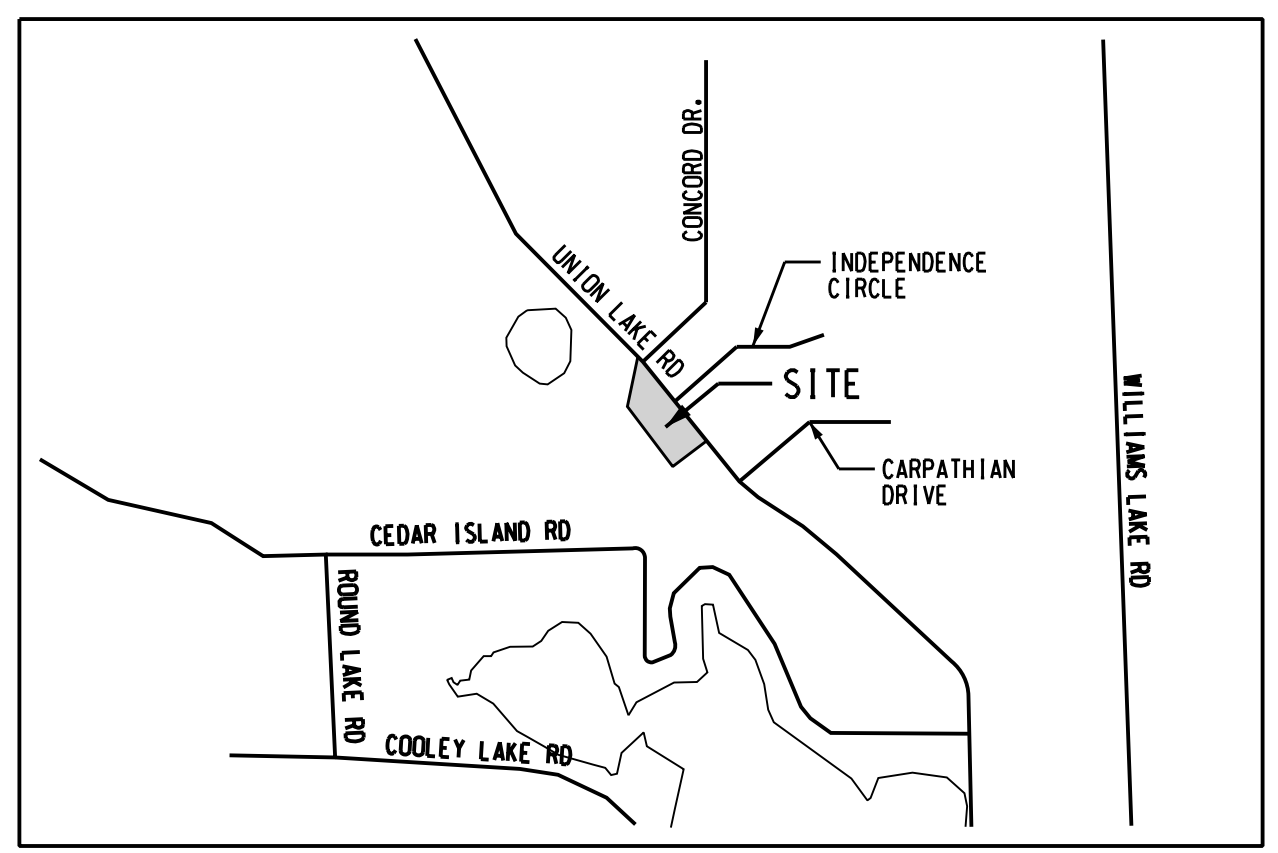
TOPOGRAPHIC SURVEY STATEMENT:

THE EXISTING FEATURES SHOWN ON THIS PLAN ARE FROM AN ACTUAL TOPOGRAPHIC SURVEY PERFORMED BY GRIGGS QUADERER, INC. IN JUNE OF 2021. THE UNDERGROUND UTILITIES SHOWN WERE EITHER VERIFIED BY THIS SURVEY OR WERE PLOTTED IN ACCORDANCE WITH THE BEST INFORMATION AVAILABLE. NO EXISTING UTILITIES WERE EXPOSED FOR VERIFICATION OF LOCATION AND ELEVATION. NO GUARANTEES ARE GIVEN THAT THE LOCATIONS ARE ABSOLUTELY ACCURATE OR THAT UTILITIES OTHER THAN THOSE SHOWN ARE NOT PRESENT.

OWNER: DOUG BOEHM
 COMFORT CARE
 4180 TITTABAWASSEE ROAD
 SACINAW, MI 48604
 PH: (248) 930-7875
 EMAIL: DOUG@COMFORTCARES.COM

ARCHITECT: JOHN COSTA, AIA
 ARCHITECTURAL DESIGN & CONSULTATION, PLLC
 417 OLMILL DRIVE
 FLUSHING, MI 48433
 PHONE: (810) 659-5275
 EMAIL: JNL.COSTA@SBCGLOBAL.NET

ENGINEER: RUDY QUADERER, PE
 GRIGGS QUADERER, INC.
 8308 OFFICE PARK DR.
 GRAND BLANC, MI 48439
 PH: (810) 695-0154
 EMAIL: RQUADERER@GQINCORP.COM



LOCATION MAP
 NOT TO SCALE

STANDARD LEGEND	
DESCRIPTION	EXISTING
BUILDING	—
STORM SEWER	— S —
SANITARY SEWER	— S —
WATER	— W —
GAS LINE	— G —
ELECTRIC LINE	— E —
TELEPHONE LINE	— T —
MANHOLE	○
CATCH BASIN	⊗
FIRE HYDRANT	△
VALVE	•
UTILITY POLE W/GUY WIRE	⊕
UTILITY RISER	⊞
LIGHT POLE	*
SIGN	△
CURB & GUTTER	—
FENCE	— x —
GUARD RAIL	—
INVERT ELEVATION	IE 6" 750.00
CONTOUR	--- 750 ---
SPOT ELEVATION	
ASPHALT SURFACE	ASPH.
CONCRETE SURFACE	CONC.
GRAVEL SURFACE	GRAV.
TREE LINE	—
TREE	+

GENERAL NOTES:

- STANDARD SPECIFICATIONS: ALL MATERIALS AND CONSTRUCTION METHODS FOR THIS PROJECT SHALL CONFORM WITH THE REQUIREMENTS OF ALL GOVERNING AGENCIES HAVING JURISDICTION (LOCAL, COUNTY, STATE). UNLESS OTHERWISE NOTED, CONSTRUCTION MATERIALS SHALL COMPLY WITH THE LATEST EDITION OF THE STATE OF MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND PROJECT SPECIFICATIONS. IN CASE OF DISCREPANCIES BETWEEN REQUIREMENTS, THE MOST STRINGENT SHALL APPLY.
- EXISTING BACKGROUND INFORMATION: THE EXISTING FEATURES SHOWN ON THESE DOCUMENTS ARE FROM AN ACTUAL TOPOGRAPHIC SURVEY PERFORMED BY GRIGGS QUADERER, INC. IN JUNE OF 2021. THE UNDERGROUND UTILITIES SHOWN WERE EITHER VERIFIED BY THIS SURVEY OR WERE OBTAINED FROM THE BEST AVAILABLE DOCUMENT INFORMATION. NO GUARANTEES ARE GIVEN TO THE ACCURACY OF ALL UTILITY INFORMATION SHOWN OR THAT ALL UTILITIES ARE INDICATED ON THIS DOCUMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND ELEVATIONS BEFORE COMMENCING WORK AND TO NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- MISS DIG UTILITY PROTECTION SERVICES: THE CONTRACTOR SHALL CONTACT MISS DIG UTILITY SERVICES (811) THREE (3) WORKING DAYS PRIOR TO BEGIN OF CONSTRUCTION TO VERIFY LOCATIONS OF UTILITIES. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ANY UTILITY DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH THE IDENTICAL MATERIAL IN ACCORDANCE WITH THE UTILITY OWNERS REQUIREMENTS. THE CONTRACTOR SHALL VERIFY THE DEPTH AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
- SUBSURFACE SOIL CONDITIONS: A SOIL INVESTIGATION FOR THIS SITE IS AVAILABLE FOR REVIEW. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT HIMSELF WITH CURRENT SOIL AND GROUNDWATER CONDITIONS FOR HIS OWN INFORMATION PRIOR TO BIDDING. NO MODIFICATIONS TO UNIT PRICES OR FINAL BID WILL BE MADE DUE TO VARIABLE SUBSURFACE CONDITIONS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR, WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION COST OF UTILITIES OR STRUCTURES.
- PERMITS: THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL PERMITS REQUIRED TO PERFORM ALL WORK SHOWN ON THESE DOCUMENTS. THE CONTRACTOR SHALL PAY FOR AND OBTAIN ALL PERMITS REQUIRED BY FEDERAL, STATE, LOCAL OR PRIVATE AGENCIES INCLUDING REQUIRED BONDS. COSTS INSPECTION AND TESTING SERVICES SHALL BE PAID FOR BY THE CONTRACTOR.
- SOIL EROSION CONTROL: CONTRACTOR SHALL OBTAIN SOIL EROSION CONTROL PERMIT PRIOR TO BEGIN OF CONSTRUCTION. THE CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS OF ACT 451, PART 91 FOR SOIL EROSION & SEDIMENTATION CONTROL, AND WILL BE RESPONSIBLE FOR ALL MAINTENANCE UNTIL THE FINAL ACCEPTANCE OF THE PROJECT. CONTRACTOR SHALL PROTECT ALL EXISTING AND PROPOSED STORM WATER FACILITIES ON SITE DURING CONSTRUCTION.
- MICHIGAN SAFETY REQUIREMENTS: ALL WORK CONSTRUCTION METHODS AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL SAFETY, OCCUPATIONAL, HEALTH AND ENVIRONMENTAL REGULATIONS AS WELL AS NFPA AND ANSI CODES AS APPLICABLE.
- PRE-CONSTRUCTION MEETING: CONTRACTOR SHALL ATTEND PRE-CONSTRUCTION MEETING FOR COORDINATION WITH MUNICIPALITY, AGENCIES AND UTILITY COMPANIES. ITEMS FOR DISCUSSION WILL INCLUDE SCHEDULE, INSPECTION SERVICES, TESTING OF PUBLIC UTILITIES AND FINAL AS-BUILT DOCUMENTS.
- CONSTRUCTION INSPECTIONS & FINAL TESTING: CONTRACTOR IS RESPONSIBLE TO NOTIFY ALL INSPECTION AGENCIES THREE (3) WORKING DAYS PRIOR TO START OF CONSTRUCTION AND ARRANGE FOR ON-SITE INSPECTION. PUBLIC UTILITIES SHALL BE TESTED PER LOCAL AND COUNTY AGENCY REQUIREMENTS WITH INSPECTORS FROM BOTH AGENCIES PRESENT. THE CONTRACTOR SHALL NOT CONNECT TO THE EXISTING PUBLIC UTILITY UNTIL THE NEW UTILITY IS TESTED AND APPROVED BY THE AGENCIES.

NO.	DATE	SUBJECT
	04-12-22	REISSUED TO WHITE LAKE TWP.
	01-12-22	REISSUED TO WHITE LAKE TWP.
	12-13-21	REISSUED WHITE LAKE TWP.
	10-28-21	WHITE LAKE TWP. (SITE PLAN)
	04-13-21	TOPOGRAPHIC SURVEY

NORTHWEST 1/4 SECTION 36 T-3N, R-8E

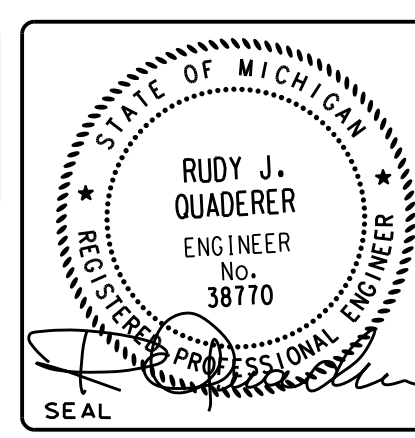
COMFORT CARE

UNION LAKE ROAD
 WHITE LAKE TWP.,
 OAKLAND COUNTY
 STATE OF MICHIGAN

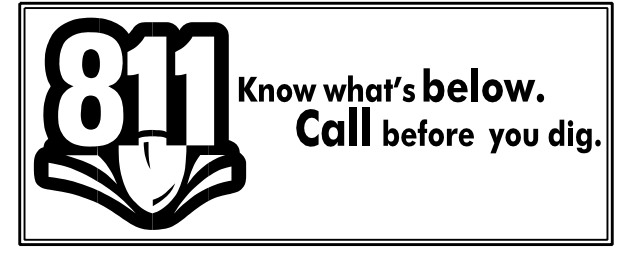
DRAWING TITLE
 COVER SHEET

PROJECT NUMBER	210303	SHEET	C000
PROJECT PHASE	SPA		

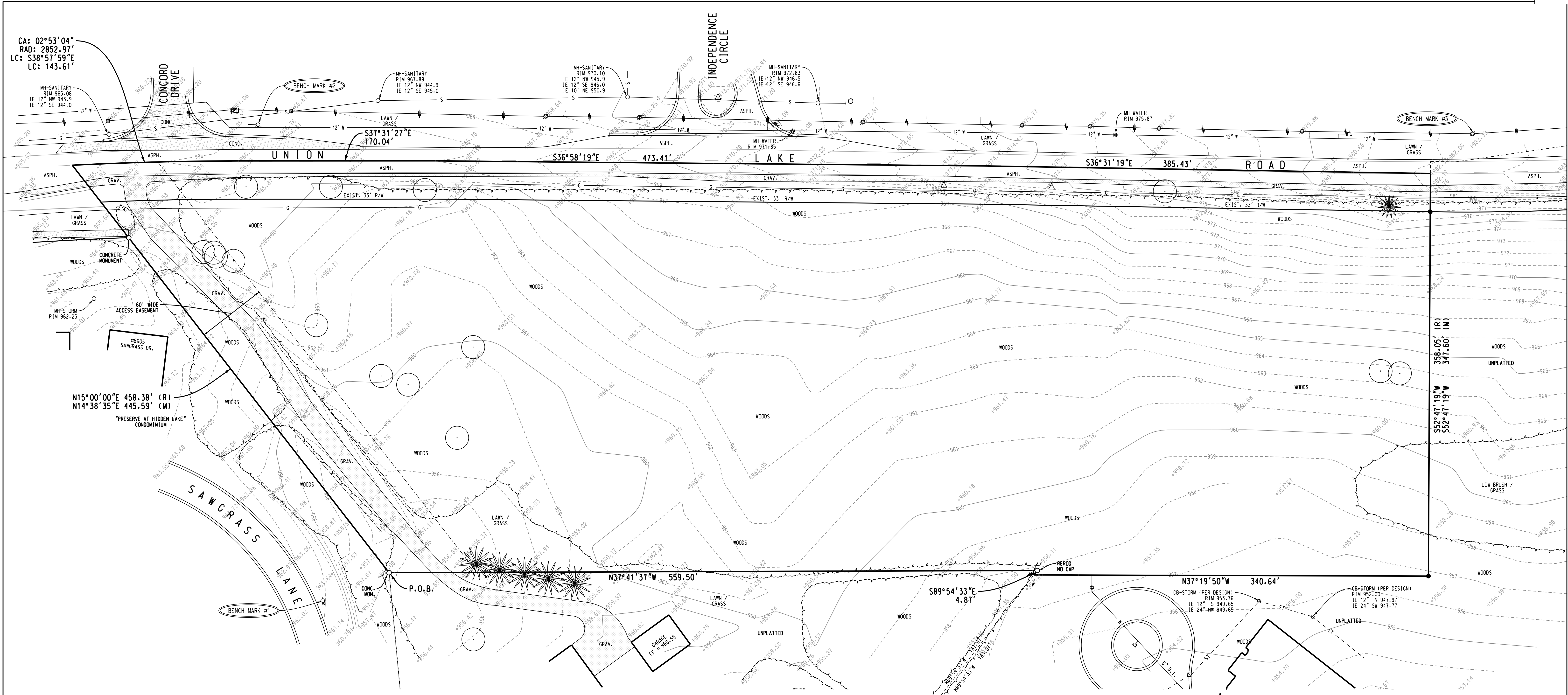
DRAWN
 DESIGNED BRZEZINSKI
 CHECKED QUADERER
 FIELD WORK



Griggs Quaderer Inc.
 CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING



8308 OFFICE PARK DRIVE
 GRAND BLANC, MI 48439
 PH: (810) 695-0154
 FX: (810) 695-0158
 WWW.GQINCORP.COM



STANDARD LEGEND	
DESCRIPTION	EXISTING
BUILDING	—
STORM SEWER	—
SANITARY SEWER	S
WATER	W
GAS LINE	G
ELECTRIC LINE	E
TELEPHONE LINE	T
MANHOLE	○
CATCH BASIN	□
FIRE HYDRANT	△
VALVE	●
UTILITY POLE W/GUY WIRE	○
UTILITY RISER	□
LIGHT POLE	☆
STON	△
CURB & CUTTER	—
FENCE	—
GUARD RAIL	—
INVERT ELEVATION	1E 6" 750.00
CONTOUR	--- 750
SPOT ELEVATION	750.00
ASPHALT SURFACE	ASPH.
CONCRETE SURFACE	CONC.
GRAVEL SURFACE	GRAV.
TREE LINE	—
TREE	○

GENERAL UTILITY NOTE:
 THE UTILITIES AS SHOWN ON THIS DOCUMENT WERE EITHER VERIFIED BY AN ACTUAL FIELD SURVEY OR WERE PLOTTED IN ACCORDANCE WITH THE BEST INFORMATION AVAILABLE. GRIGGS QUADERER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN INCLUDE ALL POSSIBLE UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHERMORE, GRIGGS QUADERER DOES NOT GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH GRIGGS QUADERER DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. THE UNDERGROUND UTILITY PIPE SIZES AS SHOWN ON THIS DOCUMENT WERE OBTAINED EITHER BY RECORD PLAN INFORMATION OR BY FIELD MEASUREMENTS. GRIGGS QUADERER CAN NOT GUARANTEE THE ACCURACY OF THE PIPE SIZES OR THEIR LOCATIONS EITHER BY FIELD MEASUREMENT OR BY RECORD DATA AND SHALL NOT BE HELD RESPONSIBLE FOR ANY DISCREPANCIES REGARDING THESE UTILITIES.

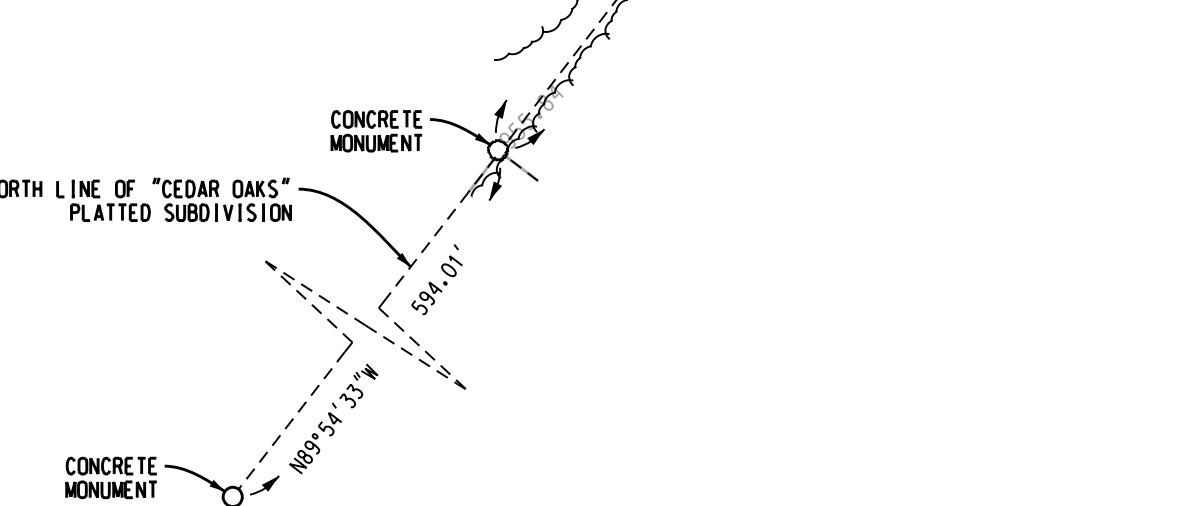
BENCHMARKS (NAVD88 DATUM):
 BM #1 TOP ARROW ON FIRE HYDRANT LOCATED APPROXIMATELY 5' EAST OF SAWGRASS LANE, 230' SOUTH OF HOUSE #8605 SAWGRASS LN AND 380' WEST OF @ UNION LAKE ROAD. ELEVATION = 964.69
 BM #2 TOP ARROW ON FLANGE OF FIRE HYDRANT LOCATED APPROXIMATELY 75' SOUTH OF CONCORD DRIVE AND 52' EAST OF @ UNION LAKE ROAD. ELEVATION = 968.21
 BM #3 TOP BENCHMITE MARKER ON WEST FACE OF UTILITY POLE LOCATED APPROXIMATELY 650' SOUTH OF @ INDEPENDENCE CIRCLE, 34' EAST OF @ UNION LAKE ROAD AND 107' SOUTH OF FIRE HYDRANT. ELEVATION = 983.51

PROPERTY DESCRIPTION (RECORDED):
 PART OF THE NORTHWEST 1/4 OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST, WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT A POINT DISTANT NORTH 00 DEGREES 12 MINUTES 01 SECONDS WEST 892.33 FEET AND DUE EAST 424.46 FEET AND SOUTH 84 DEGREES 30 MINUTES 00 SECONDS EAST 280.00 FEET AND NORTH 68 DEGREES 00 MINUTES 00 SECONDS EAST 270.00 FEET AND NORTH 46 DEGREES 30 MINUTES 00 SECONDS EAST 310.00 FEET FROM THE WEST 1/4 CORNER OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST, AND PROCEEDING THENCE NORTH 15 DEGREES 00 MINUTES 00 SECONDS EAST 458.38 FEET; THENCE ALONG A CURVE TO THE RIGHT RADIUS 2,864.93 FEET, CENTRAL ANGLE 03 DEGREES 35 MINUTES 36 SECONDS, AN ARC DISTANCE OF 179.67 FEET, AND WHOSE CHORD BEARS SOUTH 38 DEGREES 46 MINUTES 05 SECONDS EAST A DISTANCE OF 179.64 FEET; THENCE SOUTH 36 DEGREES 58 MINUTES 20 SECONDS EAST 615.98 FEET; THENCE SOUTH 36 DEGREES 31 MINUTES 20 SECONDS EAST 385.35 FEET, (THE LAST THREE COURSES BEING ALONG THE CENTERLINE OF UNION LAKE ROAD); THENCE SOUTH 52 DEGREES 47 MINUTES 19 SECONDS WEST 358.05 FEET; THENCE NORTH 37 DEGREES 19 MINUTES 50 SECONDS WEST 900.00 FEET TO THE POINT OF BEGINNING, CONTAINING 8.6977 ACRES MORE OR LESS.

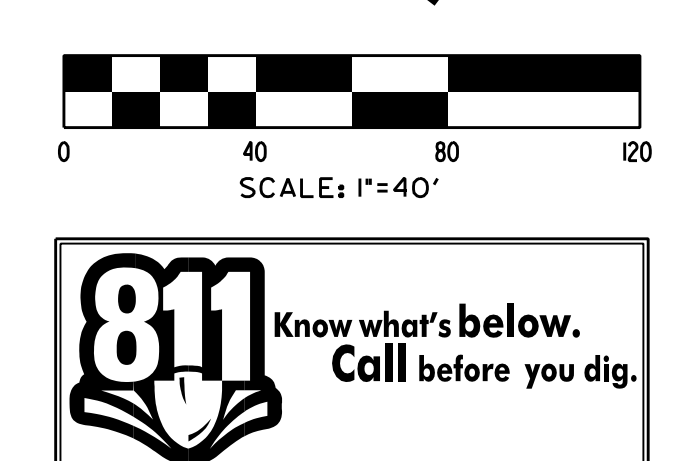
SAID PARCEL BEING SUBJECT TO THE RIGHTS OF THE PUBLIC FOR UNION LAKE ROAD OVER THE EASTERLY 33.00 FEET THEREOF.

ALSO SAID PARCEL BEING SUBJECT TO EASEMENTS FOR MICHIGAN BELL TELEPHONE COMPANY AS RECORDED IN LIBER 5157, PAGES 872, 873 AND 874, OAKLAND COUNTY RECORDS AND TO ANY OTHER EASEMENTS THAT MAY BE OF RECORD OVER SAID PARCEL.

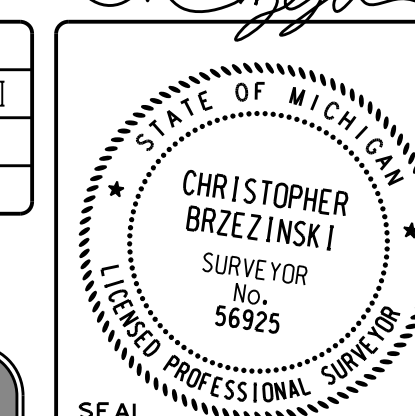
ALSO SAID PARCEL BEING SUBJECT TO A 60 FOOT EASEMENT FOR INGRESS AND EGRESS DESCRIBED AS PART OF THE NORTHWEST 1/4 OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST, WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT A POINT DISTANT NORTH 00 DEGREES 12 MINUTES 01 SECONDS WEST 892.33 FEET AND DUE EAST 424.46 FEET AND SOUTH 84 DEGREES 30 MINUTES 00 SECONDS EAST 280.00 FEET AND NORTH 68 DEGREES 00 MINUTES 00 SECONDS EAST 270.00 FEET AND NORTH 46 DEGREES 30 MINUTES 00 SECONDS EAST 310.00 FEET FROM THE WEST 1/4 CORNER OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST, AND PROCEEDING THENCE NORTH 15 DEGREES 00 MINUTES 00 SECONDS EAST 458.38 FEET TO A POINT ON THE CENTERLINE OF UNION LAKE ROAD; THENCE ALONG SAID LINE, ALONG A CURVE TO THE RIGHT, RADIUS 2,864.93 FEET, AN ARC DISTANCE OF 173.46 FEET; THENCE SOUTH 15 DEGREES 00 MINUTES 00 SECONDS WEST 462.47 FEET; THENCE NORTH 37 DEGREES 19 MINUTES 50 SECONDS WEST 75.80 FEET TO THE POINT OF BEGINNING.



PROPERTY DESCRIPTION (MEASURED):
 PART OF THE NORTHWEST 1/4 OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST, WHITE LAKE TOWNSHIP, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT A POINT DISTANT NORTH 00 DEGREES 12 MINUTES 01 SECONDS WEST 892.33 FEET AND DUE EAST 424.46 FEET AND SOUTH 84 DEGREES 30 MINUTES 00 SECONDS EAST 280.00 FEET AND NORTH 68 DEGREES 00 MINUTES 00 SECONDS EAST 270.00 FEET AND NORTH 46 DEGREES 30 MINUTES 00 SECONDS EAST 310.00 FEET FROM THE WEST 1/4 CORNER OF SECTION 36, TOWN 3 NORTH, RANGE 8 EAST; SAID POINT OF BEGINNING ALSO BEING THE SOUTHWEST CORNER OF THE "PRESERVE AT HIDDEN LAKE" CONDOMINIUM AS RECORDED AT THE OAKLAND COUNTY REGISTER OF DEEDS;
 THENCE FROM SAID POINT OF BEGINNING AND ALONG THE SOUTH EAST LINE OF SAID CONDOMINIUM, NORTH 14 DEGREES 38 MINUTES 35 SECONDS EAST 445.59 FEET TO A POINT OF THE CENTERLINE OF UNION LAKE ROAD; THENCE ALONG SAID CENTERLINE ON A CURVE TO THE RIGHT WITH RADIUS 2,852.97 FEET, A CENTRAL ANGLE OF 02 DEGREES 53 MINUTES 04 SECONDS AND WHOSE CHORD BEARS SOUTH 38 DEGREES 57 MINUTES 59 SECONDS EAST A DISTANCE OF 143.61 FEET; THENCE CONTINUING ALONG SAID CENTERLINE SOUTH 37 DEGREES 31 MINUTES 27 SECONDS EAST, 170.04 FEET; THENCE CONTINUING ALONG SAID CENTERLINE SOUTH 36 DEGREES 58 MINUTES 19 SECONDS EAST, 473.41 FEET; THENCE CONTINUING ALONG SAID CENTERLINE SOUTH 36 DEGREES 31 MINUTES 19 SECONDS EAST, 385.43 FEET; THENCE SOUTH 52 DEGREES 47 MINUTES 19 SECONDS WEST, 347.60 FEET; THENCE NORTH 37 DEGREES 19 MINUTES 50 SECONDS WEST, 340.64 FEET; THENCE SOUTH 89 DEGREES 54 MINUTES 33 SECONDS EAST, 4.87 FEET; THENCE NORTH 37 DEGREES 41 MINUTES 37 SECONDS WEST, 559.50 FEET TO SAID POINT OF BEGINNING; SAID PARCEL CONTAINS 8.37 GROSS ACRES OF LAND.



DRAWN	
DESIGNED	BRZEZINSKI
CHECKED	QUADERER
FIELD WORK	



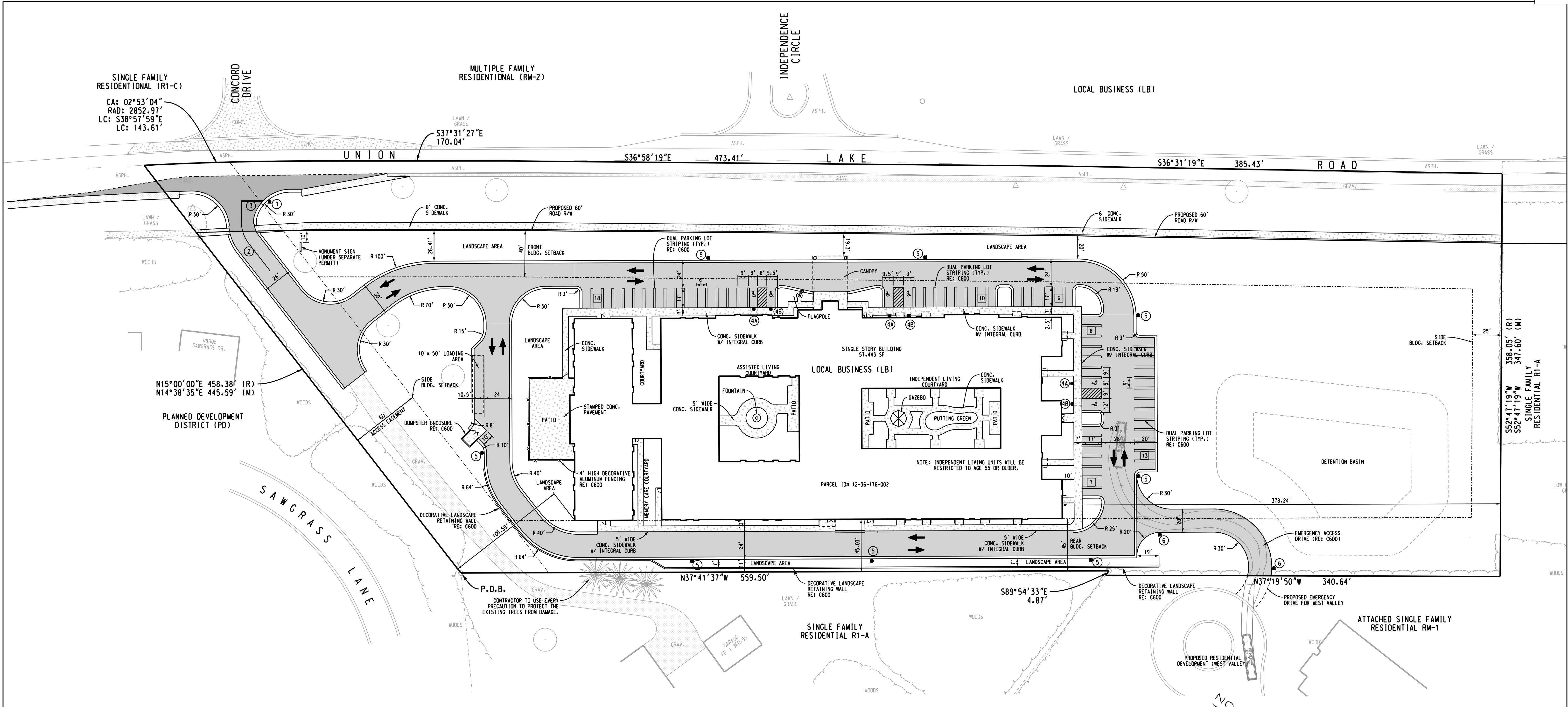
8308 OFFICE PARK DRIVE
 GRAND BLANC, MI 48439
 PH: (810) 695-0154
 FX: (810) 695-0158
 WWW.GQINCORP.COM

NO.	DATE	SUBJECT
04-12-22		REISSUED TO WHITE LAKE TWP.
01-12-22		REISSUED TO WHITE LAKE TWP.
12-13-21		REISSUED WHITE LAKE TWP.
10-28-21		WHITE LAKE TWP. (SITE PLAN)
04-13-21		TOPOGRAPHIC SURVEY

NORTHWEST 1/4 SECTION 36 T-3N, R-8E
 UNION LAKE ROAD WHITE LAKE TWP., OAKLAND COUNTY STATE OF MICHIGAN

BOUNDARY AND TOPOGRAPHIC SURVEY

PROJECT NUMBER	210303	SHEET	C100
PROJECT PHASE	SPA		



PARKING DATA:

USE	REQUIREMENTS	PARKING REQUIRED	PARKING PROVIDED
NURSING HOME	1 SPACE/4 BEDS + 1 SPACE/EMPLOY. 44 BEDS/4 + 10 EMPLOY. =	21 SPACES	62 SPACES
INDEPENDENT LIVING	1 SPACE/UNIT + 1 SPACE/EMPLOY. 30 UNITS + 5 EMPLOY. =	35 SPACES	
BARRIER FREE	51 - 75 SPACES	3 SPACES	6 SPACES
TOTAL		56 SPACES	62 SPACES

PAVEMENT LEGEND:

	ASPHALT PAVEMENT SECTION (ON-SITE) RE: C600
	ASPHALT PAVEMENT SECTION (WITHIN ROAD R/W) RE: C600
	CONCRETE PAVEMENT SECTION RE: C600

LAND USE INFORMATION:

CURRENT ZONING: LOCAL BUSINESS (LB)
 PROPOSED ZONING: PLANNED DEVELOPMENT DISTRICT (PD) (REZONE APPROVED)
 CURRENT USE: VACANT
 PROPOSED USE: NURSING HOME/INDEPENDENT LIVING
 MIN. SITE AREA: 10.0 AC.
 ACTUAL SITE AREA: 8.37 AC. GROSS (VARIANCE OBTAINED)
 NET SITE AREA: 7.49 AC. 326,268 SF
 TOTAL BUILDING AREA: 57,443 SF
 LOT COVERAGE BY BLDG: 17.6%
 TOTAL NO. OF UNITS: 60
 UNIT DENSITY: 8 UNITS/AC.
 MAX. BLDG. HEIGHT: 30 FT
 PROPOSED BLDG. HEIGHT: 22 FT

YARD SETBACKS:

BUILDING	ART. 4, SECT. 16
FRONT YARD 40LF	75LF
SIDE YARD 25LF (TOTAL 50LF)	75LF
REAR YARD TO BE DETERMINED BY PLANN. COMM. (45LF PROVIDED)	75LF

REQUESTED WAIVERS:

- BUILDING SETBACK: 19 FOOT FRONT CANOPY SETBACK (56 FEET WAIVER) 45 FOOT REAR BUILDING SETBACK (30 FOOT WAIVER)
- PER CODE, THREE (3) LOADING SPACES REQUIRED. MOST DELIVERIES MADE BY SMALL DELIVERY VEHICLES. LARGER VEHICLES WILL VISIT SITE ONLY ONCE OR TWICE A WEEK. ONE LOADING SPACE PROVIDED. ASKING TO WAIVE THE ADDITIONAL TWO (2) LOADING SPACES.

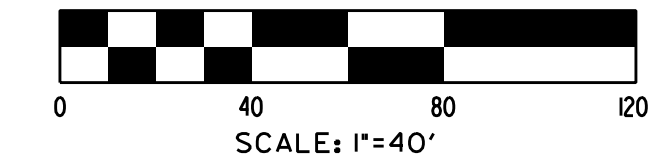
MARKING / SIGNAGE LEGEND:

- ① STOP SIGN (R1-1)
- ② 4" SINGLE SOLID LINE, YELLOW
- ③ 24" WIDE STOP LINE, WHITE
- ④ ACCESSIBLE SIGN (R7-8)
- ⑤ ACCESSIBLE SIGN (R7-B & R7-8A)
- ⑥ NO PARKING - FIRE LANE
- ⑦ STOP EMERGENCY VEHICLES ONLY

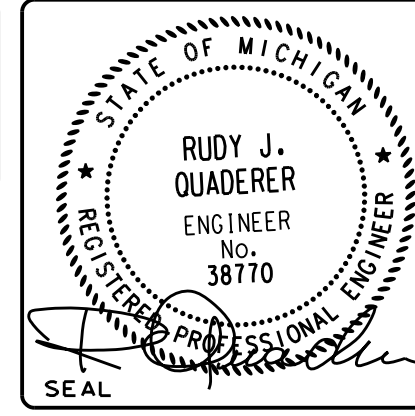
NO PARKING / NO DRIVING AREAS
 4" WIDE WHITE PAINT STRIPING
 2" ON CENTER @ 45° - REFER TO PAVEMENT MARKING NOTE #2 FOR BARRIER FREE PARKING

PAVEMENT MARKING & SIGNAGE NOTES:

- PARKING STALL WIDTH DIMENSIONS ARE TO CENTERLINE OF STRIPING.
- ALL PAVEMENT MARKINGS SHALL BE 4" WIDE WHITE PAINT STRIPING UNLESS OTHERWISE INDICATED. ALL BARRIER FREE STRIPING SHALL BE COLORED BLUE AND IN ACCORDANCE WITH THE LATEST ADA STANDARDS FOR ACCESSIBLE DESIGN.
- CONTRACTOR SHALL NOT APPLY TRAFFIC MARKING PAINT ON NEW ASPHALT UNTIL PAVEMENT HAS CURED A MINIMUM OF SEVEN (7) DAYS.
- PAINT SHALL BE APPLIED WITH MECHANICAL EQUIPMENT TO PRODUCE UNIFORM STRAIGHT EDGES. APPLY IN TWO COATS AT MANUFACTURER'S RECOMMENDED RATES TO PROVIDE MINIMUM 10.0 TO 15.0 MILS WET THICKNESS.
- ALL TRAFFIC CONTROL SIGNS SHALL CONFORM WITH ALL REQUIREMENTS AS STIPULATED IN THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- NUMBER OF PARKING SPACES (FOR INFORMATION ONLY)



DRAWN
 DESIGNED BRZEZINSKI
 CHECKED QUADERER
 FIELD WORK



Griggs Quaderer Inc.
 CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

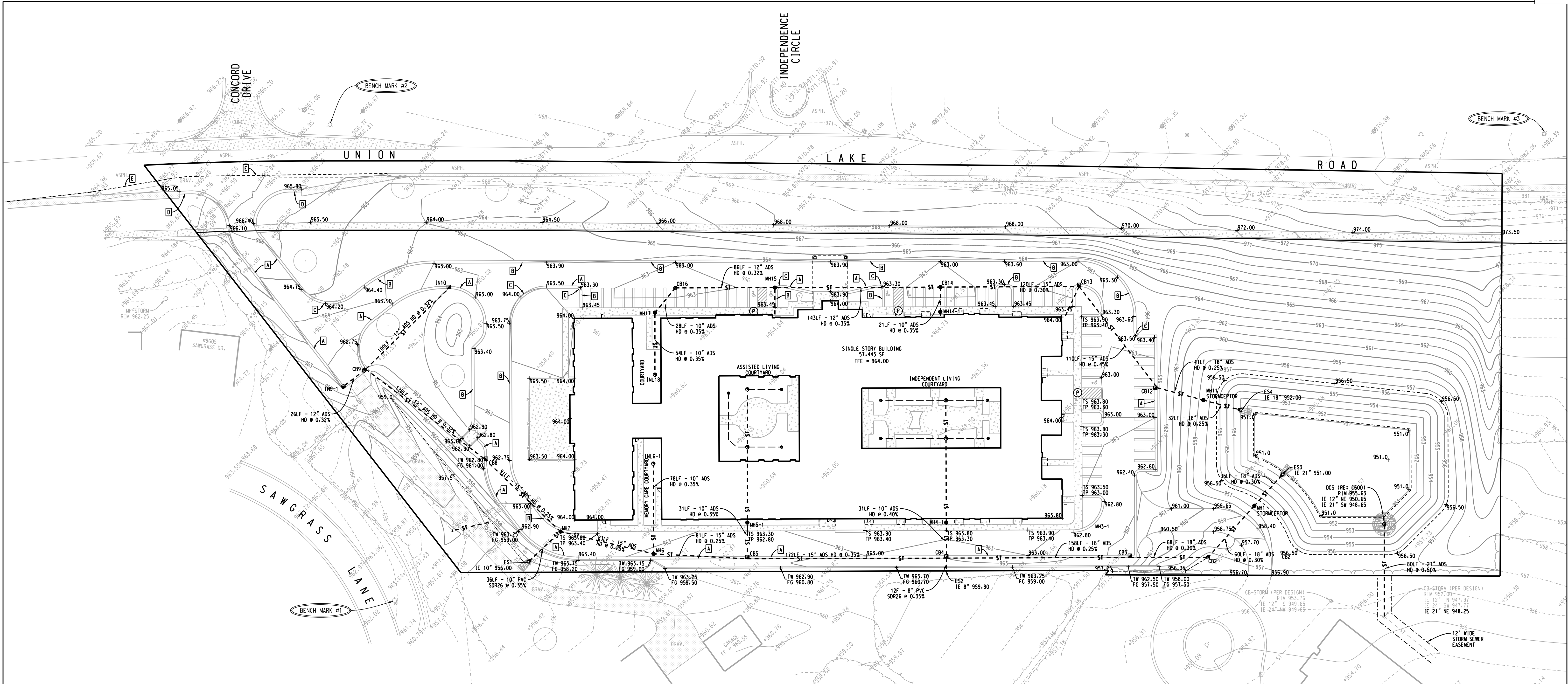
8308 OFFICE PARK DRIVE
 GRAND BLANC, MI 48439
 PH: (810) 695-0154
 FX: (810) 695-0158
 WWW.GQINCORP.COM

NO.	DATE	SUBJECT
	04-12-22	REISSUED TO WHITE LAKE TWP.
	01-12-22	REISSUED TO WHITE LAKE TWP.
	12-13-21	REISSUED WHITE LAKE TWP.
	10-28-21	WHITE LAKE TWP. (SITE PLAN)
	04-13-21	TOPOGRAPHIC SURVEY

NORTHWEST 1/4 SECTION 36 T-3N, R-8E
COMFORT CARE
 UNION LAKE ROAD
 WHITE LAKE TWP.,
 OAKLAND COUNTY
 STATE OF MICHIGAN

DRAWING TITLE
SITE LAYOUT PLAN

PROJECT NUMBER	210303	SHEET	C200
PROJECT PHASE	SPA		



DRAINAGE STRUCTURE SCHEDULE:

MH1 (STORMCEPTOR) RIM 962.80 IE 18" NE 951.10 IE 12" SW 956.50	CB9 (4" DIA.) IE 12" S 956.41 IE 12" W 956.50
CB2 (4" DIA.) RIM 956.00 IE 18" NE 951.28 IE 18" NW 951.28	MH9-1 (2" DIA.) RIM 962.50 IE 12" E 956.58
CB3 (4" DIA.) RIM 961.60 IE 18" SE 951.48 IE 18" NW 953.50 IE 10" NE 958.00	MH10 (2" DIA.) RIM 963.00 IE 12" W 956.82
CB4 (4" DIA.) RIM 962.50 IE 18" SE 953.90 IE 15" NW 954.00 IE 10" NE 957.50 IE 10" NW 954.50	MH11 (STORMCEPTOR) RIM 957.10 IE 18" SW 952.08 IE 18" NW 952.08
MH4-1 (4" DIA.) RIM 963.40 IE 10" SW 957.62	CB12 (4" DIA.) RIM 962.40 IE 15" SE 952.18 IE 15" NE 954.50
CB5 (4" DIA.) RIM 962.00 IE 15" SE 954.60 IE 15" NW 954.60 IE 10" NE 957.50	CB13 (4" DIA.) RIM 962.50 IE 15" SW 955.00 IE 10" NW 955.00
MH5-1 (4" DIA.) RIM 963.40 IE 10" SW 957.61	CB14 (4" DIA.) RIM 962.50 IE 15" SE 955.46 IE 12" NW 956.00 IE 10" SW 958.00
MH6 (4" DIA.) RIM 962.80 IE 15" SE 954.80 IE 10" NW 957.50	MH14-1 (4" DIA.) RIM 963.95 IE 10" SE 959.07
MH7 (4" DIA.) RIM 963.25 IE 15" S 955.01 IE 15" W 955.10 IE 10" W 955.87	MH15 (4" DIA.) RIM 963.30 IE 12" SE 956.50 IE 12" NW 956.60 IE 10" SW 958.00
CB8 (4" DIA.) RIM 962.50 IE 15" S 955.33 IE 12" W 956.00	CB16 (4" DIA.) RIM 963.95 IE 12" SE 956.88 IE 10" W 957.00
	MH17 (4" DIA.) RIM 963.95 IE 12" SE 957.10 IE 10" NW 957.20
	MH18 (2" DIA.) RIM 962.50 IE 12" W 957.39

STORM SEWER NOTES:

- ALL MATERIALS SHALL COMPLY WITH MDT STANDARD SPECIFICATIONS AND/OR LOCAL GOVERNING AGENCIES.
- STORM SEWER CONVEYANCE: STORM SEWER PIPE 12" AND LARGER SHALL BE ADS HD STORM PIPE AND SHALL MEET OR EXCEED ASTM F2881. ALL JOINTS SHALL BE BELL & SPIGOT AND SHALL CONFORM TO ASTM D3212. STORM SEWER PIPE 10" AND SMALLER SHALL BE PVC SDR 26 OR AS REQUIRED BY LOCAL GOVERNING AGENCY.
- STORM SEWER STRUCTURES: REINFORCED CONCRETE IN CONFORMANCE WITH ASTM C478. DEPTH AS INDICATED ON DOCUMENTS. IF MASONRY STRUCTURES ARE ALLOWED, CONCRETE BLOCKS SHALL BE STANDARD 6" x 8" x 8" CURVED UNITS FOLLOWING ASTM C139. CONCRETE BRICK UNITS SHALL BE 2" x 4" x 8" AND FOLLOW ANSI/ASTM C55, GRADE N, TYPE 1.
- FRAME & COVERS: ALL CATCH BASINS & MANHOLES SHALL BE MANUFACTURED BY EAST JORDAN IRON WORKS (UNLESS ALTERNATE IS APPROVED BY ENGINEER)
 -CATCH BASIN - CURB LINE - EJIW #7045 TYPE M2 GRATE W/ T1 BACK
 -CATCH BASIN - PAVEMENT AREA - EJIW #1040 TYPE M1 GRATE
 -CATCH BASIN - GRASS AREA - EJIW #1130 TYPE O2 BEHIVE GRATE
 -INLET - GRASS AREA - EJIW #1040 TYPE O2 BEHIVE GRATE
 -MANHOLE - ALL AREAS - EJIW #1040 TYPE A SOLID COVER
- UNDERDRAIN: 4" PERFORATED, FLEXIBLE HOPE TUBING, COUPLING BAND, PIPE SHALL BE FILTER SOCK WRAPPED AND FITTED WITH END CAPS. PERFORATIONS SHALL BE UNIFORMLY DISTRIBUTED ALONG THE TOP OF THE BOTTOM SECTION IN ACCORDANCE WITH AASHTO M252 PERFORATION REQUIREMENTS.

CURB, GRADING & SIDEWALK RAMP NOTATIONS:

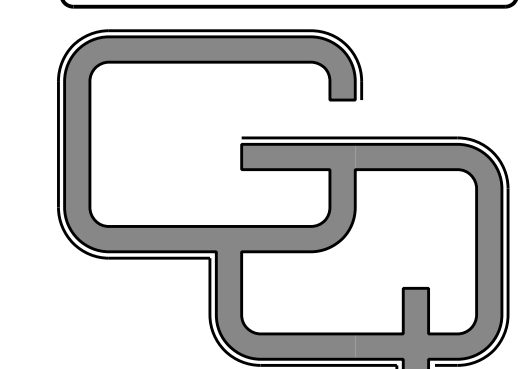
- A STANDARD CURB AND GUTTER
- B STANDARD CURB AND GUTTER WITH REVERSE SLOPE
- C 10 FOOT TRANSITION BETWEEN TYPE A AND TYPE B
- D 5 FOOT CURB END TRANSITION.
- E MATCH EXISTING PAVEMENT OR CURB ELEVATION.
- F TYPE F RAMP, PER MDT DETAIL R-28-J

GRADING NOTES:

- ALL PROPOSED SPOT ELEVATIONS IN PAVED AREAS ARE TO TOP OF PAVEMENT UNLESS NOTED OTHERWISE.
 TS - TOP OF SIDEWALK
 TP - TOP OF PAVEMENT
 TW - TOP OF WALL
 FG - FINISHED GRADE
- CONTOURS SHOWN ARE FOR REFERENCE ONLY. BASE CONSTRUCTION EFFORTS ON PROPOSED SPOT ELEVATIONS ONLY.
- "BARRIER FREE" PARKING AND SIDEWALK RAMP SHALL CONFORM IN ALL RESPECTS TO THE MICHIGAN ADA (AMERICANS WITH DISABILITIES ACT) REQUIREMENTS.
- CONTRACTOR SHALL ADJUST ANY UTILITY ELEMENT/STRUCTURE MEANT TO BE FLUSH WITH GRADE (CLEAN OUT, VALVE BOXES, MANHOLES, CATCH BASINS, INLETS, ETC.) WHICH ARE AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT. NO ADDITIONAL COSTS FOR THIS WORK WILL BE ACCEPTED. THE CONTRACTOR SHALL OBTAIN ANY NECESSARY PERMITS FOR ADJUSTMENT AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR IS RESPONSIBLE FOR CUT AND FILL QUANTITIES. ADDITIONAL COMPENSATION WILL NOT BE ACCEPTED FOR HAULING OF EXCESS AND BORROW MATERIAL TO AND FROM SITE AS WELL AS LABOR COSTS FOR PLACEMENT AND/OR REMOVAL. OFF-SITE BORROW MATERIAL MUST BE CLEAN COMPACTIBLE STRUCTURAL FILL MATERIAL (NO ORGANIC MATERIAL) WHICH WILL BE INSPECTED PRIOR TO USE FOR ON-SITE FILL MATERIAL.
- SITE CONTRACTOR IS RESPONSIBLE TO PROVIDE A STABLE SUBGRADE AT DESIGN ELEVATIONS. ALL PAVED AREAS INCLUDING BUILDING PAD SHALL BE PRODDERLED & COMPACTED TO MEET 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH ANSI/ASTM D1557.
- CONTRACTOR SHALL STORE SUFFICIENT TOPSOIL MATERIAL ON-SITE FOR RE-USE IN ALL DISTURBED GREEN AREAS AND NEW LANDSCAPE AREAS.
- PROVIDE POSITIVE DRAINAGE AT ALL TIMES TO ENSURE NO STANDING WATER. MAINTAIN A MINIMUM SLOPE OF 1.00% IN ALL NEW BITUMINOUS AREAS.

NORTH

DRAWN	
DESIGNED	BRZEZINSKI
CHECKED	QUADERER
FIELD WORK	



Griggs Quaderer Inc.
 CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
 GRAND BLANC, MI 48439
 PH: (810) 695-0154
 FX: (810) 695-0158
 WWW.GQINCORP.COM

NO.	DATE	SUBJECT
	04-12-22	REISSUED TO WHITE LAKE TWP.
	01-12-22	REISSUED TO WHITE LAKE TWP.
	12-13-21	REISSUED WHITE LAKE TWP.
	10-28-21	WHITE LAKE TWP. (SITE PLAN)
	04-13-21	TOPOGRAPHIC SURVEY

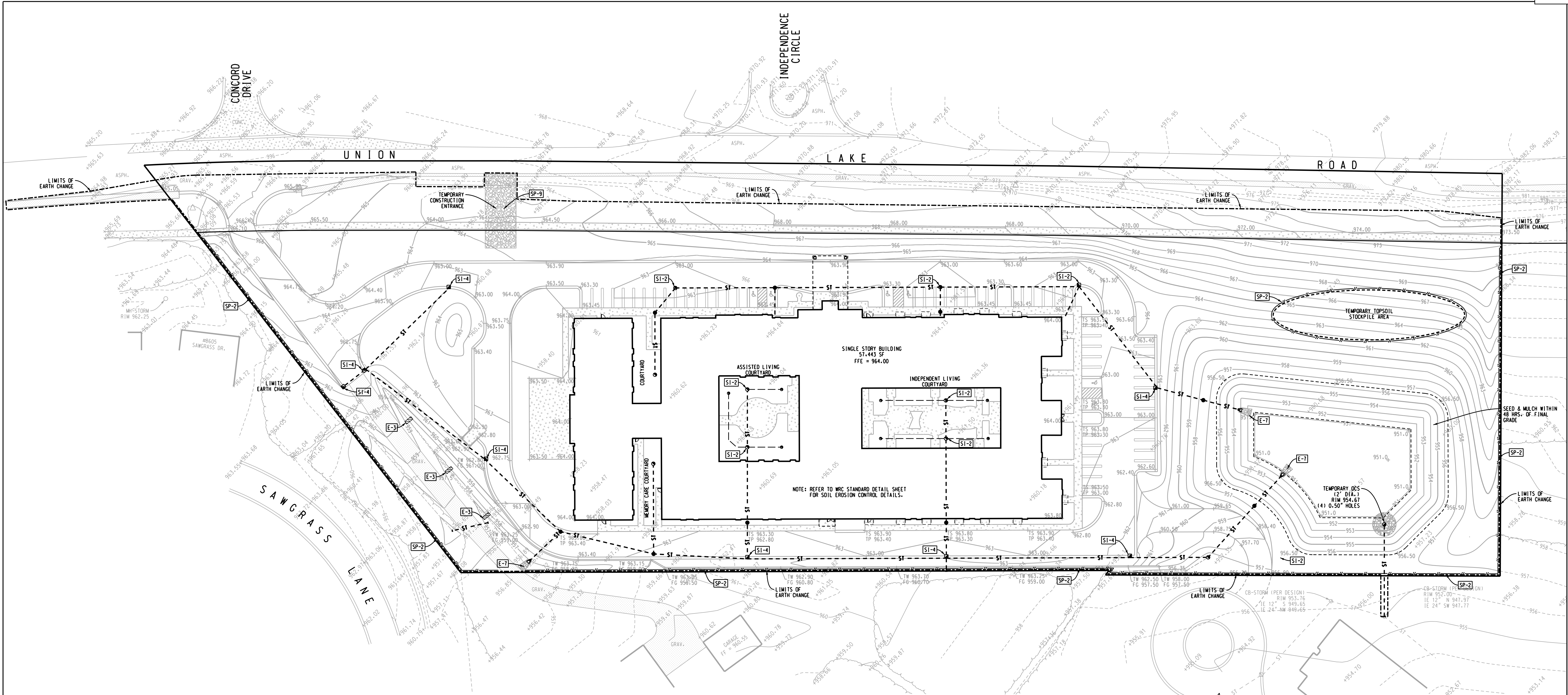
NORTHWEST 1/4
 SECTION 36
 T-3N, R-8E

COMFORT CARE

UNION LAKE ROAD
 WHITE LAKE TWP.,
 OAKLAND COUNTY
 STATE OF MICHIGAN

DRAWING TITLE
SITE GRADING PLAN

PROJECT NUMBER	210303	SHEET	C300
PROJECT PHASE	SPA		



CONSTRUCTION SEQUENCE:

1. PROVIDE EROSION CONTROL MEASURES THAT WILL BE USED AS PART OF THIS WORK. INSTALL ADDITIONAL MEASURES AS REQUIRED BY THESE DRAWINGS AND AS FIELD CONDITIONS DICTATE IN ACCORDANCE WITH OAKLAND COUNTY DRAIN COMMISSION STANDARDS AND SPECIFICATIONS.
2. STRIP TOPSOIL AND STOCKPILE AS DIRECTED BY OWNER.
3. PERFORM DEMOLITION WORK AND MASS GRADING.
4. BEGIN CONSTRUCTION OF BUILDING PAD AND FOUNDATION.
5. CONSTRUCT STORM SEWER SYSTEM COMPLETE. IMMEDIATELY INSTALL STONE FILTERS ON ALL CATCH BASINS AND INLETS.
6. INSTALL ALL UTILITIES.
7. INSTALL ALL PAVEMENT AND CURBING.
8. DAILY, OR AS REQUIRED, CONSTRUCT AND MAINTAIN TEMPORARY BERMS, DRAINS, SILT FENCE, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED.
9. FINISH GRADE, REDISTRIBUTE AND/OR PROVIDE TOPSOIL AND ESTABLISH VEGETATION ON ALL DISTURBED GROUND AREAS.
10. COMPLETE INSTALLATION OF PERMANENT EROSION CONTROL MEASURES, INCLUDING SEEDING OPERATIONS AND PAVEMENT INSTALLATION.
11. CLEAN PAVEMENT AND STORM SEWERS OF ALL SEDIMENT.
12. REMOVE SOIL EROSION CONTROL MEASURES AFTER PERMANENT VEGETATION HAS BEEN ESTABLISHED AS DIRECTED.
13. INSTALL LANDSCAPING.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THAT ALL SOIL EROSION CONTROL MEASURES ARE INSTALLED AND MAINTAINED.
15. THE OAKLAND COUNTY DRAIN COMMISSION SHALL INSPECT ALL SOIL EROSION CONTROL MEASURES. ADDITIONAL MEASURES SHALL BE CONSTRUCTED AND MAINTENANCE WORK SHALL BE PERFORMED IF REQUESTED BY OAKLAND COUNTY DRAIN COMMISSION.

SESC MAINTENANCE SCHEDULE NOTES:

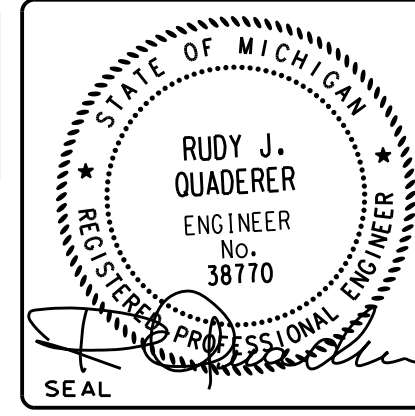
1. THE CONTRACTOR SHALL INSPECT THE SOIL EROSION AND SEDIMENT CONTROL DEVICES ONCE EACH WEEK AND WITHIN TWENTY-FOUR (24) HOURS OF A PRECIPITATION EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE. A LOG OF INSPECTION REPORTS SHALL BE MAINTAINED AND ACCESSIBLE IN ACCORDANCE WITH NPDES REQUIREMENTS. IMPLEMENT THE FOLLOWING STEPS IF ANY DAMAGE HAS RESULTED FROM CONSTRUCTION OR WEAR:
 2. CONSTRUCTION ACCESS ROADS (CLEAN STONE EXITS) MUST BE MAINTAINED AS NECESSARY. ADD ADDITIONAL STONE WHEN ACCESS ROAD BECOMES INEFFECTIVE DUE TO LOSS OF STONE OR COVERED WITH MUD.
 3. SILTATION CONTROL FENCE SHOULD BE TRENCHED IN, BACKFILLED, AND STAPLED OR STAKED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. MAINTENANCE INCLUDES THE REMOVAL OF BUILT-UP SEDIMENT WHEN THE SEDIMENT ACCUMULATES TO 1/3 OF THE HEIGHT OF THE FENCE. CONTRACTOR MAY HAVE TO REMOVE, REPLACE, RETRENCH, OR RE-BACKFILL THE FENCE IF IT FAILS. IT WOULD ALSO BE NECESSARY TO REINSTALL IF ANY PORTION OF THE FENCING WAS DAMAGED BY CONSTRUCTION MACHINERY.
 4. INSPECT INLET FILTERS FOR BUILD-UP OF SILT AND OTHER DEBRIS. EXCESSIVE BUILD-UP IS EVIDENT IF GEOTEXTILE / STONE STRUCTURE IS CAUSING FLOODING. MAINTENANCE CONSISTS OF REMOVING ALL SEDIMENT WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTER IS BEYOND THIS LEVEL OF REPAIR, IT MAY BE NECESSARY TO REPLACE BOTH THE STONE AND GEOTEXTILE FILTER FABRIC.
 5. PREPARE EROSION CONTROL SEEDING ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR / INSPECTOR SHALL INSPECT THE AREA AFTER SEEDING IS COMPLETED. REPAIR AREAS THAT ARE BARE OR NOT MULCHED PROPERLY BY SPOT SEEDING AND / OR RE-MULCHING.
 6. MAINTAIN DUST CONTROL AT ALL TIMES DURING CONSTRUCTION. SPRINKLING TANK TRUCKS SHALL BE AVAILABLE AT ALL TIMES AND USED ON HALL ROADS, ON-SITE DISTURBED AREAS, OR OTHER PLACES WHERE DUST BECOMES A PROBLEM AS A RESULT OF CONSTRUCTION EFFORTS.
 7. PROMPTLY REMOVE ALL MUD, DIRT AND DEBRIS TRACKED ONTO EXISTING ROADS FROM THIS SITE.
 8. REMOVE SILT DEPOSITS FROM TEMPORARY SEDIMENT TRAPS WHEN TRAP IS HALF FULL.
9. THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM BY THE SITE SUPERINTENDENT.

SOIL EROSION CONTROL NOTES:

1. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE OAKLAND COUNTY DRAIN COMMISSION REQUIREMENTS AND SPECIFICATIONS.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR TO DETERMINE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. ANY EROSION OR SEDIMENT FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT BE ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER EARTH CHANGES HAVE BEEN ESTABLISHED.
5. DUST CONTROL WILL BE EXERCISED AT ALL TIMES WITHIN THE PROJECT BY THE CONTRACTOR. SPRINKLING TANK TRUCKS SHALL BE AVAILABLE AT ALL TIMES TO BE USED ON HALL ROUTES OR OTHER PLACES WHERE DUST BECOMES A PROBLEM.
6. ALL MUD, DIRT AND DEBRIS TRACKED ONTO EXISTING ROADS SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR NO LESS THAN ON A DAILY BASIS. ALL MUD, DIRT AND DEBRIS TRACKED OR SPILLED ONTO PAVED SURFACES SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
7. SP-2 & SI-4 REFER TO OAKLAND COUNTY STANDARD DETAIL SHEET FOR EROSION CONTROL AND SEDIMENTATION DETAILS.
8. PROVIDE EROSION CONTROL BLANKET FOR SIDE SLOPES 1:3 AND GREATER TO ESTABLISH VEGETATION. USE NORTH AMERICAN GRASS 1550 OR APPROVED EQUAL. (IF APPLICABLE)
9. THIS PROJECT WILL CONTINUOUSLY BE INSPECTED FOR SOIL EROSION AND SEDIMENT CONTROL COMPLIANCE. DEFICIENCIES WILL BE CORRECTED BY THE CONTRACTOR WITH 24 HOURS.
10. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE THROUGH SWALES OR OVERLAND SHEET FLOW FOR THE ENTIRE SITE. SEDIMENT SHALL BE REMOVED PRIOR TO DISCHARGE FROM LIMITS OF CONSTRUCTION. NO STANDING WATER SHALL BE PERMITTED ON SITE.
11. ALL GREEN AREAS DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED PER MICHIGAN UNIFIED KEY #6 IMMEDIATELY AFTER CONSTRUCTION IS COMPLETED.
12. DISTANCE TO NEAREST LAKE, STREAM POND, OPEN DRAIN, OR WETLAND: REGULATED WETLAND APPROXIMATELY 150 FT NORTHEAST FROM NORTHEAST CORNER OF SITE.

NORTH

DRAWN	
DESIGNED	BRZEZINSKI
CHECKED	QUADERER
FIELD WORK	



Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

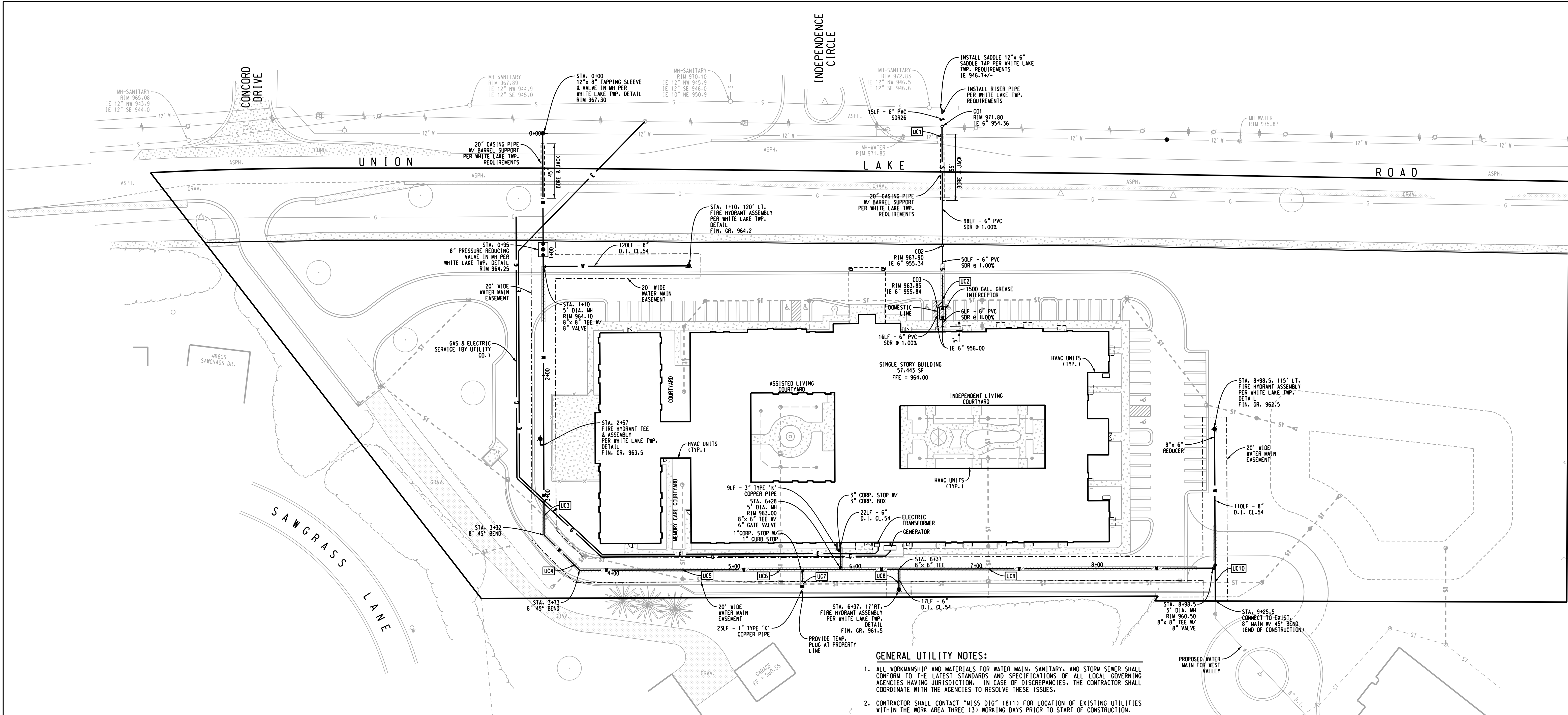
NO.	DATE	SUBJECT
	04-12-22	REISSUED TO WHITE LAKE TWP.
	01-12-22	REISSUED TO WHITE LAKE TWP.
	12-13-21	REISSUED WHITE LAKE TWP.
	10-28-21	WHITE LAKE TWP. (SITE PLAN)
	04-13-21	TOPOGRAPHIC SURVEY

NORTHWEST 1/4
SECTION 36
T-3N, R-8E

COMFORT CARE

UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

DRAWING TITLE		SHEET
SOIL EROSION CONTROL PLAN		
PROJECT NUMBER	210303	C301
PROJECT PHASE	SPA	



SANITARY SEWER NOTES:

1. MATERIAL AND CONSTRUCTION METHODS FOR THE INSTALLATION OF SANITARY SEWER SHALL BE IN ACCORDANCE WITH WHITE LAKE TOWNSHIP REQUIREMENTS.
2. ALL SANITARY SEWER PIPE SHALL BE PVC SDR 26 AND MEET OR EXCEED ASTM D-3034 FOR HEAVY WALL PIPE UNLESS OTHERWISE NOTED.
3. TESTING PROCEDURE OF NEW SANITARY LINE SHALL BE IN ACCORDANCE WITH WHITE LAKE TOWNSHIP REQUIREMENTS. CONTRACTOR TO COORDINATE INSPECTIONS WITH AGENCIES.
4. REFER TO MUNICIPALITY'S STANDARD DETAIL SHEET FOR SANITARY DETAILS AND STANDARD NOTES.

WATER MAIN NOTES:

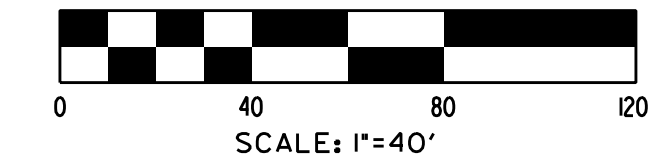
1. INSTALL WATER MAIN WITH A MINIMUM OF 6' OF COVER.
2. PROVIDE A MINIMUM OF 18" OF VERTICAL SEPARATION AND 10' OF HORIZONTAL SEPARATION BETWEEN WATERMAIN AND ALL SANITARY AND STORM SEWERS.
3. PROVIDE THRUST BLOCKS AT ALL WATER MAIN BENDS, PLUGS, AND TEES PER WHITE LAKE TOWNSHIP DESIGN STANDARDS.
4. ALL WATER MAIN MATERIALS SHALL CONFORM TO WHITE LAKE TOWNSHIP DESIGN STANDARD SPECIFICATIONS. NO SECOND HAND OR SALVAGED MATERIALS SHALL BE PERMITTED.
 - 12" AND LARGER WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 54 CONFORMING TO ANSI/AWWA A21.51 / C151
 - 4" TO 10" WATER MAIN PIPE SHALL BE DUCTILE IRON CLASS 53 CONFORMING TO ANSI/AWWA A21.51 / C151
 - 2" AND SMALLER WATER LEAD PIPE SHALL BE TYPE "K" COPPER.
5. THE WATER MAIN SHALL BE TESTED IN ACCORDANCE WITH WHITE LAKE TOWNSHIP REQUIREMENTS. THE INSPECTOR OF THE MUNICIPALITY SHALL BE PRESENT DURING THE TESTING PROCEDURE. CONTRACTOR SHALL COORDINATE INSPECTIONS WITH AGENCIES.

UTILITY CROSSING SCHEDULE:

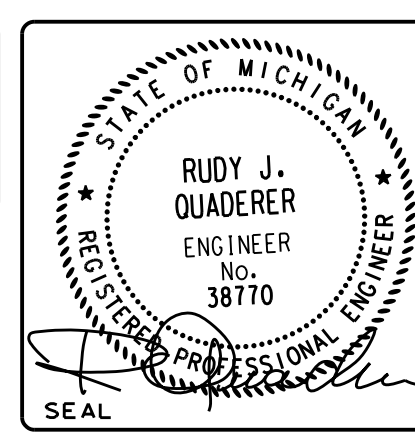
UC1	TOP SAN 955.00 BOT WATER 965.00	UC6	TOP WATER 956.40 BOT STORM 959.05
UC2	TOP SAN 956.30 BOT STORM 957.00	UC7	TOP STORM 954.00 BOT WATER 956.20
UC3	TOP WATER 955.50 BOT STORM 957.00	UC8	TOP STORM 953.90 BOT WATER 956.50
UC4	TOP WATER 955.30 BOT STORM 956.80	UC9	TOP WATER 956.50 BOT STORM 958.10
UC5	TOP STORM 954.20 BOT WATER 956.50	UC10	TOP STORM 953.50 BOT WATER 956.00

GENERAL UTILITY NOTES:

1. ALL WORKMANSHIP AND MATERIALS FOR WATER MAIN, SANITARY, AND STORM SEWER SHALL CONFORM TO THE LATEST STANDARDS AND SPECIFICATIONS OF ALL LOCAL GOVERNING AGENCIES HAVING JURISDICTION. IN CASE OF DISCREPANCIES, THE CONTRACTOR SHALL COORDINATE WITH THE AGENCIES TO RESOLVE THESE ISSUES.
2. CONTRACTOR SHALL CONTACT "MISS DIG" (811) FOR LOCATION OF EXISTING UTILITIES WITHIN THE WORK AREA THREE (3) WORKING DAYS PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND STABILIZING (IF REQUIRED) ALL TRENCH EXCAVATIONS TO ACCOMPLISH WORK INDICATED ON PLANS AND TO ACHIEVE REQUIRED COMPACTION OPERATIONS AS INDICATED IN THE PROJECT SPECIFICATIONS OR ON THESE DOCUMENTS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR, WILL BE CONSIDERED INCIDENTAL TO THE INSTALLATION COST OF UTILITIES OR STRUCTURES.
4. UTILITY SERVICE LEADS SHALL END 5 FEET FROM THE BUILDING UNLESS NOTED OTHERWISE. COORDINATE WITH BUILDING CONTRACTOR (IF NECESSARY).
5. PROTECT AND MAINTAIN 18 INCH CLEARANCE AT ALL UTILITY CROSSINGS.
6. REFER TO TRENCH DETAIL(S) SHOWN ON THESE DOCUMENTS FOR BEDDING AND BACKFILL MATERIAL REQUIREMENTS.
7. TRENCH EXCAVATIONS SHALL BE COMPACTED IN CONTINUOUS LAYERS NOT EXCEEDING 8 INCH LOOSE LIFTS. COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ANSI/ASTM D 1557 MODIFIED PROCTOR.
8. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.
9. CONTRACTOR SHALL COORDINATE INSTALLATION OF GAS, ELECTRIC, AND TELEPHONE WITH THE APPROPRIATE UTILITY COMPANIES.
10. TESTING PROCEDURES FOR SANITARY AND WATER MAIN SHALL BE IN ACCORDANCE WITH LOCAL GOVERNING AGENCY REQUIREMENTS. CONTRACTOR SHALL COORDINATE WITH ALL GOVERNING AGENCIES AND HAVE INSPECTORS PRESENT DURING THE TESTING PROCEDURES. ALL TESTING MUST BE APPROVED BY ALL GOVERNING AGENCIES PRIOR TO CONNECTION INTO EXISTING UTILITIES.
11. CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION. REPORT ANY DISCREPANCIES TO THE ENGINEER.
12. CONTRACTOR SHALL ADJUST ANY UTILITY ELEMENT MEANT TO BE FLUSH WITH NEW GRADE (CLEAN OUT, VALVE BOXES, MANHOLES, CATCH BASINS, INLETS, ETC.) THAT ARE AFFECTED BY SITE WORK OR GRADE CHANGES, WHETHER SPECIFICALLY NOTED ON PLANS OR NOT. THE CONTRACTOR SHALL OBTAIN ANY NECESSARY PERMITS FOR ADJUSTMENT AT THE CONTRACTOR'S EXPENSE (IF APPLICABLE).
13. THE CONTRACTOR SHALL PAY FOR AND OBTAIN ALL PERMITS REQUIRED BY FEDERAL, STATE, LOCAL, OR PRIVATE AGENCIES AND PAY ALL CHARGES FOR INSPECTION AND TESTING.
14. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL CONSTRUCTION LAYOUT AND GRADE ELEVATIONS FOR THEIR WORK IN ACCORDANCE WITH DATA SHOWN ON THESE DOCUMENTS.
15. THE CONTRACTOR SHALL CONTROL NOISE AND LIMIT WORKING HOURS TO TIMES AS ESTABLISHED BY THE LOCAL MUNICIPALITY.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN-UP OF WORK AREA AT COMPLETION OF THE PROJECT AND LEAVE THE SITE IN AN ACCEPTABLE CONDITION AS DETERMINED BY THE ENGINEER/INSPECTOR AND/OR OWNER.



DRAWN	
DESIGNED	BRZEZINSKI
CHECKED	QUADERER
FIELD WORK	



Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

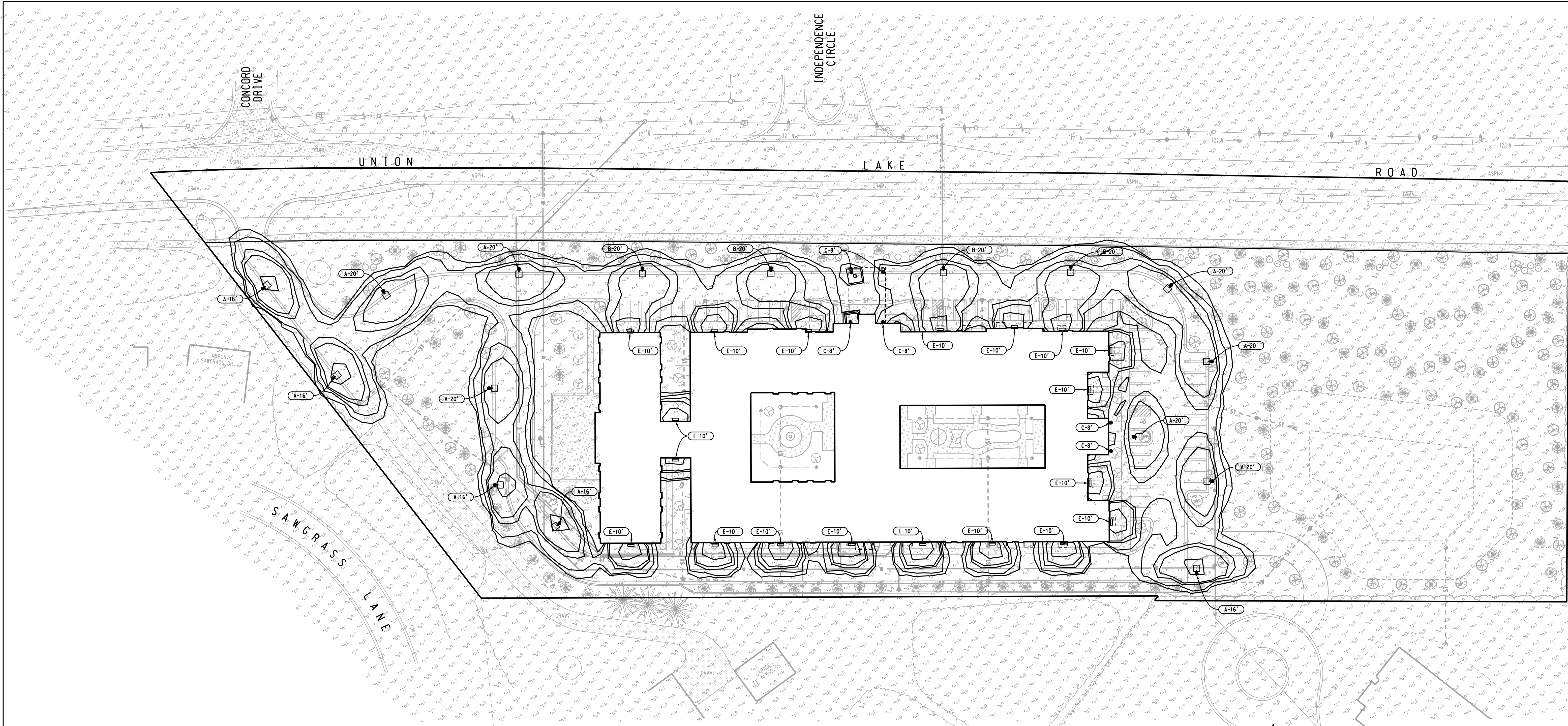
NO.	DATE	SUBJECT
	04-12-22	REISSUED TO WHITE LAKE TWP.
	01-12-22	REISSUED TO WHITE LAKE TWP.
	12-13-21	REISSUED WHITE LAKE TWP.
	10-28-21	WHITE LAKE TWP. (SITE PLAN)
	04-13-21	TOPOGRAPHIC SURVEY

NORTHWEST 1/4
SECTION 36
T-3N, R-8E

COMFORT CARE

UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

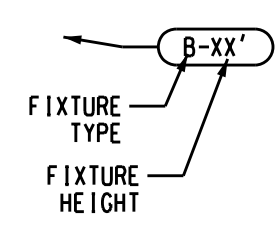
DRAWING TITLE		SHEET
SITE UTILITY PLAN		
PROJECT NUMBER	210303	C400
PROJECT PHASE	SPA	



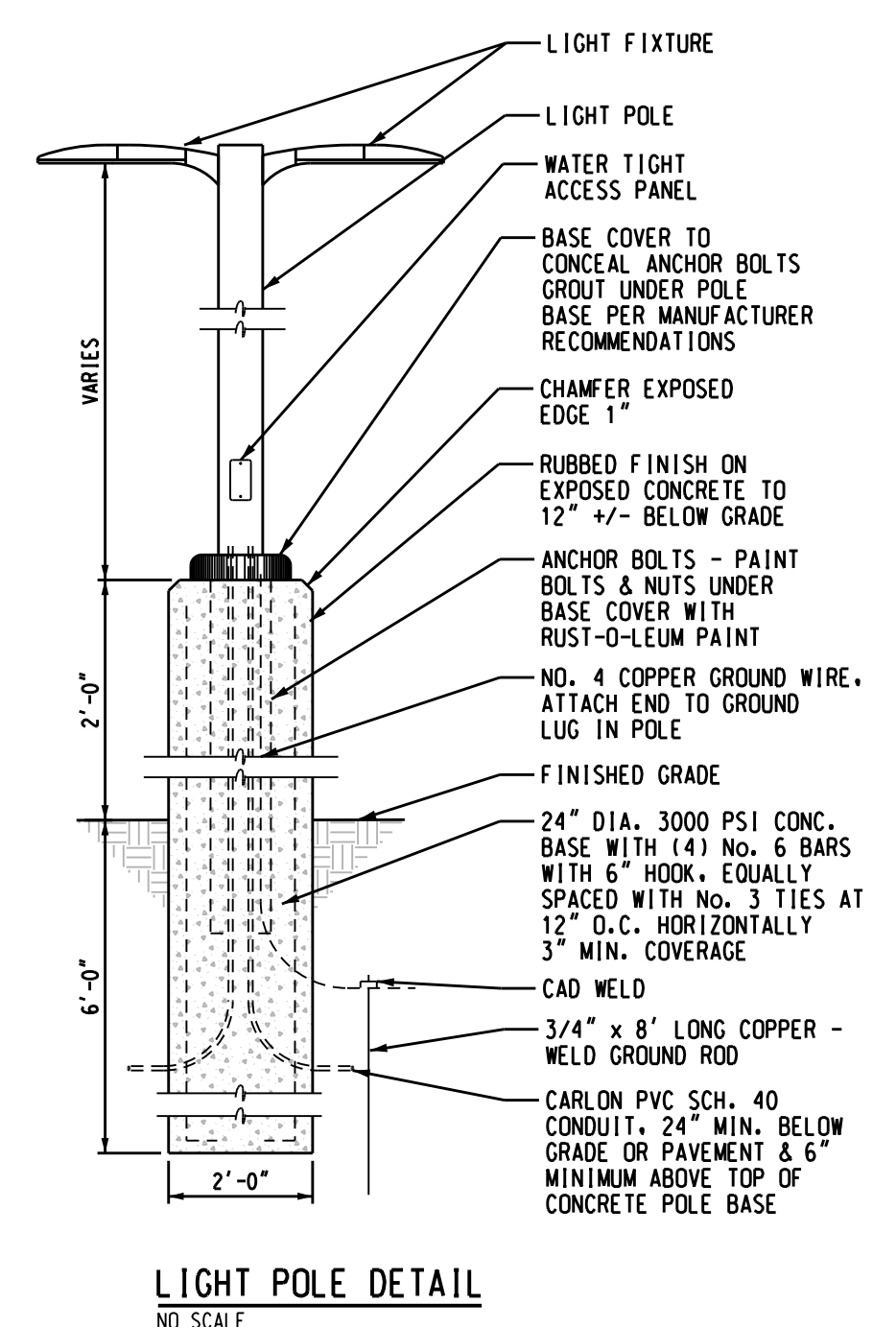
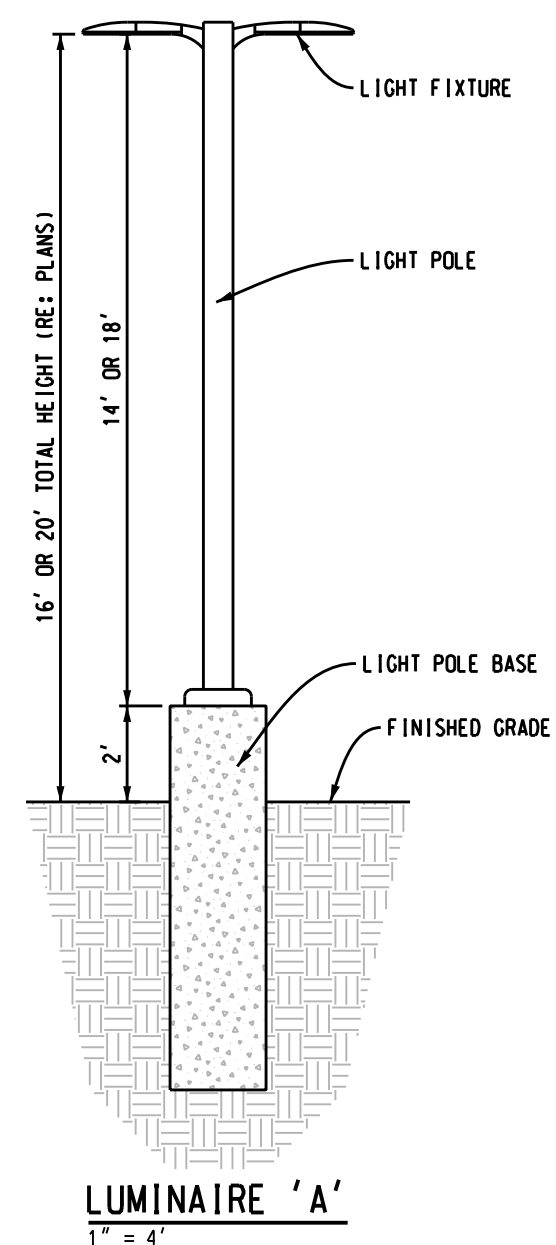
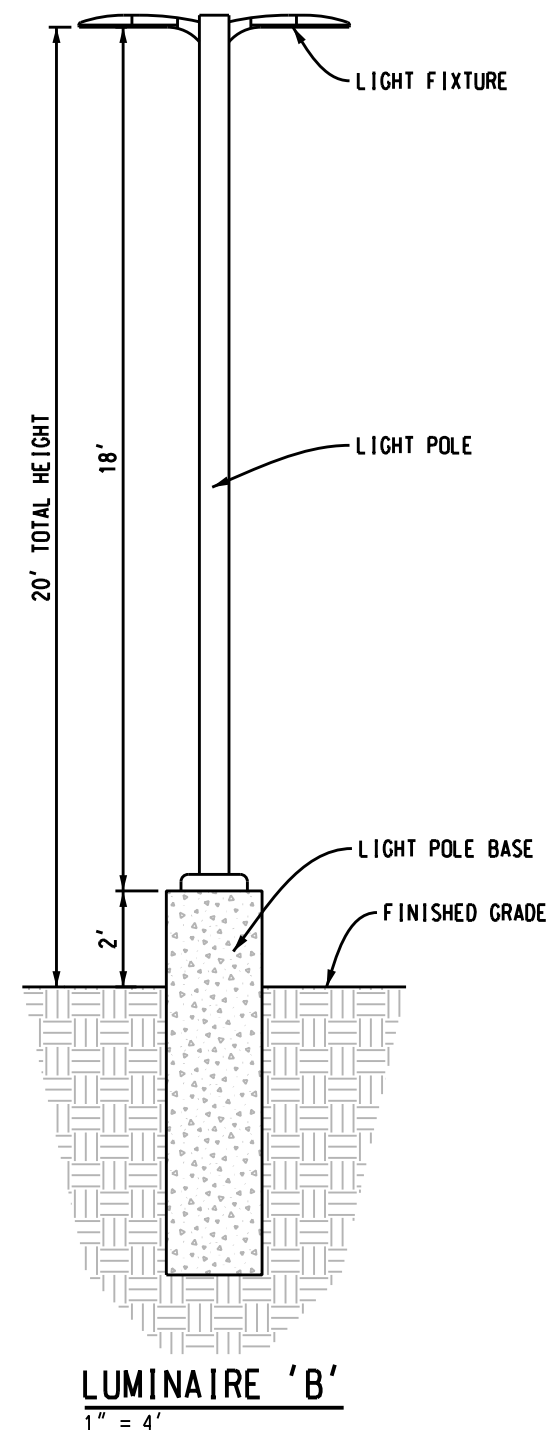
LIGHTING NOTES:

- THE FOOTCANDLES SHOWN HEREON HAVE BEEN CALCULATED AT APPROXIMATELY SIX FEET ABOVE GRADE.
- THE CATALOG DETAILS OF THE LIGHTING FIXTURE HAVE BEEN PROVIDED IN FULL BUT SEPARATELY FROM THESE SITE PLAN DOCUMENTS.

STATISTICAL AREA SUMMARY				
AVG	MAX	MIN	AVG/MIN	MAX/MIN
0.7	11.7	0.1	7.0 / 1	117 / 1



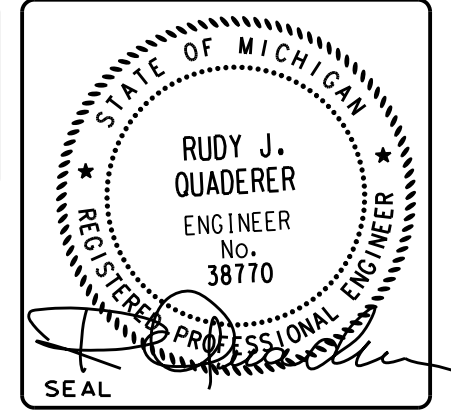
LUMINAIRE SCHEDULE							
QTY	LABEL	ARRANGEMENT	MANUFACTURER	CATALOG NO.	DESCRIPTION	LAMP	WATTAGE
12	A	SINGLE	LITHONIA	DSXO LED P1 30K T2M MVOLT HS	D-SERIES AREA SIZE 0. POLE MOUNTED, SINGLE (ONE) LIGHT FIXTURE W/ HOUSE SIDE SHIELD	LED	38
4	B	SINGLE	LITHONIA	DSXO LED P1 30K T4M MVOLT HS	D-SERIES AREA SIZE 0. POLE MOUNTED, SINGLE (ONE) LIGHT FIXTURE W/ HOUSE SIDE SHIELD	LED	38
7	C	SINGLE	LITHONIA	OLLWD LED P1 40K MVOLT	WALL MOUNTED, DOWN LIGHT ONLY, CYLINDRICAL.	LED	9
19	E	SINGLE	LITHONIA	DSXW1 LED 10C 700 30K TFTM MVOLT	DSXW1 WITH (1) 10 LED LIGHT ENGINES, WALL MOUNTED, SINGLE (ONE) LIGHT FIXTURE	LED	26.2



0 40 80 120
SCALE: 1"=40'

811 Know what's below.
Call before you dig.

DRAWN	
DESIGNED	BRZEZINSKI
CHECKED	QUADERER
FIELD WORK	



Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

NO.	DATE	SUBJECT
04-12-22		REISSUED TO WHITE LAKE TWP.
01-12-22		REISSUED TO WHITE LAKE TWP.
12-13-21		REISSUED WHITE LAKE TWP.
10-28-21		WHITE LAKE TWP. (SITE PLAN)
04-13-21		TOPOGRAPHIC SURVEY

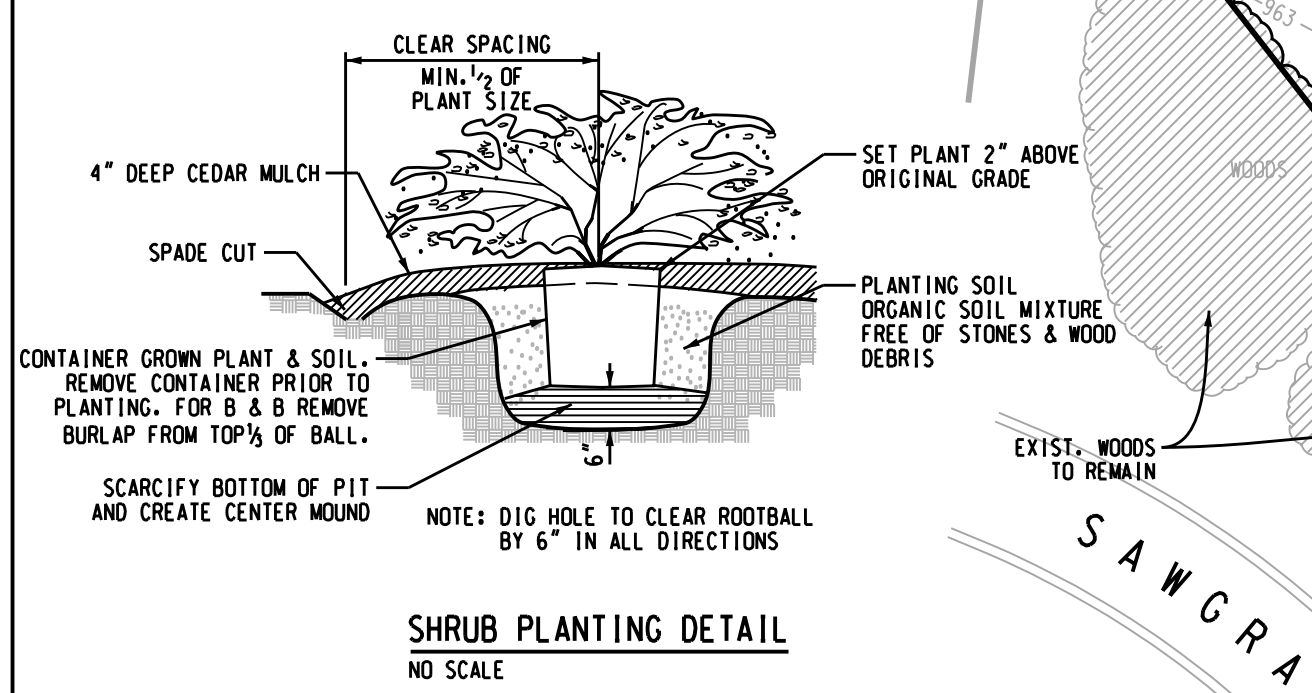
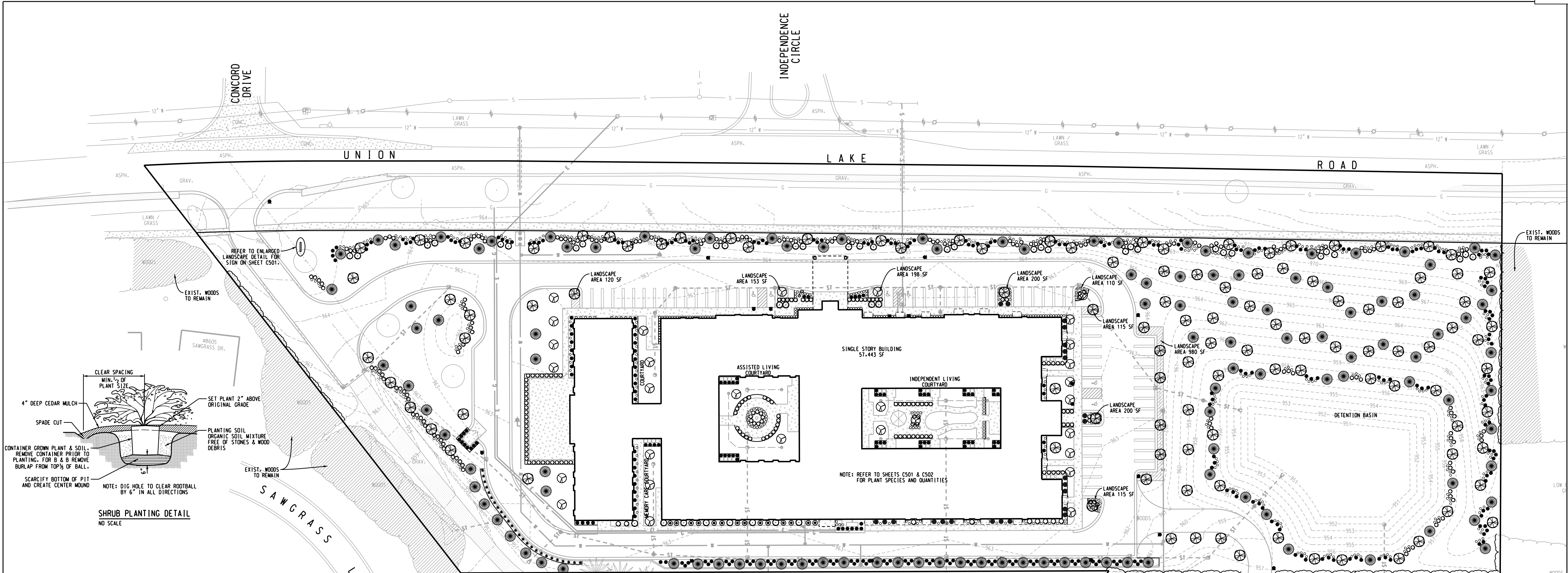
NORTHWEST 1/4 SECTION 36 T-3N, R-8E

COMFORT CARE

UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

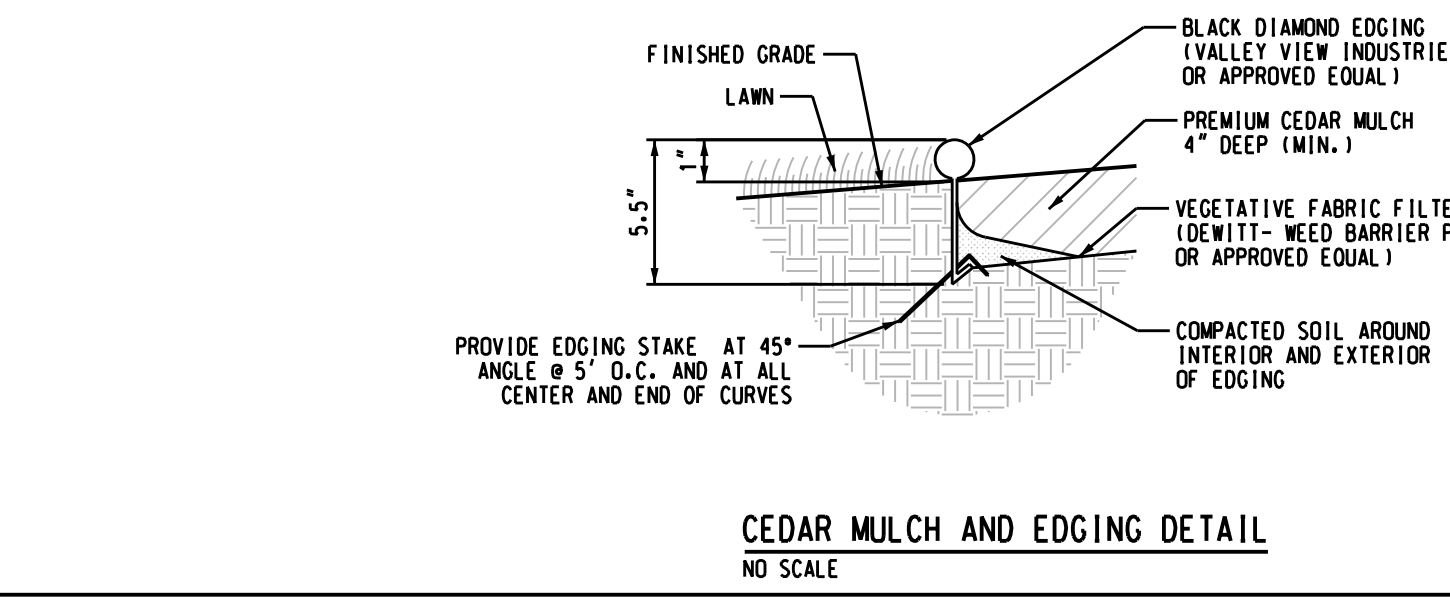
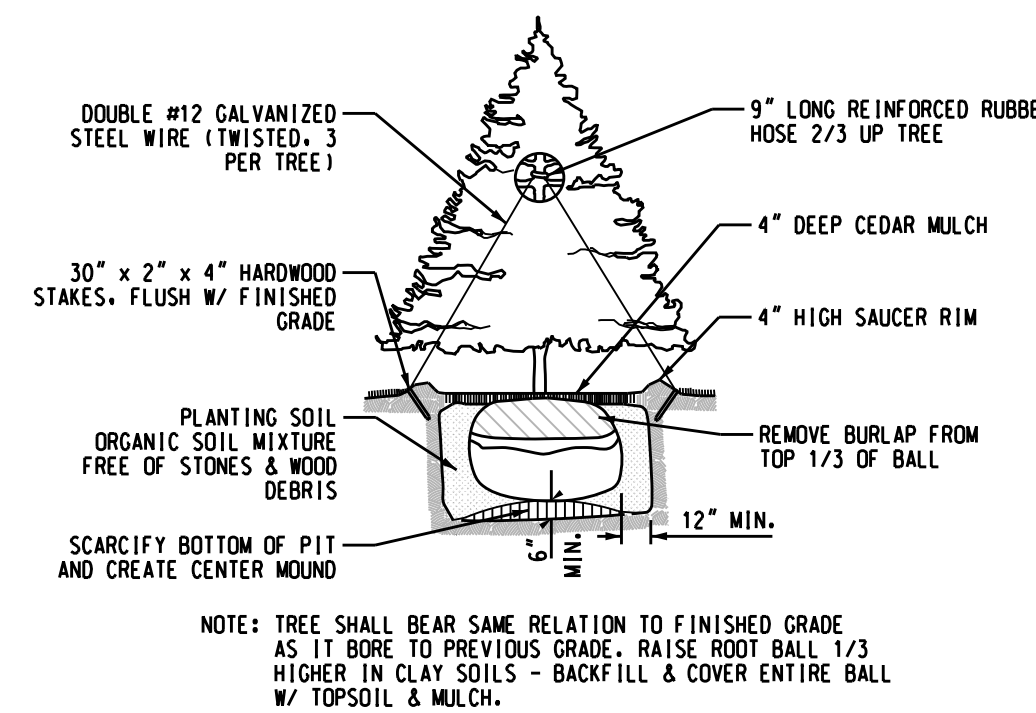
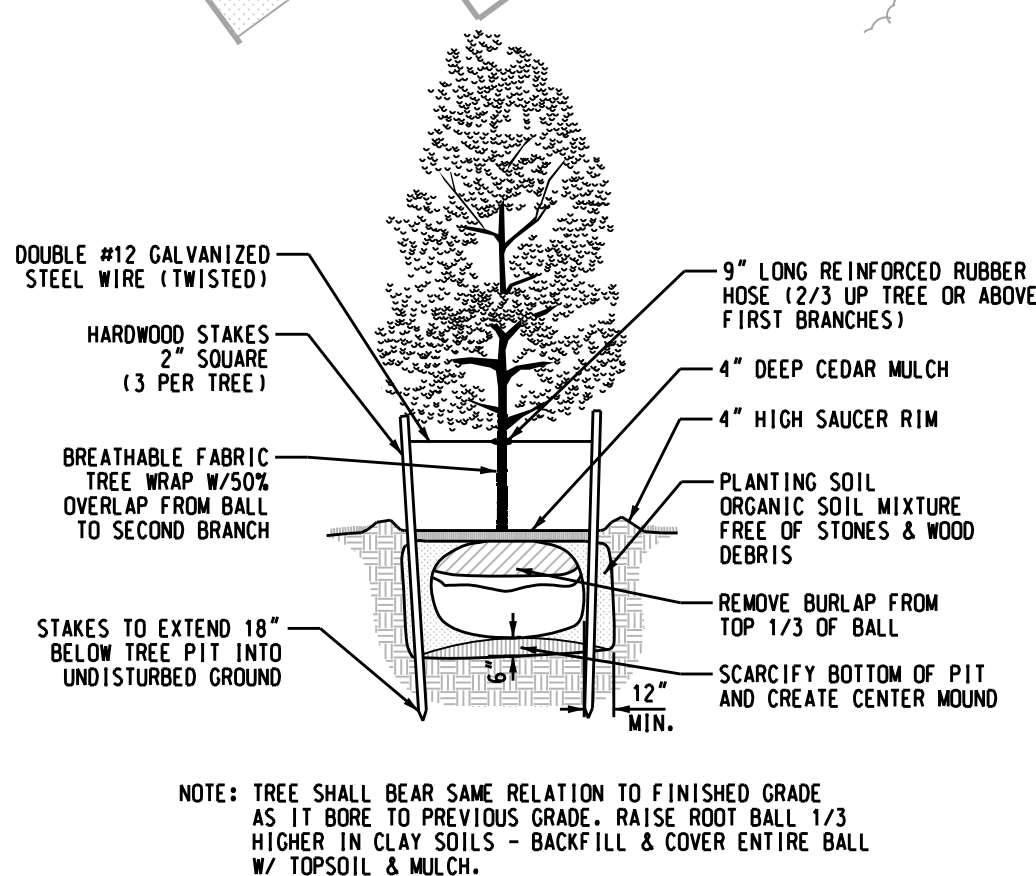
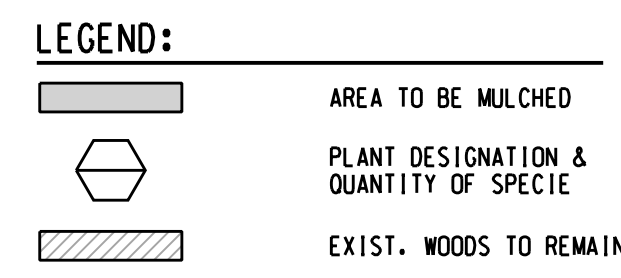
DRAWING TITLE
SITE PHOTOMETRIC PLAN

PROJECT NUMBER	210303	SHEET	C401
PROJECT PHASE	SPA		



- LANDSCAPING NOTES:**
- INSTALLATION OF PLANT MATERIAL SHALL BE IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF NURSERYMEN LANDSCAPE STANDARDS LATEST EDITION.
 - PRIOR TO BEGIN OF LANDSCAPE WORK, CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES, CONTRACTOR SHALL CONTACT MISS DIG (811) FOR LOCATIONS OF ALL PRIVATE UTILITIES. ANY DAMAGE OR INTERRUPTIONS OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COORDINATE ALL RELATED WORK ACTIVITIES WITH OTHER TRADES AND REPORT ANY UNACCEPTABLE WORK CONDITIONS TO OWNER PRIOR TO COMMENCING WORK.
 - NUMERICAL VALUE OF PLANT MATERIAL SHOWN SHALL TAKE PRECEDENCE OVER GRAPHIC REPRESENTATION. VERIFY AND REPORT ANY DISCREPANCIES WITH LANDSCAPE ARCHITECT.
 - SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED BY THE MUNICIPALITY AND/OR GOVERNING AGENCY PRIOR TO COMMENCING.
 - NEW LANDSCAPE BEDS WITHIN PREVIOUS BUILDING AND PAVEMENT AREAS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND POOR SOILS TO A MINIMUM DEPTH OF 24" AND BACKFILLED WITH GOOD MEDIUM TEXTURED ORGANIC PLANTING SOIL FREE OF ROCKS LARGER THAN 1".
 - PROTECT EXISTING TREES TO REMAIN WITH TEMPORARY FENCING PLACED AT THE DRIP LINE. NO GROUND DISTURBANCE OR STORAGE OF MATERIAL SHALL OCCUR WITHIN THE DRIP LINE LIMITS.
 - COORDINATE PLACEMENT OF PLANTS WITH UNDERGROUND UTILITY LOCATIONS. MAKE ADJUSTMENTS AS REQUIRED TO AVOID PLANTING OVER THE UTILITIES. DO NOT PLANT SHADE OR EVERGREEN TREES BELOW OVERHEAD WIRES. IF CONFLICT OCCURS, CONTACT LANDSCAPE ARCHITECT TO ADJUST LOCATION OF TREES.
 - BACKFILL ISLANDS FROM SUBGRADE TO THE TOP OF CURB WITH ON-SITE TOPSOIL UNLESS OTHERWISE NOTED ON PLAN. FINISHED GRADE IN CENTER OF ISLAND SHALL BE 4" TO 6" HIGHER THAN TOP OF CURB TO PROVIDE POSITIVE DRAINAGE TO PERIMETER OF CURB ISLAND.
 - PLACE 4" THICK BY 4" DIAMETER SHREDDED CEDAR OR CYPRESS BARK MULCH RING AT THE BASE OF ALL NEW TREES IN LAWN AREA. CUT LAWN AREA IN A SMOOTH UNIFORM CIRCULAR LINE.
 - ALL GREEN AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WITH SIDE SLOPES LESS THAN 3:1, SHALL BE GRADED AND TOPPED WITH MINIMUM 4" DEEP TOPSOIL AND SEEDED & MULCHED. REFER TO PLAN FOR SEED MIXTURE AND APPLICATION RATE.
 - ALL EXISTING TREES AND SHRUBS NOTED TO REMAIN SHALL BE PROPERLY PRUNED, TRIMMED, THINNED AND SHAPED BY A QUALIFIED NURSERYMAN OF ARBORIST. ALL DEAD LIMBS AND BRANCHES SHALL BE REMOVED FROM SITE.
 - UNLESS NOTED OTHERWISE, LANDSCAPE BEDS ADJACENT TO LAWN AREAS SHALL RECEIVE LANDSCAPE EDGING AS DETAILED ON PLAN.
 - ALL LANDSCAPING SHALL BE COMPLETED WITHIN 6 MONTHS OF COMPLETION OF BUILDING.
 - ALL STAKING MATERIALS AND WRAPPING SHALL BE REMOVED OFF SITE WITHIN ONE YEAR AFTER INSTALLATION.
 - LANDSCAPING ITEMS SHALL NOT INTERFERE WITH THE CLEAR VISION AREAS. TREES WITHIN PARKING LOT ISLANDS SHALL HAVE A CLEAR VIEW OF 4'-6" MINIMUM TO THE FIRST BRANCH AT MATURITY.
 - ALL PLANT MATERIALS INCLUDING LAWN AREAS SHALL BE WATERED, FERTILIZED, TRIMMED, MOWED AND GENERALLY MAINTAINED BY THE CONTRACTOR IN A HEALTHY GROWING CONDITION FOR A PERIOD OF 30 DAYS AFTER FINAL COMPLETION AND AFTER LAWN IS CUT FOR FIRST TIME. CONTRACTOR SHALL SUBMIT A ONE (1) YEAR WARRANTY FROM COMPLETION DATE AND BE RESPONSIBLE TO REPLACE ANY DISEASED OR DEAD PLANT MATERIAL WITHIN THAT PERIOD OF TIME WITHOUT ANY COST TO THE OWNER.

PLANTING REQUIREMENTS		
LOCATION	MINIMUM REQUIREMENT	PROVIDED
ROAD R/W GREENBELT	20' WIDE GREENBELT: 1 DECIDUOUS OR EVERGREEN TREE + 8 SHRUBS / 30LF = 1,127/30 = 38 TREES + 304 SHRUBS	57 TREES, 358 SHRUBS
PARKING LOT AREA	15SF PER PARKING SPACE = 62 SPAC. (15) = 930 SF	2,190 SF OF LANDSCAPE AREA
RESIDENTIAL BUFFER (SOUTH SIDE)	LAND FORM BUFFER A-2 = 1 TREE + 8 SHRUBS PER 30LF = 288/30 = 10 TREES + 80 SHRUBS	17 TREES, 74 SHRUBS, EXIST. WOODS
RESIDENTIAL BUFFER (WEST SIDE)	LAND FORM BUFFER A-2 = 1 TREE + 8 SHRUBS PER 30LF = 372/30 = 13 TREES + 104 SHRUBS	18 TREES, EXIST. TREES & WOODS, NEW WALL 82 SHRUBS
INTERIOR LANDSCAPING	15% OF THE TOTAL LOT AREA 1 TREE / 300 SF + 5 SHRUBS TOTAL AREA = 364,597 SF -PAVED AREA = 58,100 SF NET AREA = 306,497 SF 15% NET AREA = 45,975 SF 45975/300 = 153 TREES + 766 SHRUBS	147 TREES, 6 EXIST. TREES 722 SHRUBS



0 40 80 120
SCALE: 1"=40'

811 Know what's below. Call before you dig.

DRAWN
DESIGNED BRZEZINSKI
CHECKED QUADERER
FIELD WORK

Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

STATE OF MICHIGAN
REGISTERED PROFESSIONAL ENGINEER
RUDY J. QUADERER
No. 38770
SEAL

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

NO.	DATE	SUBJECT
04-12-22		REISSUED TO WHITE LAKE TWP.
01-12-22		REISSUED TO WHITE LAKE TWP.
12-13-21		REISSUED WHITE LAKE TWP.
10-28-21		WHITE LAKE TWP. (SITE PLAN)
04-13-21		TOPOGRAPHIC SURVEY
REVISION OR ISSUE		

NORTHWEST 1/4 SECTION 36 T-3N, R-8E

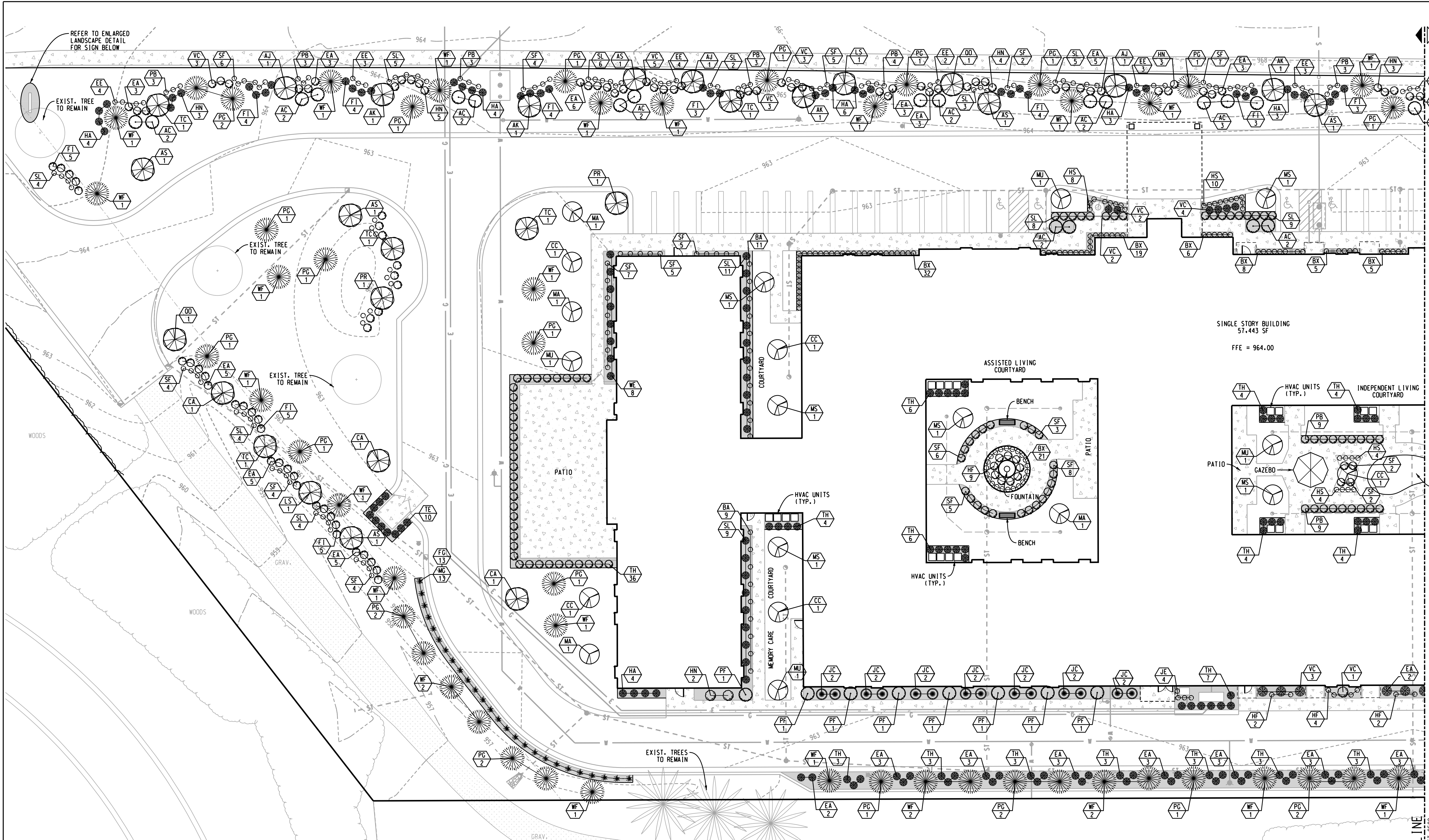
COMFORT CARE

UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

DRAWING TITLE
SITE LANDSCAPE PLAN

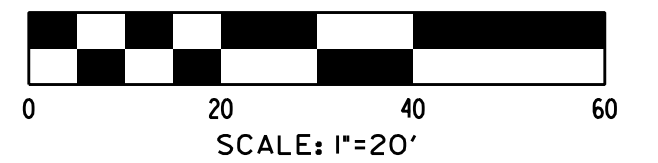
PROJECT NUMBER 210303
PROJECT PHASE SPA

SHEET
C500



SINGLE STORY BUILDING
57,443 SF
FFE = 964.00

NOTE: FOR PLANTING REQUIREMENTS AND LANDSCAPE DETAILS REFER TO SHEET C500.



MATCH LINE
REFER TO SHEET C502

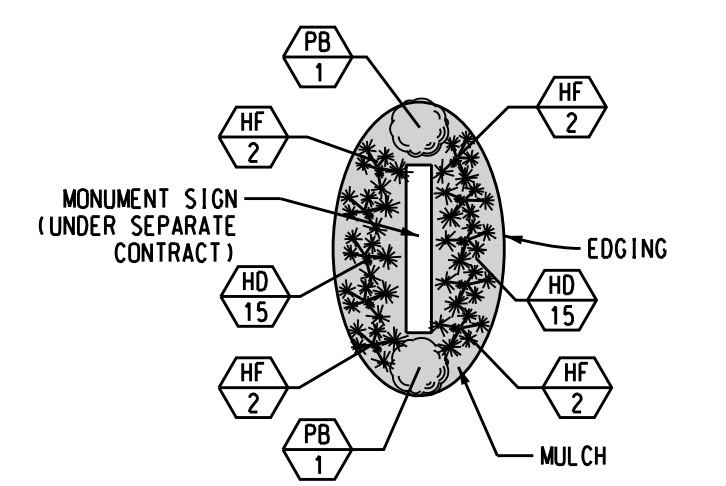
TREE SCHEDULE			
KEY	BOTANICAL NAME	COMMON NAME	SIZE QUANTITY
AF	ACER PALMATUM 'FIREGLOW'	FIREGLOW JAPANESE MAPLE	4' HT -
AK	ACER PLATANOIDES 'CRIMSON KING'	CRIMSON KING NORWAY MAPLE	2.5" CAL 4
AJ	ACER X FREEMANTII 'JEFFERSRED'	AUTUMN BLAZE MAPLE	2.5" CAL 3
AS	ACER SACCHARUM 'COMMEMORATION'	COMMEMORATION SUGAR MAPLE	2.5" CAL 6
BC	BETULA NIGRA 'CULLY'	HERITAGE RIVER BIRCH	8" HT -
CA	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	2.5" CAL 2
CC	CERCIS CANADENSIS	EASTERN REDBUD	2" CAL 5
LS	LIGULIDAMBAR STYRACIFLUA 'GODUZAM'	GOLD DUST AMERICAN SWEETGUM	2.5" CAL 2
MA	MAGNOLIA ACUMINATA 'GOLDSTAR'	GOLD STAR MAGNOLIA	2" CAL 3
MS	MALUS 'SNOWDRIFT'	SNOWDRIFT CRABAPPLE	2" CAL 6
MU	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	2" CAL 4
PG	PICEA GLAUCA	WHITE SPRUCE	8' HT 24
PR	PYRUS CALLARYANA 'REDSPIRE'	REDSPIRE PEAR	2.5" CAL 2
OD	QUERCUS RUBRA	NORTHERN RED OAK	2.5" CAL 1
TC	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2.5" CAL 5
WF	ABIES CONCOLOR	CONCOLOR WHITE FIR	8' HT 25

SHRUB SCHEDULE			
KEY	BOTANICAL NAME	COMMON NAME	SIZE QUANTITY
AC	AMELANCHIER LAEVIS 'CUMULUS'	CUMULUS SERVICEBERRY	4' HT 20
BA	BERBERIS ATROPURPUREA 'CRIRUZAM'	CRIMSON RUBY BARBERRY	18" HT 20
BX	BUXUS X 'GREEN GEM'	GREEN GEM BOXWOOD	NO. 3 CONT 96
CB	CORNUS ALBA 'BAILHALD'	IVORY HALD RED TWIG DOGWOOD	18" HT -
EE	EUONYMUS ALATUS 'COMPACTUS'	COMPACT BURNING BUSH	24" HT 43
EA	EUONYMUS FORTUNEI 'EMERALD CAIETY'	EMERALD CAIETY EUONYMUS	NO. 3 CONT 19
FI	FORSYTHIA INTERMEDIA	NORTHERN GOLD FORSYTHIA	24" HT 40
HA	HAMAMELIS VERNALIS	VERNAL WITCHHAZEL	24" HT 24
HN	HIBISCUS SYRIACUS 'NOTWOODONE'	LAV. CHIFFON ROSE OF SHARON	24" HT 20
HS	HYDRANGEA MAC. H. SERRATA 'PREZIOSA'	PINK BEAUTY HYDRANGEA	24" HT 26
JC	JUNIPERUS CHINENSIS 'GOLD COAST'	GOLD COAST JUNIPER	24" SPR. 14
JE	JUNIPERUS CHINENSIS 'SEA GREEN'	SEA GREEN JUNIPER	24" SPR. 4
PF	PICEA ABIES 'MIDIFORMIS'	BIRD'S NEST SPRUCE	18" HT 8
PB	POTENTILLA FRUTICOSA 'GOLDFINGER'	GOLDFINGER POTENTILLA	NO. 3 CONT 36
SF	SPIREA JAPONICA 'GOLDMOUND'	GOLD MOUND SPIREA	NO. 3 CONT 69
SL	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC	NO. 3 CONT 65
TE	THUJA OCCIDENTALIS 'SMARAGO'	EMERALD GREEN ARBORVITAE	5' HT 10
TH	TAXUS X MEDIA 'HICKSII'	HICKS COLUMNAR YEW	24" HT 85
VC	VIBURNUM X BURKWOODII	BURKWOOD VIBURNUM	NO. 5 CONT 24
WE	WEIGELA FLORIDA 'ELVERA'	MIDNIGHT WINE WEIGELA	NO. 3 CONT 8

PERENNIALS & GRASSES SCHEDULE			
KEY	BOTANICAL NAME	COMMON NAME	SIZE QUANTITY
FG	CALAMAGROSTIS ACUTIFLORA	FEATHER REED GRASS	NO. 2 CONT 13
HD	HEMEROCALLIS 'STELLA D'ORO'	STELLA D'ORO DAYLILLY	NO. 2 CONT 30
HF	HOSTA 'FRANCEE'	FRANCEE HOSTA	NO. 2 CONT 25
MG	MISCANTHUS SINENSIS 'GRACILLIMUS'	MAIDEN GRASS	NO. 2 CONT 13

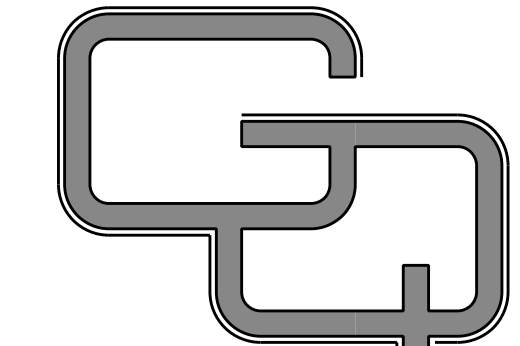
LEGEND:

- AREA TO BE MULCHED
- PLANT DESIGNATION & QUANTITY OF SPECIE



LANDSCAPE DETAIL FOR MONUMENT
NO SCALE

DRAWN
DESIGNED BRZEZINSKI
CHECKED QUADERER
FIELD WORK



Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

04-12-22	REISSUED TO WHITE LAKE TWP.	
01-12-22	REISSUED TO WHITE LAKE TWP.	
12-13-21	REISSUED WHITE LAKE TWP.	
10-28-21	WHITE LAKE TWP. (SITE PLAN)	
04-13-21	TOPOGRAPHIC SURVEY	
NO.	DATE	SUBJECT
REVISION OR ISSUE		

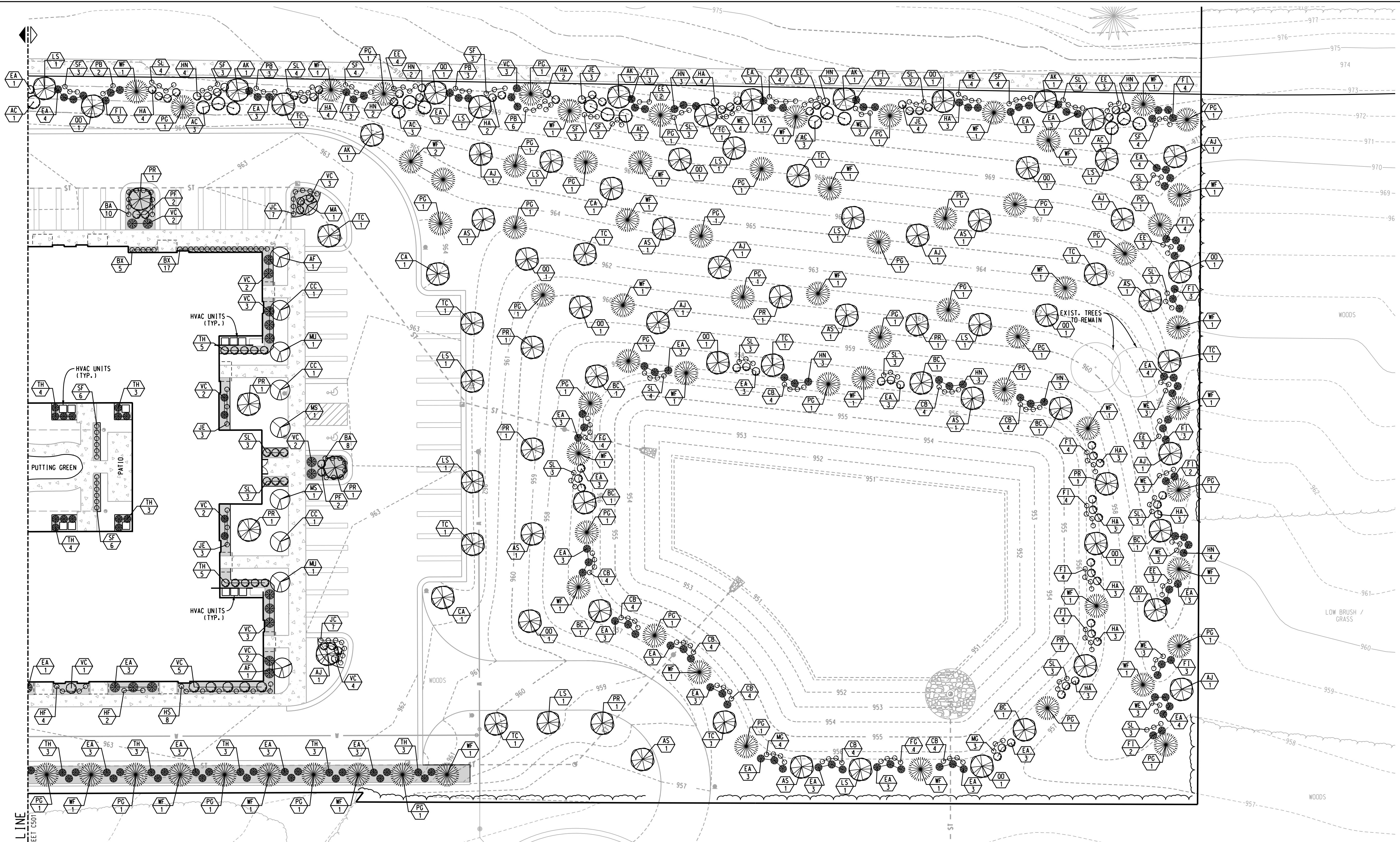
NORTHWEST 1/4 SECTION 36 T-3N, R-8E

COMFORT CARE

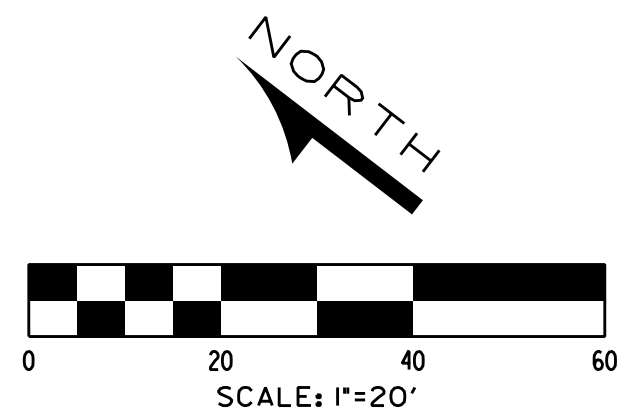
UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

DRAWING TITLE
SITE LANDSCAPE PLAN (NORTH DETAIL)

PROJECT NUMBER	210303	SHEET	C501
PROJECT PHASE	SPA		



NOTE: FOR PLANTING REQUIREMENTS AND LANDSCAPE DETAILS REFER TO SHEET C500.

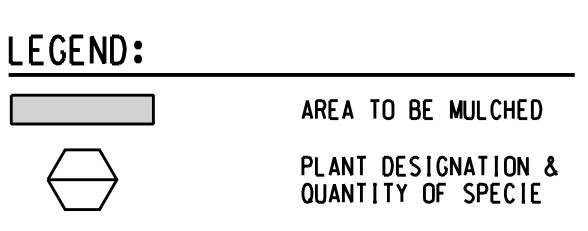


MATCH LINE
REFER TO SHEET C501

TREE SCHEDULE			
KEY BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY
AF	ACER PALMATUM 'FIREGLOW'	FIREGLOW JAPANESE MAPLE	4" HT 2
AK	ACER PLATANOIDES 'CRIMSON KING'	CRIMSON KING NORWAY MAPLE	2.5" CAL 5
AJ	ACER X FREEMANII 'JEFFERSRED'	AUTUMN BLAZE MAPLE	2.5" CAL 7
AS	ACER SACCHARUM 'COMMEMORATION'	COMMEMORATION SUGAR MAPLE	2.5" CAL 9
BC	BETULA NIGRA 'CULLY'	HERITAGE RIVER BIRCH	8" HT 6
CA	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	2.5" CAL 3
CC	CERCIS CANADENSIS	EASTERN REDBUD	2" CAL 3
LS	LIQUIDAMBAR STYRACIFLUA 'GODUZAM'	GOLD DUST AMERICAN SWEETGUM	2.5" CAL 8
MA	MAGNOLIA ACUMINATA 'GOLDSTAR'	GOLD STAR MAGNOLIA	2" CAL 1
MS	MALUS 'SNOWDRIFT'	SNOWDRIFT CRABAPPLE	2" CAL 2
MU	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	2" CAL 2
PG	PICEA GLAUCA	WHITE SPRUCE	8" HT 35
PR	PYRUS CALLARYANA 'REDSPIRE'	REDSPIRE PEAR	2.5" CAL 9
OO	QUERCUS RUBRA	NORTHERN RED OAK	2.5" CAL 10
TC	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2.5" CAL 11
WF	ABIES CONCOLOR	CONCOLOR WHITE FIR	8" HT 33

SHRUB SCHEDULE			
KEY BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY
AC	AMELANCHIER LAEVIS 'CUMULUS'	CUMULUS SERVICEBERRY	4" HT 16
BA	BERBERIS ATROPURPUREA 'CRIRUZAM'	CRIMSON RUBY BARBERRY	18" HT 18
BX	BUXUS X 'GREEN GEM'	GREEN GEM BOXWOOD	NO. 3 CONT 22
CB	CORNUS ALBA 'BAILHALO'	IVORY HALO RED TWIG DOGWOOD	18" HT 36
EE	EUDONYMUS ALATAS 'COMPACTUS'	COMPACT BURNING BUSH	24" HT 93
EA	EUDONYMUS FORTUNEI 'EMERALD GALETY'	EMERALD GALETY EUDONYMUS	NO. 3 CONT 20
FI	FORSYTHIA INTERMEDIA	NORTHERN GOLD FORSYTHIA	24" HT 33
HA	HAMAMELIS VERNALIS	VERNAL WITCHHAZEL	24" HT 21
HN	HIBISCUS SYRIACUS 'NOTWOODONE'	LAV. CHIFFON ROSE OF SHARON	24" HT 30
HS	HYDRANGEA MAC. H. SERRATA 'PREZIOSA'	PINK BEAUTY HYDRANGEA	24" HT 8
JE	JUNIPERUS CHINENSIS 'GOLD COAST'	GOLD COAST JUNIPER	24" SPR. 14
JC	JUNIPERUS CHINENSIS 'SEA GREEN'	SEA GREEN JUNIPER	24" SPR. 13
PF	PICEA ABIES 'NIDIFORMIS'	BIRD'S NEST SPRUCE	18" HT 4
PB	POTENTILLA FRUTICOSA 'GOLDFINGER'	GOLDFINGER POTENTILLA	NO. 3 CONT 14
SF	SPIREA JAPONICA 'GOLDMOUND'	GOLD MOUND SPIREA	NO. 3 CONT 36
SL	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC	NO. 3 CONT 55
TE	THUJA OCCIDENTALIS 'SMARAGO'	EMERALD GREEN ARBORVITAE	5' HT -
TH	TAXUS X MEDIA 'HICKSII'	HICKS COLUMNAR YEW	24" HT 39
VC	VIBURNUM X BURKWOODII	BURKWOOD VIBURNUM	24" HT 21
WE	WEIGELA FLORIDA 'ELVERA'	MIDNIGHT WINE WEIGELA	NO. 3 CONT 29

PERENNIALS & GRASSES SCHEDULE			
KEY BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY
FG	CALAMAGROSTIS ACUTIFLORA	FEATHER REED GRASS	NO. 2 CONT 8
MG	MISCANTHUS SINENSIS 'GRACILLIMUS'	MAIDEN GRASS	NO. 2 CONT 7



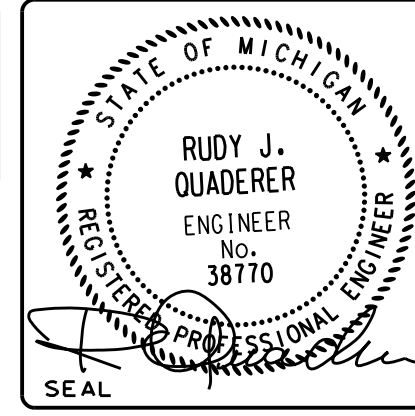
NO.	DATE	SUBJECT
04-12-22		REISSUED TO WHITE LAKE TWP.
01-12-22		REISSUED TO WHITE LAKE TWP.
12-13-21		REISSUED WHITE LAKE TWP.
10-28-21		WHITE LAKE TWP. (SITE PLAN)
04-13-21		TOPOGRAPHIC SURVEY

NORTHWEST 1/4
SECTION 36
T-3N, R-8E

COMFORT CARE

UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

DRAWN
DESIGNED BRZEZINSKI
CHECKED QUADERER
FIELD WORK

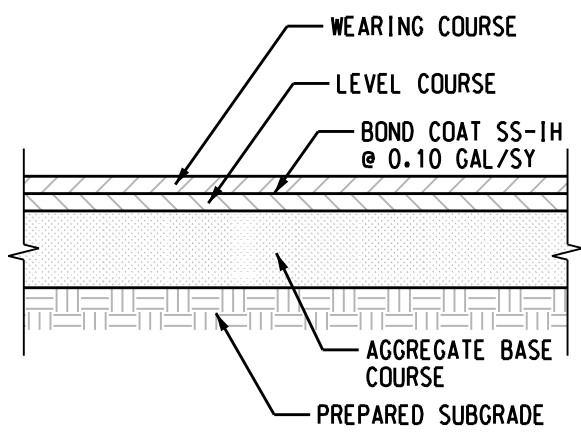


Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

DRAWING TITLE
**SITE LANDSCAPE PLAN
(SOUTH DETAIL)**

PROJECT NUMBER 210303	SHEET C502
PROJECT PHASE SPA	



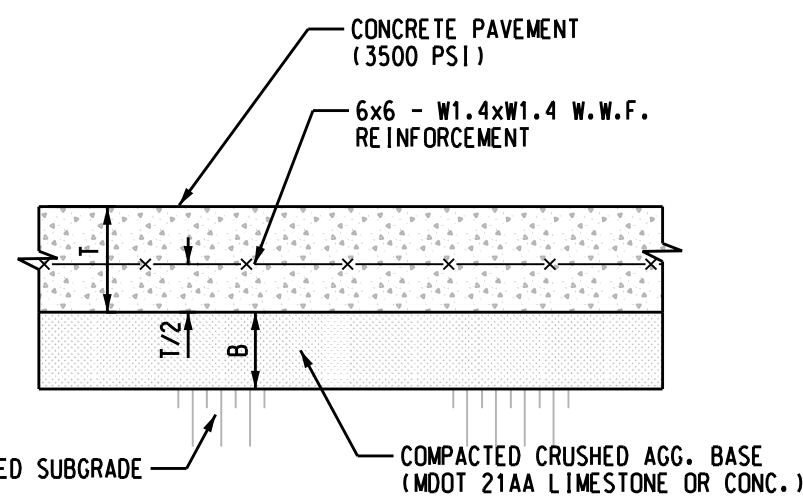
ON-SITE PAVEMENT SECTION
NO SCALE

WEARING COURSE - 1.5" MDOT 13A
LEVEL COURSE - 3" MDOT 3C
AGGREGATE BASE - 8" MDOT 21AA CRUSHED LIMESTONE

ROAD R/W PAVEMENT SECTION
NO SCALE

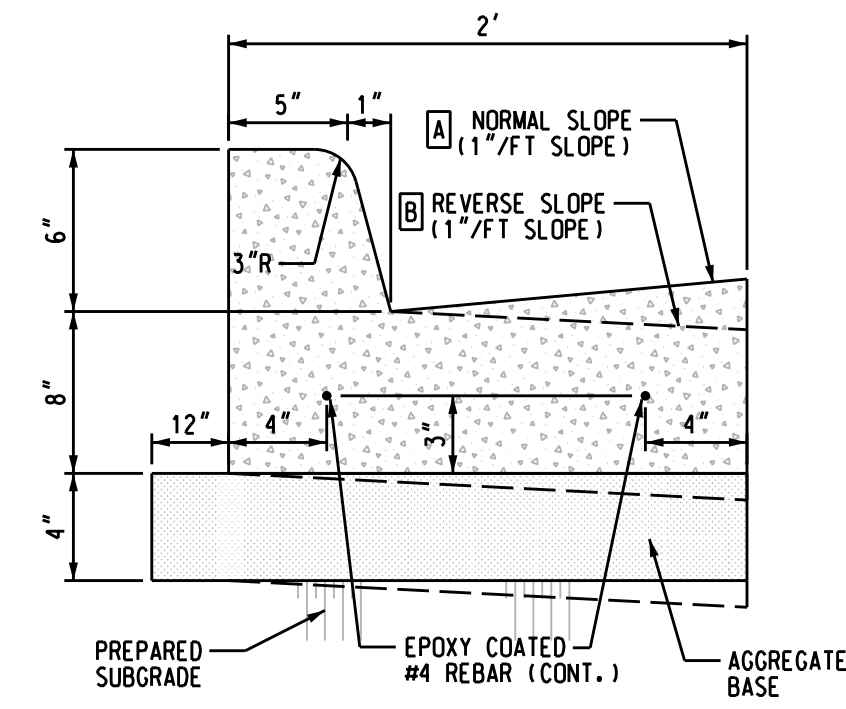
19" OF DEEP STRENGTH ASPHALT SECTION
WEARING COURSE - 2" MDOT 4C
LEVEL COURSE - 3" MDOT 3C
LEVEL COURSE - 4" MDOT 2C (FIRST LIFT)

NOTE: AS AN ALTERNATE, CONTRACTOR IS ALLOWED TO SUBSTITUTE MDOT 21AA CRUSHED CONCRETE FOR ON-SITE AGGREGATE BASE.



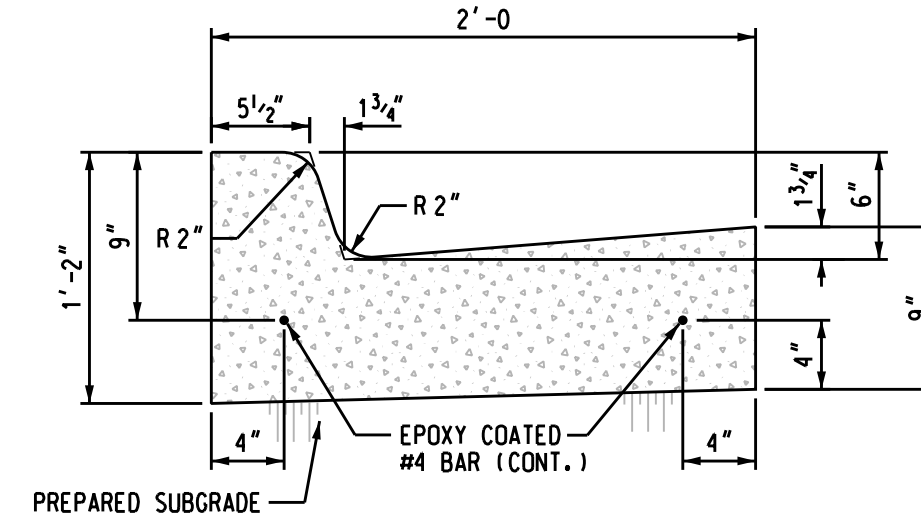
CONCRETE PAVEMENT SECTION
NO SCALE

DESIGN:
PAD UNDER CANOPY 8" 8" YES
DUMPSTER ENCLOSURE 8" 8" YES
SIDEWALK 4" 6" YES



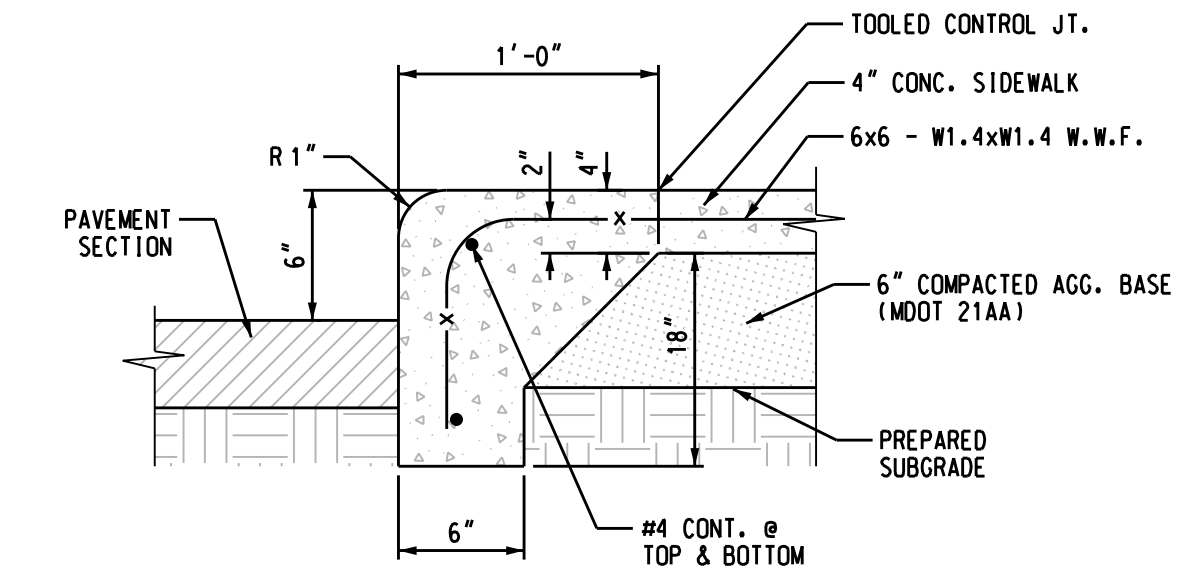
CURB & GUTTER DETAIL
NO SCALE

PROVIDE CONTROL JOINTS AT 10 FEET MAXIMUM SPACING AND DOWELED EXPANSION JOINTS AT 100 FEET MAXIMUM INTERVALS AND AT RADIUS POINTS

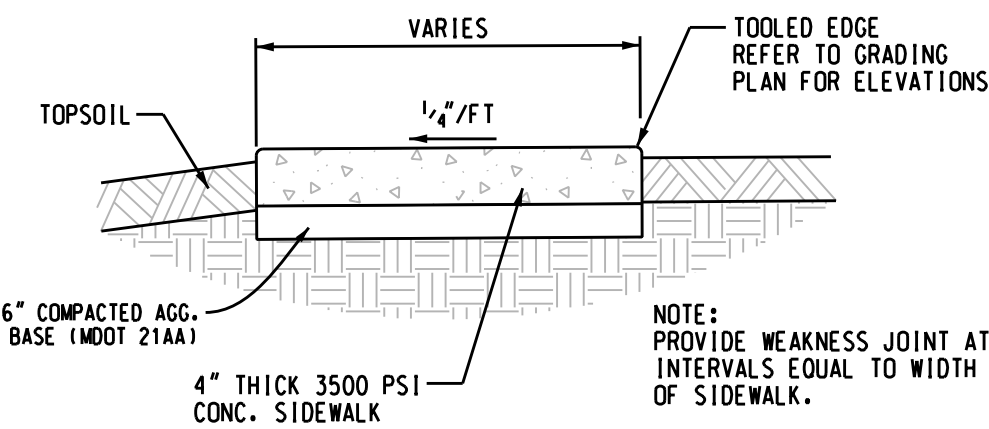


CURB & GUTTER DETAIL
NO SCALE

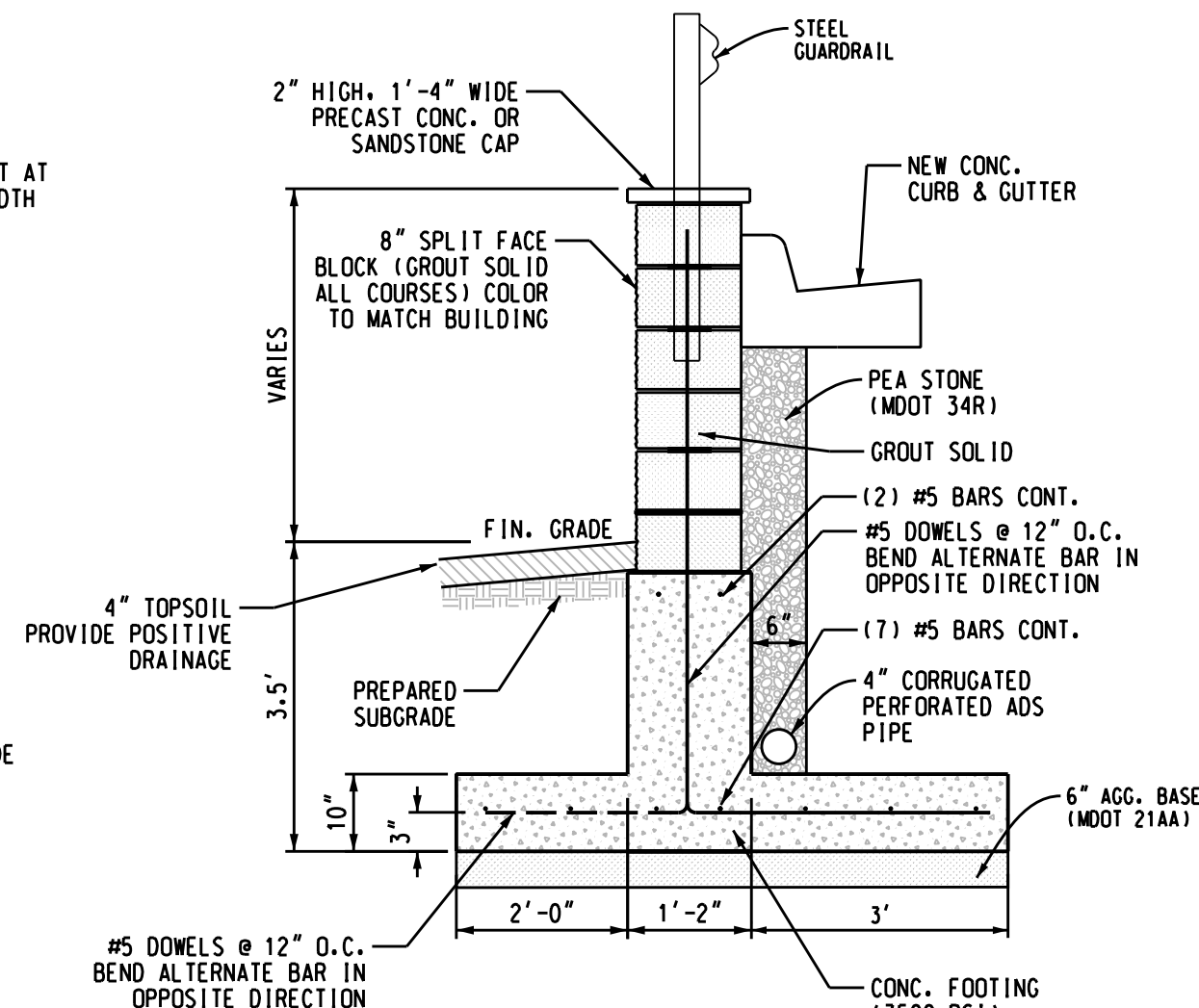
PROVIDE CONTROL JOINTS AT 10 FEET MAXIMUM SPACING AND DOWELED EXPANSION JOINTS AT 100 FEET MAXIMUM INTERVALS AND AT RADIUS POINTS



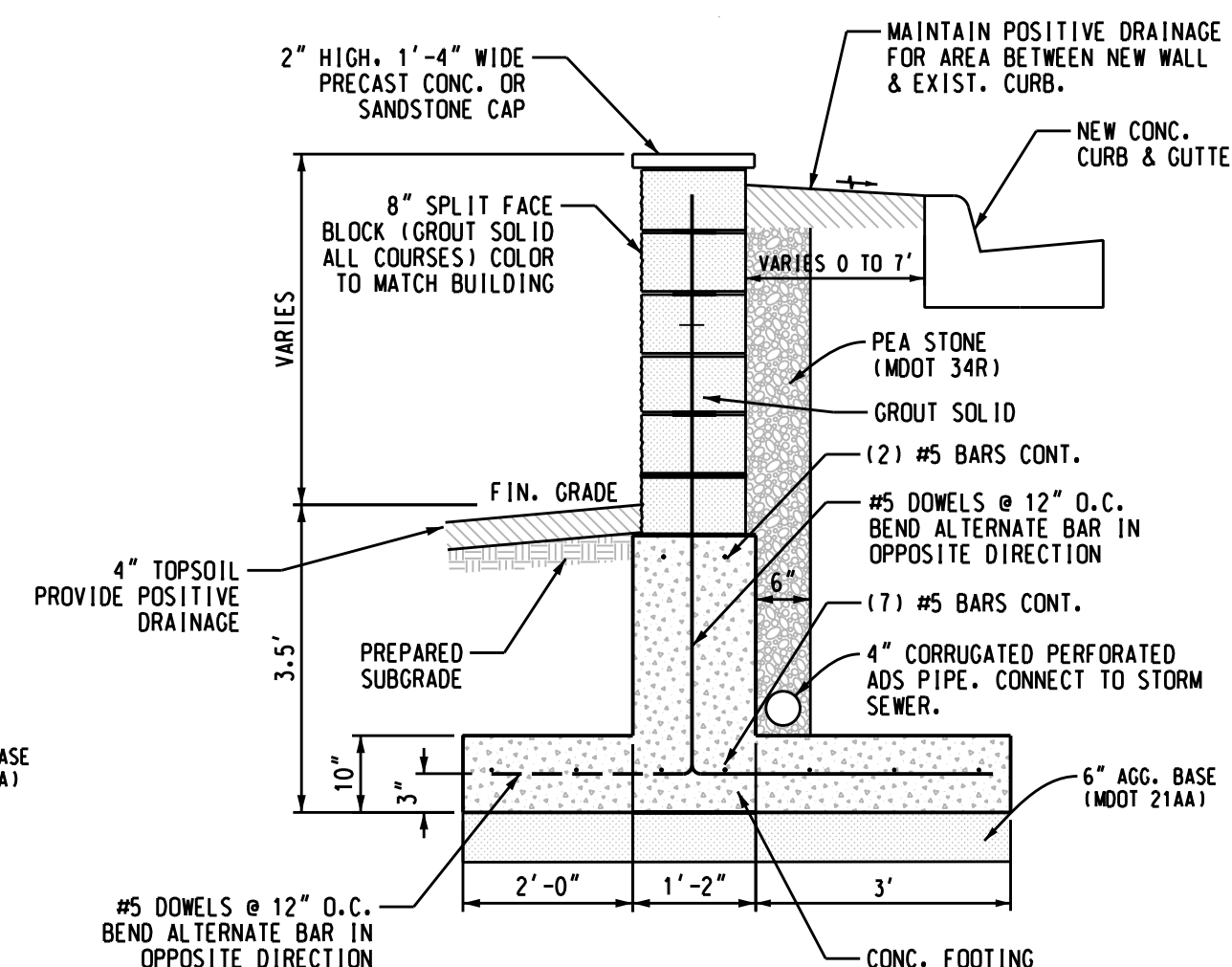
INTEGRAL CURB & SIDEWALK DETAIL
NO SCALE



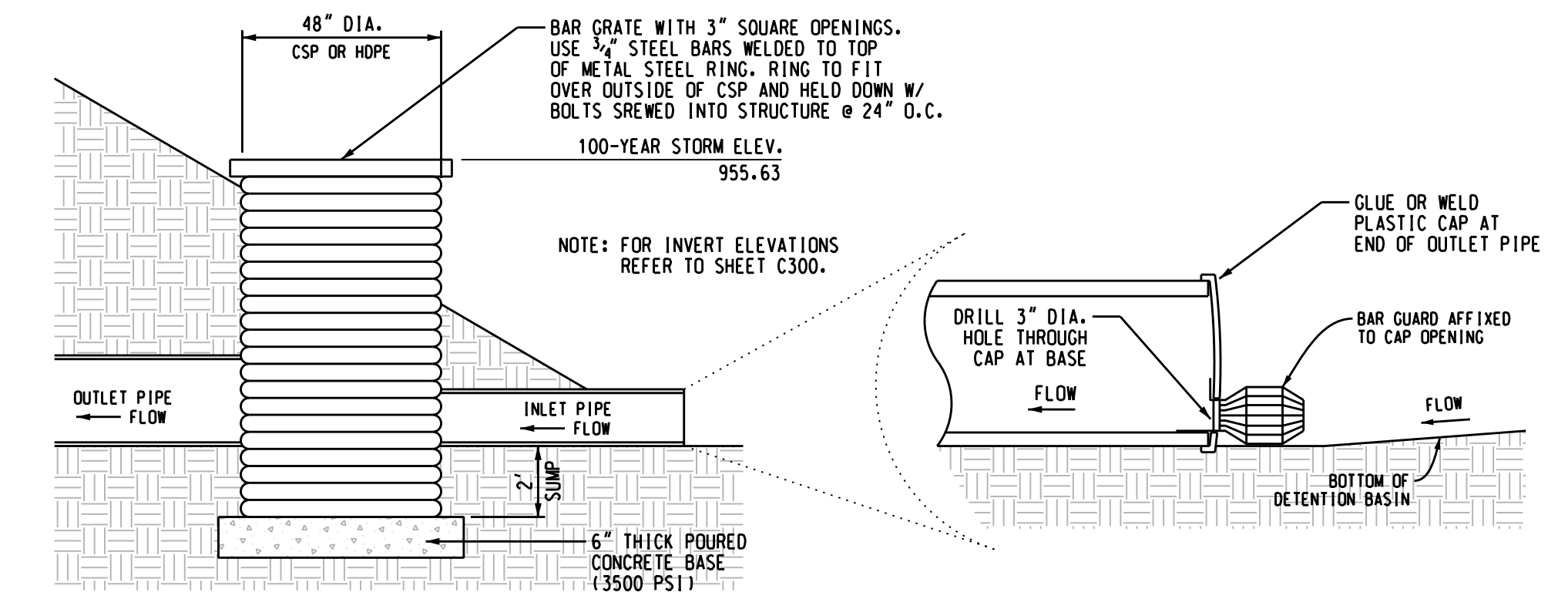
TYP. SIDEWALK DETAIL
NO SCALE



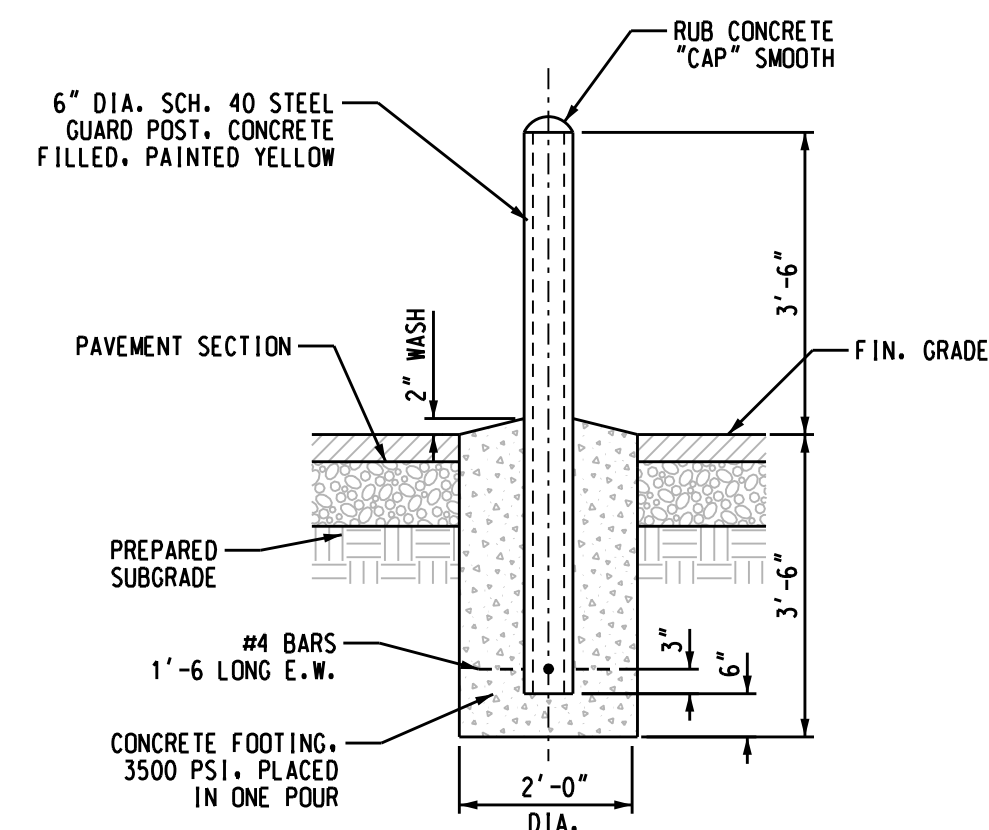
CROSS SECTION MASONRY WALL SW CORNER
NO SCALE



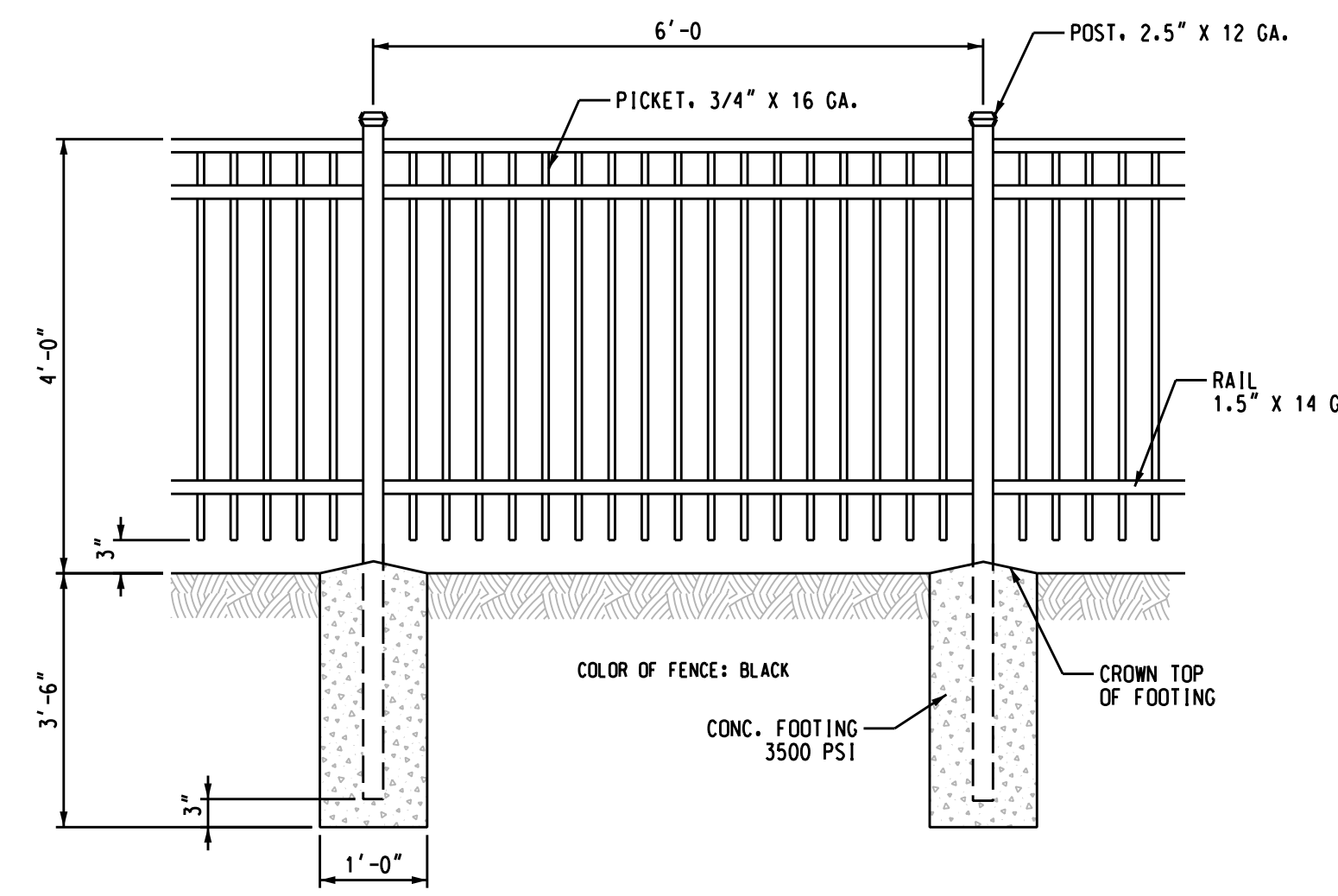
CROSS SECTION MASONRY WALL SE CORNER
NO SCALE



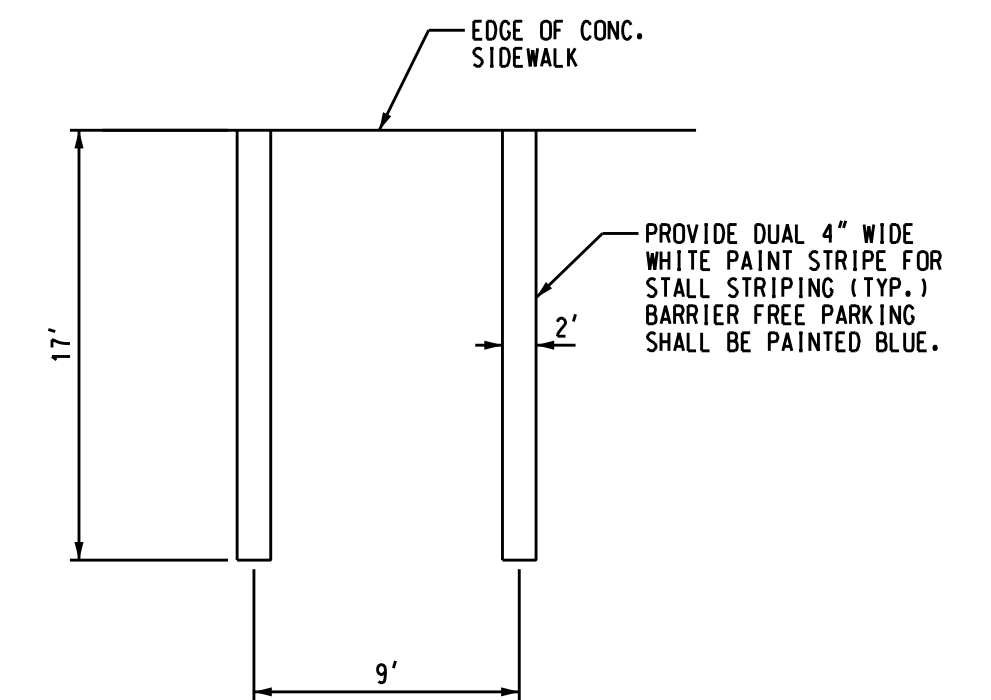
OUTLET CONTROL STRUCTURE
NO SCALE



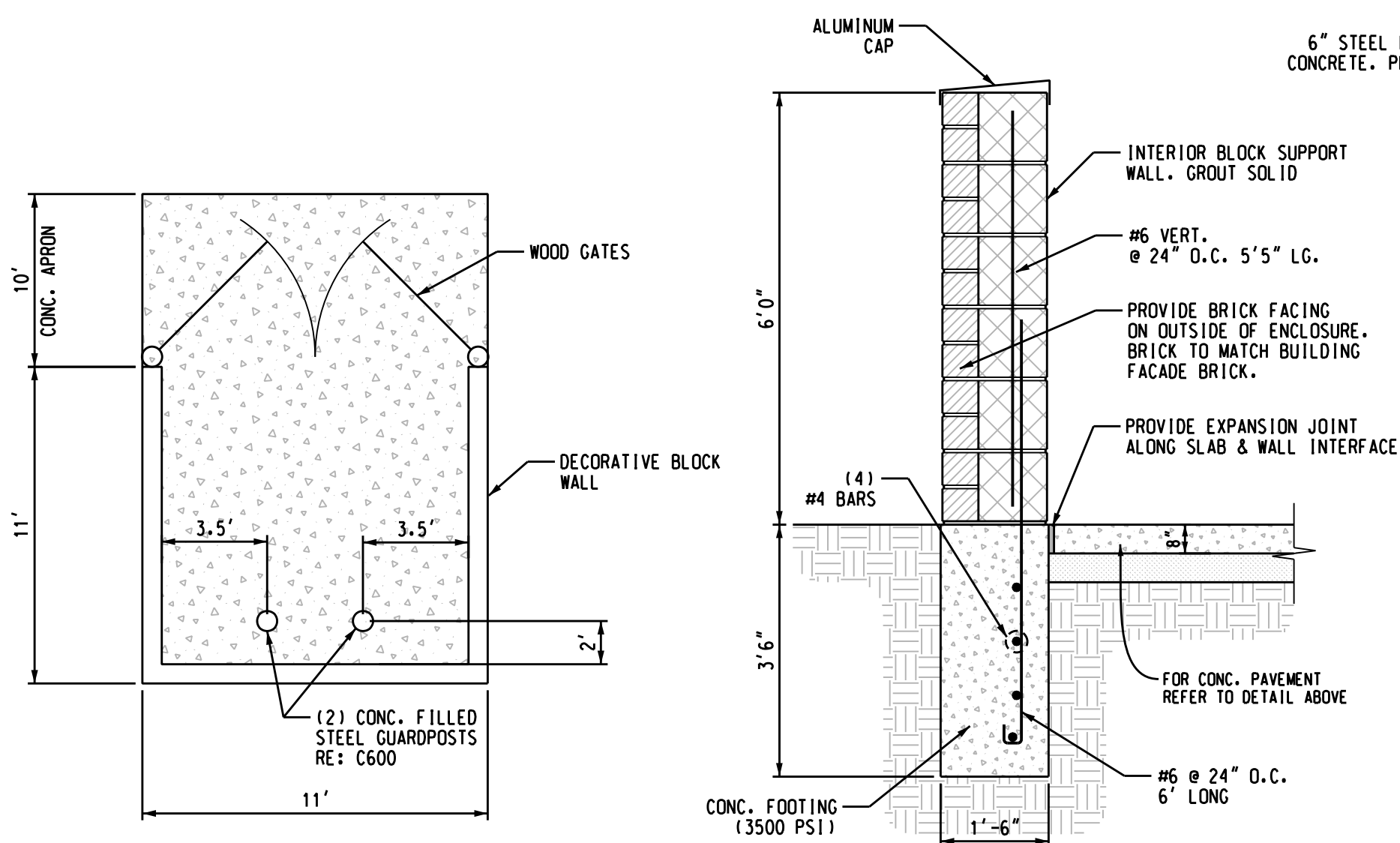
GUARD POST DETAIL
NO SCALE



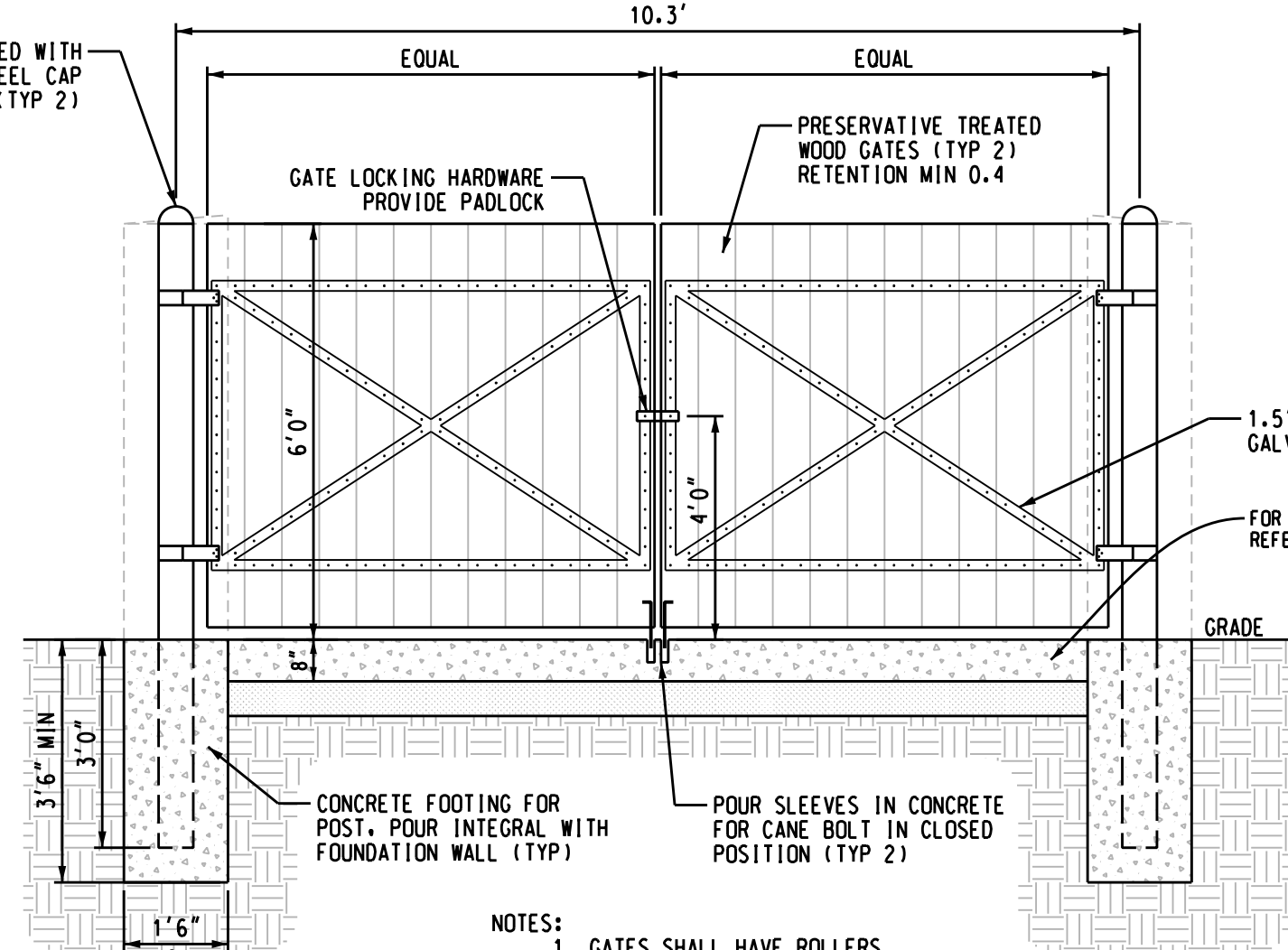
DECORATIVE ALUMINUM FENCE DETAIL
NO SCALE



PARKING STALL PAINT STRIPING DETAIL
NO SCALE

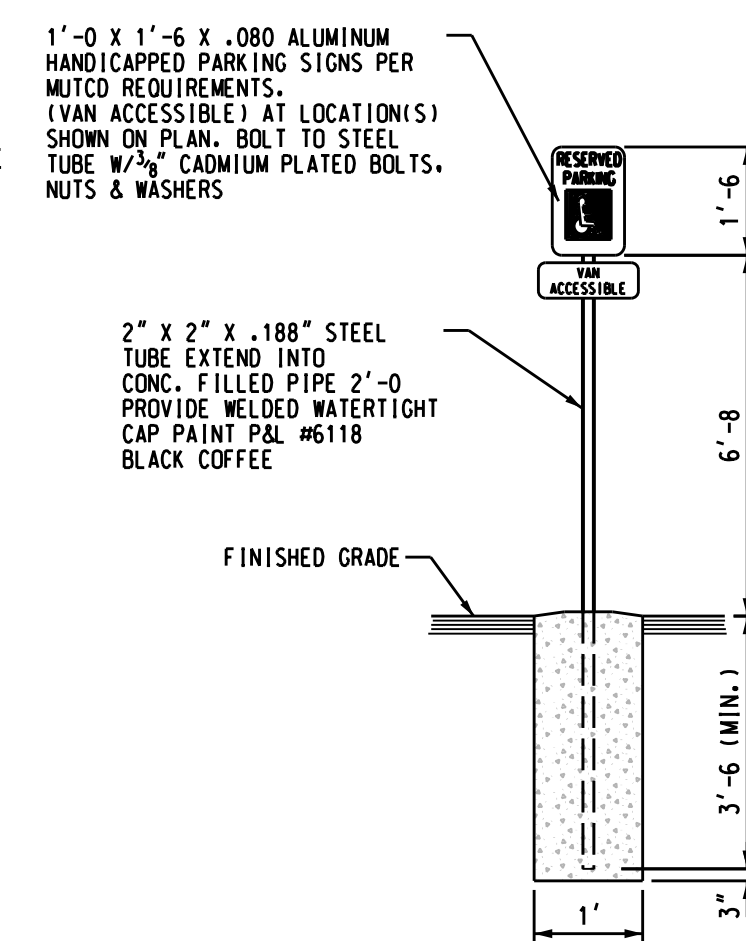


TRASH ENCLOSURE DETAIL
NO SCALE



FRONT ELEVATION

NOTES:
1. GATES SHALL HAVE ROLLERS.
2. COLOR OF GATES SHALL COMPLEMENT COLOR OF BRICK.



BARRIER FREE PARKING SIGN
NO SCALE

1'-0" x 1'-6" x .080 ALUMINUM HANDICAPPED PARKING SIGNS PER MITED REQUIREMENTS (VAN ACCESSIBLE) AT LOCATION(S) SHOWN ON PLAN. BOLT TO STEEL TUBE W/ 1/2" CADMIUM PLATED BOLTS, NUTS & WASHERS

2" x 2" x .188" STEEL TUBE EXTEND INTO CONC. FILLED PIPE 2'-0" PROVIDE WELDED WATER TIGHT CAP PAINT PAL #6118 BLACK COFFEE

DRAWN
DESIGNED BRZEZINSKI
CHECKED QUADERER
FIELD WORK



Griggs Quaderer Inc.
CIVIL ENGINEERING · LAND SURVEYING · SITE PLANNING

8308 OFFICE PARK DRIVE
GRAND BLANC, MI 48439
PH: (810) 695-0154
FX: (810) 695-0158
WWW.GQINCORP.COM

NO.	DATE	SUBJECT
	04-12-22	REISSUED TO WHITE LAKE TWP.
	01-12-22	REISSUED TO WHITE LAKE TWP.
	12-13-21	REISSUED WHITE LAKE TWP.
	10-28-21	WHITE LAKE TWP. (SITE PLAN)
	04-13-21	TOPOGRAPHIC SURVEY
NO.	DATE	SUBJECT
REVISION OR ISSUE		

NORTHWEST 1/4 SECTION 36 T-3N, R-8E

COMFORT CARE

UNION LAKE ROAD
WHITE LAKE TWP.,
OAKLAND COUNTY
STATE OF MICHIGAN

DRAWING TITLE
SITE DETAILS

PROJECT NUMBER	210303	SHEET	C600
PROJECT PHASE	SPA		

PROPOSED NEW SENIOR HOUSING
COMFORT CARE SENIOR LIVING
 UNION LAKE ROAD, WHITE LAKE TOWNSHIP

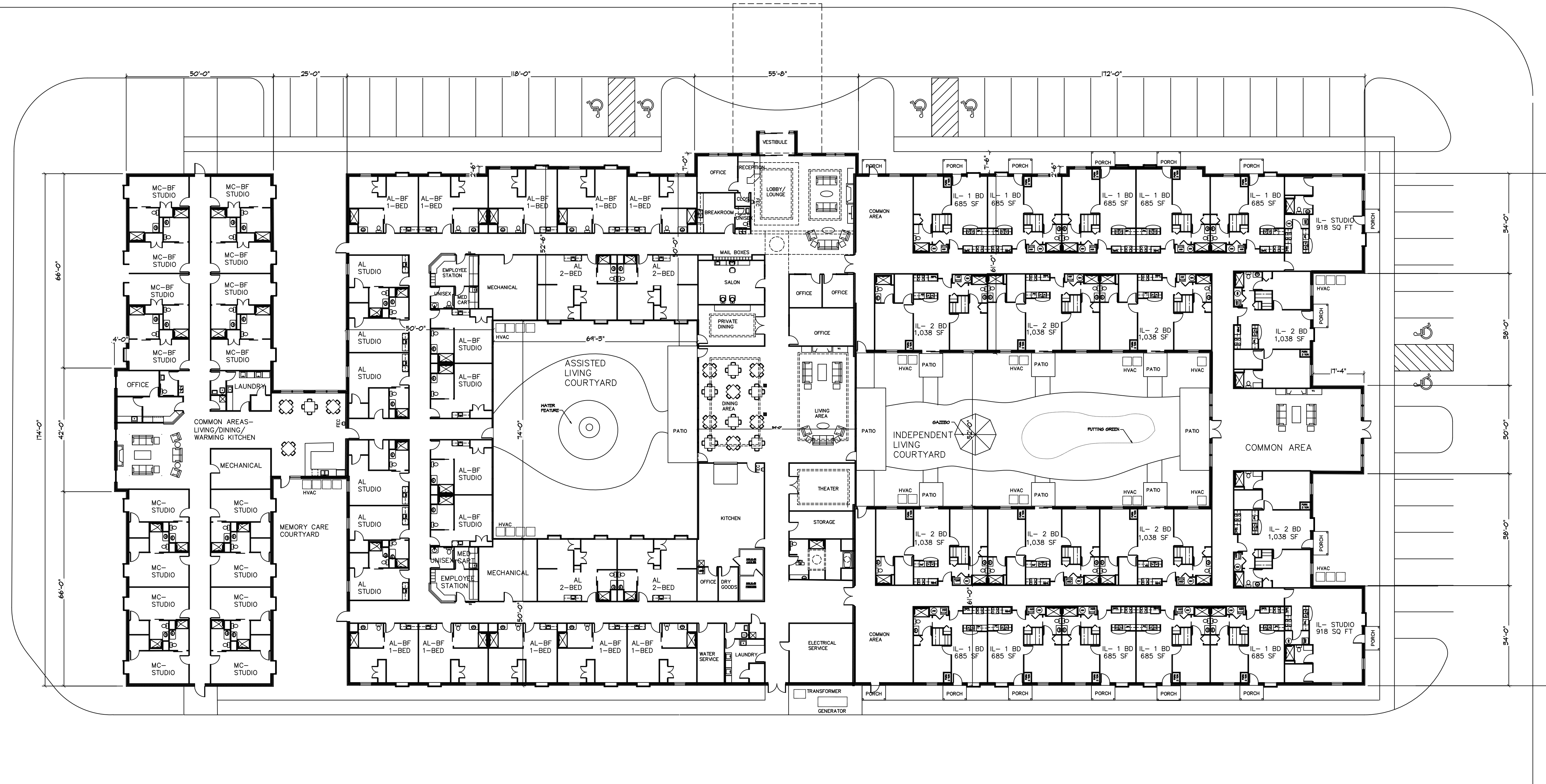
CONCEPTUAL FLOOR PLAN

REVISIONS

1	12-8-2021
2	1-7-2022
3	2-14-2022
4	

JOB NO: 021-024
 DATE: 6-1-2021
 DRAWN BY: JKC
 SCALE: AS NOTED
 SHEET NO:

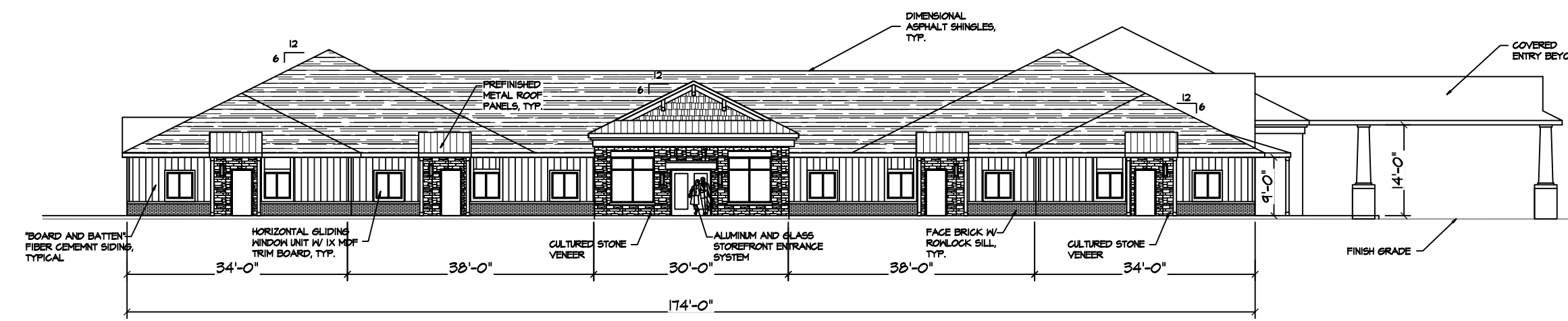
A1



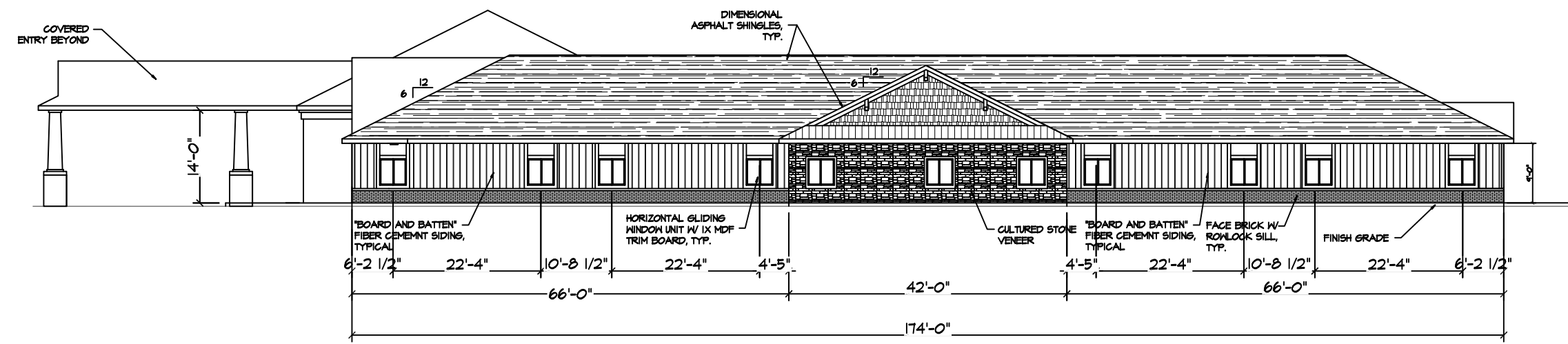
CONCEPTUAL OVERALL FLOOR PLAN
 1" = 20'-0"

UNIT SUMMARY
ASSISTED LIVING
 10-AL STUDIO UNITS
 4-AL ONE BED UNITS
 8-AL TWO BED UNITS
 16-MC STUDIO UNITS
 TOTAL AL UNITS = 40
 34,970 SQ FT

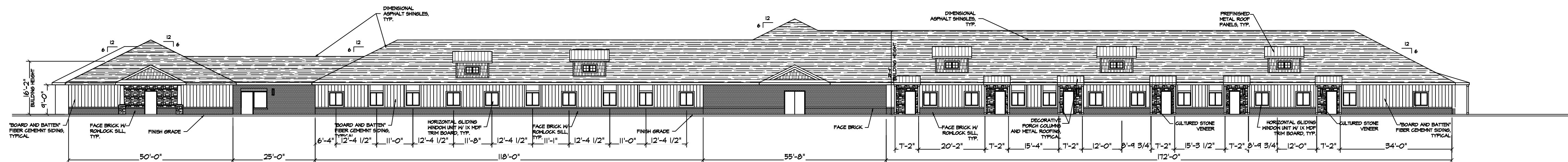
INDEPENDENT LIVING
 2-IL STUDIO UNITS
 10-IL ONE BED UNITS
 8-IL TWO BED UNITS
 TOTAL IL UNITS = 20
 22,473 SQ FT



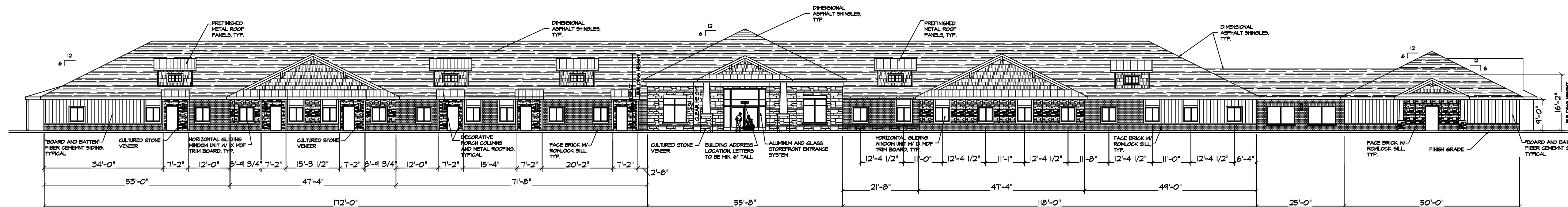
CONCEPTUAL EAST ELEVATION
 1" = 20'-0"



CONCEPTUAL WEST ELEVATION
 1" = 20'-0"



CONCEPTUAL SOUTH ELEVATION
 1" = 20'-0"



CONCEPTUAL NORTH ELEVATION
 1" = 20'-0"

REVISIONS

1	2-8-2021
2	1-7-2022
3	2-14-2022

JOB NO: 021-024
 DATE: 6-1-2021
 DRAWN BY: JKC
 SCALE: AS NOTED

SHEET NO:

A2

Rik Kowall, Supervisor
Anthony L. Noble, Clerk
Mike Roman, Treasurer



Section 8, Item C.

Scott Huggles
Liz Fessler Smith
Andrea C. Voorheis
Michael Powell

WHITE LAKE TOWNSHIP

7525 Highland Road • White Lake, Michigan 48383-2900 • (248) 698-3300 • www.whitelaketwp.com

June 28, 2022

Steven Hutch
9910 Highland Rd
White Lake, MI 48386

Mr. Hutch

At the September 21, 2021 White Lake Township Board meeting, the Board approved the revocation of the Demolition Order for your house located at 9910 Highland Rd. This decision was conditioned on the progress of construction to the satisfaction of the Building Official, and the project being completed in eight months.

As of today, the conditions of the demolition order revocation have not been satisfied; very little work, other than removal of the roof structure has been completed. The house has been fully open to the elements for several months, further deteriorating an already dilapidated structure. The eight-month time period expired on May 21, 2022. Therefore, at the July 19, 2022 I will be making a formal request to the Township Board to reinstate the demolition order as previously approved. Moving forward with any work on this structure is at your own financial risk, as the board may reverse their decision.

If you have any questions call the White Lake Township Building Department at (248)698-3300, ext. 2.

Sincerely,

A handwritten signature in black ink, appearing to read "Nick Spencer".

Nick Spencer, Building Official
White Lake Township



POLICE DEPARTMENT

CHARTER TOWNSHIP OF WHITE LAKE

DANIEL T. KELLER
CHIEF OF POLICE

July 7, 2022

Rik Kowall, Township Supervisor
White Lake Township

RE: PHONE/RADIO RECORDING EQUIPMENT PURCHASE PROPOSAL

As with most police agencies, the need to record and preserve phone calls and radio traffic is paramount. The nature of our work requires that we have the ability to pull phone calls and audio logs for a myriad of reasons. Quality control, court discovery, internal investigations, and Freedom of Information Act (FOIA) requests come into the police station on a daily basis. The system we currently use is the DI Series event recorder, which is accessed through a client based operating software called Enhanced Courier. This current system replaced a reel-to-reel system which used to record all calls to a rolling tape. The DI series system is now out of date, unsupported, and showing signs of failure. A client based system means that in order to access the recordings, there has to be a computer program installed on each individual terminal. The server that houses the calls is stored on-site and based on this type of technology there is no ability for remote support. For example, in approximately July of 2021, we discovered that for a two week period, the system failed and we were not recording any data on our administrative lines. With no remote tech support, we had to have a local vendor "backdoor" the system and get it operational. We will never recover the lost phone calls. To further explain the aging system, Lieutenant Ivory was unable to locate any paperwork for the purchase and installation of the DI system. Best estimates show that the system is no less than twelve to fourteen years old. The operating system on the server is Windows 7 which is a completely unsupported operating system. The potential pitfalls of continuing to use this system cannot be overstated. If the system decides to fail, we will not be able to fix it and there is no replacement for what we have. Current shipping and installation time frames for updated equipment are currently running at four to six weeks. A four to six week gap in recording of information is catastrophic.

With the knowledge of the failing system, Lieutenant Ivory began researching up-to-date solutions, which could potentially support us for the next seven to ten years. Keeping in mind that the Township is in the process of constructing a new Public Safety Building, one of the parameters of his search included portability. In looking at the standard of recording platforms, Lt. Ivory found that three systems are more universally used than any other. Those systems are Equature, Eventide, and NICE. While NICE is an option, Lt. Ivory has not been able to find any agencies in Michigan that use the NICE recording system. Lt. Ivory also has not been able to locate support locations for NICE, meaning that if remote support was not able to handle a breakdown, then a technician would have to be dispatched from another state. Based on these issues, Lt. Ivory discounted NICE as a viable option. He reached out to three vendors for the remaining two systems.

Lt. Ivory spoke with John Pace from Interaction Insight Corporation, Mark Traeger Eventide, Inc., and Paul Frezza from Equature. Both Eventide and Equature are highly recommended and systems used in Michigan. Mark Traeger and John Pace are both resellers of the Eventide System. Paul Frezza works directly for Equature and is the sole source of that equipment. They are the manufacturer of the product and do not have retail sales companies. Further research revealed that the Eventide system is used in the northern parts of Michigan, as well as various agencies in the south, boarding Ohio and Indiana. The Equature system is universally used by all Public Safety Answering Points (PSAPs) in Oakland County. Paul Frezza is the representative for the accounts for twenty dispatch centers in Oakland County, including the Sheriff's Office. He is familiar with CLEMIS and their systems have been adapted to interact within that operating space. Lt. Ivory provided the necessary information to all three sales representatives and received quotes back from all three. The quotes listed below are based on investment cost for the systems. There are additional service and maintenance costs, which are discussed within each quote, however there are many options for payments so the listed number at the top does not factor in maintenance cost.

INTERACTION INSIGHT (EVENTIDE DEALER)	\$26,565.00
QUALITY ASSURANCE AND MAINTENANCE	\$16,400.00
TOTAL	\$42,965.00

This quote is for the installation of all needed hardware, software, and operating licenses, including 16 analog channels of recording and the first year of onsite service. The quote also includes 24 VoIP lines (we need 21 but they are sold in groups of 8). The police department also uses Emergency Call Works for 911 lines. The integration package for ECW is another \$9,995.00. It is considered an optional upgrade. In order to have quality assurance support, the add-on is \$3,200.00. Finally, this quote only covers remote and onsite support for the first year, which is listed as Monday through Friday from 0900 hrs. to 1700 hrs. The additional years of coverage were not listed in the quote, however in speaking with John Pace, he advised that additional coverage years would be approximately \$3,300 per year and it's based on a percentage of the cost of the system. He was unable to provide an exact number.

EVENTIDE INC	\$29,437.90
MAINTENANCE	No return calls.
TOTAL	Unknown

This quote is for the installation of all needed hardware, software, and operating licenses, including 24 analog channels of recording and the first year of onsite service. This quote does also not account for any VoIP channels and licenses that will be needed in the switch over. It also does not specify what the additional cost would be for those VoIP channels. Any cost associated with the VoIP switch would be in addition to the above mentioned quote. Finally, this quote also does not account for extended service plans, which would be at the cost of \$3,350.00 or more per year, depending on the setup which we select.

On June 27th, 2022, Lt. Ivory attempted to contact Mark Traeger via both telephone and email. He has yet to receive a return email and upon calling the number provided, he was greeted with a message that states the number is no longer in service. Lt. Ivory has been unable to get in contact with Mark Traeger in any other fashion. The quote from Eventide Inc. was the highest based on previous need and it is reasonable to believe that it would have been the highest with the VoIP options added per the requested quote.

EQUATURE	\$25,779.00
MAINTENANCE	\$15,464.00
TOTAL	\$41,243.00

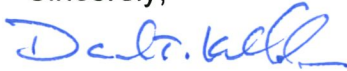
This quote is for the installation of all needed hardware, software, and operating licenses, 8 analog channels of recording and the first year onsite service. This quote also takes into account 21 additional VOIP channels that are being planned for installation. As stated, this amount includes the first year of remote and onsite service. This quote also specifically outlines additional cost for continued support services through years two to five. The cost of the yearly maintenance on the system is \$3,866.00. Equature has quoted and offers multiple methods to pay for the solution.

Option 1 is to pay for the system and installation and then pay yearly for the maintenance agreement. This would be an upfront cost of \$25,779.00, with four years of reoccurring costs totaling \$3,866.00 plus a potential cost increase of around 6% every year for the four years. Option 2 is the "paid-in-full" option. This includes initial equipment, the installation costs, and then prepaying for the four additional years of service. If we choose this option, we would receive a 5% discount on equipment and it would lock in the maintenance agreement rate at \$3,866.00. We would see no cost increase for maintenance. The total cost of this option is \$40,930.85 and would cover us for five years from the date of installation with yearly costs. Option 3 is referred to as the "Premier Partnership Agreement". This option amortizes the cost of the system, with the maintenance agreement locked in for five years. The upfront cost of the equipment, installation and first year of service is \$9,998.60. Years two through five would be an annual cost of \$8,248.60. This option does not incur the cost increase in the maintenance agreement, however it also does not allow for the 5% paid in full discount. The total cost of this option over five years is \$42,993.00.

After careful review and consideration of all the quotes provided, it is my recommendation that we select Equature as the recording solution. The company is based in Southfield, MI and the account representative, Paul Frezza, works out of Clarkston. Communication with Mr. Frezza has been highly responsive. The quote from Equature accounted for all of our current and future needs, including the additional of VOIP lines which are now coming. When looking at the total recording solution, Equature is the cheapest of all the options, once maintenance is factored. Oakland County and all Oakland County PSAPs are currently using the Equature system. Having a known integration already existing with CLEMIS is a benefit which eliminates many unknowns such as hidden costs associated with day one integrations.

If the Equature system is selected, it is my recommendation that we select either the "paid-in-full w/ 5 year maintenance agreement" option or the Premier Partnership option. Either option locks in the maintenance costs, which otherwise could rise year by year as much as \$200.00 per year. Paul Frezza advised that if his company is selected, timeframe for shipping and installation would be approximately four to six weeks, however since we are local and they already service Oakland County, should we experience a failure of a DI system, he could potentially expedite the installation to accommodate our need. I have attached copies of all the quotes I received to this memorandum as supporting documents for the numbers I have outlined.

As you are aware, a portion of the recording that we do is for the White Lake Township Fire Department. Per our conversation with Chief Holland on July 1st, 2022, they will be providing funding for their recorded lines and a portion of the equipment. They are recording four radio lines at \$400 per line and assisting with half the cost of the 16 port switch card. Their half of the switch card is \$1,865.00. Their total provided funding will be \$3,465.00. This quote would increase by the amount of the four analogue lines, however the cost for the 16 port switch card is already factored in. I am requesting the Board approve the total amount of \$42,530.85 for the Equature system.

Sincerely,

Daniel T. Keller
Chief of Police



125 Half Mile Road Suite 200
Red Bank, NJ 07701
Phone: 216.666.2700
jpace@scaloggers.com

Lt. Matt Ivory
White Lake Twp PD
7525 Highland Road
White Lake, MI 48383

EVENTIDE

- Eventide NexLogDX 740 Recording System and Application Software
- 16 - Analog Channels
- 24 - VoIP Channels
- Recording with MediaWorks Access Licenses for Eight Users
- Built-In Redaction
- 911 NENA ANI/ALI Integration
- Instant Recall for Dispatchers
- The Chassis comes with:
 - (2) RAID-1 1TB Swappable Hard Drives
 - (1) Blu-ray Drive
 - Dual Hot Swappable Power Supplies
 - Embedded Linux NexLog Base Software
 - Network Cards
 - Rack Mount
 - Archiving to your SAN
- Project Management & Testing
- On-Site & Remote Installation
- Unlimited On-Site and Remote Training
- One-Year **(M-F, 9-5)** Onsite & Remote Support

TOTAL FOR SYSTEM = \$26,545.00



NEXLOG COMMUNICATIONS RECORDING SYSTEMS

1 Alsan Way, Little Ferry, NJ 07643
t. 603 490-5258 f.

Section 9, Item A.

Date Jan 31, 2022

Quote No. MBHRQ2197-01

(Please include our Quote No. on your P.O.)

Quoted To: White Lake Twp PD 7525 Highland Road White Lake, MI 48383	Ship To: White Lake Twp PD 7525 Highland Road White Lake, MI 48383	Eventide Sales Contact: Mark Traeger Business Development Manager EVENTIDE INC. (603) 887-5589 Extension
Phone	Phone	
Email	Email	

Quote Description:

Quoted By	Warranty	Payment Terms	Discount	Freight Terms	Valid For
Mark Traeger	Standard One Year	Net 30 Days	0% (LIST)	FOB Factory	90 Days

Line	Part No.	Item Description	Qty	Unit List	Ext'd List	Disc.	Unit Price	Ext'd Price
1	NexLog740DX	NexLog 740 DX-Series base system: 3U rack-mountable, Core i5 CPU, 16GB DDR4 RAM, 2 x1TB fixed-Mount HDDs (RAID 1), 1 Blu-ray Multi-Drive, 2 Network Ports (100/1000), Embedded Linux, NexLog DX-Series software, web-based configuration manager, audio controls & amplified speaker on front panel, dual hot-swap 120-240VAC 50/60Hz power supplies and first year hardware warranty. Requires ongoing Eventide DX Software Update Subscription (DXSUS) for access to critical DX-Series Software & Security Updates.	1	\$7,995.00	\$7,995.00	0%	\$7,995.00	\$7,995.00
2	DX701	Integrated 7" Color LCD Touch Screen Display for NexLog 740 DX-Series	1	\$1,595.00	\$1,595.00	0%	\$1,595.00	\$1,595.00
3	108109	Rack Mt Slides - 2 Post Center Mt., 3U (for NexLog 740)	1	\$450.00	\$450.00	0%	\$450.00	\$450.00
4	271083	8 pack MediaWorks DX web concurrent license [About MediaWorks DX: Advanced browser-based HTML5 interface for Search, Replay, Incident Reconstruction, Incident Export, Live Monitoring, Instant Recall and more]	1	\$995.00	\$995.00		\$995.00	\$995.00

Line	Part No.	Item Description	Qty	Unit List	Ext'd List	Disc.	Unit Pr	
------	----------	------------------	-----	-----------	------------	-------	---------	--

Section 9, Item A.

0%

5	DX799	Upgrade 740 DX-Series (at time of order) 2x1TB HotSwap RAID1=1TB storage	1	\$1,850.00	\$1,850.00	0%	\$1,850.00	\$1,850.00
6	DXANA24	24-Channel Analog PCIe (PCI Express) Card, 24 Ch. Licenses (For use in DX-Series recorders only)	1	\$6,000.00	\$6,000.00	0%	\$6,000.00	\$6,000.00
7	109033-007	Quick Install Kit (23 ft Cable + "66" Block)	1	\$300.00	\$300.00	0%	\$300.00	\$300.00
8	209029	911 NENA ANI/ALI CAD Spill Integration	1	\$3,495.00	\$3,495.00	0%	\$3,495.00	\$3,495.00

SubTotal

\$22,680.00

\$22,680.00

9	DXSUS-12MO	SOFTWARE UPDATE SUBSCRIPTION (DXSUS): FIRST 12 MONTHS IS INCLUDED. AFTER THE FIRST 12 MONTHS, EACH 12-MONTH SUBSCRIPTION PRICE IS 3% OF TOTAL LIST PRICE (NON-DISCOUNTABLE)	1	\$0.00	\$0.00		\$657.90	\$657.90
---	------------	---	---	--------	--------	--	----------	----------

Services

10	500011	Installation and Training by Third Party Provider, Per Site, USA Only	1	\$2,750.00	\$2,750.00	None	\$2,750.00	\$2,750.00
11	500013	First Year M-F, 9-5 Onsite Support	1	\$3,350.00	\$3,350.00		\$3,350.00	\$3,350.00

Line	Part No.	Item Description	Qty	Unit List	Ext'd List	Disc.	Unit Price
------	----------	------------------	-----	-----------	------------	-------	------------

Section 9, Item A.

Total List Price (USD):	\$28,780.00	Total Net Price (USD):	\$29,437.90
--------------------------------	--------------------	-------------------------------	--------------------

Thank you for requesting this Eventide NexLog Quotation.

Sincerely,

Export Information: HTS Code: 8519813000. Commodity Code: 8519813000. ECCN for NexLog systems without P25, TETRA or 9-1-1 licenses is 5D002.c.1 with 740.17(b)(1) treatment. ECCN for NexLog systems with P25, TETRA or 9-1-1 licenses; and for Add-On licenses for P25, TETRA or 9-1-1 is 5D002.c.1 with 740.17(b)(2) treatment. Export or re-export of NexLog products or services to destinations, companies or individuals subject to USA embargoes or restrictions (including Cuba, Iran, North Korea DPRK, Sudan and Syria) are prohibited.

June 27, 2022

Thank you for investing your valuable time in Equature! We are excited and grateful for the opportunity to begin our partnership into the future. With that in mind, we have created a Strategic Recording Plan with the highest level of recording capability.

The Strategic Recording Plan features:

- Replacement of Existing Hardware
- Next Generation 911 Capture Software
- Unlimited Client Access License(s)
- Lifetime Software Upgrades & Training
- 24/7/365 Technical Support (Remote & On-Site)
- 24/7/365 Proactive Alert & Monitoring
- Self-Healing Software
- Internal & External Archive Data Storage

As a true Public Safety focused firm Equature only works with PSAPs, providing mission critical recording systems, full-service dispatch training and video/AI technology to agencies across the country. Equature is proud to have been the recording partner to more than 3000 Police, Fire, EMS, Universities, Hospitals, Primary and Secondary PSAPs nationwide and we are looking forward to beginning our partnership with White Lake Township Police!



Paul G. Frezza II, ENP, PMP

Public Safety Professional



A: 18311 W. Ten Mile Road, Southfield MI-48075
P: 248.281.1078 | **M:** 248.752.0115 | **F:** 248.569.6567
W: www.equature.com | **E:** pfrezza@equature.com

EQUATURE

18311 W. 10 Mile Road
Southfield, MI 48075



Section 9, Item A.

Equature NG9-1-1 Solution Highlights

- Fully NG9-1-1 Compliant (NENA i3)
- Analog & VoIP Capture Engine
- Motorola P25 Compliant
- ANI/ALI & RapidSOS Data Integration
- Quality Assessment Package

Equature Full-Service Agreement

Equature provides full hardware, software, and proactive alert response measures for the life cycle of the agreement.

Equature Software Agreement

Throughout the lifetime of our partnership, Equature guarantees you will have the latest, most up-to-date recording software available from Equature to the market. As an Equature partner you will receive annual software updates and enhancements at no additional costs or fees.

Equature Direct Advantage

Equature focuses on a direct marketing model. We manufacture, sell, support, service, and train all right here in the United States. We provide 24x7x365 Proactive Onsite Support anywhere in the U.S. within 4 hours. Our Equature Direct Advantage model allows us to build functionality faster based on our PSAP client's needs.

Equature Premier Partnership Program

The premier partnership program divides the total cost of the recording server and maintenance cost over a five-year period. By selecting this option, you are acknowledging a five-year commitment to net amount listed. Equature will continue to keep your recording server's software updated and maintained throughout the contract's lifespan.

EQUATURE18311 W. 10 Mile Road
Southfield, MI 48075

Section 9, Item A.

Name: **White Lake Township Police**
 Address: **7525 Highland Road**
White Lake MI 48383
 Attn: **Lt. Matthew Ivory**
 Phone: **(248) 698-4400**
 Email: mivory@whitelakepolice.com

Date: **June 27, 2022**
 Contact: **Paul G. Frezza II**
 Phone: **(248) 281-1078**
 Email: pfrezza@equature.com
 Fax: **(248) 569-6567**

Item	Qty	Model #	Deliverable	Investment
			Equature NG911 Core Solution - 29 Channel Capture (Expansion Ready)	
1	1	EQRECSRV	Equature Advanced 4U Server Chassis <ul style="list-style-type: none"> • Intel 2.1 GHz Intel Silver processor • 16GB RAM • Storage: 2TB RAID1 Internal & External Archive RAID1 • Redundant Hot Swap Power Supplies • Windows 10 LTSB 2019 	INCLUDED
2	1	EQCORE	Equature NG Virtual Core Software Suite	INCLUDED
3	1	EQLD1609	Viewpoint Virtual Core Site License Software	INCLUDED
4	29	EQV001	Equature Analog Recording Interface Care Equature Voice Device License(s) 8 Analog Compliant 21 VoIP Compliant	INCLUDED
5	1	EQANI	Equature DataFeed (ANI/ALI Integration)	INCLUDED
6	6	EQSUR	Equature Assessments & Reporting Package - 6 Dispatchers	INCLUDED
	1	Warranty	One-Year Equature Warranty 24x7x365 Support & Proactive Monitoring	INCLUDED
Investment				\$25,779.00
Professional Services (One-Time)				\$1,750.00
Years 2 - 5 Annual Maintenance (CPI Increase)				\$3,866.00
Outright Purchase w/5-Year Warranty & Professional Services				\$40,930.85

Assumptions:

- (1) One Hundred (100%) percent of "Annual Investment" due upon receipt of equipment.
- (2) Professional Services: Implementation, Quality Confirmation & Training.
- (3) One Hundred (100%) of "Professional Services" due upon acceptance sign-off.

Client Acceptance

- () Outright Purchase w/One-Year Warranty
 () Outright Purchase w/Five-Year Prepaid Warranty
 () Premier Partnership Program

Signature: _____ Date: _____

Print Name: _____ Title: _____

Please fax to Paul G. Frezza II at (248) 569-6567 or E-Mail pfrezza@equature.com

Equature Premier Partner Program Agreement

The Equature Premier Partner Program provides a full NG9-1-1 Recording solution along with full extended warranty. The program is an extended warranty program where CUSTOMER pays annually for five years at a locked in rate and receives full support, feature enhancements and software updates.

Equature (hereunder referred to as “PROVIDER”), upon acceptance of this Agreement by an authorized officer of its corporation, agrees to furnish to the above-designated entity (hereinafter referred to as “CUSTOMER”) under the terms and conditions contained herein, warranty and service on the solution deliverables list.

Adjusted Annual Investment	\$8,248.60
Professional Services	\$1,750.00

Payment Allocation Table		
Year 1	\$9,998.60	Annual Investment & Professional Services
Year 2	\$8,248.60	Annual Investment
Year 3	\$8,248.60	Annual Investment
Year 4	\$8,248.60	Annual Investment
Year 5	\$8,248.60	Annual Investment

I. Terms of Agreement

This agreement between PROVIDER and CUSTOMER shall remain in force for an initial period of Five (5) years. The Maintenance Agreement shall be automatically renewed by CUSTOMER after the initial term in one-year increments. Details of the equipment serviced, and special terms are outlined in Exhibit A.

II. Maintenance Agreement Charge

- a) This Maintenance Agreement charge is payable annually in advance at the beginning of each term. The Agreement price shall remain fixed during the initial period (5 years).
- b) Charges include unlimited calls, 24 X7, 4-hour response time, software updates, remote access, remote alerts, all parts and labor not excluded in section c or d.
- c) Charges do not include consumable, expendable, supply items, such as, CD disks, or External Archive Drives. The use of supplies other than those recommended by PROVIDER may cause adverse equipment performance. Maintenance required to correct inadequate performance or equipment malfunctions caused by inferior supplies shall be charged to the CUSTOMER at the current hourly maintenance rates.
- d) Charges do not include labor costs, installation charges, or equipment costs associated with system upgrades or changes to the PROVIDER configured system recommended or mandated by either party. Changes to the PROVIDER configured systems made by the CUSTOMER or third parties not authorized causing malfunction will be fixed by PROVIDER on a time and material basis.
- e) The PROVIDER is not responsible for data loss due to corruption, user error, computer error, computer failure, provider error, and power surges. The PROVIDER can recover data at a cost to the CUSTOMER.
- f) The PROVIDER is not responsible for Microsoft Windows hot fixes, updates, and service packs. The PROVIDER is not responsible for anti-virus, anti-malware, and anti-spyware software. If the CUSTOMER encounters a virus the PROVIDER may assist at a cost and at the PROVIDERS discretion.
- g) All invoices are due and payable upon receipt. Equature owns the equipment until year 5 payment is received.

III. Maintenance of Equipment

- a) PROVIDER shall provide service on equipment covered by Maintenance Agreement 24 hours per day, seven days per week with a one-hour response time.
- b) Upon notification of an equipment malfunction from the CUSTOMER, PROVIDER will assign a service technician to make necessary repairs. The customer shall permit the service technician free access to the equipment while making the repair, including relevant password for normal system use.
- c) Maintenance required due to fault of negligence of the CUSTOMER shall be charged at the current hourly rates.
- d) Preventative maintenance shall be performed on a scheduled basis according to data processing volume.

IV. Excusable Delays / Force Majeure

PROVIDER shall not be liable or deemed in default for any delay or failure in performance under this Agreement or interruption of service resulting directly from acts of God, acts of government, war or national emergency, accident, fires, riots, strikes, labor disputes, action or inaction where action is required by the CUSTOMER, damage to or delay of equipment in route, or for any indirect or consequential damage for any delay or failure or performance under this Agreement.

V. Default

In the event CUSTOMER fails to make the maintenance payment as herein provided or fails to observe or perform any term or conditions hereof, and such default shall continue for a period of twenty (20) days after PROVIDER shall have given written notice thereof, then PROVIDER may, at its option, and in addition and without prejudice to any other remedies, declare the entire amount of unpaid charges immediately due and payable, and/or terminate this Agreement.

VI. Transfer of Maintenance Service

If CUSTOMER relocates the equipment from the site shown herein, it shall be at the sole option of the PROVIDER to continue to provide maintenance under this Agreement, and this may result in additional cost to CUSTOMER. CUSTOMER should arrange for continuing maintenance with PROVIDER prior to relocation of equipment.

VII. Assignment

This Agreement may not be assigned, transferred, sublet, or pledged by the CUSTOMER without prior written consent of an authorized officer of the PROVIDER Corporation. However, this agreement may be assigned to an entity controlling, controlled by, or under common control with customer or any successor by merger.

VIII. Governing Law

This Agreement shall be governed by and construed in accordance with the laws of the State of Michigan exclusive of its conflicts of law provisions.

IX. Survival of Obligations

All obligations accrued but unfulfilled prior to expiration or termination of this Agreement shall survive.

X. Entire Agreement

This document and the documents incorporated herein constitute the entire Agreement between the CUSTOMER and PROVIDER. This Agreement supersedes any prior proposals, agreements, commitments, or representations of any kind, whether oral or written, with respect to PROVIDER service.

Proposal Incentive Expiration Date: 7/31/2022

**WHITE LAKE TOWNSHIP
INTER-OFFICE MEMORANDUM
COMMUNITY DEVELOPMENT DEPARTMENT**

DATE: July 8, 2022

TO: Rik Kowall, Supervisor
Township Board of Trustees

FROM: Sean O'Neil, AICP
Community Development Director

SUBJECT: **The Avalon f.k.a. White Lake Hill**

Preliminary site plan approval and rezoning request

Property described as parcel number 12-20-101-003 (1085 Hill Road), located on the north side of Highland Road, west of Hill Road, consisting of approximately 68.96 acres. Property described as parcel number 12-20-126-006, located north of Highland Road, east of Hill Road, consisting of approximately 41.06 acres. Applicant requests to rezone parcel number 12-20-101-003 from (AG) Agricultural and (PB) Planned Business to (PD) Planned Development or any other appropriate zoning district, and parcel number 12-20-126-006 from (R1-A) Single Family Residential to (PD) Planned Development or any other appropriate zoning district.

The rezoning request was considered by the Planning Commission at their regular meeting of April 21, 2022 at which time the **Planning Commission recommended approval of this rezoning request**. The preliminary site plan approval was considered by the Planning Commission at their regular meeting of July 7, 2022, at which time the **Planning Commission recommended approval of the preliminary site plan**. Please find enclosed the following related documents:

- ❑ Minutes of the April 21st, 2022 Planning Commission meeting.
- ❑ Draft minutes of the July 7th, 2022 Planning Commission meeting.
- ❑ Review letters prepared by the Township Engineering Consultant, Mike Leuffgen, dated May 25, 2022 and April 13, 2022.
- ❑ Review letter prepared by DLZ Traffic Consultant, Leigh Merrill, dated June 15, 2022.
- ❑ Review letters prepared by the Township Staff Planner, Justin Quagliata, dated May 25, 2022 and April 13, 2022.
- ❑ Review letter prepared by White Lake Township Fire Chief, John Holland, dated May 24, 2022.
- ❑ Site plan and floor plans submitted by the applicant
- ❑ Community impact statement submitted by the applicant.
- ❑ Traffic impact study submitted by the applicant.

Please place this matter on the next available Township Board agenda. Do not hesitate to contact me should you require additional information.

**WHITE LAKE TOWNSHIP
PLANNING COMMISSION**

Township Annex, 7527 Highland Road
White Lake, MI 48383
July 7, 2022 @ 7:00 PM

CALL TO ORDER

Commissioner Anderson called the meeting to order at 7:00 PM and led the Pledge of Allegiance. Roll was called.

ROLL CALL

Steve Anderson
Merrie Carlock
Pete Meagher
Debby Dehart
Robert Seeley
Scott Ruggles
Mark Fine

Absent: Matt Slicker
T. Joseph Seward

Also Present: Sean O’Neil, Community Development Director
Justin Quagliata, Staff Planner
Mike Leuffgen, DLZ
Lisa Kane, Recording Secretary

Visitors: Approximately 10 members of the public were present

APPROVAL OF AGENDA

Commissioner Seeley moved to approve the agenda of the July 7, 2022 Planning Commission Meeting.

Commissioner Fine supported and the MOTION CARRIED with a voice vote: 7 yes votes.

APPROVAL OF MINUTES

- a. Regular meeting minutes of June 16, 2022
- b. Commissioner Anderson requested amendments to the minutes, showing the motions carrying for tabling cases Elizabeth Lake Retail and White Lake Hill LLC.

Commissioner Ruggles moved to approve the amended Minutes of June 16, 2022.

Commissioner Fine supported and the MOTION CARRIED with a voice vote: 7 yes votes.

CALL TO THE PUBLIC (FOR ITEMS NOT ON THE AGENDA)

John Hunt of 871 Oxhill Dr is concerned about the cement that will surround his property when the Black Rock restaurant is built.

PUBLIC HEARING

None

CONTINUING BUSINESS

A. The Avalon fka White Lake Hill

Property described as parcel number 12-20-101-003 (1085 Hill Road), located on the north side of Highland Road, west of Hill Road, consisting of approximately 68.96 acres. Property described as parcel number 12-20-126-006, located north of Highland Road, east of Hill Road, consisting of approximately 41.06 acres. Parcel number 12-20-101-003 is currently zoned (AG) Agricultural and (PB) Planned Business, and parcel number 12-20-126-006 is currently zoned (R1-A) Single Family Residential.

Request:

1) Preliminary site plan approval

Applicant: White Lake Hill, LLC
31550 Northwestern Highway
Farmington Hills, MI 48334

Applicant present: Mark Kassab of Lautrec and Mike Bank

Commissioner Meagher motioned to untable the preliminary site plan. **Commissioner Fine** supported and the MOTION CARRIED with a voice vote. (6 – 1, with Commissioner Seeley voting no)

Director O’Neil introduced the project, stating that the rezoning was previously recommended for approval to the Township Board, however the preliminary site plan was tabled. The applicant has revised the plan, reducing the density to 6.1 per acre for the multiple-family lots and to 2.6 per acre for the single-family lots. The applicant has eliminated many waiver requests, as well as increasing the multiple-family north property setback to 120 feet.

Mr. Leuffgen presented the engineering review. The applicant has proved engineering feasibility with the current plan and the expectation is that the utility plan has not changed from what was previously presented. A donation to the sidewalk fund was indicated due to lack of sidewalk on the west side of Hill Rd. The plan is deficient for extending the sanitary sewer to the property line, it is recommended to have an escrow for the future utility/sanitary sewer connection. To ensure sufficient pressure, a second water supply to the property is necessary and should be a condition of approval. An analysis of sanitary sewer pump station is required at final site plan review.

Commissioner Anderson stated that the applicant has been flexible and agreeable to requests made of them.

Mr. Leuffgen presented the June 15, 2022 letter regarding the traffic impact study results.

Commissioner Ruggles inquired if the study indicated a traffic light be installed.

Mr. Kassab stated that they met with residents recently and considered the comments from the Planning Commission and the residents when reducing the density for the revised plan.

Mr. Levity provided clarification of the traffic study and stated that the data warrants a traffic signal with M-DOT but there has not been a decision made from M-DOT at this time.

Commissioner Meagher asked if M-DOT doesn't approve the signal, what are the ramifications.

Mr. Levity stated that M-DOT would have to offer an alternative if they do not approve a traffic signal or the applicant would have to come up with something else.

Commissioner Anderson inquired about the timeline for that process with M-DOT.

Mr. Levity they would likely install the light when the lowest amount of traffic for the warrant is met.

Mr. Kassab stated that they are prepared to abide by all M-DOT requirements.

Commissioner Seeley and **Commissioner Dehart** stated concerns about the density and size of the single-family lots.

The Board deliberated on the lot sizes and setbacks.

Commissioner Carlock inquired about disturbance to the wooded area during construction.

Mr. Kassab stated that they plan to keep that area in its natural state, installing a retaining wall 30 feet from the buildings. A wetland delineation has been completed identifying the regulated wetlands. They will coordinate with Road Commission of Oakland County for grading and paving of Hill Road. They will also contract a landscape architect to develop the landscaping plan.

Director O'Neil stated that the applicant has offered a \$100,000 contribution to the park fund that could be used for Stanley Park or other park projects.

Commissioner Ruggles inquired about the amount of wetlands on the property.

Mr. Kassab stated that there are 11 acres of wetlands on the project site.

Commissioner Meagher inquired about the front lot requirement and if it is for aesthetics and what the average cost of the single-family units would sell for.

Director O'Neil Stated that the front lot line requirement was established long ago but the trend has gone down in the area. It is believed that smaller lots are easier to maintain and people are in favor of more common areas.

Mr. Kassab stated that the single-family homes are expected to see for about \$450,000.

The Board deliberated how the sidewalk fund would be determined and if it would be based on the construction cost.

Commissioner Anderson inquired if they had considered a larger donation to the park fund.

Commissioner Seeley inquired about what waivers being requested.

Director O'Neil listed the waivers that the applicant is requesting.

John Ranking of 1849 Hill Rd has concerns of the safety of this development's pavement ending on Hill Roads "S" curve and if the curve could be eliminated.

Harvey Wilson of 1795 Hill Rd appreciates the applicant meeting with residents but feels that this development is too dense.

A letter of support of the project was entered into record.

Commissioner Meagher moved to forward a favorable recommendation, subject to the applicant addressing all of the staff and consultants' review comments and recommendations to the Township Board, the preliminary site plan for the property described as parcel number 12-20-101-003 (1085 Hill Road), located on the north side of Highland Road, west of Hill Road, consisting of approximately 68.96 acres. Property described as parcel number 12-20-126-006, located north of Highland Road, east of Hill Road, consisting of approximately 41.06 acres. Parcel number 12-20-101-003 is currently zoned (AG) Agricultural and (PB) Planned Business, and parcel number 12-20-126-006 is currently zoned (R1-A) Single Family Residential.

Commissioner Fine supported, and the MOTION CARRIED with a roll call vote (6 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seeley/no, Ruggles/yes)

NEW BUSINESS

A. Hypershine Car Wash

Property described as parcel number 12-23-202-006 (9345 Highland Road), located on the south side of Highland Road, west of Fisk Road, consisting of approximately 4.91 acres. Currently zoned as (GB) General Business.

Request:

1) Final site plan approval

Applicant: EROP, LLC
2390 East Federal Drive
Decatur, IL 62526

Applicant Present: Erin McMachen representing EROP

Mr. Leuffgen presented the engineering review. The sanitary and storm sewer have items that need clarification. Engineering approval is recommended based on all items being addressed.

Commission Dehart inquired about the front access easement.

Mr. Quagliata gave a brief presentation of the project which received Township Board approval and was granted three variances by the Zoning Board of Appeals. The applicant has complied to all landscaping requirements and the frontage road has been widened to 24 feet to accommodate cross access.

Ms. McMachen addressed two outstanding comments, one regarding trees and the other was clarification on the screening fence.

The Board deliberated on the materials proposed for the exterior of the building.

Commissioner Carlock inquired about the reclaimed water system.

Ms. McMachen explained how the water reclamation system worked and stated no waste from within the building would enter the storm system.

Commissioner Fine asked if 55-gallon drums would be used and if they would be stored on the premises.

Mary Early of 5925 Pioneer Ct has concerns about the size of the lot for the project and inquired if there was a traffic impact study.

Mr. Quagliata M-DOT required a taper lane for this project which is indicated on the plan.

Commissioner Anderson inquired about the traffic stacking requirement.

Mr. Quagliata stated that the plan presented exceeds the requirement.

Commissioner Seeley moved to approve the final site plan subject to all staff and consultants' review comments being addressed as parcel number 12-23-202-006 (9345 Highland Road), located on the south side of Highland Road, west of Fisk Road, consisting of approximately 4.91 acres. Currently zoned as (GB) General Business.

Commissioner Meagher supported, and the MOTION CARRIED with a roll call vote (7 yes votes): (Anderson/yes, Dehart/yes, Carlock/yes, Fine/yes, Meagher/yes, Seeley/yes, Ruggles/yes)

OTHER BUSINESS

A. Concept plan for the southeast corner of Hilltop Drive & Highland Road

Sam Stafa and Arban Stafa requested feedback from the Planning Commission about a potential project that would rezone the proposed site to allow attached single-family homes. Discussion about what direction the Township is interested in as it relates to rentals and home ownership.

Bob Hoffman of Highland Township stated that he currently owned one of the parcels and asked if rezoning would be the first step in the process.

LIAISON'S REPORT

Commissioner Ruggles reported that the Township Board approved the Comfort Care project at the June 21st meeting. DPS has requested two new vehicles, the Board approved one dump truck.

Commissioner Dehart reported that the Zoning Board of Appeals heard two cases at the last meeting, Last Resort Marina on Pontiac Lake Rd was denied.

Commissioner Carlock reported that the Parks Board had a successful Family Fun Day, 125 people enjoyed the event.

DIRECTOR'S REPORT

Director O'Neil Planning Commission members will be receiving ID badges. The update of the CIP is underway and will be available in August for review by the Planning Commission and in September for a vote.

COMMUNICATIONS

NEXT MEETING DATES: August 4, 2022

ADJOURNMENT

**Commissioner Fine moved to adjourn the meeting at 9:02 PM
Commissioner Meagher supported and the MOTION CARRIED with a voice vote: 7 yes votes**

DRAFT

**WHITE LAKE TOWNSHIP
PLANNING COMMISSION**

Township Annex, 7527 Highland Road
White Lake, MI 48383
April 21, 2022 @ 7:00 PM

CALL TO ORDER

Chairperson Anderson called the meeting to order at 7:00 PM and led the Pledge of Allegiance. Roll was called.

ROLL CALL

Steve Anderson
Merrie Carlock
Pete Meagher
Debby Dehart
Scott Ruggles
Matt Slicker
Robert Seeley
T. Joseph Seward

Absent: Mark Fine

Also Present: Sean O'Neil, Community Development Director
Justin Quagliata, Staff Planner
Mike Leuffgen, DLZ
Kyle Gall, DLZ
Lisa Kane, Recording Secretary

Visitors: 20+ members of the public were present

APPROVAL OF AGENDA

Commissioner Meagher moved to approve the agenda of the April 21, 2022 Planning Commission Meeting.

Commissioner Carlock supported and the **MOTION CARRIED** with a voice vote: 8 yes votes.

APPROVAL OF MINUTES

- a. Regular meeting minutes of April 7, 2022

Commissioner Meagher moved to approve the Minutes of April 7, 2022

Commissioner Seward supported and the **MOTION CARRIED** with a voice vote: 8 yes votes.

CALL TO THE PUBLIC (FOR ITEMS NOT ON THE AGENDA)

None

PUBLIC HEARING

A. White Lake Hill LLC

Property described as parcel number 12-20-101-003 (1085 Hill Road), located on the north side of Highland Road, west of Hill Road, consisting of approximately 68.96 acres. Property described as parcel number 12-20-126-006, located north of Highland Road, east of Hill Road, consisting of approximately 41.06 acres.

Requests:

1) Preliminary site plan approval

2) Rezoning request: Applicant requests to rezone parcel number 12-20-101-003 from (AG) Agricultural and (PB) Planned Business to (PD) Planned Development or any other appropriate zoning district, and parcel number 12-20-126-006 from (R1-A) Single Family Residential to (PD) Planned Development or any other appropriate zoning district.

Applicant: White Lake Hill, LLC
31550 Northwestern Highway
Farmington Hills, MI 48334

Applicant Present: Mark Kassab

Director O'Neil presented the Fire Department's comments and Assessing's comments on the parcels.

Commissioner Slicker disclosed a professional relationship with the applicant and asked to recuse himself from voting.

Commissioner Meagher moved to allow Commissioner Slicker to recuse himself due to the professional relationship with the applicant. Commissioner Seward supported and the motion carried with a roll call vote (7 yes votes)
(Carlock/yes, Dehart/yes, Meagher/yes, Anderson/yes, Seeley/yes, Seward/yes, Ruggles/yes)

Commissioner Ruggles disclosed a professional relationship for consideration by the board, as his family has farmed that land in the past. It was determined that there were no conflicts of interest and Commissioner Ruggles remained present for the public hearing.

Mr. Leuffgen presented the engineering report from DLZ Engineering. Because sidewalks are not feasible on both sides of Hill Road and the applicant has offered a community benefit for sidewalk fund to compensate for that. The ordinance requires that work done within the 25-foot wetland buffer will need a plan in place to restore it to the original vegetative state. All roads, whether private or public, need to meet Road Commission of Oakland County requirements and this will be required to be indicated on the final site plan. The preliminary site plan provides a reasonable means of stormwater management. The sanitary sewer ordinance requires that sewer be extended across the full extent of the property frontage for the benefit of future use, however the grade and location of trees will make it difficult to extend all the way to the northern property line on Hill Road, therefore it may be left about 40 feet short. The recommendation is for the applicant to consider depositing funds in an escrow account for future use when there is a need for it by an adjoining property. The master plan does include sanitary sewer extending north on Hill Road. It should be considered to include a condition for a loop system for the water supply which provides a redundant source of water service to provide redundancy and reliability concern. A pump station analysis is recommended for the sewage system as the closed pump station has two pumps and a third pump may be warranted. There is a concern regarding building envelopes in relation to patios and decks extending into the sewer easements that should be limited as much as possible.

Commissioner Seeley inquired about the single point of road access and if there is a number of units that would indicate the need of a second road access.

Mr. Quagliata stated that the Fire Department indicated that the preliminary site plan met the intent of the fire code.

Commissioner Ruggles inquired about the loop water system and if the water main on Highland Road would meet the needs of the development.

Mr. Leuffgen explained that where this project would tie in to the water main is in a different pressure district than the water tower. There is not a water main on Hill Road but they are proposing installing one.

Commissioner Anderson inquired about the number of units, the need for the looping water system and if the residents nearby would benefit from the looping water system.

Mr. Leuffgen stated that the residents on Highland Road have direct access to the water main on Highland Road and would not require access to the looped water system.

Discussion occurred of the benefits of looped water system and whether it stabilizes water pressure.

Mr. Quagliata presented the project as 493 total units which consists of 87 detached single-family site condos and 406 multiple-family rental apartment units. The single-family homes will be governed by a declaration of covenant and the apartment rentals will remain owned and managed by the developer. The property on the west side of Hill Road has split zoning, which would be remedied by the rezoning. Rezoning to Planned Development is necessary to develop these properties as indicated on the preliminary site plan. The clubhouse is in the hub of the apartments providing amenities such as a patio and pool and the single-family dwellings will not have access to the clubhouse. The applicant has proposed a public benefit of \$100,000 Parks and Rec fund. Between the two parcels 22 wetlands are identified and are regulated by EGLE, the applicant has stated that any natural area that requires grading for walk-out basements will be returned to its natural, undisturbed state with only native plantings. The multi-family apartments on Hill Road will have a boulevard style entrance. The traffic impact statement recommends a signal be installed east of Hill Road with a right turn taper installed, which is consistent with generally accepted engineering standards. MDOT has jurisdiction of Highland Road and will need to approve any traffic light or changes to the roadway. The Planning Commission can consider waivers in exchange for amenities requested. The applicant would request a waiver for some recreation space. Parallel plans could be considered for parcels without Planned Development district approval, in which the applicant would request a waiver for density. The Planning Commission should consider if the proposed setbacks and lot coverage are appropriate for this project. They will request a 5-foot waiver for some lots' setbacks. There would be no deck or patio in any setback, however a waiver for some patios or decks in the storm water easement may be requested. The ordinance requires double striping and the applicant has indicated that they will seek a waiver for parking striping as double striping is more appropriate for commercial properties, not residential. A 930-foot waiver for the length of street due to topographies and natural features. Sidewalks will be installed on the west side of Hill Road but not on the east side of the road and the applicant has proposed a contribution to the Township Sidewalk Fund to accommodate for that. The applicant would also seek a waiver for a third sign as only two signs are allowed. The dumpster enclosure by the clubhouse would either need a concrete pad in front of it or to seek a waiver. Staff recommends approval as the rezoning and site plan are consistent and compatible with the master plan, subject to getting final site plan approval and all comments and reports in the final site plan are addressed.

Commissioner Seward is troubled by the statement that this is consistent with the master plan because this area is rural and it will increase traffic.

Mr. Quagliata stated that the master plan prescribes residential at this location at a greater density than what is proposed in this project.

Director O'Neil added that this property was rezoned about 15 years ago to Planned Business in preparation for a Super Target to be built. That project did not materialize but there was anticipation of another similar project being brought forward. This residential project will bring less traffic than a large scale commercial project would.

Mr. Quagliata stated that Hill Road will be paved to the north and that they do not expect that traffic will travel north on Hill Road as there isn't anywhere to cut through to.

Commissioner Anderson reminded the public that they would have an opportunity to speak after the applicant makes their presentation.

Commissioner Carlock inquired about the orientation of the single-family units on the southeast side of Hill Road and the road that would serve them.

Mr. Quagliata stated that the road to those units would be a private road that the Homeowner's Association would maintain. The roads that serve the rest of the single-family dwellings would be petitioned by the developer to the Road Commission of Oakland County to be public. However, the roads in the multi-family apartment complex would remain private and maintained by the owner of the property.

Commissioner Meagher inquired if there was a need for rental properties.

Mr. Quagliata stated that the applicant can respond to that market analysis.

Commissioner Dehart inquired if the signs would need a variance.

Mr. Quagliata stated that the process of preliminary site plan review includes the area, quantity, location and dimension for signs but only the location was included in the submitted plan. They would have to comply with the residential standards for signs which can be approved administratively. If the requested rezoning passes, they can request a waiver for the third sign that is indicated on the preliminary site plan. The recommendation could be made at final site plan review to recommend for approval to the Township Board some or all of the waivers requested.

Discussion occurred regarding the different residential zoning districts and the density and lot size requirements for them.

Mr. Quagliata stated that if this does get approval it will be governed by a development agreement and the final site plan is a part of the development agreement. The development agreement would have designation stating that they cannot change the product or method of ownership without Township approval. The final site plan requires a list of all waivers requested, the preliminary site plan considers number of units, road layout, and similar details.

Mark Kassab, representing White Lake Hills, LLC, stated that he and his partners bought this property about 17 years ago with the intent of developing it commercially. A PowerPoint presentation was shared featuring other nearby properties they have and the commissioners were invited to visit other properties they have developed in Novi, Wixom and Commerce Township. A market study was completed which indicates demand for both single-family homes and rental properties. There is a considerable grade to be

considered with this site, approximately 75% from Highland Road to the north end of the property. The survey found approximately 8.5 acres of wetlands on the site, however only .75 acres will be impacted by development. Mr. Kassab states that wetlands are a feature that they want to keep as it is desirable to home buyers. Mr. Kassab presented the different unit models and floor plans available. Every unit has a 2 car garage and a washer and dryer with rent ranging from \$2000-\$2700 and home sales ranging from \$450,000-\$500,000. Topography made it impossible for a second access road to the apartment complex. Regarding the sidewalks on Hill Road, they preferred to put sidewalks on both side but topography was a deterrence. The applicants funded a water main study that that found that the northeast portion has low pressure and the loop system through Meijer would alleviate the pressure issue. They have various building elevations to choose from so the building envelopes could be met to limit the impact on the stormwater easements. The public park requirement within the development is believed to be better met with a contribution to Stanley Park as a public benefit. The clubhouse amenities, such as dog wash, dog park and walking trails will be desirable to residents. There will be an Amazon delivery center for packages to be safely received. There will also be a full gym and yoga studio accessed with key card. Every residence will have a separate entryway, no common hallways. This is an all-ages community, with the ranch-style homes benefiting the aging. Single-family dwellings will have a master deed with CCR which will be turned over to a Homeowner's Association. Community benefits include paving Hill Road according to the traffic study comments, a contribution to Stanley Park instead of public park within development.

Commissioners thanked Mr. Kassab for his presentation.

Commissioner Seeley inquired about the willingness to scale back the waivers.

Mr. Kassab stated that they are extremely willing to work with the Township to meet any requirements.

Commissioner Anderson opened public comment at 8:22 PM

Derrick Near of 1850 Hill Road has concerns about the traffic that will travel north on Hill Road. GPS mapping systems navigate travelers north on Hill Road to get to any destination north of M59. Paving the road is going exacerbate the problem. He would like to see that the development only allow access to Highland Road.

Sean O'Callohan of 1831 Hill Road appreciates the rural area that he lives in and is concerned about increased crime. He would prefer there were no two-story buildings.

Robert Lousey of 6501 Manchester was drawn to this area by the rural nature and doesn't believe the project meets the character of Hill Road. He is also concerned about the crime that rental properties draw.

Laura Mahler of 1445 Hill Road is concerned about the density of this development. Mrs. Maher is concerned that the development has not obtained a permit from EGLE. This development is adverse to the character of Hill Road. She requests that the Planning Commission declines the request.

Tamar Near of 1850 Hill Road is concerned about the noise that will be generated by the construction, how long the project will take to complete and what will the hours of construction be.

Jim Powers of 3711 Ormon Road complimented the applicant for the presentation and appreciated that the development will create jobs and help with the tax base for the Township. He believes this will be a great attribute to the Township. He states that traffic is something that we all have to live with and he doesn't believe that crime will increase with a high rent development such as this.

John and Mary Rankin of 1829 Hill Road submitted an email which will be available on record.

Corbin McLaughlin of 1245 Hill Rd is concerned about car accidents on Highland Road and there is littering on Hill Road.

Andrea Liveright?? of 5347 Woodland is concerned about traffic and additional traffic if there is an accident on Highland Road as drivers use Hill Road to detour. She doesn't understand how it fits in with the master plan.

Anna Wilson of 1795 Hill Road enjoys the rural nature and is very upset about the idea of having so many people residing in this area.

Commissioner Anderson closed the public hearing at 8:42 PM

Director O'Neil explained the history of the master plan, how it is developed and that they would encourage residents to be a part of the process when they review the Master Plan.

Andrea Liveright of 5347 Woodland asked if consideration is taken about how the nearby residents feel when they develop the master plan.

Director O'Neil addressed some questions from the residents and informed that the wetlands permit is not required at this stage of the process.

Applicant Mr. Kassab replied to questions about density, traffic, crime and construction time frame. The income levels are expected to be over \$100,000 annually for residents of the rental apartments and it isn't anticipated that the crime rate will increase. The project that was planned for the parcel zoned Planned Business would have been something similar to a Super Target and the buffering would have been multi-family residential. The traffic study does not support increased traffic on Hill Road. This type of development is not determined by density, they aren't trying to cram as many dwellings into the lots as possible and are willing to consider less units to better meet the needs of the Township. Some waivers will be critical to create a proper development. They will abide by Road Commission of Oakland County and MDOT requirements. The duration of construction will likely be in one phase for the single-family and two phases for the multi-family complex, it will be limited by trades and materials availability.

Commissioner Ruggles asked about the anticipated duration of the phases.

Mr. Kassab responded that construction timeframe could be 2 years.

Commissioner Carlock has concerns with the natural areas to the north being preserved.

Commissioner Seward agrees with Commissioner Carlock about the north end wooded lot. He inquired about the possibility of deterring people from traveling north on Hill Road.

Commissioner Dehart sees the need for adding residential to support the local economy but has reservations because she appreciates the rural nature of White Lake.

Commissioner Seeley is concerned about the density and the size of the lots.

Mr. Quagliata addressed the concern about the rezoning stating that the rezoning to Planned Development allows the Planning Commission to consider waivers and whether or not they are appropriate.

Director O'Neil explained the broad range of the zoning of Planned Neighborhood and that the master plan doesn't perfectly align with all of the zoning districts but it is consistent with the future land use for this area and it falls within the prescribed range for density.

Discussion regarding the differences in zoning and the designations in the master plan for this area.

Commissioner Ruggles asked if the roads will be public or private.

Mr. Kassab stated that the roads in the single-family area will be public but the rental apartment homes will be private so that they can maintain them as the rental property management. He also explained that there is a waiver that they can sign so that the police can respond to violations on the private roads.

Commissioner Ruggles shares the concerns of many of the residents about the traffic on Hill Road and with the density.

Commissioner Meagher moved to forward a favorable recommendation, subject to the applicant addressing all of the staff and consultant comments and recommendations to the Township Board, the preliminary site plan for the property described as parcel number 12-20-101-003 (1085 Hill Road), located on the north side of Highland Road, west of Hill Road, consisting of approximately 68.96 acres. Property described as parcel number 12-20-126-006, located north of Highland Road, east of Hill Road, consisting of approximately 41.06 acres.

Commissioner Anderson supported, and the MOTION FAILED with a roll call vote (2 yes votes): (Carlock/no, Dehart/no, Meagher/yes, Anderson/yes, Seeley/no, Seward/no, Ruggles/no)

Commissioner Seeley moved to forward a favorable recommendation, subject to getting preliminary site plan approval, to the Township Board, the rezoning from parcel number 12-20-101-003 from (AG) Agricultural and (PB) Planned Business to (PD) Planned Development or any other appropriate zoning district.

Commissioner Dehart supported, and the MOTION CARRIED with a roll call votes (6 yes votes): (Carlock/yes, Dehart/yes, Meagher/yes, Anderson/yes, Seeley/yes, Seward/no, Ruggles/yes)

Commissioner Seeley moved to forward a favorable recommendation, subject to getting preliminary site plan approval, to the Township Board, the rezoning from parcel number parcel number 12-20-126-006 from (R1-A) Single Family Residential to (PD) Planned Development or any other appropriate zoning district.

Commissioner Meagher supported, and the MOTION CARRIED with a roll call votes (5 yes votes): (Carlock/yes, Dehart/no, Meagher/yes, Anderson/yes, Seeley/yes, Seward/no, Ruggles/yes)

Director O'Neil will have a conversation with the Township attorney about how to proceed.

Commissioner Anderson reminded the attendees that agendas are posted on the website and they will need to check to see when this project is coming back to the Planning Commission for consideration.

B. Hypershine Car Wash

Property described as parcel number 12-23-202-006 (9345 Highland Road), located on the south side of Highland Road, west of Fisk Road, consisting of approximately 4.91 acres.

Requests:

1) Preliminary site plan approval

2) Special land use approval

Applicant: EROP, LLC
2390 East Federal Drive
Decatur, IL 62526

Applicant present: Reid Cooksy of EROP, LLC

Mr. Quagliata presented the project for the parcel that was rezoned two years ago by a developer who wanted to bring plans forward for a carwash but it did not materialize. Driveways are required to meet setbacks from adjacent driveways and be offset from opposing driveways. The applicant will need to request from the Planning Commission a waiver from interlocking driveway rule or they would need a variance from the Zoning Board of Appeals. They are proposing a six-foot vinyl fence to provide screening from the residential properties. The outdoor lighting plan would be reviewed at final site plan review. There are concerns about the dumpster placement and the gate orientation which may require a variance from the Zoning Board of Appeals. The required number of stacking spaces and parking spaces are met. The ordinance requires a certain number of shrubs and trees in greenbelt. There is a water main easement that is deterring them from meeting the planting requirements. They will request a variance for one wall sign placement as the water main easement is deterring them from a monument sign.

Commissioner Dehart inquired about the previous applicant's proposal to give the rear portion of the parcel to the township.

Mr. Quagliata replied that the current applicant has not proposed the same offer.

Commissioner Slicker inquired about the need of a bypass lane.

Mr. Quagliata explained that the ordinance does not require a bypass lane and that they providing more stacking space than is required.

Mr. Quagliata stated that six variances would be requested: potentially two for the driveway, for the 450 ft separation although the Planning Commission can consider a waiver for driveways; one for the dumpster location; potentially two for the landscaping trees & shrubs in the greenbelt; and one for the sign.

Director O'Neil commented on the possible ways that the applicant could avoid requesting variances.

Commissioner Dehart inquired who determines the addition of a deceleration lane.

Director O'Neil responded that MDOT has jurisdiction over Highland Road.

Commissioner Slicker inquired about the greenbelt requirements.

Mr. Quagliata stated that the applicant meets the width for the greenbelt but did not indicate the proper number of trees and shrubs to be planted.

Commissioner Seeley also inquired about the bypass lane and if there is not a teller available in the pay booth how will someone exit who accidentally pulled in to the driveway.

Discussion occurred regarding the requirements of a frontage road for cross access between adjacent businesses.

Mr. Leuffgen of DLZ Engineering presented the second review for engineering feasibility. It was noted

that a 20-foot one way drive was required by the Fire Department for the exit of the carwash. A storm water management plan including a storm water detention pond with an outlet discharging to the MDOT storm system will need to be approved by MDOT. It is recommended that the sanitary sewer connection be a pressure sewer including a grinder station. Clarification from the Oakland County Water Resource Commissioner is needed at final site plan review on the need of an external oil gride separator. Mr. Leuffgen finds nothing that prohibits recommending an approval from engineering.

Commissioner Slicker inquired about the grade entering Highland Road to avoid parking lot run off.

Mr. Cooksy responded to concerns about stacking and circulation of the site. Membership based model, three lanes: two are membership lanes which use license plate readers and one is pay based. Vacuums are free after paying for wash with unlimited use. The entrance was aligned with the opposing boulevard entrance to avoid needing a variance. They weren't aware that they could plant within three feet of the watermain in the greenbelt and they will work with landscaping requirement.

Commissioner Slicker inquired about the bypass lane and how will patrons leave without paying for a carwash if they decide not to use the service.

Mr. Cooksy answered that there are constraints to the parcel including overhead electrical lines to creating a bypass lane and the throughput time is very fast so even with a lot of cars stacked they will get through the tunnel quickly.

Commissioner Dehart inquired about the orientation of the dumpster.

Mr. Cooksy responded that due to the size of the refuse truck, it will not be able to enter the rear of the property. He also is willing to work with the Township to find an alternative.

Commissioner Anderson inquired about the fees for the services.

Mr. Cooksy stated that that the fee structure model is mainly the monthly membership which ranges from \$30 - \$40 per month but there will be employees on site to assist customers but not in a booth to take payment.

Commissioner Meagher asked if someone needed to get through without paying would someone be available to help them continue through without paying for a wash.

Commissioner Seeley informed that there is an ordinance requirement for a frontage road and that would provide a bypass for people who didn't intend on obtaining carwash services.

Mr. Cooksy stated that they will provide a stub and an easement to the east that is part of the employee parking spaces for a future possible frontage road.

Commissioner Anderson opened public comment at 10:26 PM

Commissioner Anderson stated that two emails were received from the Kenneth T Johnson Jr and Rachel Cook who do not support the project.

Shannon Frescas of 9240 Steephollow Dr. is adamantly against this project, is concerned about the project and is very concerned about the noise.

Ken Moomah of 9218 Steephollow Dr. is concerned about the excess lighting in the parking lot. Mr. Moomah has also reminded the commission that routing the traffic through the Dance Studio would not be safe with all of the children entering and leaving the building. Mr. Moomah added the concern about the former Brendel's property being developed.

Richard Morris of 9211 Steephollow Dr. appreciates the quietness of living on Tull Lake. Mr. Morris is concerned about the noise and is concerned about the chemicals and impact of the cleaning agents.

Margaret Penner of 9651 Steephollow Dr. shares the other residents' concerns and is also concerned about the well head protection.

Darryl Davis of 9265 Steephollow Dr. would like a taller fence and landscaping to buffer the noise.

Dave Gian of 9315 Steephollow Dr agrees with all of the concerns from other residents and would like to see trees to buffer the rear of the lot. He would also like to know what the plan is for the runoff from the parking lot as well as the runoff from the cleaning of the cars.

Marcy Denesca of 4745 Berry Patch Lane is concerned about the impact on the lake.

Kathleen Grant of 9268 Steephollow Dr takes great pride in her neighborhood and the lake. Ms. Grant is concerned about the drainage and runoff.

Monica Wilcowski of 9292 Steephollow Dr believes there are other carwashes and doesn't see the need for another one.

Ken Moomah of 9218 Steephollow Dr. returned to ask if there was the possibility of the back part of the parcel being split and sold to other commercial development.

Mr. Quagliata responded that the area indicated is landlocked and would not be able to be split and sold because there would be no way to access it from Highland Road.

A member of the audience asked what the hours of operation would be.

Mr. Cooksy responded that the hours of operation would be 8am-8pm, 7 days of the week.

Commissioner Anderson closed public comments at 10:41 PM

Commissioner Carlock inquired about the water source, if it would be the water main at Highland Road and how run off from the parking lot and waste water would be managed.

Director O'Neil replied that they would be connected to the municipal water and sewer, runoff would

drain into the stormwater basin at the curb and the waste water generated from the carwash will enter a reclamation system for processing, but ultimately enter the sanitary sewer.

Commissioner Slicker asked why the Belle Tire doesn't have an access road.

Director O'Neil answered that the reciprocal access easements came in when there was a traffic study done with MDOT in about 2003, that is when the Township's access management plan was adopted and Belle Tire had been in operation for years before that. They do share the driveway with the old Tim Hortons restaurant. And they were required by the township to make a connection to the shopping center to the east.

Discussion occurred regarding the possibility of a frontage road.

Mr. Cooksy responded to questions from residents about the waste water, fence, trees and water shed. Concerning light and noise, studies have been done on these vacuum systems, which have mufflers, they are less than 60 decibels at the property line. The lights meet the ordinance allowances and will not impact the neighboring. No drainage will leave the site as it will be directed to the detention pond. Considering the sanitary discharge, the reclamation tanks inside separate oil and chemicals and it cleans the water and sends very minimal discharge into the sanitary sewer system. The 6-foot-tall fence is what is required by the Township and can plant trees on the west side. All chemicals are contained and employees will maintain the property. The noise study can be provided. The wash tunnel has silencers on the blowers at the end of the tunnel which mitigate the noise.

Discussion occurred about the noise study and the noise generated from the vacuums and from the tunnel itself.

Commissioner Carlock inquired about the special land use for this zoning.

Commissioner Meagher inquired about the screening wall composition.

Director O'Neil explained that the screening will include the 400-foot buffer of vacant land which will help mitigate all noise and light.

Discussion about the feasibility of the project due to the inability to provide a frontage lane.

Commissioner Slicker moved to table the project until the applicant can comply with the requirement for the front access road.

Commissioner Seward supported and the MOTION FAILED with a roll call vote (2 yes votes): (Carlock/no, Dehart/no, Meagher/no, Anderson/no, Seeley/no, Seward/yes, Ruggles/no, Slicker/yes)

Commissioner Seeley moved to forward a favorable recommendation, subject to the applicant addressing all of the staff and consultant comments and recommendations, the easement requirement, providing a waiver for the coordination of the driveway and subject to special approval, to the Township Board, the preliminary site plan for the property described as parcel number 12-23-202-006 (9345 Highland Road), located on the south side of Highland Road, west of Fisk Road, consisting of approximately 4.91 acres.

Commissioner Meagher supported, and the MOTION CARRIED with a roll call vote (6 yes votes):
(Carlock/yes, Dehart/yes, Meagher/yes, Anderson/yes, Seeley/yes, Seward/no, Ruggles/yes,
Slicker/no)

Commissioner Meagher moved to approve the special land use for the property described as
parcel number 12-23-202-006 (9345 Highland Road), located on the south side of Highland Road,
west of Fisk Road, consisting of approximately 4.91 acres.

Commissioner Seeley supported and the MOTION CARRIED with a roll call vote (8 yes votes):
(Carlock/yes, Dehart/ yes, Meagher/ yes, Anderson/ yes, Seeley/yes, Seward/yes, Ruggles/yes,
Slicker/yes)

CONTINUING BUSINESS

None

NEW BUSINESS

None

OTHER BUSINESS

None

LIAISON'S REPORT

None

DIRECTOR'S REPORT

COMMUNICATIONS

NEXT MEETING DATES: May 5, 2022
May 19, 2022

ADJOURNMENT

Commissioner Meagher moved to adjourn the meeting at 11:27 PM
Commissioner Seeley supported and the MOTION CARRIED with a voice vote: 8 yes votes



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

May 25, 2022

Sean O’ Neil
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

RE: The Avalon- f.k.a. White Lake Hill- Preliminary Site Plan Review – 4th Review

Ref: DLZ No. 2145-7233-21 Design Professional: PEA Group

Dear Mr. O’ Neil,

Our office has performed the above mentioned Preliminary Site Plan review for the revised plan dated May 16, 2022. The plans were reviewed for feasibility based on general conformance with the Township Engineering Design Standards.

General Site Information

This site is located on the north side of M-59 and east of Ormond Road. The property is located on both sides of Hill Road: across from former Brooks Elementary School and West of Meijers. Total site acreage is approximately 110.02 acres.

Site Improvement Information:

- Construction of a Planned Development consisting of **81 (previously 87)** single family condominium homes on the east side of Hill Road.
- Proposed paved and public road for the single family condominium homes with one point of access off Hill Road.
- Construction of a Planned Development consisting of **406? 393?** [see comment o)] multi-family units for lease on the west side of Hill Road. Associated clubhouse and pool as part of multi-family development.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 2 of 9

- For multi- family units: associated paved and curbed parking including ADA accessible parking spaces and maneuvering aisles for clubhouse and pool. Internal streets and drives are also proposed with a point of access off M-59 and a second point of access off Hill Road.
- Site to be serviced by watermain and sanitary sewer.
- Storm water runoff is proposed to be detained as follows: 1) Detention Pond at the northwest corner of Hill Road and M-59- to discharge to existing storm sewer just south. 2) Two detention ponds on the west side of Hill Road and located centrally in the multi-family portion- to discharge to existing culvert under Hill Road. 3) Detention ponds located on the southernmost portion of the single family phase- to discharge to existing watercourse located between the two ponds. 4) Detention pond located on the eastern portion of the single family phase- to discharge to the existing wetlands to the southwest.

We offer the following comments:

Note that comments from our April 13, 2022 review letter are in *italics*. Responses to those comments are in **bold**. New comments are in standard typeface.

The following items should be noted with respect to Planning Commission review:

- a) We note that the number of single family lots has been reduced from 87 to 81 and that the multi-family has been reduced from 406 units to 393 units. These reductions in the number of lots and units will likely not impact utility layout or design. We note that the plan sheets included as part of this submittal did not show the proposed watermain, sanitary sewer, or storm sewer; we assume that the layouts proposed on the previous Preliminary Site Plan dated April 4, 2022 are to remain the same.
- b) *Pond 2 located in the single family section of the development (see plan Sheet P-5.1) proposes discharge to the adjacent wetlands to the west. Clarify where drainage from this wetland shall be routed as it appears from existing topography that there is no outlet from this wetland. In addition, a portion of this wetland is located off site; an off-site drainage easement would be required. Additional topographical survey information will be required for the property to the south of the wetlands in order to clarify the drainage path. The design engineer has noted that the discharge from the proposed pond (now labeled as Pond 5) will discharge at an agricultural rate and follow its natural off site drainage course. The difference in pre and post development area discharging from proposed Pond 5 to the existing wetlands is an increase of 0.2 acres. We can consider this item*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 3 of 9

complete for this level of review, however the capacity for the receiving wetland to accommodate the increased runoff volume will need to be demonstrated at the time of Final Site Plan.

- c) *The multifamily exiting drive onto M-59 shows a width of 16 feet. Township Zoning Ordinance 5.11Q.v. requires a width of 20' for one way drives and a minimum width of 24' for two way drives. Dimensions have been clarified; DLZ defers further comment regarding compliance to Township Planning Department.*
- d) *We defer to the Township as to whether 6 foot wide sidewalk is required on both sides of Hill Road. None is proposed at this time. Township Zoning Ordinance 5.21 requires a minimum of 6 foot width for sidewalks along major roadways. Comment outstanding. We continue to defer to the Township with regard to this item. Note that an 8' wide path has now been added along a portion of the west side only of the Hill Road frontage and that two road crossings of the path have been proposed near the Hill Road entrances in order to connect the multi-family to the single-family units. The locations for the path crossings should be reviewed for proper pavement markings and pedestrian crossing signage. Comment addressed at this level of review. Per the design engineer, this item was discussed at a Township Zoom meeting on March 25, 2022. It was determined that an 8' wide path will be added along the western side of Hill Road from M-59 to the single family entrance. Paths are also now shown along the frontage for Units 81-84 and 85-87 only as the adjacent areas pose an issue with regulated wetlands and stream encroachment. The developer agreed at the meeting to make a contribution to the White Lake Sidewalk Fund to supplement pathway areas not installed along Hill Road.*

We note that portions of the proposed sidewalk along the western side of Hill Road are proposed outside the future ROW. This sidewalk locations shall be either adjusted to inside the future ROW or an easement shall be provided. In addition, our comment with respect to the proper pavement markings and pedestrian crossing signage for Hill Road crossing will need to be addressed at the time of FSP/FEP submittal.

- e) *The following single family lots present conflicts with either the proposed house, required grading, or the potential deck/patio encroaching into the wetlands setback: 1,27,28,40,61, and 88. Impacts to the wetlands buffer will need to be removed. Comment outstanding. The wetlands setback/buffer for all wetlands was not shown on the initial Preliminary Site Plan submittal dated December 8, 2021. There are now units in the single family portion of this development as well as other areas of the development where grading is proposed in the wetlands setback/buffer which is not allowable. The following single family units will require revision with respect to grading in the wetlands setback: 1-7,20,27,28,39,40,52-54,61,75,76,84,85, and 88. In addition, the proposed retaining wall adjacent*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 4 of 9

grading to the northwest of multi-family Unit 19 will also require adjustment with respect to grading in the wetlands buffer. Since the units listed border EGLE regulated wetlands, our office concurs with the recommendation by Barr Engineering, Inc Wetland Delineation Report (dated February 9, 2022) recommending that Barr's wetland boundary determination and jurisdictional opinion be reviewed by EGLE prior to undertaking any activity near or within any identified wetlands; the proposed layout as submitted may require revision, in response to EGLE's review, to unit/ lot layout in the single family phase, thus impacting the preliminary site layout. **Comment addressed. Per a meeting with the Township on March 25, 2022, it was agreed that grading within the 25' wetland setback would be acceptable. A wetland restoration plan shall be required at the time of FSP/FEP submittal. Plan shall include a timeline for restoration of the wetland buffers. Note that the developer shall also be required to comply with all EGLE requirements with respect to grading and regulated wetlands. A note shall be provided on the FSP/FEP with regard to the wetland buffer restoration.**

- f) *All public roads are required to be built to RCOC standards. Comment remains as a notation.*
- g) *Specify the proposed width of the shared access driveways for Lots 81-84 and 85-88 of the single family portion. These drives shall be built to private access drive standards of White Lake as specified in the Zoning Ordinance Section 5.16. Section C. ii. requires two points of access for such drives to an adjacent public or private road. Section D. ii. requires that access driveways shall be able to accommodate emergency vehicles. Comment partially addressed. Two points of access for each of the drives are now proposed, however, Ordinance 5.16 C.i. requires a 30' wide easement width for an access drive; 25' is proposed for Lots 81-84 and 85-88. In addition, Zoning Ordinance Section 5.16 C. iii. regarding setbacks shall be met (Unit 85 is not in compliance). Also specify on plan that the 20' drive widths proposed are measured as 20' from the edge of the gutter line per Ordinance 5.16 C. v. Please also provide fire truck turning radius for these private access drives. Comment addressed. Fire truck movements have been provided and show that while tight the trucks will be able to traverse the drives.*
- h) *Clarify if there is an existing drainage easement on the property south of the single family Detention Ponds 1 and 3. An easement will be required for discharge of drainage off site. In addition, the design engineer will be required to demonstrate that there will be no downstream impacts from the proposed development in terms of stormwater discharge flows. Engineer will need to demonstrate that adequate downstream capacity exists to handle post development flow. Comment remains as a notation and can be further clarified at the time of FSP. Design engineer has stated in their February 15, 2022 review response letter: "There is not an easement in place. There is an existing stream which provides the historical drainage route through the said parcel to a box culvert under M-59. Since the development will have a 100-year detention basin and will discharge stormwater at an agricultural rate, the downstream ditch should have adequate capacity. A detailed*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 5 of 9

engineering analysis will be provided to the township and MDOT during the construction plan phase.”

- i) *End sections for the three detention basins proposed on the single family portion will be required to be located outside the wetland setback. Comment partially addressed. Our office finds the basin outlet locations acceptable and that the outlet pipes for Basins 4 and 5 shall be constructed within the wetlands setback and the land restored to its natural preconstruction condition. Note that location of the basin end sections shall be subject to review and approval by EGLE. EGLE may require revision of the end section locations. Our office recommends the Township require a wetland setback restoration plan and that the developer be required to post a bond amount to guarantee proper and timely completion of restoration of the wetland buffer setbacks in these two areas should EGLE approve the end section locations. **Comment addressed for this level of review. The design engineer notes a wetland setback restoration plan shall be provided at the time of FSP/FEP submittal. A note shall be provided on the FSP/FEP regarding wetland setback restoration.***
- j) *Extend the sanitary sewer to the north property line along Hill Road. Comment remains. Applicant indicated that the topography near the northern property restricts construction of the sanitary sewer at this location and would require a construction easement from the adjacent property owner. Township Ordinance requires extension to the limits of the property line and the sanitary sewer master plan indicates that gravity sanitary sewer is ultimately proposed north of this location. We defer to the Township if a variance can be granted on this requirement or if completion of this item will be a condition of approval. **Comment addressed. Discussion with the Township concluded that the sewer shall not be extended to the north property line and that an easement for future sanitary sewer extension shall be provided. In addition, the developer shall be required to deposit a monetary fee or escrow with the Township as assurance to supplement the future sewer extension.***
- k) *With nearly 60 feet of elevation change, the designer should ensure that sufficient pressure exists at the higher elevations for a bathroom on the 2nd story. The water may have to come from Pressure District 4 to service units with higher elevations as it appears that there will be insufficient pressure on the northern portions of the proposed development. To interconnect between the pressure districts, at least one PRV may be required. We suggest that the Township request escrow funds with regard to this item such that DLZ can model the water system to determine any deficiencies that may exist regarding water pressures and/or capacities. Our office has performed modeling of the proposed water system, see attached water model results; In all scenarios the area at the northeast corner of Aurora Circle experienced the lowest resulting pressure. There is a need for a handful of homes in this vicinity to have individual booster pumps to ensure adequate pressure given the various scenarios. It can also not be understated that the proposed design places an incredibly high criticality*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 6 of 9

rating on the existing 16" watermain along M59. This is the only supply proposed to serve the nearly 500 residential units. If something were to happen to this watermain there is no second source or storage to feed this area temporarily. DLZ recommends a second water supply be installed to provide redundancy to the proposed distribution system. Please note that in order to stay within the same pressure district the source would need to be from south of the existing Pressure Reducing Valves that exist on either side of the existing Meijer store. **Comment addressed at this level of review. As a condition of the Township engineer's recommendation for Preliminary Site Plan approval, the developer acknowledges the critical issue of not having a redundant source of water supply for the proposed development. The design engineer has stated that a second supply connection is being researched.**

- l) Sanitary sewage from this development is tributary to the existing Meijer sanitary sewer pump station located at the Northeast corner of Highland Road and Bogie Lake Road; an analysis will need to be provided that indicates there is sufficient capacity within the existing pump station, or if upgrades will be necessary to support the additional discharges. **Comment addressed and remains as a notation. Design engineer states in their review response letter dated February 15, 2022: "Since an 18" sewer has been stubbed to the Hill Road/M-59 intersection, it is our understanding that the pump station and forcemain were designed for future development along Hill Road and Ormond Roads. A detailed analysis will be conducted during the construction plan phase."**
- m) Proposed future decks or patios for Lots 12,15,82, and 83 of the single family portion of the development appear to encroach into the proposed storm sewer easement. Please revise. Comment outstanding. A 12' wide deck or patio would only allow for 5' of easement on one side of the storm sewer relative to Units 82 and 83; 6' minimum is required. In addition, Units 9-12 would have a similar issue. Unit 80- the deck or patio could only be placed on the NE area of the rear of the house. Units 85 and 86 would not have enough space for a deck or patio without storm sewer easement encroachment. **This comment remains outstanding. Since the lot numbering and count has changed and no utility information has been included with the current submittal, we are unable to review requested changes or provide comment.**
- n) Parcel Area Table on Sheet P-2.0 of plans appears to be missing parcel data for Units 82,83,84,86, and 87. Please update. **Comment addressed.**
- o) The number of multifamily units of 393 in the 'Multi-Family Site Data Table' on Sheet P-2.0 does not match the total shown (72+334=406) in the same table under subsection "Minimum Lot Size.'



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 7 of 9

The following comments can be addressed on the Final Site Plan/Final Engineering Plan:

Final Site Plan/Final Engineering Plan Comments-

General

1. Plan shall contain notes per White Lake Township Engineering Design Standards Section A. 8. a.-d.
2. Provide at least two permanent benchmarks on NAVD 88 datum. Benchmarks are required at least every 1,200 feet.
3. Provide soil boring reports that were prepared by CTI and McDowell.
4. The topographical survey shows existing overhead electrical lines on the parcel west of Hill Road. Clarify as to whether these lines shall remain or be relocated and as to whether an easement for the lines exists. In the event the lines are to be relocated, the easements (if existing) will need to be vacated.
5. A landscape plan showing all proposed trees relative to proposed storm sewer, sanitary sewer, and watermain shall be submitted. Note that 10' horizontal separation is required between proposed utilities noted and proposed trees.

Paving/Grading

1. ADA accessible ramps will be required on sidewalk adjacent to ADA parking spaces. Ramp slopes shall meet ADA requirements.
2. Structural wall calculations, that have been signed and sealed by a Registered Structural Engineer, verifying the wall integrity and the ability to support lateral and vertical stresses will need to be provided for retaining walls over 30" tall.
3. Retaining walls >30" in height shall require a decorative fence or railing at the top that is a minimum of 36" in height.
4. Wetland buffers shall be clearly shown on all grading sheets.
5. Sheets 3.1-3.4 have Hill Road mislabeled as Highland Road. Please revise.

Watermain

1. We defer to the Fire Department regarding items related to fire suppression and hydrant coverage.
2. Show 20' wide easements for all watermain on plan.
3. Additional gate wells will be required to meet isolation requirements.
4. Radii of watermain appears to be too small at Units 40-41. Bends may be necessary.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 8 of 9

5. There appears to be less than 10 feet of separation barrel to barrel between the storm sewer and watermain proposed in front of multifamily Unit 38. Please revise.

Sanitary Sewer

1. A manhole will need to be added along Hill Road southeast of multifamily Unit 28. There is 720 feet between manholes.
2. There appears to be less than 10 feet of horizontal separation to storm sewer in front of multifamily Unit 57. Please revise so minimum separation is achieved.
3. Modify sanitary sewer connection note on Sheet P-4.1 to read: "Connect proposed 10" **and 18"** sanitary to existing 18" sanitary stub."

Stormwater Management

1. We recommend that the proposed ditch end section tie into the MH southwest (adjacent to multi-family Detention Pond 3) be moved such that the end section ties into a separate manhole due south of the end section. This would eliminate the potential for four pipe connections into the same MH. See Sheet 4.2.
2. Show 12' easements for storm sewer on plan.
3. A minimum of 12" diameter sewer is required for storm sewer carrying surface drainage. Reference Sheet 4.4; proposed sewer for Lots 55-80 and 28-36 will need to be changed from 8" to 12".
4. Storm sewer shall be located no closer than a 10' horizontally from proposed buildings/structures. Reference Building #28 multi-family.

Recommendation

Most of our previous comments have been addressed; the need for a redundant water source is a significant outstanding item that needs to be acknowledged by the applicant as a condition of PSP approval should the Planning Commission desire to make that motion. The storm sewer easement deck encroachments mentioned in Item m) above should be discussed as they may pose problems as units are built out. DLZ is confident the remaining items can be further clarified on the Final Site Plan submittals without significant modification to the site layout.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.04

May 25, 2022

Page 9 of 9

Please feel free to contact our office should you have any questions.

Sincerely,

DLZ Michigan

Michael Leuffgen, P.E.
Department Manager

Victoria Loemker, P.E.
Senior Engineer

Cc: Justin Quagliata, Community Development, *via email*
Hannah Micallef, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township, *via email*
John Holland, Fire Chief, White Lake Township, *via email*
Jason Hanifen, Fire Marshal, White Lake Township, *via email*

X:\Projects\2021\2145\723321 White Lake Hill\PSP Review.04\Review.04.docx



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

April 13, 2022

Sean O’ Neil
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

RE: The Avalon- f.k.a. White Lake Hill- Preliminary Site Plan Review – 3rd Review

Ref: DLZ No. 2145-7233-21 Design Professional: PEA Group

Dear Mr. O’ Neil,

Our office has performed the above mentioned Preliminary Site Plan review for the revised plan dated April 4, 2022. The plans were reviewed for feasibility based on general conformance with the Township Engineering Design Standards.

General Site Information

This site is located on the north side of M-59 and east of Ormond Road. The property is located on both sides of Hill Road: across from former Brooks Elementary School and West of Meijers. Total site acreage is approximately 110.02 acres.

Site Improvement Information:

- Construction of a Planned Development consisting of 87 single family condominium homes on the east side of Hill Road.
- Proposed paved and public road for the single family condominium homes with one point of access off Hill Road.
- Construction of a Planned Development consisting of 406 multi-family units for lease on the west side of Hill Road. Associated clubhouse and pool as part of multi-family development.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03

April 13, 2022

Page 2 of 9

- For multi- family units: associated paved and curbed parking including ADA accessible parking spaces and maneuvering aisles for clubhouse and pool. Internal streets and drives are also proposed with a point of access off M-59 and a second point of access off Hill Road.
- Site to be serviced by watermain and sanitary sewer.
- Storm water runoff is proposed to be detained as follows: 1) Detention Pond at the northwest corner of Hill Road and M-59- to discharge to existing storm sewer just south. 2) Two detention ponds on the west side of Hill Road and located centrally in the multi-family portion- to discharge to existing culvert under Hill Road. 3) Detention ponds located on the southernmost portion of the single family phase- to discharge to existing watercourse located between the two ponds. 4) Detention pond located on the eastern portion of the single family phase- to discharge to the existing wetlands to the southwest.

We offer the following comments:

Note that comments from our March 15, 2022 review letter are in *italics*. Responses to those comments are in **bold**. New comments are in standard typeface.

The following items should be noted with respect to Planning Commission review:

- a) *Pond 2 located in the single family section of the development (see plan Sheet P-5.1) proposes discharge to the adjacent wetlands to the west. Clarify where drainage from this wetland shall be routed as it appears from existing topography that there is no outlet from this wetland. In addition, a portion of this wetland is located off site; an off-site drainage easement would be required. Additional topographical survey information will be required for the property to the south of the wetlands in order to clarify the drainage path.* **The design engineer has noted that the discharge from the proposed pond (now labeled as Pond 5) will discharge at an agricultural rate and follow its natural off site drainage course. The difference in pre and post development area discharging from proposed Pond 5 to the existing wetlands is an increase of 0.2 acres. We can consider this item complete for this level of review, however the capacity for the receiving wetland to accommodate the increased runoff volume will need to be demonstrated at the time of Final Site Plan.**
- b) *The multifamily exiting drive onto M-59 shows a width of 16 feet. Township Zoning Ordinance 5.11Q.v. requires a width of 20' for one way drives and a minimum width of 24' for two way drives.* **Dimensions have been clarified; DLZ defers further comment regarding compliance to Township Planning Department.**



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03

April 13, 2022

Page 3 of 9

- c) *We defer to the Township as to whether 6 foot wide sidewalk is required on both sides of Hill Road. None is proposed at this time. Township Zoning Ordinance 5.21 requires a minimum of 6 foot width for sidewalks along major roadways. Comment outstanding. We continue to defer to the Township with regard to this item. Note that an 8' wide path has now been added along a portion of the west side only of the Hill Road frontage and that two road crossings of the path have been proposed near the Hill Road entrances in order to connect the multi-family to the single-family units. The locations for the path crossings should be reviewed for proper pavement markings and pedestrian crossing signage. Comment addressed at this level of review. Per the design engineer, this item was discussed at a Township Zoom meeting on March 25, 2022. It was determined that an 8' wide path will be added along the western side of Hill Road from M-59 to the single family entrance. Paths are also now shown along the frontage for Units 81-84 and 85-87 only as the adjacent areas pose an issue with regulated wetlands and stream encroachment. The developer agreed at the meeting to make a contribution to the White Lake Sidewalk Fund to supplement pathway areas not installed along Hill Road.*

We note that portions of the proposed sidewalk along the western side of Hill Road are proposed outside the future ROW. This sidewalk locations shall be either adjusted to inside the future ROW or an easement shall be provided. In addition, our comment with respect to the proper pavement markings and pedestrian crossing signage for Hill Road crossing will need to be addressed at the time of FSP/FEP submittal.

- d) *Clarify ADA space number determination for ADA spaces associated with the clubhouse for the multi-family portion; are the four ADA spaces based on guest count of 79? Comment outstanding. Although design engineer states that the required ADA parking spaces are provided at the clubhouse for residents or visitors using the facilities, the basis for determining the 4 (four) required spaces for the clubhouse will need to be provided. Comment addressed. Basis for number of ADA spaces has now been provided.*
- e) *The following single family lots present conflicts with either the proposed house, required grading, or the potential deck/patio encroaching into the wetlands setback: 1, 27, 28, 40, 61, and 88. Impacts to the wetlands buffer will need to be removed. Comment outstanding. The wetlands setback/buffer for all wetlands was not shown on the initial Preliminary Site Plan submittal dated December 8, 2021. There are now units in the single family portion of this development as well as other areas of the development where grading is proposed in the wetlands setback/buffer which is not allowable. The following single family units will require revision with respect to grading in the wetlands setback: 1-7, 20, 27, 28, 39, 40, 52-54, 61, 75, 76, 84, 85, and 88. In addition, the proposed retaining wall adjacent*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03

April 13, 2022

Page 4 of 9

grading to the northwest of multi-family Unit 19 will also require adjustment with respect to grading in the wetlands buffer. Since the units listed border EGLE regulated wetlands, our office concurs with the recommendation by Barr Engineering, Inc Wetland Delineation Report (dated February 9, 2022) recommending that Barr's wetland boundary determination and jurisdictional opinion be reviewed by EGLE prior to undertaking any activity near or within any identified wetlands; the proposed layout as submitted may require revision, in response to EGLE's review, to unit/ lot layout in the single family phase, thus impacting the preliminary site layout. **Comment addressed. Per a meeting with the Township on March 25, 2022, it was agreed that grading within the 25' wetland setback would be acceptable. A wetland restoration plan shall be required at the time of FSP/FEP submittal. Plan shall include a timeline for restoration of the wetland buffers. Note that the developer shall also be required to comply with all EGLE requirements with respect to grading and regulated wetlands. A note shall be provided on the FSP/FEP with regard to the wetland buffer restoration.**

- f) *Is the existing sidewalk along the M-59 road frontage being removed once the new 8' wide concrete sidewalk is installed? Please clarify. Comment partially addressed. The design engineer has indicated that the existing sidewalk shall remain and that the intent shall be for the developer to adhere to MDOT recommendations and requirements. Further clarification shall be required as to whether there will ultimately be two parallel running sidewalks along the M-59 frontage; redundancy with respect to the sidewalks should be avoided.* **Comment addressed. The existing sidewalk will be eliminated per the design engineer and a new walk placed 1' inside the ROW.**
- g) *All public roads are required to be built to RCOC standards.* **Comment remains as a notation.**
- h) *All drive widths adjacent to carports in the multi-family residential shall be specified and built in accordance with White Lake Township width requirements. Comment partially addressed. No carports are required, however the drive widths adjacent to all parking spaces shall be shown as some drive widths have not been provided.* **Comment addressed. All drive widths have now been provided.**
- i) *Specify the proposed width of the shared access driveways for Lots 81-84 and 85-88 of the single family portion. These drives shall be built to private access drive standards of White Lake as specified in the Zoning Ordinance Section 5.16. Section C. ii. requires two points of access for such drives to an adjacent public or private road. Section D. ii. requires that access driveways shall be able to accommodate emergency vehicles. Comment partially addressed. Two points of access for each of the drives are now proposed, however, Ordinance 5.16 C.i. requires a 30' wide easement width for an access drive; 25' is proposed for Lots 81-84 and 85-88. In addition, Zoning Ordinance Section 5.16 C. iii. regarding setbacks shall be met (Unit 85 is not in compliance). Also specify on plan that the 20' drive widths proposed are measured as 20' from the edge of the gutter line per Ordinance 5.16 C. v. Please also provide fire truck turning radius for these private access drives.* **Comment addressed, fire**



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03
April 13, 2022
Page 5 of 9

truck movements have been provided and show that while tight the trucks will be able to traverse the drives.

- j) *Clarify what is being done with the existing culvert that crosses under Hill Road and routes drainage through an existing ditch in front of the parking lot that is east of Hill Road and north of M-59. Comment outstanding. The design engineer has provided clarification with regard to the culvert under Hill Road that is adjacent to the proposed Detention Basin 3. The clarification request was however regarding the culvert at M-59 and Hill Road; this will require a response. **Comment addressed. Clarification has now been provided.***
- k) *Clarify if there is an existing drainage easement on the property south of the single family Detention Ponds 1 and 3. An easement will be required for discharge of drainage off site. In addition, the design engineer will be required to demonstrate that there will be no downstream impacts from the proposed development in terms of stormwater discharge flows. Engineer will need to demonstrate that adequate downstream capacity exists to handle post development flow. **Comment remains as a notation and can be further clarified at the time of FSP. Design engineer has stated in their February 15, 2022 review response letter: "There is not an easement in place. There is an existing stream which provides the historical drainage route through the said parcel to a box culvert under M-59. Since the development will have a 100-year detention basin and will discharge stormwater at an agricultural rate, the downstream ditch should have adequate capacity. A detail engineering analysis will be provided to the township and MDOT during the construction plan phase."***
- l) *End sections for the three detention basins proposed on the single family portion will be required to be located outside the wetland setback. Comment partially addressed. Our office finds the basin outlet locations acceptable and that the outlet pipes for Basins 4 and 5 shall be constructed within the wetlands setback and the land restored to its natural preconstruction condition. Note that location of the basin end sections shall be subject to review and approval by EGLE. EGLE may require revision of the end section locations. Our office recommends the Township require a wetland setback restoration plan and that the developer be required to post a bond amount to guarantee proper and timely completion of restoration of the wetland buffer setbacks in these two areas should EGLE approve the end section locations. **Comment addressed for this level of review. The design engineer notes a wetland setback restoration plan shall be provided at the time of FSP/FEP submittal. A note shall be provided on the FSP/FEP regarding wetland setback restoration.***
- m) *Extend the sanitary sewer to the north property line along Hill Road. Comment remains. Applicant indicated that the topography near the northern property restricts construction of the sanitary sewer at this location and would require a construction easement from the adjacent property owner. Township Ordinance requires extension to the limits of the property line and the sanitary sewer master plan indicates that gravity sanitary sewer is ultimately proposed north of this location. We defer*



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03

April 13, 2022

Page 6 of 9

to the Township if a variance can be granted on this requirement or if completion of this item will be a condition of approval. **Comment addressed. Discussion with the Township concluded that the sewer shall not be extended to the north property line and that an easement for future sanitary sewer extension shall be provided. In addition, the developer shall be required to deposit a monetary fee or escrow with the Township as assurance to supplement the future sewer extension.**

- n) *With nearly 60 feet of elevation change, the designer should ensure that sufficient pressure exists at the higher elevations for a bathroom on the 2nd story. The water may have to come from Pressure District 4 to service units with higher elevations as it appears that there will be insufficient pressure on the northern portions of the proposed development. To interconnect between the pressure districts, at least one PRV may be required. We suggest that the Township request escrow funds with regard to this item such that DLZ can model the water system to determine any deficiencies that may exist regarding water pressures and/or capacities. Our office has performed modeling of the proposed water system, see attached water model results; In all scenarios the area at the northeast corner of Aurora Circle experienced the lowest resulting pressure. There is a need for a handful of homes in this vicinity to have individual booster pumps to ensure adequate pressure given the various scenarios. It can also not be understated that the proposed design places an incredibly high criticality rating on the existing 16" watermain along M59. This is the only supply proposed to serve the nearly 500 residential units. If something were to happen to this watermain there is no second source or storage to feed this area temporarily. DLZ recommends a second water supply be installed to provide redundancy to the proposed distribution system. Please note that in order to stay within the same pressure district the source would need to be from south of the existing Pressure Reducing Valves that exist on either side of the existing Meijer store. **Comment addressed at this level of review. As a condition of the Township engineer's recommendation for Preliminary Site Plan approval, the developer acknowledges the critical issue of not having a redundant source of water supply for the proposed development. The design engineer has stated that a second supply connection is being researched.***
- o) *Sanitary sewage from this development is tributary to the existing Meijer sanitary sewer pump station located at the Northeast corner of Highland Road and Bogie Lake Road; an analysis will need to be provided that indicates there is sufficient capacity within the existing pump station, or if upgrades will be necessary to support the additional discharges. **Comment addressed and remains as a notation. Design engineer states in their review response letter dated February 15, 2022: "Since an 18" sewer has been stubbed to the Hill Road/M-59 intersection, it is our understanding that the pump station and forcemain were designed for future development along Hill Road and Ormond Roads. A detailed analysis will be conducted during the construction plan phase."***



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03

April 13, 2022

Page 7 of 9

- p) *Proposed future decks or patios for Lots 12,15,82, and 83 of the single family portion of the development appear to encroach into the proposed storm sewer easement. Please revise. **Comment outstanding. A 12' wide deck or patio would only allow for 5' of easement on one side of the storm sewer relative to Units 82 and 83; 6' minimum is required. In addition, Units 9-12 would have a similar issue. Unit 80- the deck or patio could only be placed on the NE area of the rear of the house. Units 85 and 86 would not have enough space for a deck or patio without storm sewer easement encroachment.***
- q) Parcel Area Table on Sheet P-2.0 of plans appears to be missing parcel data for Units 82,83,84,86, and 87. Please update.

The following comments can be addressed on the Final Site Plan/Final Engineering Plan:

Final Site Plan/Final Engineering Plan Comments-

General

1. Plan shall contain notes per White Lake Township Engineering Design Standards Section A. 8. a.-d.
2. Provide at least two permanent benchmarks on NAVD 88 datum. Benchmarks are required at least every 1,200 feet.
3. Provide soil boring reports that were prepared by CTI and McDowell.
4. The topographical survey shows existing overhead electrical lines on the parcel west of Hill Road. Clarify as to whether these lines shall remain or be relocated and as to whether an easement for the lines exists. In the event the lines are to be relocated, the easements (if existing) will need to be vacated.
5. A landscape plan showing all proposed trees relative to proposed storm sewer, sanitary sewer, and watermain shall be submitted. Note that 10' horizontal separation is required between proposed utilities noted and proposed trees.

Paving/Grading

1. ADA accessible ramps will be required on sidewalk adjacent to ADA parking spaces. Ramp slopes shall meet ADA requirements.
2. Structural wall calculations, that have been signed and sealed by a Registered Structural Engineer, verifying the wall integrity and the ability to support lateral and vertical stresses will need to be provided for retaining walls over 30" tall.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03

April 13, 2022

Page 8 of 9

3. Retaining walls >30" in height shall require a decorative fence or railing at the top that is a minimum of 36" in height.
4. Wetland buffers shall be clearly shown on all grading sheets.
5. Sheets 3.1-3.4 have Hill Road mislabeled as Highland Road. Please revise.

Watermain

1. We defer to the Fire Department regarding items related to fire suppression and hydrant coverage.
2. Show 20' wide easements for all watermain on plan.
3. Additional gate wells will be required to meet isolation requirements.
4. Radii of watermain appears to be too small at Units 40-41. Bends may be necessary.
5. There appears to be less than 10 feet of separation barrel to barrel between the storm sewer and watermain proposed in front of multifamily Unit 38. Please revise.

Sanitary Sewer

1. A manhole will need to be added along Hill Road southeast of multifamily Unit 28. There is 720 feet between manholes.
2. There appears to be less than 10 feet of horizontal separation to storm sewer in front of multifamily Unit 57. Please revise so minimum separation is achieved.
3. Modify sanitary sewer connection note on Sheet P-4.1 to read: "Connect proposed 10" **and 18"** sanitary to existing 18" sanitary stub."

Stormwater Management

1. We recommend that the proposed ditch end section tie into the MH southwest (adjacent to multi-family Detention Pond 3) be moved such that the end section ties into a separate manhole due south of the end section. This would eliminate the potential for four pipe connections into the same MH. See Sheet 4.2.
2. Show 12' easements for storm sewer on plan.
3. A minimum of 12" diameter sewer is required for storm sewer carrying surface drainage. Reference Sheet 4.4; proposed sewer for Lots 55-80 and 28-36 will need to be changed from 8" to 12".
4. Storm sewer shall be located no closer than a 10' horizontally from proposed buildings/structures. Reference Building #28 multi-family.



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

WLT-White Lake Hill- PSP Review.03
April 13, 2022
Page 9 of 9

Recommendation

Most of our previous comments have been addressed; the need for a redundant water source is a significant outstanding item that needs to be acknowledged by the applicant as a condition of PSP approval should the Planning Commission desire to make that motion. The storm sewer easement deck encroachments mentioned in Item p) above should be discussed as it may pose problems as units are built out. DLZ is confident the remaining items can be further clarified on the Final Site Plan submittals without significant modification to the site layout.

Please feel free to contact our office should you have any questions.

Sincerely,

DLZ Michigan

Michael Leuffgen, P.E.
Department Manager

Victoria Loemker, P.E.
Senior Engineer

Cc: Justin Quagliata, Community Development, *via email*
Hannah Micallef, Community Development, *via email*
Aaron Potter, DPS Director, White Lake Township, *via email*
John Holland, Fire Chief, White Lake Township, *via email*
Jason Hanifen, Fire Marshal, White Lake Township, *via email*

X:\Projects\2021\2145\723321 White Lake Hill\PSP Review.03\Review.03.docx



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

June 15, 2022

Sean O’Neil, Director
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

**RE: Traffic Impact Study Review
Mixed-Use Development at Highland Road (M-59) and Hill Road**

Ref: DLZ File No. 2145-7233-21
Date of Study: 06/07/2022

Design Professional: Fishbeck

The applicant has submitted a revised Traffic Impact Study for the redevelopment of P.I.’s #12-20-101-003 and 12-20-126-006. P.I. #12-20-101-003 and 12-20-126-006 total 110.02 acres and are located on the north side of Highland Road (M-59) on both the east and west side of Hill Road. The study evaluated existing conditions, anticipated background conditions and anticipated traffic generated by the proposed development, then it completed both traffic signal warrants and right turn lane warrants for the proposed site. All of the intersections evaluated along Highland Road are under the jurisdiction of the Michigan Department of Transportation (MDOT).

The first observation of the TIS, is that despite utilizing the same traffic data as the previous TIS, which was submitted in December 2021, the Level of Service (LOS) analysis for the existing conditions had a significant change in the existing LOS of the WB Highland Rd. and EB Crossover intersection in the PM Peak hour. The previous TIS had an existing LOS of F and a delay time of 66.8 sec. The revised TIS has an existing LOS of D and a delay time of 29.1 sec for the same intersection in the PM Peak hour. DLZ is not aware of the reason for the change in delay, but the change provides doubt to the potential findings in the TIS. There is also a significant difference between the two reports for the same intersection and same time period in the Background Conditions analysis (LOS F: 78.0 sec delay vs LOS D: 31.3 sec delay).

Upon running the traffic signal warrants at each intersection, the study determined that Warrant 1 – Eight Hour Vehicular Volume and Warrant 3 – Peak Hour Vehicular Volume are met for the WB Highland Road and EB Cross (east of Hill Road) intersection. The intersection was then modeled with a traffic signal, which resulted in improved LOS for the intersection compared with the unimproved future conditions. However, the improved future condition LOS analysis revealed that the LOS is significant worse for the following intersections in the PM Peak hour compared with the background conditions analysis:



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

Intersection	Background Condition LOS/Delay	Improved Future Condition LOS/Delay
M-59 and EB crossover (NB)	AM: LOS B – 14.1 sec	AM: LOS D – 45.0 sec
	PM: LOS D – 31.3 sec	PM: LOS E – 60.5 sec
WB M-59 and Hill Road (SB)	AM: LOS B – 14.2 sec	AM: LOS C – 21.3 sec
	PM: LOS D – 30.1 sec	PM: LOS F – 68.2 sec
EB M-59 and WB crossover (SB)	AM: LOS C – 22.3 sec	AM: LOS E – 36.6 sec
	PM: LOS D – 29.1 sec	PM: LOS E – 40.6 sec
EB M-59 and Haven Rd (SB)	PM: LOS D – 34.6 sec	PM: LOS E – 46.4 sec

Due to the number of intersections where the LOS changes from LOS D to LOS E or F, DLZ believes there are further improvements to be made in this area.


We have reviewed the analysis; the methodology appear to be in line with standard practices, and the findings are supported by the data provided, though are in potential conflict with the previous TIS that used the same data. However, the resulting LOS for the intersections is worse than the background conditions for the site on several legs of the analyzed intersections. Several legs currently operating at LOS D or better will change to a LOS E or F, and nearly all legs will operate at a LOS worse than the background conditions. Further evaluation and improvements adjacent to the proposed site should be considered.

Upon running the right turn lane warrant for the WB Highland Road and Hill Road intersection, it was determined that a full right turn lane was warranted due to PM peak hour traffic volumes.

DLZ believes additional improvements are needed in the area in order to improve Level of Service in the corridor to an acceptable level, but would note that final approval of the Traffic Impact Study will be provided by MDOT.

If you have any questions, please feel free to contact to me.

Respectfully,
DLZ Michigan, Inc.


 Digitally signed by Leigh C Merrill III
 Date: 2022.06.16 12:52:27-04'00'

Leigh Merrill, P.E.
Project Manager

CC: Cc: Michael Leuffgen, P.E., DLZ *via email*
Justin Quagliata, Community Development *via e-mail*

WHITE LAKE TOWNSHIP PLANNING COMMISSION

REPORT OF THE COMMUNITY DEVELOPMENT DEPARTMENT

TO: Planning Commission

FROM: Sean O’Neil, AICP, Community Development Director
Justin Quagliata, Staff Planner

DATE: May 25, 2022

RE: The Avalon
Rezoning and Preliminary Site Plan – Review #4

Staff reviewed the revised preliminary site plan (PSP) prepared by PEA Group (revision date May 16, 2022). The previous staff report for the rezoning and PSP (attached) should be referenced for a more complete overview of the project. At its April 21, 2022 meeting the Planning Commission recommended approval of rezoning both parcels to Planned Development (PD) and recommended denial of the PSP. In an effort to address concerns of the Planning Commission, a number of changes were made to the PSP, including:

- Reduction of 13 multiple-family (apartment) units, from 406 to 393
 - Multiple-family density reduced from 6.3 units per acre to 6.1 units per acre
- Reduction of 6 single-family units, from 87 to 81
 - Single-family density reduced from 2.8 units per acre to 2.6 units per acre
- Increased multiple-family setback from north property line, from 50 feet to 120 feet
- Eliminated sign setback waiver request at the corner of Hill Road and Highland Road
- Eliminated Highland Road driveway width waiver request
- Eliminated parking stall striping waiver request
- Eliminated dumpster pad waiver request

Overall, there would be 393 apartment units for rent among 57 buildings (**Building 39 is not located on the PSP; revise building numbers accordingly**) consisting of 17, twelve-unit buildings; 17, six-unit buildings (21 on the prior PSP); 4, five-unit buildings (5 on the prior PSP); 10, four-unit buildings (6 on the prior PSP); and 9, three-unit buildings. **An updated number of two-bedroom units and three-bedroom units shall be provided on Sheet P-2.0.** In the multiple-family portion of the development, the 12-plex buildings would be two-stories in height and all other building types would consist of ranch-style dwellings. The 81 site condominiums would consist of one- and two-story units. All of the single-family and multiple-family units would have an attached two-car garage. Some single-family products have an optional two-and-a-half car garage and/or three-car garage. There are no side-entry garages on either the single-family or the multiple-family units.

On Sheet P-2.0, the following shall be updated in the Multi-Family Site Data Table:

- **Proposed Use: incorrect dwelling units per acre provided.**
- **Building Footprint Area: was not updated from prior PSP.**
- **Minimum Lot Size: number of units and minimum lot size not updated from prior PSP.**
- **Building Lot Coverage: was not updated from prior PSP.**
- **Setback Requirements (proposed only): was not updated from prior PSP.**
- **Parking Calculations: was not updated from prior PSP.**
- **Open Space: was not updated from prior PSP.**

On Sheet P-2.0, the following shall be updated in the Single-Family Site Data Table:

- **Maximum Building Lot Coverage: incorrect standard listed (correct standard is 20%) and proposed maximum lot coverage was not updated from prior PSP.**
- **Proposed Setbacks: the prior PSP noted a 45-foot rear yard setback prescribed for Units 8-13. If proposed, the data table shall note differing setbacks for certain units.**
- **Open Space: was not updated from prior PSP.**

Parallel Plan

For any residential project, a parallel plan demonstrating the layout and density of residential uses that would be possible without use of the PD District is required. A parallel plan must meet all standards for lot area, lot width, and setbacks; roadway improvements; open space; and contain an area which conceptually would provide sufficient area for stormwater detention. Lots in the parallel plan must provide sufficient building envelope size without impacting regulated wetlands.

The applicant provided a parallel plan showing the parcel on the east side of Hill Road developed under R1-D (Single-Family Residential) zoning. According to the plan, 96 units could be developed on “lots” 80 feet wide and 12,000 square feet in area (the minimum lot size standards for R1-D zoning). With 96 units on 32.51 net acres (net acreage for parallel plan purposes only), the parallel plan yields a single-family density of 2.9 dwelling units per acre.

On the west side of Hill Road, the parallel plan shows the parcel developed under RM-2 (Multiple-Family) zoning. As indicated on the plan, 600 units (apartments) could be developed among 49 twelve-unit buildings and 2 six-unit buildings. For the multiple-family portion of the development, the parallel plan shows buildings on the site at the maximum lot coverage (20%), and the minimum amount of recreation space is provided (1.49 acres). Note areas of recreation space are not identified on the plan; it appears areas likely comprising recreation space include the pocket park, clubhouse facility, and park commons noted on the plan. With 600 units on 63.94 net acres (net acreage for parallel plan purposes only), the parallel plan yields a multiple-family density of 9.4 dwelling units per acre.

Waivers

Generally, in a PD the standard requirements for lot size, yards, frontage, setbacks, building height, and type and size of dwelling unit are waived, provided the purpose and intent of the zoning ordinance are incorporated into the overall development plan. For PDs the zoning ordinance is intended to provide flexibility for the Planning Commission and Township Board to set appropriate standards during site plan review. Where modifications of zoning ordinance standards are requested, the Developer must provide a table which clearly compares each requested modification to the zoning ordinance standard to be modified. Unless variations are specifically requested and approved by the Planning Commission, the final site plan must comply with the appropriate standards of the Township. Based on the revised PSP, the Developer is requesting the following waivers for the Avalon PD:

Recreation Space

Multiple-family developments are required to provide recreation space for the use of the residents therein. A formula is applied whereby 5,000 square feet for the first unit plus an additional 100 square feet for each additional unit determines such space required for recreation. For a 406-unit multiple-family development, 45,500 square feet of recreation space is required. The submitted open space plan shall be revised to note the correct recreation space requirement (10,700 square feet is incorrectly listed as required). 18,623 square feet of recreation space (clubhouse, pool, and dog park) is proposed in the multiple-family portion of the development; therefore, a waiver of 26,877 square feet is required for the amount of recreation space. **It appears a recreation space waiver is still required – an updated calculation shall be provided on the PSP.**

Lot Area

The existing R1-A zoning district requires parcels have a minimum lot area of one acre. In the R1-D (Single-Family Residential) zoning district, the densest district in the Township, parcels are required to have a minimum lot area of 12,000 square feet. For the single-family portion of the project, the PD has “lots” ranging from 7,431.38 square feet to 17,750.68 square feet in size. The average “lot” size is 9,118.05 square feet. Staff suggests the Planning Commission consider requiring minimum lot area of at least 8,000 square feet. **Based on the revised PSP, “lots” range from 8,039 square feet (607.62 square foot increase) to 17,205 square feet (545.68 square foot decrease) in size. The average “lot” is 9,337 square feet (218.95 square foot increase) in size.**

Lot Frontage/Width

Lot width is the straight-line distance between parallel side lot lines, measured at the front setback line. Where side lot lines are not parallel, the width is measured at the front setback line parallel to the street or tangent to the curve of the street. The existing R1-A zoning district requires parcels have a minimum of 150 feet of lot frontage. In the R1-D zoning district, parcels are required to have a minimum lot width of 80 feet. Lots on a cul-de-sac or curvilinear street must have a minimum of 65 feet of frontage and comply with the lot width requirement at the minimum front setback line. Additionally, corner lots in condominium subdivisions must be at least 20 feet wider than the minimum width required by the zoning ordinance. For the single-family portion of the project, the PD has “lots” ranging from 62 feet of lot width (including “lots” on a cul-de-sac or curvilinear street) to 107 feet (**now 105 feet**). The average “lot” width is 68 feet. Staff suggests the Planning Commission consider requiring minimum lot width of at least 70 feet. **Based on the revised PSP, the minimum lot width and average lot width remain unchanged from the prior plan. Maximum lot width decreased two feet, from 107 feet to 105 feet. Staff still supports a larger lot width, with 70 feet suggested as the requirement for the PD.**

Setbacks and Lot Coverage

The yard setbacks and lot coverage for the existing R1-A zoning district, R1-D zoning district, PD zoning district, and the proposed PD (single-family) are summarized in the table below.

	R1-A zoning	R1-D zoning	PD zoning	Proposed PD
Front yard setback	35 feet	30 feet	40 feet	25 feet
Side yard setback	25 feet	10 feet	25 feet	10 feet
Rear yard setback	40 feet	30 feet	TBD	35 feet**
Max. lot coverage	20%*	20%*	TBD	35%***

*A maximum 30% lot coverage may be approved administratively by the Community Development Director or his designee on existing lots of record where the lot has sanitary sewer service and the proposed building complies with all setback requirements.

A 45-foot rear yard setback is prescribed for Units 8-13. **As noted on page 2 of this report, clarification is required on the revised PSP.

*** **As noted on page 2 of this report, clarification is required on the revised PSP.**

Buildings within a multiple-family development must have a minimum setback of 25 feet from the back of sidewalk or 25 feet from back of curb (if no sidewalk is present). A five-foot waiver is requested to allow a 20-foot front setback. **Waiver remains requested.**

The Planning Commission may consider the proposed setbacks and lot coverage and determine whether they are appropriate or whether additional setbacks or less lot coverage should be established. The submitted plan notes no deck or patio would encroach into any setback.

Decks, Porches, and Patios

The zoning ordinance states “In no instance shall a deck, porch, patio or paved terrace be located in any recorded easement...” As noted in the DLZ review letter dated April 13, 2022 decks and patios attached to several single-family units would likely encroach into the proposed storm sewer easement. Staff is concerned about deck/patio encroachment into the storm sewer easement. Maintenance activities within the easement could potentially damage decks/patios in the vicinity. While the storm system is private and must be maintained by the condo association (after assignment by the Developer), if the association fails to maintain the storm sewer and the Township exercises its right to maintain/repair/replace the system (as would be outlined in the development agreement and master deed) correcting resulting damage to private decks/patios should not be the responsibility of the Township. Hold harmless language, subject to approval by the Township Attorney, would need to be incorporated into the development agreement and master deed if a waiver was granted to allow deck/patio encroachment into the storm sewer easement. There is an alternative to not install decks/patios on the rear of units where encroachment into the storm sewer easement would occur. The decks/patios on the units in question could potentially be relocated to the sides of units and/or reduced in size. **As noted in the DLZ review letter dated May 25, 2022, since the unit count and numbering has changed and no utility information was included with the current submittal staff and consultants are unable to review requested changes or provide comment.**

Separate from the waiver request, the note under the typical lot layout on Sheets P-2.3 and P-2.4 of the site plan shall be revised to add the word “within” following the word “encroaching.” Also, the words “wetland buffer” shall be replaced with the words “natural features.” **Comment outstanding.**

Additionally, the Developer shall clarify its correspondence to the Township dated April 4, 2022. In said communication, the Developer requested a waiver to allow decks/patios to encroach within the Natural Features Setback on Units 1, 4, 9, 27, and 40. Such a request for waiver is inconsistent with the submitted preliminary site plans. **Comment outstanding; however, it does not appear a waiver for the aforementioned units to encroach into the Natural Features Setback is required.**

Driveway Access

For boulevard-style driveways, the minimum required entering road width is 20 feet and the minimum required exiting road width is 22 feet. The Hill Road boulevard access to the multiple-family portion of the development (both entering and exiting drives) appear to be 19 feet in width (the PSP measures the drive width to the back of curb; road measurement surface is taken between the edges of the gutter pan) and is noncompliant. Waivers (1 foot for entrance; 3 feet for exit) are needed to allow a reduction of the required road surface width.

Street Layouts and Blocks

The maximum length of cul-de-sac streets and maximum length of blocks within condominium subdivisions cannot exceed 1,500 feet. The Developer is seeking a 930-foot waiver to allow maximum block length of 2,430 feet. Topography, steep grades, and natural features on the site were the stated reasons for the requested waiver. The Fire Department has reviewed the length of the streets and blocks and is satisfied with accommodations for emergency access.

Street Continuation

The zoning ordinance requires the street layout in condominium subdivisions provide for continuation of streets to adjoining residential developments or the proper projections of streets (a stub) to adjoining property which could be developed in the future. Currently there is no street stub proposed to the property to the north. The applicant stated there is a 26-foot grade difference from the north property line to the proposed road. Topographic conditions seem to justify a waiver from this requirement.

Sidewalks

The zoning ordinance requires a minimum six-foot-wide sidewalk placed one-foot from the inside edge of the right-of-way along both the east and west Hill Road property frontages, which the applicant is required to install as part of the project. The submitted site plan shows an eight-foot concrete sidewalk along the west side of the Hill Road property frontage from Highland Road to the south side of the single-family access (across the street). Portions of this sidewalk are proposed outside of the future right-of-way; the sidewalk must be relocated inside the road right-of-way or an easement be provided. Right-of-way/easement widths for public walkways when not adjacent to or a part of street rights-of-way must be at least 15 feet and dedicated to the use of the public. Sidewalks on the east side of Hill Road are proposed along the frontage of Units 81-84 (**now Units 75-78**) and Units 85-87 (**now Units 79-81**). There are regulated wetlands and a stream along the remaining portion of Hill Road north of Units 81-84 (**now Units 75-78**); therefore, the Developer is requesting a waiver to not install sidewalks in this location. However, the Developer offered to make a contribution to the Township Sidewalk Fund to supplement the pathway areas not installed along Hill Road. The amount of the proposed donation must be provided and accepted by the Township.

Signs

The zoning ordinance requires the area, quantity, location, and dimensions of all signs to be provided with the preliminary site plan. One monument sign, not more than 30 square feet in area, may be maintained at or adjacent to the principal entrance to a residential development. One additional sign may be permitted if the residential development has access to two thoroughfares or the development has more than one boulevard street entrance from an existing arterial or it has at least 250 dwellings. The signs may not exceed a height of six feet. The multiple-family portion of the development would contain more than 250 units, so a second development entry sign is permitted by right.

A waiver is requested to install a third sign (determined to be the sign at the corner of Highland Road and Hill Road). For the multiple-family portion of the development, the other monument signs are proposed adjacent to (Highland Road) and within (Hill Road) the boulevard entrances. One monument sign is proposed within the boulevard entrance to the single-family portion of the development.

While signage details were not provided, staff can administratively review and approve the sign design. The monument signs would be required to comply with residential district sign regulations, including not more than 30 square feet in area and six feet in height.

Comments to be addressed from previous review

- The apartments would have access to a 6,658 square foot clubhouse consisting of a business center, fitness center, and leasing office. A patio (covered and uncovered) at the rear of the clubhouse is adjacent to a swimming pool. The conceptual clubhouse renderings state the building would be 5,132 square feet in size. Clarify the size of the clubhouse and revise the plans for consistency.
- The open space plan does not clearly indicate if stormwater management areas are counted as open space. Clarification must be provided.
- Parking calculations (for multiple-family dwellings) on Sheet P-2.0 shall be revised; the number of bedrooms, guest parking required, and total parking required are incorrect.
- Phasing, if any, shall be indicated on the plans.
- A trash enclosure detail shall be provided on Sheet P-7.0 showing the finished face on the outside walls of the enclosure and indicate the color of the gate.
- An updated list of all requested waivers shall be provided by the Developer. Furthermore, PD modifications 2, 4, and 5 shall be removed from the table on Sheet P-2.0.

Planning Commission Options / Recommendation

The Planning Commission may recommend approval or denial of the rezoning request, or it may recommend a different zoning designation than proposed by the applicant to the Township Board. The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board. **The proposed rezoning and planned development are both compatible with the Master Plan and with surrounding land uses. Staff recommends approval of the rezoning, and approval of the preliminary site plan subject to the items identified in this report being addressed prior to final site plan.**

The following notations summarize the preliminary site plan review:

- Recommendation of approval is in accordance with the preliminary site plans prepared by PEA Group (revision date ~~April 4, 2022~~ **May 16, 2022**), subject to revisions as required. The utility, grading, and storm drainage plans for the site are subject to the approval of the Township Engineering Consultant and shall be completed in accordance with the Township Engineering Design Standards.
- Recommendation of approval is in accordance with the preliminary ranch unit building elevations and floor plans prepared by Alexander V. Bogaerts & Associates, P.C. dated March 29, 2022, subject to revisions as required and with the preliminary 12-plex elevations and floor plans prepared by Burmann Associates Inc. dated June 27, 2018 and July 17, 2018, subject to revisions as required.

Attachments:

1. Avalon staff report dated April 13, 2022.
2. Revised preliminary site plan prepared by PEA Group (revision date May 16, 2022).
3. Preliminary ranch unit building elevations and floor plans prepared by Alexander V. Bogaerts & Associates, P.C. dated March 29, 2022.
4. Preliminary 12-plex elevations and floor plans prepared by Burmann Associates Inc. dated June 27, 2018 and July 17, 2018.

WHITE LAKE TOWNSHIP PLANNING COMMISSION

REPORT OF THE COMMUNITY DEVELOPMENT DEPARTMENT

TO: Planning Commission

FROM: Sean O’Neil, AICP, Community Development Director
Justin Quagliata, Staff Planner

DATE: April 13, 2022

RE: The Avalon
Rezoning and Preliminary Site Plan – Review #3

White Lake Hill, LLC has submitted an approximately \$140,000,000 planned development (PD) proposal for a project identified as The Avalon. Overall, the 493-unit PD proposal includes the construction of 87 detached single-family site condominiums (The Residence at Avalon) on approximately 30.66 net acres located on the east side of Hill Road, north of Highland Road and the construction of 406 multiple-family units (The Avalon Apartment Homes) on approximately 64.82 net acres located on the west side of Hill Road, north of Highland Road. Site condominiums are units whereby a person owns their individual “lot” and shares ownership of common space with the rest of the owners in the development. Typically, an owner is responsible for maintaining their own “lot,” much like a traditional subdivision. The site condominium would be governed by a declaration of Covenants, Conditions and Restrictions (CCRs), which were provided with the application. The multiple-family development would be maintained by a management company.

The area proposed for a PD is comprised of two parcels, which would be required to be rezoned. The property west of Hill Road (1085 Hill Road; Parcel Number 12-20-101-003) is zoned PB (Planned Business) and AG (Agricultural), and the property east of Hill Road (Parcel Number 12-20-126-006) is zoned R1-A (Single-Family Residential). The parcels proposed for the PD are identified in the table below:

Property/Parcel Number	Acreage	Street Frontage
Parcel Number 12-20-126-006	41.06 gross acres 30.66 net acres	1,624.88 feet (Hill Road)
1085 Hill Road Parcel Number 12-20-101-003	68.96 gross acres 64.82 net acres	1,406.50 feet (at the chord – Highland Road) 2,443.61 feet (Hill Road)

The intent of the PD district is to permit greater flexibility and more creative design of residential developments than is possible under conventional zoning regulations. A PD allows a developer to propose a residential project with diverse housing types and different lot dimensions and yard setbacks as those prescribed in the standard residential districts. Lot size, yards, frontage requirements, setbacks, building height, and type and size of dwelling unit restrictions are generally waived in a PD. In exchange for the flexible standards, a public benefit must be provided to offset the impact(s) of development on the Township. The Developer is proposing to contribute \$100,000 to the Township Parks and Recreation Fund to be utilized at Stanley Park.

Overall, there would 406 apartment units for rent among 58 buildings consisting of 17, twelve-unit buildings; 21, six-unit buildings; 5, five-unit buildings; 6, four-unit buildings; and 9, three-unit buildings. There would be 334 two-bedroom units and 72 three-bedroom units. The 12-plex buildings would be two-stories in height and all other building types would consist of ranch-style dwellings. The 87 site condominiums would consist of one- and two-story units. All of the single-family and multiple-family units would have an attached two-car garage. Some single-family products have an optional two-and-a-half car garage and/or three-car garage. There are no side-entry garages on either the single-family or the multiple-family units.

The apartments would have access to an approximately 6,658 square foot clubhouse consisting of a business center, fitness center, and leasing office. A patio (covered and uncovered) at the rear of the clubhouse is adjacent to a swimming pool. The conceptual clubhouse renderings state the building would be 5,132 square feet in size. The Developer must clarify the size of the clubhouse and revise the plans for consistency.

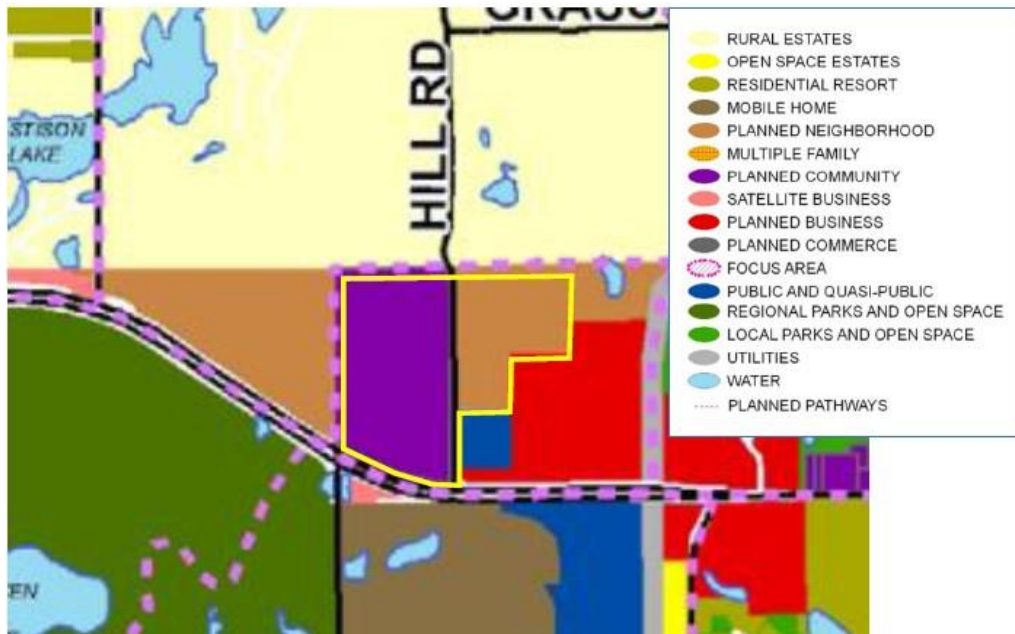
In total, the Developer estimates approximately 1,200 persons would reside within the overall development and anticipates the multiple-family apartments would lease for rates ranging from \$2,000 - \$2,700 per month and the single-family units would be for sale ranging from \$450,000 - \$500,000.

Master Plan

The Future Land Use Map from the Master Plan designates the subject site east of Hill Road in the Planned Neighborhood category, which is envisioned as a primarily residential land use of mixed densities and multiple product types, in a setting which may occasionally include a limited number of neighborhood retail, office, and personal service clusters. Connections to and segments of the Township community-wide pathway system are required as an integral part of all developments. All Planned Neighborhood development is intended to be served by Township sanitary sewers and either Township public water or community well systems. Net residential densities are anticipated to range between 2.0 and 8.0 units per acre, and nonresidential elements should not exceed 25 percent of the net land area after preservation of natural features. With 87 total units on approximately 30.66 net acres, density of the proposed site condominium is 2.8 dwelling units per acre (du/a).

The subject site west of Hill Road is designated as Planned Community on the Future Land Use Map. Planned Community is characterized by a mix of uses including higher residential densities and a variety of housing product types as well as a core area with retail, dining, entertainment, governmental, recreational, institutional, office and personal service establishments. Residential elements of a Planned Community may take the form of a freestanding neighborhood, or may be permitted on the upper floors of nonresidential development in the community core area. Multi-use/story buildings are expected to have two or three stories, however open space must be provided. Connections to and segments of the Township community-wide pathway system are required as an integral part of all developments. With 406 total units on approximately 64.82 net acres, density of the proposed multiple-family portion of the development is 6.3 du/a.

FUTURE LAND USE MAP



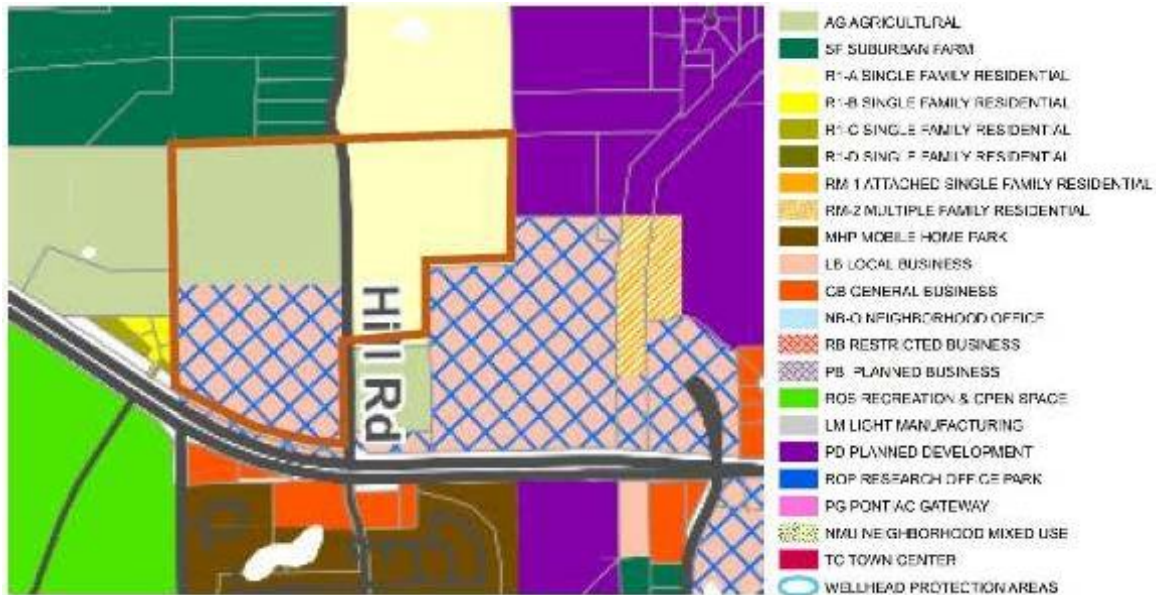
Zoning

The subject site west of Hill Road has split zoning; the south portion of the parcel is located in the PB (Planned Business) zoning district and the north portion of the parcel is located in the AG (Agricultural) zoning district. The subject site east of Hill Road is located in the R1-A (Single-Family Residential) zoning district. The following table illustrates the lot width and lot area standards for the existing and proposed zoning districts:

ZONING DISTRICT	LOT WIDTH	LOT AREA
AG	300 feet	5 acres
PB	No minimum	10 acres
R1-A	150 feet	1 acre

The properties proposed for development are requested to rezone to PD. A PD is allowed on properties a minimum of 10 acres in size. Any type and mix of housing (detached or attached single-family dwellings or multiple-family dwellings) are permitted in a PD. Various types of planned land use on large parcels held in common ownership, which includes preservation of open space, should characterize the PD district.

ZONING MAP



Physical Features

Currently the parcels are undeveloped and in parts are wooded with rolling topography. Wetlands on the properties were delineated by Barr Engineering Co. in March and April of 2021. There were 22 wetlands onsite, identified as A through V in the delineation report. According to the delineation report Wetlands I, J, K, O, R, and S appear to be regulated under Part 303 (Wetlands Protection, of the Michigan Natural Resources and Environmental Protection Act) because they are within 500 feet of the stream located east of Hill Road. Wetlands H and N may be regulated under Part 303 because they extend offsite and may be connected to a larger wetland complex, located west of the area of investigation that appears to be greater than five acres in size. Wetlands T and U may also be regulated under Part 303 because they are part of a larger wetland complex, located offsite, which is likely within 500 feet of the stream and likely five acres or more in size. Therefore, a Part 303 permit would likely be required from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to place fill, remove soil, drain surface water from, or make use of these specific wetlands. EGLE has regulatory authority regarding the wetland boundary location(s) and jurisdictional status of wetlands on this site. The Developer acknowledged prior to final site plan the wetland boundary determination and jurisdictional opinion shall be reviewed and verified by EGLE. The proposed unit layout may require revision in response to the EGLE review. Based on the submitted plans, 0.41-acre of wetland impact is proposed within the single-family portion of the development and 0.34-acre of wetland impact is proposed within the multiple-family portion of the development.

No building or structure can be located closer than 25 feet to any regulated wetland, submerged land, watercourse, pond, stream, lake or like body of water. The setback shall be measured from the edge of the established wetland boundary as reviewed and approved by the Township. Grading activities should also not occur in the Natural Features Setback (NFS) as the intent is to, as much as possible, leave said area in its natural state (i.e., not maintaining a lawn, not applying fertilizers or pesticides, native plantings only). In the single-family portion of the development, grading is proposed within the NFS. If grading is permitted to occur in the NFS, the area must be restored to its natural, undisturbed state. The Developer acknowledged a NFS restoration plan is required and must be submitted at final site plan, and also acknowledged the following must be conditions of any approval:

- Prior to any construction or grading on the site, the Developer shall install silt fencing at the upland edge of Natural Features Setbacks / limits of grading. The silt fencing shall be removed after construction once the area is stabilized and vegetation has been established.
- Wetland limits shall be clearly identified with permanent markers. The size, number, location, and language on the markers shall be subject to the approval of the Community Development Director.

Access

The site fronts on Highland Road and Hill Road. Highland Road (state trunkline) along the subject site is a four-lane divided highway designated as a Principal Arterial on the Township Thoroughfare Plan. Development of the subject site requires the installation of an eight-foot-wide sidewalk along the Highland Road property frontage (shown on plans; the existing paved shoulder is to be removed and converted to greenbelt). Hill Road is a gravel, two-lane public road without curb and gutter with a proposed 86-foot right-of-way requirement by the Road Commission for Oakland County (RCOC). The Developer will be required to dedicate (if not already completed) the additional portion of the future right-of-way to the RCOC. As part of the project, the Developer would pave Hill Road beginning approximately 140 feet from the northern extent of the condominium southward to Highland Road in accordance with the requirements of the RCOC.

A traffic impact statement (TIS) is required if the proposed use(s) would generate 750 or more driveway trips per day, or 100 or more peak-hour, peak-direction driveway trips. An average day is the average 24-hour total of all vehicle trips counted to and from a study site from Monday through Friday. A peak hour of traffic is the hour of highest volume of traffic entering and exiting the site during the morning and afternoon hours. A TIS prepared by Rowe dated November 22, 2021 was submitted examining traffic generation, access management, safety, and sight distance for the proposed development. The study looks at existing, background (future traffic volumes without the traffic generated by the proposed development; there were no future background developments identified in the study), and future level of service (LOS) during the AM (7:00-9:00 a.m.) and PM (4:00-6:00 p.m.) peak hours at the following intersections around the project site:

- Highland Road and Hill Road
- Highland Road and Le Grand Court
- Westbound Highland Road and crossover east of Hill Road
- Eastbound Highland Road and crossover west of Hill Road
- Westbound Highland Road and crossover west of Hill Road
- Highland Road and Haven Road
- Hill Road and Driveway 1
 - Proposed driveway approximately 2,300 feet north of Highland Road
- Hill Road and Driveway 2
 - Proposed driveway approximately 1,600 feet north of Highland Road

The traffic study notes existing traffic at the studied intersections all operate at an acceptable LOS (LOS D or better) during the AM and PM peak hours, with the exception of westbound Highland Road and eastbound crossover (east of Hill Road). The study shows background traffic at the studied intersections will operate at an acceptable LOS during AM and PM peak hours, with the exception of Highland Road and Haven Road, and westbound Highland Road and eastbound crossover (east of Hill Road). For future traffic, the study indicates all studied intersections will continue to operate at an acceptable LOS during the AM and PM peak hours, with the exception of several movements at the following intersections:

- Westbound Highland Road and Eastbound Crossover (east of Hill Road)
 - The northbound left-turn movement would continue to operate at LOS F in the PM peak hour and experience a total 95th percentile queue length of 411 feet (17 vehicles).
- Highland Road and Hill Road
 - The southbound right turn movement would operate at LOS F in the PM peak hour and experience a 95th percentile queue length of 612 feet (25 vehicles).
- Eastbound Highland Road and Westbound Crossover (west of Hill Road)
 - The southbound left turn movement would operate at LOS E in the PM peak hour and experience a total 95th percentile queue length of 354 feet (14 vehicles).
- Highland Road and Haven Road
 - The southbound left turn movements would operate at LOS E in the PM peak hour and experience a total 95th percentile queue length of 91 feet (4 vehicles).

The 95th percentile queue lengths were reviewed at the studied intersections. Significant queues were observed in the simulation for the westbound Highland Road and eastbound crossover (east of Hill Road) that impacted the eastbound through movements. To mitigate those issues, the study recommends a traffic signal for the westbound Highland Road and eastbound crossover (east of Hill Road). A signal at this intersection would reduce delay for the northbound left turns experienced during the PM peak hour and reduce queues experienced at this intersection and the intersection of Highland Road and Hill Road. The results of the LOS analysis for future conditions with the improvement listed above results in the following:

- Westbound Highland Road and Eastbound Crossover (east of Hill Road)
 - The northbound left turn movement would continue to operate at LOS F in the PM peak hour with a reduction in delay from 239.5 seconds to 189.4 seconds and experience a total 95th percentile queue length of 217 feet (9 vehicles).

- Highland Road and Hill Road
 - The southbound right turn movement would continue to operate at LOS F in the PM peak hour and experience a 95th percentile queue length of 227 feet (9 vehicles).

With improvements, the 95th percentile queue lengths were reviewed at the studied intersections. No significant queue lengths were observed in the simulations and queue lengths did not block any study intersection. The study also suggests a right-turn lane is warranted for the driveway off of westbound Highland Road. The recommended improvements are shown on the plan.

The following table summarizes traffic generation estimates for the proposed project:

Land Use	Land Use Code	Units	AM Peak Hour			PM Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Single-family Detached Housing	210	88 Units	17	49	66	55	33	88	897
Multi-family Housing (Low-Rise)	220	406 Units	36	113	149	123	72	195	2,678
Total	-	-	53	162	215	178	105	283	3,575

Utilities

Municipal water and sanitary sewer are available in the vicinity of the subject site and would have to be extended to serve the proposed development. The location and capacity of utilities will be reviewed by the Director of Public Services and the Township Engineering Consultant.

The Developer intends to construct sanitary sewer along Hill Road to the furthest extent north possible. To supplement the shortened length (approximately 50 feet from north property line), the Developer will make a contribution to the Township Sanitary Sewer Fund. The amount of the proposed contribution must be provided and accepted by the Township. Additionally, a utility easement will be provided to the Township at north end of the property along Hill Road.

Staff Analysis

In considering any petition for an amendment to the zoning map, the Planning Commission and Township Board must consider the criteria from Article 7, Section 13 of the zoning ordinance in making its findings, recommendations, and decision. Review of the rezoning request should focus on whether the proposed PD zoning is appropriate for the site. When reviewing the preliminary site plan, the Planning Commission should consider if the project meets the design standards for Planned Developments found in Article 6, Section 7 (C) and (D) of the zoning ordinance, the appropriateness of the requested waivers, and the site standards and development procedures for a PD as outlined in Articles 5 and 6, respectively, of the zoning ordinance.

The Planned Development review process is summarized by the following steps:

1. **Preliminary Site Plan:** During this review, the number of units and road layout are established, the amount of open space is determined, and other project details are decided upon. The Planning Commission holds a public hearing on the rezoning, reviews the PD proposal, and makes a recommendation to the Township Board. The Township Board takes final action, approving or denying the preliminary site plan. The rezoning request is reviewed concurrently with the preliminary site plan and is decided by the Township Board.
2. **Final Site Plan:** At this time, building materials and colors are finalized and all conditions of preliminary site plan approval must be satisfied. The Planning Commission reviews and takes action to approve or deny the final site plan, and also reviews the proposed Development Agreement and makes a recommendation to the Township Board.
3. **Development Agreement:** Upon recommendation by the Planning Commission, the Township Board takes final action on the Development Agreement.

Following is a summary of the project’s consistency with the provisions of the zoning ordinance.

Open Space

Planned Developments are intended to include the preservation of open space. Common open space is land in an undeveloped state preserving natural resources, natural features, scenic or wooded conditions, agricultural use, or a similar use or condition. Land in an undeveloped state may include a recreational trail, picnic area, children’s play area, greenway, or linear park. Land in common open space is not required to be dedicated to the use of the public. With a total of 30.66 acres of developable area, the single-family portion of the development provides 5.93 acres (19.3% of the developable area) as open space. With a total of 64.82 acres of developable area, the multiple-family portion of the development provides 24.22 acres (37.4% of the developable area) as open space. Note the submitted open space plan does not clearly indicate if stormwater management areas are counted as open space. Clarification must be provided.

Parking

For multiple-family dwellings, the zoning ordinance requires two parking spaces for each dwelling unit plus ¼ of a space per bedroom for guest parking in common areas. With 406 multiple-family dwelling units consisting of 884 bedrooms, a total of 1,033 spaces would be required for the project (812 resident spaces and 221 guest spaces). A total of 1,297 spaces are proposed (812 resident spaces in garages, 406 guest spaces in driveways, and 79 guest spaces not associated with individual units). Parking calculations on Sheet P-2.0 shall be revised; the number of bedrooms, guest parking required, and total parking required are incorrect.

Phasing: The applicant indicated both the single-family and multiple-family portions of the project will be developed in one phase. Based on the magnitude and scope of the project, staff estimates 2025-2027 as the project build-out year.

Sidewalks: The zoning ordinance requires sidewalks for internal circulation with a minimum of five feet in width. The submitted site plan shows five-foot-wide sidewalks along both sides of each street in the single-family portion of the project and along at least one side of each street in the multiple-family portion of the project. A crosswalk connection is proposed across Hill Road between the entrances of both the single-family and multiple-family developments.

Streets/Circulation: All condominium subdivisions must be developed with public streets conforming to all minimum requirements, general specifications, typical cross-sections and other conditions set forth in the zoning ordinance and any other requirements of the RCOC. All streets must also be approved by and dedicated to the RCOC. In the event the Developer is unable to obtain approval from, and dedicate the proposed streets to the RCOC, a separate application for approval of private condominium streets must be filed with the Planning Commission. All private condominium streets must conform to the standards of the zoning ordinance. The Developer indicated the streets at The Residences at Avalon would be built to public standards and approved and dedicated to the RCOC. All streets in the multiple-family portion of the development would be private.

Building Architecture and Design

Generally, exterior building materials should be comprised primarily of high quality, durable, low maintenance material, such as masonry, stone, brick, glass, or equivalent materials. Buildings should be completed on all sides with acceptable materials. As shown on the preliminary architectural plans, the proposed building materials for the project are a mix of horizontal siding and brick veneer, with asphalt shingle roofing. Ranch units within the multiple-family portion of the project would have rear recessed covered patios. Most 12-plex units would also have a recessed covered patio; those units that do not would have a balcony (second-story). At final site plan, detailed elevations will be required to clearly indicate the exterior building materials to be used. Also, the architectural plans shall not identify the 12-plex units as condominiums, as condominiums are not a housing type but rather a form of ownership.

A sample board of building materials to be displayed at the Planning Commission meeting and elevations in color are required by the zoning ordinance and must be submitted at final site plan. Additionally, address (street number) locations must be shown on the buildings. Three-inch-tall numbers visible from the street are required. The address locations are subject to approval of the Township Fire Marshal.

An outdoor patio is located on the north side of the clubhouse building and around the pool. Details for the items to be located on the patio and details for the patio surfacing shall be provided at final site plan. An ornamental paving treatment should be required by the Planning Commission. The treatment should be something either decorative or something to provide aesthetic quality to the patio. Potential options for ornamental paving treatments include, but are not limited to, CMU pavers; brick; stone; or stamped, stained, and sealed concrete. Accessory items within the development such as railings, benches, trash receptacles, outdoor seating (such as tables and chairs), or sidewalk planters located in the vicinity of sidewalks and/or outdoor seating areas are required to be of commercial quality and complement the building design and style. These details must be provided at final site plan.

Landscaping and Screening

Landscaping must generally comply with the provisions of the zoning ordinance and should be designed to preserve existing significant natural features and to buffer service areas, parking lots, and dumpsters. A mix of evergreen and deciduous plants and trees are preferred, along with seasonal accent plantings. A landscape plan will be provided and reviewed in detail during final site plan if the preliminary site plan is approved.

Lighting

Site lighting is required to comply with the zoning ordinance. Information on site lighting will be provided and reviewed in detail during final site plan.

Waivers

Generally, in a PD the standard requirements for lot size, yards, frontage, setbacks, building height, and type and size of dwelling unit are waived, provided the purpose and intent of the zoning ordinance are incorporated into the overall development plan. For PDs the zoning ordinance is intended to provide flexibility for the Planning Commission and Township Board to set appropriate standards during site plan review. Where modifications of zoning ordinance standards are requested, the Developer must provide a table which clearly compares each requested modification to the zoning ordinance standard to be modified. Unless variations are specifically requested and approved by the Planning Commission, the final site plan must comply with the appropriate standards of the Township. Based on the submitted site plan, the Developer is requesting the following waivers for the Avalon PD:

Recreation Space

Multiple-family developments are required to provide recreation space for the use of the residents therein. A formula is applied whereby 5,000 square feet for the first unit plus an additional 100 square feet for each additional unit determines such space required for recreation. For a 406-unit multiple-family development, 45,500 square feet of recreation space is required. The submitted open space plan shall be revised to note the correct recreation space requirement (10,700 square feet is incorrectly listed as required). 18,623 square feet of recreation space (clubhouse, pool, and dog park) is proposed in the multiple-family portion of the development; therefore, a waiver of 26,877 square feet is required for the amount of recreation space.

Parallel Plan

For any residential project, a parallel plan demonstrating the layout and density of residential uses that would be possible without use of the PD District is required. The Developer requested a waiver of this requirement, as the densities proposed are within the Master Plan guidelines.

Lot Area

The existing R1-A zoning district requires parcels have a minimum lot area of one acre. In the R1-D (Single-Family Residential) zoning district, the densest district in the Township, parcels are required to have a minimum lot area of 12,000 square feet. For the single-family portion of the project, the PD has “lots” ranging from 7,431.38 square feet to 17,750.68 square feet in size. The average “lot” size is 9,118.05 square feet. Staff suggests the Planning Commission consider requiring minimum lot area of at least 8,000 square feet.

Lot Frontage/Width

Lot width is the straight-line distance between parallel side lot lines, measured at the front setback line. Where side lot lines are not parallel, the width is measured at the front setback line parallel to the street or tangent to the curve of the street. The existing R1-A zoning district requires parcels have a minimum of 150 feet of lot frontage. In the R1-D zoning district, parcels are required to have a minimum lot width of 80 feet. Lots on a cul-de-sac or curvilinear street must have a minimum of 65 feet of frontage and comply with the lot width requirement at the minimum front setback line. Additionally, corner lots in condominium subdivisions must be at least 20 feet wider than the minimum width required by the zoning ordinance. For the single-family portion of the project, the PD has “lots” ranging from 62 feet of lot width (including “lots” on a cul-de-sac or curvilinear street) to 107 feet. The average “lot” width is 68 feet. Staff suggests the Planning Commission consider requiring minimum lot width of at least 70 feet.

Setbacks and Lot Coverage

The yard setbacks and lot coverage for the existing R1-A zoning district, R1-D zoning district, PD zoning district, and the proposed PD (single-family) are summarized in the table below.

	R1-A zoning	R1-D zoning	PD zoning	Proposed PD
Front yard setback	35 feet	30 feet	40 feet	25 feet
Side yard setback	25 feet	10 feet	25 feet	10 feet
Rear yard setback	40 feet	30 feet	TBD	35 feet**
Max. lot coverage	20%*	20%*	TBD	35%

*A maximum 30% lot coverage may be approved administratively by the Community Development Director or his designee on existing lots of record where the lot has sanitary sewer service and the proposed building complies with all setback requirements.

**A 45-foot rear yard setback is prescribed for Units 8-13.

Buildings within a multiple-family development must have a minimum setback of 25 feet from the back of sidewalk or 25 feet from back of curb (if no sidewalk is present). A five-foot waiver is requested to allow a 20-foot front setback.

The Planning Commission may consider the proposed setbacks and lot coverage and determine whether they are appropriate or whether additional setbacks or less lot coverage should be established. The submitted plan notes no deck or patio would encroach into any setback.

Decks, Porches, and Patios

The zoning ordinance states “In no instance shall a deck, porch, patio or paved terrace be located in any recorded easement...” As noted in the DLZ review letter dated April 13, 2022 decks and patios attached to several single-family units would likely encroach into the proposed storm sewer easement. Staff is concerned about deck/patio encroachment into the storm sewer easement. Maintenance activities within the easement could potentially damage decks/patios in the vicinity. While the storm system is private and must be maintained by the condo association (after assignment by the Developer), if the association fails to maintain the storm sewer and the Township exercises its right to maintain/repair/replace the system (as would be outlined in the development agreement and master deed) correcting resulting damage to private decks/patios should not be the responsibility of the Township. Hold harmless language, subject to approval by the Township Attorney, would need to be incorporated into the development agreement and master deed if a waiver was granted to allow deck/patio encroachment into the storm sewer easement. There is an alternative to not install decks/patios on the rear of units where encroachment into the storm sewer easement would occur. The decks/patios on the units in question could potentially be relocated to the sides of units and/or reduced in size.

Separate from the waiver request, the note under the typical lot layout on Sheets P-2.3 and P-2.4 of the site plan shall be revised to add the word “within” following the word “encroaching.” Also, the words “wetland buffer” shall be replaced with the words “natural features.”

Additionally, the Developer shall clarify its correspondence to the Township dated April 4, 2022. In said communication, the Developer requested a waiver to allow decks/patios to encroach within the Natural Features Setback on Units 1, 4, 9, 27, and 40. Such a request for waiver is inconsistent with the submitted preliminary site plans.

Driveway Access

One-way drives must be a minimum of 20-feet-wide. Furthermore, for boulevard-style driveways, the minimum required entering road width is 20 feet and the minimum required exiting road width is 22 feet. The exiting drive onto Highland Road is 16 feet in width. DLZ deferred compliance regarding this matter (Item B, Page 2 of the DLZ review letter dated April 13, 2022) to the Community Development Department. The aforementioned item was not addressed. The site plan measures the drive width to the back of curb; the road measurement surface is taken between the edges of the gutter pan. A waiver of six feet is required to allow the Highland Road exit drive to consist of a 16-foot-wide road surface. Additionally, the Hill Road boulevard access (both entering and exiting drives appear to be 19 feet in width) to the multiple-family portion of the development is noncompliant and waivers (1 foot for entrance; 3 feet for exit) are needed to allow a reduction of the required road surface width.

Parking

The zoning ordinance requires each individual parking space be delineated by dual stripes, two feet apart centered on the dividing lines and painted white. A waiver is requested to allow single stripes. Separate from the waiver request, a “Van Accessible” sign detail for the barrier-free parking shall also be provided on Sheet P-7.0 of the site plan.

Street Layouts and Blocks

The maximum length of cul-de-sac streets and maximum length of blocks within condominium subdivisions cannot exceed 1,500 feet. The Developer is seeking a 930-foot waiver to allow maximum block length of 2,430 feet. Topography, steep grades, and natural features on the site were the stated reasons for the requested waiver. The Fire Department has reviewed the length of the streets and blocks and is satisfied with accommodations for emergency access.

Sidewalks

The zoning ordinance requires a minimum six-foot-wide sidewalk placed one-foot from the inside edge of the right-of-way along both the east and west Hill Road property frontages, which the applicant is required to install as part of the project. The submitted site plan shows an eight-foot concrete sidewalk along the west side of the Hill Road property frontage from Highland Road to the south side of the single-family access (across the street). Portions of this sidewalk are proposed outside of the future right-of-way; the sidewalk must be relocated inside the road right-of-way or an easement be provided. Right-of-way/easement widths for public walkways when not adjacent to or a part of street rights-of-way must be at least 15 feet and dedicated to the use of the public. Sidewalks on the east side of Hill Road are proposed along the frontage of Units 81-84 and Units 85-87. There are regulated wetlands and a stream along the remaining portion of Hill Road north of Units 81-84; therefore, the Developer is requesting a waiver to not install sidewalks in this location. However, the Developer offered to make a contribution to the Township Sidewalk Fund to supplement the pathway areas not installed along Hill Road. The amount of the proposed donation must be provided and accepted by the Township.

Signs

The zoning ordinance requires the area, quantity, location, and dimensions of all signs to be provided with the preliminary site plan. The site plan shows the location of a monument sign (at the corner of Highland Road and Hill Road) setback eight feet from the Highland Road right-of-way line. Development entry signs not placed within a boulevard entrance must be setback at least 10 feet from the road right-of-way. Therefore, a two-foot waiver is requested for the aforementioned sign.

One monument sign, not more than 30 square feet in area, may be maintained at or adjacent to the principal entrance to a residential development. One additional sign may be permitted if the residential development has access to two thoroughfares or the development has more than one boulevard street entrance from an existing arterial or it has at least 250 dwellings. The signs may not exceed a height of six feet. The multiple-family portion of the development would contain more than 250 units, so a second development entry sign is permitted by right. A waiver is requested to install a third sign (determined to be the sign at the corner of Highland Road and Hill Road). For the multiple-family portion of the development, the other monument signs are proposed within the boulevard entrances on Highland Road and Hill Road. One monument sign is proposed within the boulevard entrance to the single-family portion of the development.

While signage details were not provided, staff can administratively review and approve the sign design. The monument signs would be required to comply with residential district sign regulations, including not more than 30 square feet in area and six feet in height.

Trash Collection

All units would be served by individual trash carts provided by the waste collection company. A 10-foot by 20-foot dumpster pad/enclosure is located east of the clubhouse building. The zoning ordinance requires dumpsters to be surrounded by a six-foot-tall wall on three sides and an obscuring wood gate on a steel frame on the fourth side, located on a six-inch concrete pad extending 10 feet in front of the gate, with six-inch concrete-filled steel bollards to protect the rear wall and gates. As proposed, the pad does not extend 10 feet in front of the gate; therefore, a 10-foot waiver is required. The zoning ordinance also states dumpsters and trash storage enclosures shall be constructed of the same decorative masonry materials as the buildings to which they are accessory. Brickform concrete (simulated brick pattern) or stained, decorative CMU block are not permitted where the principal building contains masonry. Plain CMU block is also prohibited. As a condition of site plan approval, the dumpster enclosure shall match the same brick veneer/cultured stone veneer as the facade of the clubhouse with a steel-backed wood gate painted a complementary color to the brick veneer/cultured stone veneer. A trash enclosure detail shall be provided on Sheet P-7.0 of the site plan showing the finished face on the outside walls of the enclosure and indicate the color of the gate.

An updated list of all requested waivers shall be provided by the Developer. Furthermore, PD modifications 2, 4, and 5 shall be removed from the table on Sheet P-2.0 of the site plan. Said waivers are not needed.

Planning Commission Options / Recommendation

The Planning Commission may recommend approval or denial of the rezoning request, or it may recommend a different zoning designation than proposed by the applicant to the Township Board. The Planning Commission may recommend approval, approval with conditions, or denial of the preliminary site plan to the Township Board. **The proposed rezoning and planned development are both compatible with the Master Plan and with surrounding land uses. Staff recommends approval of the rezoning, and approval of the preliminary site plan subject to the items identified in this report being addressed prior to final site plan.**

The following notations summarize the preliminary site plan review:

- Recommendation of approval is in accordance with the preliminary site plans prepared by PEA Group (revision date April 4, 2022), subject to revisions as required. The utility, grading, and storm drainage plans for the site are subject to the approval of the Township Engineering Consultant and shall be completed in accordance with the Township Engineering Design Standards.
- Recommendation of approval is in accordance with the preliminary ranch unit building elevations and floor plans prepared by Alexander V. Bogaerts & Associates, P.C. dated March 29, 2022, subject to revisions as required and with the preliminary 12-plex elevations and floor plans prepared by Burmann Associates Inc. dated June 27, 2018 and July 17, 2018, subject to revisions as required.

Attachments:

1. Rezoning application dated December 6, 2021.
2. Site plan review application dated December 10, 2021.
3. Community Impact Statement prepared by Developer dated February 25, 2022.
4. Traffic Impact Statement prepared by Rowe dated February 18, 2022.
5. Wetland Delineation Report prepared by Barr Engineering Co. dated February 9, 2022.
6. Preliminary site plans prepared by PEA Group (revision date April 4, 2022).
7. Preliminary ranch unit building elevations and floor plans prepared by Alexander V. Bogaerts & Associates, P.C. dated March 29, 2022.
8. Preliminary 12-plex elevations and floor plans prepared by Burmann Associates Inc. dated June 27, 2018 and July 17, 2018.
9. Preliminary clubhouse rendering and floor plan prepared by TK Design & Associates dated November 13, 2021.
10. Single-family architectural plans prepared by MJC Companies.



Fire Department
Charter Township
of White Lake

Site / Construction Plan Review

To: Sean O'Neil, Planning Department Director

Date: 05/24/22

Project: The Avalon

File #: N/A

Date on Plans:

The Fire Department has the following comments with regards to the Revised site plan for the project known as The Avalon:

1. Multifamily phase.
 - a. The spacing between hydrants shall not exceed 300 feet. **Comment addressed**
 - b. The hydrants shall be arranged to provide adequate coverage for all buildings including #56 and #57 (additional hydrant to be added to this area). **Comment addressed**
 - c. Include a turn radius profile for units # 49-58. **Comment addressed**
 - d. The layout/configuration of the proposed street names assigned to this project are too closely grouped creating potential confusion to responders. **Pending (Street names are subject to Fire department approval)**

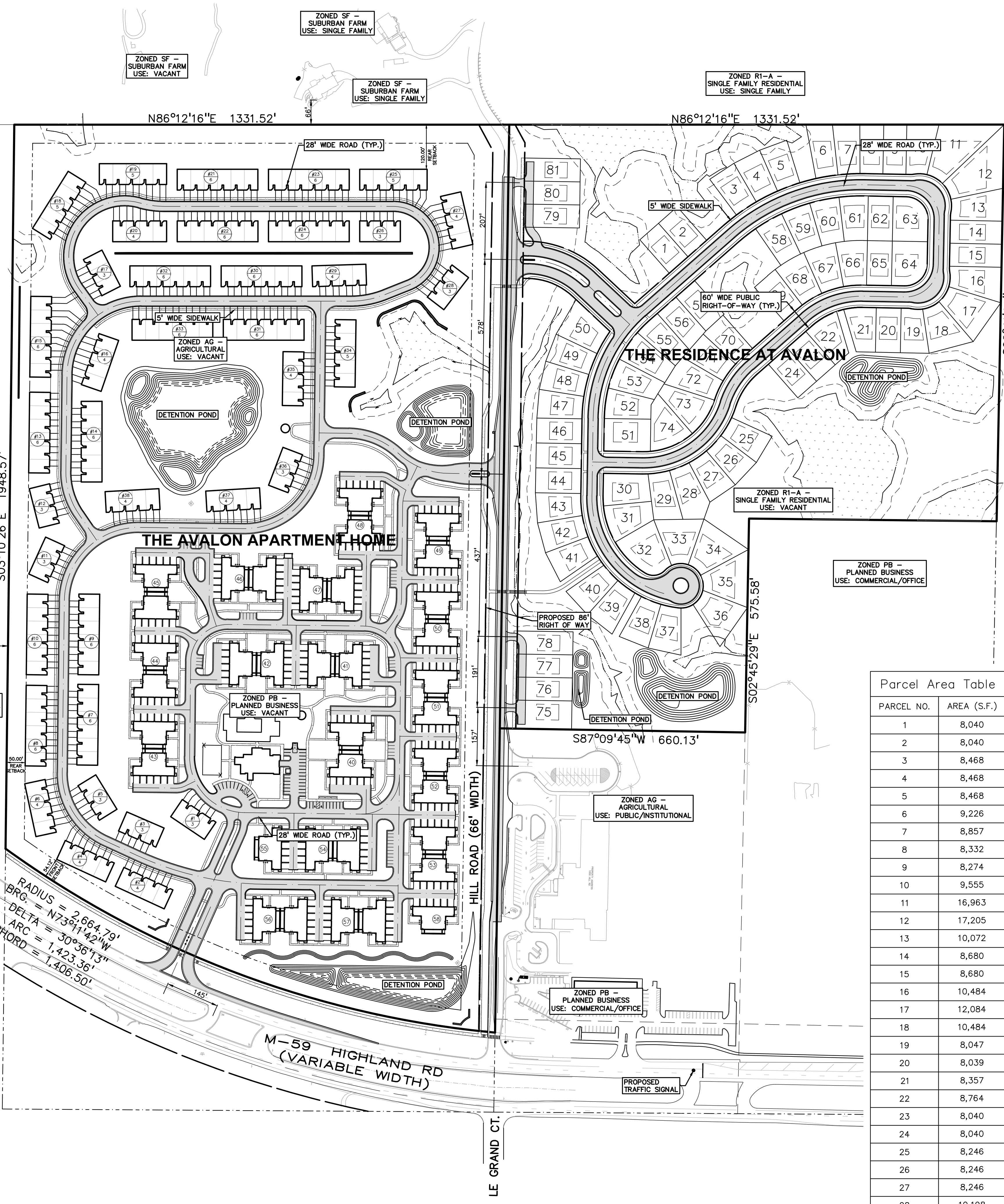
Avoid the following:

- Name changes at jogs and curves.
- Duplicate names.
- Names that could be mispronounced or are difficult to pronounce.
- Names that are spelled or pronounced close to an existing street/road name.

Reference the Township map for guidance.

John Holland
Fire Chief
Charter Township of White Lake
(248)698-3993
jholland@whitelaketwp.com

Plans are reviewed using the International Fire Code (IFC), 2015 Edition and Referenced NFPA Standards.



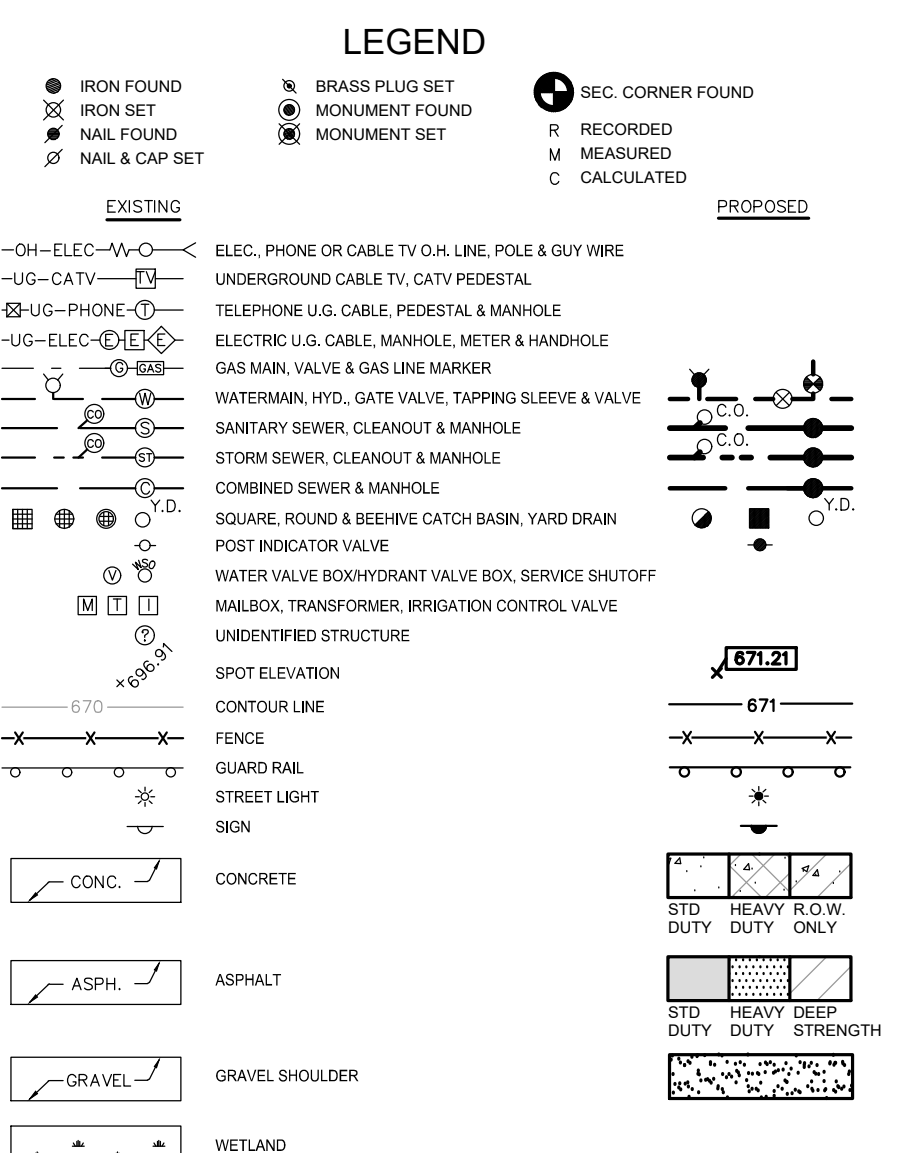
GENERAL NOTES:
THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
2. 'NO PARKING-FIRE LANE' SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100 FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
3. REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
4. REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS.

REQUESTED PD MODIFICATIONS:
1. 3.11.U - FRONT SETBACK FROM BUILDING TO SIDEWALK/CURB TO BE 20' INSTEAD OF 25'
2. ARTICLE III, SECTION 20-62 - PRIVATE ACCESS DRIVE EASEMENT TO BE 25' INSTEAD OF 30' WIDE
3. 3.11.S LOT WIDTH TO BE 62' - AT THE SETBACK LINE INSTEAD OF 65' MIN.
4. CHAPTER 20, ARTICLE 3, SECTION 20-62.b.1.a.10 PROVIDE ONE BOULEVARD ACCESS WITH 28' WIDTH EACH SIDE INSTEAD OF MULTIPLE ACCESS POINTS
5. CHAPTER 20, ARTICLE 3, SECTION 20-62.b.1.a.2 EXTENSIONS OF PROPOSED ROADS TO ADJOINING PROPERTIES NOT PROVIDED

DEVELOPMENT NOTES:
1. PRIOR TO FINAL SITE PLAN APPROVAL, A WETLAND BOUNDARY DETERMINATION AND JURISDICTIONAL OPINION SHALL BE REVIEWED BY EGLE.
2. PRIOR TO FINAL SITE PLAN APPROVAL, A WETLAND BOUNDARY DETERMINATION AND JURISDICTIONAL OPINION SHALL BE REVIEWED BY EGLE.
3. UPON COMPLETION OF ANY WORK WITHIN THE WETLAND SETBACK, THE AREA SHALL BE RESTORED TO ITS NATIVE VEGETATIVE STATE.
4. A WETLAND SETBACK RESTORATION PLAN AND A WETLAND RESTORATION BOND SHALL BE REQUIRED TO ENSURE PROPER RESTORATION.
5. A SIDEWALK ALONG HILL ROAD SHALL BE CONSTRUCTED AS SHOWN ON THE SITE PLAN. TO LIMIT WETLAND IMPACTS AND REDUCE SIDEWALKS TO 'NO WHERE', A CONTRIBUTION TO THE WHITE LAKE SIDEWALK FUND SHALL BE ESTABLISHED.
6. A DETAILED ENGINEERING ANALYSIS SHALL BE CONDUCTED OF THE EXISTING BOX CULVERT UNDER M-59 TO DETERMINE ENOUGH CAPACITY. THE RESULTS SHALL BE PROVIDED TO THE TOWNSHIP AND MDOT DURING THE CONSTRUCTION PLAN PHASE.
7. THE DEVELOPER SHALL CONSTRUCT A SANITARY SEWER LINE ALONG HILL ROAD TO THE FURTHEST EXTEND POSSIBLE, TO SUPPLEMENT THE SHORTENED LENGTH A CONTRIBUTION TO THE TOWNSHIP SANITARY SEWER FUND SHALL BE MADE. IN ADDITION, A CONSTRUCTION EASEMENT SHALL BE PROVIDED TO THE TOWNSHIP AT THE NORTH END OF THE PROPERTY ALONG HILL ROAD.
8. A SECONDARY WATERMAIN CONNECTION ANALYSIS SHALL BE INVESTIGATED. IF THE SECOND CONNECTION IS NOT OBTAINABLE, ADDITIONAL BOOSTER PUMPS MAY BE REQUIRED AT SOME OF THE SINGLE FAMILY UNITS.

TRASH COLLECTION NOTE:
ALL UNITS WILL BE SERVED BY INDIVIDUAL TRASH CARTS PROVIDED BY WASTE COLLECTION COMPANY

NOTES:
1. NO DECK OR PATIO WILL ENROACH INTO ANY SETBACK.
2. LARGEST SF HOUSE TO BE 2,448 SF FLOOR AREA

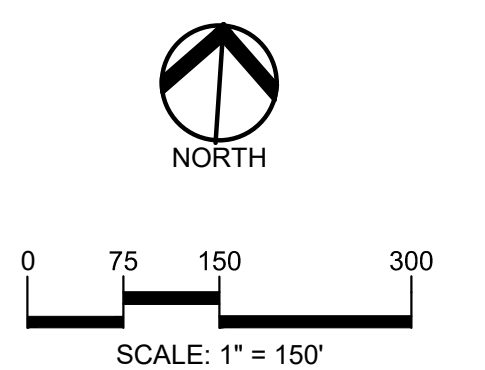


SINGLE FAMILY SITE DATA TABLE:
SITE AREA: 41.06 ACRES GROSS, 8.82 WETLAND ACRES, 30.66 ACRES NET (NO R.O.W. OR REMAINING WETLAND AREA), 5.93 OPEN SPACE ACRES
ZONING: EXISTING: R1-A, SINGLE FAMILY RESIDENTIAL
PROPOSED: PD, PLANNED DEVELOPMENT
PROPOSED USE: 81 UNIT OWNER OCCUPIED SINGLE FAMILY HOME CONDOMINIUM (2.6 UNITS PER ACRE)
SCHEDULE OF DEVELOPMENT: SINGLE FAMILY SPRING 2023 - FALL 2025
BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 30 FEET (2 STORIES)
PROPOSED BUILDING HEIGHT: < 30' (2 STORIES)
MAXIMUM BUILDING LOT COVERAGE = 35%
PROPOSED MAXIMUM BUILDING LOT COVERAGE = 2,448/7,431 = 32.9% (LARGEST BUILDING FOOTPRINT/MINIMUM LOT AREA)
MIN SF BUILDING ALLOWED: 1,000 SF GROUND FLOOR
MIN SF BUILDING PROVIDED: 1,297 SF GROUND FLOOR
SETBACK REQUIREMENTS: PD: 40', R1-A: 35', PROPOSED(INT): 25', PROPOSED(EXT.): 50'
FRONT: 40', SIDE: 25'/50', REAR: TBD
OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 5.93/30.66 = 19.3%
(SEE SHEET P-6.0 PRELIMINARY OPEN SPACE PLAN)
WETLANDS:
EGLE WETLAND IMPACT: 0.41 ACRES

MULTI-FAMILY SITE DATA TABLE:
SITE AREA: 68.96 ACRES GROSS, 1.7 WETLAND ACRES, 64.82 ACRES NET (NO R.O.W. OR REMAINING WETLAND AREA), 24.22 ACRES OPEN SPACE
ZONING: EXISTING: PB, PLANNED BUSINESS, AG, AGRICULTURAL
PROPOSED: PD, PLANNED DEVELOPMENT
PROPOSED USE: 393 MULTI-FAMILY UNITS (FOR LEASE) (6.3 UNITS PER ACRE)
SCHEDULE OF DEVELOPMENT: MULTI-FAMILY SPRING 2022 - FALL 2025
BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 30 FEET (2 STORIES)
PROPOSED MAX BUILDING HEIGHT: MULTI-FAMILY = 27 FEET (2 STORIES)
BUILDING FOOTPRINT AREA:
SINGLE STORY RANCH BUILDINGS = 5,898-11,735 SQ.FT.
2-STORY BUILDINGS = 5,956-11,981 SQ.FT.
CLUBHOUSE = 6,658 SQ.FT.
TOTAL SF = 526,566 SQ.FT.
BUILDING LOT COVERAGE = 12.1/64.82 = 18.7%
MINIMUM LOT SIZE:
FIRST UNIT = 10,000 SF
72 - 3 BEDROOM UNITS x 4,500 SF = 324,000
334 - 2 BEDROOM UNITS x 4,000 SF = 1,336,000
MINIMUM LOT SIZE REQUIRED = 1,660,000 (38.1 ACRES)
TOTAL LOT SIZE PROVIDED = 68.96 AC. (GROSS) - 1.7 AC. (WETLAND) - 2.44 AC. (R.O.W.) - 3.96 AC. (STORM) = 60.86 ACRES
SETBACK REQUIREMENTS: PD: 40', PROPOSED: 59.08'
FRONT: 40', SIDE: 25' (50' TOTAL), REAR: TBD
PARKING CALCULATIONS:
MULTI-FAMILY = 2 PER DWELLING UNIT + 1/4 SPACE PER BEDROOM FOR GUEST PARKING IN COMMON AREAS
TOTAL MULTI-FAMILY GUEST PARKING REQUIRED = 890 BEDROOMS/4 = 223 SPACES
TOTAL REQUIRED PARKING = 1,035 SPACES
TOTAL PROPOSED PARKING SPACES = 1,297 (812 RESIDENT PARKING IN GARAGE) (406 GUEST PARKING IN DRIVEWAYS) (79 GUEST SPACES INC. 4 H/C SPACES)
TOTAL PARKING SPACES NOT ASSOCIATED WITH INDIVIDUAL UNITS = 78 SPACES
TOTAL REQUIRED ADA SPACES = 75-100 = 4 SPACES
TOTAL ADA SPACES PROVIDED = 4 SPACES WITH 1 VAN SPACE
OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 15% OF NET SITE AREA
PROVIDED OPEN SPACE = 24.22/64.82 = 37.4%
WETLANDS:
EGLE WETLAND IMPACT: 0.34 ACRES

Parcel Area Table		Parcel Area Table		Parcel Area Table	
PARCEL NO.	AREA (S.F.)	PARCEL NO.	AREA (S.F.)	PARCEL NO.	AREA (S.F.)
1	8,040	31	9,644	61	8,462
2	8,040	32	12,761	62	8,040
3	8,468	33	10,937	63	10,627
4	8,468	34	11,957	64	10,627
5	8,468	35	12,162	65	8,040
6	9,226	36	10,747	66	8,894
7	8,857	37	8,899	67	9,041
8	8,332	38	8,492	68	9,045
9	8,274	39	8,691	69	8,330
10	9,555	40	8,631	70	8,065
11	16,963	41	8,736	71	8,433
12	17,205	42	8,578	72	9,574
13	10,072	43	8,519	73	10,050
14	8,680	44	8,186	74	10,217
15	8,680	45	8,167	75	11,539
16	10,484	46	8,149	76	9,300
17	12,084	47	8,316	77	9,300
18	10,484	48	8,331	78	9,300
19	8,047	49	8,352	79	9,300
20	8,039	50	10,679	80	9,300
21	8,357	51	10,961	81	9,300
22	8,764	52	8,536		
23	8,040	53	9,084		
24	8,040	54	9,637		
25	8,246	55	8,795		
26	8,246	56	8,403		
27	8,246	57	8,099		
28	10,198	58	8,534		
29	8,755	59	8,534		
30	10,098	60	8,534		

MINIMUM LOT SIZE = 8,039 SF
MAXIMUM LOT SIZE = 17,205 SF
AVERAGE LOT SIZE = 9,337 SF
MINIMUM LOT WIDTH AT SETBACK = 62'
MAXIMUM LOT WIDTH AT SETBACK = 105'
AVERAGE LOT WIDTH AT SETBACK = 68'



811 Know what's below. Call before you dig.
CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS	DATE
REVISED SITE LAYOUT	5-16-2022
TOWNSHIP PSP REVIEW	4-4-2022
TOWNSHIP PSP REVIEW	2-25-2022
OWNER REVIEW	11-29-2021
ORIGINAL ISSUE DATE:	12-8-2021

DRAWING TITLE
OVERALL PRELIMINARY SITE PLAN

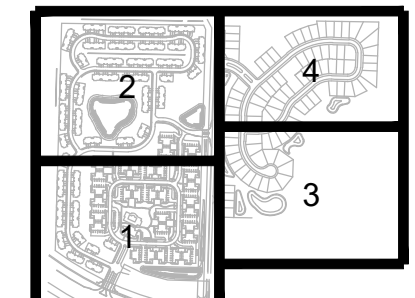
PEA JOB NO. 2021-0084
P.M. JC
DN. KMB
DES. DSK
DRAWING NUMBER:



0 40 80 160
SCALE: 1" = 80'



CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.



CLIENT
WHITE LAKE HILL, LLC
31550 NORTHWESTERN HWY
FARMINGTON HILLS, MI 48334

PROJECT TITLE
THE AVALON
HIGHLAND ROAD
WHITE LAKE TWP, MI

REVISIONS

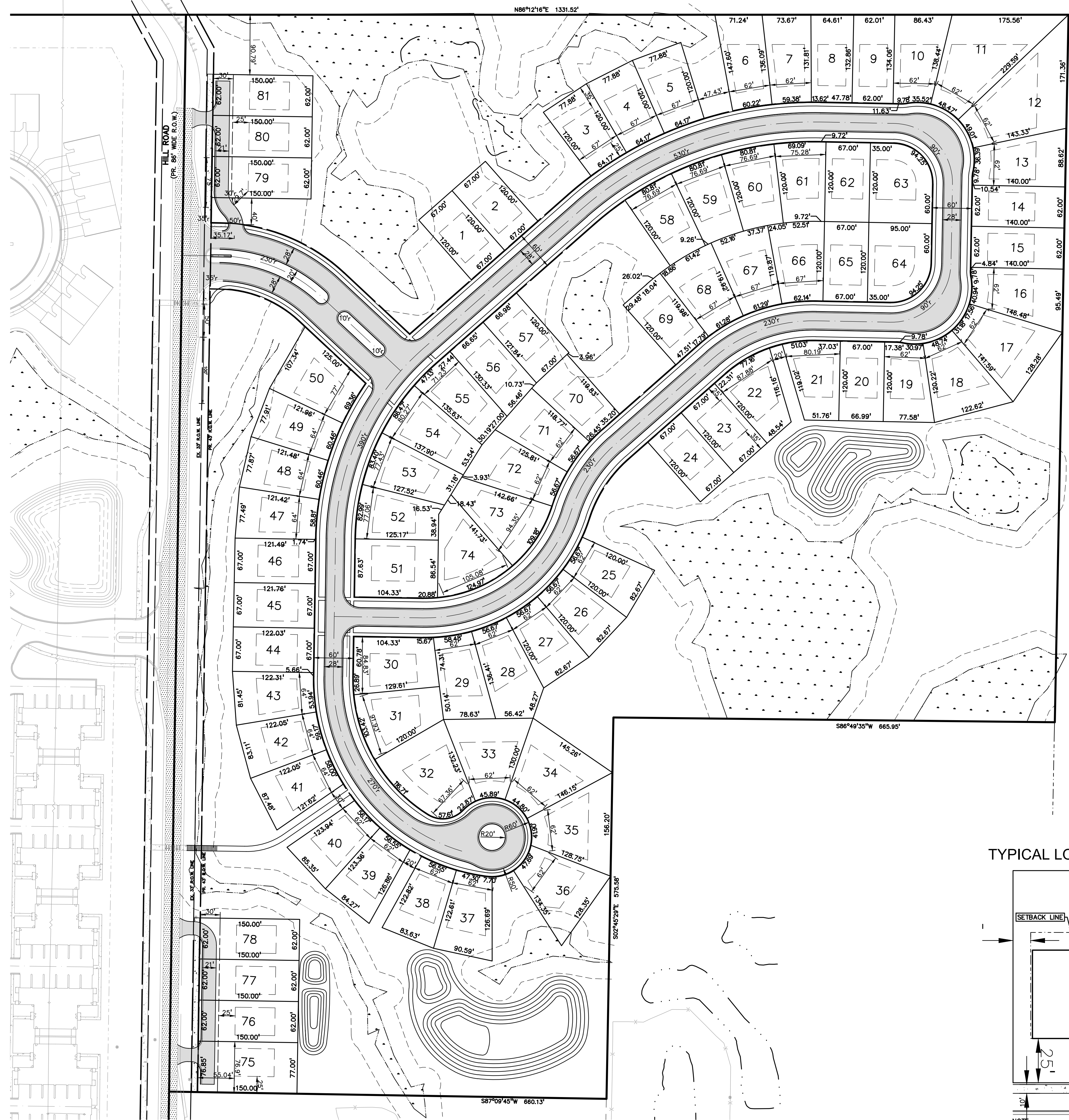
NO.	DESCRIPTION	DATE

REVISED SITE LAYOUT 5-16-2022
TOWNSHIP PSP REVIEW 4-4-2022
TOWNSHIP PSP REVIEW 2-25-2022
OWNER REVIEW 11-29-2021
ORIGINAL ISSUE DATE:
12-8-2021

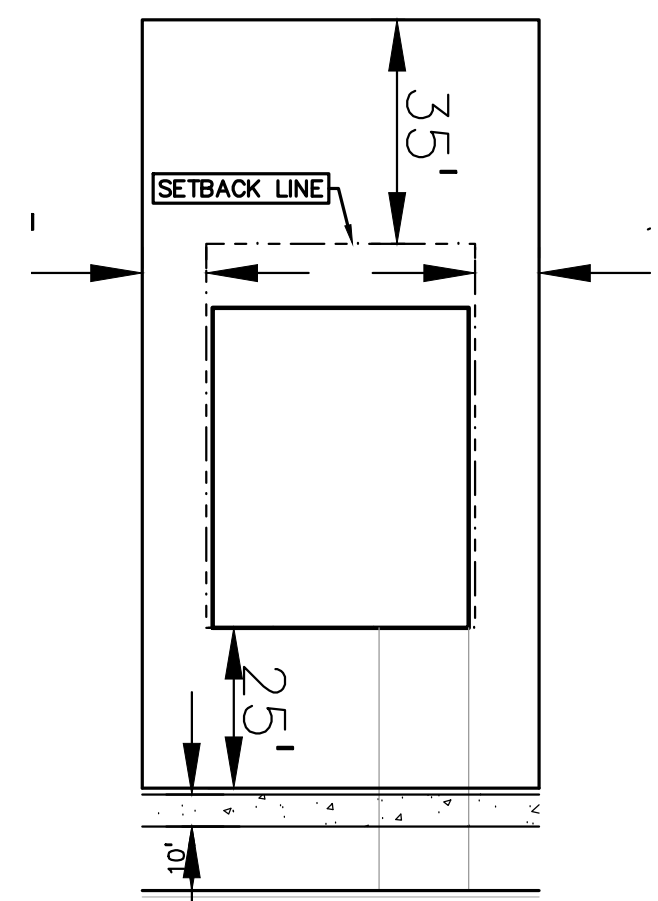
DRAWING TITLE
PRELIMINARY SITE PLAN - 4

PEA JOB NO. 2021-0084
P.M. JC
DN. KMB
DES. DSK
DRAWING NUMBER:

P-2.4



TYPICAL LOT LAYOUT



NOTE:
BUILDING STRUCTURES, INCLUDING DECKS, DRIVES, SIDEWALKS, ETC. ARE RESTRICTED FROM ENCRoACHING THE 25' WETLAND BUFFER SETBACK.

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

EXISTING

- OH-ELEC-W-O- ELEC. PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UC-CATV- UNDERGROUND CABLE TV, CATV PEDESTAL
- UC-PHONE- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- UC-ELEC- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS- GAS MAIN, VALVE & GAS LINE MARKER
- WATER- WATER MAIN, HYD. GATE VALVE, TAPPING SLEEVE & VALVE
- SEWER- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM- STORM SEWER, CLEANOUT & MANHOLE
- COMB- COMBINED SEWER & MANHOLE
- SQUARE- SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
- POST- POST INDICATOR VALVE
- WATER- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- METER- METER BOX, TRANSFORMER, IRRIGATION CONTROL, VALVE
- UNIDENT- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN

PROPOSED

- CONC. CONCRETE
- ASPH. ASPHALT
- GRAVEL GRAVEL SHOULDER
- WETLAND

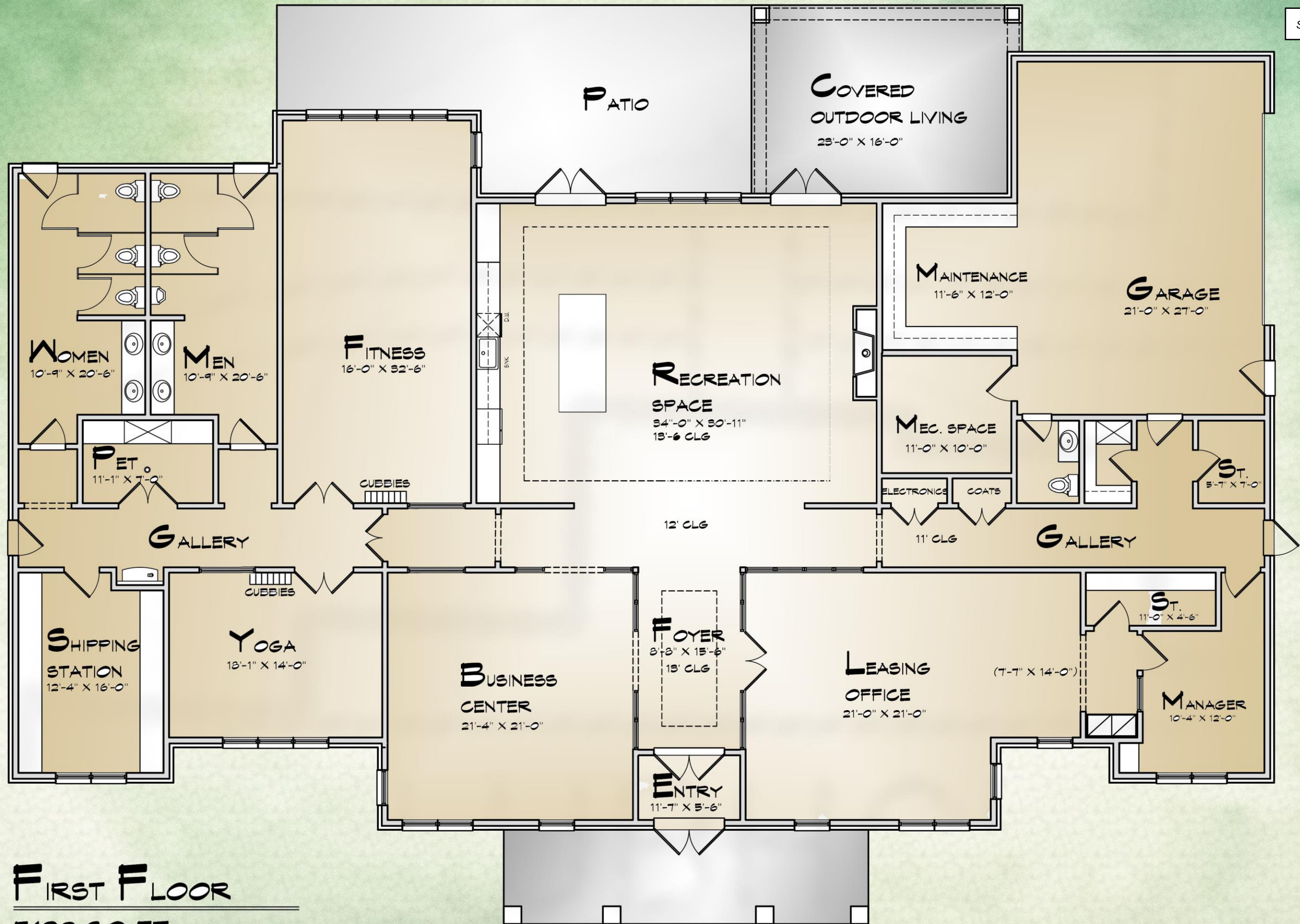
STANDARD SYMBOLS:
STD. HEAVY R.O.W. DUTY ONLY
STD. HEAVY DEEP DUTY, DUTY STRENGTH

NOT FOR CONSTRUCTION

WHITE LAKE HILLS
PROPOSED CLUBHOUSE

+ OPT. 5132 SQ.FT. BONUS
11-13-2021
VERSION 3





FIRST FLOOR

5132 SQ FT

(EXCLUDES GARAGE AND MAINTANCE AREA)

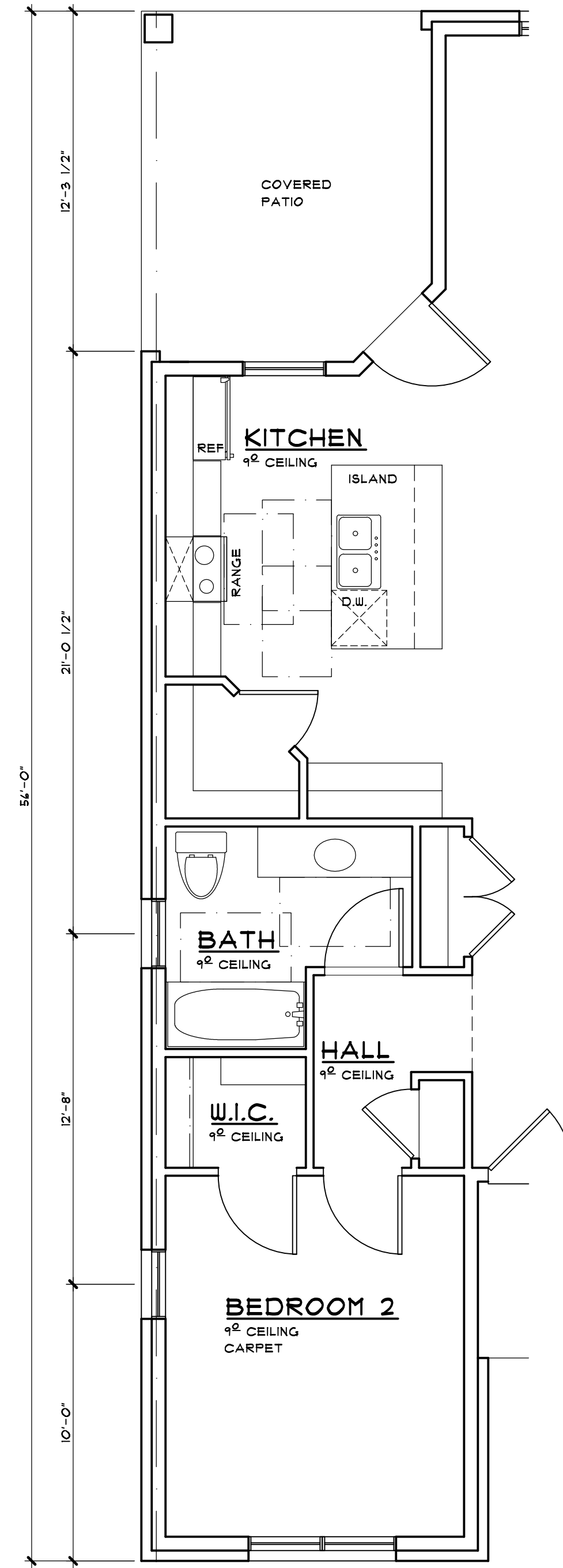
10' CLG



PROPOSED CRAFTSMAN CLUB HOUSE
ENTRY SIDE

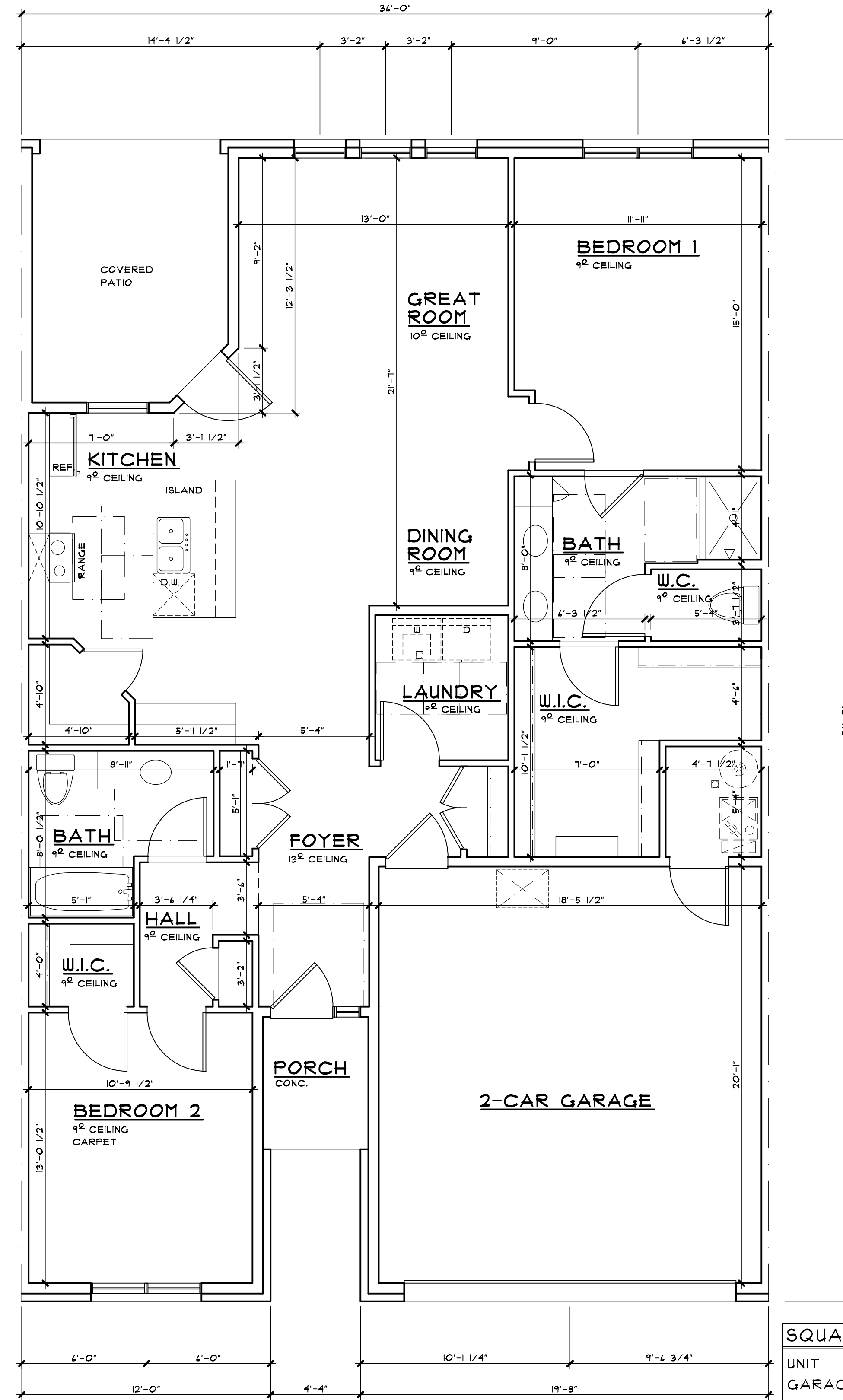


PROPOSED CRAFTSMAN CLUB HOUSE
POOL SIDE



**UNIT FLOOR PLAN -
LEFT SIDE END**

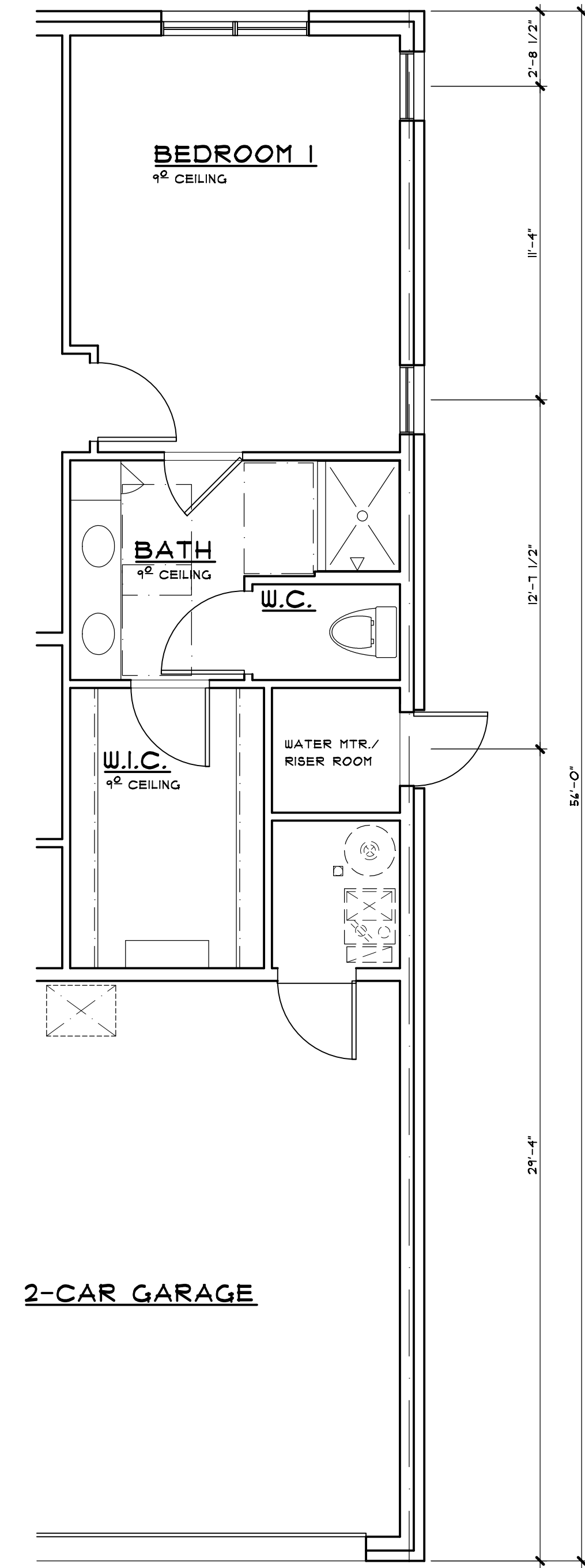
SCALE: 1/4" = 1'-0"



SQUARE FOOTAGE	
UNIT	1,424 SQ FT
GARAGE	403 SQ FT
COV. PAT.	122 SQ FT

UNIT FLOOR PLAN

SCALE: 1/4" = 1'-0"



**UNIT FLOOR PLAN -
RIGHT SIDE END**

SCALE: 1/4" = 1'-0"



Section 9, Item B.

Alexander V. Bogaerts + Associates, P.C. • Architecture • Planning • Interior Design

2445 Franklin Road
Bloomfield Hills, MI 48302
248-334-5000

CLIENT/PROJECT
WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

COPYRIGHT 2022
ALEXANDER V. BOGAERTS + ASSOC.

■ PRELIMINARY
2022-03-29

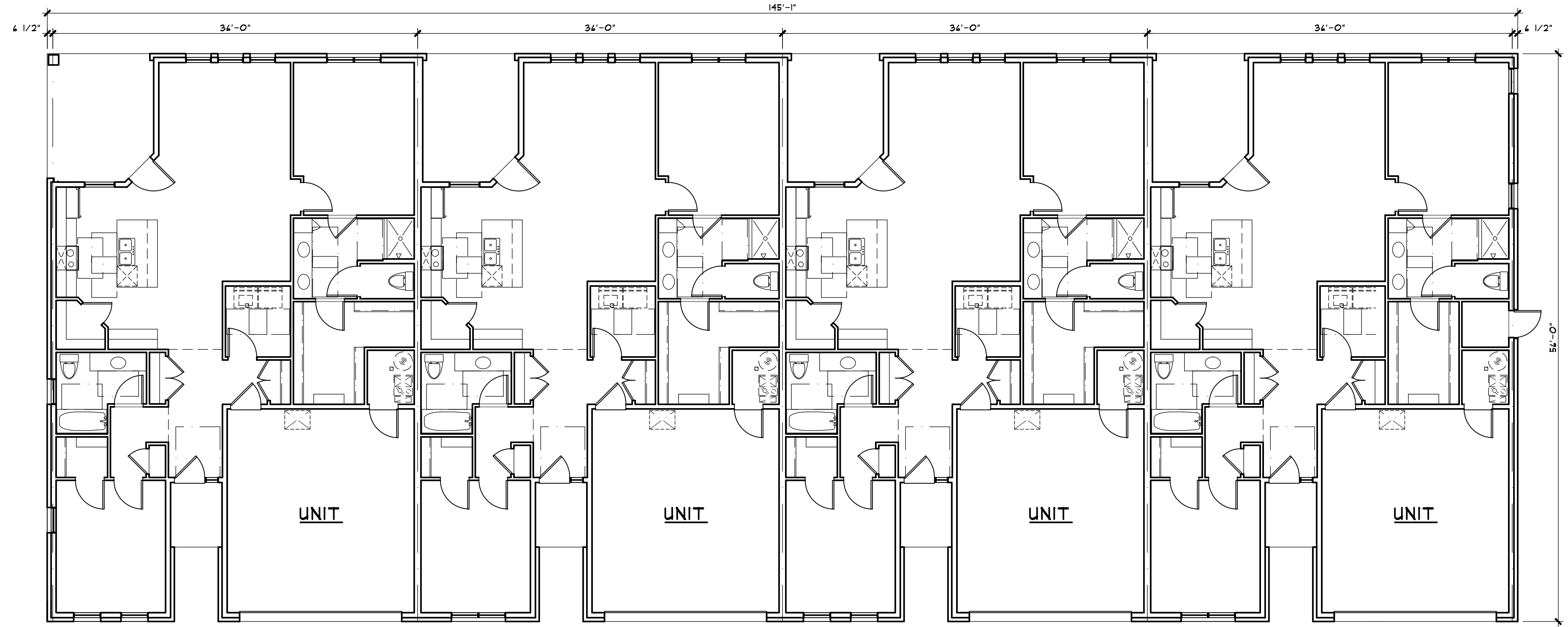
BIDS
 PERMITS
 CONSTRUCTION

REVISIONS
2022-03-29
SITE PLAN APPROVAL

DRAWN BY
CAD FILENAME
CHECKED BY
JOB NUMBER
2451
DATE
2022-03-29
SHEET NUMBER

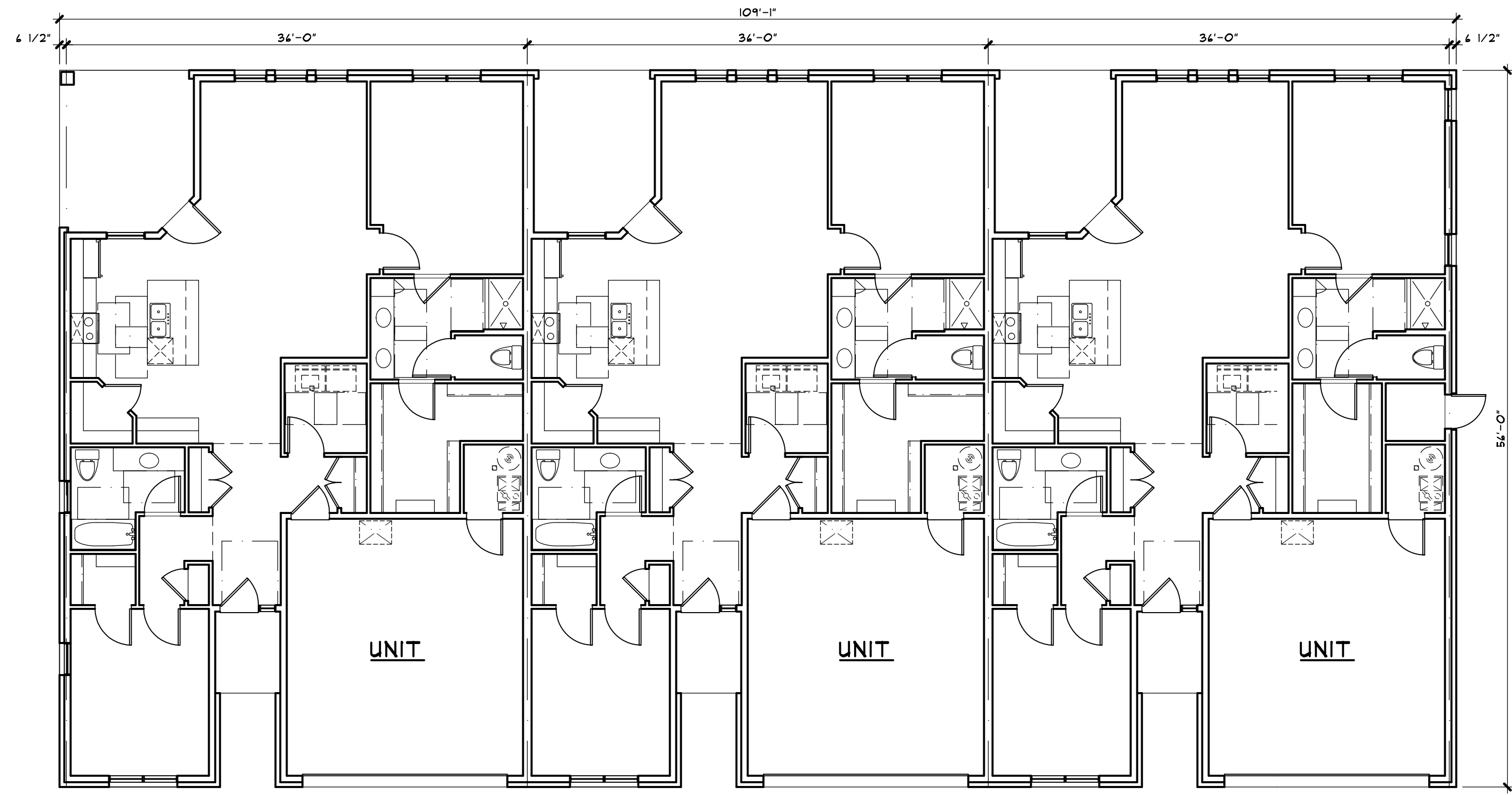
A100

226



4 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"



3 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"

Interior Design
 2445 Franklin Road
 Bloomfield Hills, MI 48302
 248-334-5000

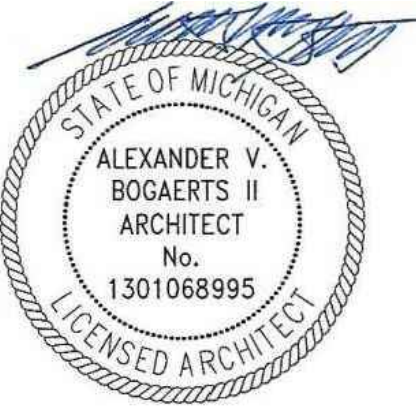
BUILDING FLOOR PLANS

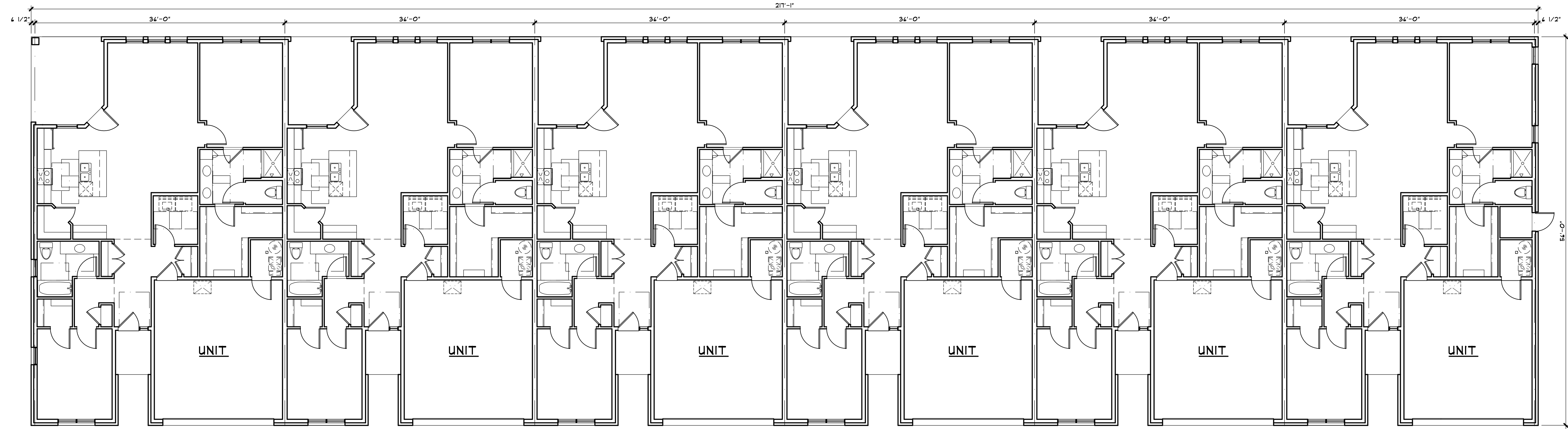
CLIENT/PROJECT
 WHITE LAKE HILL, LLC
 AVALON - RANCHES
 WHITE LAKE TOWNSHIP, MICHIGAN

COPYRIGHT 2022
 ALEXANDER V. BOGAERTS + ASSOC.
 PRELIMINARY
 2022-03-29
 BIDS
 PERMITS
 CONSTRUCTION

REVISIONS
 2022-03-29
 SITE PLAN APPROVAL

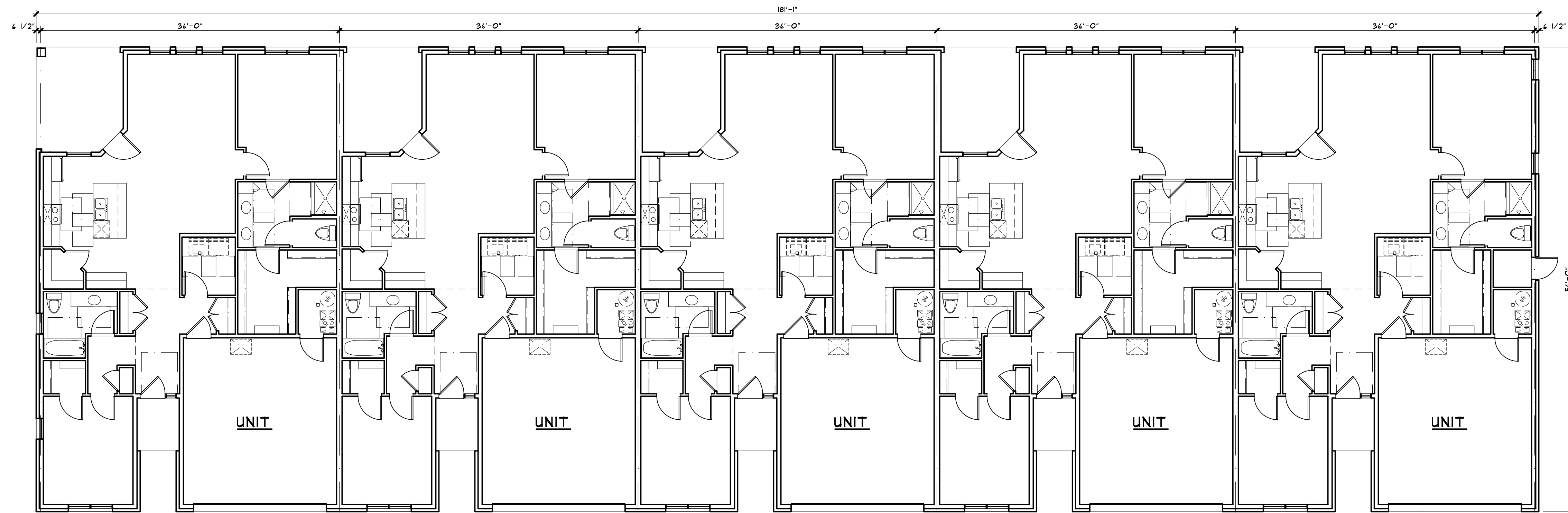
DRAWN BY
 CAD FILENAME
 CHECKED BY
 JOB NUMBER
 2451
 DATE
 2022-03-29
 SHEET NUMBER
 A101





6 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"



5 UNIT BUILDING FLOOR PLAN

SCALE: 1/8" = 1'-0"

Alexander V. Bogaerts + Associates, P.C. • Interior Design
 2445 Franklin Road
 Bloomfield Hills, MI 48302
 248 • 334 • 5000

BUILDING FLOOR PLANS

CLIENT/PROJECT
 WHITE LAKE HILL, LLC
 AVALON - RANCHES
 WHITE LAKE TOWNSHIP, MICHIGAN

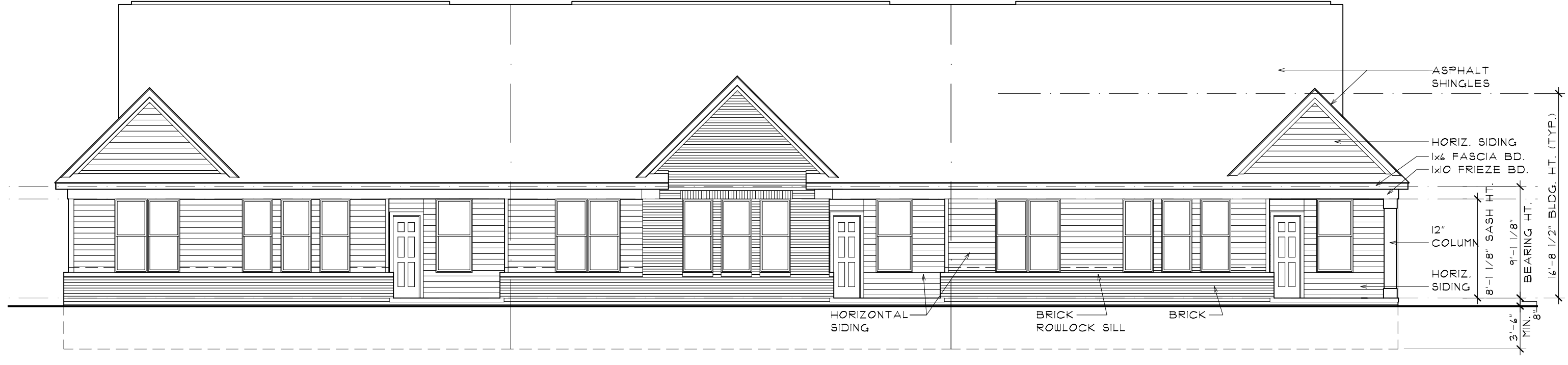
COPYRIGHT 2022
 ALEXANDER V. BOGAERTS + ASSOC.

PRELIMINARY
 2022-03-29

REVISIONS
 2022-03-29
 SITE PLAN APPROVAL

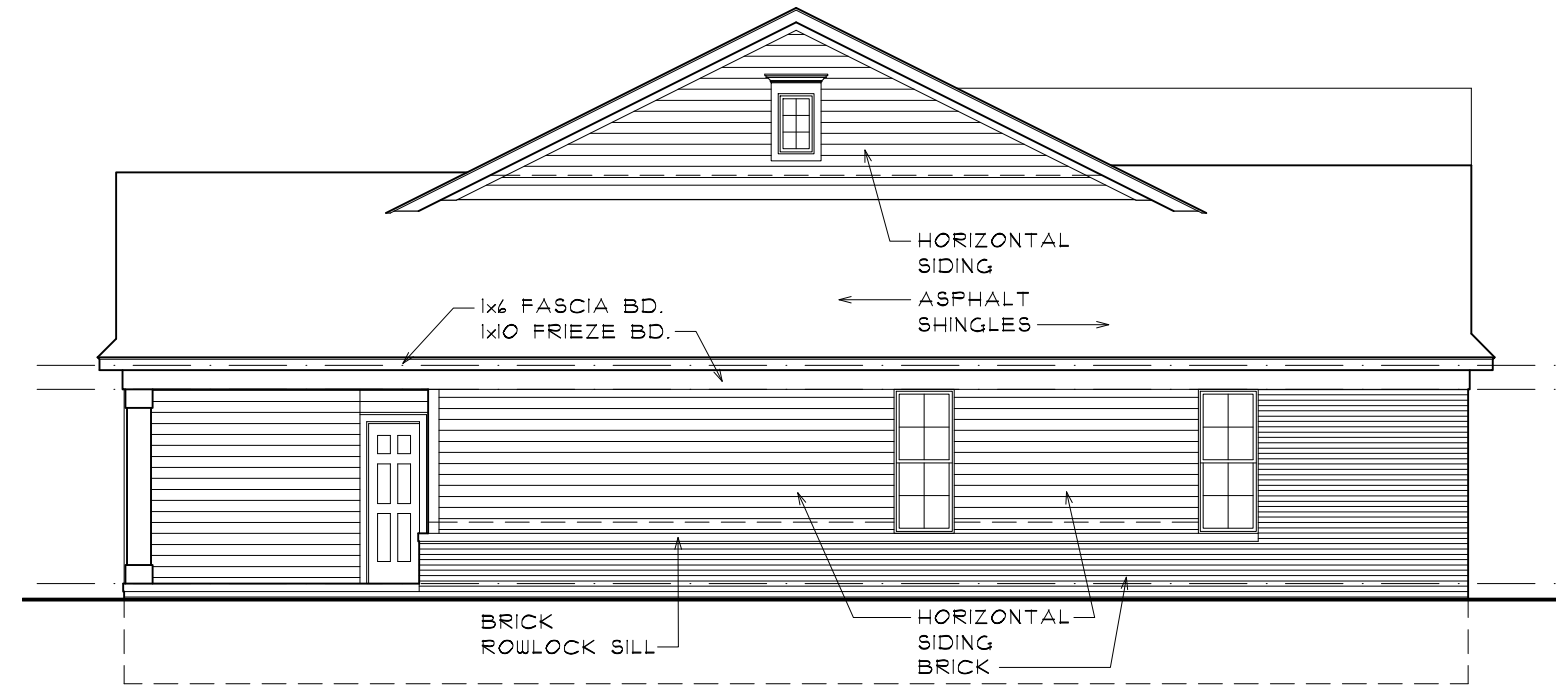
DRAWN BY
 CAD FILENAME
 CHECKED BY
 JOB NUMBER
 2451
 DATE
 2022-03-29
 SHEET NUMBER





3 UNIT REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



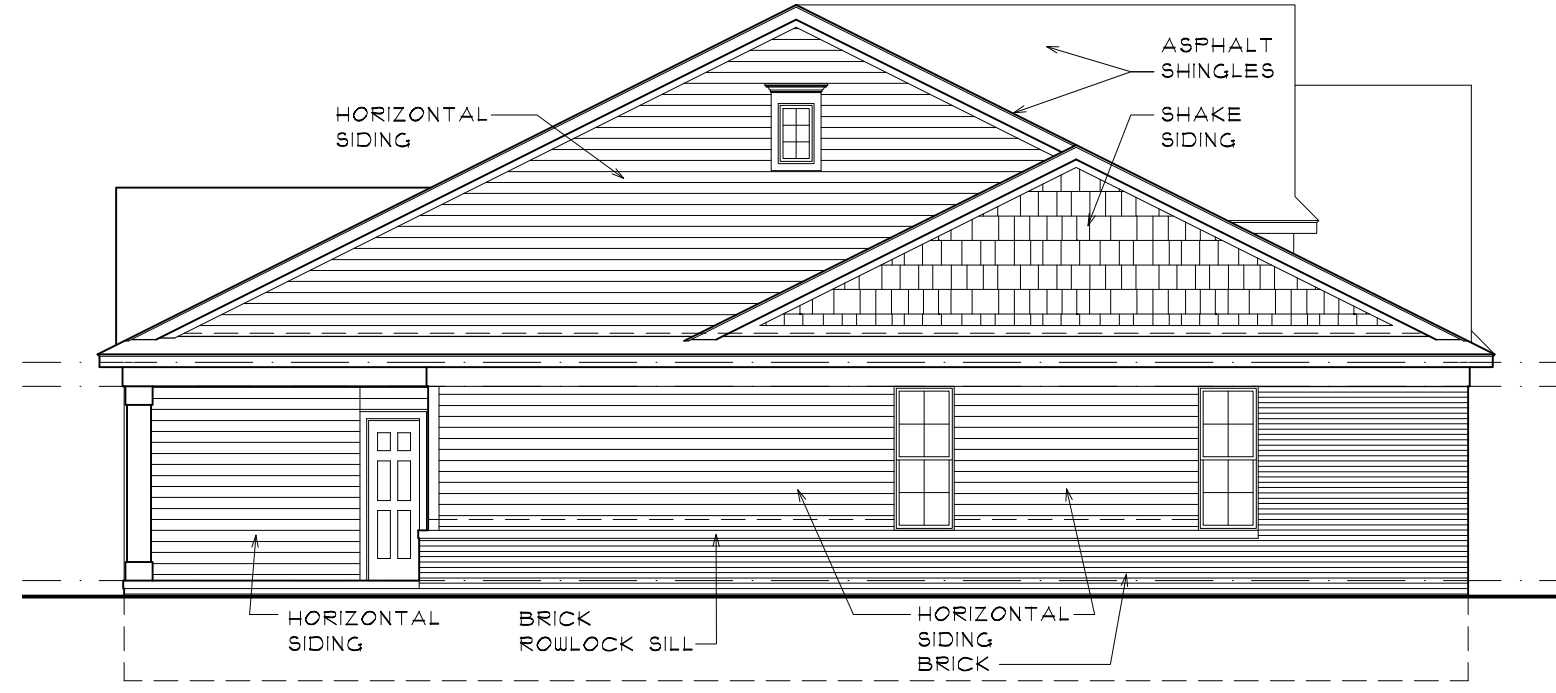
LEFT SIDE ELEVATION 'A' and 'C'

SCALE: 1/8" = 1'-0"



3 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"



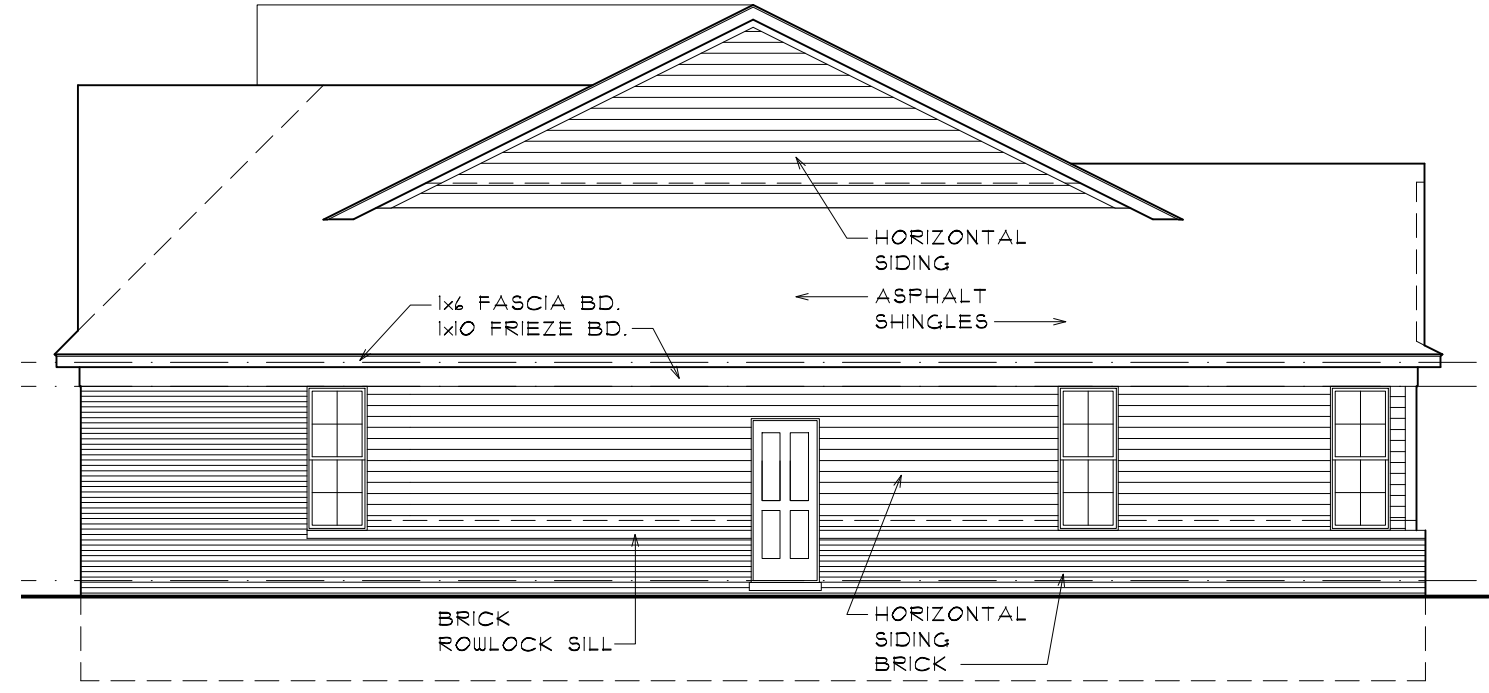
LEFT SIDE ELEVATION 'B'

SCALE: 1/8" = 1'-0"



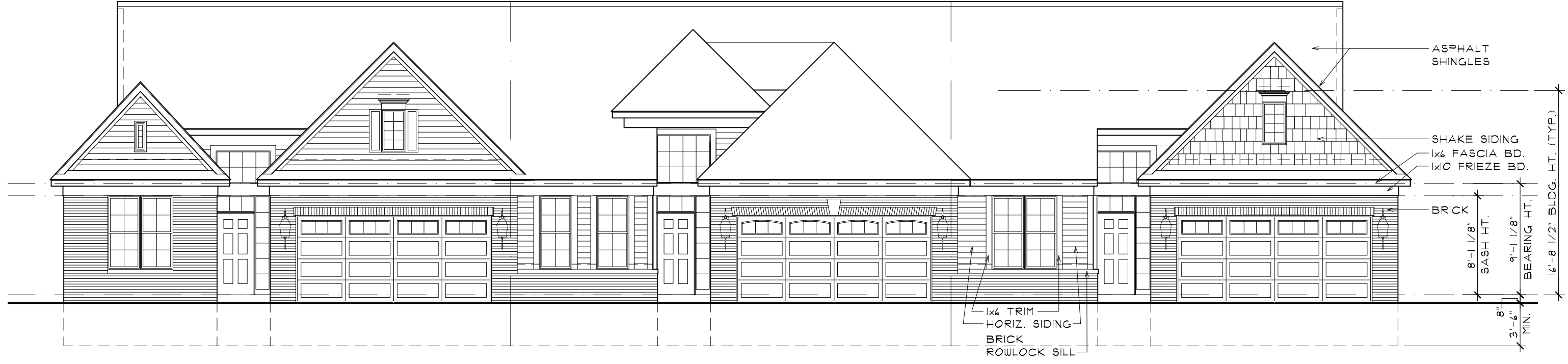
3 UNIT FRONT ELEVATION 'B'

SCALE: 1/8" = 1'-0"



RIGHT SIDE ELEVATION 'B' ('A' and 'C' SIMILAR)

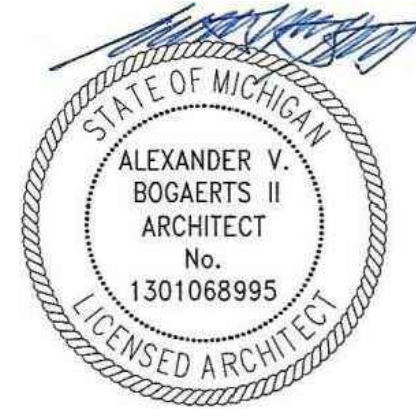
SCALE: 1/8" = 1'-0"

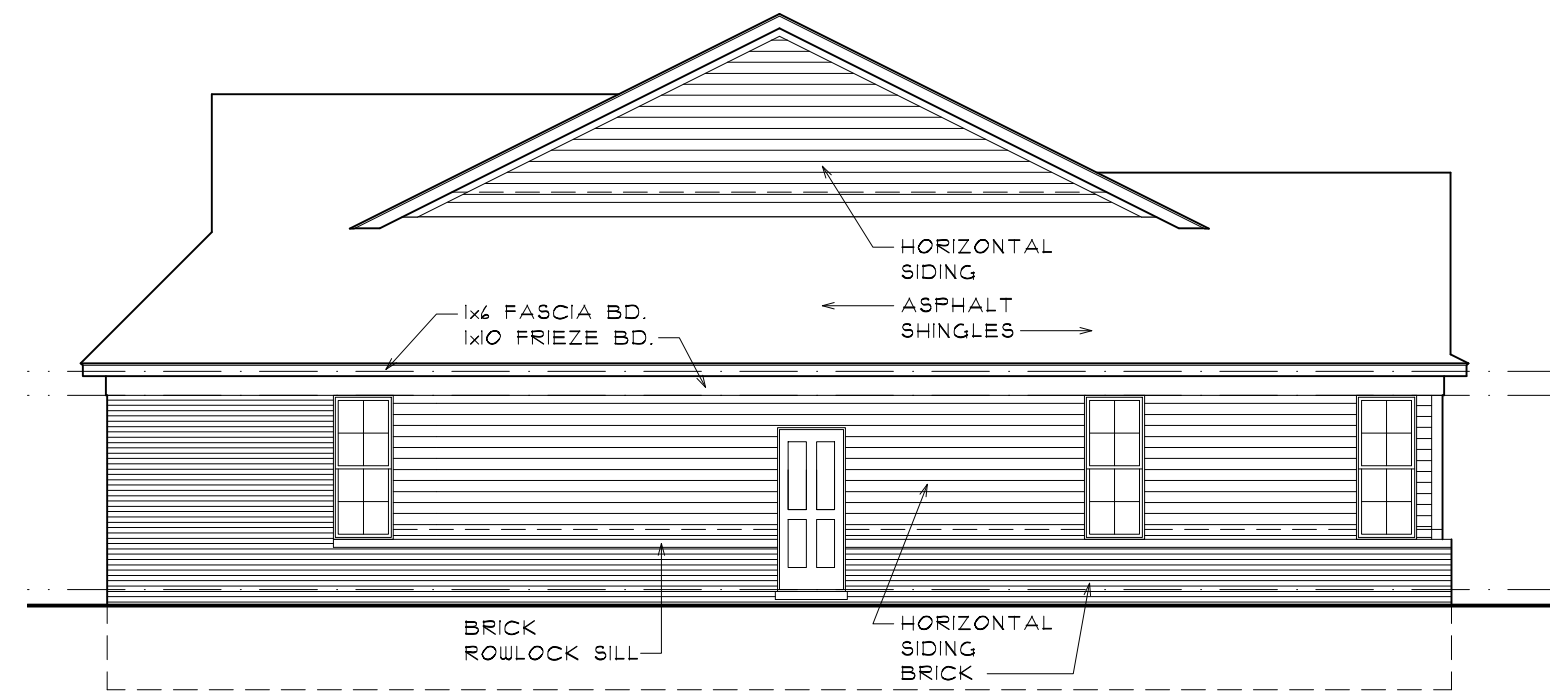


3 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

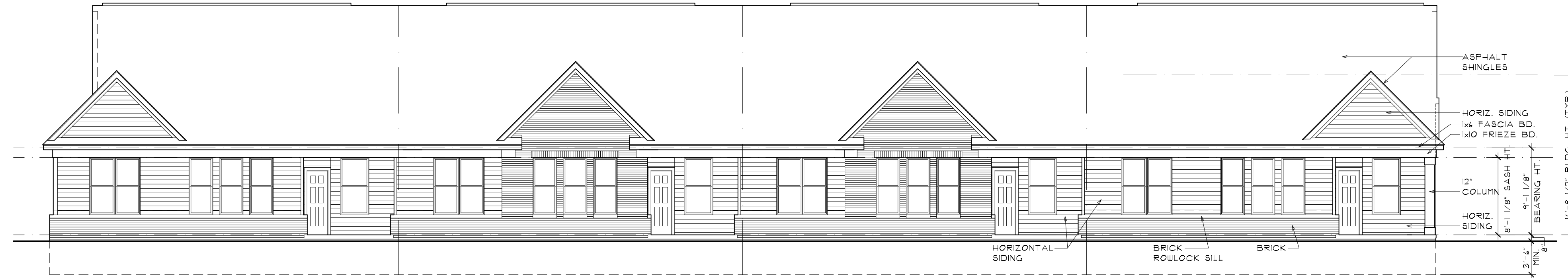
NOTE:
 SEE BUILDING RENDERINGS
 FOR ALL BUILDING MATERIAL
 COLORS. 3 DIFFERENT COLOR
 SCHEMES PROPOSED FOR A,
 B, AND C. 3RD SCHEME C
 SIMILAR TO 4 AND 4 UNIT
 RENDERINGS.
 ELEVATIONS RENDERED:
 4 UNIT FRONT ELEVATION 'B'
 & UNIT FRONT ELEVATION 'A'





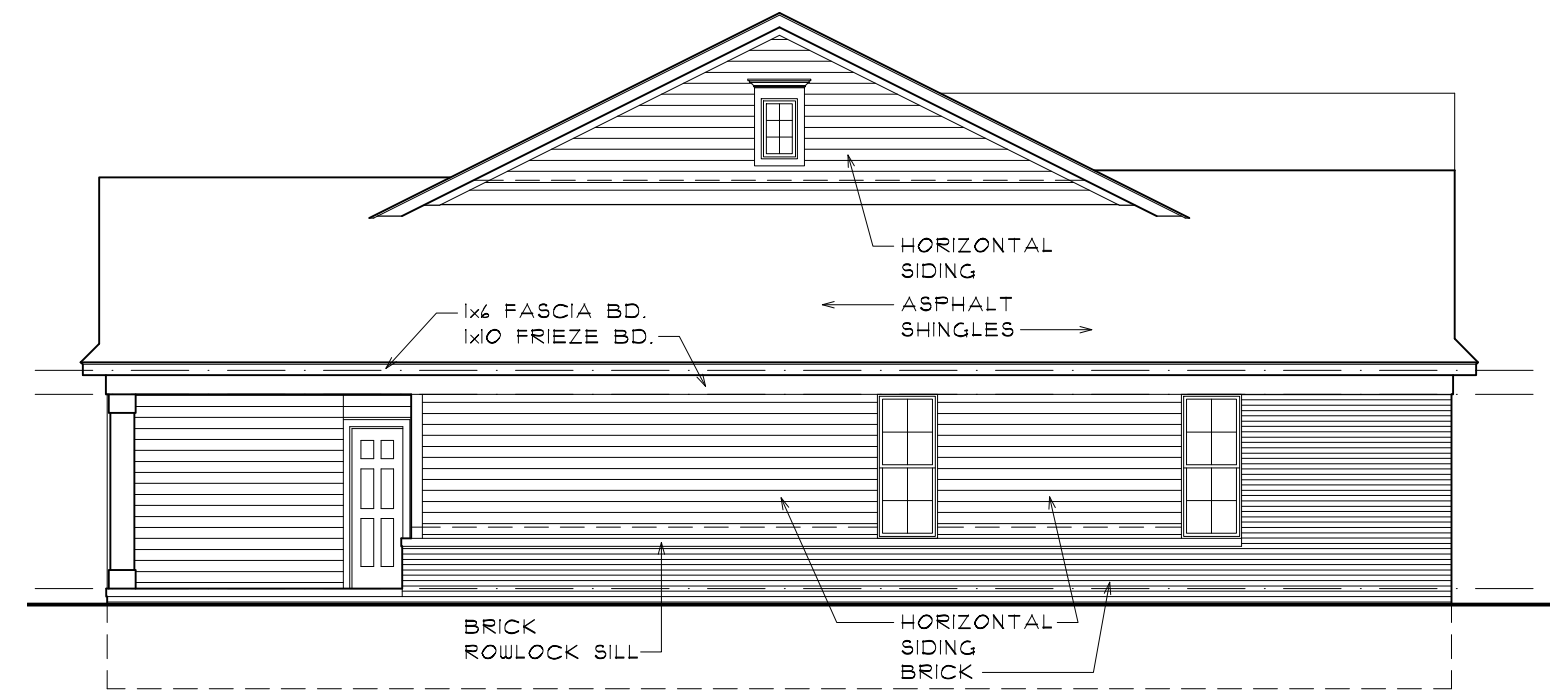
RIGHT SIDE ELEVATION 'B' ('A' and 'C' SIMILAR)

SCALE: 1/8" = 1'-0"



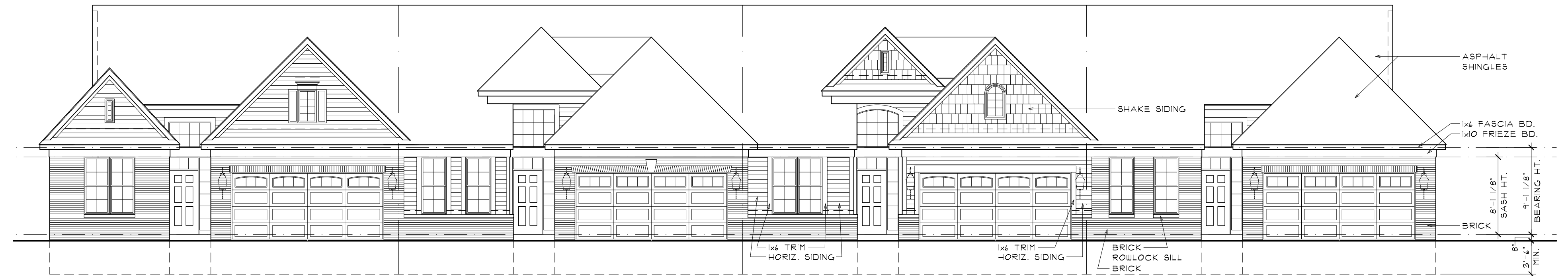
REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



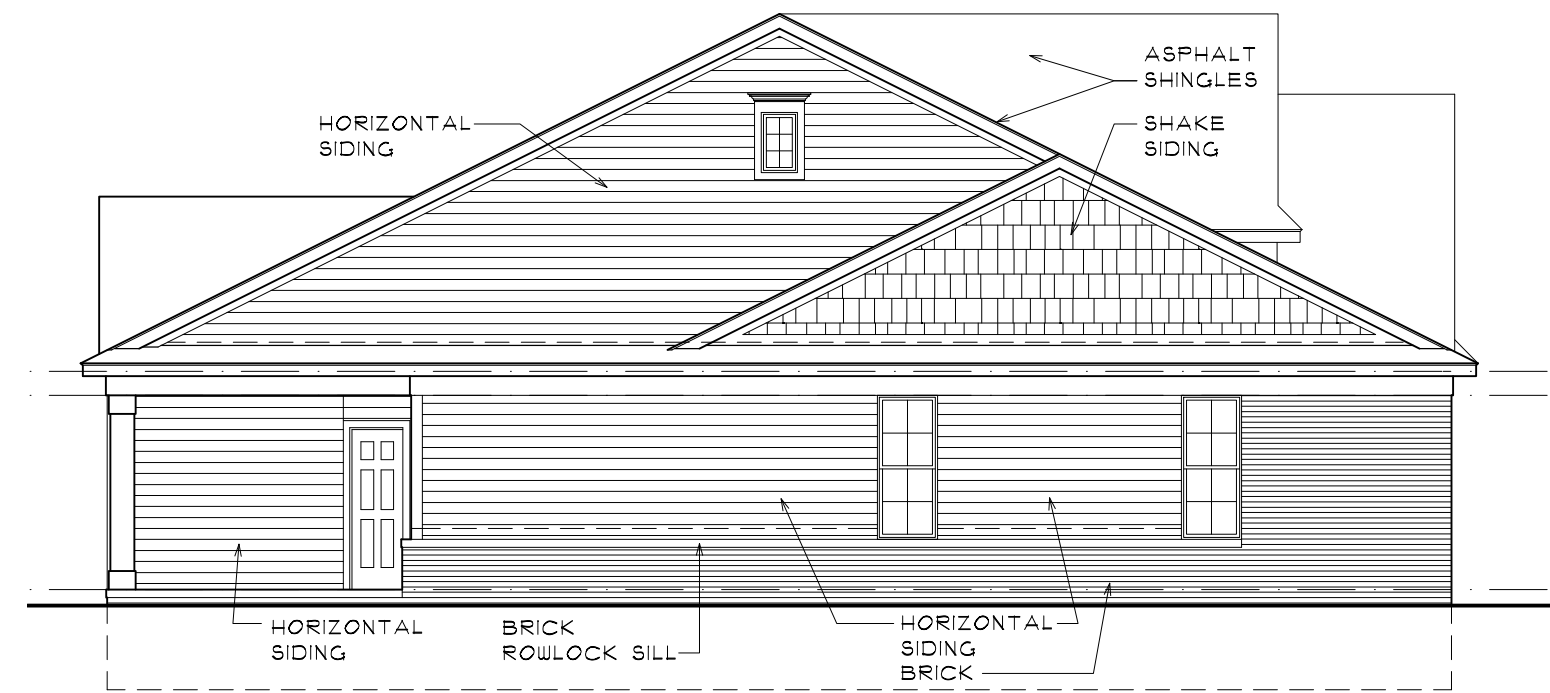
LEFT SIDE ELEVATION 'A' and 'C'

SCALE: 1/8" = 1'-0"



4 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION 'B'

SCALE: 1/8" = 1'-0"



4 UNIT FRONT ELEVATION 'B'

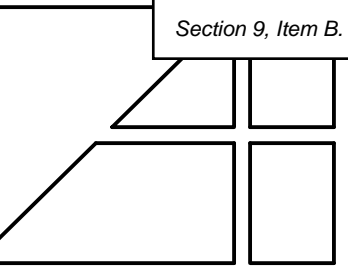
SCALE: 1/8" = 1'-0"



4 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO 4 AND 6 UNIT RENDERINGS.
ELEVATIONS RENDERED: 4 UNIT FRONT ELEVATION 'B' & 4 UNIT FRONT ELEVATION 'A'



Interior Design
2445 Franklin Road
Bloomfield Hills, MI 48302
248 • 334 • 5000

BUILDING ELEVATIONS

CLIENT/PROJECT
WHITE LAKE HILL, LLC
AVALON - RANCHES
WHITE LAKE TOWNSHIP, MICHIGAN

COPYRIGHT 2022
ALEXANDER V. BOGAERTS + ASSOC.

PRELIMINARY
2022-03-29

BIDS

PERMITS

CONSTRUCTION

REVISIONS
2022-03-29
SITE PLAN APPROVAL

DRAWN BY

CAD FILENAME

CHECKED BY

JOB NUMBER
2451

DATE
2022-03-29

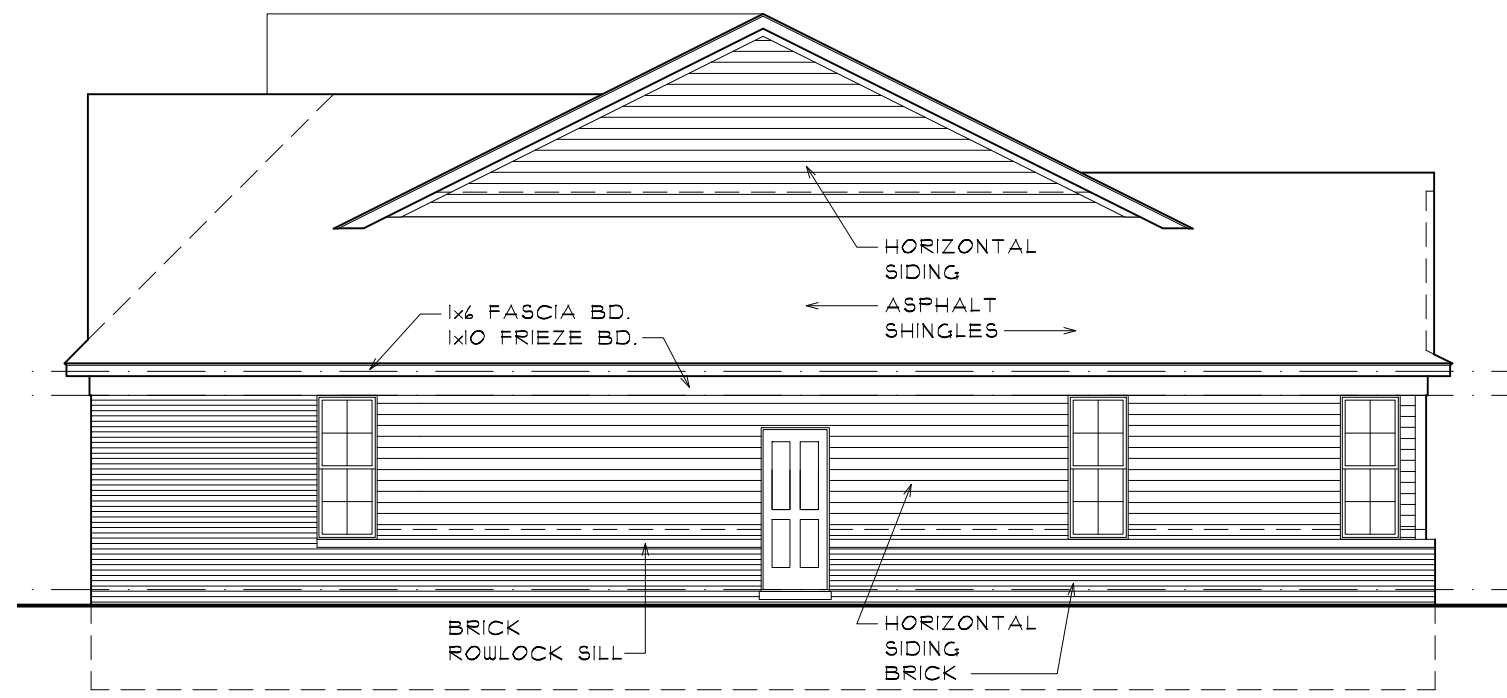
SHEET NUMBER

A104

230

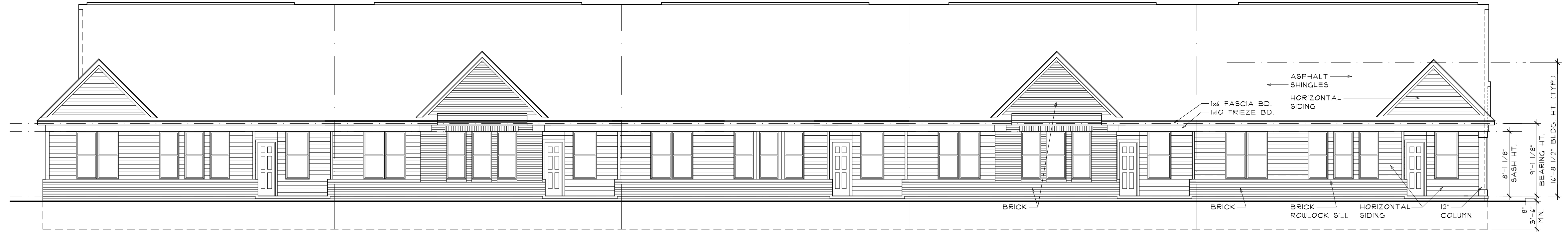


Alexander V. Bogaerts + Associates, P.C. • Architecture • Planning • Interior Design



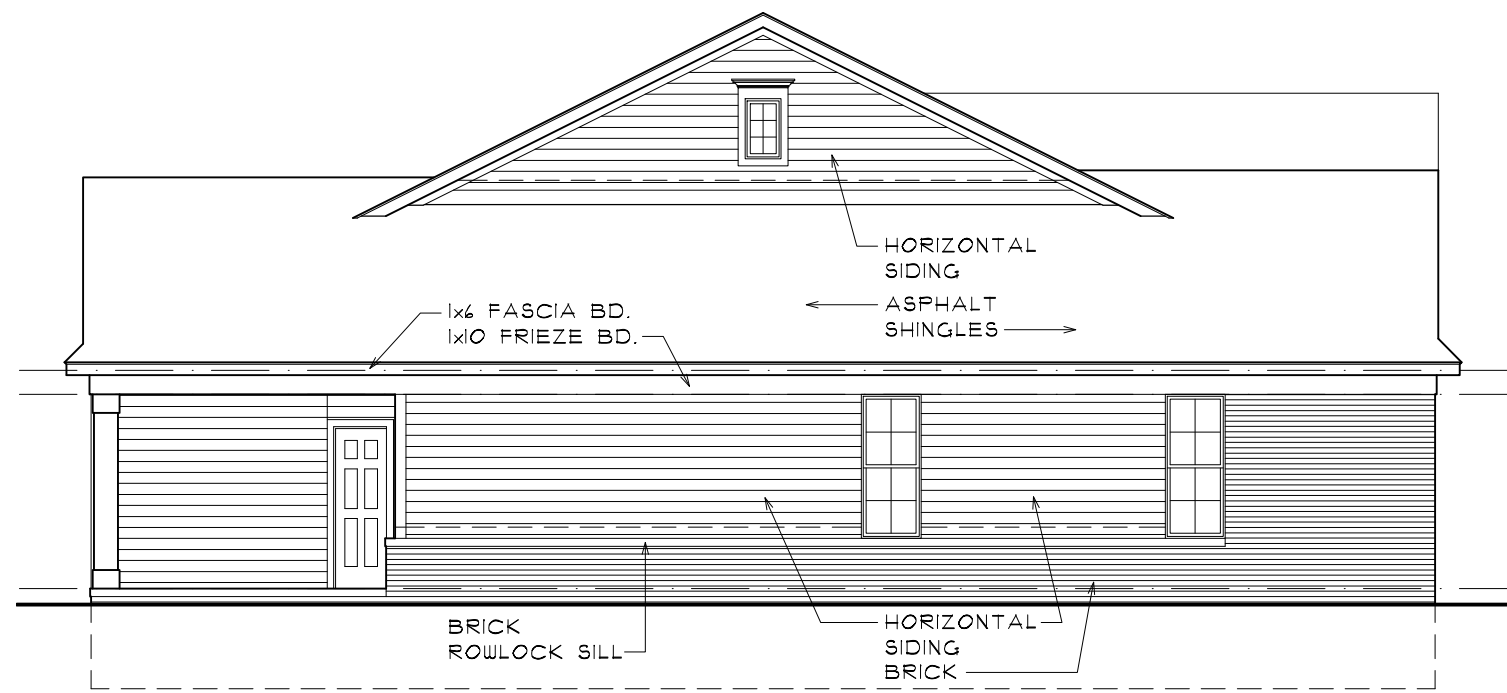
RIGHT SIDE ELEVATION 'B' ('A' and 'C' SIMILAR)

SCALE: 1/8" = 1'-0"



REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



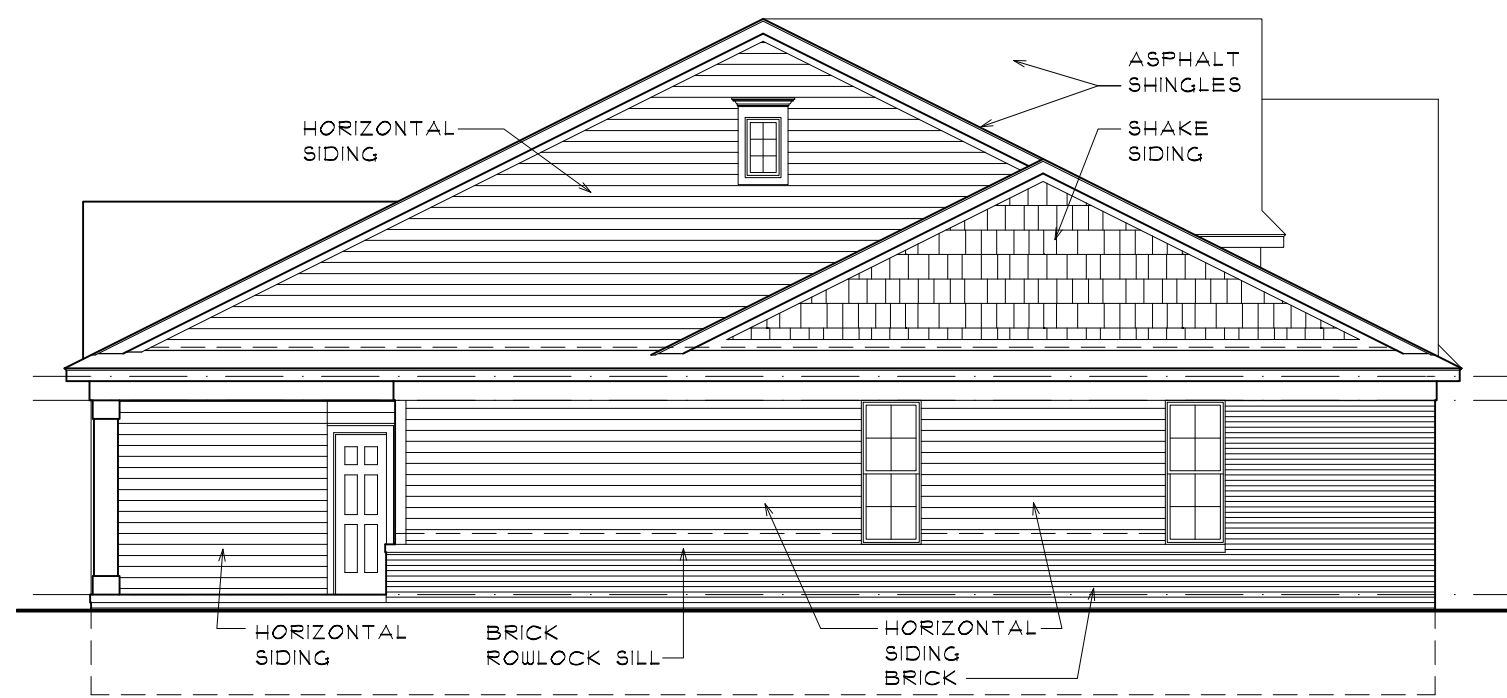
LEFT SIDE ELEVATION 'A' and 'C'

SCALE: 1/8" = 1'-0"



5 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION 'B'

SCALE: 1/8" = 1'-0"



5 UNIT FRONT ELEVATION 'B'

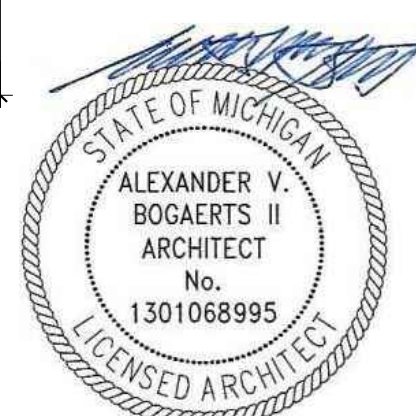
SCALE: 1/8" = 1'-0"



5 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"

NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO 4 AND 2 UNIT RENDERINGS.
ELEVATIONS RENDERED: 4 UNIT FRONT ELEVATION 'B' & 4 UNIT FRONT ELEVATION 'A'



Section 9, Item B.

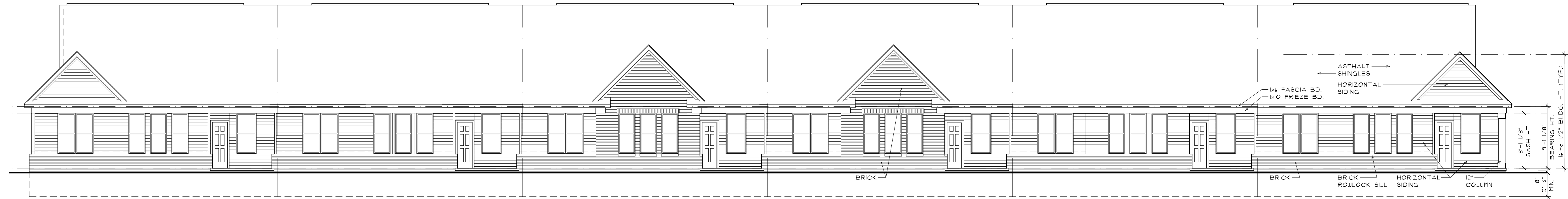
Alexander V. Bogaerts + Associates, P.C. • Architecture • Planning • Interior Design
 2445 Franklin Road
 Bloomfield Hills, MI 48302
 248 • 334 • 5000

SHEET TITLE: BUILDING ELEVATIONS
 CLIENT/PROJECT: WHITE LAKE HILL, LLC
 AVALON - RANCHES
 WHITE LAKE TOWNSHIP, MICHIGAN

COPYRIGHT 2022
 ALEXANDER V. BOGAERTS + ASSOC.
 ■ PRELIMINARY 2022-03-29
 BIDS
 PERMITS
 CONSTRUCTION
 REVISIONS
 2022-03-29
 SITE PLAN APPROVAL

DRAWN BY:
 CAD FILENAME:
 CHECKED BY:
 JOB NUMBER: 2451
 DATE: 2022-03-29
 SHEET NUMBER: A105

231



REAR ELEVATION 'A' and 'C' ('B' SIMILAR)

SCALE: 1/8" = 1'-0"



6 UNIT FRONT ELEVATION 'A'

SCALE: 1/8" = 1'-0"

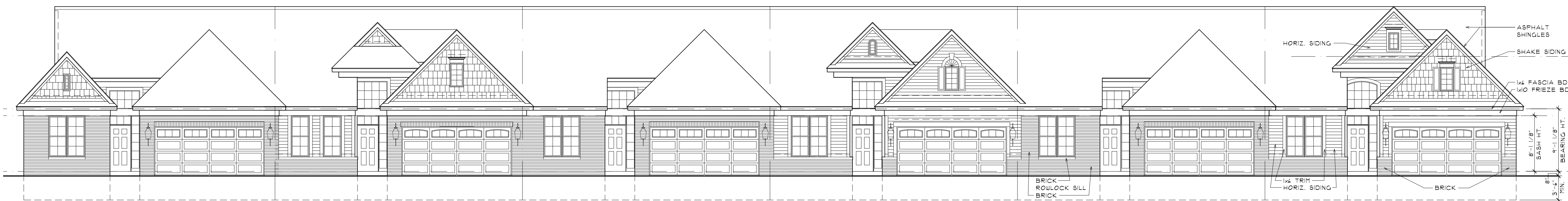


6 UNIT FRONT ELEVATION 'B'

SCALE: 1/8" = 1'-0"

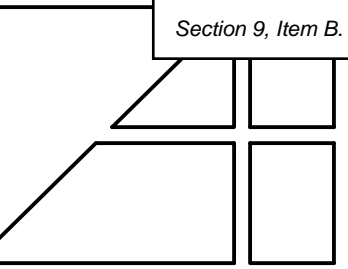
NOTE:
SEE BUILDING RENDERINGS FOR ALL BUILDING MATERIAL COLORS. 3 DIFFERENT COLOR SCHEMES PROPOSED FOR A, B, AND C. 3RD SCHEME C SIMILAR TO A AND 4 UNIT RENDERINGS.
ELEVATIONS RENDERED: 4 UNIT FRONT ELEVATION 'B' & 4 UNIT FRONT ELEVATION 'A'

NOTE:
REFER TO SHEET A105 FOR BUILDING SIDE ELEVATIONS



6 UNIT FRONT ELEVATION 'C'

SCALE: 1/8" = 1'-0"



Section 9, Item B
2445 Franklin Road
Bloomfield Hills, MI 48302
248 • 334 • 5000

BUILDING ELEVATIONS

WHITE LAKE HILL, LLC
AVALON - RANCHES

COPYRIGHT 2022
ALEXANDER V. BOGAERTS + ASSOC.

PRELIMINARY
2022-03-29

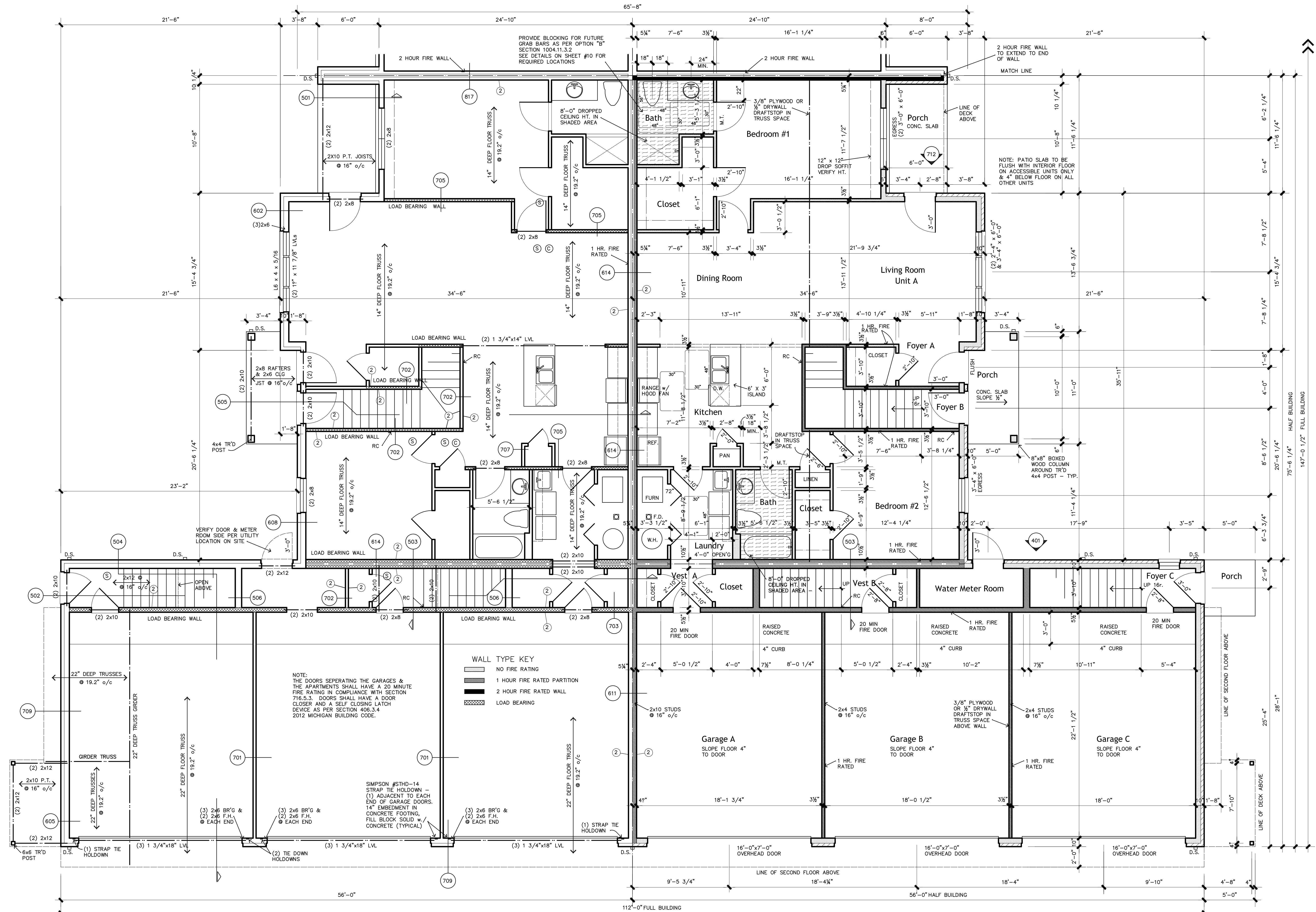
- BIDS
- PERMITS
- CONSTRUCTION

REVISIONS
2022-04-01
SITE PLAN APPROVAL

DRAWN BY
CAD FILENAME
CHECKED BY
JOB NUMBER
2451
DATE
2022-03-29
SHEET NUMBER



A106



WALL TYPE KEY

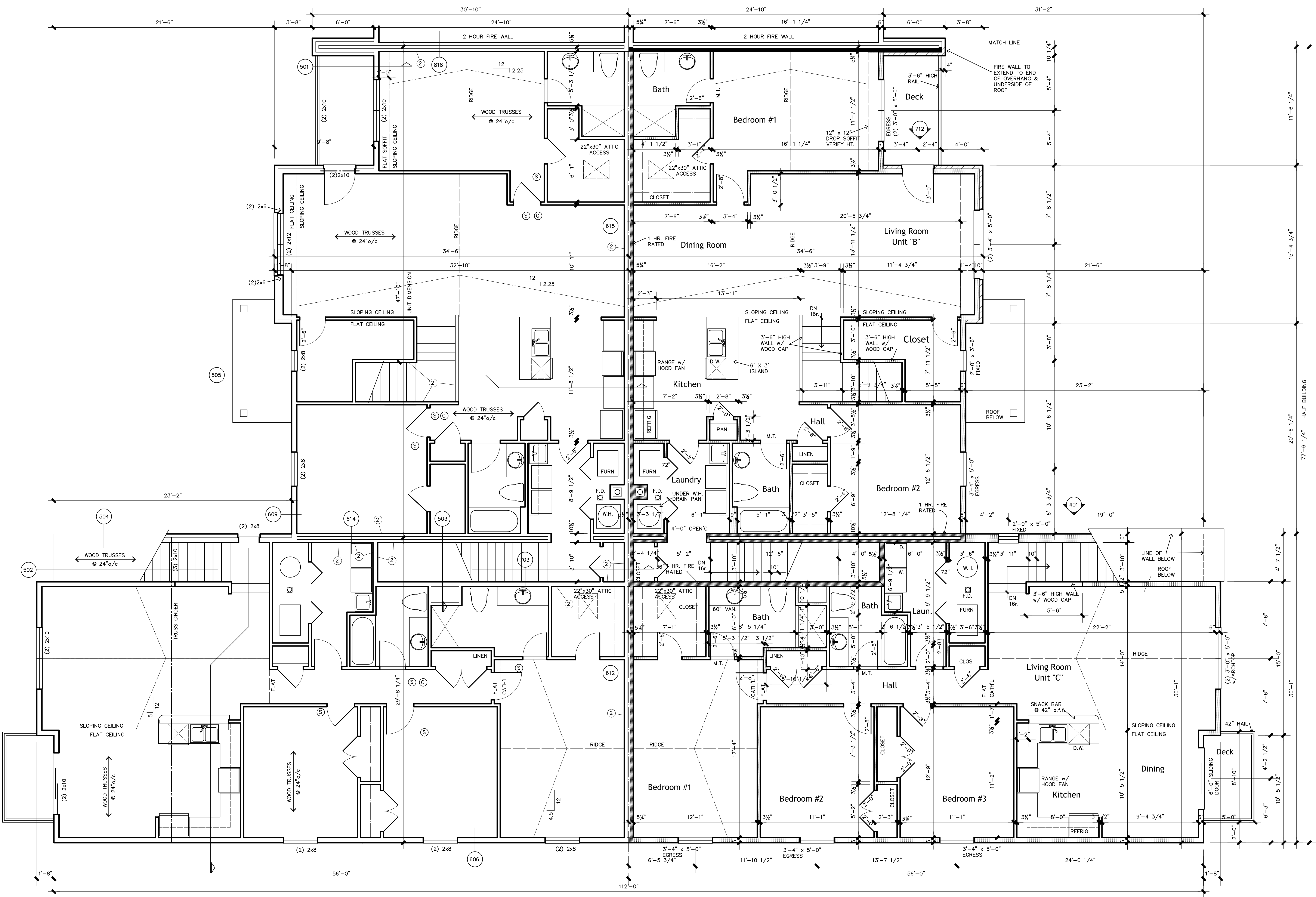
[White Box]	NO FIRE RATING
[Grey Box]	1 HOUR FIRE RATED PARTITION
[Black Box]	2 HOUR FIRE RATED WALL
[Hatched Box]	LOAD BEARING

NOTE: THE DOORS SEPARATING THE GARAGES & THE APARTMENTS SHALL HAVE A 20 MINUTE FIRE RATING IN COMPLIANCE WITH SECTION 716.5.3. DOORS SHALL HAVE A DOOR CLOSER AND A SELF-CLOSING LATCH DEVICE AS PER SECTION 406.3.4 2012 MICHIGAN BUILDING CODE.

First Floor Plan
 Scale: 1/4" = 1'-0"

Type "B" Units
 ALL UNITS EXCEPT FOR:
 BUILDINGS #3, #4 & #9 - SEE SHEET #10
 BUILDING #10 - SEE SHEET #11

REPRODUCTION OF PRINTS IS PROHIBITED.



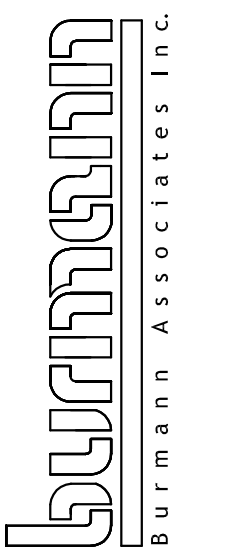
WALL TYPE KEY

[Symbol]	NO FIRE RATING
[Symbol]	1 HOUR FIRE RATED PARTITION
[Symbol]	2 HOUR FIRE RATED WALL
[Symbol]	LOAD BEARING

Second Floor Plan
 Scale: 1/4" = 1'-0"

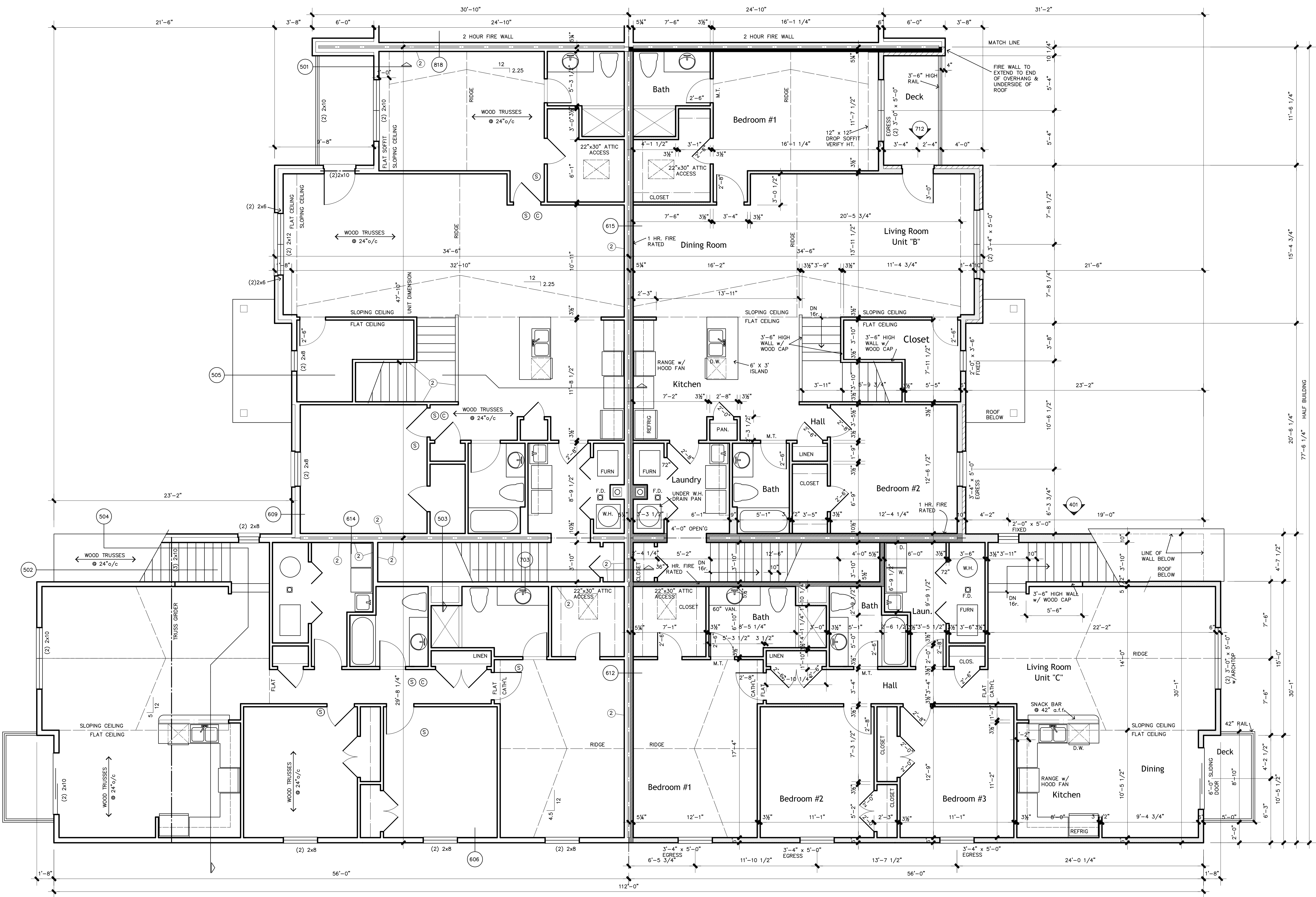
ALL UNITS "B" & "C" ARE NOT ACCESSIBLE UNITS.

Proposed Condominiums for:
MJC
 12 - Plex Condominiums
 Architects • Engineers • Historic Restorations
 110 W. St. Clair • Romeo • Michigan • 48065-4655
 Office: 586-752-9010 • 586-201-1602 Cell
 greatarchitects@charter.net
 Member of the American Institute of Architects
A.I.A.
 Burmann Associates Inc.



Sheet Contents:
 Second Floor
 Job: 18173
 Drawn by: REB
 Date: 17JUL18
 Sheet Number:

REPRODUCTION OF PRINTS IS PROHIBITED.



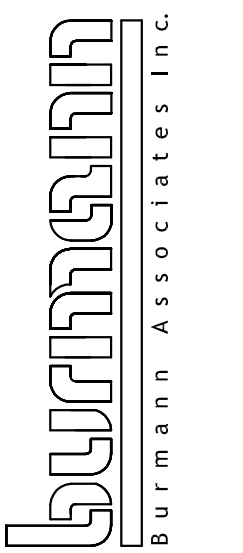
WALL TYPE KEY

[Solid line]	NO FIRE RATING
[Dashed line]	1 HOUR FIRE RATED PARTITION
[Thick solid line]	2 HOUR FIRE RATED WALL
[Hatched pattern]	LOAD BEARING

Second Floor Plan
 Scale: 1/4" = 1'-0"

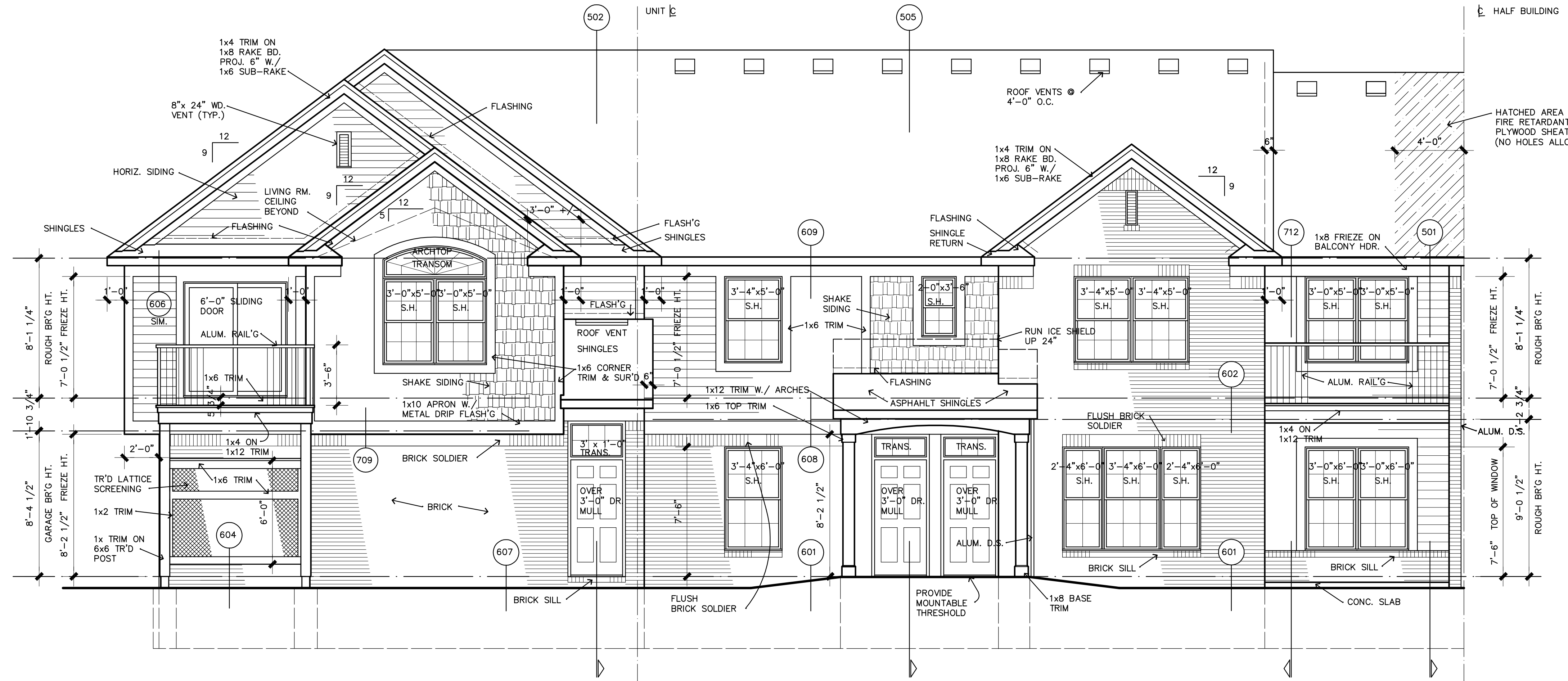
ALL UNITS "B" & "C" ARE NOT ACCESSIBLE UNITS.

Proposed Condominiums for:
MJC
 12 - Plex Condominiums
 Architects • Engineers • Historic Restorations
 110 W. St. Clair • Romeo • Michigan • 48065-4655
 Office 586-752-9010 • 586-201-1602 Cell
 greatarchitects@charter.net
 Member of the American Institute of Architects
A.I.A.
 Burmann Associates Inc.

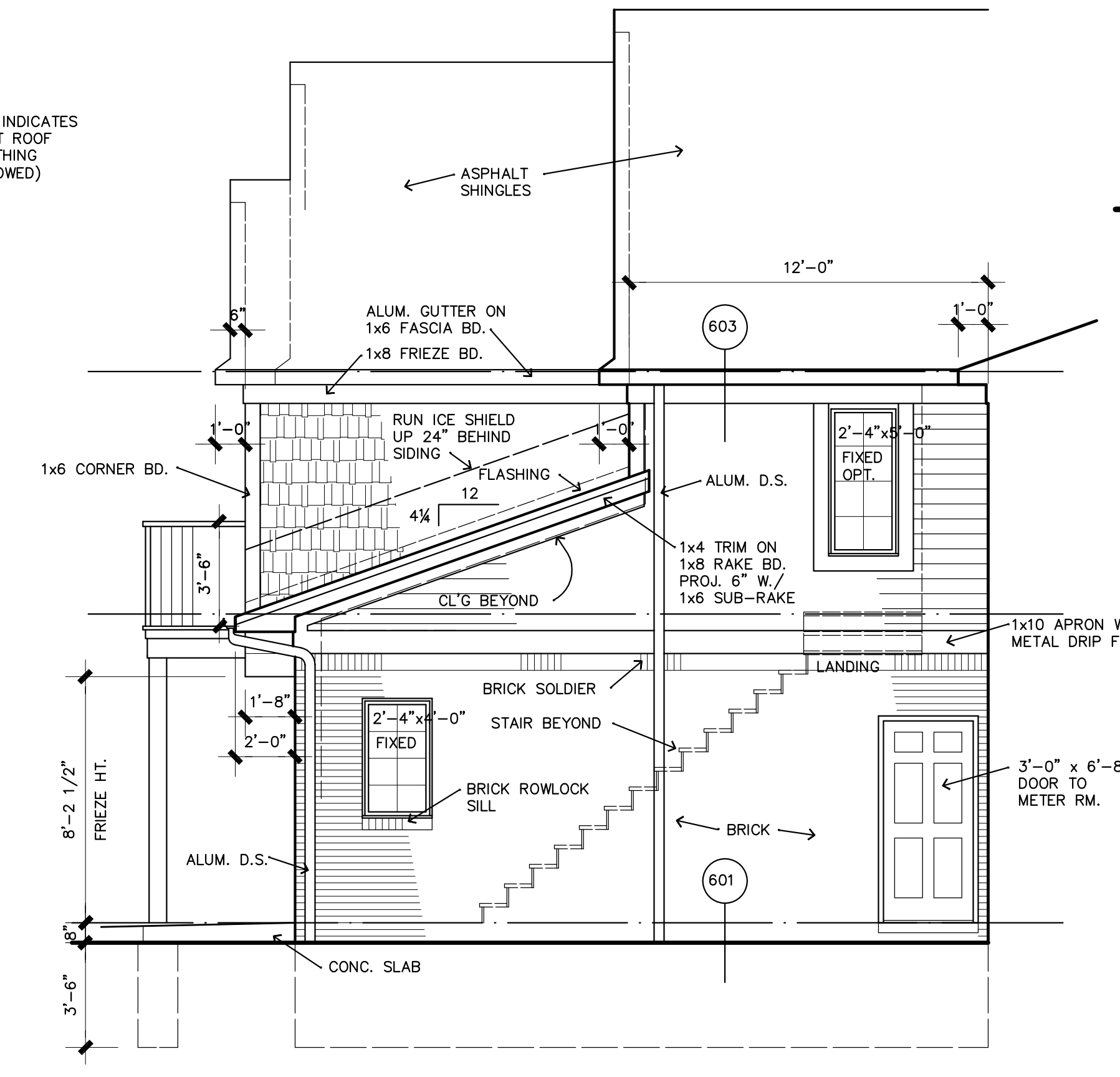


Sheet Contents:
 Second Floor
 Job: 18173
 Drawn by: REB
 Date: 27JUN18
 Sheet Number:

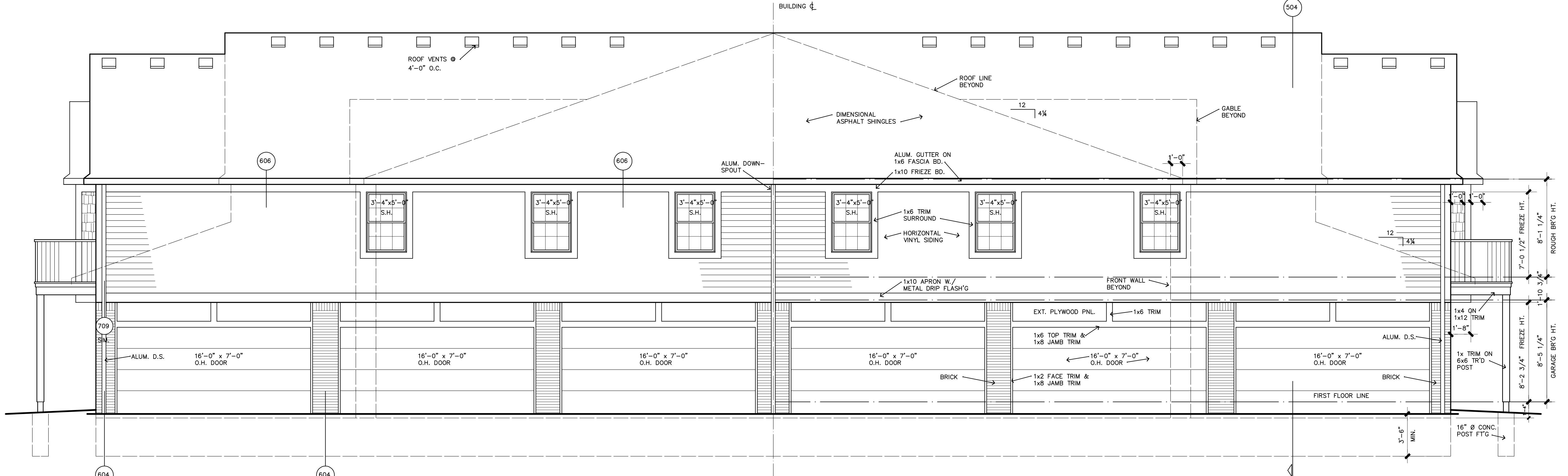
REPRODUCTION OF PRINTS IS PROHIBITED.



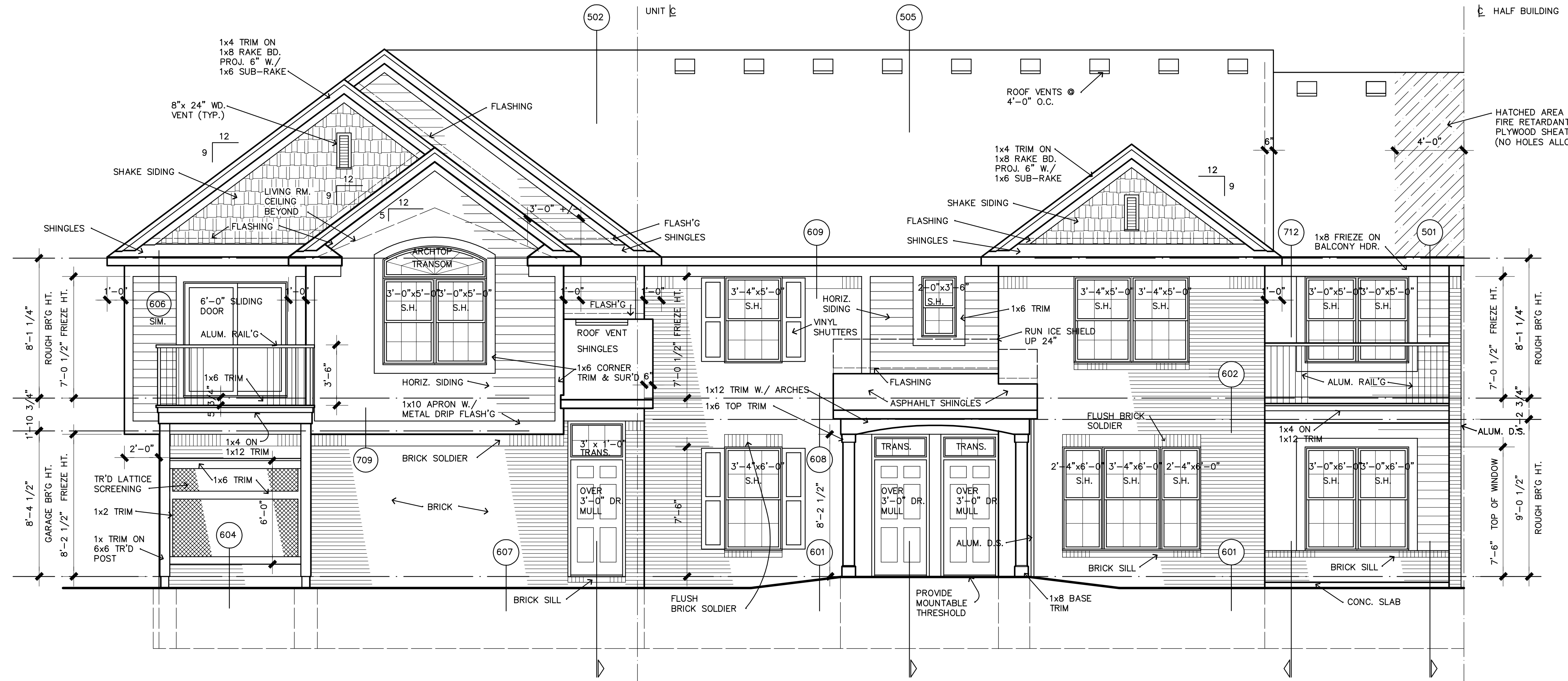
Front/Rear Elevation "A"
 Scale: 1/4" = 1'-0"



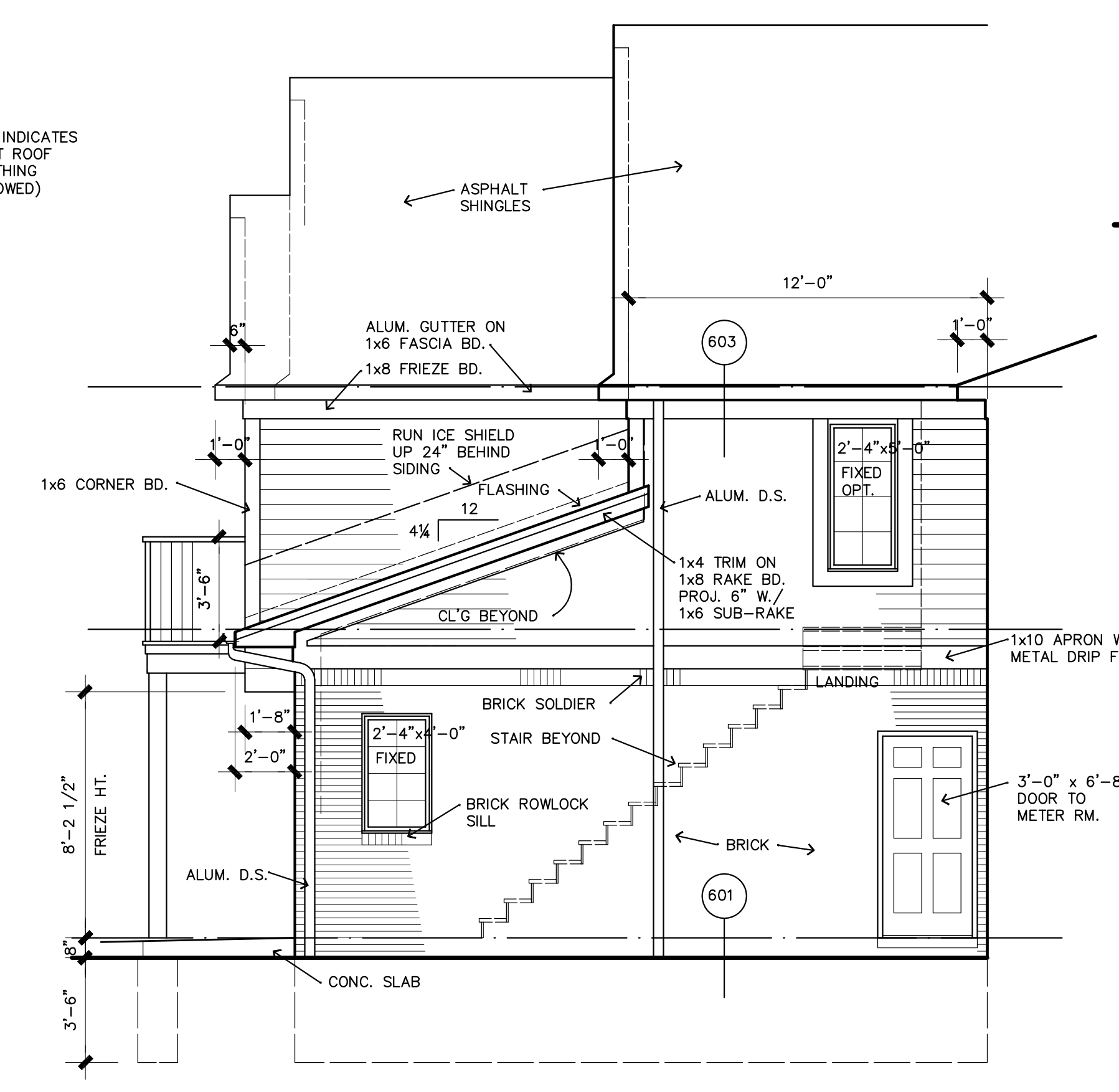
401 Partial Elevation "A"
 Scale: 1/4" = 1'-0"



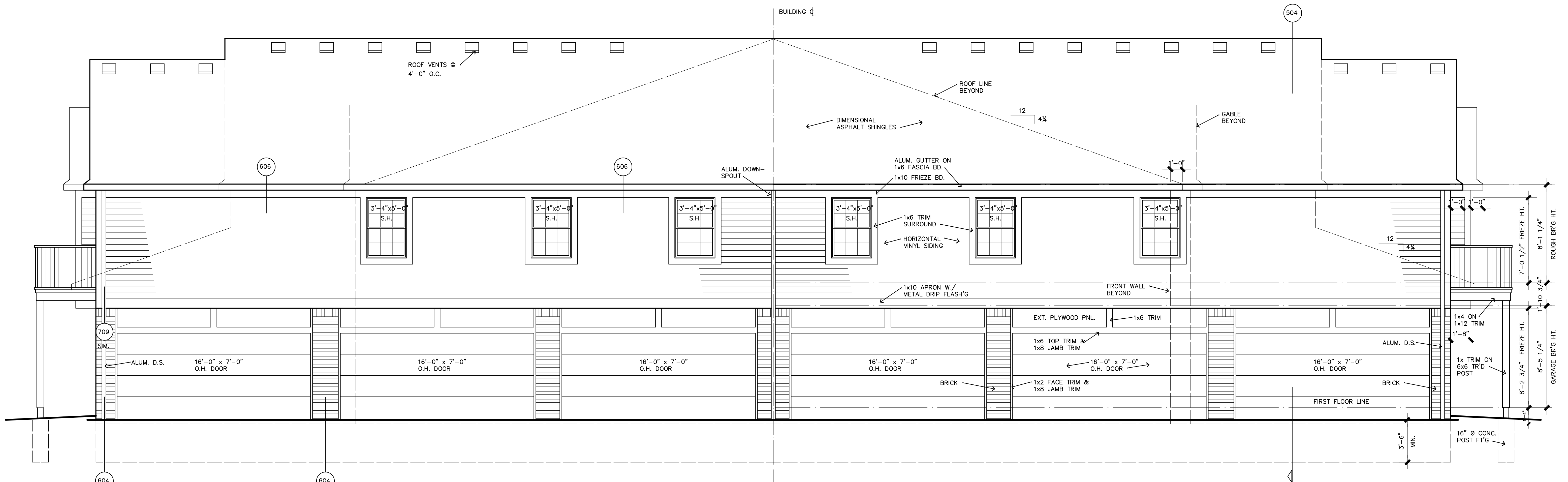
Side Elevation "A"
 Scale: 1/4" = 1'-0"



Front/Rear Elevation "B"
 Scale: 1/4" = 1'-0"



Partial Elevation "B"
 Scale: 1/4" = 1'-0"



Side Elevation "B"
 Scale: 1/4" = 1'-0"

Proposed Condominiums for:
MJC
 12 - Plex Condominiums

Architects • Engineers • Historic Restorations
 110 W. St. Clair • Romeo • Michigan • 48065-4655
 Office: 586-752-9010 • 586-201-1602 Call
 greatarchitects@charter.net
A.I.A.
 Member of the American Institute of Architects

BURMANN
 BURMANN ASSOCIATES INC.

Sheet Contents:
 Elevations
 Job: 18173
 Drawn by: MAK
 Date: 27JUN18
 Sheet Number:



ABERDEEN

First Level	1,182 sf
Second Level	1,091 sf
Total	2,273 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

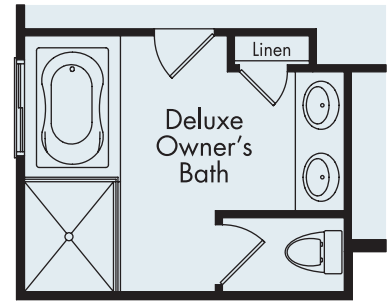
MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

ABERDEEN

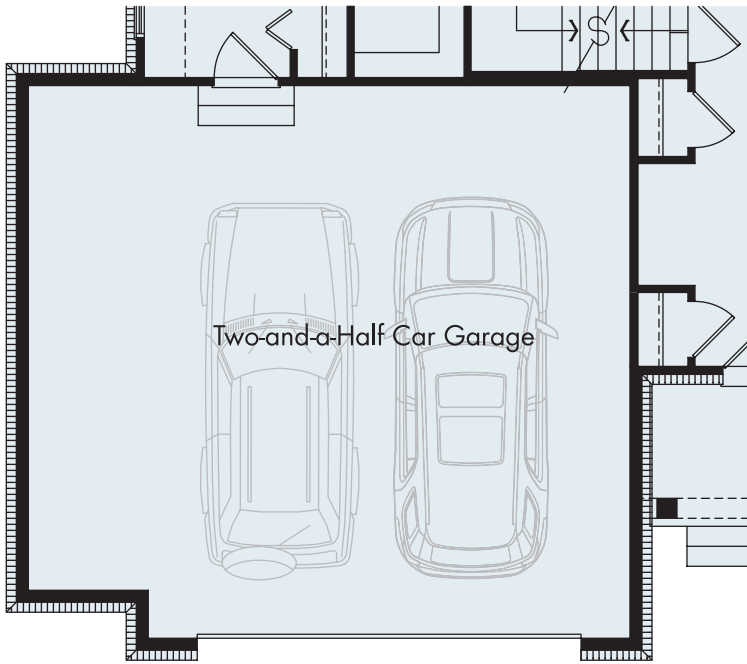
First Level 1,182 sf
 Second Level 1,091 sf
 Total 2,273 sf



The Aberdeen is designed for entertaining and flexible family living. There's smart space for everything — main-floor study, a mud room with an optional bench, island kitchen with walk-in pantry, large family room with fireplace, and options for a covered porch or harvest room off the dining area. Upstairs, there's a convenient laundry room, private wing with an elegant owner's suite, complete with its own luxurious bath and walk-in closet. There are also options for an oversized 2.5-car or 3-car garage.



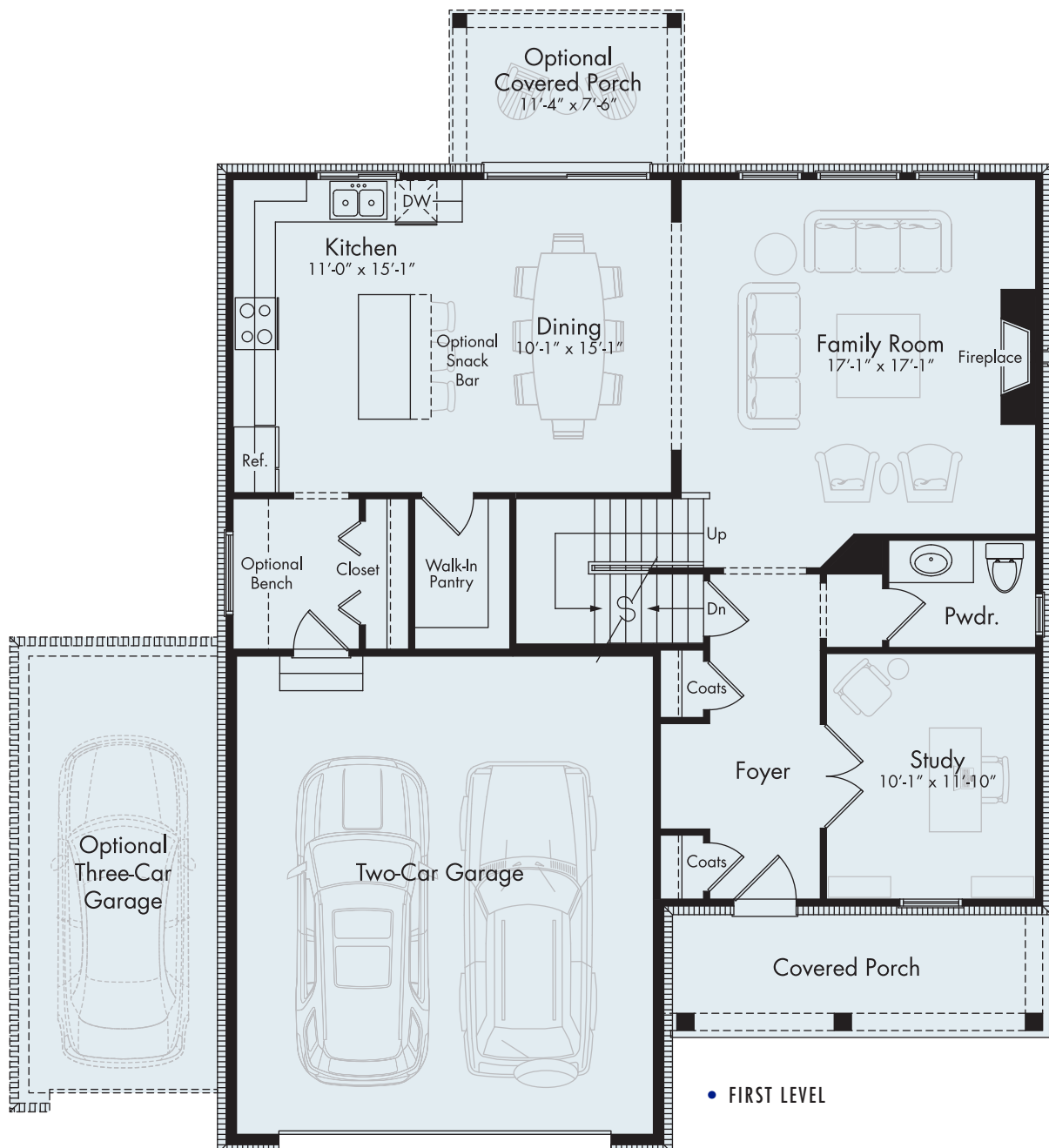
• OPTIONAL DELUXE OWNER'S BATH



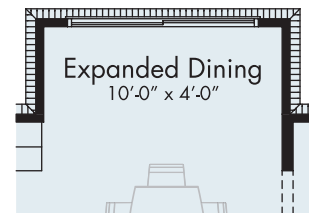
• OPTIONAL TWO-AND-A-HALF CAR GARAGE



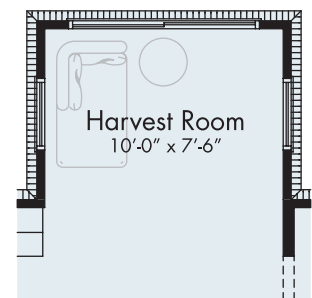
• SECOND LEVEL



• FIRST LEVEL



• OPTIONAL EXPANDED DINING ROOM



• OPTIONAL HARVEST ROOM

The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FRENCH ECLECTIC

American soldiers returned home in the mid-1920's with romantic thoughts of French architecture. This timeless, eclectic style showcases rich exterior materials with tall, steeply pitched roofs, dormers and shutters.



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



MJCompanies.com

All information contained herein was accurate at the time of publication. In order to maintain the high degree of quality and incorporate improvements with greater facilities and economy, we reserve the right to make changes in price, specifications, or materials or to change or discontinue models without notice or obligation. Floor plan dimensions are approximate. Renderings are artist's conception. © 2019 MJC Companies





BERKSHIRE

First Level 1,653 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

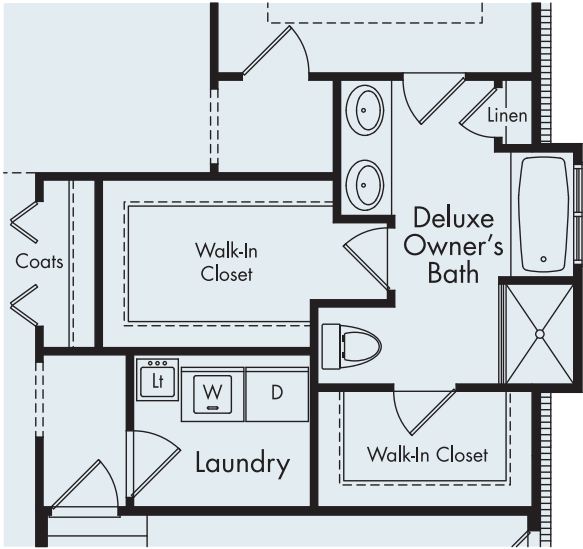
MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

BERKSHIRE

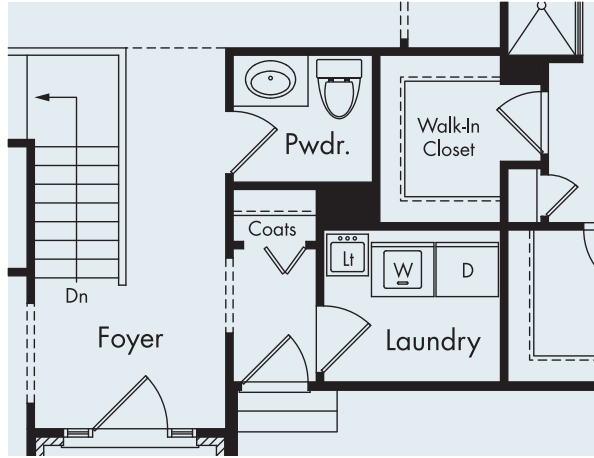
First Level 1,653 sf



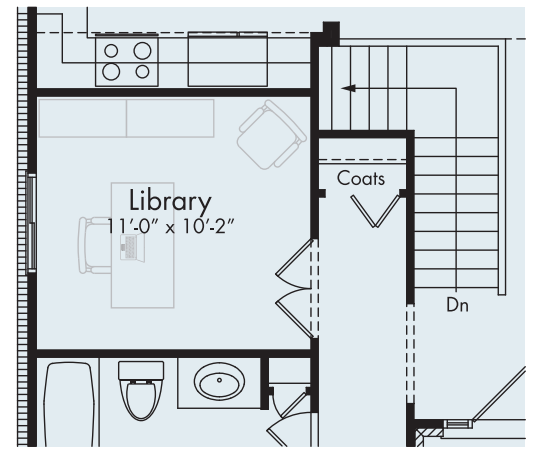
We designed the Berkshire to offer modern, single-level living with a casual touch. The kitchen, family room and dining area have all been brought together to create an open flow for relaxed family times and lively entertaining. Whether you were unwinding in the family room or gathering in the spacious island kitchen, you'll love the natural sunlight that comes in from all the windows in the main living area. The owner's suite showcases the stepped ceiling, spacious private bath and twin walk-in closets. Another wing at the front of the home contains two spacious bedrooms with walk-in closets and access to a second full bath.



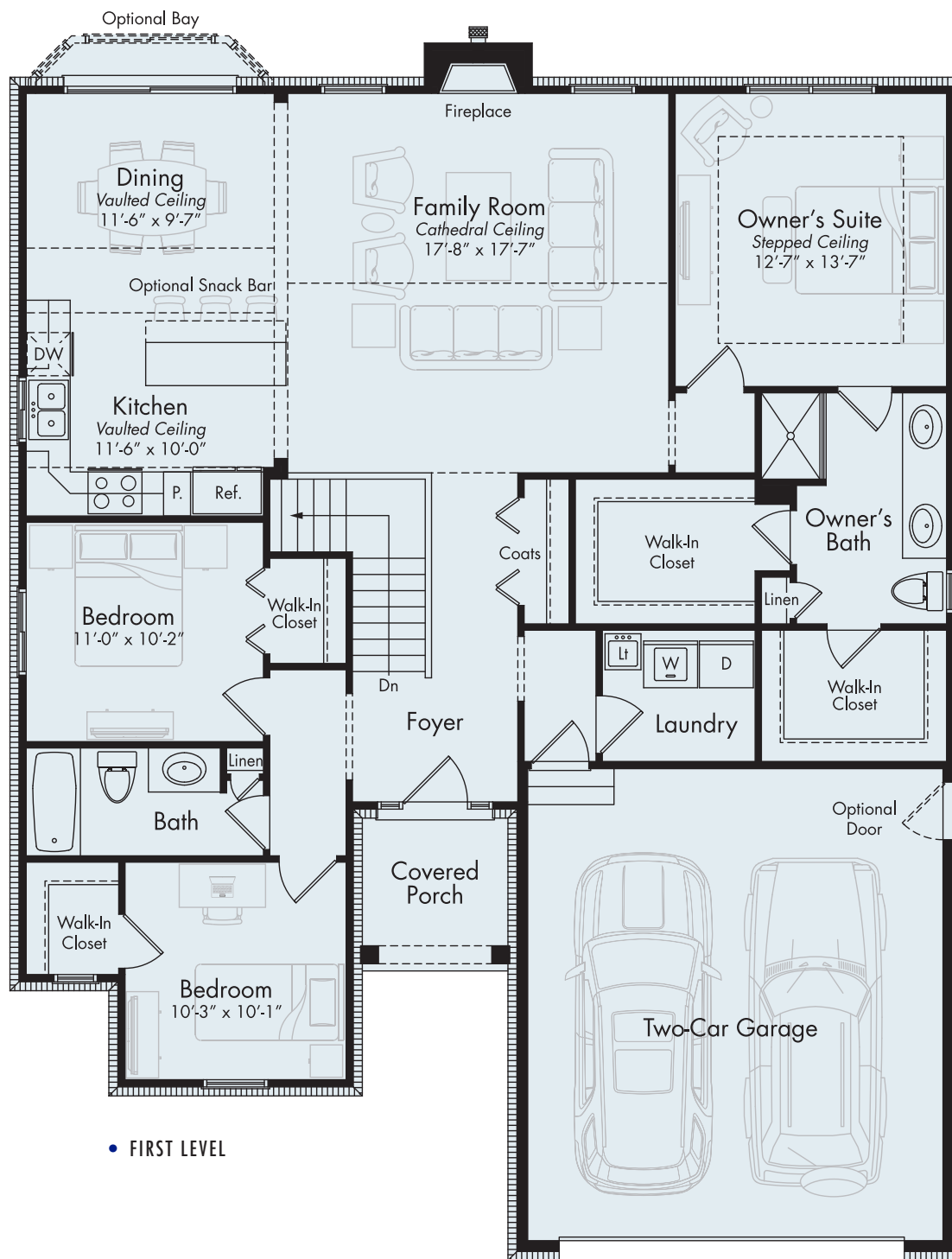
• OPTIONAL DELUXE OWNER'S BATH



• OPTIONAL POWDER ROOM



• OPTIONAL LIBRARY



• FIRST LEVEL

The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FRENCH ECLECTIC

American soldiers returned home in the mid-1920's with romantic thoughts of French architecture. This timeless, eclectic style showcases rich exterior materials with tall, steeply pitched roofs, dormers and shutters.



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



MJCompanies.com

All information contained herein was accurate at the time of publication. In order to maintain the high degree of quality and incorporate improvements with greater facilities and economy, we reserve the right to make changes in price, specifications, or materials or to change or discontinue models without notice or obligation. Floor plan dimensions are approximate. Renderings are artist's conception. © 2019 MJC Companies





BURBANK

First Level	1,332 sf
Second Level	1,160 sf
Total	2,492 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

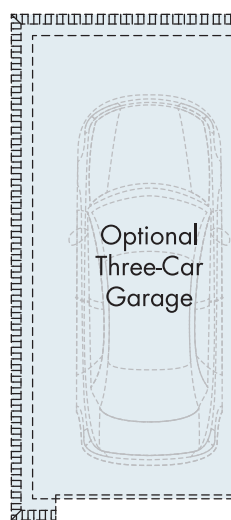
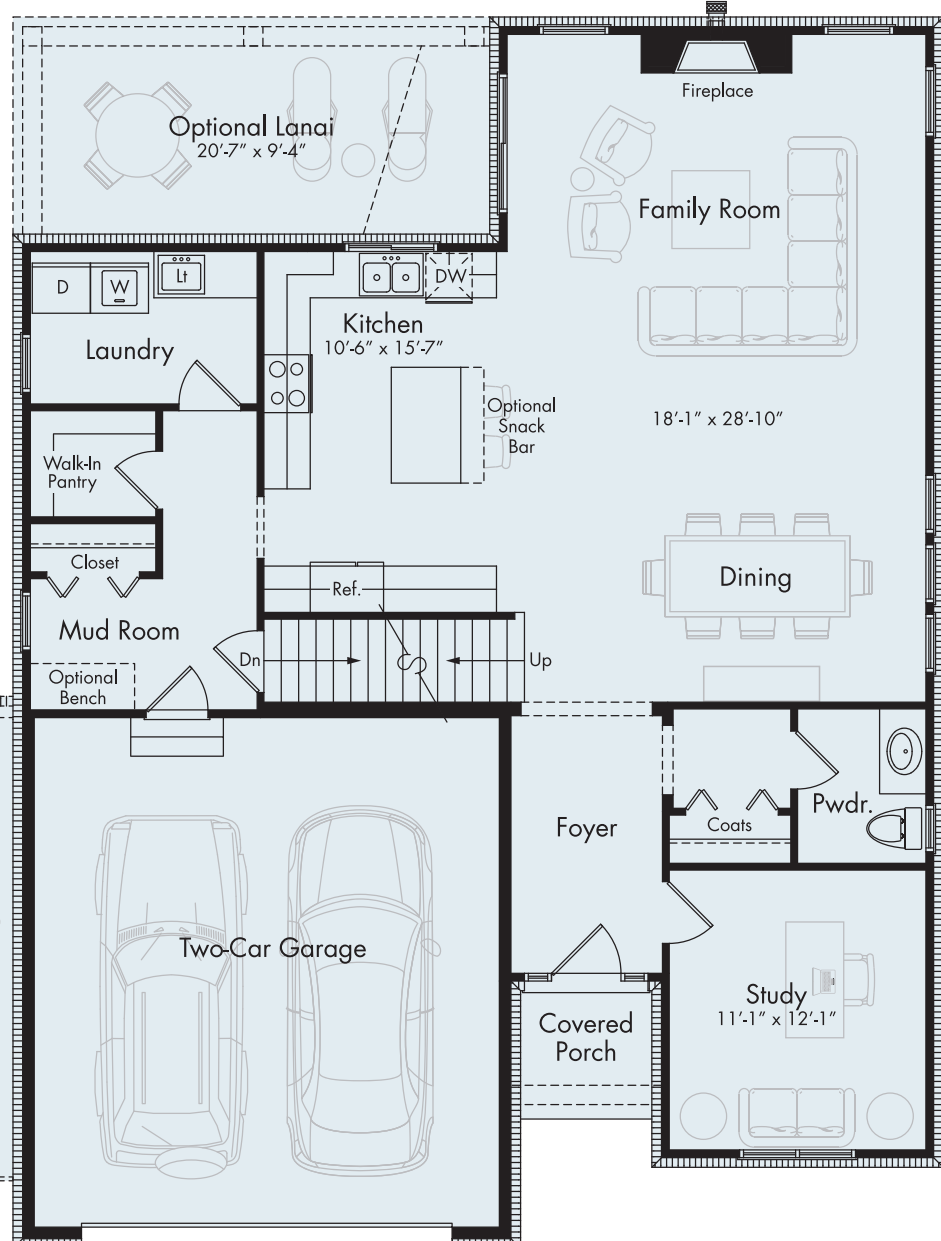
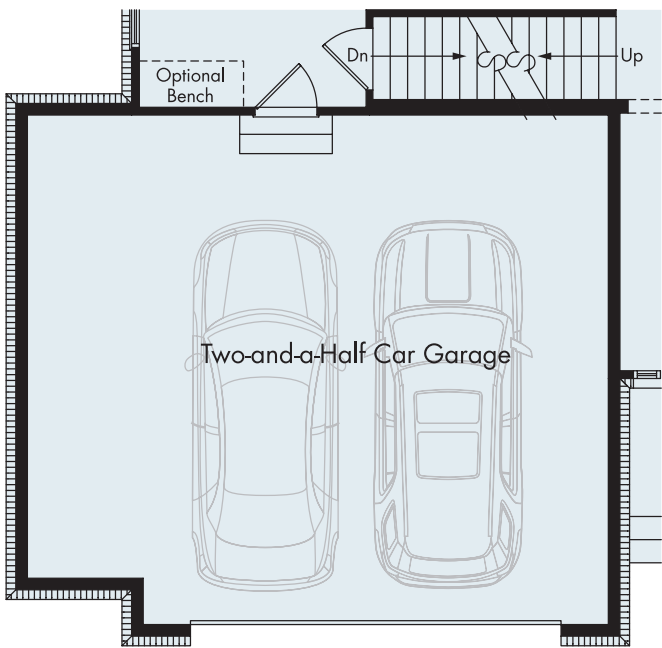
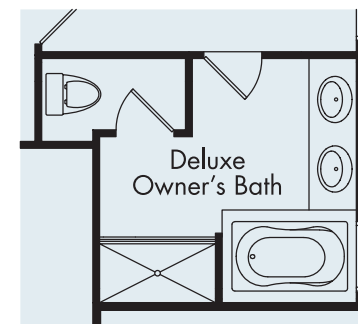
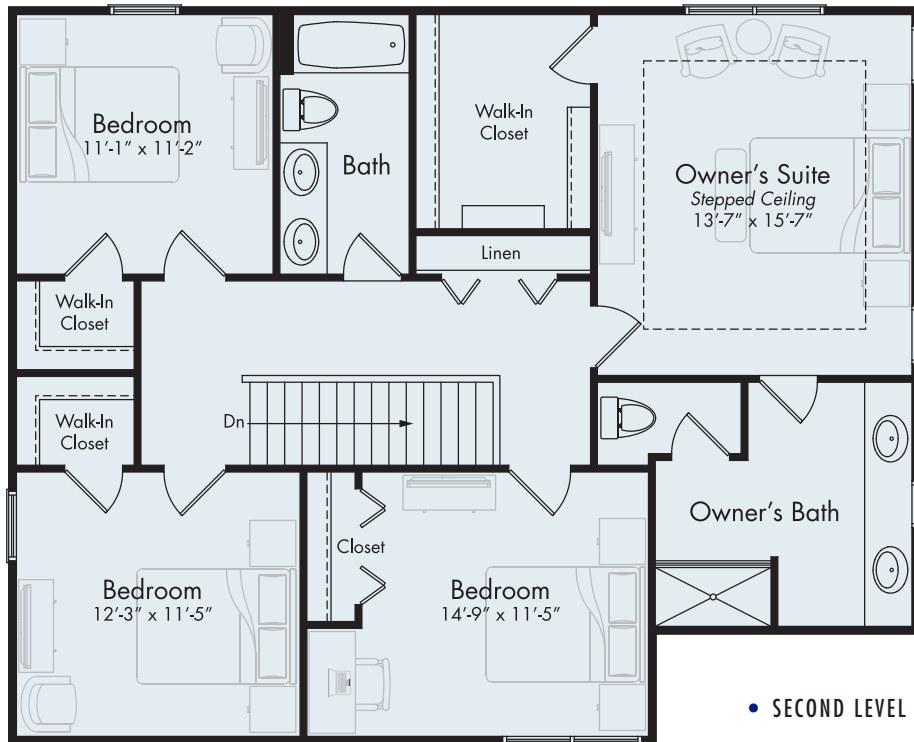
BURBANK

First Level 1,332 sf
 Second Level 1,160 sf
 Total 2,492 sf



The two-story Burbank is a stunning open concept plan with an L-shaped living area that includes the family room, oversized dining room and enormous island kitchen. The optional lanai vastly increases the living space and brings the outdoors into this spacious home. The main floor also includes a secluded study, guest closet, powder room, mud room, walk-in pantry and laundry room. No convenience was overlooked, including the option of a 2.5- or 3-car garage.

Upstairs, the owner's suite features a stepped ceiling, spacious bath with an optional whirlpool tub and oversized walk-in closet. Three more large bedrooms share a central bath with double sinks. No convenience was overlooked, including the option of a 2.5- or 3-car garage.



For Information Visit
MJCCompanies.com

The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



CAMPBELL

First Level	1,217 sf
Second Level	1,402 sf
Total	2,619 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

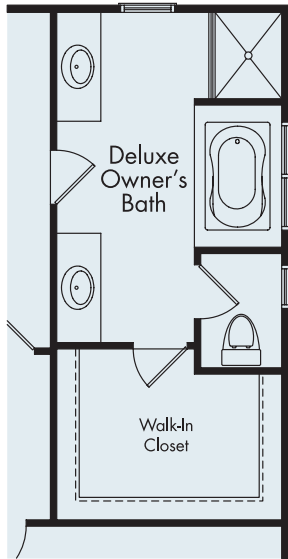
CAMPBELL

First Level 1,217 sf
 Second Level 1,402 sf
 Total 2,619 sf

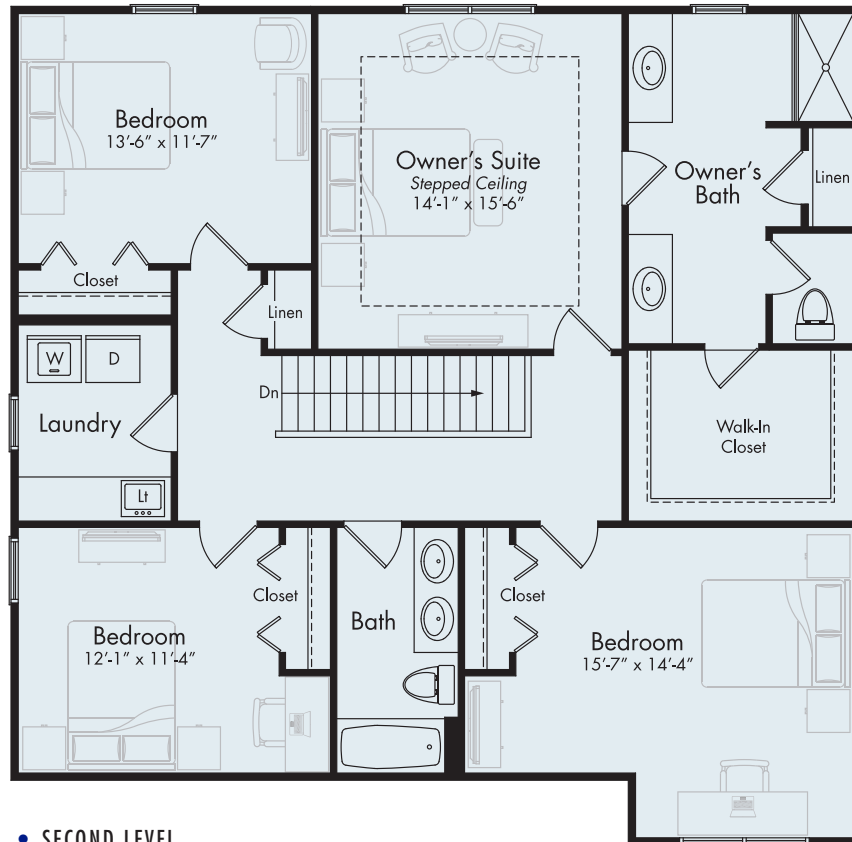


The four-bedroom Campbell is an ideal family home with two spacious levels. The foyer opens to reveal the family room with its centered fireplace and triple windows. This sunny dining room with its sliding glass doorwall can extend outdoors for an optional covered porch. The U-shaped kitchen is centered on a convenient island with snack bar seating. The main floor also includes a secluded study, powder room, mud room and walk-in pantry.

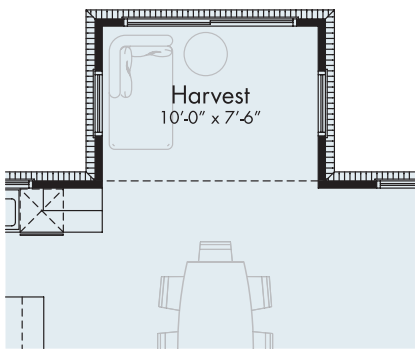
The upper level showcases the owner's suite with stepped ceiling, spacious bath with twin vanities, and large walk-in closet. There is also an option to include a whirlpool tub. There are three more bedrooms on the second floor along with a full bath and oversized laundry room.



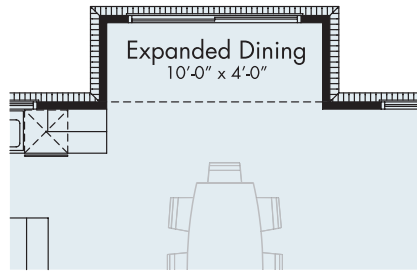
• OPTIONAL DELUXE OWNER'S BATH



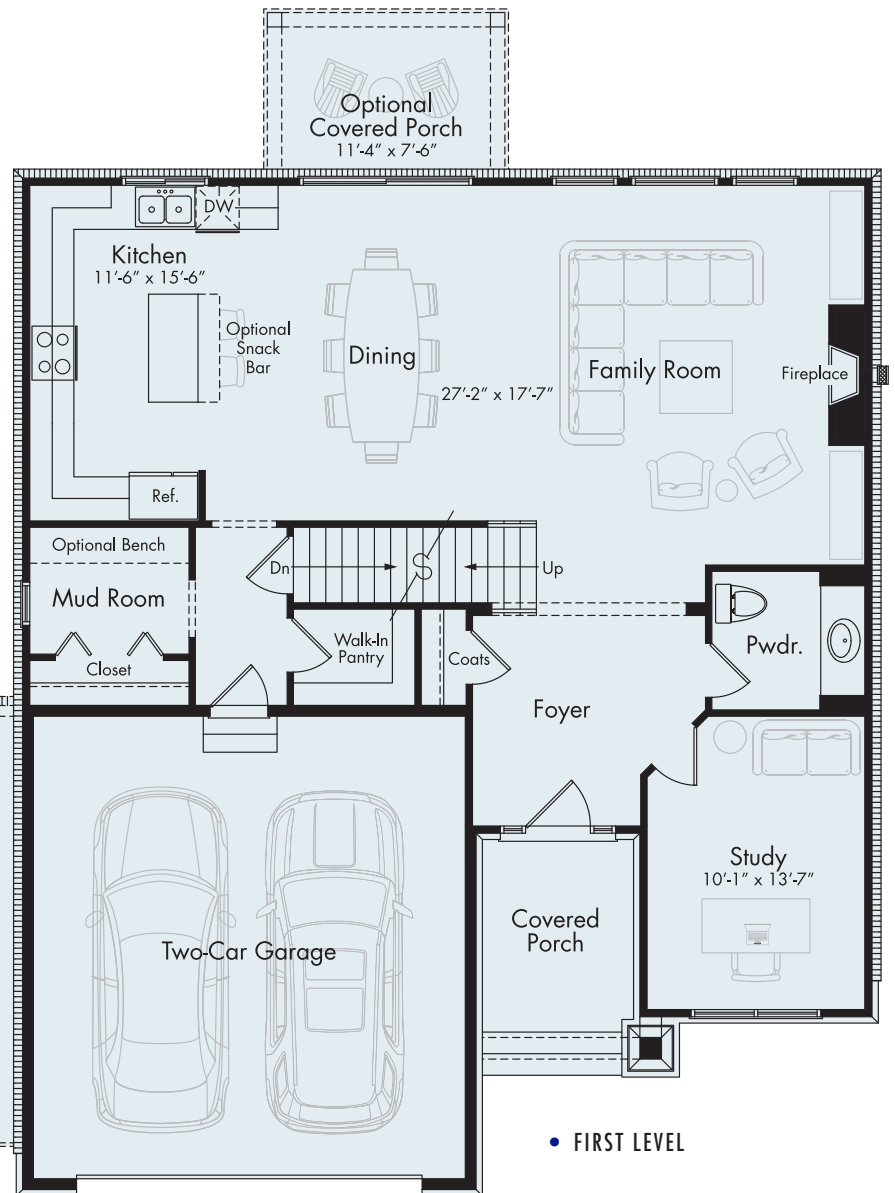
• SECOND LEVEL



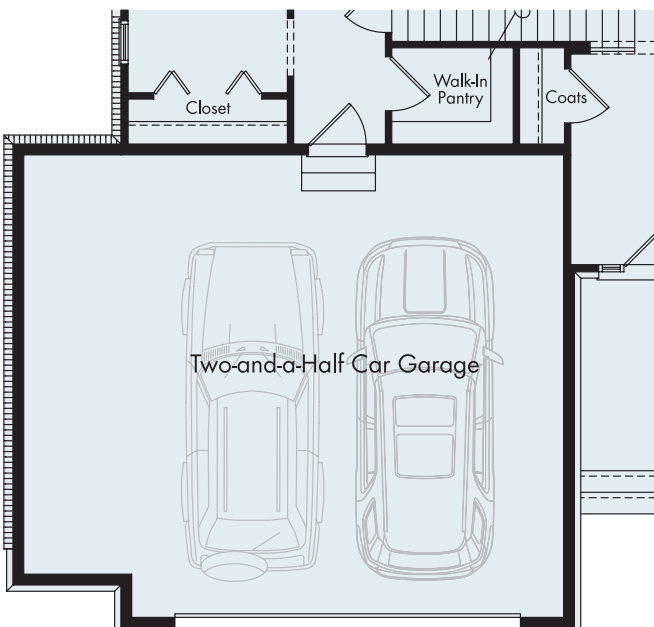
• OPTIONAL HARVEST ROOM



• OPTIONAL EXPANDED DINING ROOM



• FIRST LEVEL



• OPTIONAL TWO-AND-A-HALF CAR GARAGE



For Information Visit
MJCCompanies.com

The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



CYPRESS

First Level 1,539 sf

THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

CYPRESS

First Level 1,539 sf



If you're looking for the perfect ranch floor plan with no wasted space, then the Cypress is ideal for you! The open island kitchen, dining area with its optional bay window, and family room with a cozy fireplace, will keep your family together and enhance the connections during special times hosted at your home. The Cypress also keeps privacy in mind with the elegant owner's suite and two additional bedrooms and a full bath nicely separated from the living space. The 2-car garage opens to a large mud room with a closet and adjacent laundry room.



For Information Visit
MJCCompanies.com



MJCompanies.com

All information contained herein was accurate at the time of publication. In order to maintain the high degree of quality and incorporate improvements with greater facilities and economy, we reserve the right to make changes in price, specifications, or materials or to change or discontinue models without notice or obligation. Floor plan dimensions are approximate. Renderings are artist's conception. © 2019 MJC Companies





DAVENPORT

First Level	1,411 sf
Second Level	1,293 sf
Total	2,704 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

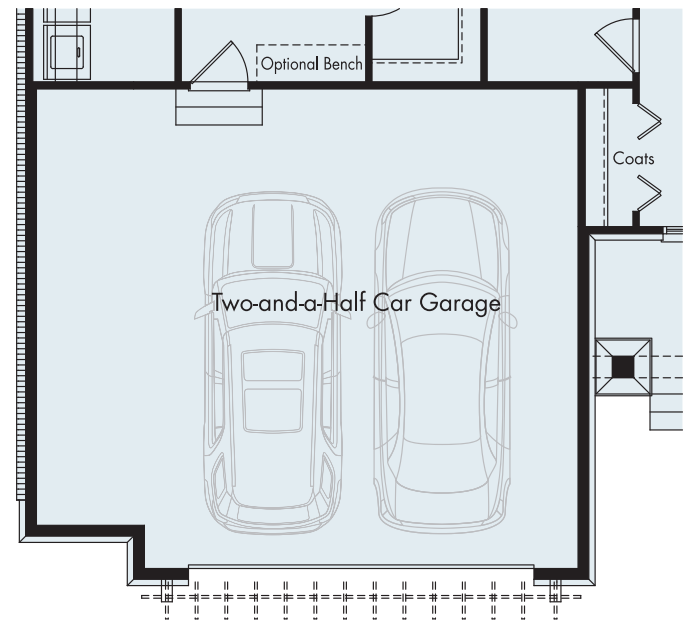
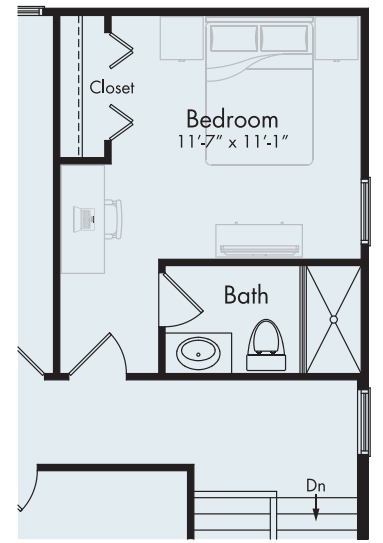
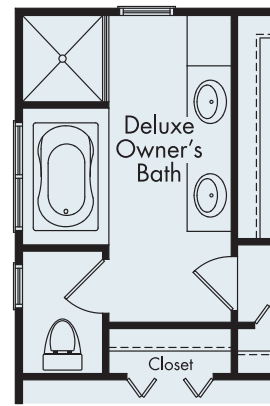
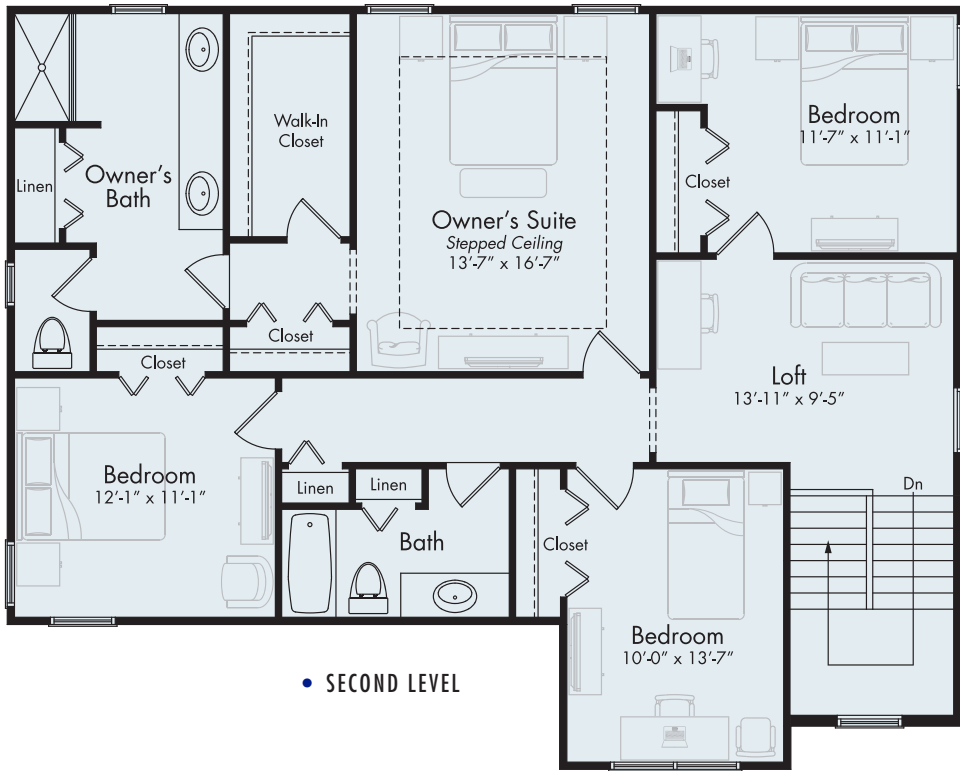
DAVENPORT

First Level 1,411 sf
 Second Level 1,293 sf
 Total 2,704 sf



Fall in love with the spacious open flow of the Davenport's main floor living area. The Davenport offers an imaginatively designed two-story home with an inviting central family room with a cozy fireplace and triple windows. The adjoining kitchen is a dream with lots of counter space and a functional island with optional snack bar seating. The dining room is extended beyond the balance of the room with triple windows and a French door. A flex-room is a pleasant surprise off this area with its double doors and double window. The first floor also offers a powder room, mud room, laundry and walk-in pantry.

The second floor showcases four bedrooms including the owner's suite with its stepped ceiling, plenty of closet space and an elegant bath with the option of a spa tub and stall shower. There is an option for a second bedroom suite with a full bath on this level or a large loft as the standard. A covered front porch adds a distinctive touch to the home as well as an optional 2.5-car or 3-car garage.



The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



EASTWIND

First Level 1,848 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

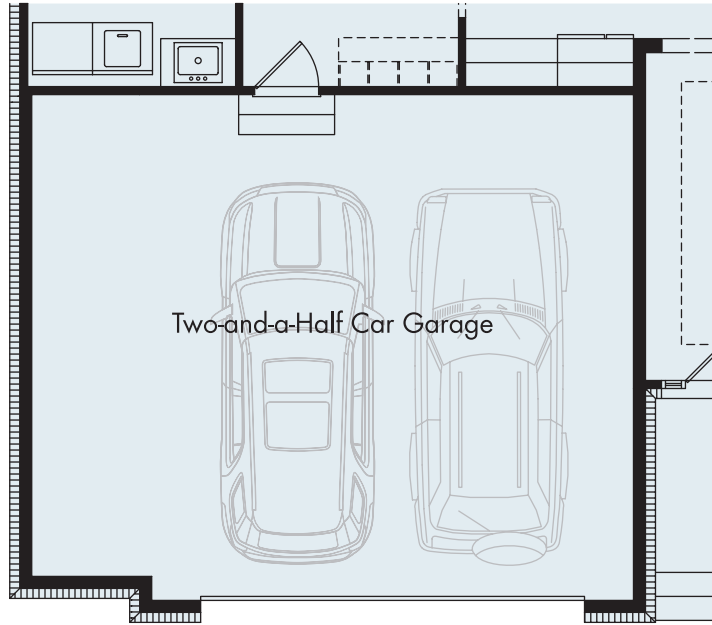
EASTWIND

First Level 1,848 sf

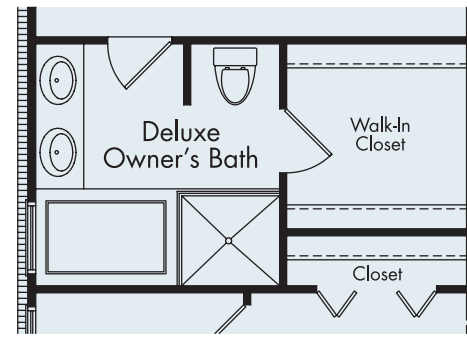


Love the open layouts offered by modern ranch designs, but want more space? The Eastwind is the floor plan for you – with no wasted space. The kitchen, with its oversized island, is the heart of the home with the adjoining dining and family room and a cozy fireplace, abundant windows and stepped ceiling. This creative space will keep your guests well entertained during special occasions.

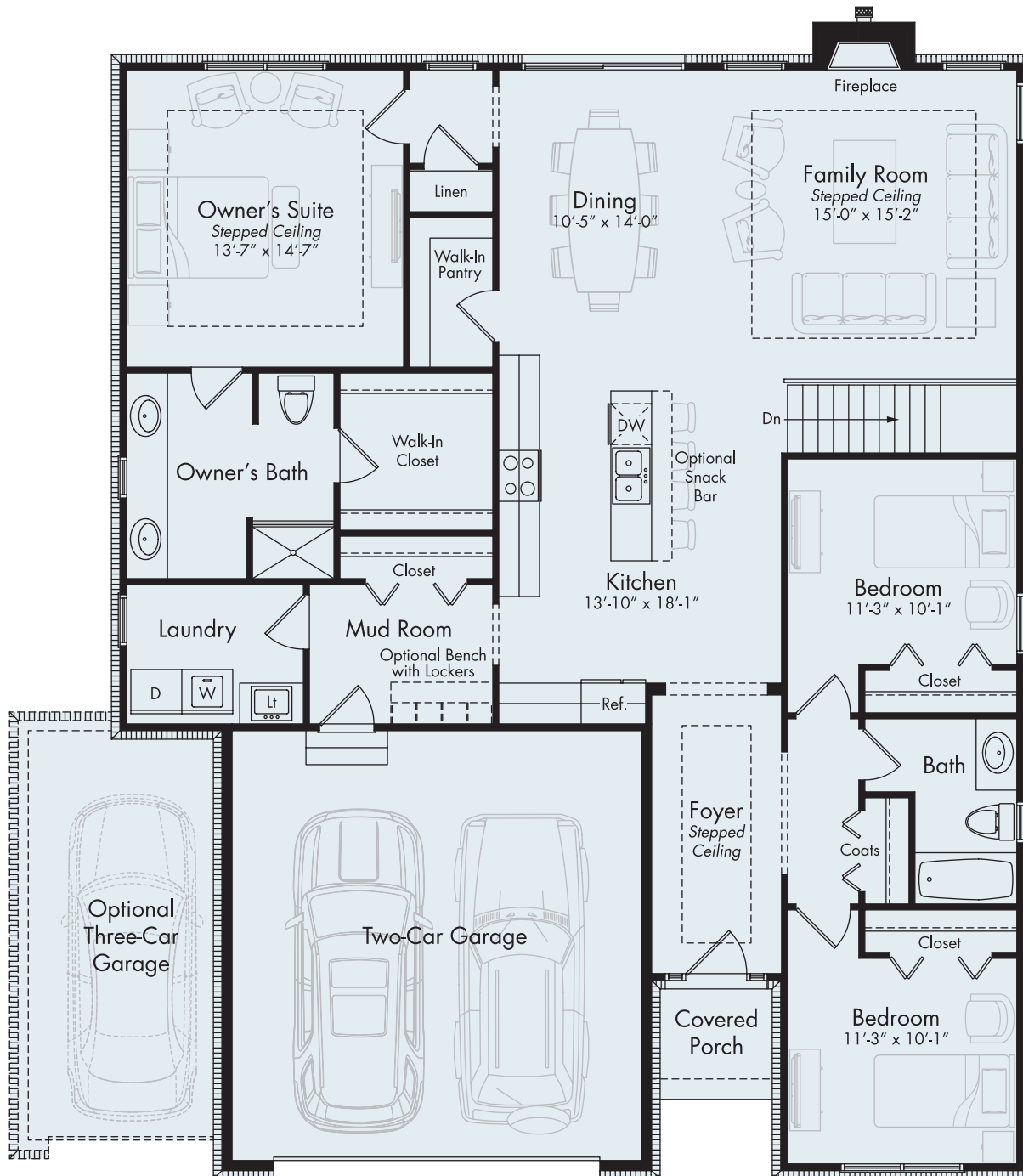
Two bedrooms are tucked away off the foyer with a central bath to share. An owner's suite offers an extra measure of privacy and elegance with its stepped ceiling, spacious bath and an optional soaking tub and large walk-in closet. The garage offers options for 2.5-cars and 3-cars, opens to a mud room with optional bench and lockers and a central laundry room.



• OPTIONAL TWO-AND-A-HALF CAR GARAGE



• OPTIONAL DELUXE OWNER'S BATH



• FIRST LEVEL

The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



MJCompanies.com

All information contained herein was accurate at the time of publication. In order to maintain the high degree of quality and incorporate improvements with greater facilities and economy, we reserve the right to make changes in price, specifications, or materials or to change or discontinue models without notice or obligation. Floor plan dimensions are approximate. Renderings are artist's conception. © 2019 MJC Companies





EVANSTON IV

First Level	797 sf
Second Level	1,139 sf
Total	1,936 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

EVANSTON IV

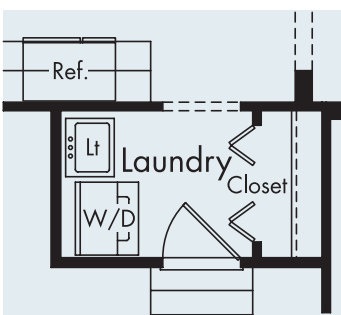
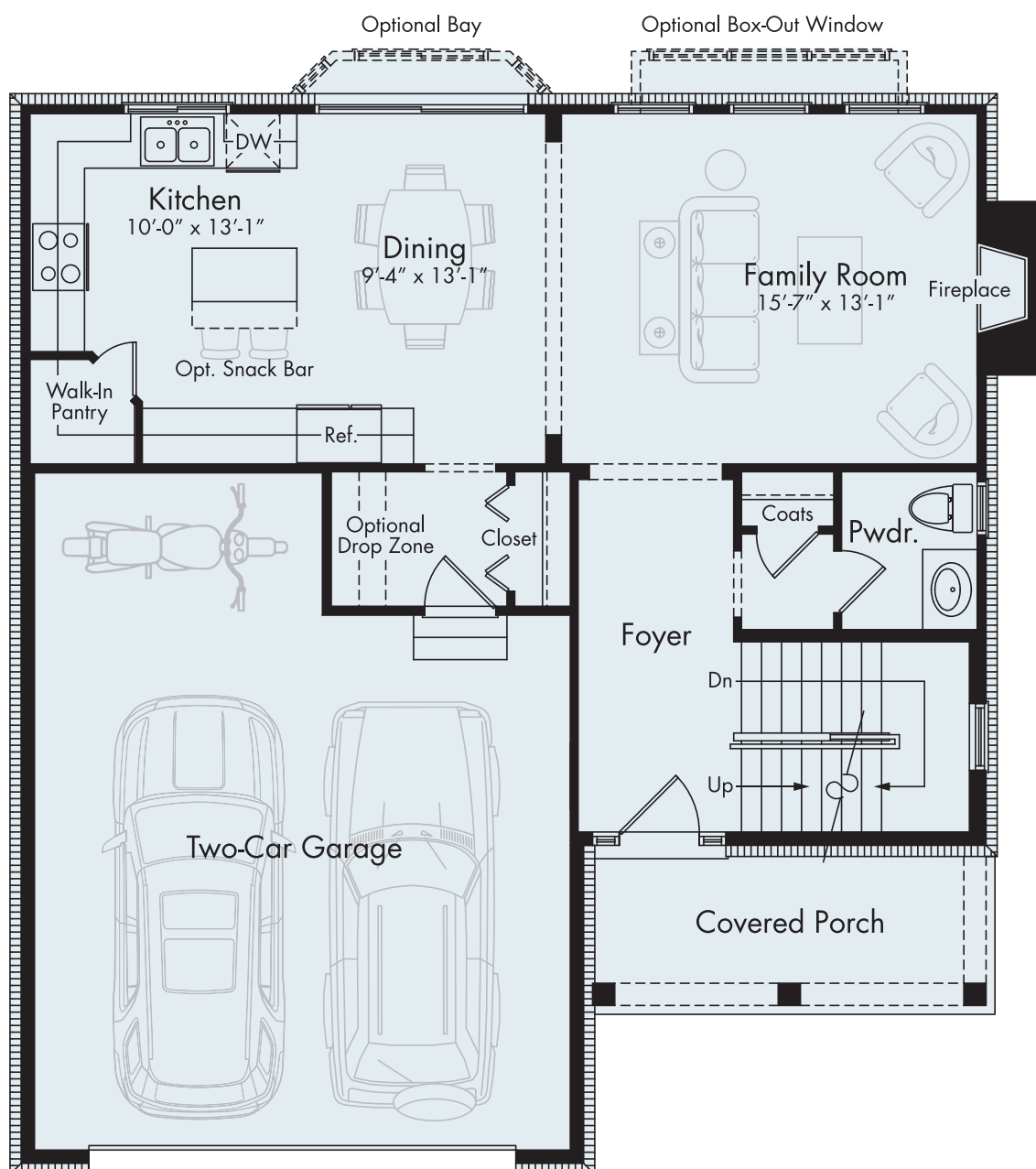
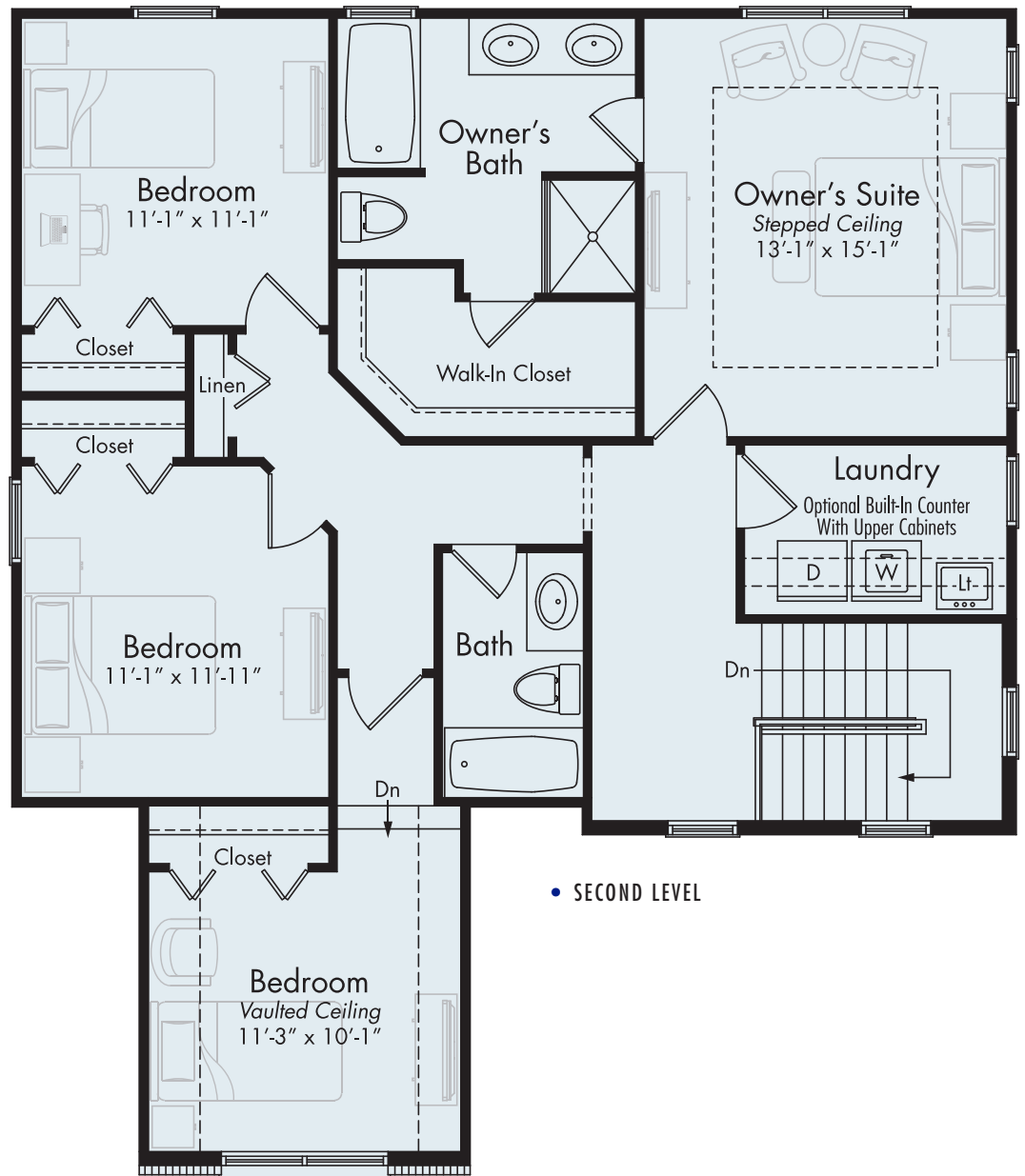
First Level 797 sf
 Second Level 1,139 sf
 Total 1,936 sf



This home is a two-story masterpiece. Featuring a charming front porch with columns, the Evanston IV opens to a large foyer with a guest closet and powder room. The huge U-shaped kitchen, a dining area and family room are bathed in sunlight from lots of windows and sliding glass doorwall with options for a bay and box-out windows to further enhance the open feeling.

Upstairs, the owner's suite boasts a stepped ceiling, elegant bath with separate tub, shower and walk-in closet. There are three more bedrooms on the second floor, along with a central bath and convenient laundry room.

The garage opens to an optional drop zone or second laundry area.



For Information Visit
MJCCompanies.com

The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.



WASHINGTON

First Level	1,147 sf
Second Level	1,092 sf
Total	2,239 sf

THE CRAFTSMAN

Craftsman architecture has been one of America's most iconic styles for decades. The historic design includes an array of distinctive porches, gables, siding materials and stately rooflines.

THE NEXT GENERATION OF STYLE

MJC homes are a lot like custom homes without the expense and added stress of starting with a blank canvas. Begin by browsing our newest collection of modern living designs and personalize the spaces that matter most to your family. Want a special style of cabinets and countertops? Unique flooring options? It's up to you. Personalize one of our award-winning home designs to your heart's content. Then sit back and watch your worry-free building experience unfold. Come explore your options to live better with MJC.

WASHINGTON

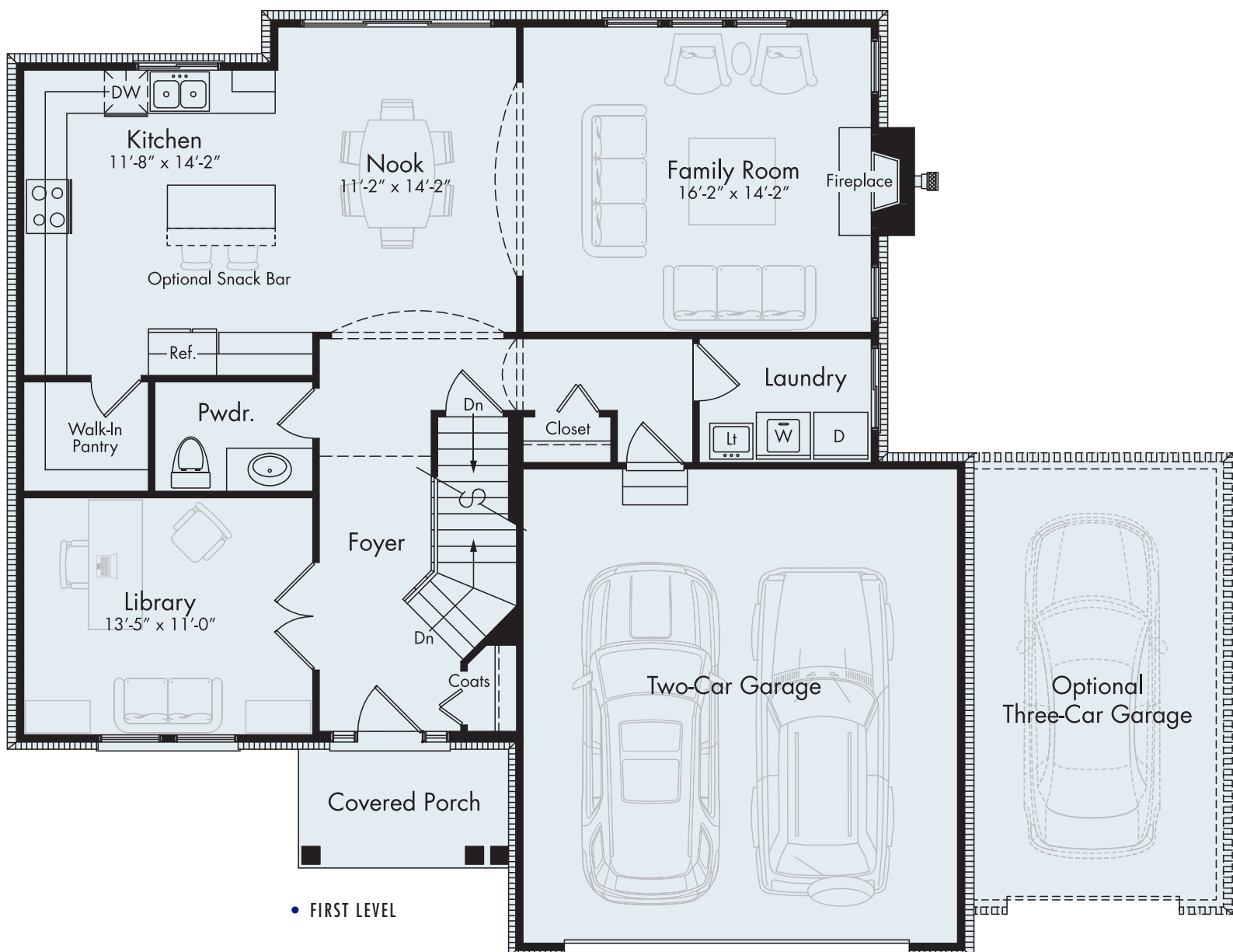
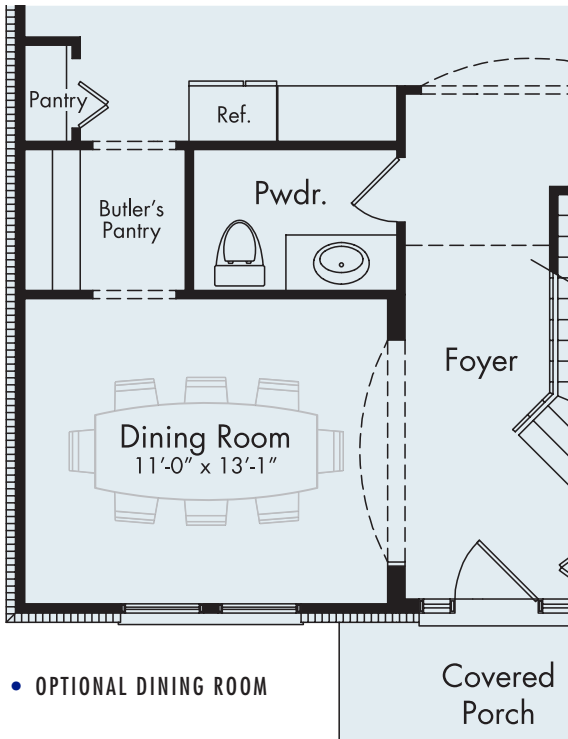
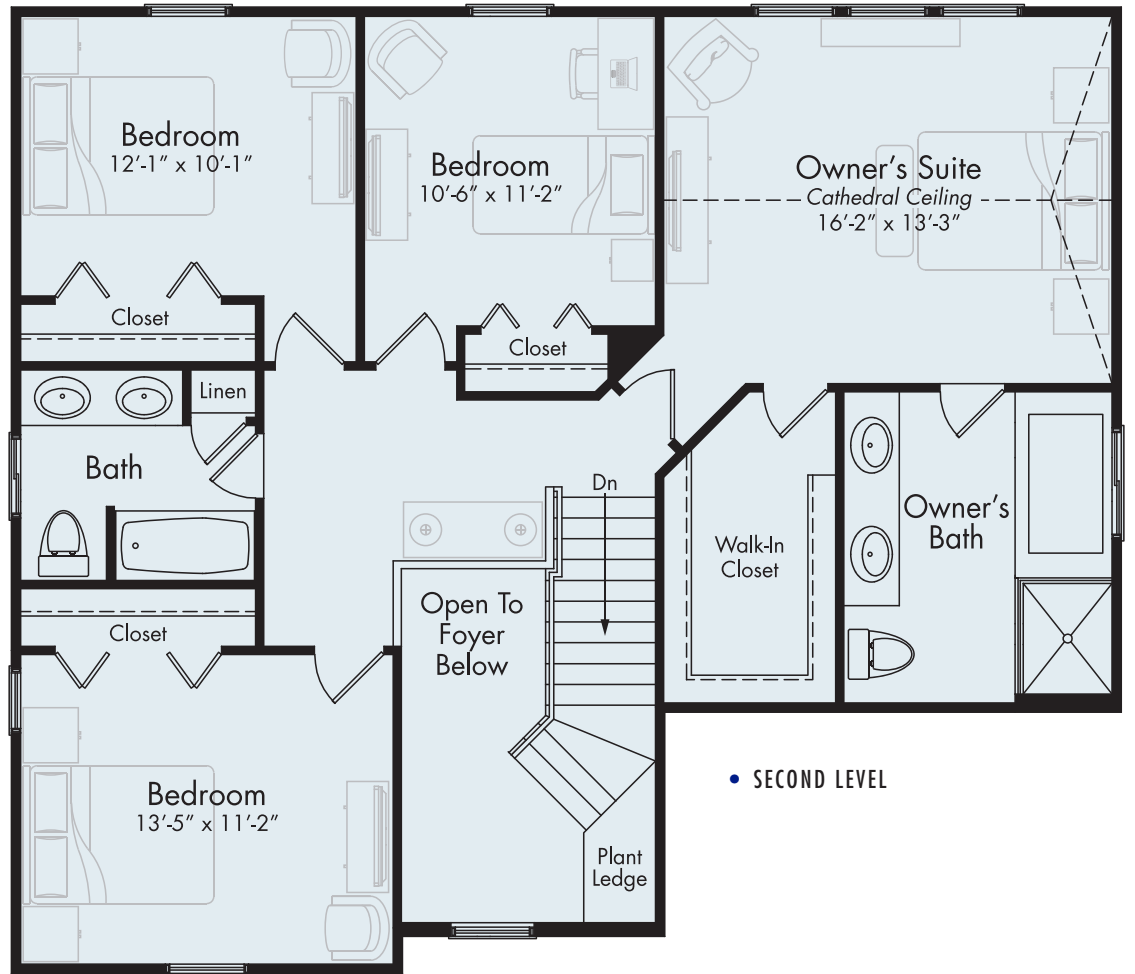
First Level 1,147 sf
 Second Level 1,092 sf
 Total 2,239 sf



The Washington is a very unique floor plan that lives large thanks to its two-story foyer and very open, flowing first floor living area. The foyer opens to a cozy library or optional formal dining room with butler's pantry. The spacious island kitchen, dining nook and family room keep the family connected and engaged.

The second level owner's suite offers a cathedral ceiling, triple windows and an elegant spa bath with separate tub and shower. Three additional bedrooms share a central bath and space for a study station.

A 2-car or optional 3-car garage leads to a mud room and convenient laundry. You'll love this home from the moment you enter from the covered porch.



The Wide Choice of Elevations Create a Varied and Appealing Streetscape in Your Neighborhood



THE FARMHOUSE

Modern farmhouse architecture evokes feelings of warmth and comfort. This historic style combines clean lines with rustic touches to provide a relaxed level of sophistication.



THE TRADITIONAL

MJC's traditional elevation styles are modern interpretations of classic forms that provide an attractive, cohesive look to the community. Our traditional elevations offer eye-pleasing symmetry, brick details and timeless color palettes.

COMMUNITY IMPACT STATEMENT

- 1.0 General Project Information
 - 1.1 Project Overview
 - 1.2 Master Plan Analysis
 - 1.3 Surrounding Uses

- 2.0 Community and Facilities Services
 - 2.1 Police and Fire Demand
 - 2.2 Utilities
 - 2.3 Stormwater Management

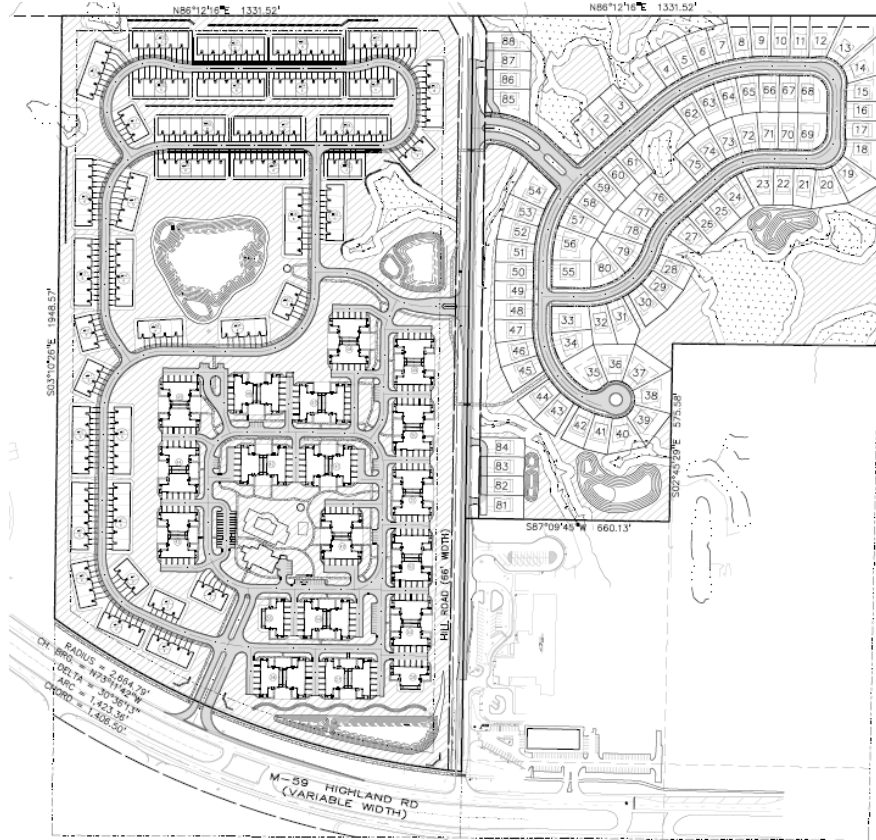
- 3.0 Economics
 - 3.1 Tax Revenues Analysis
 - 3.2 Job Analysis

- 4.0
 - 4.1 Natural resources Analysis
 - 4.2 Hazardous Materials
 - 4.3 Air Quality Impact
 - 4.4 Groundwater Impact
 - 4.5 Noise

- 5.0 Traffic

- 6.0 Development Statement

WHITE HILL LAKE, LLC



The Avalon

APARTMENT HOMES

&

The Residences at Avalon

PRELIMINARY PD SITE PLAN

APPLICATION & COMMUNITY IMPACT STATEMENT

SECTION 1: GENERAL PROJECT INFORMATION

1.1 Project Overview

Avalon is a proposed residential community consisting of 88 single-family homes on the east side of Hill Road and 406 attached apartment units on the west side of Hill Road with an associated clubhouse/pool and other amenities. The project shall include open space and other elements as set forth in the PD plan. The project will include approximately 30.1 acres of total open space. This site is currently designated as vacant and is zoned AG -Agricultural, PB-Planned Business, and R-1A -single-family residential and currently petitioning to be rezoned to PD, Planned Development.

The proposed land use consists of multi-family and single-family residential units. The project total 494 units and will have 4.49 units per acre for the total acreage of the Property.

Unit counts for the proposed The Avalon Apartment Homes and The Residences at Avalon uses are as follows:

Multi-Family Units (64.82 Net Acres):	406 units
<u>Single-Family Units (30.66 Net Acres):</u>	<u>88 units</u>
(95.48 Net Acres)	494 units

The Residences at Avalon Planned Development (PD) proposes single-family condominium homes with a density of 2.8 du/acre, which is consistent with the Township Master Plan for residential densities anticipated to range between 2.0 and 8.0 units per acre. The Township Master Plan for multi-family residential development densities are expected to range between 6.0 and 10.0 units per acre and Avalon’s Planned Development (PD) proposes 6.3 du/acre which is also consistent.

1.2 Master Plan Analysis

- **Value communities and neighborhoods** – The Avalon will be an exclusive neighborhood community targeting demographics of all ages. The development will focus on quality building materials and attention to architecture details.
- **Walkable neighborhoods** – In addition to sidewalks proposed on both sides of the planned internal roadways, the development will also have a system of winding pathways within the extensive open space areas.

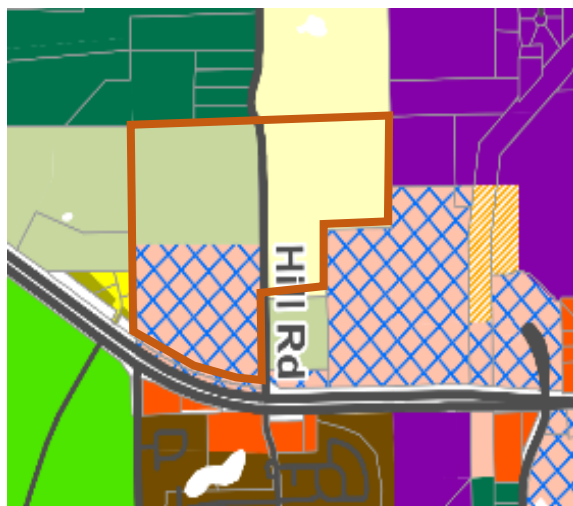
- **Variety of recreational facilities** – The Avalon proposed sidewalks and interconnectivity within the community, dog park, gazebo, benches, clubhouse, pool and fitness center consisting of a Yoga room, business center, dog wash to accommodate residents of all ages, interests, and physical abilities.

Refer to the Preliminary Site Plan for additional information of the neighborhood layout and representative architectural details.

1.3 Existing Surrounding Uses

The existing surrounding uses for the subject site are residential land uses of varying densities. These existing uses are as follows:

Location	Existing Land Use	Master Plan	Existing Zoning
Site	Vacant	Planned Community & Planned Neighborhood	Agricultural and PB Planned Business on the west side of Hill Rd & R-1A, Single Family Residential on the east side of Hill Rd
North	Single-Family Residential	Planned Neighborhood and Rural Estates	SF, Suburban Farm & R-1A Single-Family Residential
East	Vacant School Building	Planned Business	PD, Planned Development, PB, Planned Business and AG, Agricultural
South	Single family residential	Mobile Home	MHP, Mobile Home Park
West	Vacant, public institutional and single-	Planned Neighborhood	AG, Agricultural and R-1B, Single Family Residential



SECTION 2: COMMUNITY AND FACILITY SERVICES

2.1 Police and Fire Demand

This Development has been reviewed by both Public Safety and the Fire Department. A fiscal impact statement is prepared and attached to the CIS to determine the annual tax revenue. The additional annual tax revenue at full buildout will be approximately \$1,760,000.

2.2 Utilities

Utility services will be provided by existing public water and sewer systems in the area. The development proposes a total of 88 single-family homes and 406 attached apartment unit connections to the existing public utilities. We estimate of 36,500 gallons per year per person, based on the 10 States Standards Calculations.

All Utility lines, structures, and trenches shall be constructed in accordance with the standards and requirements of White Lake Township, the County of Oakland and EGLE. All hydrants will be a minimum of 5' from back of curb.

Water main extensions to the existing mains will be constructed on-site to provide for a looped system in accordance with the Township standards and placed within a public easement, with connections to existing proposed 12" watermain to connect to existing stub along Hill Rd. There is a proposed 18" sanitary, 16' water main along Highland Road. There will be 10" sanitary sewer along Hill Road for future connection.

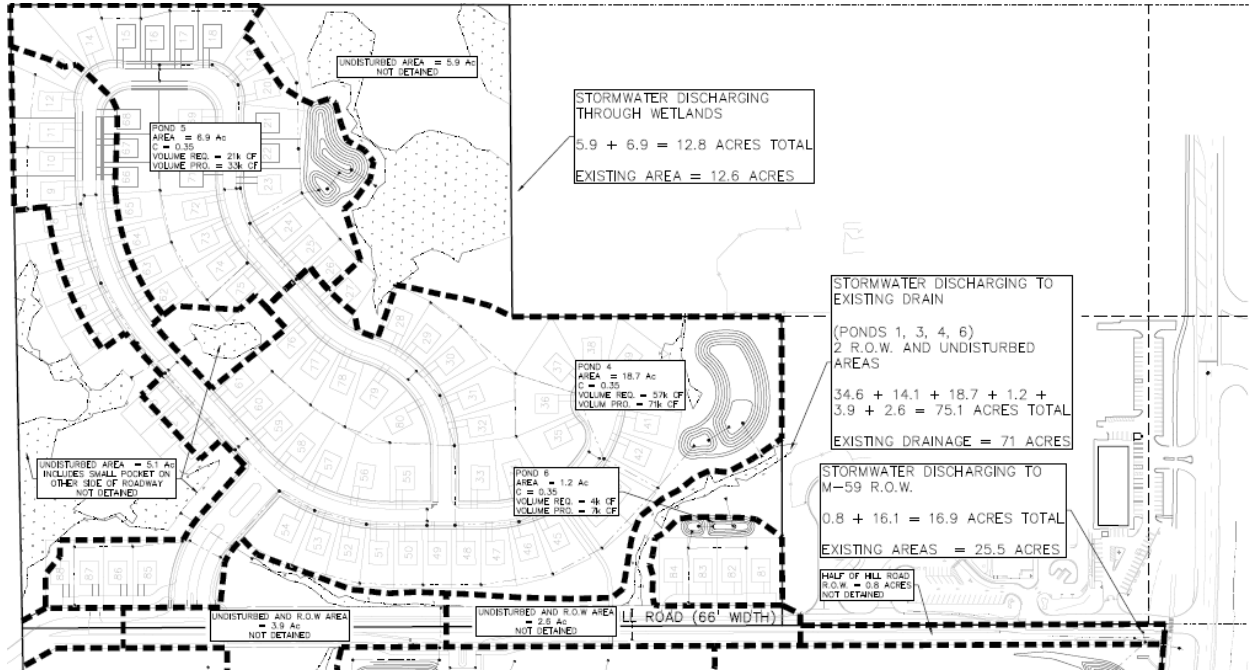
2.3 Stormwater Management

Stormwater management for quality treatment and storage will be provided in proposed detention basin optimally located at the southeast end of Highland Rd. These basins will be designed and approved in accordance with the Township and Oakland County Water Resource Commissioner (OCWRC) standards to accommodate a 100-year frequency storm runoff from the proposed development.

Stormwater management is outlined in the attached site plan. Stormwater runoff is proposed to have three detention ponds in the multi-family site at the northwest corner of Hill Road and M-59 and to discharge to existing storm sewer just south. Three detention ponds on the west side of Hill Road and located centrally in the multi-family portion. (**refer to figure 2.3a and 2.3b*)

The culvert will be removed. A new storm sewer will be constructed which provides an outlet for ponds 1 and 3 of the multi-family development on Hill Road drainage. A new culvert will be constructed at the low point of the road.

Fig. 2.3a

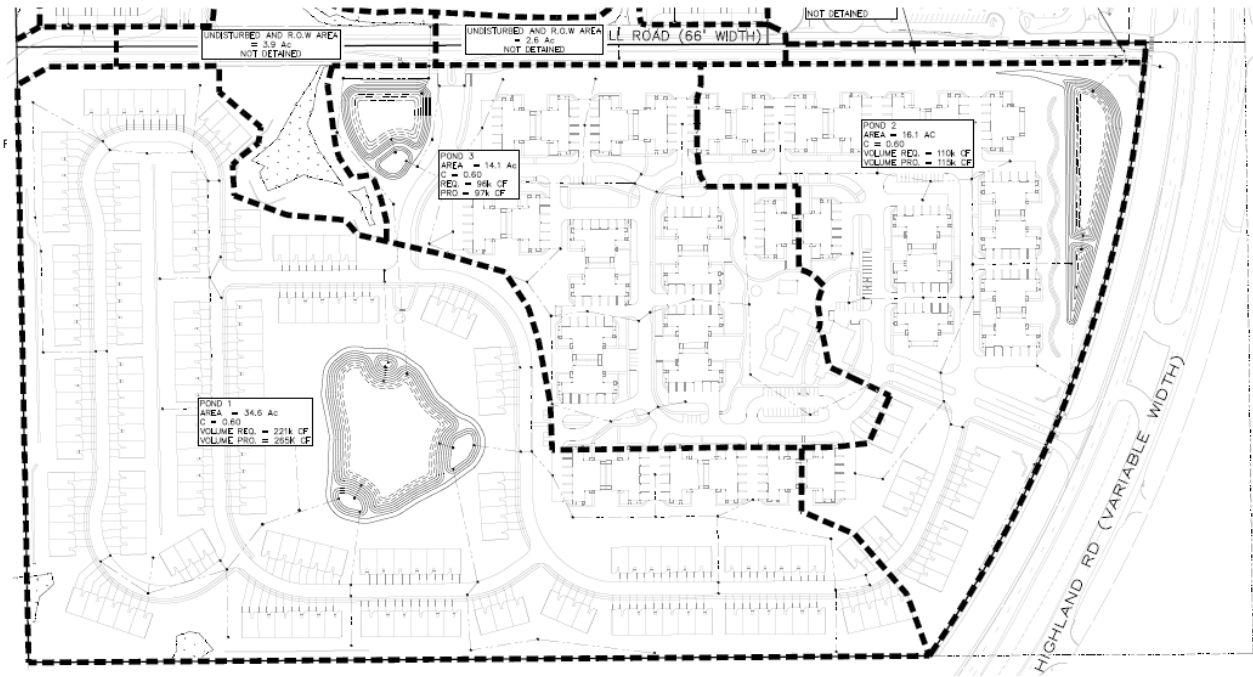


*Drainage calculations -Single Family
*Refer to a clear version on Preliminary Engineering Plan

Pond 4		
Total Area: (A1)	39.48 acre	
Drainage Area (A)	17.20 acre	
Weighted Coefficient of Runoff (C)	0.35	
Pretreatment		
Forebay: V _f = (545)CA	3,281 cf	
CPVC: Channel Protection Volume		
V _{cpvc} = (4,719)CA	28,408 cf	
CPRC: Channel Protection Rate Control Volume		
V _{cpvc} = (8897)CA (Extended Detention)	41,520 cf	
100-Year Allowable Outlet Rate (Q_{allow})		
Since 2<A1<100, Q100all = A1 x (0.207xln(A1)+1.1055)		
Q100all =	0.34 cfs/ac	
100-Year Peak Allowable Discharge (Q_o)		
Q _o = Q _{allow} (A)	5.93 cfs	
Rainfall Intensity		
Time of Concentration (T _c)	20 min	
I100 = 83.3/(T _c +9.17) ^{0.81}	5.42 in/hr	
100-Year Peak Inflow (Q_i)		
Q _i = C _i (Q _o)	32.63 cfs	
100-Year Runoff Volume (V_r)		
V _r = (18,985)CA	114,260 cf	
Storage Ratio (V_r/V_s)		
V _r /V _s = 0.206-0.15 x ln(Q _o /Q _i)	0.4619	
100-Year Storage Volume (V_s)		
V _s = V _r /Storage Ratio	52,286 cf	

Pond 5		
Total Area: (A1)	39.48 acre	
Drainage Area (A)	8.70 acre	
Weighted Coefficient of Runoff (C)	0.35	
Pretreatment		
Forebay: V _f = (545)CA	1,660 cf	
CPVC: Channel Protection Volume		
V _{cpvc} = (4,719)CA	14,369 cf	
CPRC: Channel Protection Rate Control Volume		
V _{cpvc} = (8897)CA (Extended Detention)	21,001 cf	
100-Year Allowable Outlet Rate (Q_{allow})		
Since 2<A1<100, Q100all = A1 x (0.207xln(A1)+1.1055)		
Q100all =	0.34 cfs/ac	
100-Year Peak Allowable Discharge (Q_o)		
Q _o = Q _{allow} (A)	3.00 cfs	
Rainfall Intensity		
Time of Concentration (T _c)	20 min	
I100 = 83.3/(T _c +9.17) ^{0.81}	5.42 in/hr	
100-Year Peak Inflow (Q_i)		
Q _i = C _i (Q _o)	16.51 cfs	
100-Year Runoff Volume (V_r)		
V _r = (18,985)CA	57,809 cf	
Storage Ratio (V_r/V_s)		
V _r /V _s = 0.206-0.15 x ln(Q _o /Q _i)	0.4619	
100-Year Storage Volume (V_s)		
V _s = V _r /Storage Ratio	26,200 cf	

Pond 6		
Total Area: (A1)	39.48 acre	
Drainage Area (A)	1.20 acre	
Weighted Coefficient of Runoff (C)	0.35	
Pretreatment		
Forebay: V _f = (545)CA	229 cf	
CPVC: Channel Protection Volume		
V _{cpvc} = (4,719)CA	1,982 cf	
CPRC: Channel Protection Rate Control Volume		
V _{cpvc} = (8897)CA (Extended Detention)	2,897 cf	
100-Year Allowable Outlet Rate (Q_{allow})		
Since 2<A1<100, Q100all = A1 x (0.207xln(A1)+1.1055)		
Q100all =	0.34 cfs/ac	
100-Year Peak Allowable Discharge (Q_o)		
Q _o = Q _{allow} (A)	0.41 cfs	
Rainfall Intensity		
Time of Concentration (T _c)	10 min	
I100 = 83.3/(T _c +9.17) ^{0.81}	7.62 in/hr	
100-Year Peak Inflow (Q_i)		
Q _i = C _i (Q _o)	3.20 cfs	
100-Year Runoff Volume (V_r)		
V _r = (18,985)CA	7,974 cf	
Storage Ratio (V_r/V_s)		
V _r /V _s = 0.206-0.15 x ln(Q _o /Q _i)	0.5129	
100-Year Storage Volume (V_s)		
V _s = V _r /Storage Ratio	4,089 cf	



*Drainage calculations -Single Family
 *Refer to a clear version on Preliminary Engineering Plan

Pond 1		
Total Area: (A1)	66.52 acre	
Drainage Area (A):	34.60 acre	
Weighted Coefficient of Runoff (C):	0.60	
Pretreatment		
Forebay: V _f = (545)CA		11,314 cf
CPVC: Channel Protection Volume		
V _{cpvc} = (4,719)CA		97,966 cf
CPRC: Channel Protection Rate Control Volume		
V _{cpvc} = (6897)CA (Extended Detention)		143,182 cf
100-Year Allowable Outlet Rate (Qallow)		
Since 2-A1<100, Q100all= A1 x (-0.207xln(A1)+1.1055)		0.24 cfs/ac
Q100all =		
100-Year Peak Allowable Discharge (Qo)		
Qo=Qallow(A)		8.19 cfs
Rainfall Intensity		
Time of Concentration (Tc)	20 min	
100=83.3/(Tc+9.17) ^{0.81}	5.42 in/hr	
100-Year Peak Inflow (Qi)		
Qi=Ci(A)		112.53 cfs
100-Year Runoff Volume (Vr)		
Vr=(18,985)CA		394,129 cf
Storage Ratio (Vr/Vs)		
Vr/Vs = 0.206-0.15 x ln(Qo/Qi)		0.5991
100-Year Storage Volume (Vs)		
Vs =Vr/Storage Ratio		236,124 cf

Pond 2		
Total Area: (A1)	66.52 acre	
Drainage Area (A):	16.10 acre	
Weighted Coefficient of Runoff (C):	0.60	
Pretreatment		
Forebay: V _f = (545)CA		5,265 cf
CPVC: Channel Protection Volume		
V _{cpvc} = (4,719)CA		45,586 cf
CPRC: Channel Protection Rate Control Volume		
V _{cpvc} = (6897)CA (Extended Detention)		66,625 cf
100-Year Allowable Outlet Rate (Qallow)		
Since 2-A1<100, Q100all= A1 x (-0.207xln(A1)+1.1055)		0.24 cfs/ac
Q100all =		
100-Year Peak Allowable Discharge (Qo)		
Qo=Qallow(A)		3.81 cfs
Rainfall Intensity		
Time of Concentration (Tc)	20 min	
100=83.3/(Tc+9.17) ^{0.81}	5.42 in/hr	
100-Year Peak Inflow (Qi)		
Qi=Ci(A)		52.36 cfs
100-Year Runoff Volume (Vr)		
Vr=(18,985)CA		183,395 cf
Storage Ratio (Vr/Vs)		
Vr/Vs = 0.206-0.15 x ln(Qo/Qi)		0.5991
100-Year Storage Volume (Vs)		
Vs =Vr/Storage Ratio		109,873 cf

Pond 3		
Total Area: (A1)	66.52 acre	
Drainage Area (A):	14.10 acre	
Weighted Coefficient of Runoff (C):	0.60	
Pretreatment		
Forebay: V _f = (545)CA		4,611 cf
CPVC: Channel Protection Volume		
V _{cpvc} = (4,719)CA		39,923 cf
CPRC: Channel Protection Rate Control Volume		
V _{cpvc} = (6897)CA (Extended Detention)		58,349 cf
100-Year Allowable Outlet Rate (Qallow)		
Since 2-A1<100, Q100all= A1 x (-0.207xln(A1)+1.1055)		0.24 cfs/ac
Q100all =		
100-Year Peak Allowable Discharge (Qo)		
Qo=Qallow(A)		3.34 cfs
Rainfall Intensity		
Time of Concentration (Tc)	20 min	
100=83.3/(Tc+9.17) ^{0.81}	5.42 in/hr	
100-Year Peak Inflow (Qi)		
Qi=Ci(A)		45.86 cfs
100-Year Runoff Volume (Vr)		
Vr=(18,985)CA		160,613 cf
Storage Ratio (Vr/Vs)		
Vr/Vs = 0.206-0.15 x ln(Qo/Qi)		0.5991
100-Year Storage Volume (Vs)		
Vs =Vr/Storage Ratio		96,224 cf

SECTION 3: ECONOMICS

3.1 Tax Revenue Analysis

A fiscal impact analysis was prepared to determine the anticipated annual tax revenue to be generated as a result of the development. Based on this analysis, we anticipate Avalon will have a taxable value of approximately \$70,000,000 and will generate an annual revenue gain to the Township of approximately \$1,760,000.

3.2 Jobs Created

Avalon will be a residential development. Avalon will create construction jobs during the installation of the infrastructure and the construction of the homes on the site. In addition, MJC Homes will employ sales staff. Avalon Apartment Homes will create permanent leasing, management, and maintenance jobs.

SECTION 4: ENVIRONMENT

4.1 Natural Resources Analysis

The site of the proposed development is vacant with existing open areas. The site contains a significant amount of rolling topography with approximately 70 feet of elevation change across the site. There are no adjacent subdivisions to connect to. The topography and natural features would limit the stubbing of future connection to the adjoining property; furthermore, the multi-family site is self-contained.

The site is located in Flood Zone X per FEMA FIRM PANEL 26125C0318F, effective 9/29/2006, and area of minimal flooding. Thus, impact to regulated floodplain or special flood areas are not anticipated to occur with the proposed development.

Storm water runoff for the site will be detained and treated in accordance with applicable Township, County and State requirements prior to discharge from the site. No significant impact or pollution to offsite water bodies is anticipated with the development.

The proposed development will seek to preserve existing wooded areas around the perimeter of the development where grading would allow, to serve as a buffer between the development and neighboring properties. New trees will be planted in the proposed development in accordance with an approved Landscaping Plan.

4.2 Hazardous Materials

No hazardous materials will be manufactured, used, or stored on site.

4.3 Air Quality Impact

Avalon is a residential development and will not plan to have any significant impact to the air quality of the area. No quantifiable type or quantities of pollutants are expected to be released in the air. During construction, special measures will be included within the Soil Erosion and Sedimentation (SESC) Plan to mitigate any potential dust creation during dryer site conditions, including the use of water trucks.

4.4 Groundwater Impact

Avalon is a residential development that will utilize connections to the existing public utilities in the area. The development fits within the master planned unit density for the area and does not plan to have any significant impact to the groundwater levels within the area.

4.5 Noise

Avalon is a residential development that does not plan to have any significant impact to the increased noise in the area. During construction, the development intends to minimize noise as reasonable and follow the Township's ordinance regarding hours of allowed construction operation.

SECTION 5: TRAFFIC

Avalon is a residential project consisting of a multi-family and single-family units that are proposed to have access off Highland Road in addition to Hill Road. The main access to Avalon Apartment Homes will be from a boulevard off Highland Road which is a State Road. In addition to the main access off Highland Road, Avalon Apartment Homes will have a secondary access off of Hill Road.

The Residences at Avalon will have access via a boulevard off of Hill Road which is a County Road. The exiting drive width along Highland Road has been revised to meet the width required by Article 5, Section 11.Q.v. The Developer will pave Hill Road from Highland Road to the north, just prior to the curve on Hill Road.

A Traffic Impact Study (TIS) has been prepared in accordance with the Township Ordinance Section 6.3 to determine if any improvements would be necessary to mitigate any traffic impacts to the adjacent road network.

The proposed development is forecast to generate 215 new trips during the AM peak hour and 283 new trips during the PM peak hour. The report was completed in accordance with the requirements specified by the Michigan Department of Transportation (MDOT), the Road Commission for Oakland County (RCOC), and White Lake Township. The majority, if not all these

trips, would be attributed to small vehicles. Large truck daily trips and axle loading impacts to the existing roads as a result of Avalon and The Residences at Avalon development are not to be anticipated. The operational analysis indicated that most approaches of the study intersections will operate at acceptable levels of service during both the AM and PM peak hours of the future traffic conditions.

Refer to *Appendix G* for the Traffic Impact Statement prepared by Rowe.

DEVELOPER’S STATEMENT

Avalon will be developed by White Lake Hill LLC whose member/managers are Mickey Shapiro and Mike Chirco. White Lake Hill has owned the property since 2005.

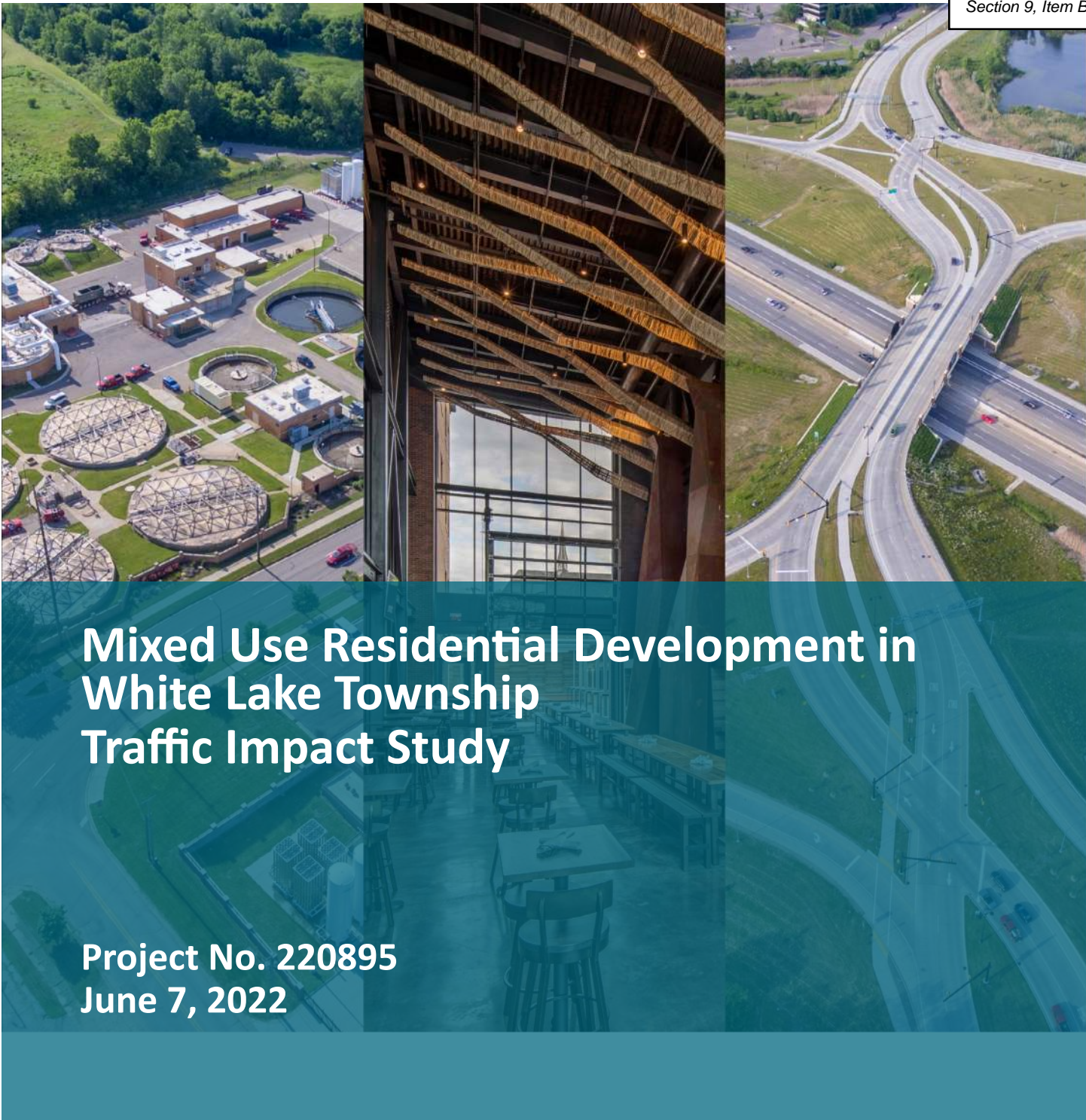
Site development will be managed by the M. Shapiro Real Estate Group. MJC Homes will handle the construction of the Avalon Apartment Homes and the Single-Family Homes. MJC Homes will also be responsible for home sales.

The M. Shapiro Real Estate Group will manage the Avalon Apartment Homes.

The Manager/Members of White Lake Hill, LLC have over forty-years in the development and building industry. Recent examples of Apartment Home Communities developed by MJC and the M. Shapiro Real Estate Group are as follows:

- Barrington Apartment Homes -located in Commerce Township consisting of 300 units offering luxury living in a woodland setting, at Pontiac Trail and Martin Parkway.
- ShearWater Apartment Homes -consisting of 200 units nestled in Commerce Township, located at the prominent intersection of Maple and Beck Road.
- Huntley Manor Apartment Homes -privately-gated 200-unit-apartment-homes, located in Novi at Meadowbrook and Grand River.





Mixed Use Residential Development in White Lake Township Traffic Impact Study

Project No. 220895
June 7, 2022

Mixed Use Residential Development in White Lake Township Traffic Impact Study

Prepared For:
Lautrec Ltd.
Farmington Hills, MI

June 7, 2022
Project No. 220895

Executive Summary1

1.0 Introduction.....2

 1.1 Project Overview.....2

 1.2 Study Methodology.....2

 1.3 Intersection Characteristics3

 1.4 Existing Traffic Volumes.....5

2.0 Existing Conditions Analysis7

 2.1 Traffic Operations Analysis Methodology7

 2.2 Existing Conditions Traffic Analysis7

3.0 Background Conditions Analysis8

 3.1 Background Conditions Traffic Analysis10

4.0 Site Traffic Characteristics.....10

 4.1 Trip Generation.....11

 4.2 Trip Distribution12

5.0 Future Conditions Analysis.....15

 5.1 Turn Lane Warrants15

 5.2 Future Conditions Traffic Analysis.....15

 5.3 Future Improvement Conditions Traffic Analysis.....16

 5.4 Signal Warrant Analysis18

6.0 Findings and Recommendations.....19

List of Figures

Figure 1 – Project Location and Study Network2

Figure 2 – Existing Lane Configurations4

Figure 3 – Existing Traffic Volumes6

Figure 4 – Background Traffic Volumes9

Figure 5 – Conceptual Site Plan.....11

Figure 6 – Trip Generation Volumes13

Figure 7 – Pass-By Volumes.....14

List of Tables

Table 1 – Proposed Improvements1

Table 2 – LOS Criteria7

Table 3 – LOS Analysis for Existing Conditions.....7

Table 4 – LOS Analysis for Background Conditions.....10

Table 5 – Trip Generation for Proposed Development11

Table 6 – Trip Distribution12

Table 7 – Turn Lane Warrants15

Table 8 – LOS Analysis for Future Conditions15

Table 9 – LOS Analysis for Future Improvement Conditions.....17

Table 10 – Signal Warrants – Intersection of WB M-59 and Crossover East of Hill Road.....18

Table 11 – Proposed Improvements19

List of Appendices

- Appendix 1 – Traffic Volume Data
- Appendix 2 – Existing LOS Output Reports
- Appendix 3 – Background LOS Output Reports
- Appendix 4 – Trip Generation Calculations
- Appendix 5 – Turn Lane Warrant
- Appendix 6 – Future LOS Output Reports
- Appendix 7 – Future Improvement LOS Output Reports
- Appendix 8 – Signal Warrants

List of Abbreviations/Acronyms

AASHTO	American Association of State Highway and Transportation Officials
DU	Dwelling Units
EB	Eastbound
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LUC	Land Use Code
M-59	Highland Road
MDOT	Michigan Department of Transportation
MMUTCD	Michigan Manual on Uniform Traffic Control Devices
mph	Miles per Hour
NB	Northbound
RCOC	Road Commission for Oakland County
RIRO	Right-In/Right-Out (driveway)
SB	Southbound
SEMCOG	Southeast Michigan Council of Governments
TIS	Traffic Impact Study
TMC	Turning Movement Count
TCDS	Traffic Count Database System
Township	White Lake Township
WB	Westbound

References

The Highway Capacity Manual, 6th Edition. (2016). Washington, DC.
The Highway Capacity Manual: 2000. (2000). Washington, DC.
Trip Generation Handbook, 3rd Edition. (2017). Washington DC.
Trip Generation Manual, 11th Edition. (2021). Washington DC.

Executive Summary

Fishbeck has completed a traffic impact study (TIS) related to the development of a mixed-use residential development located on the northeast and northwest side of Hill Road near Highland Road (M-59) in White Lake Township (Township), Michigan. The existing land is vacant. The proposed site presents 88 single family condominiums and 406 multifamily housing (low-rise) units. The development is assumed to be open and fully operational in 2027.

All the access points to the development are proposed. There will be three access points on Hill Road and one access point on M-59. The accesses on Hill Road will be full movement (left and right turn movements allowed, ingress and egress). The access on M-59 will be right-in/right-out (RIRO).

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Michigan Department of Transportation (MDOT), Road Commission for Oakland County (RCOC), and the Township.

Vehicular, pedestrian, and cyclist Turning Movement Count (TMC)s were collected at the study intersection on Thursday, September 30, 2021, during the weekday a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the roadway network. Based on this review of 2021 traffic counts from Southeast Michigan Council of Governments (SEMCOG)'s Traffic Count Database System (TCDS), there was no compelling evidence to apply a COVID adjustment factor to the collected TMCs.

Site-generated traffic was forecast using the information and methodologies specified in the latest version of Trip Generation, Trip Generation Manual, 11th Edition, 2021. The existing traffic volumes, site layout, and engineering judgement were used to develop a trip distribution model for the a.m. and p.m. peak hours for the new traffic that will be generated by the proposed development. Additionally, directions of origin, surrounding residential densities, and commuting patterns were considered.

Capacity analyses were conducted for existing, background, and total future conditions based on Highway Capacity Manual (HCM) 6th Edition methodologies using Synchro traffic analysis software. Synchro network models were also simulated using SimTraffic to evaluate network operations including intersection queueing.

Based on the findings of the HCM operational analyses, crash data, and site traffic generation, Table 1 – Proposed Improvements has the recommended existing, background, and future improvements to the study intersections to mitigate traffic impacts.

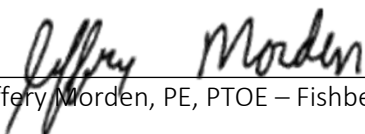
Table 1 – Proposed Improvements

Intersection	Existing	Background	Future
WB M-59 and crossover east of Hill Road	No improvements	No improvements	Traffic signal warranted.
WB M-59 and Driveway 4	No improvements	No improvements	Right turn lane warranted.

Westbound (WB)

The opinions, findings, and conclusions expressed in this TIS are those of Fishbeck and not necessarily those of the Owner/Applicant, MDOT, RCOC, or the Township.

Prepared By:


 Jeffrey Morden, PE, PTOE – Fishbeck


 Jill Bauer, PE, PTOE – Fishbeck
 Project Manager

1.0 Introduction

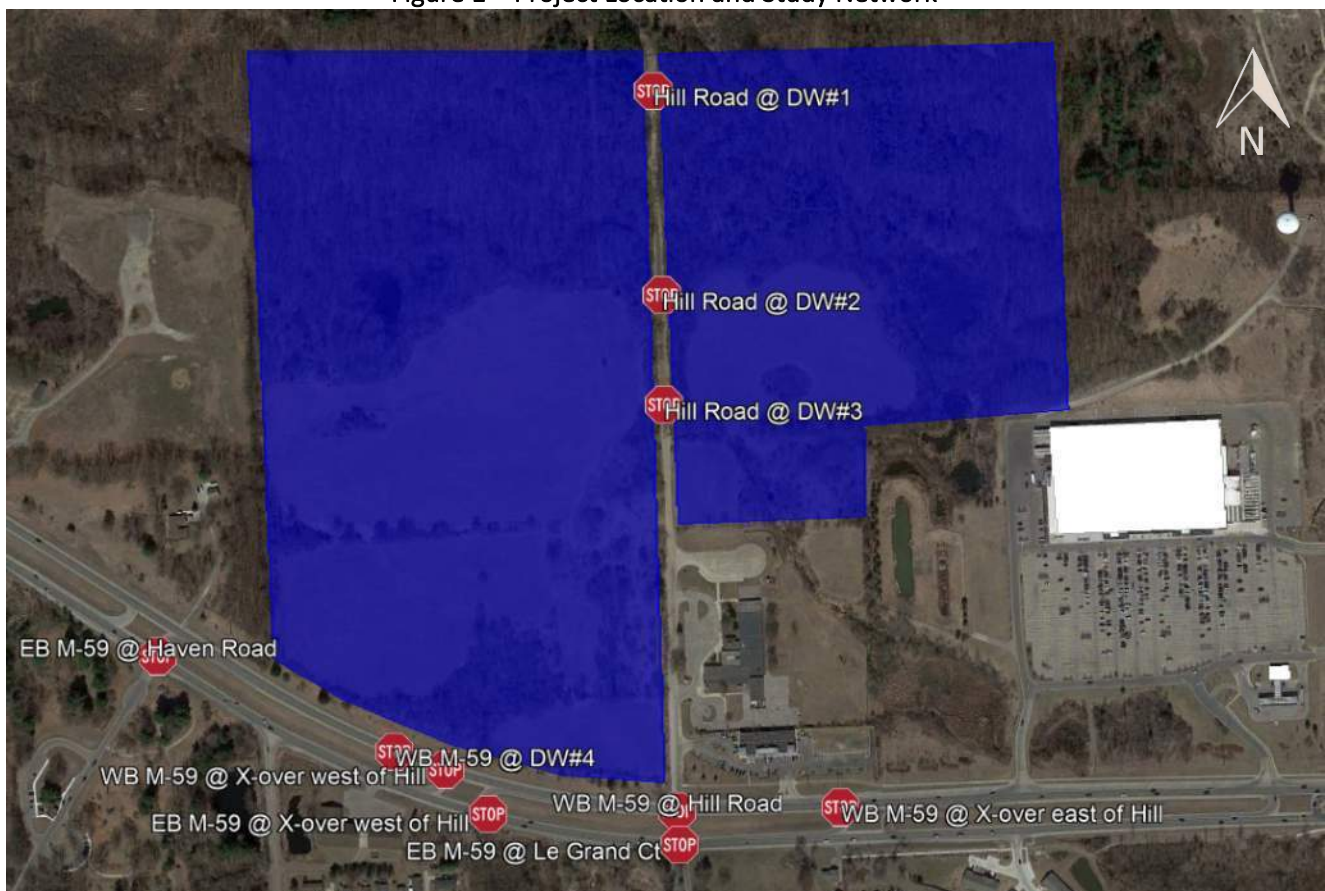
1.1 Project Overview

On behalf of Lautrec Ltd., Fishbeck has conducted a traffic impact study (TIS) related to the development of a mixed-use residential development located on the northeast and northwest side of Hill Road near Highland Road (M-59) in White Lake Township (Township), Michigan. The existing land is vacant. The proposed site presents 88 single family condominiums and 406 multifamily housing (low-rise) units. The development is assumed to be open and fully operational in 2027.

All the access points to the development are proposed. There will be three access points on Hill Road and one access point on M-59. The accesses on Hill Road will be full movement (left and right turn movements allowed, ingress and egress). The access on M-59 will be right-in/right-out (RIRO).

The project location and study intersections are indicated in Figure 1 – Project Location and Study Network.

Figure 1 – Project Location and Study Network



1.2 Study Methodology

The objectives of this TIS were to determine what impacts, if any, the proposed project will have on adjacent roadway traffic operations, and to develop recommendations for any improvements necessary to mitigate the project impacts on the studied intersections. Study analyses were completed relative to typical weekday a.m. and p.m. peak periods.

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Michigan Department of Transportation (MDOT), Road Commission for Oakland County (RCOC), and the Township.

1.3 Intersection Characteristics

Based on the type and size of the proposed development and the likely area of influence for the site trips, traffic operations were analyzed for the following intersections:

1. Westbound (WB) M-59 and Hill Road (unsignalized).
2. Eastbound (EB) M-59 and Le Grand Court (unsignalized).
3. WB M-59 and crossover east of Hill Road (unsignalized).
4. EB M-59 and crossover west of Hill Road (unsignalized).
5. WB M-59 and crossover west of Hill Road (unsignalized).
6. EB M-59 and Haven Road (unsignalized).
7. Hill Road and Driveway 1 (proposed unsignalized driveway approximately 2,300 feet north of M-59).
8. Hill Road and Driveway 2 (proposed unsignalized driveway approximately 1,600 feet north of M-59).
9. Hill Road and Driveway 3 (proposed unsignalized driveway approximately 1,150 feet north of M-59).
10. WB M-59 and Driveway 4 (proposed unsignalized driveway approximately 950 feet west of Hill Road).

The existing intersection lane configurations, traffic controls, and posted speed limits are indicated in Figure 2 – Existing Lane Configurations.

1.4 Existing Traffic Volumes

Vehicular Turning Movement Count (TMC)'s was collected at the following study intersection during the weekday a.m. (7 to 9 a.m.) and p.m. (4 to 6 p.m.) peak periods of the road network on Thursday, September 30, 2021:

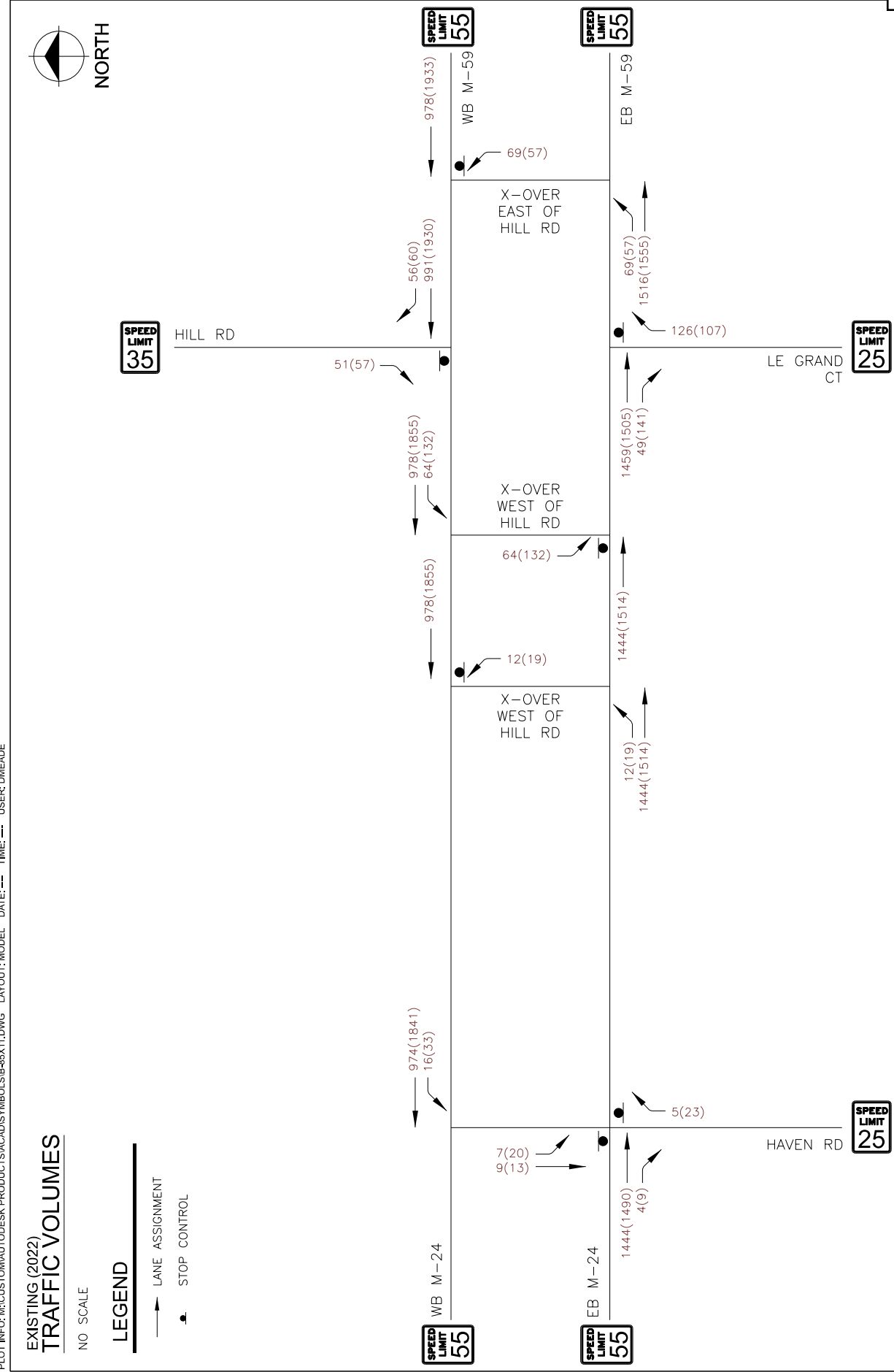
- WB M-59 and Hill Road.
- EB M-59 and Le Grand Court.
- WB M-59 and crossover east of Hill Road.
- EB M-59 and crossover west of Hill Road.
- WB M-59 and crossover west of Hill Road.
- EB M-59 and Haven Road.

Due to the impact of COVID-19, current traffic volume data may not be representative of typical operations. Historical traffic data from the Southeast Michigan Council of Governments (SEMCOG) Traffic Count Database System (TCDS) TMC's website was reviewed. Based on this review of 2021 traffic counts, there was no compelling evidence to apply a COVID adjustment factor to the collected TMCs.

Traffic volume information can be found in Appendix 1 – Traffic Volume Data, which includes heavy vehicle data. The adjusted existing traffic volumes used in this study are indicated in Figure 3– Existing Traffic Volumes.

Figure 3 – Existing Traffic Volumes

Section 9, Item B.



PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\S\SYMBOLS\B-35X11.DWG LAYOUT; MODEL DATE: --- TIME: --- USER: DMEADE



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development
White Lake Township, MI 48383
Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

3

2.0 Existing Conditions Analysis

2.1 Traffic Operations Analysis Methodology

Synchro was used to perform Highway Capacity Manual (HCM) operational analyses during the a.m. and p.m. peak hours for all the intersections within this study. According to the most recent editions of the HCM, level of service (LOS) is a qualitative measure describing operational conditions of a traffic stream or intersection. LOS ranges from A to F, with LOS A representing desirable traffic operations characterized by low delay and LOS F representing extremely poor traffic operations characterized by excessive delays and long vehicle queues. LOS D is generally considered acceptable for most areas. Table 2 – LOS Criteria presents the HCM criteria for various LOS for unsignalized and signalized intersections.

Table 2 – LOS Criteria

LOS	Average Stopped Vehicle Delay (seconds)	
	Unsignalized	Signalized
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

2.2 Existing Conditions Traffic Analysis

Synchro models for the existing network were created based on the existing roadway configurations and traffic controls. Where applicable, data concerning the existing intersection and roadway lane configurations, geometry, and traffic control that were observed in the field were entered in the models. The traffic signal timing permit for the signalized intersections of M-59 and Bogie Lake Road and EB M-59 and crossover west of Ormond Road were provided by RCOC for use in the models. These signalized intersections were added to the models to provide traffic progression through the study corridor.

The resulting LOS and delay for the existing conditions are indicated in Table 3 – LOS Analysis for Existing Conditions.

Table 3 – LOS Analysis for Existing Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover east of Hill Road	B 14.8	D 29.1
Overall	A 1.5	A 1.1
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Le Grand Court	D 26.3	C 24.4
Overall	A 2.3	A 1.9
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	B 13.9	D 27.9
Overall	A 1.0	A 1.0

Table 3 – LOS Analysis for Existing Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	C 21.2	D 26.8
Overall	A 1.1	A 2.5
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 12.9	C 22.9
Overall	A 0.2	A 0.4
EB M-59 Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.1	C 16.9
SB crossover at Haven Road	E 36.7	E 36.5
Overall	A 0.6	A 1.5

Northbound (NB)
Southbound (SB)

Further analysis of the LOS results for existing conditions revealed that most movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For existing conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length. See Appendix 2 – Existing LOS Output Reports for the existing conditions LOS reports and queuing analysis reports.

3.0 Background Conditions Analysis

Historical traffic data on the SEMCOG TCDS website was referenced in order to determine the applicable growth rate for the existing traffic volumes to the project build-out year in 2027. Based on this review, a background growth rate of 0.5% was utilized. There were no background developments identified and included in the background traffic conditions.

The total background traffic volumes are indicated in Figure 4 – Background Traffic Volumes.

Figure 4 – Background Traffic Volumes

Section 9, Item B.



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development

White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

4

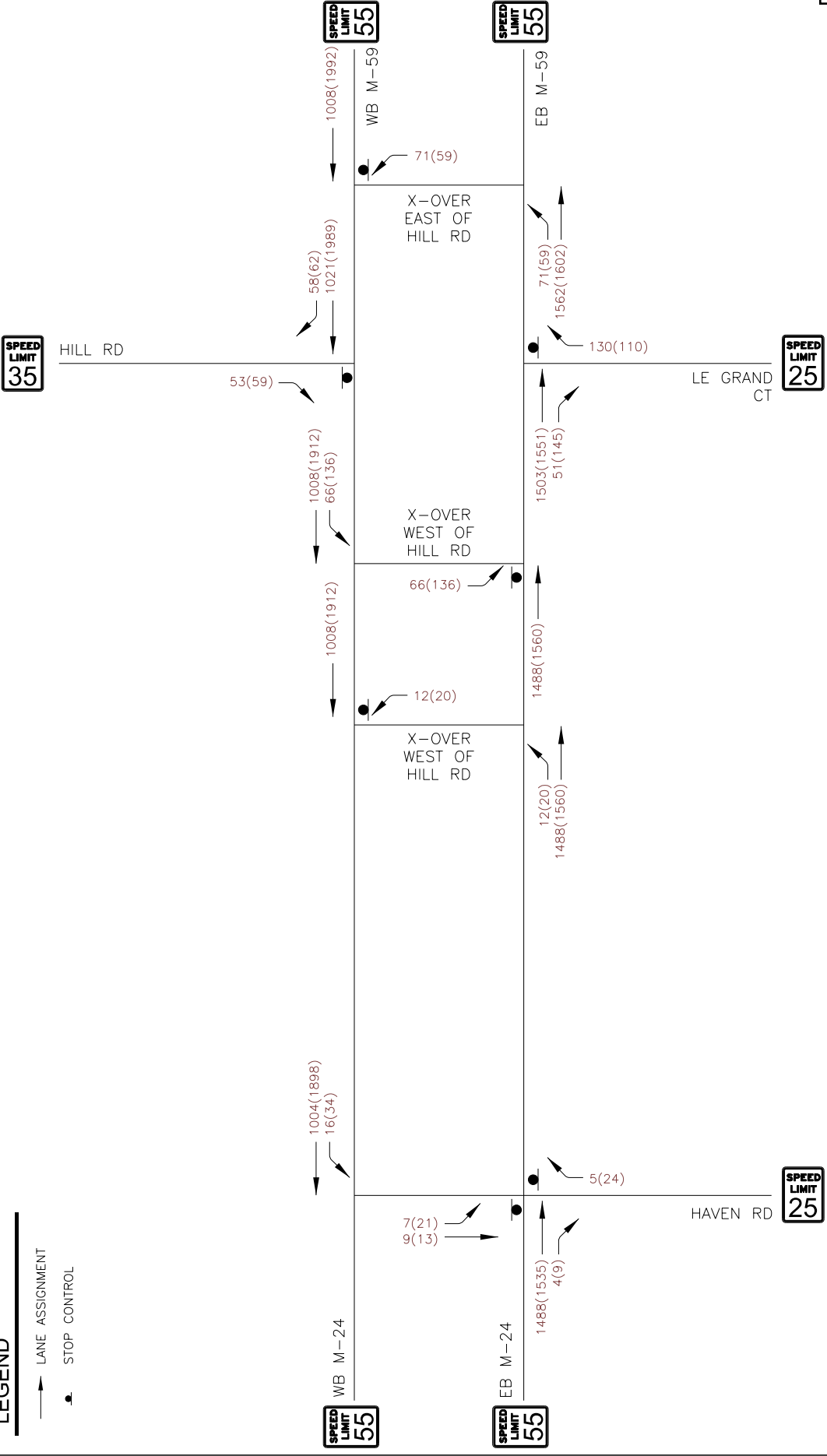
PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-35X11.DWG LAYOUT: MODEL DATE: --- TIME: --- USER: DMEADE

**NO BUILD (BACKGROUND) (2027)
TRAFFIC VOLUMES**

NO SCALE

LEGEND

- LANE ASSIGNMENT
- STOP CONTROL



3.1 Background Conditions Traffic Analysis

The resulting LOS and delay for the background conditions are indicated in Table 4 – LOS Analysis for Background Conditions.

Table 4 – LOS Analysis for Background Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover east of Hill Road	B 14.1	D 31.3
Overall	A 1.0	A 1.2
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-5	A 0.0	A 0.0
NB Le Grand Court	D 28.6	D 26.2
Overall	A 2.5	A 2.0
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	B 14.2	D 30.1
Overall	A 1.0	A 1.1
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	C 22.3	D 29.1
Overall	A 1.1	A 2.7
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 13.1	C 24.1
Overall	A 0.2	A 0.4
EB M-59 and Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.6	C 17.5
SB crossover at Haven Road	E 39.5	D 34.6
Overall	A 0.6	A 1.1

Further analysis of the LOS results for background conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. peak hour.

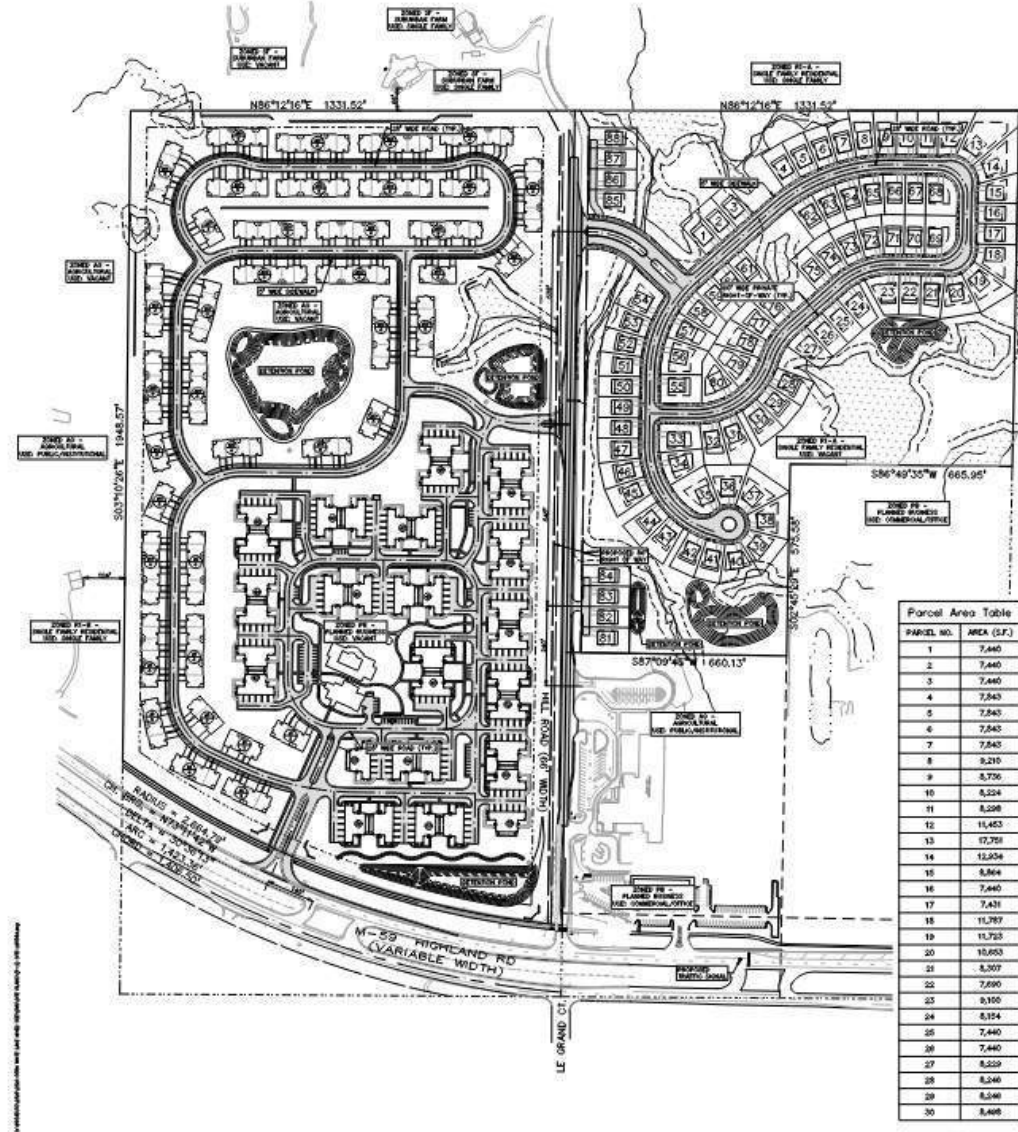
The LOS/delay for the p.m. peak hour became acceptable due to an increase in vehicles due to growth and the average delay decreased.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For background conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length, see Appendix 3 – Background LOS Output Reports.

4.0 Site Traffic Characteristics

A representation of the current conceptual site plan is provided in Figure 5 – Conceptual Site Plan.

Figure 5 – Conceptual Site Plan



4.1 Trip Generation

Using the information and methodologies specified in the latest version of Trip Generation, Fishbeck forecast the weekday a.m. and p.m. peak hour trips associated with the proposed development.

Table 5 – Trip Generation for Proposed Development presents the resulting trip generation for the development. Refer to Appendix 4 – Trip Generation Calculations.

Table 5 – Trip Generation for Proposed Development

ITE Land Use	LUC	Units	a.m. Peak Hour			p.m. Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Single-family Detached Housing	210	88 DU	17	49	66	55	33	88	897
Multi-family Housing (Low-Rise)	220	406 DU	36	113	149	123	72	195	2,678
Total			53	162	215	178	105	283	3,575

Dwelling Units (DU)
Land Use Code(LUC)

4.2 Trip Distribution

The directions that site traffic will travel to and from were based upon existing traffic patterns during the a.m. and p.m. peak hours. The existing traffic patterns reflect the gravity between origins and destinations in the study area, and therefore an accurate indication of where the proposed trips would be coming from and going to.

Table 6 – Trip Distribution provides the probable distribution based on the existing traffic patterns.

Table 6 – Trip Distribution

Direction	Via	a.m. peak hour		p.m. peak hour	
		To	From	To	From
North	Hill Road	2% (4)	2% (1)	1% (1)	2% (3)
East	M-59	60% (96)	40% (21)	45% (47)	55% (98)
West	M-59	38% (62)	58% (31)	54% (57)	43% (77)
Total		100% (162)	100% (53)	100% (105)	100% (178)

The trip distribution for the site is indicated in Figure 6 – Trip Generation Volumes, see below. These trips were added to the background volumes (Figure 4) to result in the future conditions volumes in Figure 7– Future Conditions Volumes.

Figure 6 – Trip Generation Volumes

Section 9, Item B.



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development

White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

6

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-35X11.DWG LAYOUT: MODEL DATE: --- TIME: --- USER: DMEADE

**SITE GENERATED VEHICLE TRIPS
TRAFFIC VOLUMES**

NO SCALE

LEGEND

- LANE ASSIGNMENT
- STOP CONTROL

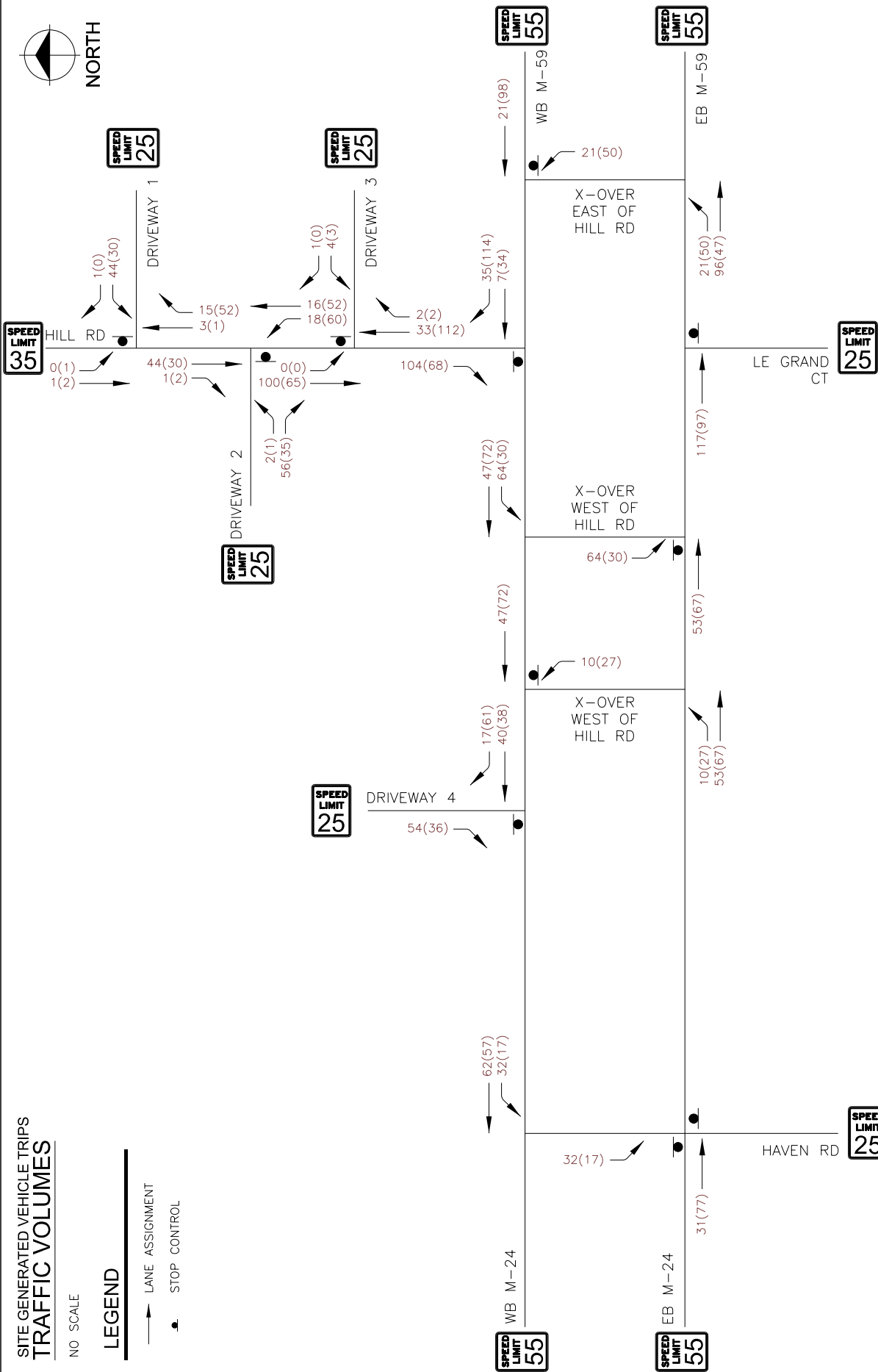
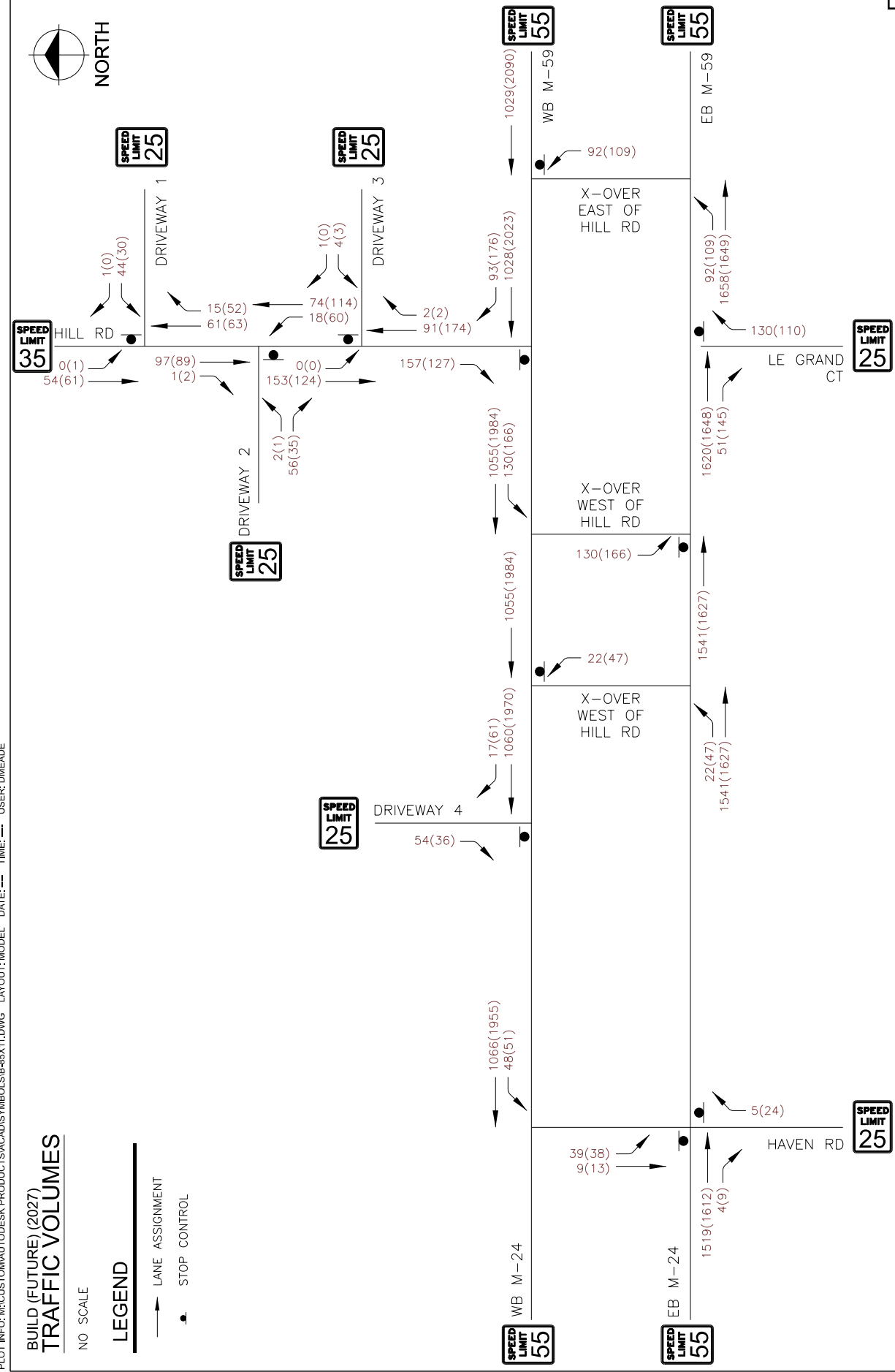


Figure 7 – Future Conditions Volumes

Section 9, Item B.



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development
White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.	220895
FIGURE NO.	7

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-35X11.DWG LAYOUT: MODEL DATE: --- TIME: --- USER: DMEADE

5.0 Future Conditions Analysis

5.1 Turn Lane Warrants

An evaluation was performed in accordance with MDOT requirements to determine if right turn deceleration lanes are required at the site driveway on WB M-59. The results of the analysis indicated that a full width right turn lane is warranted at Driveway 4. All turn lane warrant charts are in Appendix 5 – Turn Lane Warrants. The results of the analysis are presented in Table 7 – Turn Lane Warrants.

Table 7 – Turn Lane Warrants

Intersection	Movement	Result
WB M-59 and Driveway 4	WB Right-turn	Full width right turn lane warranted

5.2 Future Conditions Traffic Analysis

The resulting LOS and delay for the future conditions are shown in Table 8 – LOS Analysis for Future Conditions.

Table 8 – LOS Analysis for Future Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover east of Hill Road	B 16.7	F 63.7
Overall	A 2.1	A 4.2
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Le Grand Court	D 33.8	D 29.4
Overall	A 2.8	A 2.1
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	C 21.3	F 68.2
Overall	A 3.8	A 4.9
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	E 36.6	E 40.6
Overall	A 3.4	A 4.3
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 11.8	C 18.0
Overall	A 0.4	A 0.7
EB M-59 and Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.9	C 18.4
SB crossover at Haven Road	E 36.8	E 46.4
Overall	A 1.6	A 2.3
Hill Road and Driveway 1 (Stop-Controlled)		
WB Driveway 1	A 9.4	A 9.5
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.1
Overall	A 2.4	A 1.4

Table 8 – LOS Analysis for Future Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
Hill Road and Driveway 2 (Stop-Controlled)		
WB Driveway 2	A 9.1	A 9.0
NB Hill Road	A 1.5	A 2.6
SB Hill Road	A 0.0	A 0.0
Overall	A 2.7	A 2.6
Hill Road and Driveway 3 (Stop-Controlled)		
WB Driveway 3	A 9.8	B 10.4
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.0
Overall	A 0.2	A 0.1
WB M-59 and Driveway 4 (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Driveway 4	B 13.7	D 25.2
Overall	A 0.7	A 0.5

Further analysis of the LOS results for future conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- WB M-59 and crossover east of Hill Road:
 - The NB crossover approach operates at LOS F in the p.m. peak hour.
- WB M-59 and Hill Road:
 - The SB approach operates at LOS F in the p.m. peak hour.
- EB M-59 and crossover west of Hill Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours
- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For future conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length. See Appendix 6 – Future LOS Output Reports for the future conditions LOS reports and queueing analysis reports.

The 95th percentile queue lengths were reviewed for the development driveways. During the a.m. and p.m. peak hours, the queue lengths are less than 55 feet (two vehicles).

5.3 Future Improvement Conditions Traffic Analysis

The following observations were made, and improvements were recommended, if applicable, at the following intersections due to Future traffic conditions:

- WB M-59 and crossover east of Hill Road:
 - Due to unacceptable LOS/delay during the future condition, a traffic signal warrant was investigated to determine if a traffic signal could alleviate delay. The traffic signal is warranted for Warrants 1B, 2 (70%), and 3B. For more information on the traffic signal warrant, see section 5.4. The addition of this traffic signal is also providing additional vehicular gaps for SB Hill Road vehicles to enter WB M-59. The resulting LOS and delay for the future improvement conditions are indicated in Table 9 – LOS Analysis for Future Improvement Conditions.

Table 9 – Future with Improvements Conditions LOS/Delay

Approach/Lane Group	LOS/Delay(s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Signalized)		
WB M-59	B 16.6	C 33.3
NB crossover east of Hill Road	D 45.0	E 60.5
Overall	C 20.1	D 35.1
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Le Grand Court	D 33.8	D 29.4
Overall	A 2.8	A 2.1
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	C 21.3	F 68.2
Overall	A 3.8	A 4.9
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	E 36.6	E 40.6
Overall	A 3.4	A 4.3
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 11.8	C 18.0
Overall	A 0.4	A 0.7
EB M-59 and Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.9	C 18.4
SB crossover at Haven Road	E 36.8	E 46.4
Overall	A 1.6	A 2.3
Hill Road and Driveway 1 (Stop-Controlled)		
WB Driveway 1	A 9.4	A 9.5
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.1
Overall	A 2.4	A 1.4
Hill Road and Driveway 2 (Stop-Controlled)		
WB Driveway 2	A 9.1	A 9.0
NB Hill Road	A 1.5	A 2.6
SB Hill Road	A 0.0	A 0.0
Overall	A 2.7	A 2.6
Hill Road and Driveway 3 (Stop-Controlled)		
WB Driveway 3	A 9.8	B 10.4
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.0
Overall	A 0.2	A 0.1
WB M-59 and Driveway 4 (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Driveway 4	B 13.7	D 25.2
Overall	A 0.7	A 0.5

Further analysis of the LOS a result for future improvement conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- WB M-59 and crossover east of Hill Road:
 - The NB crossover approach operates at LOS E in the p.m. peak hour.
- WB M-59 and Hill Road:
 - The SB approach operates at LOS F in the p.m. peak hour.
- EB M-59 and crossover west of Hill Road.
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.
- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For future improvement conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length, see Appendix 7 – Future Improvement LOS Output.

The addition of the traffic signal at WB M-59 and the crossover east of Hill Road provides some delay relief. It benefits the minor streets’ approaches on WB M-59 operationally. The traffic signal provides additional gaps for vehicles from Hill Road to turn onto WB M-59. For the p.m. peak hour, the SB queue reduced from 314 feet (13 vehicles) to 203 feet (eight vehicles). For the a.m. peak hour, the queue increased 13 feet with the traffic signal. The queue lengths for the crossover for the a.m. and p.m. peak hours is relatively the same with or without the traffic signal.

5.4 Signal Warrant Analysis

Signal warrants were completed at the intersection of WB M-59 and crossover east of Hill Road in accordance with Michigan Manual on Uniform Traffic Control Devices (MMUTCD) requirements. The results of this analysis revealed that several warrants are met at the intersection. The results of this analysis are presented in Table 10 – Signal Warrants – Intersection of WB M-59 and Crossover East of Hill Road, all signal warrant charts are included in Appendix 8 – Signal Warrants.

Table 10 – Signal Warrants – Intersection of WB M-59 and Crossover East of Hill Road

Warrant		Is Warrant Met?	Comments
1 – Eight Hour Vehicular Volume	Overall	Yes	
	Condition A	No	Hours Met: 3
	Condition B	Yes	Hours Met: 12
	Condition A and B	N/A	Hours Met: N/A
2 – Four Hour Vehicular Volume (70%)		Yes	Hours Met: 12
3 – Peak Hour Vehicular Volume (70%)	Overall	Yes	
	Condition A	No	
	Condition B	Yes	Hours Met: 8
4 – Four Hour Pedestrian Volume (70%)		No	Hours Met:
5 – School Crossing		Not Evaluated	
6 – Coordinated Signal System		Not Evaluated	
7 – Crash Experience	Overall	Not Evaluated	Crashes in five-year period:
	Condition A	Not Evaluated	
	Condition B	Not Evaluated	
8 – Roadway Network		Not Evaluated	
9 – Intersection Near at Grade Railroad Crossing		N/A	

6.0 Findings and Recommendations

The analyses conducted for this TIS indicate the proposed development will not result in any significant impact to the adjacent road network with improvements. The proposed site access configuration is appropriate and will acceptably facilitate site ingress and egress. These conclusions are supported by the following key findings:

1. Existing storage lengths are adequate for all movements in existing and future conditions.
2. Lane configurations and physical capacity are appropriate within the study area.
3. Existing nor planned transit or non-motorized facilities in the site vicinity would not be impacted by the project.

Based on the findings of the HCM operational analyses and site traffic generation, Table 11 – Proposed Improvements includes the recommended existing, background, and future improvements to the study intersections to mitigate traffic impacts.

Table 11 – Proposed Improvements

Intersection	Existing	Background	Future
WB M-59 and crossover east of Hill Road	No improvements	No improvements	Traffic signal warranted.
WB M-59 and Driveway 4	No improvements	No improvements	Right turn lane warranted.

Appendix 1

Traffic Volume Data

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
2021-09-30 7:00AM	357	12	369	164	0	164	533
7:15AM	354	8	362	188	0	188	550
7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
Hourly Total	1440	69	1509	844	0	844	2353
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
8:30AM	306	4	310	225	0	225	535
8:45AM	362	8	370	229	0	229	599
Hourly Total	1356	32	1388	940	0	940	2328
4:00PM	297	9	306	423	0	423	729
4:15PM	372	8	380	463	0	463	843
4:30PM	345	9	354	497	0	497	851
4:45PM	348	14	362	466	0	466	828
Hourly Total	1362	40	1402	1849	0	1849	3251
5:00PM	416	9	425	478	0	478	903
5:15PM	396	20	416	490	0	490	906
5:30PM	377	14	391	499	0	499	890
5:45PM	364	15	379	426	0	426	805
Hourly Total	1553	58	1611	1893	0	1893	3504
Total	5711	199	5910	5526	0	5526	11436
% Approach	96.6%	3.4%	-	100%	0%	-	-
% Total	49.9%	1.7%	51.7%	48.3%	0%	48.3%	-
Lights	5547	188	5735	5345	0	5345	11080
% Lights	97.1%	94.5%	97.0%	96.7%	0%	96.7%	96.9%
Articulated Trucks	60	1	61	61	0	61	122
% Articulated Trucks	1.1%	0.5%	1.0%	1.1%	0%	1.1%	1.1%
Buses and Single-Unit Trucks	104	10	114	120	0	120	234
% Buses and Single-Unit Trucks	1.8%	5.0%	1.9%	2.2%	0%	2.2%	2.0%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
Total	1417	69	1486	978	0	978	2464
% Approach	95.4%	4.6%	-	100%	0%	-	-
% Total	57.5%	2.8%	60.3%	39.7%	0%	39.7%	-
PHF	0.945	0.575	0.917	0.955	-	0.955	0.932
Lights	1354	65	1419	923	0	923	2342
% Lights	95.6%	94.2%	95.5%	94.4%	0%	94.4%	95.0%
Articulated Trucks	27	0	27	20	0	20	47
% Articulated Trucks	1.9%	0%	1.8%	2.0%	0%	2.0%	1.9%
Buses and Single-Unit Trucks	36	4	40	35	0	35	75
% Buses and Single-Unit Trucks	2.5%	5.8%	2.7%	3.6%	0%	3.6%	3.0%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 4:45PM	348	14	362	466	0	466	828
5:00PM	416	9	425	478	0	478	903
5:15PM	396	20	416	490	0	490	906
5:30PM	377	14	391	499	0	499	890
Total	1537	57	1594	1933	0	1933	3527
% Approach	96.4%	3.6%	-	100%	0%	-	-
% Total	43.6%	1.6%	45.2%	54.8%	0%	54.8%	-
PHF	0.924	0.713	0.938	0.968	-	0.968	0.973
Lights	1506	54	1560	1897	0	1897	3457
% Lights	98.0%	94.7%	97.9%	98.1%	0%	98.1%	98.0%
Articulated Trucks	11	1	12	16	0	16	28
% Articulated Trucks	0.7%	1.8%	0.8%	0.8%	0%	0.8%	0.8%
Buses and Single-Unit Trucks	20	2	22	20	0	20	42
% Buses and Single-Unit Trucks	1.3%	3.5%	1.4%	1.0%	0%	1.0%	1.2%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



M-59 (Highland Road) and Le Grand Ct - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877562, Location: 42.64847, -83.537354



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	M 59 Eastbound				M 59 Westbound				Le Grand Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:00AM	346	5	0	351	0	0	0	0	0	31	0	31	382
7:15AM	336	11	0	347	0	0	0	0	0	29	0	29	376
7:30AM	342	20	0	362	0	0	0	0	0	40	0	40	402
7:45AM	399	8	0	407	0	0	0	0	0	26	0	26	433
Hourly Total	1423	44	0	1467	0	0	0	0	0	126	0	126	1593
8:00AM	352	10	0	362	0	0	0	0	0	31	0	31	393
8:15AM	332	12	0	344	0	0	0	0	0	19	0	19	363
8:30AM	313	8	0	321	0	0	0	0	0	24	0	24	345
8:45AM	340	14	0	354	0	0	0	0	0	40	0	40	394
Hourly Total	1337	44	0	1381	0	0	0	0	0	114	0	114	1495
4:00PM	319	27	0	346	0	0	0	0	0	14	0	14	360
4:15PM	382	40	0	422	0	0	0	0	0	17	0	17	439
4:30PM	365	34	0	399	0	0	0	0	0	19	0	19	418
4:45PM	366	32	0	398	0	0	0	0	0	23	0	23	421
Hourly Total	1432	133	0	1565	0	0	0	0	0	73	0	73	1638
5:00PM	394	39	0	433	0	0	0	0	0	36	0	36	469
5:15PM	367	36	0	403	0	0	0	0	0	26	0	26	429
5:30PM	384	34	0	418	0	0	0	0	0	22	0	22	440
5:45PM	360	35	0	395	0	0	0	0	0	20	0	20	415
Hourly Total	1505	144	0	1649	0	0	0	0	0	104	0	104	1753
Total	5697	365	0	6062	0	0	0	0	0	417	0	417	6479
% Approach	94.0%	6.0%	0%	-	0%	0%	0%	-	0%	100%	0%	-	-
% Total	87.9%	5.6%	0%	93.6%	0%	0%	0%	0%	0%	6.4%	0%	6.4%	-
Lights	5517	352	0	5869	0	0	0	0	0	403	0	403	6272
% Lights	96.8%	96.4%	0%	96.8%	0%	0%	0%	-	0%	96.6%	0%	96.6%	96.8%
Articulated Trucks	60	0	0	60	0	0	0	0	0	0	0	0	60
% Articulated Trucks	1.1%	0%	0%	1.0%	0%	0%	0%	-	0%	0%	0%	0%	0.9%
Buses and Single-Unit Trucks	120	13	0	133	0	0	0	0	0	14	0	14	147
% Buses and Single-Unit Trucks	2.1%	3.6%	0%	2.2%	0%	0%	0%	-	0%	3.4%	0%	3.4%	2.3%

*L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Le Grand Ct - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

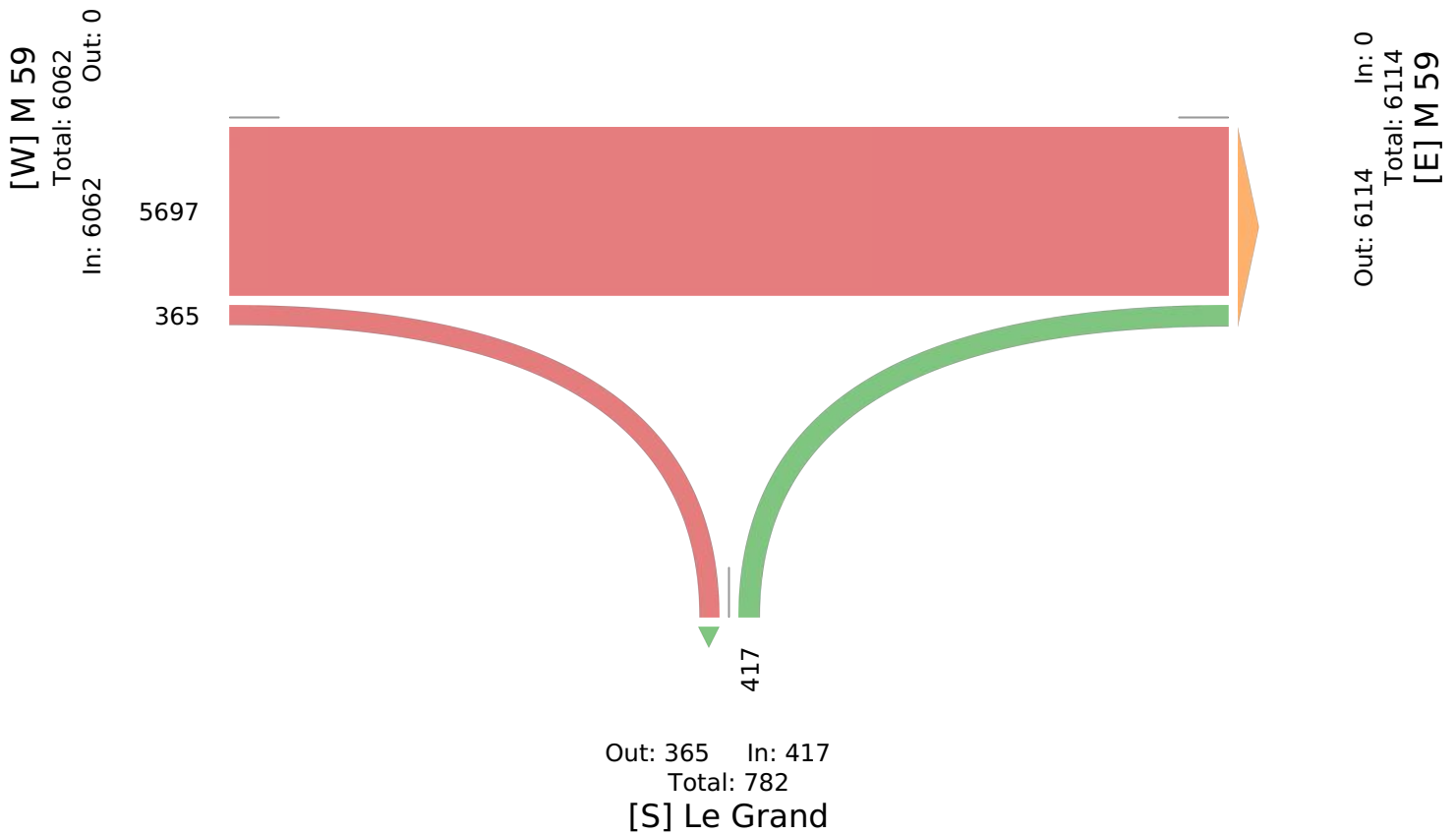
All Movements

ID: 877562, Location: 42.64847, -83.537354



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



M-59 (Highland Road) and Le Grand Ct - TMC
 Thu Sep 30, 2021
 AM Peak (7:15 AM - 8:15 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877562, Location: 42.64847, -83.537354

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	M 59 Eastbound				M 59 Westbound				Le Grand Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:15AM	336	11	0	347	0	0	0	0	0	29	0	29	376
7:30AM	342	20	0	362	0	0	0	0	0	40	0	40	402
7:45AM	399	8	0	407	0	0	0	0	0	26	0	26	433
8:00AM	352	10	0	362	0	0	0	0	0	31	0	31	393
Total	1429	49	0	1478	0	0	0	0	0	126	0	126	1604
% Approach	96.7%	3.3%	0%	-	0%	0%	0%	-	0%	100%	0%	-	-
% Total	89.1%	3.1%	0%	92.1%	0%	0%	0%	0%	0%	7.9%	0%	7.9%	-
PHF	0.895	0.613	-	0.908	-	-	-	-	-	0.788	-	0.788	0.926
Lights	1369	46	0	1415	0	0	0	0	0	122	0	122	1537
% Lights	95.8%	93.9%	0%	95.7%	0%	0%	0%	-	0%	96.8%	0%	96.8%	95.8%
Articulated Trucks	26	0	0	26	0	0	0	0	0	0	0	0	26
% Articulated Trucks	1.8%	0%	0%	1.8%	0%	0%	0%	-	0%	0%	0%	0%	1.6%
Buses and Single-Unit Trucks	34	3	0	37	0	0	0	0	0	4	0	4	41
% Buses and Single-Unit Trucks	2.4%	6.1%	0%	2.5%	0%	0%	0%	-	0%	3.2%	0%	3.2%	2.6%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Le Grand Ct - TMC

Thu Sep 30, 2021

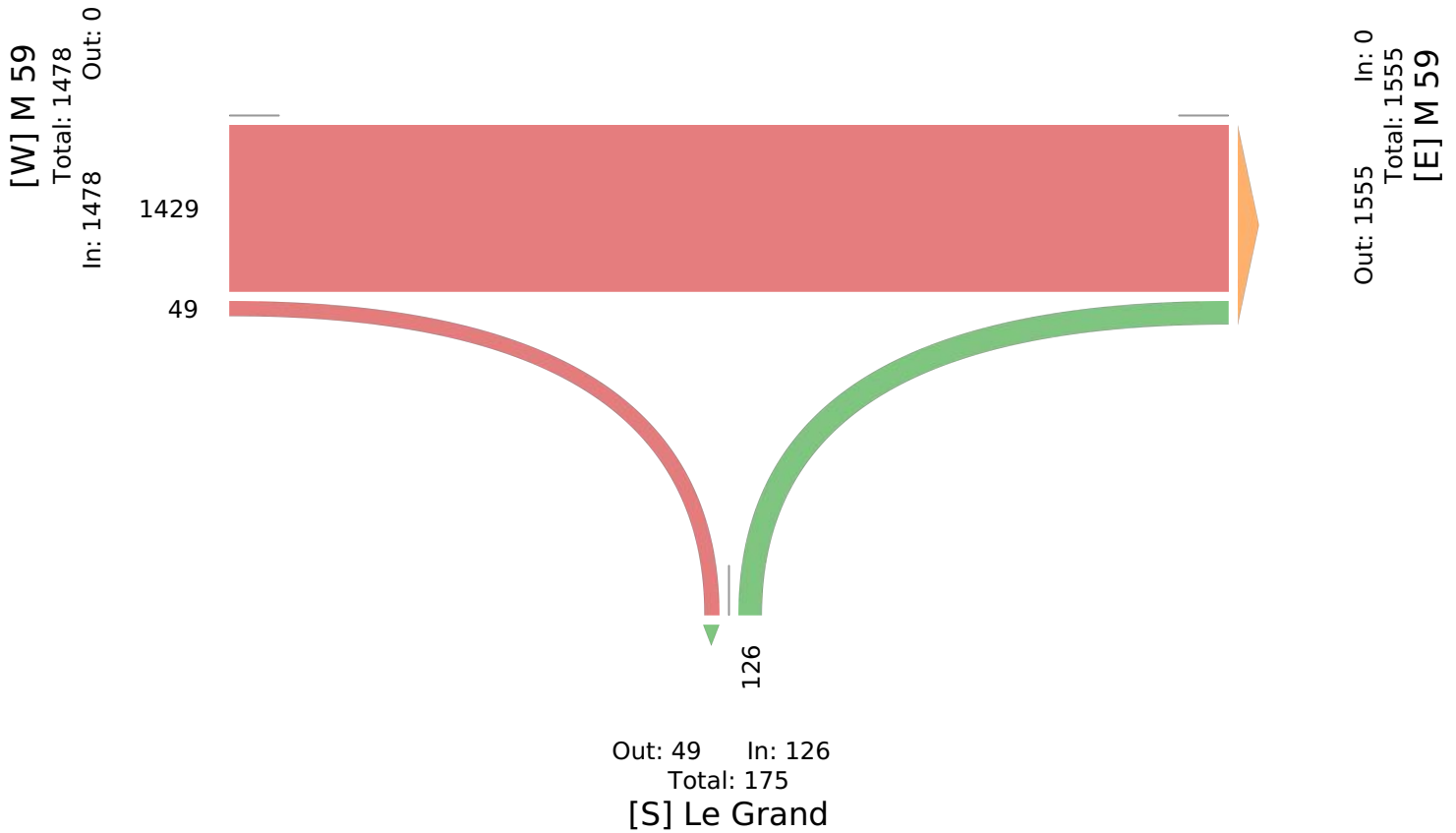
AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877562, Location: 42.64847, -83.537354

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

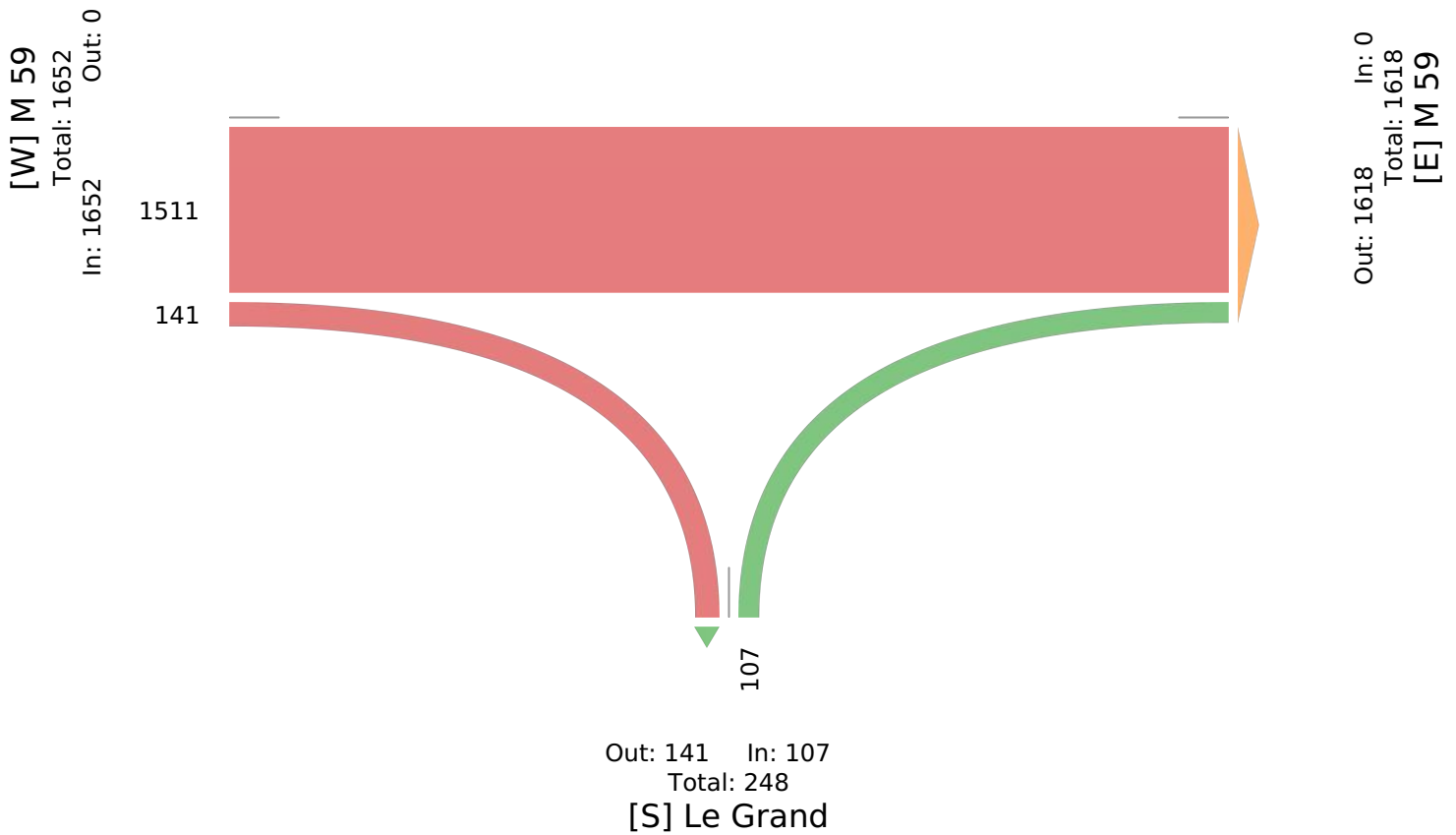


M-59 (Highland Road) and Le Grand Ct - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877562, Location: 42.64847, -83.537354

Leg Direction	M 59 Eastbound				M 59 Westbound				Le Grand Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 4:45PM	366	32	0	398	0	0	0	0	0	23	0	23	421
5:00PM	394	39	0	433	0	0	0	0	0	36	0	36	469
5:15PM	367	36	0	403	0	0	0	0	0	26	0	26	429
5:30PM	384	34	0	418	0	0	0	0	0	22	0	22	440
Total	1511	141	0	1652	0	0	0	0	0	107	0	107	1759
% Approach	91.5%	8.5%	0%	-	0%	0%	0%	-	0%	100%	0%	-	-
% Total	85.9%	8.0%	0%	93.9%	0%	0%	0%	0%	0%	6.1%	0%	6.1%	-
PHF	0.959	0.904	-	0.954	-	-	-	-	-	0.743	-	0.743	0.938
Lights	1476	138	0	1614	0	0	0	0	0	103	0	103	1717
% Lights	97.7%	97.9%	0%	97.7%	0%	0%	0%	-	0%	96.3%	0%	96.3%	97.6%
Articulated Trucks	9	0	0	9	0	0	0	0	0	0	0	0	9
% Articulated Trucks	0.6%	0%	0%	0.5%	0%	0%	0%	-	0%	0%	0%	0%	0.5%
Buses and Single-Unit Trucks	26	3	0	29	0	0	0	0	0	4	0	4	33
% Buses and Single-Unit Trucks	1.7%	2.1%	0%	1.8%	0%	0%	0%	-	0%	3.7%	0%	3.7%	1.9%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Le Grand Ct - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877562, Location: 42.64847, -83.537354



M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Hill Southbound				Int
	L	T	U	App	T	R	U	App	L	R	U	App	
2021-09-30 7:00AM	0	0	0	0	177	1	0	178	0	8	0	8	186
7:15AM	0	0	0	0	193	4	0	197	0	4	0	4	201
7:30AM	0	0	0	0	245	12	0	257	0	8	0	8	265
7:45AM	0	0	0	0	250	31	0	281	0	26	0	26	307
Hourly Total	0	0	0	0	865	48	0	913	0	46	0	46	959
8:00AM	0	0	0	0	242	7	0	249	0	13	0	13	262
8:15AM	0	0	0	0	254	6	0	260	0	4	0	4	264
8:30AM	0	0	0	0	232	0	0	232	0	8	0	8	240
8:45AM	0	0	0	0	232	2	0	234	0	4	0	4	238
Hourly Total	0	0	0	0	960	15	0	975	0	29	0	29	1004
4:00PM	0	0	0	0	423	8	0	431	0	7	0	7	438
4:15PM	0	0	0	0	463	5	0	468	0	10	0	10	478
4:30PM	0	0	0	0	490	5	0	495	0	8	0	8	503
4:45PM	0	0	0	0	473	8	0	481	0	9	0	9	490
Hourly Total	0	0	0	0	1849	26	0	1875	0	34	0	34	1909
5:00PM	0	0	0	0	473	11	0	484	0	11	0	11	495
5:15PM	0	0	0	0	480	11	0	491	0	17	0	17	508
5:30PM	0	0	0	0	494	15	0	509	0	9	0	9	518
5:45PM	0	0	0	0	462	23	0	485	0	20	0	20	505
Hourly Total	0	0	0	0	1909	60	0	1969	0	57	0	57	2026
Total	0	0	0	0	5583	149	0	5732	0	166	0	166	5898
% Approach	0%	0%	0%	-	97.4%	2.6%	0%	-	0%	100%	0%	-	-
% Total	0%	0%	0%	0%	94.7%	2.5%	0%	97.2%	0%	2.8%	0%	2.8%	-
Lights	0	0	0	0	5389	141	0	5530	0	162	0	162	5692
% Lights	0%	0%	0%	-	96.5%	94.6%	0%	96.5%	0%	97.6%	0%	97.6%	96.5%
Articulated Trucks	0	0	0	0	47	2	0	49	0	0	0	0	49
% Articulated Trucks	0%	0%	0%	-	0.8%	1.3%	0%	0.9%	0%	0%	0%	0%	0.8%
Buses and Single-Unit Trucks	0	0	0	0	147	6	0	153	0	4	0	4	157
% Buses and Single-Unit Trucks	0%	0%	0%	-	2.6%	4.0%	0%	2.7%	0%	2.4%	0%	2.4%	2.7%

*L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Hill

Total: 315

In: 166 Out: 149

166

149

5583

[W] MI 59

Total: 5749

In: 0

Out: 5749

Out: 0 In: 5732

Total: 5732

[E] MI 59

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Hill Southbound				Int
	L	T	U	App	T	R	U	App	L	R	U	App	
2021-09-30 7:30AM	0	0	0	0	245	12	0	257	0	8	0	8	265
7:45AM	0	0	0	0	250	31	0	281	0	26	0	26	307
8:00AM	0	0	0	0	242	7	0	249	0	13	0	13	262
8:15AM	0	0	0	0	254	6	0	260	0	4	0	4	264
Total	0	0	0	0	991	56	0	1047	0	51	0	51	1098
% Approach	0%	0%	0%	-	94.7%	5.3%	0%	-	0%	100%	0%	-	-
% Total	0%	0%	0%	0%	90.3%	5.1%	0%	95.4%	0%	4.6%	0%	4.6%	-
PHF	-	-	-	-	0.975	0.452	-	0.931	-	0.490	-	0.490	0.894
Lights	0	0	0	0	934	52	0	986	0	50	0	50	1036
% Lights	0%	0%	0%	-	94.2%	92.9%	0%	94.2%	0%	98.0%	0%	98.0%	94.4%
Articulated Trucks	0	0	0	0	17	0	0	17	0	0	0	0	17
% Articulated Trucks	0%	0%	0%	-	1.7%	0%	0%	1.6%	0%	0%	0%	0%	1.5%
Buses and Single-Unit Trucks	0	0	0	0	40	4	0	44	0	1	0	1	45
% Buses and Single-Unit Trucks	0%	0%	0%	-	4.0%	7.1%	0%	4.2%	0%	2.0%	0%	2.0%	4.1%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Hill

Total: 107

In: 51 Out: 56

51

56

[W] MI 59

Total: 1042

In: 0

Out: 1042

991

Out: 0 In: 1047

Total: 1047

[E] MI 59

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Hill Southbound				Int
	L	T	U	App	T	R	U	App	L	R	U	App	
2021-09-30 5:00PM	0	0	0	0	473	11	0	484	0	11	0	11	495
5:15PM	0	0	0	0	480	11	0	491	0	17	0	17	508
5:30PM	0	0	0	0	494	15	0	509	0	9	0	9	518
5:45PM	0	0	0	0	462	23	0	485	0	20	0	20	505
Total	0	0	0	0	1909	60	0	1969	0	57	0	57	2026
% Approach	0%	0%	0%	-	97.0%	3.0%	0%	-	0%	100%	0%	-	-
% Total	0%	0%	0%	0%	94.2%	3.0%	0%	97.2%	0%	2.8%	0%	2.8%	-
PHF	-	-	-	-	0.966	0.652	-	0.967	-	0.713	-	0.713	0.978
Lights	0	0	0	0	1878	58	0	1936	0	56	0	56	1992
% Lights	0%	0%	0%	-	98.4%	96.7%	0%	98.3%	0%	98.2%	0%	98.2%	98.3%
Articulated Trucks	0	0	0	0	9	1	0	10	0	0	0	0	10
% Articulated Trucks	0%	0%	0%	-	0.5%	1.7%	0%	0.5%	0%	0%	0%	0%	0.5%
Buses and Single-Unit Trucks	0	0	0	0	22	1	0	23	0	1	0	1	24
% Buses and Single-Unit Trucks	0%	0%	0%	-	1.2%	1.7%	0%	1.2%	0%	1.8%	0%	1.8%	1.2%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Hill

Total: 117

In: 57 Out: 60

57

60

1909

[W] MI 59

Total: 1966

In: 0

Out: 1966

Out: 0 In: 1969

Total: 1969

[E] MI 59

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
2021-09-30 7:00AM	344	0	344	172	10	182	526
7:15AM	328	0	328	185	13	198	526
7:30AM	340	0	340	224	22	246	586
7:45AM	397	0	397	254	15	269	666
Hourly Total	1409	0	1409	835	60	895	2304
8:00AM	345	0	345	243	14	257	602
8:15AM	327	0	327	243	13	256	583
8:30AM	312	0	312	232	9	241	553
8:45AM	342	0	342	221	16	237	579
Hourly Total	1326	0	1326	939	52	991	2317
4:00PM	319	0	319	397	25	422	741
4:15PM	382	0	382	425	40	465	847
4:30PM	374	0	374	465	23	488	862
4:45PM	372	0	372	454	28	482	854
Hourly Total	1447	0	1447	1741	116	1857	3304
5:00PM	378	0	378	420	41	461	839
5:15PM	370	0	370	444	40	484	854
5:30PM	376	0	376	447	35	482	858
5:45PM	357	0	357	426	41	467	824
Hourly Total	1481	0	1481	1737	157	1894	3375
Total	5663	0	5663	5252	385	5637	11300
% Approach	100%	0%	-	93.2%	6.8%	-	-
% Total	50.1%	0%	50.1%	46.5%	3.4%	49.9%	-
Lights	5490	0	5490	5078	374	5452	10942
% Lights	96.9%	0%	96.9%	96.7%	97.1%	96.7%	96.8%
Articulated Trucks	65	0	65	56	0	56	121
% Articulated Trucks	1.1%	0%	1.1%	1.1%	0%	1.0%	1.1%
Buses and Single-Unit Trucks	108	0	108	118	11	129	237
% Buses and Single-Unit Trucks	1.9%	0%	1.9%	2.2%	2.9%	2.3%	2.1%

*T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
Thu Sep 30, 2021
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 877565, Location: 42.648726, -83.539668



EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	340	0	340	224	22	246	586
7:45AM	397	0	397	254	15	269	666
8:00AM	345	0	345	243	14	257	602
8:15AM	327	0	327	243	13	256	583
Total	1409	0	1409	964	64	1028	2437
% Approach	100%	0%	-	93.8%	6.2%	-	-
% Total	57.8%	0%	57.8%	39.6%	2.6%	42.2%	-
PHF	0.887	-	0.887	0.949	0.727	0.955	0.915
Lights	1346	0	1346	912	60	972	2318
% Lights	95.5%	0%	95.5%	94.6%	93.8%	94.6%	95.1%
Articulated Trucks	30	0	30	17	0	17	47
% Articulated Trucks	2.1%	0%	2.1%	1.8%	0%	1.7%	1.9%
Buses and Single-Unit Trucks	33	0	33	35	4	39	72
% Buses and Single-Unit Trucks	2.3%	0%	2.3%	3.6%	6.3%	3.8%	3.0%

*T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
Thu Sep 30, 2021
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 877565, Location: 42.648726, -83.539668



EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 4:30PM	374	0	374	465	23	488	862
4:45PM	372	0	372	454	28	482	854
5:00PM	378	0	378	420	41	461	839
5:15PM	370	0	370	444	40	484	854
Total	1494	0	1494	1783	132	1915	3409
% Approach	100%	0%	-	93.1%	6.9%	-	-
% Total	43.8%	0%	43.8%	52.3%	3.9%	56.2%	-
PHF	0.988	-	0.988	0.959	0.805	0.981	0.989
Lights	1468	0	1468	1737	129	1866	3334
% Lights	98.3%	0%	98.3%	97.4%	97.7%	97.4%	97.8%
Articulated Trucks	10	0	10	17	0	17	27
% Articulated Trucks	0.7%	0%	0.7%	1.0%	0%	0.9%	0.8%
Buses and Single-Unit Trucks	16	0	16	29	3	32	48
% Buses and Single-Unit Trucks	1.1%	0%	1.1%	1.6%	2.3%	1.7%	1.4%

*T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Section 9, Item B.



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:00AM	339	1	340	175	10	185	525
7:15AM	339	2	341	185	13	198	539
7:30AM	353	2	355	230	22	252	607
7:45AM	407	5	412	257	15	272	684
Hourly Total	1438	10	1448	847	60	907	2355
8:00AM	344	3	347	243	13	256	603
8:15AM	340	2	342	246	13	259	601
8:30AM	309	4	313	233	9	242	555
8:45AM	341	3	344	220	16	236	580
Hourly Total	1334	12	1346	942	51	993	2339
4:00PM	322	2	324	401	25	426	750
4:15PM	378	2	380	437	40	477	857
4:30PM	370	8	378	469	23	492	870
4:45PM	368	3	371	458	27	485	856
Hourly Total	1438	15	1453	1765	115	1880	3333
5:00PM	387	4	391	438	42	480	871
5:15PM	368	9	377	459	40	499	876
5:30PM	380	3	383	463	34	497	880
5:45PM	350	4	354	446	41	487	841
Hourly Total	1485	20	1505	1806	157	1963	3468
Total	5695	57	5752	5360	383	5743	11495
% Approach	99.0%	1.0%	-	93.3%	6.7%	-	-
% Total	49.5%	0.5%	50.0%	46.6%	3.3%	50.0%	-
Lights	5541	53	5594	5183	373	5556	11150
% Lights	97.3%	93.0%	97.3%	96.7%	97.4%	96.7%	97.0%
Articulated Trucks	64	0	64	46	0	46	110
% Articulated Trucks	1.1%	0%	1.1%	0.9%	0%	0.8%	1.0%
Buses and Single-Unit Trucks	90	4	94	131	10	141	235
% Buses and Single-Unit Trucks	1.6%	7.0%	1.6%	2.4%	2.6%	2.5%	2.0%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201

Section 9, Item B.



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	353	2	355	230	22	252	607
7:45AM	407	5	412	257	15	272	684
8:00AM	344	3	347	243	13	256	603
8:15AM	340	2	342	246	13	259	601
Total	1444	12	1456	976	63	1039	2495
% Approach	99.2%	0.8%	-	93.9%	6.1%	-	-
% Total	57.9%	0.5%	58.4%	39.1%	2.5%	41.6%	-
PHF	0.887	0.600	0.883	0.949	0.716	0.955	0.912
Lights	1392	11	1403	927	59	986	2389
% Lights	96.4%	91.7%	96.4%	95.0%	93.7%	94.9%	95.8%
Articulated Trucks	27	0	27	11	0	11	38
% Articulated Trucks	1.9%	0%	1.9%	1.1%	0%	1.1%	1.5%
Buses and Single-Unit Trucks	25	1	26	38	4	42	68
% Buses and Single-Unit Trucks	1.7%	8.3%	1.8%	3.9%	6.3%	4.0%	2.7%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 4:45PM	368	3	371	458	27	485	856
5:00PM	387	4	391	438	42	480	871
5:15PM	368	9	377	459	40	499	876
5:30PM	380	3	383	463	34	497	880
Total	1503	19	1522	1818	143	1961	3483
% Approach	98.8%	1.2%	-	92.7%	7.3%	-	-
% Total	43.2%	0.5%	43.7%	52.2%	4.1%	56.3%	-
PHF	0.971	0.528	0.973	0.982	0.851	0.982	0.989
Lights	1472	17	1489	1781	141	1922	3411
% Lights	97.9%	89.5%	97.8%	98.0%	98.6%	98.0%	97.9%
Articulated Trucks	12	0	12	14	0	14	26
% Articulated Trucks	0.8%	0%	0.8%	0.8%	0%	0.7%	0.7%
Buses and Single-Unit Trucks	19	2	21	23	2	25	46
% Buses and Single-Unit Trucks	1.3%	10.5%	1.4%	1.3%	1.4%	1.3%	1.3%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201



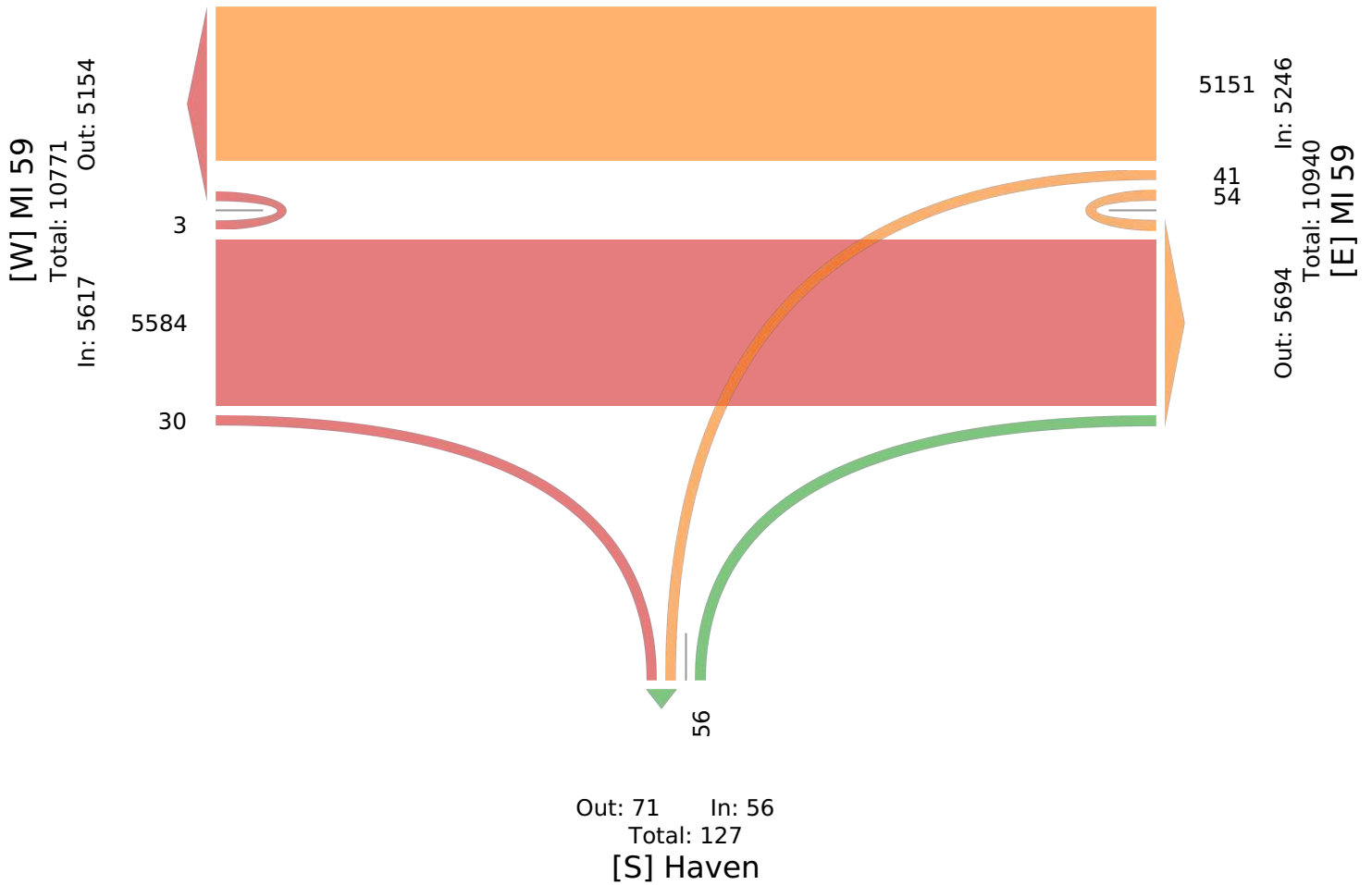
EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Haven Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:00AM	327	1	0	328	2	170	2	174	0	1	0	1	503
7:15AM	332	1	0	333	1	185	2	188	0	0	0	0	521
7:30AM	335	1	0	336	3	226	0	229	0	1	0	1	566
7:45AM	384	1	1	386	1	256	3	260	0	1	0	1	647
Hourly Total	1378	4	1	1383	7	837	7	851	0	3	0	3	2237
8:00AM	346	2	0	348	3	235	3	241	0	1	0	1	590
8:15AM	321	0	0	321	2	230	1	233	0	2	0	2	556
8:30AM	314	2	0	316	1	225	4	230	0	1	0	1	547
8:45AM	335	2	0	337	1	216	2	219	0	3	0	3	559
Hourly Total	1316	6	0	1322	7	906	10	923	0	7	0	7	2252
4:00PM	317	0	0	317	3	371	7	381	0	6	0	6	704
4:15PM	378	3	0	381	2	428	2	432	0	3	0	3	816
4:30PM	376	3	2	381	4	432	2	438	0	8	0	8	827
4:45PM	364	1	0	365	3	445	3	451	0	1	0	1	817
Hourly Total	1435	7	2	1444	12	1676	14	1702	0	18	0	18	3164
5:00PM	382	2	0	384	2	427	5	434	0	3	0	3	821
5:15PM	350	1	0	351	3	451	5	459	0	13	0	13	823
5:30PM	386	5	0	391	5	438	7	450	0	6	0	6	847
5:45PM	337	5	0	342	5	416	6	427	0	6	0	6	775
Hourly Total	1455	13	0	1468	15	1732	23	1770	0	28	0	28	3266
Total	5584	30	3	5617	41	5151	54	5246	0	56	0	56	10919
% Approach	99.4%	0.5%	0.1%	-	0.8%	98.2%	1.0%	-	0%	100%	0%	-	-
% Total	51.1%	0.3%	0%	51.4%	0.4%	47.2%	0.5%	48.0%	0%	0.5%	0%	0.5%	-
Lights	5412	30	3	5445	40	4979	51	5070	0	55	0	55	10570
% Lights	96.9%	100%	100%	96.9%	97.6%	96.7%	94.4%	96.6%	0%	98.2%	0%	98.2%	96.8%
Articulated Trucks	64	0	0	64	1	53	1	55	0	0	0	0	119
% Articulated Trucks	1.1%	0%	0%	1.1%	2.4%	1.0%	1.9%	1.0%	0%	0%	0%	0%	1.1%
Buses and Single-Unit Trucks	108	0	0	108	0	119	2	121	0	1	0	1	230
% Buses and Single-Unit Trucks	1.9%	0%	0%	1.9%	0%	2.3%	3.7%	2.3%	0%	1.8%	0%	1.8%	2.1%

*L: Left, R: Right, T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706



EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

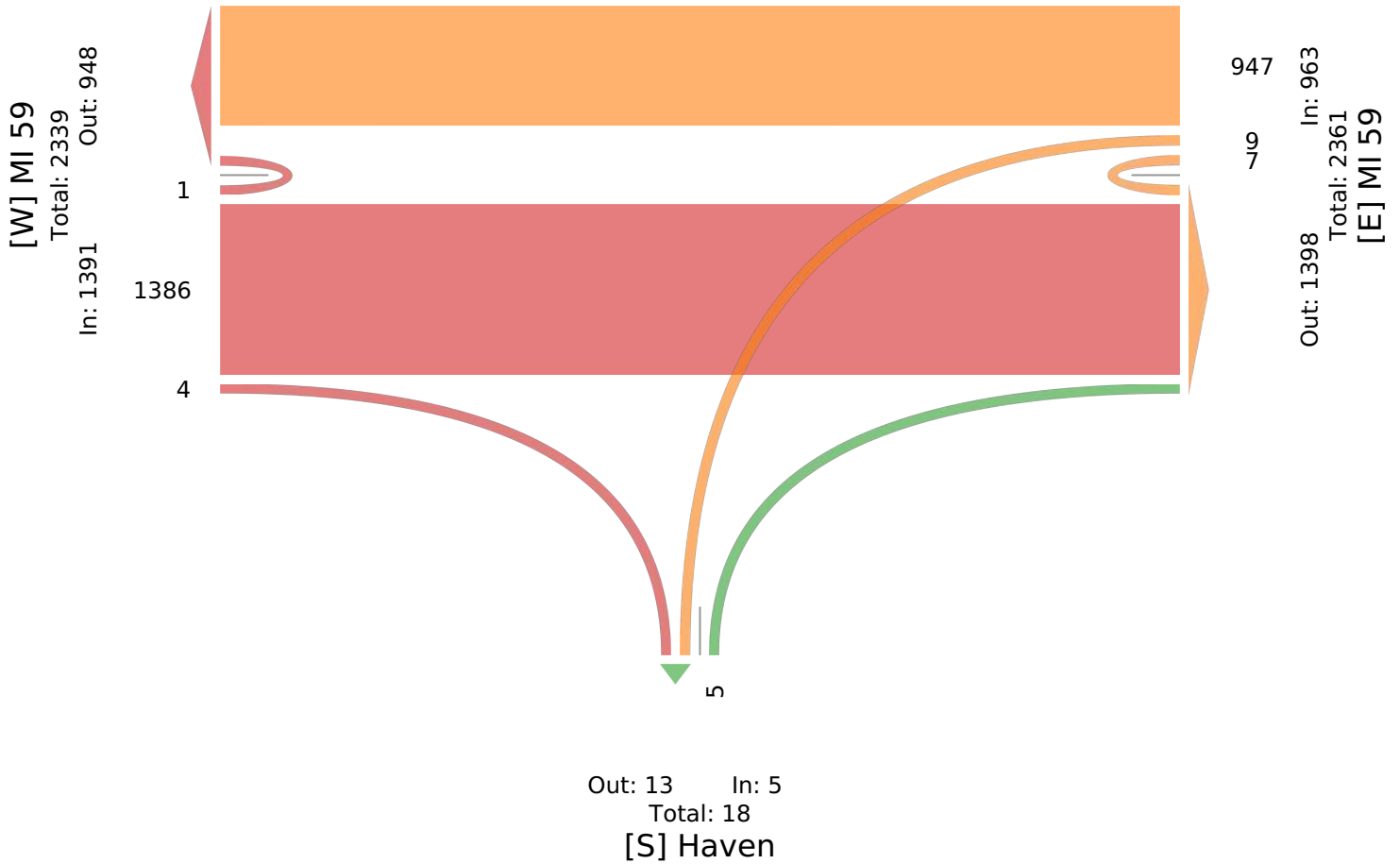
Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Haven Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:30AM	335	1	0	336	3	226	0	229	0	1	0	1	566
7:45AM	384	1	1	386	1	256	3	260	0	1	0	1	647
8:00AM	346	2	0	348	3	235	3	241	0	1	0	1	590
8:15AM	321	0	0	321	2	230	1	233	0	2	0	2	556
Total	1386	4	1	1391	9	947	7	963	0	5	0	5	2359
% Approach	99.6%	0.3%	0.1%	-	0.9%	98.3%	0.7%	-	0%	100%	0%	-	-
% Total	58.8%	0.2%	0%	59.0%	0.4%	40.1%	0.3%	40.8%	0%	0.2%	0%	0.2%	-
PHF	0.902	0.500	0.250	0.901	0.750	0.925	0.583	0.926	-	0.625	-	0.625	0.912
Lights	1321	4	1	1326	9	899	6	914	0	5	0	5	2245
% Lights	95.3%	100%	100%	95.3%	100%	94.9%	85.7%	94.9%	0%	100%	0%	100%	95.2%
Articulated Trucks	32	0	0	32	0	15	0	15	0	0	0	0	47
% Articulated Trucks	2.3%	0%	0%	2.3%	0%	1.6%	0%	1.6%	0%	0%	0%	0%	2.0%
Buses and Single-Unit Trucks	33	0	0	33	0	33	1	34	0	0	0	0	67
% Buses and Single-Unit Trucks	2.4%	0%	0%	2.4%	0%	3.5%	14.3%	3.5%	0%	0%	0%	0%	2.8%

* L: Left, R: Right, T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

Section 9, Item B.



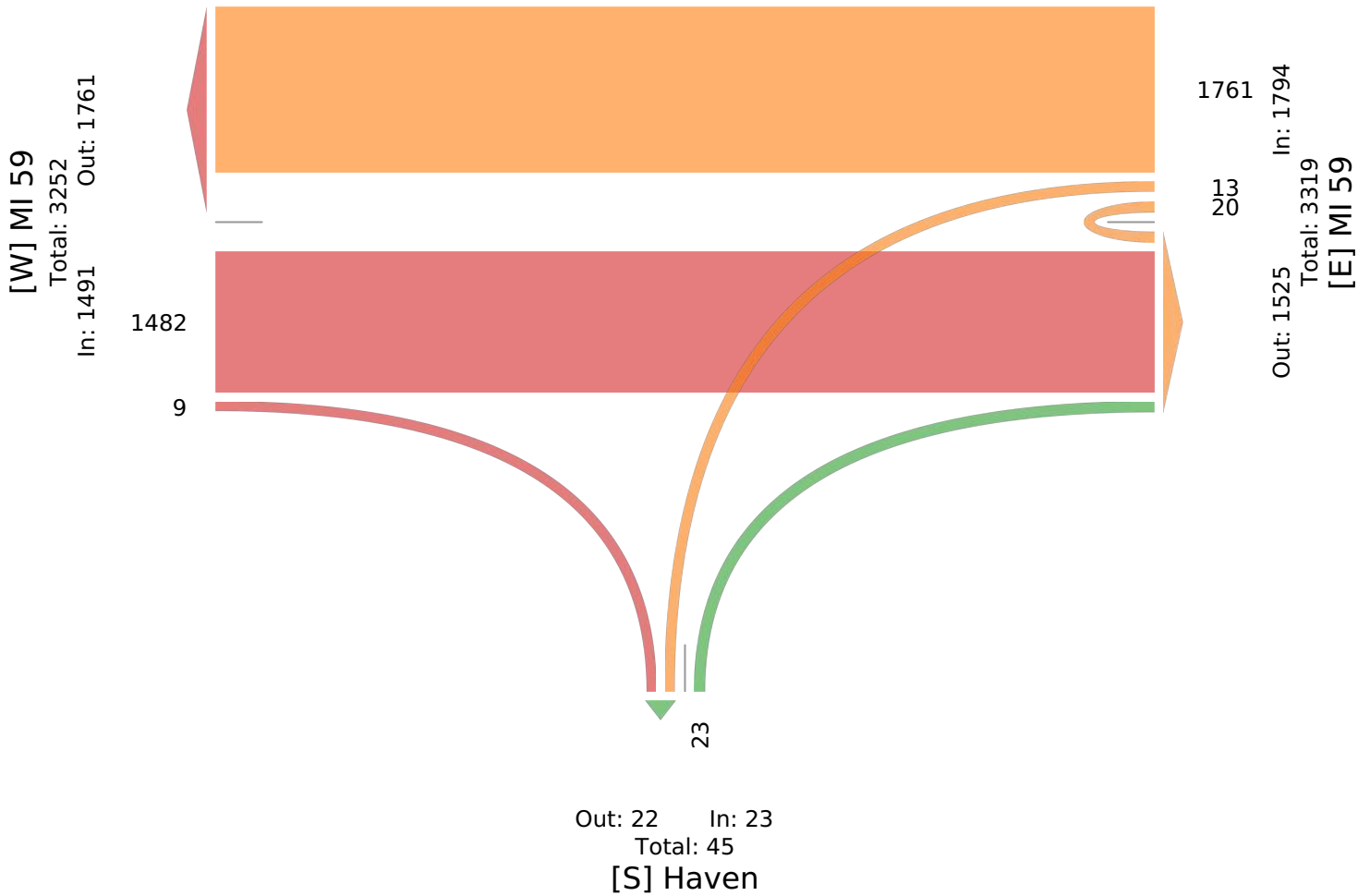
EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Haven Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 4:45PM	364	1	0	365	3	445	3	451	0	1	0	1	817
5:00PM	382	2	0	384	2	427	5	434	0	3	0	3	821
5:15PM	350	1	0	351	3	451	5	459	0	13	0	13	823
5:30PM	386	5	0	391	5	438	7	450	0	6	0	6	847
Total	1482	9	0	1491	13	1761	20	1794	0	23	0	23	3308
% Approach	99.4%	0.6%	0%	-	0.7%	98.2%	1.1%	-	0%	100%	0%	-	-
% Total	44.8%	0.3%	0%	45.1%	0.4%	53.2%	0.6%	54.2%	0%	0.7%	0%	0.7%	-
PHF	0.960	0.450	-	0.953	0.650	0.976	0.714	0.977	-	0.442	-	0.442	0.976
Lights	1451	9	0	1460	13	1725	19	1757	0	23	0	23	3240
% Lights	97.9%	100%	0%	97.9%	100%	98.0%	95.0%	97.9%	0%	100%	0%	100%	97.9%
Articulated Trucks	10	0	0	10	0	14	1	15	0	0	0	0	25
% Articulated Trucks	0.7%	0%	0%	0.7%	0%	0.8%	5.0%	0.8%	0%	0%	0%	0%	0.8%
Buses and Single-Unit Trucks	21	0	0	21	0	22	0	22	0	0	0	0	43
% Buses and Single-Unit Trucks	1.4%	0%	0%	1.4%	0%	1.2%	0%	1.2%	0%	0%	0%	0%	1.3%

* L: Left, R: Right, T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706



Section 9, Item B.

Existing Adj. Year: **2021**

Existing Adjustment Rate: **1.00**
 Growth Rate: **0.5%**
 Buildout Year: **2027**
 Scenario: **AM Peak**

Bckgrd. Dev. A:
 Bckgrd. Dev. B:
 Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR			
#1 - WB M-59 & EB Crossover (East of Hill Rd)	AM Peak 09/30/21		PHF		0.92			0.95			0.60											
			% Heavy		5%			6%			6%											
			Existing		1516	0		978		69												
		2021 Existing Adj.	0	1516	0	0	978	0	69	0	0	0	0	0	0	0						
		2027 Background	0	1562	0	0	1008	0	71	0	0	0	0	0	0	0						
		Bckgrd. Dev. A																				
		Bckgrd. Dev. B																				
		Bckgrd. Dev. C																				
		Total Background	0	1562	0	0	1008	0	71	0	0	0	0	0	0	0						
		Site Generated		96			21		21													
		Pass By																				
		Total Site Gen	0	96	0	0	21	0	21	0	0	0	0	0	0	0						
		Total Future	0	1658	0	0	1029	0	92	0	0	0	0	0	0	0						

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
#2 - EB M-59 & Le Grand Court	AM Peak 09/30/21		PHF		0.91						0.79										
			% Heavy		4%						3%										
			Existing		1459	49							126								
		2021 Existing Adj.	0	1459	49	0	0	0	0	0	0	126	0	0	0	0					
		2027 Background	0	1503	50	0	0	0	0	0	0	130	0	0	0	0					
		Bckgrd. Dev. A																			
		Bckgrd. Dev. B																			
		Bckgrd. Dev. C																			
		Total Background	0	1503	51	0	0	0	0	0	0	130	0	0	0	0					
		Site Generated		117																	
		Pass By																			
		Total Site Gen	0	117	0	0	0	0	0	0	0	0	0	0	0	0					
		Total Future	0	1620	51	0	0	0	0	0	0	130	0	0	0	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#3 - WB M-59 & Hill Road	AM Peak 09/30/21		PHF		0.93									0.60						
			% Heavy							6%					2%					
			Existing				991	56									51			
		2021 Existing Adj.	0	0	0	991	56	0	0	0	0	0	0	0	0	51				
		2027 Background	0	0	0	1021	58	0	0	0	0	0	0	0	0	53				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	1021	58	0	0	0	0	0	0	0	0	53				
		Site Generated				7	35									104				
		Pass By																		
		Total Site Gen	0	0	0	7	35	0	0	0	0	0	0	0	0	104				
		Total Future	0	0	0	1028	93	0	0	0	0	0	0	0	0	157				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#4 - EB M-59 & WB Crossover (West of Hill Rd)	AM Peak 09/30/21		PHF		0.89										0.73					
			% Heavy		4%					5%						6%				
			Existing		1444			978							64					
		2021 Existing Adj.	0	1444	0	0	978	0	0	0	0	0	0	64	0	0				
		2027 Background	0	1488	0	0	1008	0	0	0	0	0	0	66	0	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	1488	0	0	1008	0	0	0	0	0	0	66	0	0				
		Site Generated		53			47							64						
		Pass By																		
		Total Site Gen	0	53	0	0	47	0	0	0	0	0	0	64	0	0				
		Total Future	0	1541	0	0	1055	0	0	0	0	0	0	130	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#5 - WB M-59 & EB Crossover (West of Hill Rd)	AM Peak 09/30/21		PHF		0.89										0.60					
			% Heavy		4%					5%						8%				
			Existing		1444			978				12								
		2021 Existing Adj.	0	1444	0	0	978	0	0	0	12	0	0	0	0	0				
		2027 Background	0	1488	0	0	1008	0	0	0	12	0	0	0	0	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	1488	0	0	1008	0	0	0	12	0	0	0	0	0				
		Site Generated		53			47				10									
		Pass By																		
		Total Site Gen	0	53	0	0	47	0	0	0	10	0	0	0	0	0				
		Total Future	0	1541	0	0	1055	0	0	0	22	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#6 - EB M-59 & Haven Road / WB Crossover	AM Peak 09/30/21		PHF		0.90										0.67					
			% Heavy		5%					5%						6%				
			Existing		1444	4		947						5	7	9				
		2021 Existing Adj.	0	1444	4	0	947	0	0	0	0	0	5	7	9	0				
		2027 Background	0	1488	4	0	976	0	0	0	0	5	7	9	0					
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	1488	4	0	976	0	0	0	0	5	7	9	0					
		Site Generated		31			62							32						
		Pass By																		
		Total Site Gen	0	31	0	0	62	0	0	0	0	0	0	32	0	0				
		Total Future	0	1519	4	0	1038	0	0	0	0	5	39	9	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
#7 - Hill Rd & Driveway 1	AM Peak 09/30/21		PHF	0.92			0.92			0.92											
			% Heavy	2%			2%			2%											
			Existing								56				51						
		2021	Existing Adj.	0	0	0	0	0	0	0	56	0	0	51	0						
		2027	Background	0	0	0	0	0	0	0	58	0	0	53	0						
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	0	0	0	0	0	0	58	0	0	53	0						
			Site Generated				44			1		3	15		1						
			Pass By																		
			Total Site Gen	0	0	0	44	0	1	0	3	15	0	1	0						
			Total Future	0	0	0	44	0	1	0	61	15	0	54	0						

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#8 - Hill Rd & Driveway 2	AM Peak 09/30/21		PHF	0.92			0.92			0.92										
			% Heavy	2%			2%			2%										
			Existing								56				51					
		2021	Existing Adj.	0	0	0	0	0	0	0	56	0	0	51	0					
		2027	Background	0	0	0	0	0	0	0	58	0	0	53	0					
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	0	0	0	0	0	0	58	0	0	53	0					
			Site Generated	2		56				18	16				44	1				
			Pass By																	
			Total Site Gen	2	0	56	0	0	0	18	16	0	0	44	1					
			Total Future	2	0	56	0	0	0	18	74	0	0	97	1					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#9 - Hill Rd & Driveway 3	AM Peak 09/30/21		PHF	0.92			0.92			0.92										
			% Heavy	2%			2%			2%										
			Existing								56				51					
		2021	Existing Adj.	0	0	0	0	0	0	0	56	0	0	51	0					
		2027	Background	0	0	0	0	0	0	0	58	0	0	53	0					
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	0	0	0	0	0	0	58	0	0	53	0					
			Site Generated				4			1	33	2		100						
			Pass By																	
			Total Site Gen	0	0	0	4	0	1	0	33	2	0	100	0					
			Total Future	0	0	0	4	0	1	0	91	2	0	153	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#10 - WB M-59 & Driveway 4	AM Peak 09/30/21		PHF	0.95			0.92			0.92										
			% Heavy	5%			2%			2%										
			Existing					990												
		2021	Existing Adj.	0	0	0	0	990	0	0	0	0	0	0	0	0				
		2027	Background	0	0	0	0	1020	0	0	0	0	0	0	0					
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	0	0	0	1020	0	0	0	0	0	0	0					
			Site Generated					40	17						54					
			Pass By																	
			Total Site Gen	0	0	0	0	40	17	0	0	0	0	0	54					
			Total Future	0	0	0	0	1060	17	0	0	0	0	0	54					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR			
#11 - M-59 & Bogie Lake Road	AM Peak 09/30/21		PHF	0.92			0.95			0.92			0.92									
			% Heavy	5%			6%			2%			2%									
			Existing		1516			795	166		55	200		61	183							
		2021	Existing Adj.	0	1516	0	0	795	166	0	55	200	0	61	183							
		2027	Background	0	1562	0	0	819	171	0	57	206	0	63	189							
			Bckgrd. Dev. A																			
			Bckgrd. Dev. B																			
			Bckgrd. Dev. C																			
			Total Background	0	1562	0	0	819	171	0	57	206	0	63	189							
			Site Generated			96			21													
			Pass By																			
			Total Site Gen	0	96	0	0	21	0	0	0	0	0	0	0							
			Total Future	0	1658	0	0	840	171	0	57	206	0	63	189							

Section 9, Item B.

Existing Adj. Year: 2021

Existing Adjustment Rate: 1.00
 Growth Rate: 0.5%
 Buildout Year: 2027
 Scenario: PM Peak

Bckgrd. Dev. A:
 Bckgrd. Dev. B:
 Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#1 - WB M-59 & EB Crossover (East of Hill Rd)	PM Peak 09/30/21		PHF		0.92			0.95			0.71									
			% Heavy		2%			2%			5%									
		2021	Existing		1555			1933		57										
		2021	Existing Adj.	0	1555	0	0	1933	0	57	0	0	0	0	0	0				
		2027	Background	0	1602	0	0	1992	0	59	0	0	0	0	0	0				
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	1602	0	0	1992	0	59	0	0	0	0	0	0				
			Site Generated		47			98		50										
			Pass By																	
			Total Site Gen	0	47	0	0	98	0	50	0	0	0	0	0	0				
			Total Future	0	1649	0	0	2090	0	109	0	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#2 - EB M-59 & Le Grand Court	PM Peak 09/30/21		PHF		0.95						0.74								
			% Heavy		2%						4%								
		2021	Existing		1505	141						107							
		2021	Existing Adj.	0	1505	141	0	0	0	0	0	107	0	0	0	0			
		2027	Background	0	1551	145	0	0	0	0	0	110	0	0	0	0			
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	1551	145	0	0	0	0	0	110	0	0	0	0			
			Site Generated		97														
			Pass By																
			Total Site Gen	0	97	0	0	0	0	0	0	0	0	0	0	0			
			Total Future	0	1648	145	0	0	0	0	0	110	0	0	0	0			

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#3 - WB M-59 & Hill Road	PM Peak 09/30/21		PHF					0.95							0.71				
			% Heavy					2%							2%				
		2021	Existing					1930		60						57			
		2021	Existing Adj.	0	0	0	0	1930	60	0	0	0	0	0	0	57			
		2027	Background	0	0	0	0	1989	62	0	0	0	0	0	0	59			
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	0	0	0	1989	62	0	0	0	0	0	0	59			
			Site Generated					34	114							68			
			Pass By																
			Total Site Gen	0	0	0	0	34	114	0	0	0	0	0	0	68			
			Total Future	0	0	0	0	2023	176	0	0	0	0	0	0	127			

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#4 - EB M-59 & WB Crossover (West of Hill Rd)	PM Peak 09/30/21		PHF		0.95										0.81				
			% Heavy		2%										2%				
		2021	Existing		1514				1855					132					
		2021	Existing Adj.	0	1514	0	0	1855	0	0	0	0	0	132	0	0			
		2027	Background	0	1560	0	0	1911	0	0	0	0	136	0	0				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	1560	0	0	1912	0	0	0	0	136	0	0				
			Site Generated		67			72						30					
			Pass By																
			Total Site Gen	0	67	0	0	72	0	0	0	0	0	30	0	0			
			Total Future	0	1627	0	0	1984	0	0	0	0	0	166	0	0			

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#5 - WB M-59 & EB Crossover (West of Hill Rd)	PM Peak 09/30/21		PHF		0.95						0.60								
			% Heavy		2%							11%							
		2021	Existing		1514				1855		19								
		2021	Existing Adj.	0	1514	0	0	1855	0	19	0	0	0	0	0	0			
		2027	Background	0	1560	0	0	1911	0	20	0	0	0	0	0				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	1560	0	0	1912	0	20	0	0	0	0	0	0			
			Site Generated		67			72		27									
			Pass By																
			Total Site Gen	0	67	0	0	72	0	27	0	0	0	0	0	0			
			Total Future	0	1627	0	0	1984	0	47	0	0	0	0	0	0			

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBU	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#6 - EB M-59 & Haven Road / WB Crossover	PM Peak 09/30/21		PHF		0.95						0.60				0.68				
			% Heavy		2%							0%			4%				
		2021	Existing		1490	9			1841				23	20	13				
		2021	Existing Adj.	0	1490	9	0	1841	0	0	0	23	20	13	0				
		2027	Background	0	1535	9	0	1897	0	0	0	24	21	13	0				
			Bckgrd. Dev. A																
			Bckgrd. Dev. B																
			Bckgrd. Dev. C																
			Total Background	0	1535	9	0	1898	0	0	0	24	21	13	0				
			Site Generated		77			57						17					
			Pass By																
			Total Site Gen	0	77	0	0	57	0	0	0	0	17	0	0				
			Total Future	0	1612	9	0	1955	0	0	0	24	38	13	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
#7 - Hill Rd & Driveway 1	PM Peak 09/30/21		PHF					0.92			0.92			0.92							
			% Heavy					2%				2%			2%						
			Existing										60			57					
		Existing Adj.	0	0	0	0	0	0	0	0	0	60	0	0	57	0					
		Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0					
		Bckgrd. Dev. A																			
		Bckgrd. Dev. B																			
		Bckgrd. Dev. C																			
		Total Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0					
		Site Generated						30				1	52	1	2						
		Pass By																			
		Total Site Gen	0	0	0	30	0	0	0	0	0	1	52	1	2	0					
		Total Future	0	0	0	30	0	0	0	0	0	63	52	1	61	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
#8 - Hill Rd & Driveway 2	PM Peak 09/30/21		PHF		0.92						0.92			0.92							
			% Heavy		2%							2%			2%						
			Existing										60			57					
		Existing Adj.	0	0	0	0	0	0	0	0	0	60	0	0	57	0					
		Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0					
		Bckgrd. Dev. A																			
		Bckgrd. Dev. B																			
		Bckgrd. Dev. C																			
		Total Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0					
		Site Generated	1		35						60	52			30	2					
		Pass By																			
		Total Site Gen	1	0	35	0	0	0	0	0	60	52	0	0	30	2					
		Total Future	1	0	35	0	0	0	0	0	60	114	0	0	89	2					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#9 - Hill Rd & Driveway 3	PM Peak 09/30/21		PHF					0.92			0.92			0.92						
			% Heavy					2%				2%			2%					
			Existing										60			57				
		Existing Adj.	0	0	0	0	0	0	0	0	0	60	0	0	57	0				
		Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Site Generated						3				112	2		65					
		Pass By																		
		Total Site Gen	0	0	0	3	0	0	0	0	0	112	2	0	65	0				
		Total Future	0	0	0	3	0	0	0	0	0	174	2	0	124	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#10 - WB M-59 & Driveway 4	PM Peak 09/30/21		PHF					0.92			0.92			0.92						
			% Heavy					2%				2%			2%					
			Existing					1874												
		Existing Adj.	0	0	0	0	1874	0	0	0	0	0	0	0	0	0				
		Background	0	0	0	0	1931	0	0	0	0	0	0	0	0	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	0	1932	0	0	0	0	0	0	0	0	0				
		Site Generated						38	61						36					
		Pass By																		
		Total Site Gen	0	0	0	0	38	61	0	0	0	0	0	0	36	0				
		Total Future	0	0	0	0	1970	61	0	0	0	0	0	0	36	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#11 - M-59 & Bogie Lake Road	PM Peak 09/30/21		PHF		0.94			0.95			0.92			0.92						
			% Heavy		2%			2%				2%			2%					
			Existing		1555			1715	225		75	200			73	218				
		Existing Adj.	0	1555	0	0	1715	225	0	75	200	0	0	73	218					
		Background	0	1602	0	0	1767	232	0	77	206	0	0	75	225					
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	1602	0	0	1767	232	0	77	206	0	0	75	225					
		Site Generated		47				98												
		Pass By																		
		Total Site Gen	0	47	0	0	98	0	0	0	0	0	0	0	0	0				
		Total Future	0	1649	0	0	1865	232	0	77	206	0	0	75	225					

OAKLAND COUNTY ROAD COMMISSION
 TRAFFIC - SAFETY DEPARTMENT
 SIGNAL WORK ORDER

Section 9, Item B.

LOCATION: Bogie LK & M-59 DATE: 1-17-17
 CITY/TOWNSHIP: White Lake BY: E Labiano
 COUNTY#: 4110 STATE#: 63041-01-029 CHARGES: WO 168612

PLEASE PERFORM THE FOLLOWING:

ELECTRICAL DEVICE: INSTALL MODERNIZE MAINTENANCE
 UNDERGROUND: _____
 EDISON OK: YES NO JOB#: _____
 COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4
SPLIT.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<input type="checkbox"/> CHANGE TIMING.....																
<input checked="" type="checkbox"/> CHANGE OFFSET.....	<input checked="" type="checkbox"/>															
<input type="checkbox"/> CHANGE CYCLE LENGTH.....																
<input checked="" type="checkbox"/> ADD DIAL/SPLIT.....													<input checked="" type="checkbox"/>			

CHANGE BREAKOUT OR EPROM: _____
 CHANGE HOURS OF OPERATION:
 OLD: 5am - Midnight
 NEW: 5:30am - 11pm
 REPROGRAM TBC (Traffic Events)
 INSTALL INTERCONNECT: TBC MINITROL TONE
 MBT OK: YES NO
 NO CHANGE - RECORD CORRECTION
 OTHER: Rev 23

MDOT RETIMING - FINAL

APPROVED BY: [Signature] DATE: 1/17/17
 DATE INSTALLED: 1/21/17
 INSTALLED BY: Richardson

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

INTERSECTION: BOGIE LAKE & M-59

CITY/VILLAGE/TOWNSHIP: WHITE LAKE

COUNTY#: 4110 MDOT#: 63041-01-029 REV#: 23 DETROIT EDISON#: 1043

DRAWN BY: E Labiano APPROVED BY: [Signature] DATE DRAWN: 1/17/17

INSTALLED BY: _____ DATE INSTLD: 1/1

HOURS OF OPERATION: 7 DAYS: 5:30AM - 11:00PM

HOURS OF FLASHING: 7 DAYS: 11:00PM - 5:30AM

2. UTILITIES - 1. ACCESS

CODE: _____: 1642 CODE: Four digits (0000 - 9999)

4. UNIT DATA - 5. RING STRUCTURE

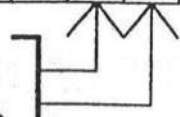
NOTE: INSERT ALL RING #'S FIRST, THEN NXT & CONCUR

CHANNEL:	RING	PHNXT	CONCURRENT PHASES																CHANNEL					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VEH	PED				
PHASE 1:			1																					
PHASE 2:	1	4		1																			2	9
PHASE 3:					1																			
PHASE 4:	1	2				1																	4	10
PHASE 5:							1																	
PHASE 6:								1																
PHASE 7:									1															
PHASE 8:										1														
PHASE 9:											1													
PHASE 10:												1												
PHASE 11:													1											
PHASE 12:														1										
PHASE 13:															1									
PHASE 14:																1								
PHASE 15:																	1							
PHASE 16:																		1						

CODES:

RING Ring Number for Phase (1-4)
 PHNXT Phase Next In Ring (1-16)
 CONCUR PH Phases To Be Concurrent (0=NO, 1=YES)

For vehicle channel & ped channel, enter "1" under channel# shown.



3. PHASE DATA - 1. BASIC TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE
Minimum Green		10		7													00-99
Passage																	0.0-9.9
Maximum #1		9.2		2.9													000-999
Maximum #2																	000-999
Yellow Clearance		4.7		4.3													3.0-9.9
Red Clearance		2.0		6.6													0.0-9.9

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
 PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

3. PHASE DATA - 3. PEDESTRIAN TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE (SEC)
Walk		7		7													00-99
Pedest Clearance		20		12													00-99
Flashing Walk																	
Extend Ped Clear		0		0													
Act Rest in Walk																	

3. PHASE DATA - 4. INITIALIZE & NON ACTUATED RESPONSE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Initial		4		1												
NA Response																

CODES: 0 1 2 3 4
 Initial none inactive red yellow green
 NA Response none to 1 to 2 both -----

3. PHASE DATA - 5. VEHICLE & PEDESTRIAN RECALLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vehicle Recall		3		3												
Pedestrian Recall		0		0												

CODES: 0 1 2 3 4
 Vehicle none 1 call min max soft
 Pedestrian none 1 call ped bot N.A. -----

3. PHASE DATA - 6. NONLOCK & MISC CONTROLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nonlock Memory																
Dual Entry																
Last Car Passage																
Conditional Service																

CODES: 0 = NO 1 = YES

3. PHASE DATA - 8. SPECIAL DETECTOR - 0. SPC 1-8 (Epac 300/M52)

Detector # on Print	1	2	3	4	5	6	7	8
EPAC/M52 "D" Connector	1	6	7	8	4	5	2	3
Assigned Phase								

CODES: 0 1 2 3 4
 Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

A. CONTROLS								RANGE (SEC)
Extend Time								00-99
Delay Time								00-999

See attached detection sheet for D-connector pin assignments

3. PHASE DATA - 8. SPECIAL DETECTOR - 2. VEH 9-16 (2070)

Detector # on Print	1	2	3	4	5	6	7	8
2070 "D" Connector	9	10	11	12	13	14	15	16
Assigned Phase								

CODES: 0 1 2 3 4
 Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

A. CONTROLS								RANGE (SEC)
Extend Time								00-99
Delay Time								00-999

See attached detection sheet for D-connector pin assignments

4. UNIT DATA - 1. STARTUP & MISCELLANEOUS

Start up time : 10 (00-99) State : 0 (0 = fl, 1 = red)
 Auto ped clear : 0 Red revert : 7.0 (2.0 - 9.9)
 Stop time reset : 0 (0 = No, 1 = Yes)

4. UNIT DATA - 2. REMOTE FLASH

Phase	1	2	3	4	5	6	7	8	A	B	C	D	E	F	G	H
FLASH																
YEL																
ALT																
ENTER				1												
EXIT		1														

Test A = Remote Flash: (0 = no & 1 = yes)

6. TIME BASE - 0. SPC FUNCTION MAPPING

FUNCTION NAME
 AS 8-15 = OLI - P FL G PHS
 AS 8-15 = OLI - P FL R PHS

SPC FUNC							
1	2	3	4	5	6	7	8

NOTE: Go up after entering to get this screen.

4. UNIT DATA - 6 ALT SEQ. 08-15

EPAC ALT SEQ (PHASE PAIR TO REVERSE)

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
08						
09						
10						
11						

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
12						
13						
14						
15						

4. UNIT DATA - 3. OVERLAP STANDARD

Phase	1	2	3	4	5	6	7	8	CH#
Overlap A				1					13
Overlap B									
Overlap C									
Overlap D									
Overlap E									
Overlap F									
Overlap G									
Overlap H									

Phase	1	2	3	4	5	6	7	8	CH#
Overlap I									
Overlap J									
Overlap K									
Overlap L									
Overlap M									
Overlap N									
Overlap O									
Overlap P									

Enter a "1" in the channel # shown.

0 = Phase not part of overlap; 1 = Phase part of overlap.

4. UNIT DATA - 4. OVERLAP SPECIAL

Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trail green	4															
Trail yellow	4.3															
Trail red	2.6															
-Green / -yellow (-G/Y)																
+Green (+GRN)																

- * Overlap green omitted by # - phase green; Overlap yellow omitted by # - phase yellow
- * For FYA operation, '-G/Y' entry defines the phase that is the green arrow
- * For FYA operation, '+GRN' entry is the thru phase opposing the FYA phase

4. UNIT DATA - 8. I/O MISCELLANEOUS

Ring#	1	2	3	4	CONN	MODE
Input Response	1				"D"	
Output Select	1				"D"	

Connector "D" : 0 = Standard & 1 = Alternate

I/O Modes	INPUT	OUTPUT
"ABC" Connector		
"D" Connector		

Controller with Solo Detection:
 EPAC300/M52 enter "1" under D Conn Input
 2070 enter "0" under D Conn Input

5. COORDINATION DATA - 1. COORD SETUP

	0	1	2	3	4	5
OPER:	1	FRE	AUT	MAN	-----	-----
MODE:	2	PRM	YLD	PYL	POM	SOM
MAX :	0	INH	MX1	MX2	-----	-----
CORR:	2	DWL	MDW	SWY	SW+	-----
OFST:		BEG	END OF GREEN			
FRCE:		PLN CYC LE TIME				
MX DWELL:		YIELD PERIOD:				

5. COORDINATION DATA - 2. MANUAL CONTROL

DIAL: _____ SPLIT: _____ OFFSET: _____ SYNC: _____

To set cycle zero in manual control enter "1" for sync then press "E".

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

Mode: 0 = actuated, 1 = coord phase, 2 = minimum recall, 3 = maximum recall,
 4 = pedestrian recall, 5 = maximum + pedestrian recall, 6 = phase omit,
 7 = dual coord phase.

Sequence: 00 - 15 (Unit data has definition)

Ring Lag: Ring offset from local cycle zero when not barrier locked to Ring #1.

Time: 00 - 99 seconds.

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 1 / SPLIT 1 CYCLE LENGTH: 110 sccs PROGRAM CYCLE LENGTH

PHASE	1	2	3	4	5	6	7	8
TIME		80		24				
MODE		1		3				

DIAL 1 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 1 CYCLE LENGTH: 90 sccs PROGRAM CYCLE LENGTH

PHASE	1	2	3	4	5	6	7	8
TIME		60		27				
MODE		1		3				

DIAL 2 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	42		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME	56		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 3 / SPLIT 1 CYCLE LENGTH: 120 SECS ^{PROGRAM} CYCLE LENGTH

PHASE	1	2	3	4	5	6	7	8
TIME		90		28				
MODE		1		3				

DIAL 3 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 1 CYCLE LENGTH: 110 SECS

PHASE	1	2	3	4	5	6	7	8
TIME		75		35				
MODE		1		3				

DIAL 4 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	93		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME	36		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

**ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070**

Section 9, Item B.

6. TIME BASE DATA - 2. SET TIME / DATE

-- DATE -- -- TIME -- BEG -- DST -- END
 MM/DD/YY HH:MM:SS MON & WEEK: MM SW MM SW
 / / : : 3 2 11 1

CYCLE ZERO: 24 : 00 (HH:MM - EVENT)

STZ DIFF: -18000 (GPS OFFSET)



2. UTILITIES - 8. CONFIGURE PORTS - 8. GPS CONFIGURATION

GPS: 1 (0-NO, 1-YES) PORT: 4



6. TIME BASE DATA - 3. TRAFFIC EVENTS

PRO DAY	TIME H H : M M	COORD PATRN D / S / O	MAX 2 PHASE #S						OMIT PHASE #S					
***	*****	D/S/O	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
01	00:00	5/5/1												
01	05:30	1/1/1												
01	23:00	5/5/1												
02	00:00	5/5/1												
02	05:30	1/1/1												
02	06:00	2/1/1												
02	09:00	1/1/1												
02	13:55	4/1/1												
02	14:25	1/1/1												
02	15:00	3/1/1												
02	19:00	1/1/1												
02	23:00	5/5/1												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												
	:	/ /												

REFERENCE DATA
 PRO DAY = 01 - 99
 (Program day)

HH:MM = 24 Hour clock

PATTERN: (D/S/O)
 FLASH = 5/5/
 FREE = 0/0/4

MAX2 & OMITs:
 Call free, set pattern
 to 0/0/0.

D = DIAL #
 S = SPLIT #
 O = OFFSET #

6. TIME BASE DATA - 4. AUXILIARY EVENTS

PRO DAY	TIME H H : M M	AUX			DET VALUE			DIM DIM
		A1	A2	A3	D1	D2	D3	
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							

REFERENCE DATA:
PRO DAY = 00 - 99
(Program day)

HH:MM = 24 Hour clock

AUX = Output states
DET VALUE:
1 = Det diag value
2 = Enables report
3 = Repeat multiplier

DIM = Dimming state

ALL: 0 = off, 1 = on

6. TIME BASE DATA - 5. TIME OF YEAR EVENTS

DATE MM / DD / YY	SPECIAL	
	DAY	WEEK
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		

DATE MM / DD / YY	SPECIAL	
	DAY	WEEK
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		
/ /		

REFERENCE DATA
Special day = Any
program day 00 - 99.

Special week:
Week 0 = Pro Day 01-07
Week 1 = Pro Day 11-17
Week 2 = Pro Day 21-27

6. TIME BASE DATA - 6. EQUATE/TRANSFER

CODE: 0 (0 = equate, 1 = transfer)

FROM	TO	TO	TO	TO	TO	TO	TO	TO
01	=	07						
02	=	03	04	05	06			
	=							
	=							
	=							
	=							
	=							

DAY EQUATE: Care must be taken to insure days are not equated to undefined days or days that are equated to other days. The result will be a day without events to run.

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
 PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

7. PREEMPT DATA - 1. ALL PREEMPTS

RING TIMES	1	2	3	4		
MIN GREEN/WALK						
OVERRIDE	FL	1/2	2/3	3/4	4/5	5/6
STATUS						
CODES	0 = NO, 1 = YES					

7. PREEMPT DATA - PREEMPT 1

1. MISC DATA: (0 = no, 1 = yes)

TEST..: ___ N-LOCK.: ___ LINK PR#.: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
EXIT								
CALLS								

2. INTERVAL TIMES:

SEL PED CLR: ___ TRK YEL CHG: ___
 SEL YEL CHG: ___ TRK RED CLR: ___
 SEL RED CLR: ___ DWELL GREEN: ___
 TRACK GREEN: ___ RET PED CLR: ___
 TRK PED CLR: ___ RET YEL CHG: ___
 RET YEL CLR: ___

3. VEHICLE STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)
 CYCLE [] [] [] [] [] [] [] []
 (0=no, 1=act, 2=min recall, 3=max recall)

4. PEDESTRIAN STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=dont wlk, 1=wlk, 2=flwlk, 3=dark)
 CYCLE [] [] [] [] [] [] [] []
 (0 = no, 1 = act, 2 = recall)

5. OVERLAP STATUS:

OVERLAP	A	B	C	D
TRK GRN				
DWELL				

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)
 CYCLE [] [] [] [] [] [] [] []
 (0 = no, 1 = act)

6. LOW PRIORITY: (0=no, 1=yes)

TEST..: ___ N-LOCK.: ___ SKIP.....: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 DWELL: ___ MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
DWELL								
CALLS								

SIGNAL PHASING

PHASE#	ROAD	PHASE	LOAD SW	FLASH
1				
2	M-59	A	2	A
3				
4	BOGIE LAKE (NEAR)	B	4	R
5				
6				
7				
8				
OLA	BOGIE LAKE (FAR)	C	5	R
OLB				
OLC				
OLD				
1PED				
2PED	M-59 PED	WA	6	
3PED				
4PED	BOGIE LAKE PED	WB	8	
5PED				
6PED				
7PED				
8PED				

Controller Information Sheet
For 4 Phase EPAC
Pole Mount Cabinet

Intersection: M-59 and Bogie Lake Rd
County No: 04110
State No: 63041-01-029
Prepared By: Rachel Jones
Date: 11-30-11

Phasing:

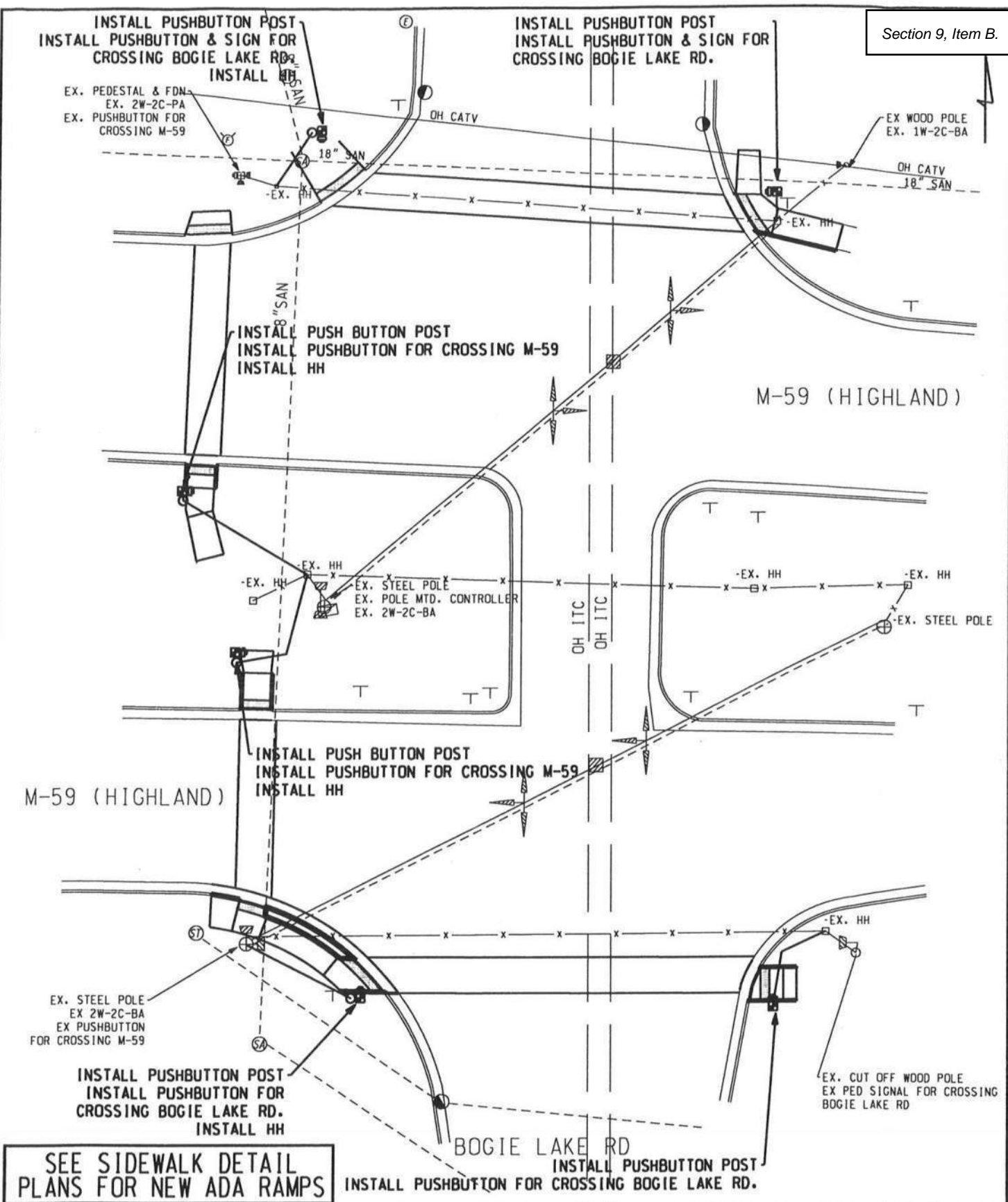
Load Switch 2:	M-59	A	FLA
Load Switch 4:	Bogie Lake Near	B	FLR
Load Switch 5:(OLA)	Bogie Lake Far	C	FLR
Load Switch 6:	M-59 Peds	WA	
Load Switch 8:	Bogie Lake Ped West	WB	

Jumpers:

121-213, 151-152, 153-154, 155-156, 158-159, 161-162, 164-165, 173-174,
175-176, 177-178, 179-180, 185-186, 223-224, 229-230, 233-PB1, 237-PB1,
241-242, 243-244, 245-246, 255-256, 257-258, 259-260, 261-262, 263-PB1,
268-269, 273-274.

Conflict Monitor: 4-5.

All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,4,5.
Minimum Flash = 4 + 2 + 1



SEE SIDEWALK DETAIL PLANS FOR NEW ADA RAMPS



AUTH. NO.	DRAWN DJP
CONT. SEC. 63041	DATE 03-08-11
REF. 110761	SCALE N.T.S.
PLAN 63041-01-029	SHEET 3 OF 4

M-59 (HIGHLAND) AT BOGIE LAKE RD
 WHITE LAKE TOWNSHIP
 OAKLAND COUNTY

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: M-59 & X/O W/O Ormond DATE: 07/28/20
CITY/TOWNSHIP: White Lake BY: Dawn Bierlein
COUNTY#: 4132 STATE#: 63041-01-113 CHARGES: X00058

PLEASE PERFORM THE FOLLOWING:

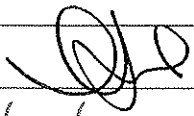
ELECTRICAL DEVICE: INSTALL MODERNIZE MAINTENANCE
 UNDERGROUND: _____
 EDISON OK: YES NO JOB#: _____
 COORDINATE W/DISTRICT 7: _____

	DIAL..															
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4
	SPLIT.															
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<input checked="" type="checkbox"/>	X				X				X							
<input type="checkbox"/>																
<input type="checkbox"/>																
<input type="checkbox"/>																

CHANGE BREAKOUT OR EPROM: _____
 CHANGE HOURS OF OPERATION:
OLD: _____ JUL 30 2020
NEW: _____
 REPROGRAM TBC
 INSTALL INTERCONNECT: TBC MINITROL TONE
 MBT OK: YES NO
 NO CHANGE - RECORD CORRECTION
 OTHER 3.5 Veh recalls-phase 4

(Rev 2)

(LOOPS HOOKED UP & WORKING)

APPROVED BY:  DATE: 7/28/20
DATE INSTALLED: 7/29/20
INSTALLED BY: D-8

INTERSECTION: EB M-59 (HIGHLAND) & X/O W/O ORMOND

Section 9, Item B.

CITY/VILLAGE/TOWNSHIP: WHITE LAKE

COUNTY#: 4132 MDOT#: 63041-01-113 REV#: 2 DETROIT EDISON#:

DRAWN BY: DAWN BIERLEIN APPROVED BY: _____ DATE DRAWN: 07/28/20

INSTALLED BY: _____ DATE INSTLD: 1 1

HOURS OF OPERATION: 7 DAYS: 5:30AM - 10:00pm

HOURS OF FLASHING: 7 DAYS: 10:00PM - 5:30AM



2. UTILITIES - 1. ACCESS

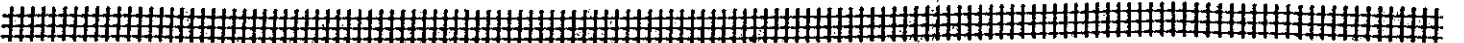
CODE.....: 1642 CODE: Four digits (0000 - 9999)



2. UTILITIES - 6. LOAD DEFAULT

C - CHANGE CURRENT SOFTWARE OPTION

SELECT SOFTWARE OPTION 1- FIO (TS1 ONLY); 2- TS2 (TS2 ONLY)



4. UNIT DATA - 5. RING STRUCTURE

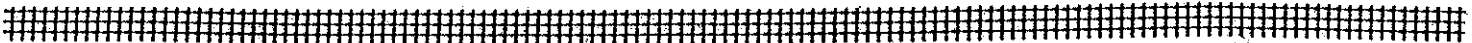
***** NOTE: INSERT ALL RING #'S FIRST, THEN NXT & CONCUR *****

CHANNEL:	RING	PHNXT	CONCURRENT PHASES																CHANNEL	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VEH	PED
PHASE 1:			1																	
PHASE 2:	1	4		1															2	
PHASE 3:					1															
PHASE 4:	1	2				1													4	
PHASE 5:							1													
PHASE 6:								1												
PHASE 7:									1											
PHASE 8:										1										
PHASE 9:											1									
PHASE 10:												1								
PHASE 11:													1							
PHASE 12:														1						
PHASE 13:															1					
PHASE 14:																1				
PHASE 15:																	1			
PHASE 16:																		1		

CODES:

- RING Ring Number for Phase (1-4)
- PHNXT Phase Next in Ring (1-16)
- CONCUR PH Phases To Be Concurrent (0=NO, 1=YES)

For vehicle channel & ped channel, enter "1" under channel# shown.



3. PHASE DATA - 1. BASIC TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE
Minimum Green		10		7													00-99
Passage																	0.0-9.9
Maximum #1		96		30													000-999
Maximum #2																	000-999
Yellow Clearance		5.0		3.0													3.0-9.9
Red Clearance		1.2		2.2													0.0-9.9

Section 9, Item B.

3. PHASE DATA - 3. PEDESTRIAN TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk																
Pedest Clearance																
Flashing Walk																
Extend Ped Clear																
Act Rest in Walk																

00-99
00-99
(0=no, 1-Y+R, 2-Y)

3. PHASE DATA - 4. INITIALIZE & NON ACTUATED RESPONSE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Initial		4		1												
NA Response																

CODES: 0 1 2 3 4
Initial none inactive red yellow green
NA Response none to 1 to 2 both

3. PHASE DATA - 5. VEHICLE & PEDESTRIAN RECALLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vehicle Recall		3		0												
Pedestrian Recall																

CODES: 0 1 2 3 4
Vehicle none 1 call min max soft
Pedestrian none 1 call ped bot N. A.

3. PHASE DATA - 6. NONLOCK & MISC CONTROLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nonlock Memory																
Dual Entry																
Last Car Passage																
Conditional Service																

CODES: 0 = NO 1 = YES

3. PHASE DATA - 7. SPECIAL SEQUENCE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Omit																
-Yel																
Ocal																

3. PHASE DATA - 8. SPECIAL DETECTOR - 0. SPC 1-8 (TS1 ONLY)

Detector # on Print	1	2	3	4	5	6	7	8
Assigned Phase	4	4						
EPAC M52 D-CONNECTOR	1	6	7	8	4	5	2	3

A. CONTROLS

	RANGE (SEC)
Extend Time	00-99
Delay Time	00-999

3. PHASE DATA - 8. SPECIAL DETECTOR - 1. VEH 1-8 OR 2.VEH 9-16 (TS2 ONLY)

Detector # on Print	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Assigned Phase																

CODES: 0 1 2 3 4
Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

A. CONTROLS

	RANGE (SEC)
Extend Time	00-99
Delay Time	00-999

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

4. UNIT DATA - 1. STARTUP & MISCELLANEOUS

Start up time : 10 (00-99) State : 0 (0 = fl, 1 = red)
 Auto ped clear : 0 Red revert : 7.0 (2.0 - 9.9)
 Stop time reset : 0 (0 = No, 1 = Yes)

4. UNIT DATA - 2. REMOTE FLASH

Phase	1	2	3	4	5	6	7	8	A	B	C	D	E	F	G	H
FLASH																
YEL																
ALT																
ENTER				1												
EXIT		1														

Test A = Remote Flash: (0 = no & 1 = yes)

6. TIME BASE - 0. SPC FUNCTION MAPPING

FUNCTION NAME
 AS 8-15 = OLI - P FL G PHS
 AS 8-15 = OLI - P FL R PHS

SPC FUNC							
1	2	3	4	5	6	7	8

NOTE: Go up after entering to get this screen.

4. UNIT DATA - 6. ALT SEQ. 08-15
EPAC ALT SEQ (PHASE PAIR TO REVERSE)

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
08						
09						
10						
11						

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
12						
13						
14						
15						

4. UNIT DATA - 3. OVERLAP STANDARD

Phase	1	2	3	4	5	6	7	8	CH#
Overlap A									
Overlap B									
Overlap C									
Overlap D									
Overlap E									
Overlap F									
Overlap G									
Overlap H									

Phase	1	2	3	4	5	6	7	8	CH#
Overlap I									
Overlap J									
Overlap K									
Overlap L									
Overlap M									
Overlap N									
Overlap O									
Overlap P									

Enter a "1" in the channel # shown.

0 = Phase not part of overlap; 1 = Phase part of overlap.

4. UNIT DATA - 4. OVERLAP SPECIAL

Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trail green																
Trail yellow																
Trail red																
-Green / -yellow (-G/Y)																
+Green (+GRN)																

- * Overlap green omitted by # - phase green; Overlap yellow omitted by # - phase yellow
- * For FYA operation, '-G/Y' entry defines the phase that is the green arrow
- * For FYA operation, '+GRN' entry is the thru phase opposing the FYA phase

4. UNIT DATA - 8. I/O MISCELLANEOUS

Ring#	1	2	3	4	CONN	MODE
Input Response	1				"D"	
Output Select	1				"D"	

Connector "D" : 0 = Standard & 1 = Alternate

I/O Modes	INPUT	OUTPUT
"ABC" Connector		
"D" Connector		

Controller with Solo Detection:
 EPAC300/M52 enter "1" under D Conn Input
 2070 enter "0" under D Conn Input



5. COORDINATION DATA - 1. COORD SETUP

	0	1	2	3	4	5
OPER: <u>1</u>	FRE	AUT	MAN	-----	-----	-----
MODE: <u>0</u>	PRM	YLD	PYL	POM	SOM	FAC
MAX : <u>0</u>	INH	MX1	MX2	-----	-----	-----
CORR: <u>2</u>	DWL	MDW	SWY	SW+	-----	-----
OFST: _____	BEG	END OF GREEN				
FRCE: _____	PLN CYC LE TIME					
MX DWELL: _____	YIELD PERIOD:					



5. COORDINATION DATA - 2. MANUAL CONTROL

DIAL: _____ SPLIT: _____ OFFSET: _____ SYNC: _____

To set cycle zero in manual control enter "1" for sync then press "E".



5. COORDINATION DATA - 3. DIAL/SPLIT DATA

Mode: 0 = actuated, 1 = coord phase, 2 = minimum recall, 3 = maximum recall,
 4 = pedestrian recall, 5 = maximum + pedestrian recall, 6 = phase omit,
 7 = dual coord phase.

Sequence: 00 - 15 (Unit data has definition)

Ring Lag: Ring offset from local cycle zero when not barrier locked to Ring #1.

Time: 00 - 99 seconds.

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 1 / SPLIT 1 CYCLE LENGTH: 110 Secs

PHASE	1	2	3	4	5	6	7	8
TIME		85		25				
MODE		1		0				

DIAL 1 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 1 CYCLE LENGTH: 90 Secs

PHASE	1	2	3	4	5	6	7	8
TIME		60		30				
MODE		1		0				

DIAL 2 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	40		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME	31		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 3 / SPLIT 1 CYCLE LENGTH: 120 secs

PHASE	1	2	3	4	5	6	7	8
TIME		96		24				
MODE		1		0				

DIAL 3 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 1 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	82		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

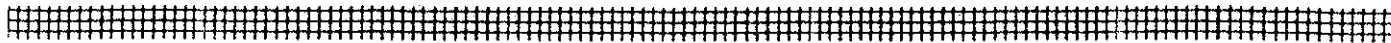
Section 9, Item B.

6. TIME BASE DATA - 2. SET TIME / DATE

-- DATE -- -- TIME -- BEG -- DST -- END
MM/DD/YY HH:MM:SS MON & WEEK: MM SW MM SW
 / / : : 3 2 11 1

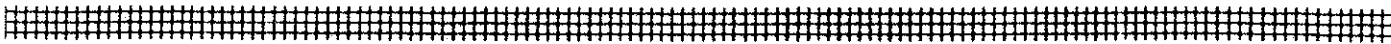
CYCLE ZERO: 24 : 00 (HH:MM - EVENT)

STZ DIFF: -18000 (GPS OFFSET)



2. UTILITIES - 8. CONFIGURE PORTS - 8. GPS CONFIGURATION

GPS: 1 (0-NO, 1-YES) PORT: 4



6. TIME BASE DATA - 3. TRAFFIC EVENTS

PRO DAY	TIME H H : M M	COORD PATRN	MAX 2 PHASE #S	OMIT PHASE #S
***	*****	D / S / O	*****	*****
01	00:00	5/5/1		
01	05:30	1/1/1		
01	22:00	5/5/1		
02	00:00	5/5/1		
02	05:30	1/1/1		
02	06:00	2/1/1		
02	09:00	1/1/1		
02	15:00	3/1/1		
02	19:00	1/1/1		
02	22:00	5/5/1		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		
	:	/ /		

REFERENCE DATA

PRO DAY = 01 - 99
(Program day)

HH:MM = 24 Hour clock

PATTERN: (D/S/O)
FLASH = 5/5/
FREE = 0/0/4

MAX2 & OMIT:
Call free, set pattern to 0/0/0.

D = DIAL #
S = SPLIT #
0 = OFFSET #

6. TIME BASE DATA - 4. AUXILIARY EVENTS

PRO DAY	TIME HH : MM	AUX			DET VALUE			DIM DIM
		A1	A2	A3	D1	D2	D3	
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							
:	:							

REFERENCE DATA:
PRO DAY = 00 - 99
(Program day)

HH:MM = 24 Hour clock

AUX = Output states
DET VALUE:
1 = Def diag value
2 = Enables report
3 = Repeat multiplier

DIM = Dimming state

ALL: 0 = off, 1 = on

6. TIME BASE DATA - 5. TIME OF YEAR EVENTS

DATE MM / DD / YY	SPECIAL		DATE MM / DD / YY	SPECIAL	
	DAY	WEEK		DAY	WEEK
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		
/ /			/ /		

REFERENCE DATA
Special day = Any
program day 00 - 99.

Special week:
Week 0 = Pro Day 01-07
Week 1 = Pro Day 11-17
Week 2 = Pro Day 21-27

6. TIME BASE DATA - 6. EQUATE/TRANSFER

CODE: ○ (0 = equate, 1 = transfer)

FROM	01 = 07	02 = 03	04	05	06			
"								
"								
"								
"								
"								

DAY EQUATE: Care must be taken to insure days are not equated to undefined days or days that are equated to other days. The result will be a day without events to run.

**ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070**

Section 9, Item B.

7. PREEMPT DATA - 1. ALL PREEMPTS

RING TIMES	1	2	3	4	
MIN GREEN/WALK					
OVERRIDE	FL	1/2	2/3	3/4	4/5
STATUS					5/6
CODES	0 = NO, 1 = YES				

7. PREEMPT DATA - PREEMPT 1

1. MISC DATA: (0 = no, 1 = yes)

TEST..: ___ N-LOCK.: ___ LINK PR#..: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
EXIT								
CALLS								

2. INTERVAL TIMES:

SEL PED CLR : ___ TRK YEL CHG : ___
 SEL YEL CHG : ___ TRK RED CLR : ___
 SEL RED CLR : ___ DWELL GREEN: ___
 TRACK GREEN: ___ RET PED CLR : ___
 TRK PED CLR : ___ RET YEL CHG : ___
 RET YEL CLR : ___

4. PEDESTRIAN STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=dont wlk, 1=wlk, 2=flwlk, 3=dark)

CYCLE								
-------	--	--	--	--	--	--	--	--

(0 = no, 1 = act, 2 = recall)

5. OVERLAP STATUS:

OVERLAP	A	B	C	D
TRK GRN				
DWELL				

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)

CYCLE								
-------	--	--	--	--	--	--	--	--

(0 = no, 1 = act)

3. VEHICLE STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)

CYCLE								
-------	--	--	--	--	--	--	--	--

(0=no, 1=act, 2=min recall, 3=max recall)

6. LOW PRIORITY: (0=no, 1=yes)

TEST..: ___ N-LOCK.: ___ SKIP.....: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 DWELL: ___ MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
DWELL								
CALLS								

SIGNAL PHASING

PHASE#	ROAD	PHASE	LOAD SW	FLASH
1				
2	EB M-59	A	2	A
3				
4	X10 W10 ORMOND	B	4	R
5				
6				
7				
8				
OLA				
OLB				
OLC				
OLD				
1PED				
2PED				
3PED				
4PED				
5PED				
6PED				
7PED				
8PED				

Controller Information Sheet
4 Phase EPAC

Intersection : EB M-59 & X/O W/O Ormond
 City/Twp : White Lake
 State No. : 63041-01-113
 County No. : 4132
 Prepared By : Dawn Bierlein
 Date : 07/28/20

Phasing:

Load Switch 2: EB M-59	A	FLA
Load Switch 4: X/O W/O Ormond	B	FLR

Jumpers:

121-213, 151-152, 153-154, 155-156, 173-174, 175-176, 177-178, 233-PB1, 237-PB1, 241-PB1, 255-256, 257-258, 259-260, 261-262, 263-PB1.

MMU: (MENU : SET/VIEW CONFIG)

Dual Indication Enable: R+G: Channel 2, 4
 R+Y: Channel 2, 4
 G+Y: Channel 2, 4

Red Fail Enable: Enable: Channel 2 & 4

Y & R Clearance Disable: Channel 2 & 4 Enabled

Unit Options: All OFF except:
 Recurrent pulse
 Program Memory Card

Program Card: Compatible Channels: None
 Min Flash Time : 4+2+1
 Min Yellow Change Disable: None
 Voltage Monitor Latch: NONE

D Connector Form for Mod 52 w/Loops

Intersection Name: M-59 & X/O W/O Ormond

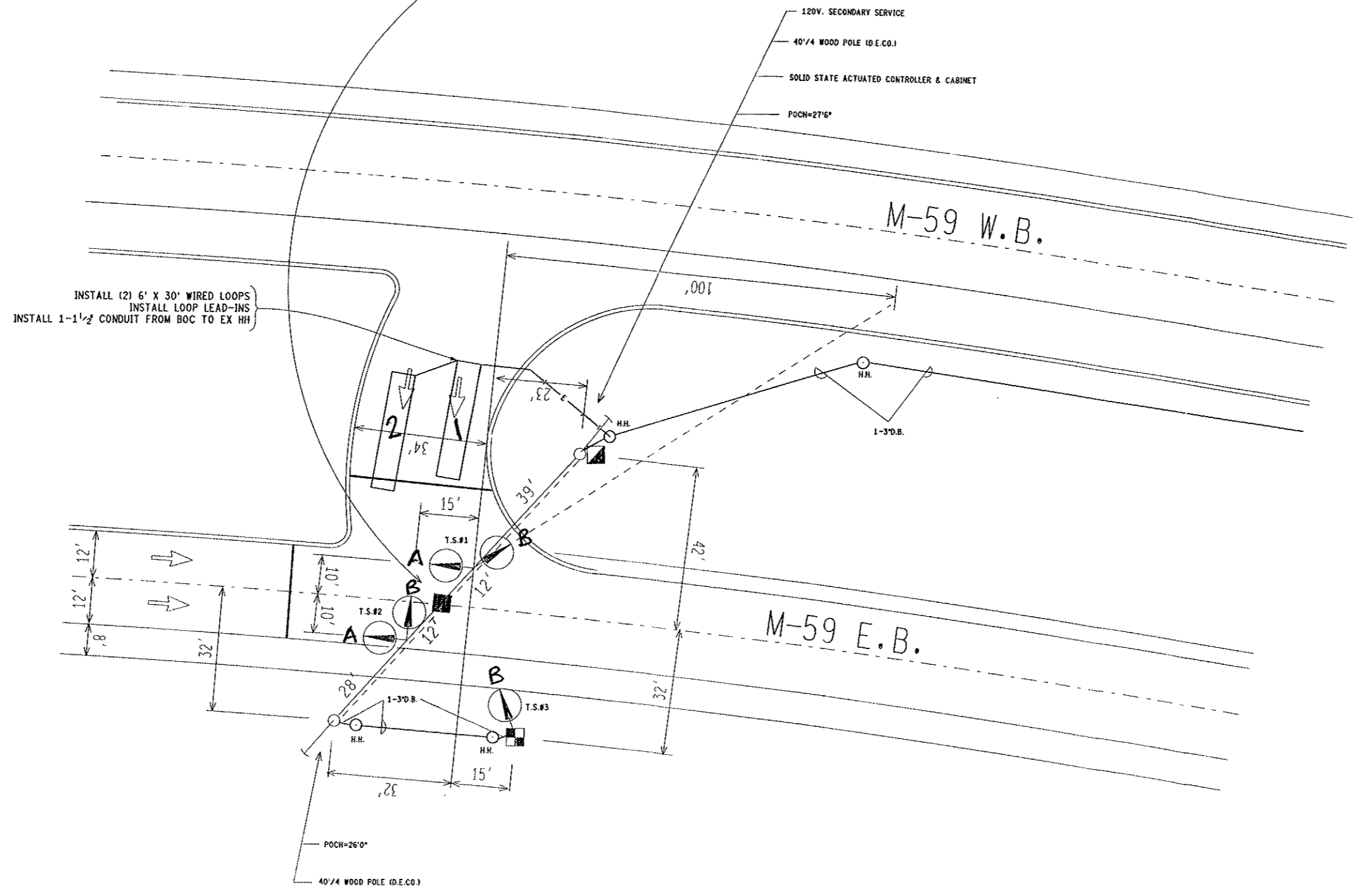
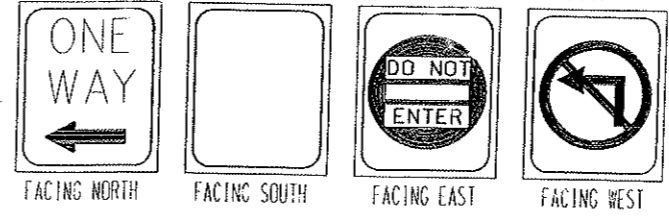
County No: 4132

Date: 07/28/20

Detector # on Print	Detector Description	D-Conn Term #	D-Conn Description	Phase
1	X/O L	1	Det. 9	
2	X/O R	6	Det. 14	
		7	Det. 15	
		8	Det. 16	
		4	Det. 12	
		5	Det. 13	
		2	Det. 10	
		3	Det. 11	

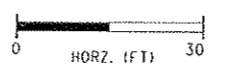


24"X30" 4-WAY ILLUMINATED CASE SIGN



64132

FINAL ROW PLAN REVISIONS		SUBMITTAL DATE:	
NO.	DATE	NO.	DATE



DATE: 2/27/20	CS: 63041
DESIGN UNIT: SIGNALS	JN:
TSC: OAKLAND	TWA#17774

TRAFFIC SIGNAL CONSTRUCTION SHEET	
M-59 (HIGHLAND) EB @ X-OVER W OF ORMOND RD	
WHITE LAKE TWP, OAKLAND COUNTY	
DRAWING	SHEET
SIGNAL	SHEET
M-59	
CON001	

SIGNALS	
OPENINGS:	19
CYCLIC WATTS:	2250
STEADY WATTS:	300
PLAN:	63041-01-113

Appendix 2

Existing LOS Output Reports

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	978	69	0
Future Vol, veh/h	0	0	0	978	69	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	92
Heavy Vehicles, %	2	2	6	6	6	5
Mvmt Flow	0	0	0	1029	115	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 515
Stage 1	-	- 0
Stage 2	-	- 515
Critical Hdwy	-	- 6.92
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.92
Follow-up Hdwy	-	- 3.56
Pot Cap-1 Maneuver	0	- 480
Stage 1	0	- - 0
Stage 2	0	- 553
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 480
Mov Cap-2 Maneuver	-	- 480
Stage 1	-	- -
Stage 2	-	- 553

Approach	WB	NB
HCM Control Delay, s	0	14.8
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	480	-
HCM Lane V/C Ratio	0.24	-
HCM Control Delay (s)	14.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.9	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1459	49	0	0	0	126
Future Vol, veh/h	1459	49	0	0	0	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1603	54	0	0	0	159

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	802
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	325
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	325
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	26.3
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	325	-	-
HCM Lane V/C Ratio	0.491	-	-
HCM Control Delay (s)	26.3	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.6	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	991	56	0	51
Future Vol, veh/h	0	0	991	56	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	6	6	2	2
Mvmt Flow	0	0	1066	60	0	85

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	13.9
HCM LOS		B

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	491
HCM Lane V/C Ratio	-	-	0.173
HCM Control Delay (s)	-	-	13.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.6

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1444	0	0	64	0
Future Vol, veh/h	0	1444	0	0	64	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	92	92	73	95
Heavy Vehicles, %	4	4	2	2	6	6
Mvmt Flow	0	1622	0	0	88	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	811	-
Stage 1	-	-	0	-
Stage 2	-	-	811	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	309	0
Stage 1	0	-	-	0
Stage 2	0	-	387	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	309	-
Mov Cap-2 Maneuver	-	-	309	-
Stage 1	-	-	-	-
Stage 2	-	-	387	-

Approach	EB	SB
HCM Control Delay, s	0	21.2
HCM LOS		C

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	309
HCM Lane V/C Ratio	-	0.284
HCM Control Delay (s)	-	21.2
HCM Lane LOS	-	C
HCM 95th %tile Q(veh)	-	1.1

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	978	12	0
Future Vol, veh/h	0	0	0	978	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1029	20	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 515
Stage 1	-	- 0
Stage 2	-	- 515
Critical Hdwy	-	- 6.96
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.96
Follow-up Hdwy	-	- 3.58
Pot Cap-1 Maneuver	0	- 475 0
Stage 1	0	- - 0
Stage 2	0	- 548 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 475 -
Mov Cap-2 Maneuver	-	- 475 -
Stage 1	-	- - -
Stage 2	-	- 548 -

Approach	WB	NB
HCM Control Delay, s	0	12.9
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	475	-
HCM Lane V/C Ratio	0.042	-
HCM Control Delay (s)	12.9	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.1	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1444	4	0	0	0	0	0	5	7	9	0
Future Vol, veh/h	0	1444	4	0	0	0	0	0	5	7	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	14688	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	6
Mvmt Flow	0	1604	4	0	0	0	0	0	8	10	13	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	802	802	1608	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	802	1608	-
Critical Hdwy	-	-	-	-	-	6.9	7.62	6.62	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.62	5.62	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.56	4.06	-
Pot Cap-1 Maneuver	0	-	-	0	0	331	268	100	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	335	156	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	331	262	100	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	262	100	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	327	156	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.1	36.7
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	331	-	-	137
HCM Lane V/C Ratio	0.024	-	-	0.174
HCM Control Delay (s)	16.1	-	-	36.7
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	0.6

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	76
Average Queue (ft)	34
95th Queue (ft)	63
Link Distance (ft)	32
Upstream Blk Time (%)	13
Queuing Penalty (veh)	10
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	127
Average Queue (ft)	44
95th Queue (ft)	92
Link Distance (ft)	269
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	71
Average Queue (ft)	20
95th Queue (ft)	46
Link Distance (ft)	450
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	82
Average Queue (ft)	33
95th Queue (ft)	66
Link Distance (ft)	34
Upstream Blk Time (%)	13
Queuing Penalty (veh)	9
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	44
Average Queue (ft)	9
95th Queue (ft)	34
Link Distance (ft)	49
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	29	56
Average Queue (ft)	4	15
95th Queue (ft)	18	44
Link Distance (ft)	507	51
Upstream Blk Time (%)		1
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	10
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	12
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	10
Average Queue (ft)	0
95th Queue (ft)	7
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 19

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	1933	57	0
Future Vol, veh/h	0	0	0	1933	57	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	71	94
Heavy Vehicles, %	2	2	2	2	5	2
Mvmt Flow	0	0	0	2035	80	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1018
Stage 1	-	- 0
Stage 2	-	- 1018
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 228
Stage 1	0	- - 0
Stage 2	0	- 303
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 228
Mov Cap-2 Maneuver	-	- 228
Stage 1	-	- -
Stage 2	-	- 303

Approach	WB	NB
HCM Control Delay, s	0	29.1
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	228	-
HCM Lane V/C Ratio	0.352	-
HCM Control Delay (s)	29.1	-
HCM Lane LOS	D	-
HCM 95th %tile Q(veh)	1.5	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1505	141	0	0	0	107
Future Vol, veh/h	1505	141	0	0	0	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1584	148	0	0	0	145

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	792
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	328
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	328
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	24.4
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	328	-	-
HCM Lane V/C Ratio	0.441	-	-
HCM Control Delay (s)	24.4	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	2.2	-	-

HCM 6th TWSC
3: WB M-59 (Highland Rd) & Hill Rd

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1930	60	0	57
Future Vol, veh/h	0	0	1930	60	0	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	0	0	2032	63	0	80

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1016
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 236
Stage 1	-	0 -
Stage 2	-	0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 236
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	27.9
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	236
HCM Lane V/C Ratio	-	-	0.34
HCM Control Delay (s)	-	-	27.9
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.4

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1514	0	0	132	0
Future Vol, veh/h	0	1514	0	0	132	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	95
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	0	1594	0	0	163	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	797	-
Stage 1	-	-	0	-
Stage 2	-	-	797	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	324	0
Stage 1	0	-	-	0
Stage 2	0	-	404	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	324	-
Mov Cap-2 Maneuver	-	-	324	-
Stage 1	-	-	-	-
Stage 2	-	-	404	-

Approach	EB	SB
HCM Control Delay, s	0	26.8
HCM LOS		D

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	324
HCM Lane V/C Ratio	-	0.503
HCM Control Delay (s)	-	26.8
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	2.7

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	1855	19	0
Future Vol, veh/h	0	0	0	1855	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	95
Heavy Vehicles, %	2	2	2	2	11	2
Mvmt Flow	0	0	0	1953	32	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 977
Stage 1	-	- 0
Stage 2	-	- 977
Critical Hdwy	-	- 7.02
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.02
Follow-up Hdwy	-	- 3.61
Pot Cap-1 Maneuver	0	- 233 0
Stage 1	0	- - 0
Stage 2	0	- 305 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 233 -
Mov Cap-2 Maneuver	-	- 233 -
Stage 1	-	- - -
Stage 2	-	- 305 -

Approach	WB	NB
HCM Control Delay, s	0	22.9
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	233	-
HCM Lane V/C Ratio	0.136	-
HCM Control Delay (s)	22.9	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.5	-

HCM 6th TWSC
6: Haven Rd & EB M-59 (Highland Road)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1490	9	0	0	0	0	0	23	20	13	0
Future Vol, veh/h	0	1490	9	0	0	0	0	0	23	20	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	16224	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	60	60	60	68	68	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	4	4	2
Mvmt Flow	0	1568	9	0	0	0	0	0	38	29	19	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	784	784	1577	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	784	1577	-
Critical Hdwy	-	-	-	-	-	6.9	7.58	6.58	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.54	4.04	-
Pot Cap-1 Maneuver	0	-	-	0	0	340	280	106	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	348	165	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	340	248	106	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	106	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	309	165	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.9	36.5
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	340	-	-	162
HCM Lane V/C Ratio	0.113	-	-	0.3
HCM Control Delay (s)	16.9	-	-	36.5
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	1.2

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	90
Average Queue (ft)	43
95th Queue (ft)	83
Link Distance (ft)	32
Upstream Blk Time (%)	38
Queuing Penalty (veh)	22
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	128
Average Queue (ft)	39
95th Queue (ft)	85
Link Distance (ft)	270
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	127
Average Queue (ft)	35
95th Queue (ft)	88
Link Distance (ft)	941
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	87
Average Queue (ft)	55
95th Queue (ft)	88
Link Distance (ft)	34
Upstream Blk Time (%)	41
Queuing Penalty (veh)	55
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	58
Average Queue (ft)	16
95th Queue (ft)	47
Link Distance (ft)	48
Upstream Blk Time (%)	2
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	EB	NB	SB
Directions Served	R	R	LT
Maximum Queue (ft)	4	41	56
Average Queue (ft)	0	14	23
95th Queue (ft)	3	38	51
Link Distance (ft)		507	51
Upstream Blk Time (%)			2
Queuing Penalty (veh)			1
Storage Bay Dist (ft)	280		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	4
95th Queue (ft)	23
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	84
Average Queue (ft)	7
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	37
Average Queue (ft)	2
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	1
95th Queue (ft)	13
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 79

Appendix 3

Background LOS Output Reports

1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1008	71	0
Future Vol, veh/h	0	0	0	1008	71	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	92	92
Heavy Vehicles, %	2	2	2	6	5	5
Mvmt Flow	0	0	0	1061	77	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	531
Stage 1	-	0
Stage 2	-	531
Critical Hdwy	-	6.9
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	5.9
Follow-up Hdwy	-	3.55
Pot Cap-1 Maneuver	0	471
Stage 1	0	0
Stage 2	0	546
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	471
Mov Cap-2 Maneuver	-	471
Stage 1	-	-
Stage 2	-	546

Approach	WB	NB
HCM Control Delay, s	0	14.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	471	-
HCM Lane V/C Ratio	0.164	-
HCM Control Delay (s)	14.1	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.6	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Background

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1503	51	0	0	0	130
Future Vol, veh/h	1503	51	0	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1652	56	0	0	0	165

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	826
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	313
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	313
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	28.6
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	313	-	-
HCM Lane V/C Ratio	0.526	-	-
HCM Control Delay (s)	28.6	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.9	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1021	58	0	53
Future Vol, veh/h	0	0	1021	58	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	6	6	2	2
Mvmt Flow	0	0	1098	62	0	88

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	14.2
HCM LOS		B

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	480
HCM Lane V/C Ratio	-	-	0.184
HCM Control Delay (s)	-	-	14.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.7

4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

AM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1488	0	0	66	0
Future Vol, veh/h	0	1488	0	0	66	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	92	92	73	92
Heavy Vehicles, %	2	4	2	2	6	2
Mvmt Flow	0	1672	0	0	90	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	836	-
Stage 1	-	-	0	-
Stage 2	-	-	836	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	298	0
Stage 1	0	-	-	0
Stage 2	0	-	376	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	298	-
Mov Cap-2 Maneuver	-	-	298	-
Stage 1	-	-	-	-
Stage 2	-	-	376	-

Approach	EB	SB
HCM Control Delay, s	0	22.3
HCM LOS		C

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	298
HCM Lane V/C Ratio	-	0.303
HCM Control Delay (s)	-	22.3
HCM Lane LOS	-	C
HCM 95th %tile Q(veh)	-	1.2

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1008	12	0
Future Vol, veh/h	0	0	0	1008	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1061	20	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 531
Stage 1	-	- 0
Stage 2	-	- 531
Critical Hdwy	-	- 6.96
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.96
Follow-up Hdwy	-	- 3.58
Pot Cap-1 Maneuver	0	- 464 0
Stage 1	0	- - 0
Stage 2	0	- 537 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 464 -
Mov Cap-2 Maneuver	-	- 464 -
Stage 1	-	- - -
Stage 2	-	- 537 -

Approach	WB	NB
HCM Control Delay, s	0	13.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	464	-
HCM Lane V/C Ratio	0.043	-
HCM Control Delay (s)	13.1	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.1	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1488	4	0	0	0	0	0	5	7	9	0
Future Vol, veh/h	0	1488	4	0	0	0	0	0	5	7	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	1084909568	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	92
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	2
Mvmt Flow	0	1653	4	0	0	0	0	0	8	10	13	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	827	827	1657	-		
Stage 1	-	-	-	-	-	-	-	0	0	-		
Stage 2	-	-	-	-	-	-	-	827	1657	-		
Critical Hdwy	-	-	-	-	-	-	6.9	7.62	6.62	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.62	5.62	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.56	4.06	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	319	257	93	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	324	147	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	319	251	93	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	251	93	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	316	147	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.6	39.5
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	319	-	-	128
HCM Lane V/C Ratio	0.025	-	-	0.187
HCM Control Delay (s)	16.6	-	-	39.5
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	0.7

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	87
Average Queue (ft)	36
95th Queue (ft)	68
Link Distance (ft)	32
Upstream Blk Time (%)	15
Queuing Penalty (veh)	11
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	136
Average Queue (ft)	52
95th Queue (ft)	104
Link Distance (ft)	270
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	89
Average Queue (ft)	22
95th Queue (ft)	59
Link Distance (ft)	449
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	EB	SB
Directions Served	T	L
Maximum Queue (ft)	7	81
Average Queue (ft)	0	36
95th Queue (ft)	5	63
Link Distance (ft)	133	33
Upstream Blk Time (%)		18
Queuing Penalty (veh)		13
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	40
Average Queue (ft)	8
95th Queue (ft)	32
Link Distance (ft)	49
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	28	54
Average Queue (ft)	6	12
95th Queue (ft)	24	39
Link Distance (ft)	507	53
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	17
Average Queue (ft)	1
95th Queue (ft)	11
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	26
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 24

1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

PM Peak Hour

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1992	59	0
Future Vol, veh/h	0	0	0	1992	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	71	94
Heavy Vehicles, %	2	2	2	2	5	2
Mvmt Flow	0	0	0	2097	83	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1049
Stage 1	-	- 0
Stage 2	-	- 1049
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 218 0
Stage 1	0	- - 0
Stage 2	0	- 292 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 218 -
Mov Cap-2 Maneuver	-	- 218 -
Stage 1	-	- - -
Stage 2	-	- 292 -

Approach	WB	NB
HCM Control Delay, s	0	31.3
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	218	-
HCM Lane V/C Ratio	0.381	-
HCM Control Delay (s)	31.3	-
HCM Lane LOS	D	-
HCM 95th %tile Q(veh)	1.7	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Background

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1551	145	0	0	0	110
Future Vol, veh/h	1551	145	0	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1633	153	0	0	0	149

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	817
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	315
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	315
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	26.2
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	315	-	-
HCM Lane V/C Ratio	0.472	-	-
HCM Control Delay (s)	26.2	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.4	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1989	62	0	59
Future Vol, veh/h	0	0	1989	62	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2094	65	0	83

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1047
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 225
Stage 1	-	0 -
Stage 2	-	0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 225
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	30.1
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	225
HCM Lane V/C Ratio	-	-	0.369
HCM Control Delay (s)	-	-	30.1
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.6

4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

PM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1560	0	0	136	0
Future Vol, veh/h	0	1560	0	0	136	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1642	0	0	168	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	821	-
Stage 1	-	-	0	-
Stage 2	-	-	821	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	313	0
Stage 1	0	-	-	0
Stage 2	0	-	393	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	313	-
Mov Cap-2 Maneuver	-	-	313	-
Stage 1	-	-	-	-
Stage 2	-	-	393	-

Approach	EB	SB
HCM Control Delay, s	0	29.1
HCM LOS		D

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	313
HCM Lane V/C Ratio	-	0.536
HCM Control Delay (s)	-	29.1
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	3

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1912	20	0
Future Vol, veh/h	0	0	0	1912	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	95
Heavy Vehicles, %	2	2	2	2	11	2
Mvmt Flow	0	0	0	2013	33	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1007
Stage 1	-	- 0
Stage 2	-	- 1007
Critical Hdwy	-	- 7.02
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.02
Follow-up Hdwy	-	- 3.61
Pot Cap-1 Maneuver	0	- 222 0
Stage 1	0	- - 0
Stage 2	0	- 294 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 222 -
Mov Cap-2 Maneuver	-	- 222 -
Stage 1	-	- - -
Stage 2	-	- 294 -

Approach	WB	NB
HCM Control Delay, s	0	24.1
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	222	-
HCM Lane V/C Ratio	0.15	-
HCM Control Delay (s)	24.1	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.5	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1535	9	0	0	0	0	0	24	21	13	0
Future Vol, veh/h	0	1535	9	0	0	0	0	0	24	21	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	16736	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	95	95	92	92	92	60	60	60	95	95	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	2	2	2
Mvmt Flow	0	1616	9	0	0	0	0	0	40	22	14	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	808	808	1625	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	808	1625	-
Critical Hdwy	-	-	-	-	-	6.9	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.52	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	328	272	101	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	341	159	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	328	239	101	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	239	101	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	299	159	-

Approach	EB	NB	SB
HCM Control Delay, s	0	17.5	34.6
HCM LOS		C	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	328	-	-	157
HCM Lane V/C Ratio	0.122	-	-	0.228
HCM Control Delay (s)	17.5	-	-	34.6
HCM Lane LOS	C	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	0.8

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	98
Average Queue (ft)	41
95th Queue (ft)	82
Link Distance (ft)	32
Upstream Blk Time (%)	36
Queuing Penalty (veh)	22
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	126
Average Queue (ft)	43
95th Queue (ft)	89
Link Distance (ft)	269
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	100
Average Queue (ft)	32
95th Queue (ft)	76
Link Distance (ft)	940
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	91
Average Queue (ft)	55
95th Queue (ft)	91
Link Distance (ft)	34
Upstream Blk Time (%)	37
Queuing Penalty (veh)	51
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	56
Average Queue (ft)	18
95th Queue (ft)	48
Link Distance (ft)	48
Upstream Blk Time (%)	2
Queuing Penalty (veh)	1
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	38	53
Average Queue (ft)	11	25
95th Queue (ft)	32	51
Link Distance (ft)	507	51
Upstream Blk Time (%)		1
Queuing Penalty (veh)		1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	43
Average Queue (ft)	3
95th Queue (ft)	24
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	74
Average Queue (ft)	7
95th Queue (ft)	38
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	23
Average Queue (ft)	2
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	27
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 75

Appendix 4

Trip Generation Calculations

Land Use: 210

Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077, 1078, 1079

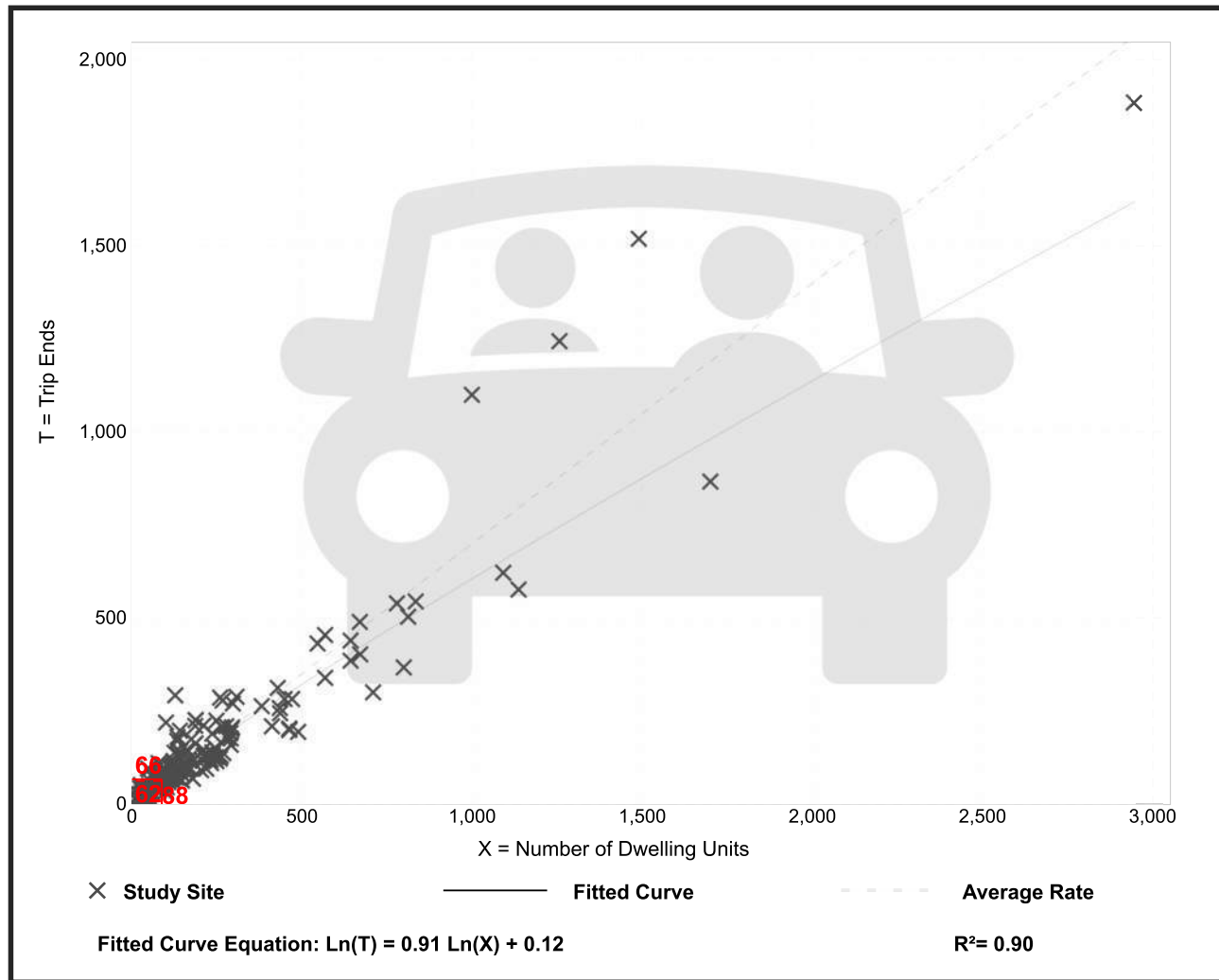
Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 192
 Avg. Num. of Dwelling Units: 226
 Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



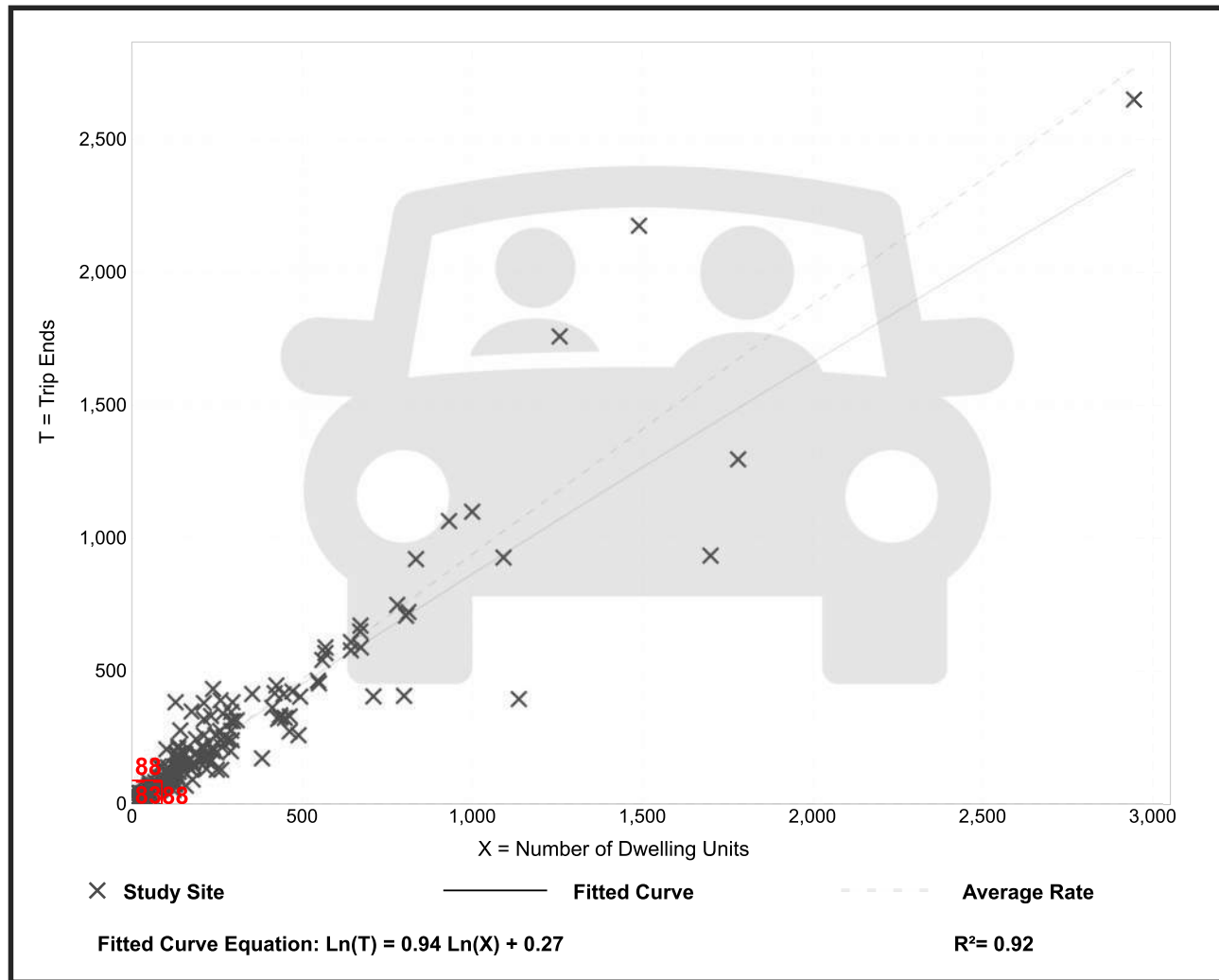
Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 208
 Avg. Num. of Dwelling Units: 248
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing (210)

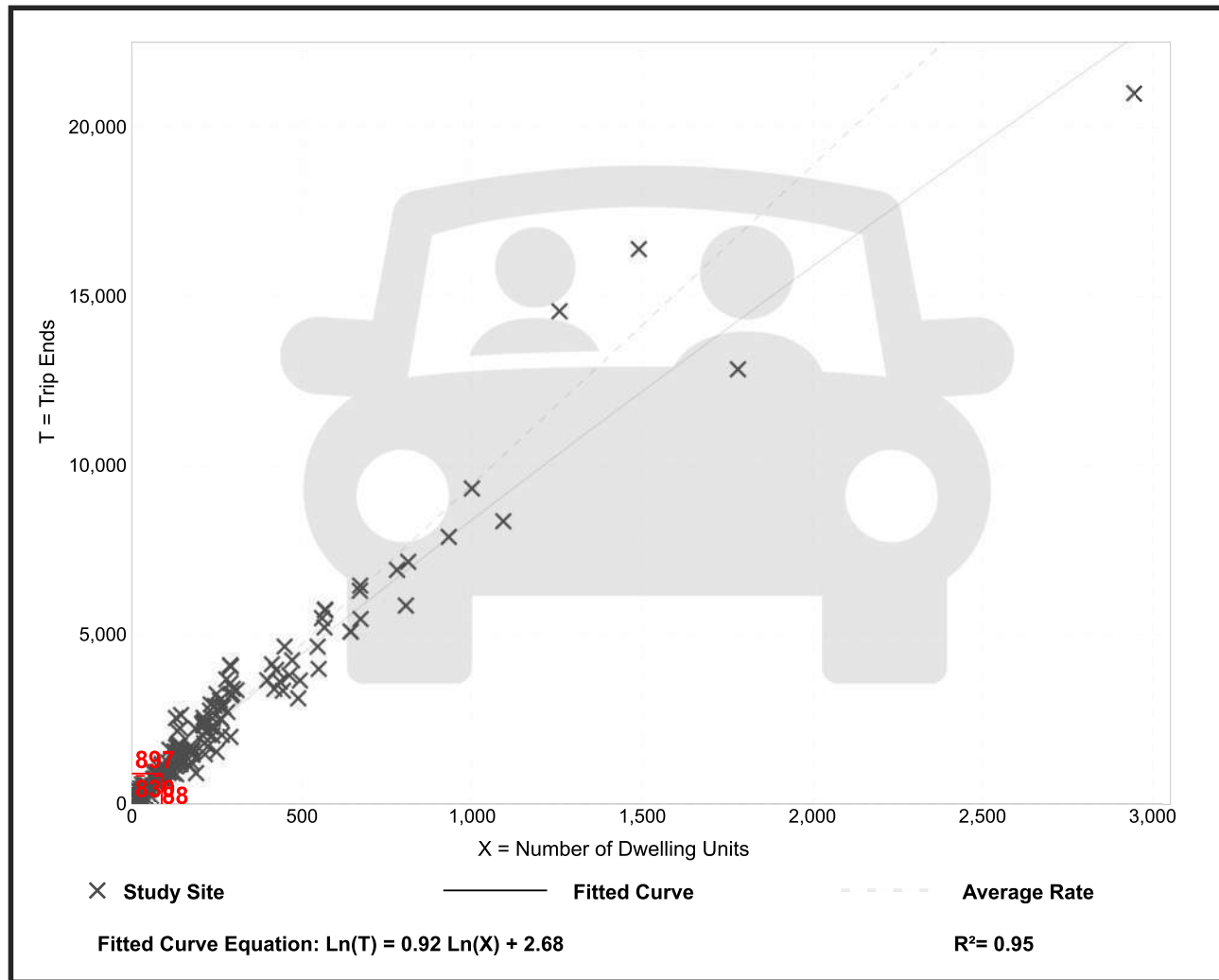
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Land Use: 220

Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.
- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.
- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.
- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

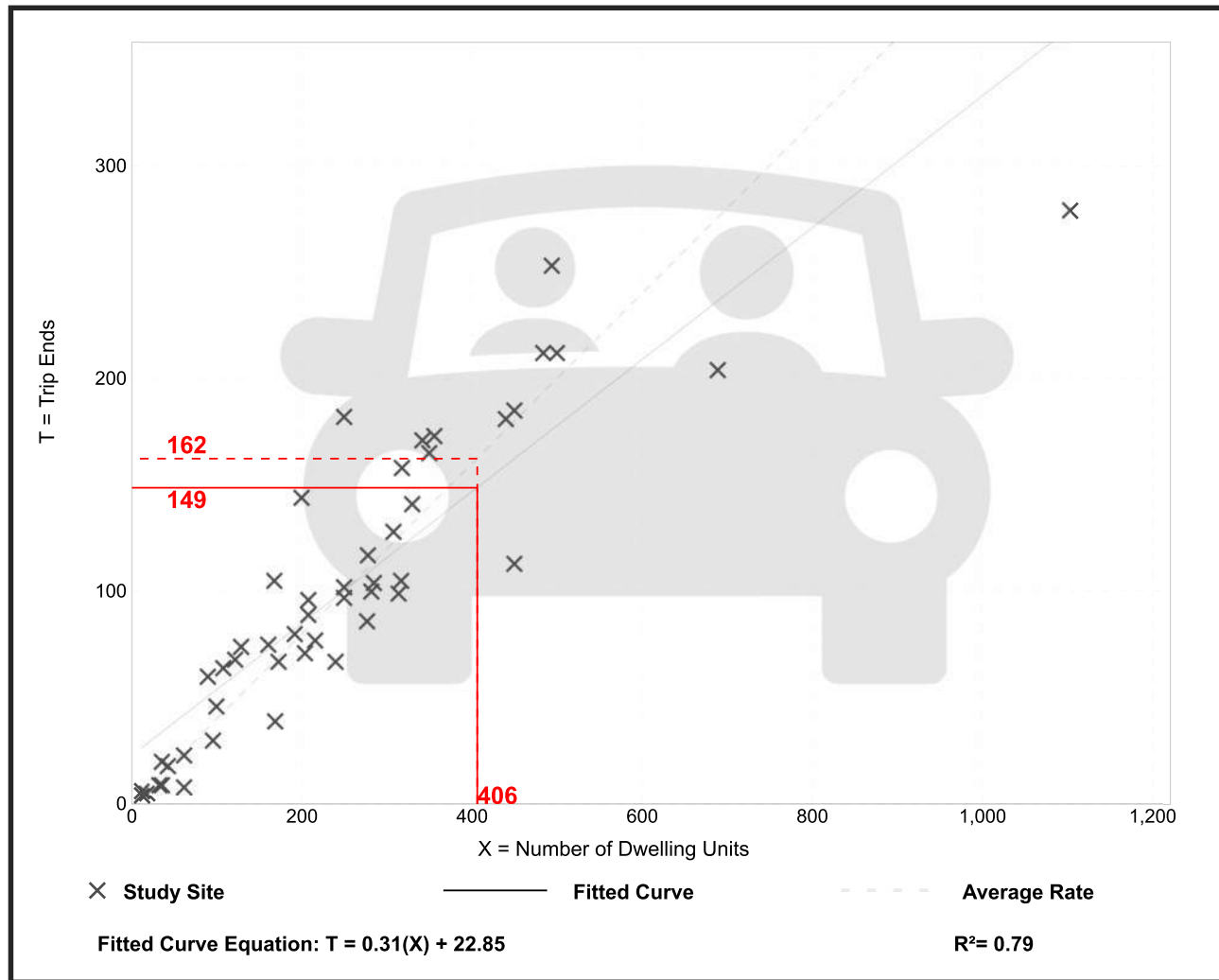
Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 49
 Avg. Num. of Dwelling Units: 249
 Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



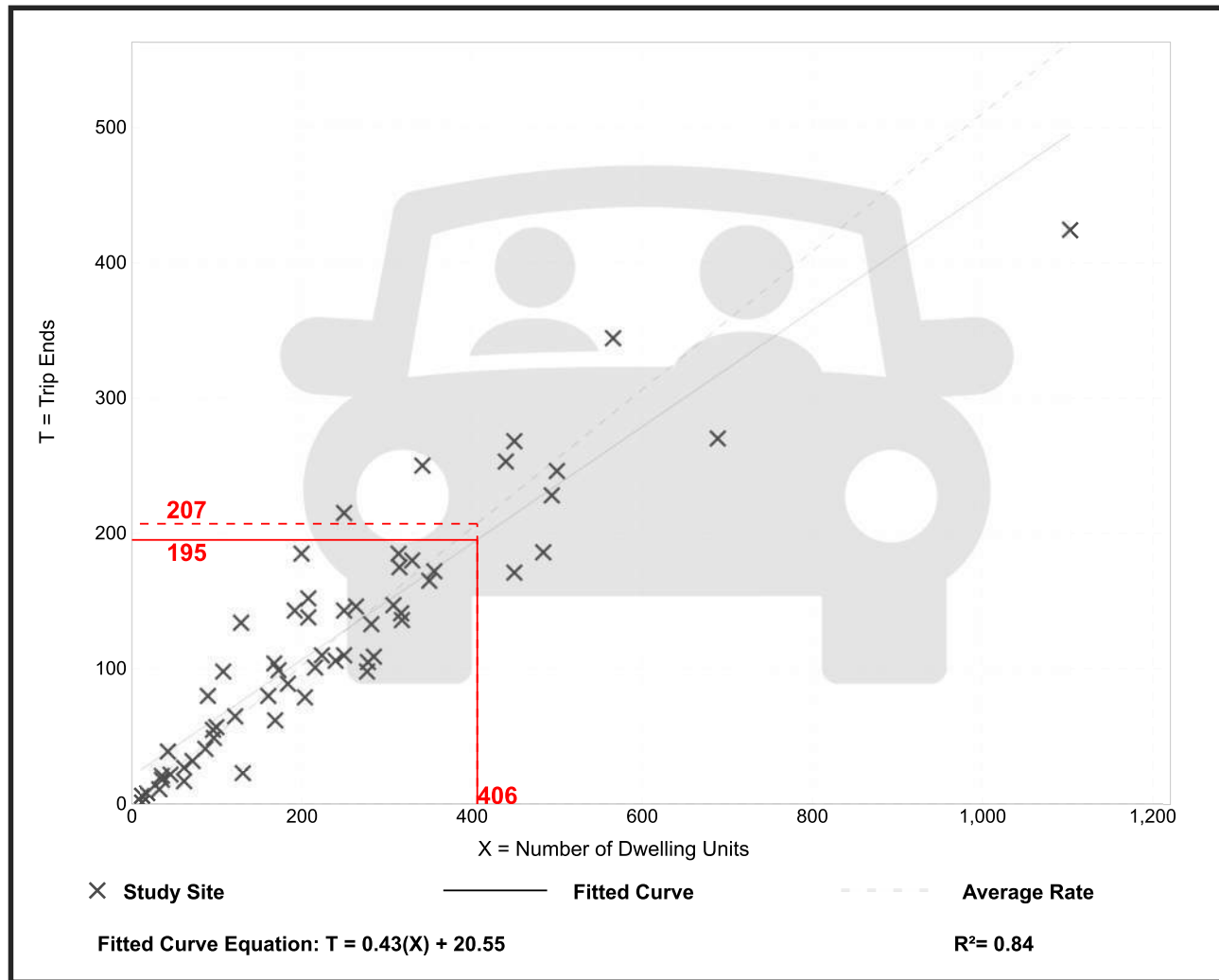
Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 59
 Avg. Num. of Dwelling Units: 241
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

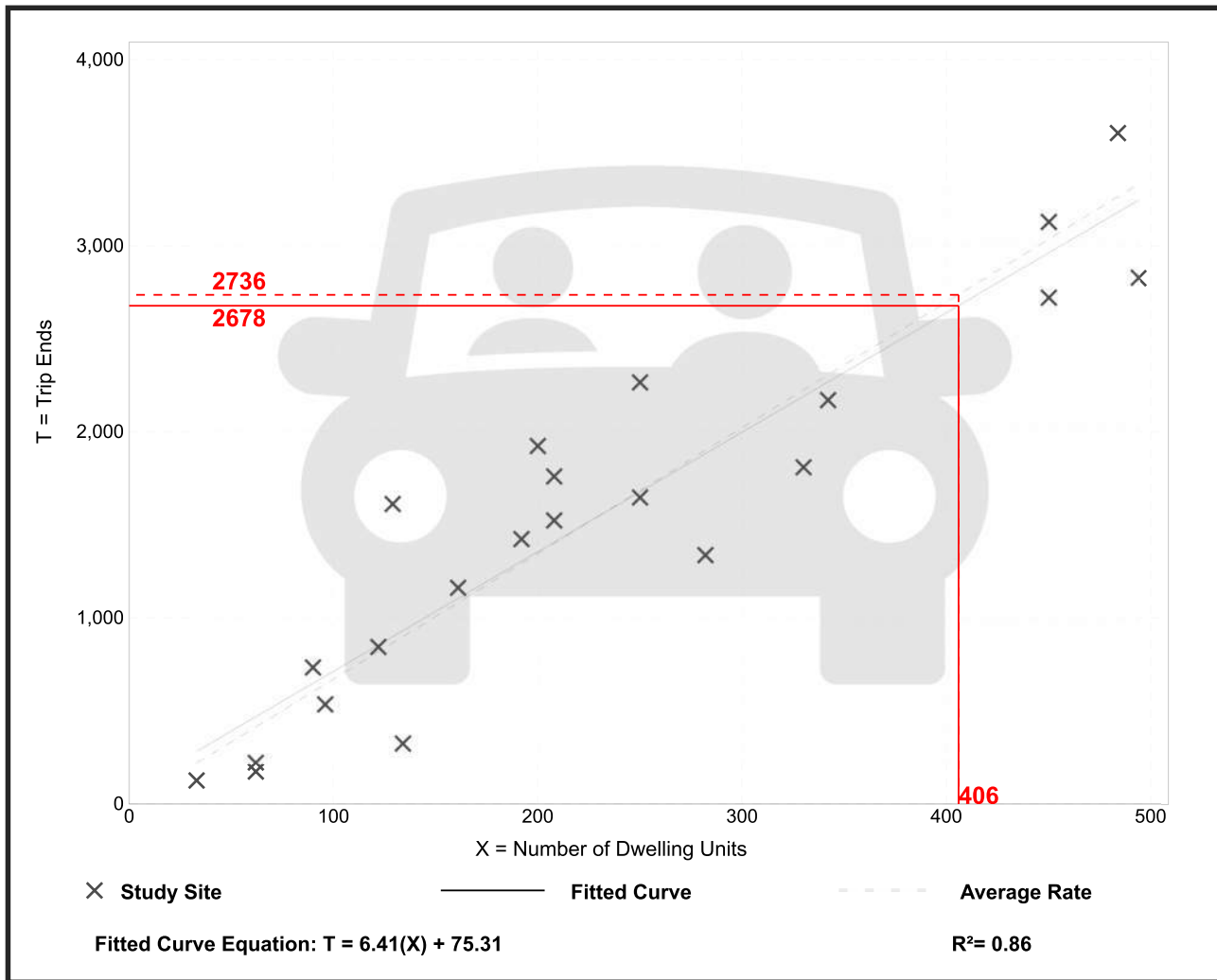
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 229
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

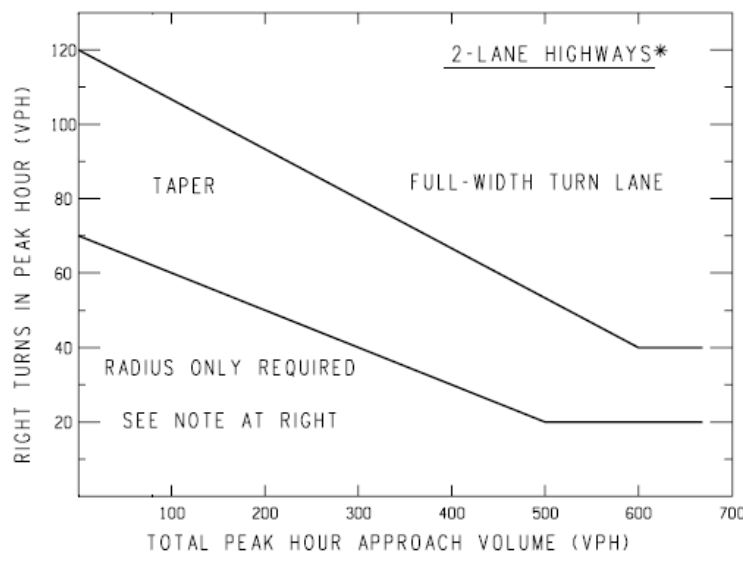
Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



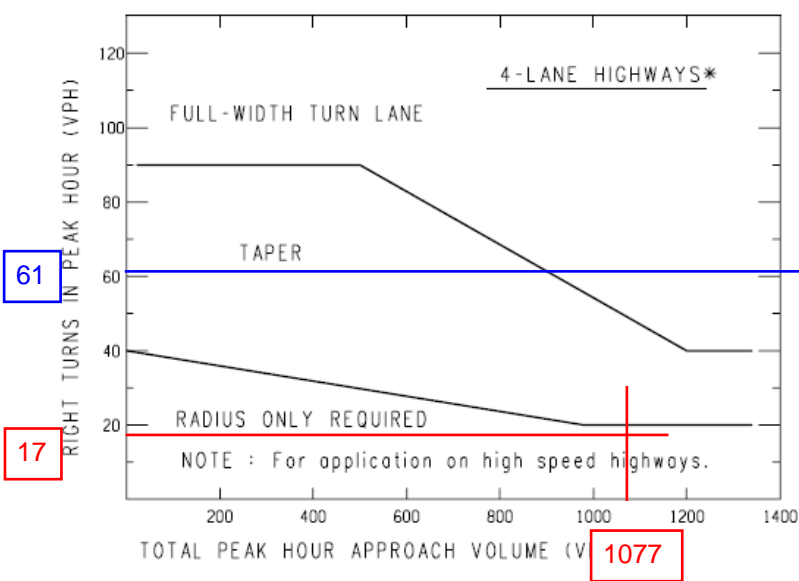
Appendix 5

Turn Lane Warrant



NOTE: For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour
Right turns = Peak hour
Right turns - 20



WB M-59 (Highland Road) and Driveway 4
AM Peak Hour
PM Peak Hour

*If a center left-turn lane exists (ie 3 or 5 lane roadway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

Sample Problem: The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hous is 100 vph. Determine if a right turn lane is recommended.

Solution: Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

Appendix 6

Future LOS Output Reports

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1029	92	0
Future Vol, veh/h	0	0	0	1029	92	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	92
Heavy Vehicles, %	2	2	2	6	6	5
Mvmt Flow	0	0	0	1083	153	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 542
Stage 1	-	- 0
Stage 2	-	- 542
Critical Hdwy	-	- 6.92
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	- 5.92
Follow-up Hdwy	-	- 3.56
Pot Cap-1 Maneuver	0	- 461
Stage 1	0	-
Stage 2	0	- 536
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 461
Mov Cap-2 Maneuver	-	- 461
Stage 1	-	-
Stage 2	-	- 536

Approach	WB	NB
HCM Control Delay, s	0	16.7
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	461	-
HCM Lane V/C Ratio	0.333	-
HCM Control Delay (s)	16.7	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	1.4	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1620	51	0	0	0	130
Future Vol, veh/h	1620	51	0	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1780	56	0	0	0	165

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	890
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	284
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	284
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	33.8
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	284	-	-
HCM Lane V/C Ratio	0.579	-	-
HCM Control Delay (s)	33.8	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	3.4	-	-

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1028	93	0	157
Future Vol, veh/h	0	0	1028	93	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	8	8	2	2
Mvmt Flow	0	0	1105	100	0	262

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	21.3
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	477
HCM Lane V/C Ratio	-	-	0.549
HCM Control Delay (s)	-	-	21.3
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.3

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1541	0	0	130	0
Future Vol, veh/h	0	1541	0	0	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	92	92	73	92
Heavy Vehicles, %	2	4	2	2	6	2
Mvmt Flow	0	1731	0	0	178	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	866	-
Stage 1	-	-	0	-
Stage 2	-	-	866	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	285	0
Stage 1	0	-	-	0
Stage 2	0	-	362	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	285	-
Mov Cap-2 Maneuver	-	-	285	-
Stage 1	-	-	-	-
Stage 2	-	-	362	-

Approach	EB	SB
HCM Control Delay, s	0	36.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	285
HCM Lane V/C Ratio	-	0.625
HCM Control Delay (s)	-	36.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	3.9

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1055	22	0
Future Vol, veh/h	0	0	0	1055	22	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1111	37	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 444
Stage 1	-	- 0
Stage 2	-	- 444
Critical Hdwy	-	- 5.86
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.16
Follow-up Hdwy	-	- 3.88
Pot Cap-1 Maneuver	0	- 567
Stage 1	0	- - 0
Stage 2	0	- 546
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 567
Mov Cap-2 Maneuver	-	- 567
Stage 1	-	- -
Stage 2	-	- 546

Approach	WB	NB
HCM Control Delay, s	0	11.8
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	567	-
HCM Lane V/C Ratio	0.065	-
HCM Control Delay (s)	11.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.2	-

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Future Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	1084905472	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	6
Mvmt Flow	0	1688	4	0	0	0	0	0	8	58	13	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	844	844	1692	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	844	1692	-
Critical Hdwy	-	-	-	-	-	6.9	7.62	6.62	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.62	5.62	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.56	4.06	-
Pot Cap-1 Maneuver	0	-	-	0	0	311	250	88	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	316	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	311	244	88	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	244	88	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	308	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.9	36.8
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	311	-	-	183
HCM Lane V/C Ratio	0.026	-	-	0.391
HCM Control Delay (s)	16.9	-	-	36.8
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	1.7

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	1	61	15	0	54
Future Vol, veh/h	44	1	61	15	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	1	66	16	0	59

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	133	74	0	0	82	0
Stage 1	74	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	861	988	-	-	1515	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	861	988	-	-	1515	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	863	1515
HCM Lane V/C Ratio	-	-	0.057	-
HCM Control Delay (s)	-	-	9.4	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	56	18	74	97	1
Future Vol, veh/h	2	56	18	74	97	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	61	20	80	105	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	226	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	762	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	751	948	1485	-	-	-
Mov Cap-2 Maneuver	751	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	905	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	940	-	-
HCM Lane V/C Ratio	0.013	-	0.067	-	-
HCM Control Delay (s)	7.5	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	4	1	91	2	0	153
Future Vol, veh/h	4	1	91	2	0	153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	1	99	2	0	166

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	266	100	0	0	101	0
Stage 1	100	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	723	956	-	-	1491	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	723	956	-	-	1491	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1491
HCM Lane V/C Ratio	-	-	0.007	-
HCM Control Delay (s)	-	-	9.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1060	17	0	54
Future Vol, veh/h	0	0	1060	17	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	92
Heavy Vehicles, %	2	2	5	5	2	2
Mvmt Flow	0	0	1116	18	0	59

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	13.7
HCM LOS		B

Minor Lane/Major Mvmt	WBT SBLn1
Capacity (veh/h)	- 473
HCM Lane V/C Ratio	- 0.124
HCM Control Delay (s)	- 13.7
HCM Lane LOS	- B
HCM 95th %tile Q(veh)	- 0.4

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	83
Average Queue (ft)	39
95th Queue (ft)	68
Link Distance (ft)	32
Upstream Blk Time (%)	18
Queuing Penalty (veh)	16
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	185
Average Queue (ft)	61
95th Queue (ft)	132
Link Distance (ft)	269
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	99
Average Queue (ft)	41
95th Queue (ft)	77
Link Distance (ft)	924
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	107
Average Queue (ft)	60
95th Queue (ft)	102
Link Distance (ft)	34
Upstream Blk Time (%)	40
Queuing Penalty (veh)	54
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	17
95th Queue (ft)	44
Link Distance (ft)	49
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	21	64
Average Queue (ft)	2	30
95th Queue (ft)	13	59
Link Distance (ft)	507	53
Upstream Blk Time (%)		4
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	55
Average Queue (ft)	25
95th Queue (ft)	49
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	58	17
Average Queue (ft)	28	1
95th Queue (ft)	52	8
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	WB
Directions Served	T
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	64
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	19
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB	WB
Directions Served	L	T
Maximum Queue (ft)	136	57
Average Queue (ft)	18	2
95th Queue (ft)	94	41
Link Distance (ft)		564
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	2	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	3
95th Queue (ft)	24
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 75

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	4.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	2090	109	0
Future Vol, veh/h	0	0	0	2090	109	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	71	92
Heavy Vehicles, %	2	2	2	2	5	2
Mvmt Flow	0	0	0	2200	154	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1100
Stage 1	-	- 0
Stage 2	-	- 1100
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 202
Stage 1	0	- - 0
Stage 2	0	- 274
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 202
Mov Cap-2 Maneuver	-	- 202
Stage 1	-	- -
Stage 2	-	- 274

Approach	WB	NB
HCM Control Delay, s	0	63.7
HCM LOS		F

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	202	-
HCM Lane V/C Ratio	0.76	-
HCM Control Delay (s)	63.7	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	5.1	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1648	145	0	0	0	110
Future Vol, veh/h	1648	145	0	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1735	153	0	0	0	149

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	868
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	292
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	292
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	29.4
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	292	-	-
HCM Lane V/C Ratio	0.509	-	-
HCM Control Delay (s)	29.4	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.7	-	-

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	2023	176	0	127
Future Vol, veh/h	0	0	2023	176	0	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2129	185	0	179

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1065
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 219
Stage 1	-	0 -
Stage 2	-	0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 219
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	68.2
HCM LOS		F

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	219
HCM Lane V/C Ratio	-	-	0.817
HCM Control Delay (s)	-	-	68.2
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	6.1

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↑	
Traffic Vol, veh/h	0	1627	0	0	166	0
Future Vol, veh/h	0	1627	0	0	166	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1713	0	0	205	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	857	-
Stage 1	-	-	0	-
Stage 2	-	-	857	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	296	0
Stage 1	0	-	-	0
Stage 2	0	-	376	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	296	-
Mov Cap-2 Maneuver	-	-	296	-
Stage 1	-	-	-	-
Stage 2	-	-	376	-

Approach	EB	SB
HCM Control Delay, s	0	40.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	296
HCM Lane V/C Ratio	-	0.692
HCM Control Delay (s)	-	40.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	4.8

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1984	47	0
Future Vol, veh/h	0	0	0	1984	47	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	2	11	4
Mvmt Flow	0	0	0	2088	78	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 835
Stage 1	-	- 0
Stage 2	-	- 835
Critical Hdwy	-	- 5.92
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	- 6.22
Follow-up Hdwy	-	- 3.91
Pot Cap-1 Maneuver	0	- 355 0
Stage 1	0	- - 0
Stage 2	0	- 331 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 355
Mov Cap-2 Maneuver	-	- 355
Stage 1	-	- -
Stage 2	-	- 331

Approach	WB	NB
HCM Control Delay, s	0	18
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	355	-
HCM Lane V/C Ratio	0.221	-
HCM Control Delay (s)	18	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.8	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Future Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	17248	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	63	63	60	68	68	68
Heavy Vehicles, %	5	2	2	2	2	2	0	0	0	4	4	4
Mvmt Flow	0	1697	9	0	0	0	0	0	40	56	19	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	849	849	1706	-		
Stage 1	-	-	-	-	-	-	-	-	0	0		
Stage 2	-	-	-	-	-	-	-	-	849	1706		
Critical Hdwy	-	-	-	-	-	-	6.9	7.58	6.58	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.58	5.58	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.54	4.04	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	308	251	89	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	318	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	308	218	89	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	218	89	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	277	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	18.4	46.4
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	308	-	-	159
HCM Lane V/C Ratio	0.13	-	-	0.472
HCM Control Delay (s)	18.4	-	-	46.4
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	2.2

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	0	63	52	1	61
Future Vol, veh/h	30	0	63	52	1	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	0	68	57	1	66

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	165	97	0	0	125	0
Stage 1	97	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	826	959	-	-	1462	-
Stage 1	927	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	825	959	-	-	1462	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	825	1462
HCM Lane V/C Ratio	-	-	0.04	0.001
HCM Control Delay (s)	-	-	9.5	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
8: Hill Rd & Driveway 2

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	35	60	114	89	2
Future Vol, veh/h	1	35	60	114	89	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	65	124	97	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	352	98	99	0	0
Stage 1	98	-	-	-	-
Stage 2	254	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	646	958	1494	-	-
Stage 1	926	-	-	-	-
Stage 2	788	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	616	958	1494	-	-
Mov Cap-2 Maneuver	616	-	-	-	-
Stage 1	882	-	-	-	-
Stage 2	788	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	943	-	-
HCM Lane V/C Ratio	0.044	-	0.041	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	174	2	0	124
Future Vol, veh/h	3	0	174	2	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	0	189	2	0	135

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	325	190	0	0	191
Stage 1	190	-	-	-	-
Stage 2	135	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	669	852	-	-	1383
Stage 1	842	-	-	-	-
Stage 2	891	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	669	852	-	-	1383
Mov Cap-2 Maneuver	669	-	-	-	-
Stage 1	842	-	-	-	-
Stage 2	891	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	669	1383
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	10.4	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1970	61	0	36
Future Vol, veh/h	0	0	1970	61	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2141	66	0	39

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1071
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 0 217
Stage 1	-	0 0 -
Stage 2	-	0 0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- - 217
Mov Cap-2 Maneuver	-	- - -
Stage 1	-	- - -
Stage 2	-	- - -

Approach	WB	SB
HCM Control Delay, s	0	25.2
HCM LOS		D

Minor Lane/Major Mvmt	WBT	SBLn1
Capacity (veh/h)	-	217
HCM Lane V/C Ratio	-	0.18
HCM Control Delay (s)	-	25.2
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	0.6

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	111
Average Queue (ft)	67
95th Queue (ft)	111
Link Distance (ft)	32
Upstream Blk Time (%)	67
Queuing Penalty (veh)	77
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	174
Average Queue (ft)	53
95th Queue (ft)	135
Link Distance (ft)	269
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	345
Average Queue (ft)	130
95th Queue (ft)	314
Link Distance (ft)	933
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	96
Average Queue (ft)	61
95th Queue (ft)	96
Link Distance (ft)	34
Upstream Blk Time (%)	49
Queuing Penalty (veh)	83
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	WB	NB
Directions Served	T	L
Maximum Queue (ft)	6	68
Average Queue (ft)	0	36
95th Queue (ft)	4	67
Link Distance (ft)	131	49
Upstream Blk Time (%)		13
Queuing Penalty (veh)		7
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	38	55
Average Queue (ft)	13	31
95th Queue (ft)	33	59
Link Distance (ft)	507	51
Upstream Blk Time (%)		7
Queuing Penalty (veh)		4
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	19
95th Queue (ft)	46
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	44	35
Average Queue (ft)	23	5
95th Queue (ft)	48	23
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	14
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	WB	SB
Directions Served	T	R
Maximum Queue (ft)	8	19
Average Queue (ft)	0	1
95th Queue (ft)	5	10
Link Distance (ft)	64	288
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB	EB	EB
Directions Served	L	T	T
Maximum Queue (ft)	205	162	117
Average Queue (ft)	46	11	6
95th Queue (ft)	168	103	79
Link Distance (ft)		465	465
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)	3	0	
Queuing Penalty (veh)	22	0	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	89
Average Queue (ft)	14
95th Queue (ft)	56
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	80
Average Queue (ft)	11
95th Queue (ft)	50
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	51
Average Queue (ft)	5
95th Queue (ft)	29
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 192

Appendix 7

Future Improvement LOS Output Reports

HCM 6th Signalized Intersection Summary
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑				
Traffic Volume (veh/h)	0	0	0	0	1029	0	92	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1029	0	92	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach				No		No						
Adj Sat Flow, veh/h/ln				0	1906	0	1906	1969	0			
Adj Flow Rate, veh/h				0	1083	0	153	0	0			
Peak Hour Factor				0.95	0.95	0.92	0.60	0.92	0.92			
Percent Heavy Veh, %				0	6	0	6	2	0			
Cap, veh/h				0	2776	0	201	0	0			
Arrive On Green				0.00	0.25	0.00	0.11	0.00	0.00			
Sat Flow, veh/h				0	3813	0	1875	0	0			
Grp Volume(v), veh/h				0	1083	0	153	0	0			
Grp Sat Flow(s),veh/h/ln				0	1811	0	1875	0	0			
Q Serve(g_s), s				0.0	22.3	0.0	7.1	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	22.3	0.0	7.1	0.0	0.0			
Prop In Lane				0.00		0.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	2776	0	201	0	0			
V/C Ratio(X)				0.00	0.39	0.00	0.76	0.00	0.00			
Avail Cap(c_a), veh/h				0	2776	0	517	0	0			
HCM Platoon Ratio				1.00	0.33	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	0.93	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	16.2	0.0	39.1	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.4	0.0	5.9	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	10.6	0.0	3.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	16.6	0.0	45.0	0.0	0.0			
LnGrp LOS				A	B	A	D	A	A			
Approach Vol, veh/h					1083			153				
Approach Delay, s/veh					16.6			45.0				
Approach LOS					B			D				
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		75.2		14.8								
Change Period (Y+Rc), s		* 6.2		* 5.2								
Max Green Setting (Gmax), s		* 54		* 25								
Max Q Clear Time (g_c+I1), s		24.3		9.1								
Green Ext Time (p_c), s		7.7		0.7								
Intersection Summary												
HCM 6th Ctrl Delay				20.1								
HCM 6th LOS				C								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future Improved

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1620	51	0	0	0	130
Future Vol, veh/h	1620	51	0	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1780	56	0	0	0	165

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	890
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	284
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	284
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	33.8
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	284	-	-
HCM Lane V/C Ratio	0.579	-	-
HCM Control Delay (s)	33.8	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	3.4	-	-

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1028	93	0	157
Future Vol, veh/h	0	0	1028	93	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	8	8	2	2
Mvmt Flow	0	0	1105	100	0	262

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	21.3
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	477
HCM Lane V/C Ratio	-	-	0.549
HCM Control Delay (s)	-	-	21.3
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.3

4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

AM Peak Hour

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1541	0	0	130	0
Future Vol, veh/h	0	1541	0	0	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	92	92	73	92
Heavy Vehicles, %	2	4	2	2	6	2
Mvmt Flow	0	1731	0	0	178	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	866	-
Stage 1	-	-	0	-
Stage 2	-	-	866	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	285	0
Stage 1	0	-	-	0
Stage 2	0	-	362	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	285	-
Mov Cap-2 Maneuver	-	-	285	-
Stage 1	-	-	-	-
Stage 2	-	-	362	-

Approach	EB	SB
HCM Control Delay, s	0	36.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	285
HCM Lane V/C Ratio	-	0.625
HCM Control Delay (s)	-	36.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	3.9

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1055	22	0
Future Vol, veh/h	0	0	0	1055	22	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1111	37	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 444
Stage 1	-	- 0
Stage 2	-	- 444
Critical Hdwy	-	- 5.86
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.16
Follow-up Hdwy	-	- 3.88
Pot Cap-1 Maneuver	0	- 567
Stage 1	0	- - 0
Stage 2	0	- 546
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 567
Mov Cap-2 Maneuver	-	- 567
Stage 1	-	- -
Stage 2	-	- 546

Approach	WB	NB
HCM Control Delay, s	0	11.8
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	567	-
HCM Lane V/C Ratio	0.065	-
HCM Control Delay (s)	11.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.2	-

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Future Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	1084905472	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	6
Mvmt Flow	0	1688	4	0	0	0	0	0	8	58	13	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	844	844	1692	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	844	1692	-
Critical Hdwy	-	-	-	-	-	6.9	7.62	6.62	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.62	5.62	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.56	4.06	-
Pot Cap-1 Maneuver	0	-	-	0	0	311	250	88	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	316	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	311	244	88	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	244	88	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	308	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.9	36.8
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	311	-	-	183
HCM Lane V/C Ratio	0.026	-	-	0.391
HCM Control Delay (s)	16.9	-	-	36.8
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	1.7

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	1	61	15	0	54
Future Vol, veh/h	44	1	61	15	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	1	66	16	0	59

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	133	74	0	0	82	0
Stage 1	74	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	861	988	-	-	1515	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	861	988	-	-	1515	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	863	1515
HCM Lane V/C Ratio	-	-	0.057	-
HCM Control Delay (s)	-	-	9.4	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	56	18	74	97	1
Future Vol, veh/h	2	56	18	74	97	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	61	20	80	105	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	226	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	762	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	751	948	1485	-	-	-
Mov Cap-2 Maneuver	751	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	905	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	940	-	-
HCM Lane V/C Ratio	0.013	-	0.067	-	-
HCM Control Delay (s)	7.5	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	91	2	0	153
Future Vol, veh/h	4	1	91	2	0	153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	1	99	2	0	166

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	266	100	0	0	101	0
Stage 1	100	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	723	956	-	-	1491	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	723	956	-	-	1491	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1491
HCM Lane V/C Ratio	-	-	0.007	-
HCM Control Delay (s)	-	-	9.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1060	17	0	54
Future Vol, veh/h	0	0	1060	17	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	92
Heavy Vehicles, %	2	2	5	5	2	2
Mvmt Flow	0	0	1116	18	0	59

Major/Minor

	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach

	WB	SB
HCM Control Delay, s	0	13.7
HCM LOS		B

Minor Lane/Major Mvmt

	WBT SBLn1
Capacity (veh/h)	- 473
HCM Lane V/C Ratio	- 0.124
HCM Control Delay (s)	- 13.7
HCM Lane LOS	- B
HCM 95th %tile Q(veh)	- 0.4

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	WB	WB	NB
Directions Served	T	T	LT
Maximum Queue (ft)	38	50	84
Average Queue (ft)	3	4	41
95th Queue (ft)	21	23	73
Link Distance (ft)	2262	2262	35
Upstream Blk Time (%)			17
Queuing Penalty (veh)			16
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	142
Average Queue (ft)	54
95th Queue (ft)	107
Link Distance (ft)	269
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	122
Average Queue (ft)	44
95th Queue (ft)	90
Link Distance (ft)	924
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	104
Average Queue (ft)	54
95th Queue (ft)	94
Link Distance (ft)	34
Upstream Blk Time (%)	36
Queuing Penalty (veh)	49
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	52
Average Queue (ft)	16
95th Queue (ft)	45
Link Distance (ft)	49
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	29	62
Average Queue (ft)	4	32
95th Queue (ft)	19	61
Link Distance (ft)	507	53
Upstream Blk Time (%)		4
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	50
Average Queue (ft)	23
95th Queue (ft)	47
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	50	34
Average Queue (ft)	28	2
95th Queue (ft)	51	15
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	24
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	SB
Directions Served	R
Maximum Queue (ft)	22
Average Queue (ft)	1
95th Queue (ft)	16
Link Distance (ft)	288
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	5
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	66
Average Queue (ft)	7
95th Queue (ft)	38
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	60
Average Queue (ft)	4
95th Queue (ft)	26
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

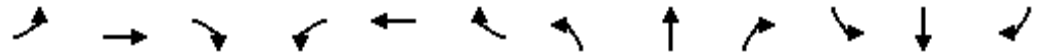
Zone wide Queuing Penalty: 68

HCM 6th Signalized Intersection Summary
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑				
Traffic Volume (veh/h)	0	0	0	0	2090	0	109	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	2090	0	109	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach				No		No						
Adj Sat Flow, veh/h/ln				0	1969	0	1922	1969	0			
Adj Flow Rate, veh/h				0	2200	0	154	0	0			
Peak Hour Factor				0.95	0.95	0.92	0.71	0.92	0.92			
Percent Heavy Veh, %				0	2	0	5	2	0			
Cap, veh/h				0	3005	0	191	0	0			
Arrive On Green				0.00	0.27	0.00	0.10	0.00	0.00			
Sat Flow, veh/h				0	3938	0	1875	0	0			
Grp Volume(v), veh/h				0	2200	0	154	0	0			
Grp Sat Flow(s),veh/h/ln				0	1870	0	1875	0	0			
Q Serve(g_s), s				0.0	64.4	0.0	9.6	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	64.4	0.0	9.6	0.0	0.0			
Prop In Lane				0.00		0.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	3005	0	191	0	0			
V/C Ratio(X)				0.00	0.73	0.00	0.81	0.00	0.00			
Avail Cap(c_a), veh/h				0	3005	0	388	0	0			
HCM Platoon Ratio				1.00	0.33	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	0.58	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	32.3	0.0	52.7	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.9	0.0	7.8	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	32.1	0.0	5.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	33.3	0.0	60.5	0.0	0.0			
LnGrp LOS				A	C	A	E	A	A			
Approach Vol, veh/h					2200			154				
Approach Delay, s/veh					33.3			60.5				
Approach LOS					C			E				
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		102.6		17.4								
Change Period (Y+Rc), s		* 6.2		* 5.2								
Max Green Setting (Gmax), s		* 84		* 25								
Max Q Clear Time (g_c+I1), s		66.4		11.6								
Green Ext Time (p_c), s		13.7		0.6								
Intersection Summary												
HCM 6th Ctrl Delay				35.1								
HCM 6th LOS				D								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future Improved

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1648	145	0	0	0	110
Future Vol, veh/h	1648	145	0	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1735	153	0	0	0	149

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	868
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	292
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	292
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	29.4
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	292	-	-
HCM Lane V/C Ratio	0.509	-	-
HCM Control Delay (s)	29.4	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.7	-	-

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	2023	176	0	127
Future Vol, veh/h	0	0	2023	176	0	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2129	185	0	179

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1065
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 219
Stage 1	-	0 -
Stage 2	-	0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 219
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	68.2
HCM LOS		F

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	219
HCM Lane V/C Ratio	-	-	0.817
HCM Control Delay (s)	-	-	68.2
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	6.1

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1627	0	0	166	0
Future Vol, veh/h	0	1627	0	0	166	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1713	0	0	205	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	857	-
Stage 1	-	-	0	-
Stage 2	-	-	857	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	296	0
Stage 1	0	-	-	0
Stage 2	0	-	376	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	296	-
Mov Cap-2 Maneuver	-	-	296	-
Stage 1	-	-	-	-
Stage 2	-	-	376	-

Approach	EB	SB
HCM Control Delay, s	0	40.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	296
HCM Lane V/C Ratio	-	0.692
HCM Control Delay (s)	-	40.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	4.8

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1984	47	0
Future Vol, veh/h	0	0	0	1984	47	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	2	11	4
Mvmt Flow	0	0	0	2088	78	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		-	-	835	-	-
Stage 1		-	-	0	-	-
Stage 2		-	-	835	-	-
Critical Hdwy		-	-	5.92	-	-
Critical Hdwy Stg 1		-	-	-	-	-
Critical Hdwy Stg 2		-	-	6.22	-	-
Follow-up Hdwy		-	-	3.91	-	-
Pot Cap-1 Maneuver		0	-	355	0	-
Stage 1		0	-	-	0	-
Stage 2		0	-	331	0	-
Platoon blocked, %				-		
Mov Cap-1 Maneuver		-	-	355	-	-
Mov Cap-2 Maneuver		-	-	355	-	-
Stage 1		-	-	-	-	-
Stage 2		-	-	331	-	-
Approach		WB		NB		
HCM Control Delay, s		0		18		
HCM LOS				C		
Minor Lane/Major Mvmt	NBLn1	WBT				
Capacity (veh/h)	355	-				
HCM Lane V/C Ratio	0.221	-				
HCM Control Delay (s)	18	-				
HCM Lane LOS	C	-				
HCM 95th %tile Q(veh)	0.8	-				

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Future Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	17248	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	63	63	60	68	68	68
Heavy Vehicles, %	5	2	2	2	2	2	0	0	0	4	4	4
Mvmt Flow	0	1697	9	0	0	0	0	0	40	56	19	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	849	849	1706	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	849	1706	-
Critical Hdwy	-	-	-	-	-	6.9	7.58	6.58	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.54	4.04	-
Pot Cap-1 Maneuver	0	-	-	0	0	308	251	89	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	318	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	308	218	89	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	218	89	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	277	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	18.4	46.4
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	308	-	-	159
HCM Lane V/C Ratio	0.13	-	-	0.472
HCM Control Delay (s)	18.4	-	-	46.4
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	2.2

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	0	63	52	1	61
Future Vol, veh/h	30	0	63	52	1	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	0	68	57	1	66

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	165	97	0	0	125	0
Stage 1	97	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	826	959	-	-	1462	-
Stage 1	927	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	825	959	-	-	1462	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	825	1462
HCM Lane V/C Ratio	-	-	0.04	0.001
HCM Control Delay (s)	-	-	9.5	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	35	60	114	89	2
Future Vol, veh/h	1	35	60	114	89	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	65	124	97	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	352	98	99	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	646	958	1494	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	616	958	1494	-	-	-
Mov Cap-2 Maneuver	616	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	943	-	-
HCM Lane V/C Ratio	0.044	-	0.041	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	3	0	174	2	0	124
Future Vol, veh/h	3	0	174	2	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	0	189	2	0	135

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	325	190	0	0	191	0
Stage 1	190	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	669	852	-	-	1383	-
Stage 1	842	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	669	852	-	-	1383	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	891	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	669	1383
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	10.4	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1970	61	0	36
Future Vol, veh/h	0	0	1970	61	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2141	66	0	39

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1071
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- - 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- - 3.32
Pot Cap-1 Maneuver	-	0 0 217
Stage 1	-	0 0 -
Stage 2	-	0 0 -
Platoon blocked, %	-	
Mov Cap-1 Maneuver	-	- - 217
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	25.2
HCM LOS		D

Minor Lane/Major Mvmt	WBT	SBLn1
Capacity (veh/h)	-	217
HCM Lane V/C Ratio	-	0.18
HCM Control Delay (s)	-	25.2
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	0.6

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	WB	WB	NB
Directions Served	T	T	LT
Maximum Queue (ft)	186	192	101
Average Queue (ft)	61	73	62
95th Queue (ft)	147	167	101
Link Distance (ft)	2252	2252	35
Upstream Blk Time (%)			49
Queuing Penalty (veh)			54
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	170
Average Queue (ft)	49
95th Queue (ft)	119
Link Distance (ft)	269
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	231
Average Queue (ft)	94
95th Queue (ft)	203
Link Distance (ft)	933
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	EB	SB
Directions Served	T	L
Maximum Queue (ft)	10	102
Average Queue (ft)	0	68
95th Queue (ft)	7	101
Link Distance (ft)	133	34
Upstream Blk Time (%)		58
Queuing Penalty (veh)		98
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	69
Average Queue (ft)	37
95th Queue (ft)	67
Link Distance (ft)	49
Upstream Blk Time (%)	14
Queuing Penalty (veh)	8
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	35	56
Average Queue (ft)	12	28
95th Queue (ft)	32	57
Link Distance (ft)	507	51
Upstream Blk Time (%)		3
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	22
95th Queue (ft)	46
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	58	40
Average Queue (ft)	24	6
95th Queue (ft)	52	28
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	2
95th Queue (ft)	13
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	SB
Directions Served	R
Maximum Queue (ft)	20
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	288
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	90
Average Queue (ft)	15
95th Queue (ft)	62
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	122
Average Queue (ft)	23
95th Queue (ft)	90
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	63
Average Queue (ft)	7
95th Queue (ft)	34
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	35
Average Queue (ft)	2
95th Queue (ft)	14
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 162

Appendix 8

Signal Warrants

Summary of Warrants

Spot Number:	0		
Major Street:	WB M-59	Minor Street:	X-over east of Hill Road
Intersection:	WB M-59 at X-over east of Hill Road		
City/Twp:	White Lake Twp		
Date Performed:	5/25/2022	Performed By:	Fishbeck
Date Volumes Collected:	9/30/2021		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	NO
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	NO
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold) HAWK	NO
	(Threshold) RRFB	NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

TRAFFIC SIGNAL WARRANT ANALYSIS DATA ENTRY
ONLY ENTER DATA IN YELLOW CELLS

Spot Number:

MAJOR STREET: at MINOR STREET:

Intersection of: at over east of Hill Rd

Analysis Date: 5/25/2022 by Feedback

DIRECTION: E-W N-S

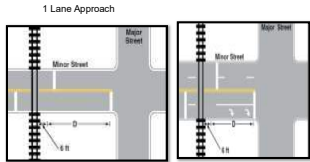
Data Collection Date: 9/30/2021

City/Twp: White Lake Twp

Is the intersection within an isolated community? Yes or No	NO
DO NOT ENTER ANY VALUE IN THIS BOX	
Discount for Right Turn Volume (or Lefts at Crossovers)?	NO
Percent Reduction in NB Right Turn Volumes	
Percent Reduction in SB Right Turn Volumes	
Percent Reduction in EB Right Turn Volumes	
Percent Reduction in WB Right Turn Volumes	
Have Other Remedial Measures Been Tried (Warrant 1 A&B)?	NO
Have Other Remedial Measures Been Tried (Warrant 7)?	NO
Are there 5 or more Crashes Susceptible to Correction by Signalization in a 12 Month Period?	
Review Peak Hour Warrant?	YES
Peak Hour Stop Delay (Vehicle Hours)	0.1
Number of Intersection Approaches	2
Peak Hour	17:00 - 18:00
Has a Study been Conducted that Demonstrates a Need for Signalization Based on a Lack of Signal Coordination (Warrant 6)?	NO
Has a Study been Conducted that Demonstrates a Need for Signalization Based on a the Need to Encourage Concentration and Organization of Traffic Flow (Warrant 8)?	NO

Pedestrian Warrant Information	
Distance to nearest Signal or Stop Sign on Major Road (ft)	
Is the 15th Percentile Speed of Pedestrians Less than 3.5ft/sec?	
DO NOT ENTER ANY VALUE IN THIS BOX	
Number of Gaps for School Crossings	
Duration of Gap Study (minutes)	
Width of Street (feet)	
Number of School Children per Group	
Number of School Children	
Crosswalk Length	
Is Pedestrian Sight Distance Sufficient?	

Grade Crossing Information	
Clear Storage Distance (Enter Greater than 140 if no Railroad Present)	
Number of Approach Lanes Crossing Tracks	
Peak Hour for Train Crossings (If not known, use Peak Vehicle Hour)	
Trains Crossings per Day? (Use 3-5 if Unknown)	
Percentage of High Occupancy Buses (Use 0% if Unknown)?	
Percentage of Tractor Trailers? (Use 7.6% to 12.5% if Unknown)	



Issue to Be Addressed by Signalization:

	X-over east of Hill Road				WB M-59			
	NORTHBOUND		SOUTHBOUND		EASTBOUND		WESTBOUND	
Number of lanes	1		0		0		2	
SPEED LIMIT OR 85th Percentile MPH	25						55	
	Direction # NB		Direction # SB		Direction # EB		Direction # WB	
	Machine #1	Manual Counts	Machine #1	Manual Counts	Machine #1	Manual Counts	Machine #1	Manual Counts
Traffic Counts	Machine Minor Vol #1	PED COUNT S/L/EG	Machine Minor Vol #2	PED COUNT N/L/EG	Machine Major Vol #3	PED COUNT W/L/EG	Machine Major Vol #4	PED COUNT E/L/EG
00:01 - 01:00								
01:00 - 02:00								
02:00 - 03:00								
03:00 - 04:00								
04:00 - 05:00								
05:00 - 06:00								
06:00 - 07:00	54						518	
07:00 - 08:00	104						883	
08:00 - 09:00	51						989	
09:00 - 10:00	75						986	
10:00 - 11:00	58						958	
11:00 - 12:00	79						1071	
12:00 - 13:00	67						1302	
13:00 - 14:00	73						1303	
14:00 - 15:00	96						1495	
15:00 - 16:00	94						1803	
16:00 - 17:00	119						2035	
17:00 - 18:00	150						2566	
18:00 - 19:00	116						1695	
19:00 - 20:00								
20:00 - 21:00								
21:00 - 22:00								
22:00 - 23:00								
23:00 - 00:00								

Were the machine and manual counts taken on the same day?

Ratio: MANUAL/ Machine NB: 1.00, MANUAL/ Machine SB: 1.00, MANUAL/ Machine EB: 1.00, MANUAL/ Machine WB: 1.00

Input Check: Manual Counts, Machine Counts, Manual Counts, Machine Counts

Is data correct? YES

HELP

If a count has been input during at least one of the hours, if columns are correct, ignore this error. Help may need to be used to calculate.

Check Machine Counts - A 2.00 ratio has been entered for at least one hour. Columns are correct, ignore this error. Help may need to be used to calculate.

Check Manual Counts - The ratio between the manual counts and machine counts is not of normal range. Please check columns. If columns are correct, ignore this error.

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	WB M-59 @ X-over east of Hill Road		
Date	5/25/2022	by	Fishbeck

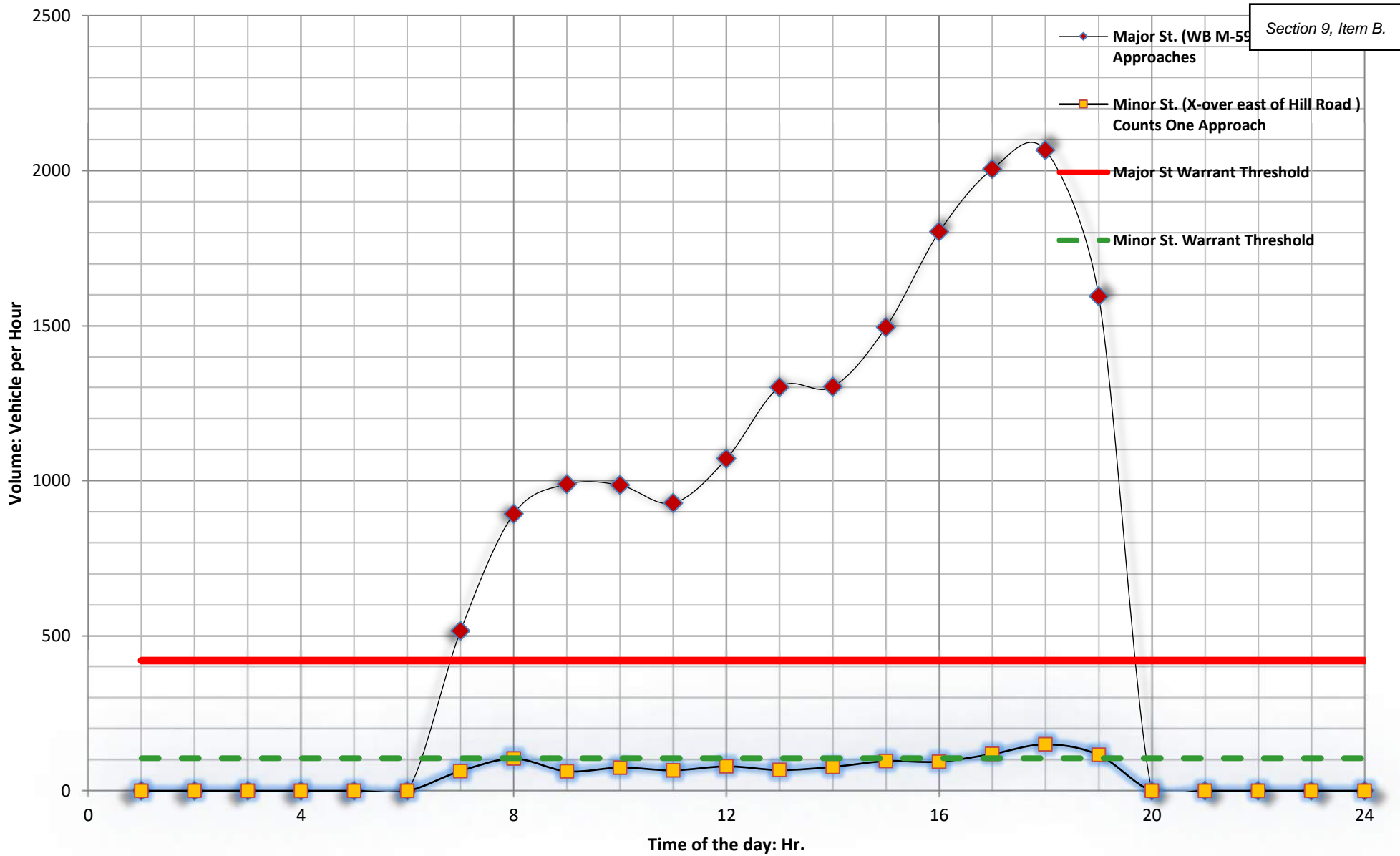
2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	516	64	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	893	104	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	989	63	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	986	75	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	928	66	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1071	79	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1302	67	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	1303	77	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1495	96	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1803	94	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	2005	119	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	2066	150	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	1595	116	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	3
Number of Hours that met the warrant 1B =	12
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	NO
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A



Section 9, Item B.

FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

WB M-59 @ X-over east of Hill Road

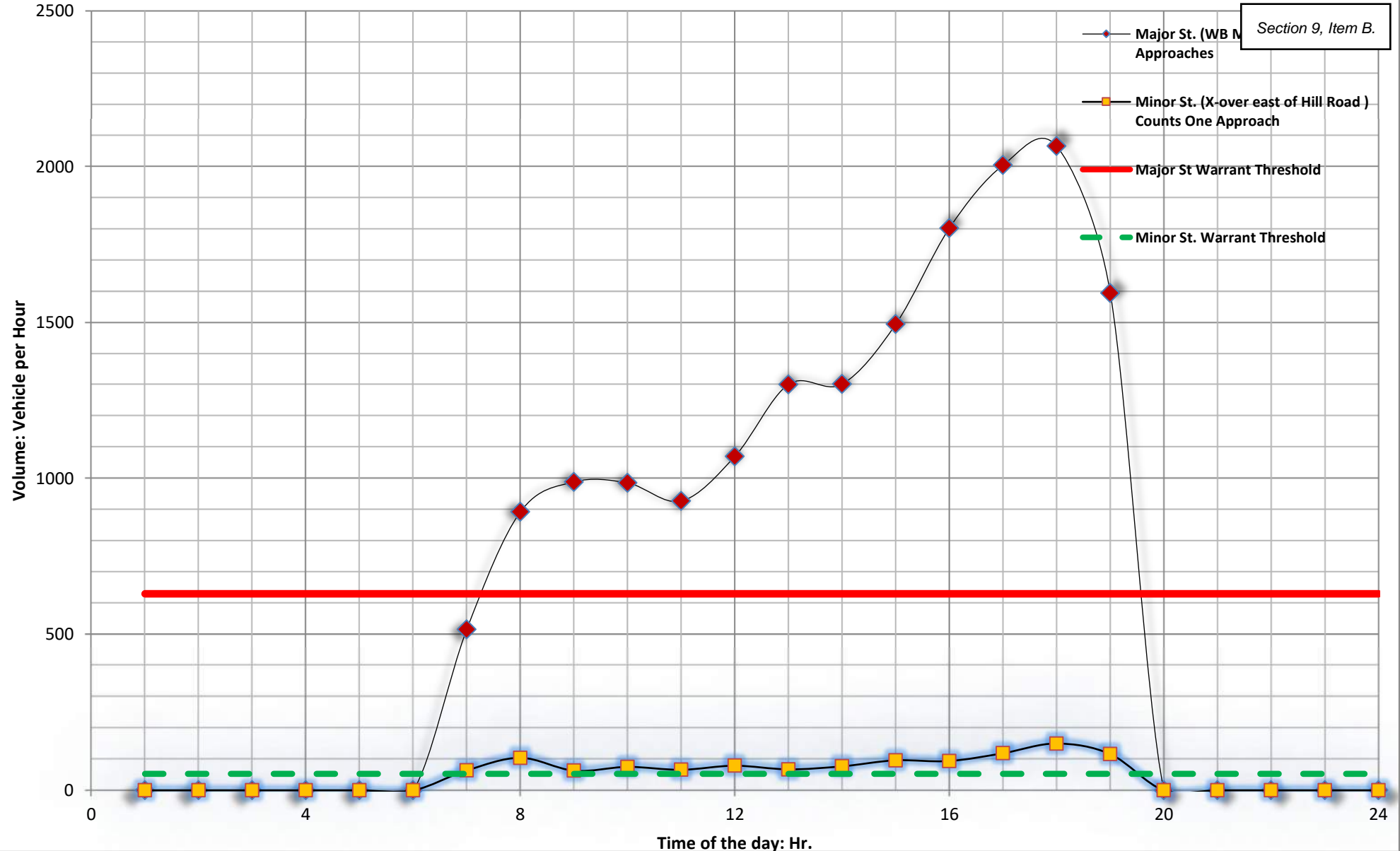
NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 3

Does this intersection meet Warrant 1A for signal installation? NO

Data Collection Date: 9/30/21 485



Section 9, Item B.

FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

WB M-59 @ X-over east of Hill Road

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 12

Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 9/30/21

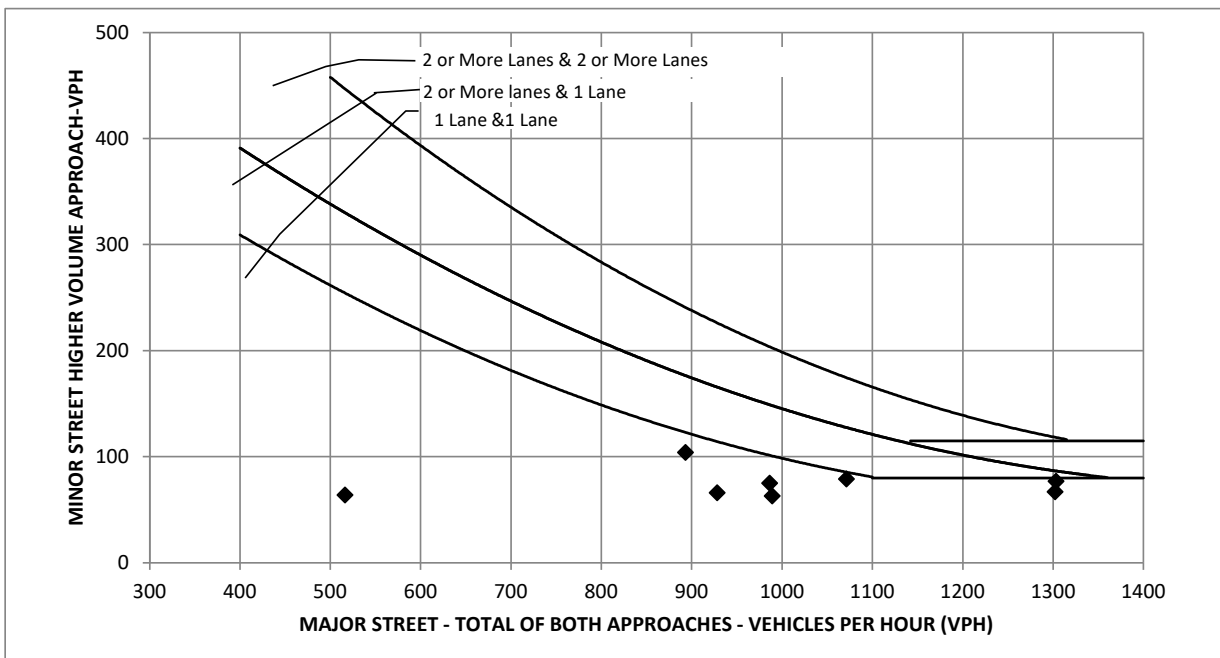
486

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	0
Intersection:	WB M-59 @ X-over east of Hill Road
Date	5/25/20222 by Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

DO NOT USE THIS GRAPH - USE 70% GRAPH

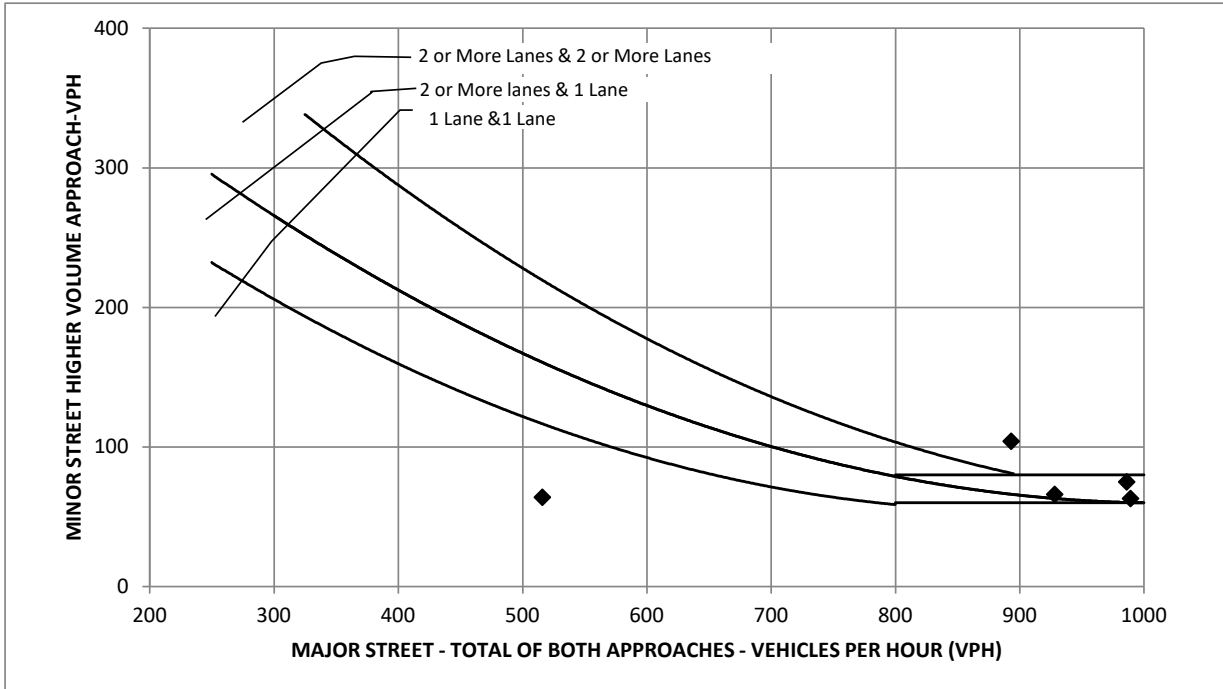


How Many Hours Are Met	5
Is Warrant 2 (100%) Met?	N/A

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	0
Intersection:	WB M-59 @ X-over east of Hill Road
Date	5/25/20222 by Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	12
Is Warrant (70%) Met?	YES

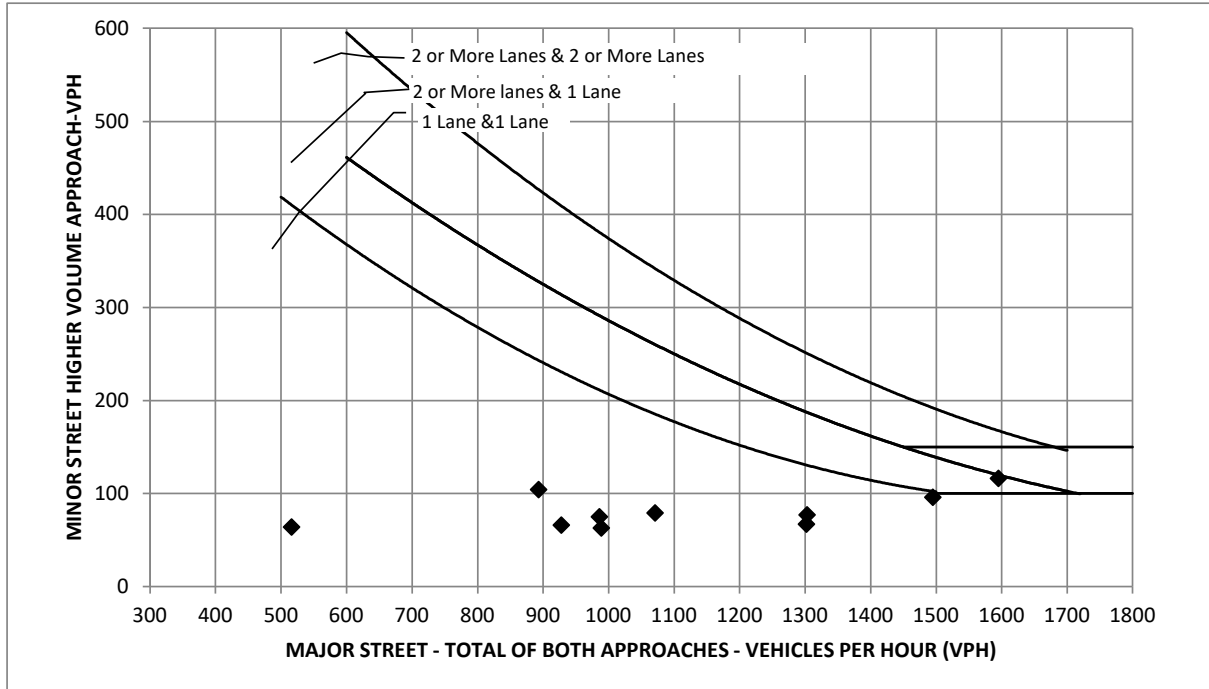
Michigan Manual of Uniform Traffic Control Devices Worksheet for Signal Warrants (Section 4C) WARRANT 3 A: Peak-Hour Vehicular Volume														
Spot Number:	0													
Intersection:	WB M-59 @ X-over east of Hill Road													
Date	5/25/2022	by Fishbeck												
NOT MET	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center;">0.13</td> <td>: Total Stop Time Delay (hrs)</td> </tr> <tr> <td style="text-align: center;">1</td> <td>: Minor Street Approach Lanes</td> </tr> <tr> <td style="text-align: center;">2</td> <td>: Total Approaches</td> </tr> <tr> <td style="text-align: center;">150</td> <td>: Minor Approach Volume</td> </tr> <tr> <td style="text-align: center;">2216</td> <td>: Total Entering Volume</td> </tr> <tr> <td style="text-align: center;">17:00 - 18:00</td> <td>: Peak Hour</td> </tr> </table>		0.13	: Total Stop Time Delay (hrs)	1	: Minor Street Approach Lanes	2	: Total Approaches	150	: Minor Approach Volume	2216	: Total Entering Volume	17:00 - 18:00	: Peak Hour
0.13	: Total Stop Time Delay (hrs)													
1	: Minor Street Approach Lanes													
2	: Total Approaches													
150	: Minor Approach Volume													
2216	: Total Entering Volume													
17:00 - 18:00	: Peak Hour													
Is Warrant 3 A Met?		NO												

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(100%): Peak-Hour Vehicular Volume**

Spot Number:	0
Intersection:	WB M-59 @ X-over east of Hill Road
Date	5/25/20222 by Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

DO NOT USE THIS GRAPH - USE 70% GRAPH

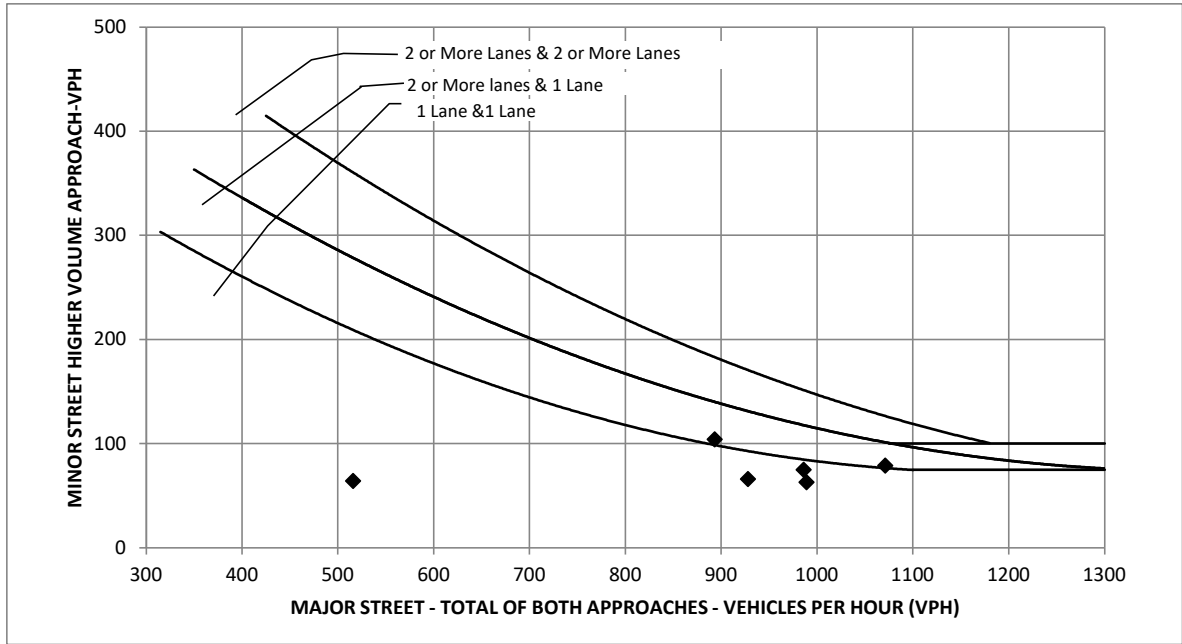


How Many Hours Are Met	3
Is Warrant 3 B (100%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	0		
Intersection:	WB M-59 @ X-over east of Hill Road		
Date	5/25/20222	by	Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

WB M-59 Merged - TMC

Thu Sep 30, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
2021-09-30 6:00AM	159	4	163	71	0	71	234
6:15AM	223	5	228	120	0	120	348
6:30AM	282	4	286	119	0	119	405
6:45AM	338	8	346	163	0	163	509
Hourly Total	1002	21	1023	473	0	473	1496
7:00AM	357	12	369	164	0	164	533
7:15AM	354	8	362	188	0	188	550
7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
Hourly Total	1440	69	1509	844	0	844	2353
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
8:30AM	306	4	310	225	0	225	535
8:45AM	362	8	370	229	0	229	599
Hourly Total	1356	32	1388	940	0	940	2328
9:00AM	320	10	330	240	0	240	570
9:15AM	299	5	304	232	0	232	536
9:30AM	299	6	305	232	0	232	537
9:45AM	284	11	295	225	0	225	520
Hourly Total	1202	32	1234	929	0	929	2163
10:00AM	236	5	241	182	0	182	423
10:15AM	249	7	256	212	0	212	468
10:30AM	253	2	255	253	0	253	508
10:45AM	251	10	261	226	0	226	487
Hourly Total	989	24	1013	873	0	873	1886
11:00AM	263	4	267	223	0	223	490
11:15AM	254	10	264	236	0	236	500
11:30AM	293	8	301	251	0	251	552
11:45AM	251	8	259	297	0	297	556
Hourly Total	1061	30	1091	1007	0	1007	2098
12:00PM	262	4	266	322	0	322	588
12:15PM	295	11	306	289	0	289	595
12:30PM	334	6	340	313	0	313	653
12:45PM	219	9	228	295	0	295	523
Hourly Total	1110	30	1140	1219	0	1219	2359
1:00PM	257	12	269	299	0	299	568
1:15PM	277	11	288	302	0	302	590
1:30PM	248	6	254	299	0	299	553
1:45PM	275	11	286	320	0	320	606
Hourly Total	1057	40	1097	1220	0	1220	2317
2:00PM	289	8	297	297	0	297	594
2:15PM	272	15	287	372	0	372	659
2:30PM	322	12	334	363	0	363	697
2:45PM	334	16	350	365	0	365	715
Hourly Total	1217	51	1268	1397	0	1397	2665
3:00PM	315	13	328	403	0	403	731
3:15PM	325	17	342	399	0	399	741
3:30PM	337	5	342	458	0	458	800
3:45PM	313	8	321	428	0	428	749
Hourly Total	1290	43	1333	1688	0	1688	3021
4:00PM	297	9	306	423	0	423	729
4:15PM	372	8	380	463	0	463	843
4:30PM	345	9	354	497	0	497	843
4:45PM	348	14	362	466	0	466	843

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Section 9, Item B.	
	T	U	App	T	U	App	Int	
Time								
Hourly Total	1362	40	1402	1849	0	1849	3251	
5:00PM	416	9	425	478	0	478	903	
5:15PM	396	20	416	490	0	490	906	
5:30PM	377	14	391	499	0	499	890	
5:45PM	364	15	379	426	0	426	805	
Hourly Total	1553	58	1611	1893	0	1893	3504	
6:00PM	301	14	315	438	0	438	753	
6:15PM	319	12	331	360	0	360	691	
6:30PM	281	13	294	368	0	368	662	
6:45PM	258	14	272	306	0	306	578	
Hourly Total	1159	53	1212	1472	0	1472	2684	
Total	15798	523	16321	15804	0	15804	32125	
% Approach	96.8%	3.2%	-	100%	0%	-	-	
% Total	49.2%	1.6%	50.8%	49.2%	0%	49.2%	-	
Lights	15281	499	15780	15227	0	15227	31007	
% Lights	96.7%	95.4%	96.7%	96.3%	0%	96.3%	96.5%	
Articulated Trucks	161	3	164	186	0	186	350	
% Articulated Trucks	1.0%	0.6%	1.0%	1.2%	0%	1.2%	1.1%	
Buses and Single-Unit Trucks	356	21	377	391	0	391	768	
% Buses and Single-Unit Trucks	2.3%	4.0%	2.3%	2.5%	0%	2.5%	2.4%	

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 Merged - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
Total	1417	69	1486	978	0	978	2464
% Approach	95.4%	4.6%	-	100%	0%	-	-
% Total	57.5%	2.8%	60.3%	39.7%	0%	39.7%	-
PHF	0.945	0.575	0.917	0.955	-	0.955	0.932
Lights	1354	65	1419	923	0	923	2342
% Lights	95.6%	94.2%	95.5%	94.4%	0%	94.4%	95.0%
Articulated Trucks	27	0	27	20	0	20	47
% Articulated Trucks	1.9%	0%	1.8%	2.0%	0%	2.0%	1.9%
Buses and Single-Unit Trucks	36	4	40	35	0	35	75
% Buses and Single-Unit Trucks	2.5%	5.8%	2.7%	3.6%	0%	3.6%	3.0%

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 Merged - TMC

Thu Sep 30, 2021

Midday Peak (11:45 AM - 12:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int	
	T	U	App	T	U	App		
Time								
	2021-09-30 11:45AM	251	8	259	297	0	297	556
	12:00PM	262	4	266	322	0	322	588
	12:15PM	295	11	306	289	0	289	595
	12:30PM	334	6	340	313	0	313	653
Total		1142	29	1171	1221	0	1221	2392
% Approach		97.5%	2.5%	-	100%	0%	-	-
% Total		47.7%	1.2%	49.0%	51.0%	0%	51.0%	-
PHF		0.855	0.659	0.861	0.948	-	0.948	0.916
Lights		1098	27	1125	1171	0	1171	2296
% Lights		96.1%	93.1%	96.1%	95.9%	0%	95.9%	96.0%
Articulated Trucks		16	0	16	21	0	21	37
% Articulated Trucks		1.4%	0%	1.4%	1.7%	0%	1.7%	1.5%
Buses and Single-Unit Trucks		28	2	30	29	0	29	59
% Buses and Single-Unit Trucks		2.5%	6.9%	2.6%	2.4%	0%	2.4%	2.5%

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

Midday Peak (11:45 AM - 12:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 Merged - TMC

Thu Sep 30, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 4:45PM	348	14	362	466	0	466	828
5:00PM	416	9	425	478	0	478	903
5:15PM	396	20	416	490	0	490	906
5:30PM	377	14	391	499	0	499	890
Total	1537	57	1594	1933	0	1933	3527
% Approach	96.4%	3.6%	-	100%	0%	-	-
% Total	43.6%	1.6%	45.2%	54.8%	0%	54.8%	-
PHF	0.924	0.713	0.938	0.968	-	0.968	0.973
Lights	1506	54	1560	1897	0	1897	3457
% Lights	98.0%	94.7%	97.9%	98.1%	0%	98.1%	98.0%
Articulated Trucks	11	1	12	16	0	16	28
% Articulated Trucks	0.7%	1.8%	0.8%	0.8%	0%	0.8%	0.8%
Buses and Single-Unit Trucks	20	2	22	20	0	20	42
% Buses and Single-Unit Trucks	1.3%	3.5%	1.4%	1.0%	0%	1.0%	1.2%

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 at EB to WB X-over, east of Hill Road

Leg	MI 59			MI 59			Growth to 2027		Growth Rate
	Eastbound		App Total	Westbound		App Total	X-over east of Hill Road	M-59	
Direction	Thru	U-Turn		Thru	U-Turn		Int	Total	
Start Time	Thru	U-Turn	App Total	Thru	U-Turn	App Total	Int	Total	
2021-09-30 06:00:00	1002	21	1023	473	0	473	1496		0.005
2021-09-30 07:00:00	1440	69	1509	844	0	844	2353		1.0304
2021-09-30 08:00:00	1356	32	1388	940	0	940	2328		
2021-09-30 09:00:00	1202	32	1234	929	0	929	2163		
2021-09-30 10:00:00	989	24	1013	873	0	873	1886		
2021-09-30 11:00:00	1061	30	1091	1007	0	1007	2098		
2021-09-30 12:00:00	1110	30	1140	1219	0	1219	2359		
2021-09-30 13:00:00	1057	40	1097	1220	0	1220	2317		
2021-09-30 14:00:00	1217	51	1268	1397	0	1397	2665		
2021-09-30 15:00:00	1290	43	1333	1688	0	1688	3021		
2021-09-30 16:00:00	1362	40	1402	1849	0	1849	3251		
2021-09-30 17:00:00	1553	58	1611	1893	0	1893	3504		
2021-09-30 18:00:00	1159	53	1212	1472	0	1472	2684		
Grand Total	15798	523	16321	15804	0	15804	32125		
% Approach	96.8%	3.2%		100.0%	0.0%				
% Total	49.2%	1.6%	50.8%	49.2%	0.0%	49.2%			
Lights	15281	499	15780	15227	0	15227	31007		
% Lights	96.7%	95.4%	96.7%	96.3%	0.0%	96.3%	96.5%		
Articulated Trucks	161	3	164	186	0	186	350		
% Articulated Trucks	1.0%	0.6%	1.0%	1.2%	0.0%	1.2%	1.1%		
Buses and Single-Unit Trucks	356	21	377	391	0	391	768		
% Buses and Single-Unit Trucks	2.3%	4.0%	2.3%	2.5%	0.0%	2.5%	2.4%		

Daily Trip Generation for Mixed Use Development

Land Use Code	210			220			210			220		
	Single-Family Detached Housing			Multifamily Housing (Low-Rise)			Single-Family Detached Housing			Multifamily Housing (Low-Rise)		
Subcategory				Not Close to Rail Transit								
Setting	General Urban/Suburban			General Urban/Suburban								
Time Period	Weekday			Weekday								
# Data Sites	7			6								
	% of 24-Hour Vehicle Trips			% of 24-Hour Vehicle Trips								
Time	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
12:00 - 1:00 AM	0.3%	0.5%	0.2%	0.7%	0.9%	0.4%						
1:00 - 2:00 AM	0.2%	0.2%	0.1%	0.4%	0.5%	0.3%						
2:00 - 3:00 AM	0.2%	0.3%	0.1%	0.4%	0.4%	0.4%						
3:00 - 4:00 AM	0.2%	0.2%	0.2%	0.4%	0.4%	0.3%						
4:00 - 5:00 AM	0.6%	0.3%	0.8%	0.9%	0.3%	1.4%						
5:00 - 6:00 AM	1.2%	0.5%	2.0%	1.6%	0.5%	2.6%						
6:00 - 7:00 AM	3.7%	1.6%	5.8%	4.2%	1.4%	6.9%	33	17	16	111	56	55
7:00 - 8:00 AM	6.5%	3.1%	10.0%	6.5%	2.0%	10.8%	59	15	44	173	42	131
8:00 - 9:00 AM	6.2%	3.8%	8.5%	5.8%	3.1%	8.5%	55	14	41	156	37	119
9:00 - 10:00 AM	4.6%	3.3%	5.8%	3.9%	2.9%	4.9%	41	21	20	104	52	52
10:00 - 11:00 AM	4.9%	4.2%	5.6%	3.6%	2.4%	4.8%	44	22	22	96	48	48
11:00 - 12:00 PM	5.3%	5.4%	5.1%	4.3%	3.8%	4.7%	47	24	23	115	58	57
12:00 - 1:00 PM	5.7%	5.7%	5.7%	4.3%	4.5%	4.1%	51	26	25	116	58	58
1:00 - 2:00 PM	6.1%	6.1%	6.0%	4.2%	4.0%	4.4%	54	27	27	112	56	56
2:00 - 3:00 PM	6.6%	7.1%	6.1%	5.2%	5.6%	4.9%	59	30	29	141	71	70
3:00 - 4:00 PM	7.5%	8.7%	6.2%	6.1%	6.9%	5.3%	67	34	33	164	82	82
4:00 - 5:00 PM	8.9%	10.5%	7.4%	7.9%	10.1%	5.6%	80	50	30	210	132	78
5:00 - 6:00 PM	8.7%	10.0%	7.3%	9.5%	11.4%	7.6%	78	49	29	254	160	94
6:00 - 7:00 PM	7.2%	8.5%	5.9%	8.2%	9.7%	6.7%	64	32	32	220	110	110
7:00 - 8:00 PM	5.1%	6.1%	4.2%	6.4%	8.1%	4.7%						
8:00 - 9:00 PM	4.6%	6.1%	3.1%	5.9%	7.7%	4.2%						
9:00 - 10:00 PM	3.3%	4.4%	2.3%	4.4%	6.0%	2.7%						
10:00 - 11:00 PM	1.6%	2.1%	1.0%	3.5%	4.7%	2.4%						
11:00 - 12:00 AM	1.0%	1.3%	0.6%	1.9%	2.5%	1.4%						

LUC	Number of Units	Weekday, number of trips	Peak hour	Distribution (Entering/Exiting)
210	88	897	AM	26/74
			PM	63/37
220	406	2678	AM	24/76
			PM	63/37

		AM		PM	
		Entering	Exiting	Entering	Exiting
East	M-59	0.4	0.6	0.55	0.45
West	M-59	0.58	0.38	0.43	0.54

Using crossover

WB entering

EB Entering

Total			EB	WB
Total	Entering	Exiting	Entering	Entering
144	73	71	42	29
232	57	175	33	23
211	51	160	30	20
145	73	72	42	29
140	70	70	41	28
162	82	80	48	33
167	84	83	36	46
166	83	83	36	46
200	101	99	43	56
231	116	115	50	64
290	182	108	78	100
332	209	123	90	115
284	142	142	61	78

Summary of Traffic Counts for Traffic Signal Warrant for WB M-59 and Crossover east of Hill Road

	2027		Trip Generation		Total	
	WB	NB	WB	NB	WB	NB
6:00:00	487	22	29	42	516	64
7:00:00	870	71	23	33	893	104
8:00:00	969	33	20	30	989	63
9:00:00	957	33	29	42	986	75
10:00:00	900	25	28	41	928	66
11:00:00	1038	31	33	48	1071	79
12:00:00	1256	31	46	36	1302	67
13:00:00	1257	41	46	36	1303	77
14:00:00	1439	53	56	43	1495	96
15:00:00	1739	44	64	50	1803	94
16:00:00	1905	41	100	78	2005	119
17:00:00	1951	60	115	90	2066	150
18:00:00	1517	55	78	61	1595	116



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

June 15, 2022

Sean O’Neil, Director
Community Development Department
Charter Township of White Lake
7525 Highland Road
White Lake, Michigan 48383

**RE: Traffic Impact Study Review
Mixed-Use Development at Highland Road (M-59) and Hill Road**

Ref: DLZ File No. 2145-7233-21
Date of Study: 06/07/2022

Design Professional: Fishbeck

The applicant has submitted a revised Traffic Impact Study for the redevelopment of P.I.’s #12-20-101-003 and 12-20-126-006. P.I. #12-20-101-003 and 12-20-126-006 total 110.02 acres and are located on the north side of Highland Road (M-59) on both the east and west side of Hill Road. The study evaluated existing conditions, anticipated background conditions and anticipated traffic generated by the proposed development, then it completed both traffic signal warrants and right turn lane warrants for the proposed site. All of the intersections evaluated along Highland Road are under the jurisdiction of the Michigan Department of Transportation (MDOT).

The first observation of the TIS, is that despite utilizing the same traffic data as the previous TIS, which was submitted in December 2021, the Level of Service (LOS) analysis for the existing conditions had a significant change in the existing LOS of the WB Highland Rd. and EB Crossover intersection in the PM Peak hour. The previous TIS had an existing LOS of F and a delay time of 66.8 sec. The revised TIS has an existing LOS of D and a delay time of 29.1 sec for the same intersection in the PM Peak hour. DLZ is not aware of the reason for the change in delay, but the change provides doubt to the potential findings in the TIS. There is also a significant difference between the two reports for the same intersection and same time period in the Background Conditions analysis (LOS F: 78.0 sec delay vs LOS D: 31.3 sec delay).

Upon running the traffic signal warrants at each intersection, the study determined that Warrant 1 – Eight Hour Vehicular Volume and Warrant 3 – Peak Hour Vehicular Volume are met for the WB Highland Road and EB Cross (east of Hill Road) intersection. The intersection was then modeled with a traffic signal, which resulted in improved LOS for the intersection compared with the unimproved future conditions. However, the improved future condition LOS analysis revealed that the LOS is significant worse for the following intersections in the PM Peak hour compared with the background conditions analysis:



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

Intersection	Background Condition LOS/Delay	Improved Future Condition LOS/Delay
M-59 and EB crossover (NB)	AM: LOS B – 14.1 sec	AM: LOS D – 45.0 sec
	PM: LOS D – 31.3 sec	PM: LOS E – 60.5 sec
WB M-59 and Hill Road (SB)	AM: LOS B – 14.2 sec	AM: LOS C – 21.3 sec
	PM: LOS D – 30.1 sec	PM: LOS F – 68.2 sec
EB M-59 and WB crossover (SB)	AM: LOS C – 22.3 sec	AM: LOS E – 36.6 sec
	PM: LOS D – 29.1 sec	PM: LOS E – 40.6 sec
EB M-59 and Haven Rd (SB)	PM: LOS D – 34.6 sec	PM: LOS E – 46.4 sec

Due to the number of intersections where the LOS changes from LOS D to LOS E or F, DLZ believes there are further improvements to be made in this area.


We have reviewed the analysis; the methodology appear to be in line with standard practices, and the findings are supported by the data provided, though are in potential conflict with the previous TIS that used the same data. However, the resulting LOS for the intersections is worse than the background conditions for the site on several legs of the analyzed intersections. Several legs currently operating at LOS D or better will change to a LOS E or F, and nearly all legs will operate at a LOS worse than the background conditions. Further evaluation and improvements adjacent to the proposed site should be considered.

Upon running the right turn lane warrant for the WB Highland Road and Hill Road intersection, it was determined that a full right turn lane was warranted due to PM peak hour traffic volumes.

DLZ believes additional improvements are needed in the area in order to improve Level of Service in the corridor to an acceptable level, but would note that final approval of the Traffic Impact Study will be provided by MDOT.

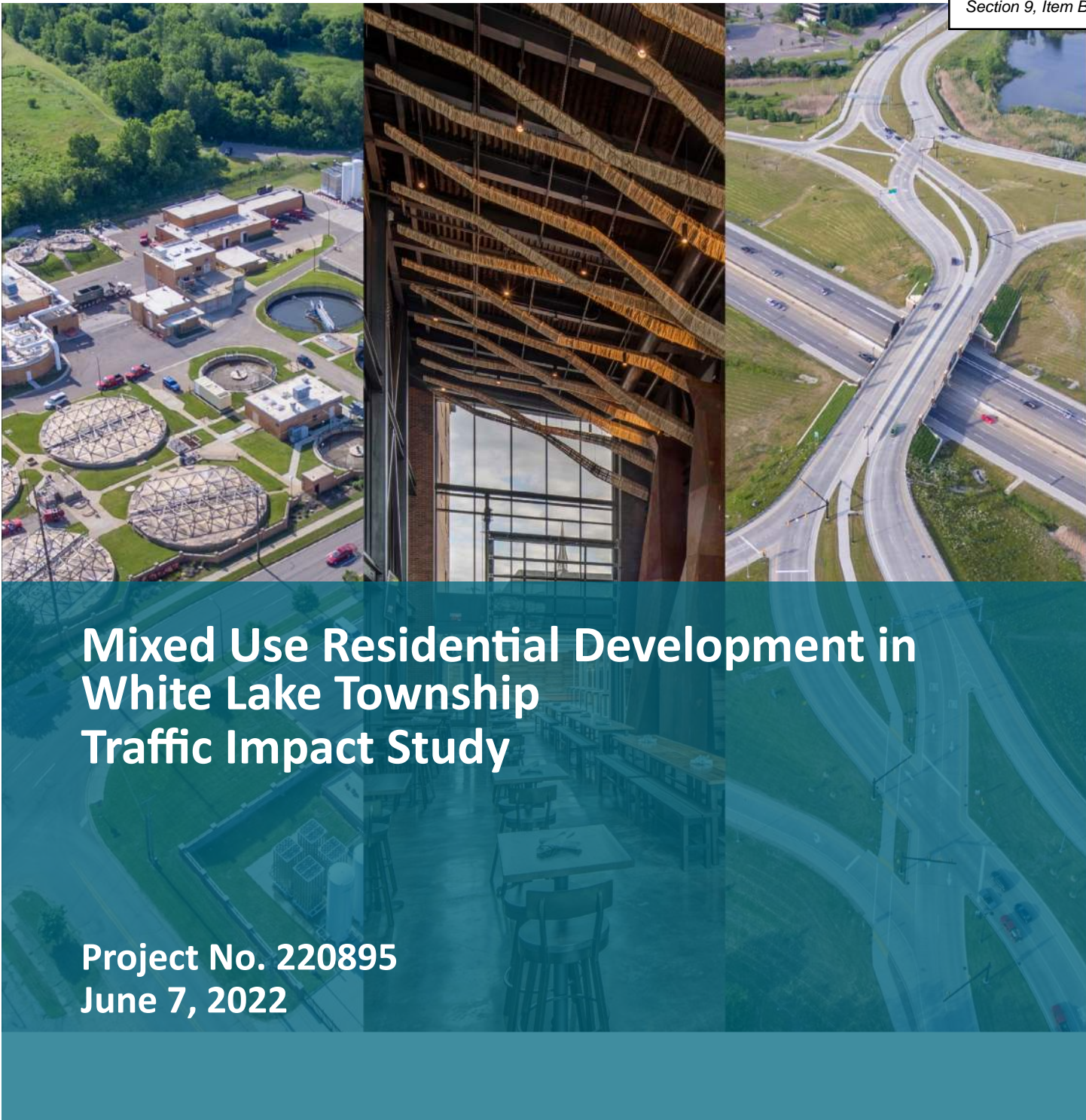
If you have any questions, please feel free to contact to me.

Respectfully,
DLZ Michigan, Inc.


 Digitally signed by Leigh C Merrill III
 Date: 2022.06.16 12:52:27-04'00'

Leigh Merrill, P.E.
Project Manager

CC: Cc: Michael Leuffgen, P.E., DLZ *via email*
Justin Quagliata, Community Development *via e-mail*



Mixed Use Residential Development in White Lake Township Traffic Impact Study

Project No. 220895
June 7, 2022

Mixed Use Residential Development in White Lake Township Traffic Impact Study

Prepared For:
Lautrec Ltd.
Farmington Hills, MI

June 7, 2022
Project No. 220895

Executive Summary1

1.0 Introduction.....2

 1.1 Project Overview.....2

 1.2 Study Methodology.....2

 1.3 Intersection Characteristics3

 1.4 Existing Traffic Volumes.....5

2.0 Existing Conditions Analysis7

 2.1 Traffic Operations Analysis Methodology7

 2.2 Existing Conditions Traffic Analysis7

3.0 Background Conditions Analysis8

 3.1 Background Conditions Traffic Analysis10

4.0 Site Traffic Characteristics.....10

 4.1 Trip Generation.....11

 4.2 Trip Distribution12

5.0 Future Conditions Analysis.....15

 5.1 Turn Lane Warrants15

 5.2 Future Conditions Traffic Analysis.....15

 5.3 Future Improvement Conditions Traffic Analysis.....16

 5.4 Signal Warrant Analysis18

6.0 Findings and Recommendations.....19

List of Figures

Figure 1 – Project Location and Study Network2

Figure 2 – Existing Lane Configurations4

Figure 3 – Existing Traffic Volumes6

Figure 4 – Background Traffic Volumes9

Figure 5 – Conceptual Site Plan.....11

Figure 6 – Trip Generation Volumes13

Figure 7 – Pass-By Volumes.....14

List of Tables

Table 1 – Proposed Improvements1

Table 2 – LOS Criteria7

Table 3 – LOS Analysis for Existing Conditions.....7

Table 4 – LOS Analysis for Background Conditions.....10

Table 5 – Trip Generation for Proposed Development11

Table 6 – Trip Distribution12

Table 7 – Turn Lane Warrants15

Table 8 – LOS Analysis for Future Conditions15

Table 9 – LOS Analysis for Future Improvement Conditions.....17

Table 10 – Signal Warrants – Intersection of WB M-59 and Crossover East of Hill Road.....18

Table 11 – Proposed Improvements19

List of Appendices

- Appendix 1 – Traffic Volume Data
- Appendix 2 – Existing LOS Output Reports
- Appendix 3 – Background LOS Output Reports
- Appendix 4 – Trip Generation Calculations
- Appendix 5 – Turn Lane Warrant
- Appendix 6 – Future LOS Output Reports
- Appendix 7 – Future Improvement LOS Output Reports
- Appendix 8 – Signal Warrants

List of Abbreviations/Acronyms

AASHTO	American Association of State Highway and Transportation Officials
DU	Dwelling Units
EB	Eastbound
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LUC	Land Use Code
M-59	Highland Road
MDOT	Michigan Department of Transportation
MMUTCD	Michigan Manual on Uniform Traffic Control Devices
mph	Miles per Hour
NB	Northbound
RCOC	Road Commission for Oakland County
RIRO	Right-In/Right-Out (driveway)
SB	Southbound
SEMCOG	Southeast Michigan Council of Governments
TIS	Traffic Impact Study
TMC	Turning Movement Count
TCDS	Traffic Count Database System
Township	White Lake Township
WB	Westbound

References

- The Highway Capacity Manual, 6th Edition.* (2016). Washington, DC.
- The Highway Capacity Manual: 2000.* (2000). Washington, DC.
- Trip Generation Handbook, 3rd Edition.* (2017). Washington DC.
- Trip Generation Manual, 11th Edition.* (2021). Washington DC.

Executive Summary

Fishbeck has completed a traffic impact study (TIS) related to the development of a mixed-use residential development located on the northeast and northwest side of Hill Road near Highland Road (M-59) in White Lake Township (Township), Michigan. The existing land is vacant. The proposed site presents 88 single family condominiums and 406 multifamily housing (low-rise) units. The development is assumed to be open and fully operational in 2027.

All the access points to the development are proposed. There will be three access points on Hill Road and one access point on M-59. The accesses on Hill Road will be full movement (left and right turn movements allowed, ingress and egress). The access on M-59 will be right-in/right-out (RIRO).

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Michigan Department of Transportation (MDOT), Road Commission for Oakland County (RCOC), and the Township.

Vehicular, pedestrian, and cyclist Turning Movement Count (TMC)s were collected at the study intersection on Thursday, September 30, 2021, during the weekday a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the roadway network. Based on this review of 2021 traffic counts from Southeast Michigan Council of Governments (SEMCOG)'s Traffic Count Database System (TCDS), there was no compelling evidence to apply a COVID adjustment factor to the collected TMCs.

Site-generated traffic was forecast using the information and methodologies specified in the latest version of Trip Generation, Trip Generation Manual, 11th Edition, 2021. The existing traffic volumes, site layout, and engineering judgement were used to develop a trip distribution model for the a.m. and p.m. peak hours for the new traffic that will be generated by the proposed development. Additionally, directions of origin, surrounding residential densities, and commuting patterns were considered.

Capacity analyses were conducted for existing, background, and total future conditions based on Highway Capacity Manual (HCM) 6th Edition methodologies using Synchro traffic analysis software. Synchro network models were also simulated using SimTraffic to evaluate network operations including intersection queueing.

Based on the findings of the HCM operational analyses, crash data, and site traffic generation, Table 1 – Proposed Improvements has the recommended existing, background, and future improvements to the study intersections to mitigate traffic impacts.

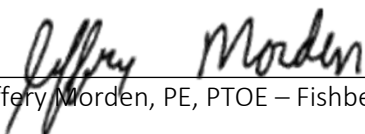
Table 1 – Proposed Improvements

Intersection	Existing	Background	Future
WB M-59 and crossover east of Hill Road	No improvements	No improvements	Traffic signal warranted.
WB M-59 and Driveway 4	No improvements	No improvements	Right turn lane warranted.

Westbound (WB)

The opinions, findings, and conclusions expressed in this TIS are those of Fishbeck and not necessarily those of the Owner/Applicant, MDOT, RCOC, or the Township.

Prepared By:


 Jeffrey Morden, PE, PTOE – Fishbeck


 Jill Bauer, PE, PTOE – Fishbeck
 Project Manager

1.0 Introduction

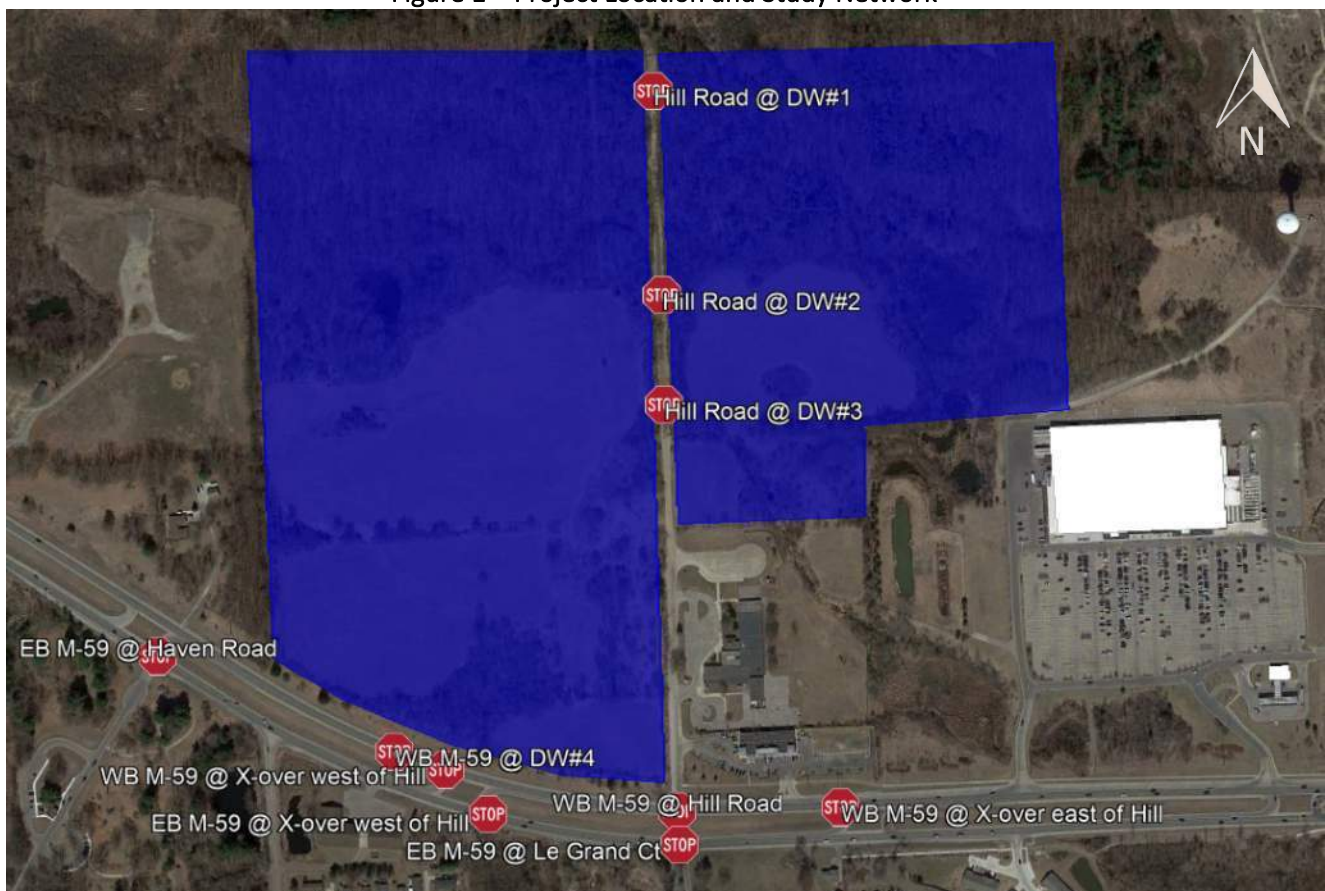
1.1 Project Overview

On behalf of Lautrec Ltd., Fishbeck has conducted a traffic impact study (TIS) related to the development of a mixed-use residential development located on the northeast and northwest side of Hill Road near Highland Road (M-59) in White Lake Township (Township), Michigan. The existing land is vacant. The proposed site presents 88 single family condominiums and 406 multifamily housing (low-rise) units. The development is assumed to be open and fully operational in 2027.

All the access points to the development are proposed. There will be three access points on Hill Road and one access point on M-59. The accesses on Hill Road will be full movement (left and right turn movements allowed, ingress and egress). The access on M-59 will be right-in/right-out (RIRO).

The project location and study intersections are indicated in Figure 1 – Project Location and Study Network.

Figure 1 – Project Location and Study Network



1.2 Study Methodology

The objectives of this TIS were to determine what impacts, if any, the proposed project will have on adjacent roadway traffic operations, and to develop recommendations for any improvements necessary to mitigate the project impacts on the studied intersections. Study analyses were completed relative to typical weekday a.m. and p.m. peak periods.

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Michigan Department of Transportation (MDOT), Road Commission for Oakland County (RCOC), and the Township.

1.3 Intersection Characteristics

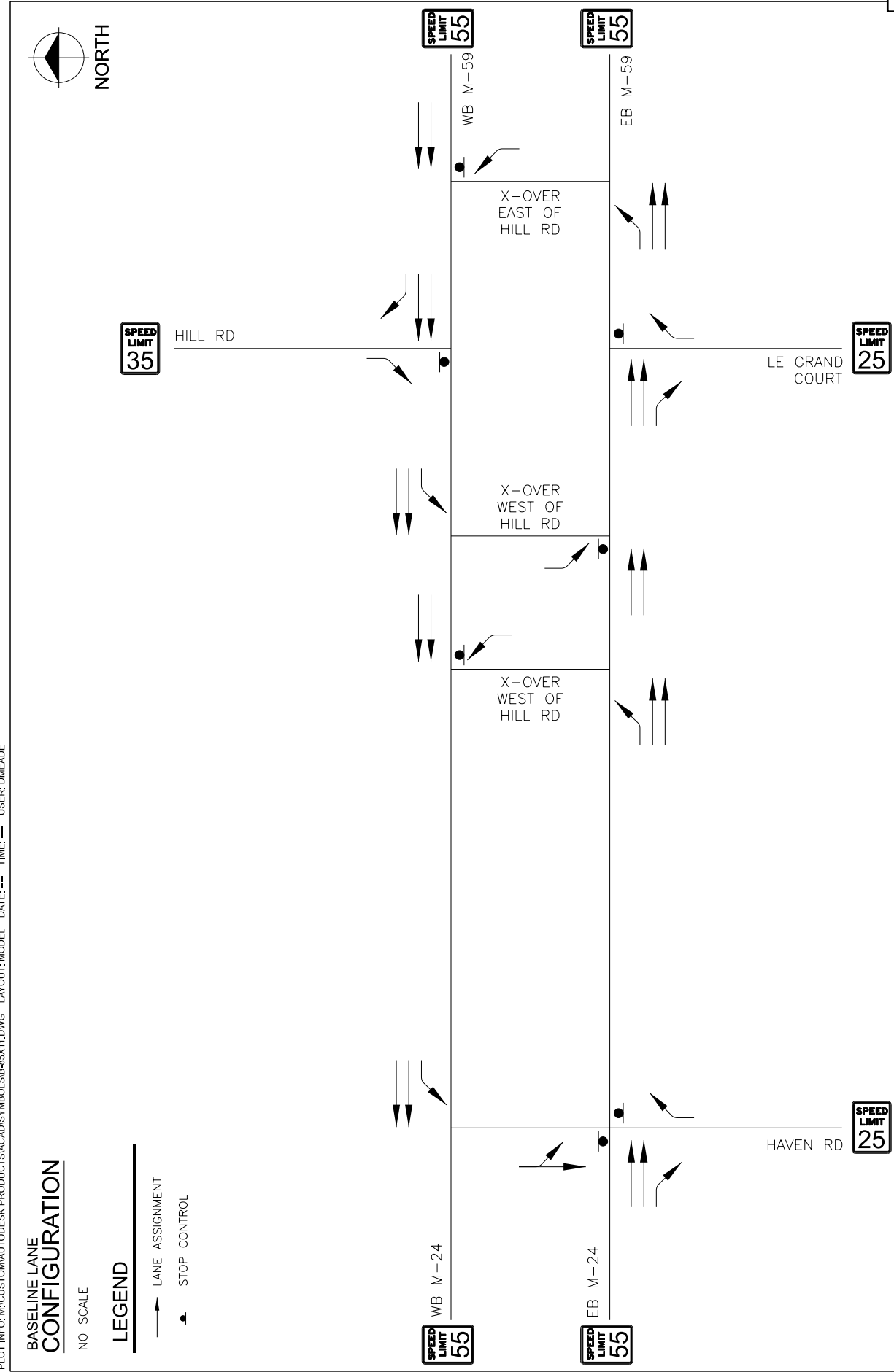
Based on the type and size of the proposed development and the likely area of influence for the site trips, traffic operations were analyzed for the following intersections:

1. Westbound (WB) M-59 and Hill Road (unsignalized).
2. Eastbound (EB) M-59 and Le Grand Court (unsignalized).
3. WB M-59 and crossover east of Hill Road (unsignalized).
4. EB M-59 and crossover west of Hill Road (unsignalized).
5. WB M-59 and crossover west of Hill Road (unsignalized).
6. EB M-59 and Haven Road (unsignalized).
7. Hill Road and Driveway 1 (proposed unsignalized driveway approximately 2,300 feet north of M-59).
8. Hill Road and Driveway 2 (proposed unsignalized driveway approximately 1,600 feet north of M-59).
9. Hill Road and Driveway 3 (proposed unsignalized driveway approximately 1,150 feet north of M-59).
10. WB M-59 and Driveway 4 (proposed unsignalized driveway approximately 950 feet west of Hill Road).

The existing intersection lane configurations, traffic controls, and posted speed limits are indicated in Figure 2 – Existing Lane Configurations.

Figure 2 – Existing Lane Configurations

Section 9, Item B.



PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\Symbols\B-35X11.DWG LAYOUT; MODEL DATE: --- TIME: --- USER: DMEADE

BASELINE LANE CONFIGURATION

NO SCALE

LEGEND

- LANE ASSIGNMENT
- STOP CONTROL



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development

White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.
2

1.4 Existing Traffic Volumes

Vehicular Turning Movement Count (TMC)'s was collected at the following study intersection during the weekday a.m. (7 to 9 a.m.) and p.m. (4 to 6 p.m.) peak periods of the road network on Thursday, September 30, 2021:

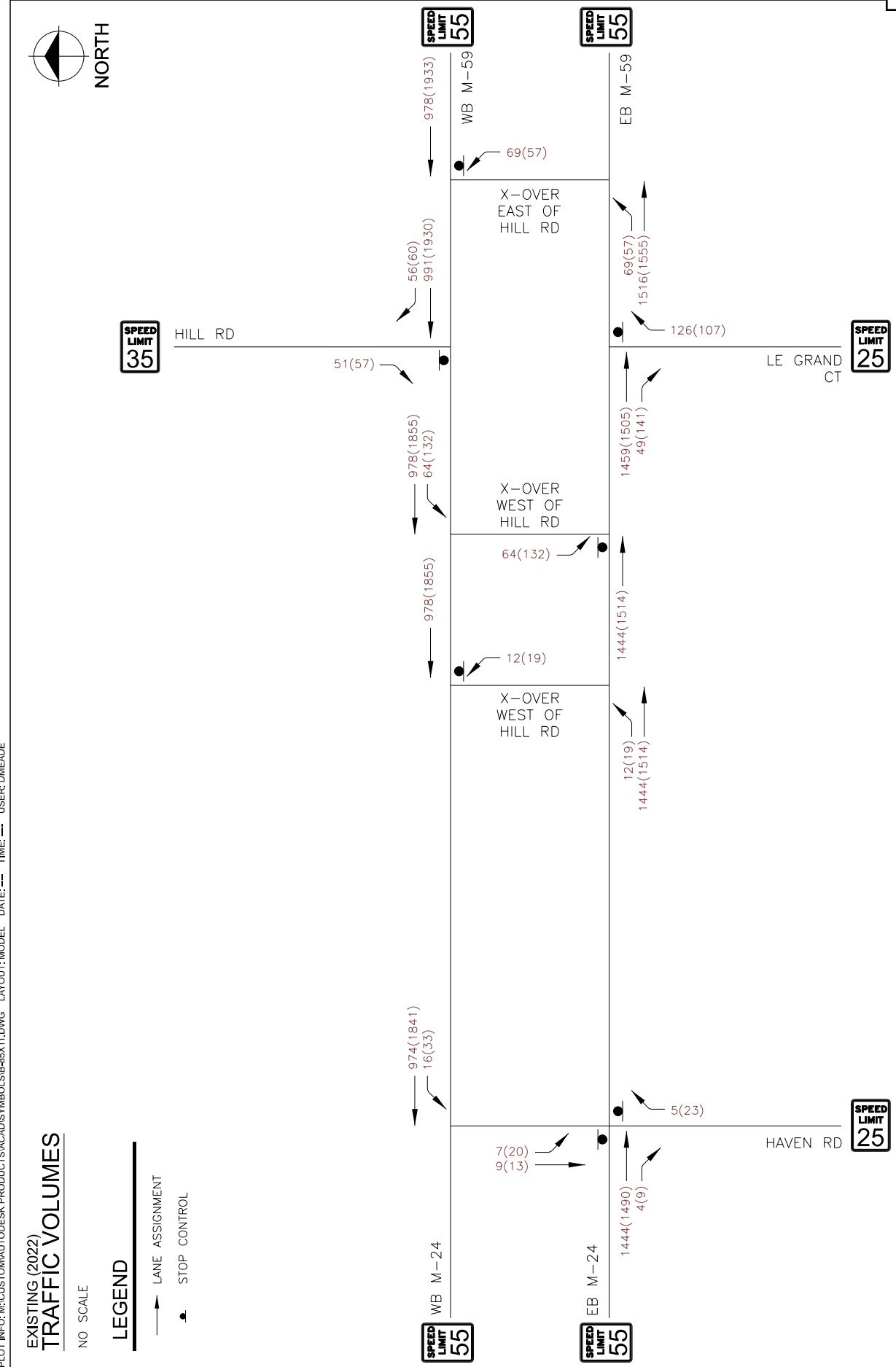
- WB M-59 and Hill Road.
- EB M-59 and Le Grand Court.
- WB M-59 and crossover east of Hill Road.
- EB M-59 and crossover west of Hill Road.
- WB M-59 and crossover west of Hill Road.
- EB M-59 and Haven Road.

Due to the impact of COVID-19, current traffic volume data may not be representative of typical operations. Historical traffic data from the Southeast Michigan Council of Governments (SEMCOG) Traffic Count Database System (TCDS) TMC's website was reviewed. Based on this review of 2021 traffic counts, there was no compelling evidence to apply a COVID adjustment factor to the collected TMCs.

Traffic volume information can be found in Appendix 1 – Traffic Volume Data, which includes heavy vehicle data. The adjusted existing traffic volumes used in this study are indicated in Figure 3– Existing Traffic Volumes.

Figure 3 – Existing Traffic Volumes

Section 9, Item B.



Engineers | Architects | Scientists | Constructors

Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development

White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

3

2.0 Existing Conditions Analysis

2.1 Traffic Operations Analysis Methodology

Synchro was used to perform Highway Capacity Manual (HCM) operational analyses during the a.m. and p.m. peak hours for all the intersections within this study. According to the most recent editions of the HCM, level of service (LOS) is a qualitative measure describing operational conditions of a traffic stream or intersection. LOS ranges from A to F, with LOS A representing desirable traffic operations characterized by low delay and LOS F representing extremely poor traffic operations characterized by excessive delays and long vehicle queues. LOS D is generally considered acceptable for most areas. Table 2 – LOS Criteria presents the HCM criteria for various LOS for unsignalized and signalized intersections.

Table 2 – LOS Criteria

LOS	Average Stopped Vehicle Delay (seconds)	
	Unsignalized	Signalized
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

2.2 Existing Conditions Traffic Analysis

Synchro models for the existing network were created based on the existing roadway configurations and traffic controls. Where applicable, data concerning the existing intersection and roadway lane configurations, geometry, and traffic control that were observed in the field were entered in the models. The traffic signal timing permit for the signalized intersections of M-59 and Bogie Lake Road and EB M-59 and crossover west of Ormond Road were provided by RCOC for use in the models. These signalized intersections were added to the models to provide traffic progression through the study corridor.

The resulting LOS and delay for the existing conditions are indicated in Table 3 – LOS Analysis for Existing Conditions.

Table 3 – LOS Analysis for Existing Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover east of Hill Road	B 14.8	D 29.1
Overall	A 1.5	A 1.1
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Le Grand Court	D 26.3	C 24.4
Overall	A 2.3	A 1.9
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	B 13.9	D 27.9
Overall	A 1.0	A 1.0

Table 3 – LOS Analysis for Existing Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	C 21.2	D 26.8
Overall	A 1.1	A 2.5
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 12.9	C 22.9
Overall	A 0.2	A 0.4
EB M-59 Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.1	C 16.9
SB crossover at Haven Road	E 36.7	E 36.5
Overall	A 0.6	A 1.5

Northbound (NB)

Southbound (SB)

Further analysis of the LOS results for existing conditions revealed that most movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For existing conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length. See Appendix 2 – Existing LOS Output Reports for the existing conditions LOS reports and queuing analysis reports.

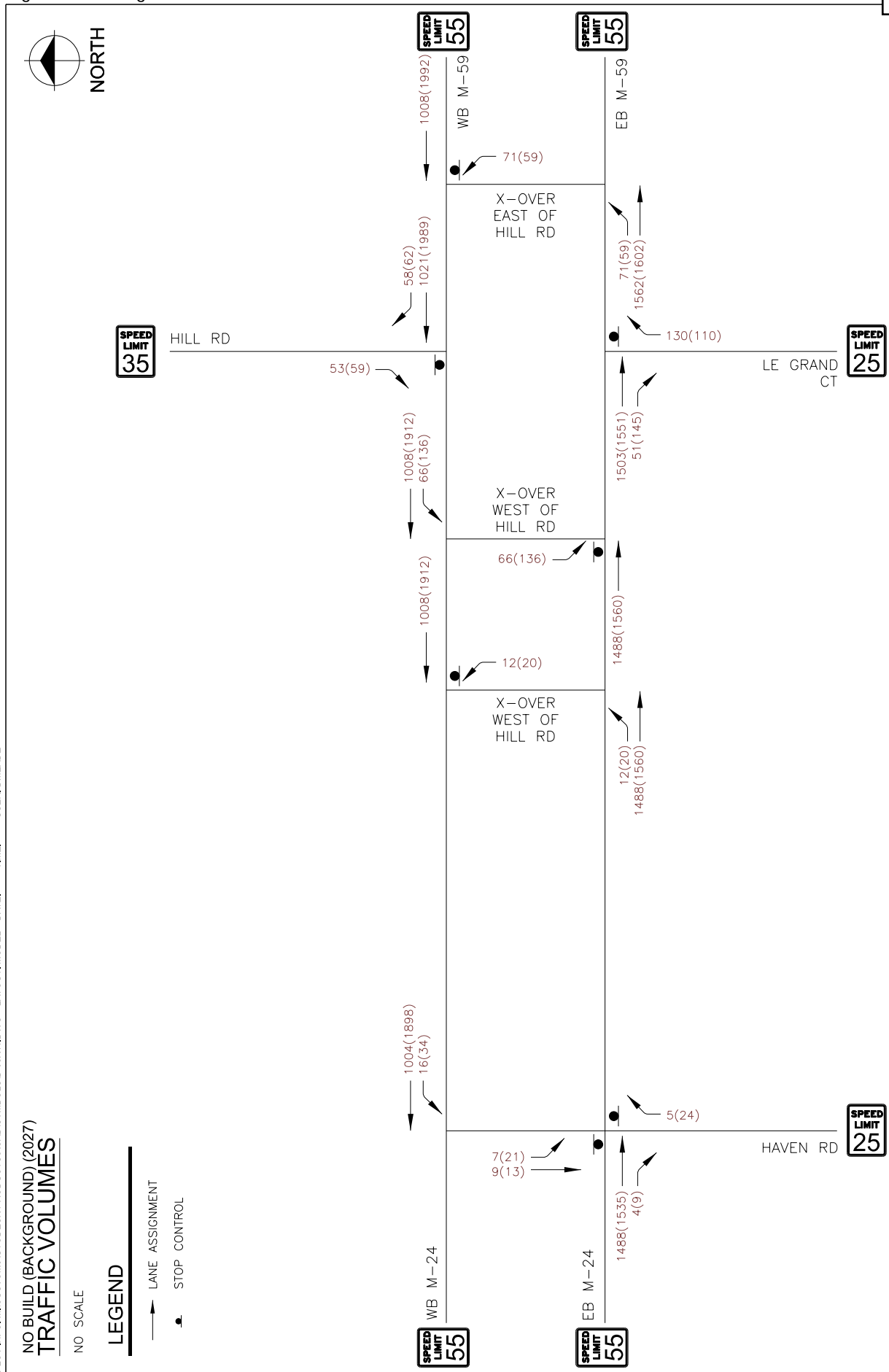
3.0 Background Conditions Analysis

Historical traffic data on the SEMCOG TCDS website was referenced in order to determine the applicable growth rate for the existing traffic volumes to the project build-out year in 2027. Based on this review, a background growth rate of 0.5% was utilized. There were no background developments identified and included in the background traffic conditions.

The total background traffic volumes are indicated in Figure 4 – Background Traffic Volumes.

Figure 4 – Background Traffic Volumes

Section 9, Item B.



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development
White Lake Township, MI 48383
Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

4

3.1 Background Conditions Traffic Analysis

The resulting LOS and delay for the background conditions are indicated in Table 4 – LOS Analysis for Background Conditions.

Table 4 – LOS Analysis for Background Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover east of Hill Road	B 14.1	D 31.3
Overall	A 1.0	A 1.2
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-5	A 0.0	A 0.0
NB Le Grand Court	D 28.6	D 26.2
Overall	A 2.5	A 2.0
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	B 14.2	D 30.1
Overall	A 1.0	A 1.1
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	C 22.3	D 29.1
Overall	A 1.1	A 2.7
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 13.1	C 24.1
Overall	A 0.2	A 0.4
EB M-59 and Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.6	C 17.5
SB crossover at Haven Road	E 39.5	D 34.6
Overall	A 0.6	A 1.1

Further analysis of the LOS results for background conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. peak hour.

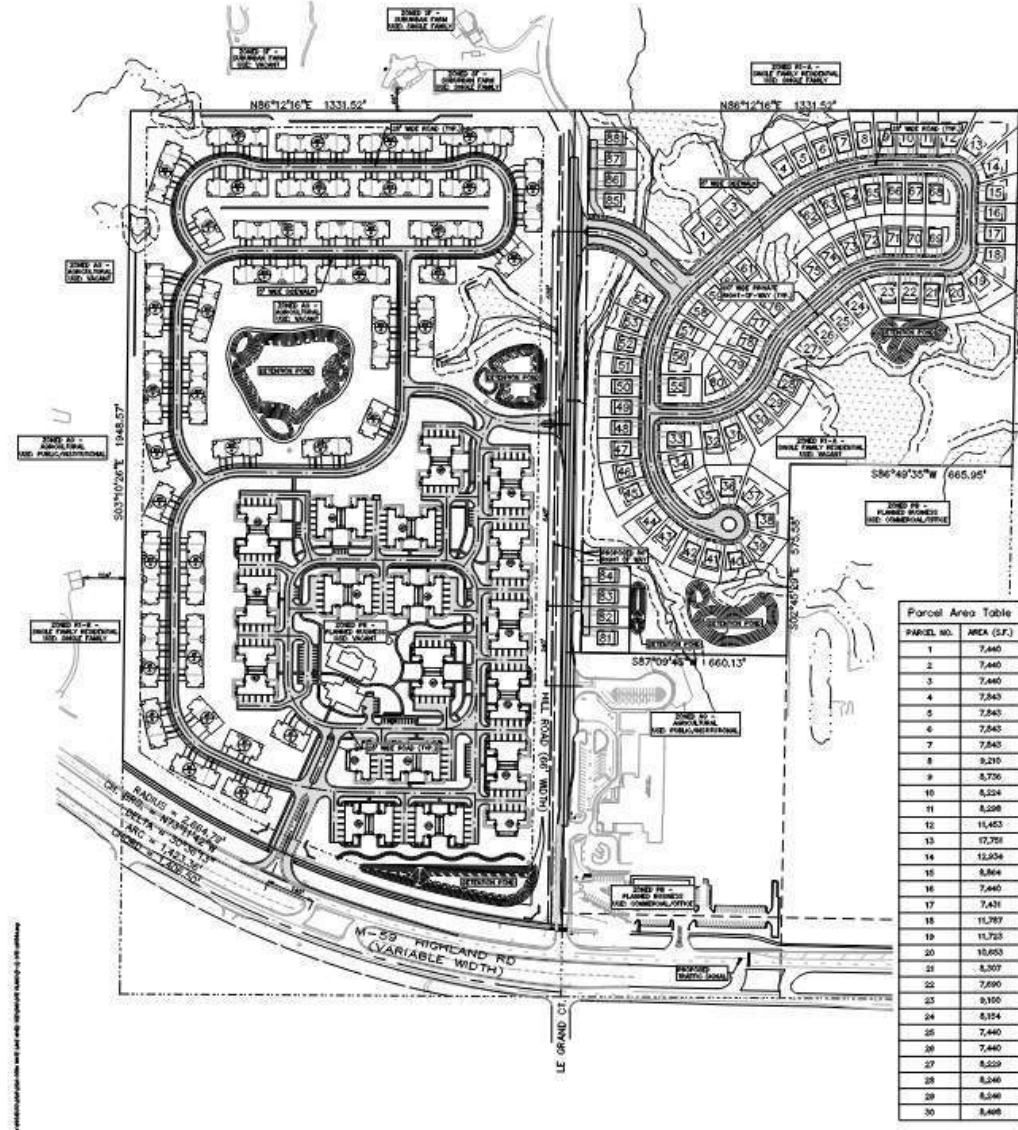
The LOS/delay for the p.m. peak hour became acceptable due to an increase in vehicles due to growth and the average delay decreased.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For background conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length, see Appendix 3 – Background LOS Output Reports.

4.0 Site Traffic Characteristics

A representation of the current conceptual site plan is provided in Figure 5 – Conceptual Site Plan.

Figure 5 – Conceptual Site Plan



4.1 Trip Generation

Using the information and methodologies specified in the latest version of Trip Generation, Fishbeck forecast the weekday a.m. and p.m. peak hour trips associated with the proposed development.

Table 5 – Trip Generation for Proposed Development presents the resulting trip generation for the development. Refer to Appendix 4 – Trip Generation Calculations.

Table 5 – Trip Generation for Proposed Development

ITE Land Use	LUC	Units	a.m. Peak Hour			p.m. Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Single-family Detached Housing	210	88 DU	17	49	66	55	33	88	897
Multi-family Housing (Low-Rise)	220	406 DU	36	113	149	123	72	195	2,678
Total			53	162	215	178	105	283	3,575

Dwelling Units (DU)
Land Use Code(LUC)

4.2 Trip Distribution

The directions that site traffic will travel to and from were based upon existing traffic patterns during the a.m. and p.m. peak hours. The existing traffic patterns reflect the gravity between origins and destinations in the study area, and therefore an accurate indication of where the proposed trips would be coming from and going to.

Table 6 – Trip Distribution provides the probable distribution based on the existing traffic patterns.

Table 6 – Trip Distribution

Direction	Via	a.m. peak hour		p.m. peak hour	
		To	From	To	From
North	Hill Road	2% (4)	2% (1)	1% (1)	2% (3)
East	M-59	60% (96)	40% (21)	45% (47)	55% (98)
West	M-59	38% (62)	58% (31)	54% (57)	43% (77)
Total		100% (162)	100% (53)	100% (105)	100% (178)

The trip distribution for the site is indicated in Figure 6 – Trip Generation Volumes, see below. These trips were added to the background volumes (Figure 4) to result in the future conditions volumes in Figure 7– Future Conditions Volumes.

Figure 6 – Trip Generation Volumes

Section 9, Item B.



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development

White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

6

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-35X11.DWG LAYOUT: MODEL DATE: --- TIME: --- USER: DMEADE

**SITE GENERATED VEHICLE TRIPS
TRAFFIC VOLUMES**

NO. SCALE

LEGEND

- LANE ASSIGNMENT
- STOP CONTROL

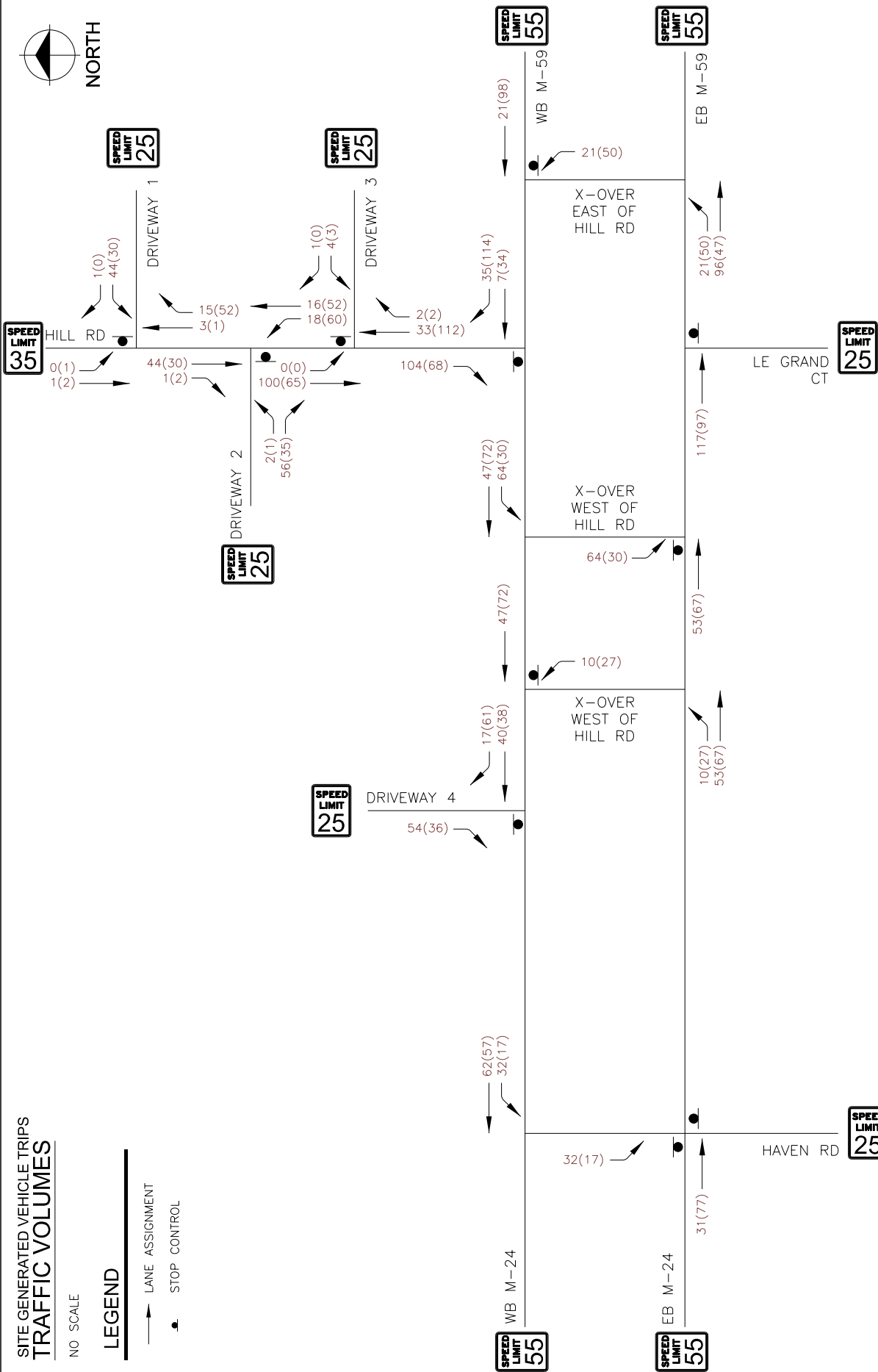


Figure 7 – Future Conditions Volumes

Section 9, Item B.



Hard copy is Intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Mixed-Use Residential Development

White Lake Township, MI 48383

Traffic Impact Study

PROJECT NO.
220895

FIGURE NO.

7

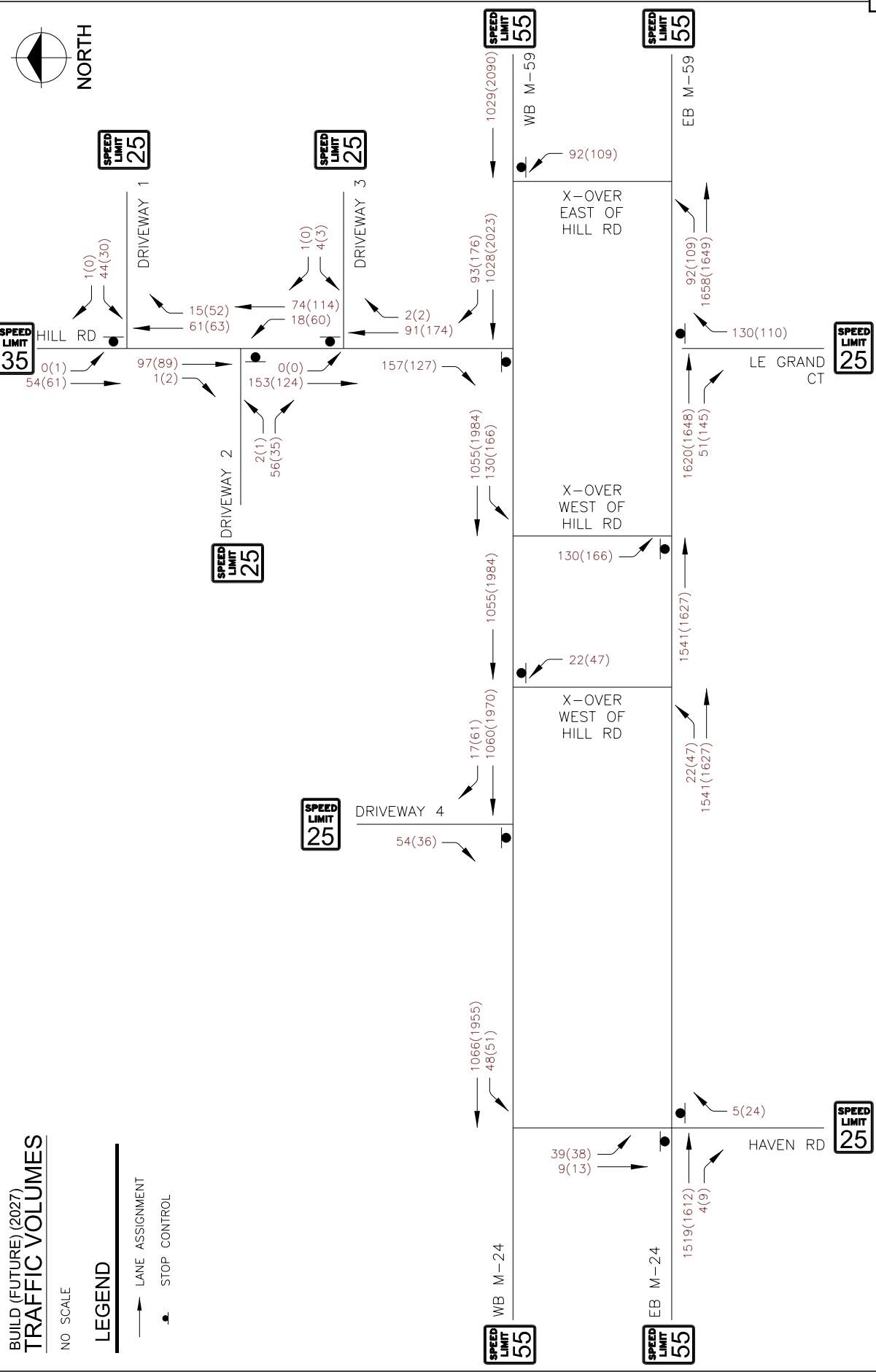
PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\S\SYMBOLS\B-35X11.DWG LAYOUT: MODEL DATE: --- TIME: --- USER: DMEADE

**BUILD (FUTURE) (2027)
TRAFFIC VOLUMES**

NO. SCALE

LEGEND

- LANE ASSIGNMENT
- STOP CONTROL



5.0 Future Conditions Analysis

5.1 Turn Lane Warrants

An evaluation was performed in accordance with MDOT requirements to determine if right turn deceleration lanes are required at the site driveway on WB M-59. The results of the analysis indicated that a full width right turn lane is warranted at Driveway 4. All turn lane warrant charts are in Appendix 5 – Turn Lane Warrants. The results of the analysis are presented in Table 7 – Turn Lane Warrants.

Table 7 – Turn Lane Warrants

Intersection	Movement	Result
WB M-59 and Driveway 4	WB Right-turn	Full width right turn lane warranted

5.2 Future Conditions Traffic Analysis

The resulting LOS and delay for the future conditions are shown in Table 8 – LOS Analysis for Future Conditions.

Table 8 – LOS Analysis for Future Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover east of Hill Road	B 16.7	F 63.7
Overall	A 2.1	A 4.2
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Le Grand Court	D 33.8	D 29.4
Overall	A 2.8	A 2.1
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	C 21.3	F 68.2
Overall	A 3.8	A 4.9
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	E 36.6	E 40.6
Overall	A 3.4	A 4.3
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 11.8	C 18.0
Overall	A 0.4	A 0.7
EB M-59 and Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.9	C 18.4
SB crossover at Haven Road	E 36.8	E 46.4
Overall	A 1.6	A 2.3
Hill Road and Driveway 1 (Stop-Controlled)		
WB Driveway 1	A 9.4	A 9.5
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.1
Overall	A 2.4	A 1.4

Table 8 – LOS Analysis for Future Conditions

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
Hill Road and Driveway 2 (Stop-Controlled)		
WB Driveway 2	A 9.1	A 9.0
NB Hill Road	A 1.5	A 2.6
SB Hill Road	A 0.0	A 0.0
Overall	A 2.7	A 2.6
Hill Road and Driveway 3 (Stop-Controlled)		
WB Driveway 3	A 9.8	B 10.4
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.0
Overall	A 0.2	A 0.1
WB M-59 and Driveway 4 (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Driveway 4	B 13.7	D 25.2
Overall	A 0.7	A 0.5

Further analysis of the LOS results for future conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- WB M-59 and crossover east of Hill Road:
 - The NB crossover approach operates at LOS F in the p.m. peak hour.
- WB M-59 and Hill Road:
 - The SB approach operates at LOS F in the p.m. peak hour.
- EB M-59 and crossover west of Hill Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours
- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For future conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length. See Appendix 6 – Future LOS Output Reports for the future conditions LOS reports and queueing analysis reports.

The 95th percentile queue lengths were reviewed for the development driveways. During the a.m. and p.m. peak hours, the queue lengths are less than 55 feet (two vehicles).

5.3 Future Improvement Conditions Traffic Analysis

The following observations were made, and improvements were recommended, if applicable, at the following intersections due to Future traffic conditions:

- WB M-59 and crossover east of Hill Road:
 - Due to unacceptable LOS/delay during the future condition, a traffic signal warrant was investigated to determine if a traffic signal could alleviate delay. The traffic signal is warranted for Warrants 1B, 2 (70%), and 3B. For more information on the traffic signal warrant, see section 5.4. The addition of this traffic signal is also providing additional vehicular gaps for SB Hill Road vehicles to enter WB M-59. The resulting LOS and delay for the future improvement conditions are indicated in Table 9 – LOS Analysis for Future Improvement Conditions.

Table 9 – Future with Improvements Conditions LOS/Delay

Approach/Lane Group	LOS/Delay(s)	
	a.m. Peak Hour	p.m. Peak Hour
WB M-59 and crossover east of Hill Road (Signalized)		
WB M-59	B 16.6	C 33.3
NB crossover east of Hill Road	D 45.0	E 60.5
Overall	C 20.1	D 35.1
EB M-59 and Le Grand Court (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Le Grand Court	D 33.8	D 29.4
Overall	A 2.8	A 2.1
WB M-59 and Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Hill Road	C 21.3	F 68.2
Overall	A 3.8	A 4.9
EB M-59 and crossover west of Hill Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
SB crossover west of Hill Road	E 36.6	E 40.6
Overall	A 3.4	A 4.3
WB M-59 and crossover west of Hill Road (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
NB crossover west of Hill Road	B 11.8	C 18.0
Overall	A 0.4	A 0.7
EB M-59 and Haven Road (Stop-Controlled)		
EB M-59	A 0.0	A 0.0
NB Haven Road	C 16.9	C 18.4
SB crossover at Haven Road	E 36.8	E 46.4
Overall	A 1.6	A 2.3
Hill Road and Driveway 1 (Stop-Controlled)		
WB Driveway 1	A 9.4	A 9.5
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.1
Overall	A 2.4	A 1.4
Hill Road and Driveway 2 (Stop-Controlled)		
WB Driveway 2	A 9.1	A 9.0
NB Hill Road	A 1.5	A 2.6
SB Hill Road	A 0.0	A 0.0
Overall	A 2.7	A 2.6
Hill Road and Driveway 3 (Stop-Controlled)		
WB Driveway 3	A 9.8	B 10.4
NB Hill Road	A 0.0	A 0.0
SB Hill Road	A 0.0	A 0.0
Overall	A 0.2	A 0.1
WB M-59 and Driveway 4 (Stop-Controlled)		
WB M-59	A 0.0	A 0.0
SB Driveway 4	B 13.7	D 25.2
Overall	A 0.7	A 0.5

Further analysis of the LOS a result for future improvement conditions revealed that most movements, approaches, and intersections are expected to continue to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, with the following exceptions:

- WB M-59 and crossover east of Hill Road:
 - The NB crossover approach operates at LOS E in the p.m. peak hour.
- WB M-59 and Hill Road:
 - The SB approach operates at LOS F in the p.m. peak hour.
- EB M-59 and crossover west of Hill Road.
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.
- EB M-59 and Haven Road:
 - The SB crossover approach operates at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. For future improvement conditions, study network operations are acceptable, without significant vehicle queues or spill-back from available storage lanes. No 95th percentile queue lengths for the turning movements exceed the provided storage length, see Appendix 7 – Future Improvement LOS Output.

The addition of the traffic signal at WB M-59 and the crossover east of Hill Road provides some delay relief. It benefits the minor streets’ approaches on WB M-59 operationally. The traffic signal provides additional gaps for vehicles from Hill Road to turn onto WB M-59. For the p.m. peak hour, the SB queue reduced from 314 feet (13 vehicles) to 203 feet (eight vehicles). For the a.m. peak hour, the queue increased 13 feet with the traffic signal. The queue lengths for the crossover for the a.m. and p.m. peak hours is relatively the same with or without the traffic signal.

5.4 Signal Warrant Analysis

Signal warrants were completed at the intersection of WB M-59 and crossover east of Hill Road in accordance with Michigan Manual on Uniform Traffic Control Devices (MMUTCD) requirements. The results of this analysis revealed that several warrants are met at the intersection. The results of this analysis are presented in Table 10 – Signal Warrants – Intersection of WB M-59 and Crossover East of Hill Road, all signal warrant charts are included in Appendix 8 – Signal Warrants.

Table 10 – Signal Warrants – Intersection of WB M-59 and Crossover East of Hill Road

Warrant		Is Warrant Met?	Comments
1 – Eight Hour Vehicular Volume	Overall	Yes	
	Condition A	No	Hours Met: 3
	Condition B	Yes	Hours Met: 12
	Condition A and B	N/A	Hours Met: N/A
2 – Four Hour Vehicular Volume (70%)		Yes	Hours Met: 12
3 – Peak Hour Vehicular Volume (70%)	Overall	Yes	
	Condition A	No	
	Condition B	Yes	Hours Met: 8
4 – Four Hour Pedestrian Volume (70%)		No	Hours Met:
5 – School Crossing		Not Evaluated	
6 – Coordinated Signal System		Not Evaluated	
7 – Crash Experience	Overall	Not Evaluated	Crashes in five-year period:
	Condition A	Not Evaluated	
	Condition B	Not Evaluated	
8 – Roadway Network		Not Evaluated	
9 – Intersection Near at Grade Railroad Crossing		N/A	

6.0 Findings and Recommendations

The analyses conducted for this TIS indicate the proposed development will not result in any significant impact to the adjacent road network with improvements. The proposed site access configuration is appropriate and will acceptably facilitate site ingress and egress. These conclusions are supported by the following key findings:

1. Existing storage lengths are adequate for all movements in existing and future conditions.
2. Lane configurations and physical capacity are appropriate within the study area.
3. Existing nor planned transit or non-motorized facilities in the site vicinity would not be impacted by the project.

Based on the findings of the HCM operational analyses and site traffic generation, Table 11 – Proposed Improvements includes the recommended existing, background, and future improvements to the study intersections to mitigate traffic impacts.

Table 11 – Proposed Improvements

Intersection	Existing	Background	Future
WB M-59 and crossover east of Hill Road	No improvements	No improvements	Traffic signal warranted.
WB M-59 and Driveway 4	No improvements	No improvements	Right turn lane warranted.

Appendix 1

Traffic Volume Data

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
2021-09-30 7:00AM	357	12	369	164	0	164	533
7:15AM	354	8	362	188	0	188	550
7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
Hourly Total	1440	69	1509	844	0	844	2353
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
8:30AM	306	4	310	225	0	225	535
8:45AM	362	8	370	229	0	229	599
Hourly Total	1356	32	1388	940	0	940	2328
4:00PM	297	9	306	423	0	423	729
4:15PM	372	8	380	463	0	463	843
4:30PM	345	9	354	497	0	497	851
4:45PM	348	14	362	466	0	466	828
Hourly Total	1362	40	1402	1849	0	1849	3251
5:00PM	416	9	425	478	0	478	903
5:15PM	396	20	416	490	0	490	906
5:30PM	377	14	391	499	0	499	890
5:45PM	364	15	379	426	0	426	805
Hourly Total	1553	58	1611	1893	0	1893	3504
Total	5711	199	5910	5526	0	5526	11436
% Approach	96.6%	3.4%	-	100%	0%	-	-
% Total	49.9%	1.7%	51.7%	48.3%	0%	48.3%	-
Lights	5547	188	5735	5345	0	5345	11080
% Lights	97.1%	94.5%	97.0%	96.7%	0%	96.7%	96.9%
Articulated Trucks	60	1	61	61	0	61	122
% Articulated Trucks	1.1%	0.5%	1.0%	1.1%	0%	1.1%	1.1%
Buses and Single-Unit Trucks	104	10	114	120	0	120	234
% Buses and Single-Unit Trucks	1.8%	5.0%	1.9%	2.2%	0%	2.2%	2.0%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424

Section 9, Item B.



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
Total	1417	69	1486	978	0	978	2464
% Approach	95.4%	4.6%	-	100%	0%	-	-
% Total	57.5%	2.8%	60.3%	39.7%	0%	39.7%	-
PHF	0.945	0.575	0.917	0.955	-	0.955	0.932
Lights	1354	65	1419	923	0	923	2342
% Lights	95.6%	94.2%	95.5%	94.4%	0%	94.4%	95.0%
Articulated Trucks	27	0	27	20	0	20	47
% Articulated Trucks	1.9%	0%	1.8%	2.0%	0%	2.0%	1.9%
Buses and Single-Unit Trucks	36	4	40	35	0	35	75
% Buses and Single-Unit Trucks	2.5%	5.8%	2.7%	3.6%	0%	3.6%	3.0%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 4:45PM	348	14	362	466	0	466	828
5:00PM	416	9	425	478	0	478	903
5:15PM	396	20	416	490	0	490	906
5:30PM	377	14	391	499	0	499	890
Total	1537	57	1594	1933	0	1933	3527
% Approach	96.4%	3.6%	-	100%	0%	-	-
% Total	43.6%	1.6%	45.2%	54.8%	0%	54.8%	-
PHF	0.924	0.713	0.938	0.968	-	0.968	0.973
Lights	1506	54	1560	1897	0	1897	3457
% Lights	98.0%	94.7%	97.9%	98.1%	0%	98.1%	98.0%
Articulated Trucks	11	1	12	16	0	16	28
% Articulated Trucks	0.7%	1.8%	0.8%	0.8%	0%	0.8%	0.8%
Buses and Single-Unit Trucks	20	2	22	20	0	20	42
% Buses and Single-Unit Trucks	1.3%	3.5%	1.4%	1.0%	0%	1.0%	1.2%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877566, Location: 42.648859, -83.535424



M-59 (Highland Road) and Le Grand Ct - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877562, Location: 42.64847, -83.537354



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	M 59 Eastbound				M 59 Westbound				Le Grand Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:00AM	346	5	0	351	0	0	0	0	0	31	0	31	382
7:15AM	336	11	0	347	0	0	0	0	0	29	0	29	376
7:30AM	342	20	0	362	0	0	0	0	0	40	0	40	402
7:45AM	399	8	0	407	0	0	0	0	0	26	0	26	433
Hourly Total	1423	44	0	1467	0	0	0	0	0	126	0	126	1593
8:00AM	352	10	0	362	0	0	0	0	0	31	0	31	393
8:15AM	332	12	0	344	0	0	0	0	0	19	0	19	363
8:30AM	313	8	0	321	0	0	0	0	0	24	0	24	345
8:45AM	340	14	0	354	0	0	0	0	0	40	0	40	394
Hourly Total	1337	44	0	1381	0	0	0	0	0	114	0	114	1495
4:00PM	319	27	0	346	0	0	0	0	0	14	0	14	360
4:15PM	382	40	0	422	0	0	0	0	0	17	0	17	439
4:30PM	365	34	0	399	0	0	0	0	0	19	0	19	418
4:45PM	366	32	0	398	0	0	0	0	0	23	0	23	421
Hourly Total	1432	133	0	1565	0	0	0	0	0	73	0	73	1638
5:00PM	394	39	0	433	0	0	0	0	0	36	0	36	469
5:15PM	367	36	0	403	0	0	0	0	0	26	0	26	429
5:30PM	384	34	0	418	0	0	0	0	0	22	0	22	440
5:45PM	360	35	0	395	0	0	0	0	0	20	0	20	415
Hourly Total	1505	144	0	1649	0	0	0	0	0	104	0	104	1753
Total	5697	365	0	6062	0	0	0	0	0	417	0	417	6479
% Approach	94.0%	6.0%	0%	-	0%	0%	0%	-	0%	100%	0%	-	-
% Total	87.9%	5.6%	0%	93.6%	0%	0%	0%	0%	0%	6.4%	0%	6.4%	-
Lights	5517	352	0	5869	0	0	0	0	0	403	0	403	6272
% Lights	96.8%	96.4%	0%	96.8%	0%	0%	0%	-	0%	96.6%	0%	96.6%	96.8%
Articulated Trucks	60	0	0	60	0	0	0	0	0	0	0	0	60
% Articulated Trucks	1.1%	0%	0%	1.0%	0%	0%	0%	-	0%	0%	0%	0%	0.9%
Buses and Single-Unit Trucks	120	13	0	133	0	0	0	0	0	14	0	14	147
% Buses and Single-Unit Trucks	2.1%	3.6%	0%	2.2%	0%	0%	0%	-	0%	3.4%	0%	3.4%	2.3%

*L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Le Grand Ct - TMC

Thu Sep 30, 2021

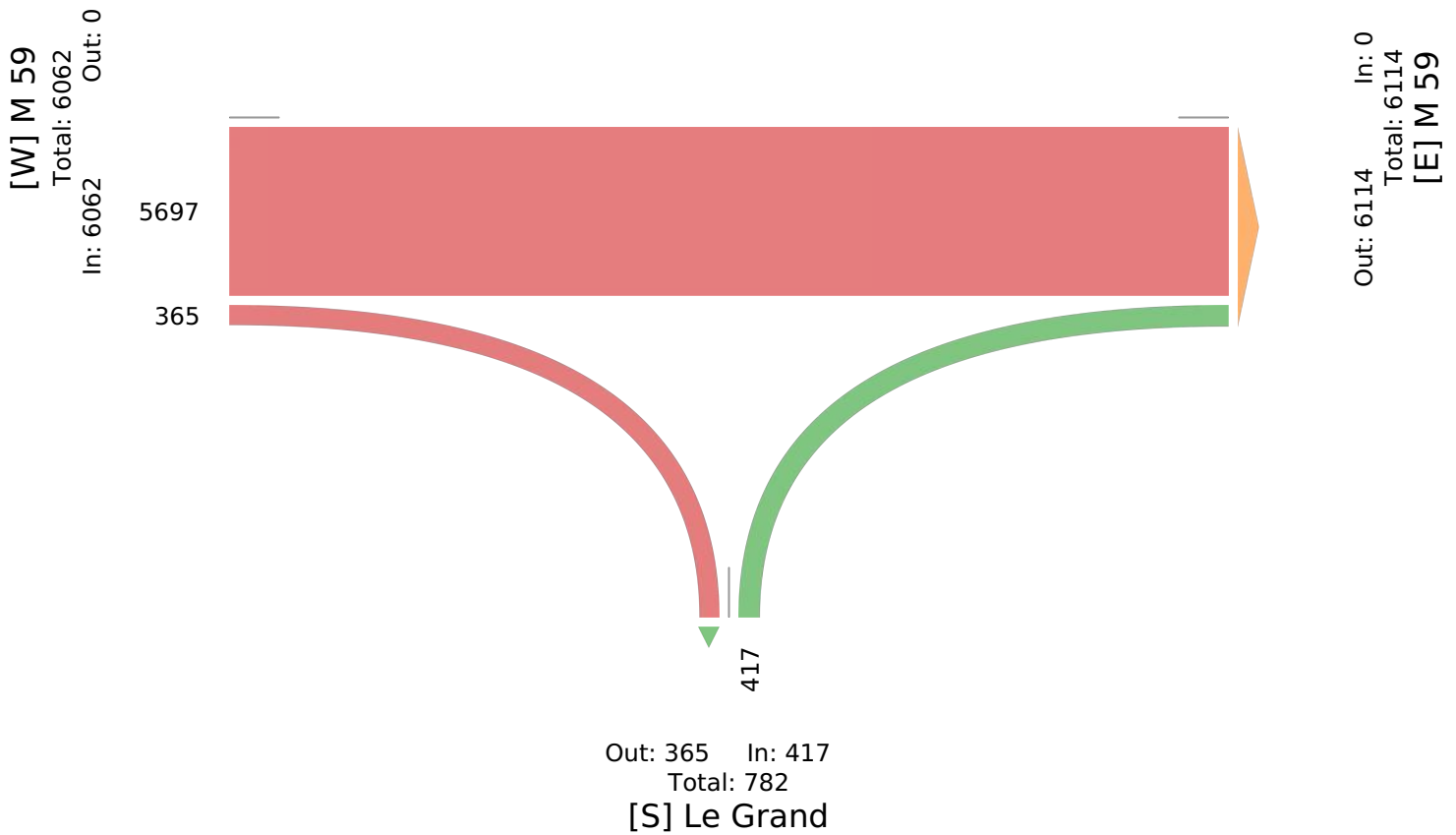
Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877562, Location: 42.64847, -83.537354

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



M-59 (Highland Road) and Le Grand Ct - TMC
 Thu Sep 30, 2021
 AM Peak (7:15 AM - 8:15 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877562, Location: 42.64847, -83.537354

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	M 59 Eastbound				M 59 Westbound				Le Grand Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:15AM	336	11	0	347	0	0	0	0	0	29	0	29	376
7:30AM	342	20	0	362	0	0	0	0	0	40	0	40	402
7:45AM	399	8	0	407	0	0	0	0	0	26	0	26	433
8:00AM	352	10	0	362	0	0	0	0	0	31	0	31	393
Total	1429	49	0	1478	0	0	0	0	0	126	0	126	1604
% Approach	96.7%	3.3%	0%	-	0%	0%	0%	-	0%	100%	0%	-	-
% Total	89.1%	3.1%	0%	92.1%	0%	0%	0%	0%	0%	7.9%	0%	7.9%	-
PHF	0.895	0.613	-	0.908	-	-	-	-	-	0.788	-	0.788	0.926
Lights	1369	46	0	1415	0	0	0	0	0	122	0	122	1537
% Lights	95.8%	93.9%	0%	95.7%	0%	0%	0%	-	0%	96.8%	0%	96.8%	95.8%
Articulated Trucks	26	0	0	26	0	0	0	0	0	0	0	0	26
% Articulated Trucks	1.8%	0%	0%	1.8%	0%	0%	0%	-	0%	0%	0%	0%	1.6%
Buses and Single-Unit Trucks	34	3	0	37	0	0	0	0	0	4	0	4	41
% Buses and Single-Unit Trucks	2.4%	6.1%	0%	2.5%	0%	0%	0%	-	0%	3.2%	0%	3.2%	2.6%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Le Grand Ct - TMC

Thu Sep 30, 2021

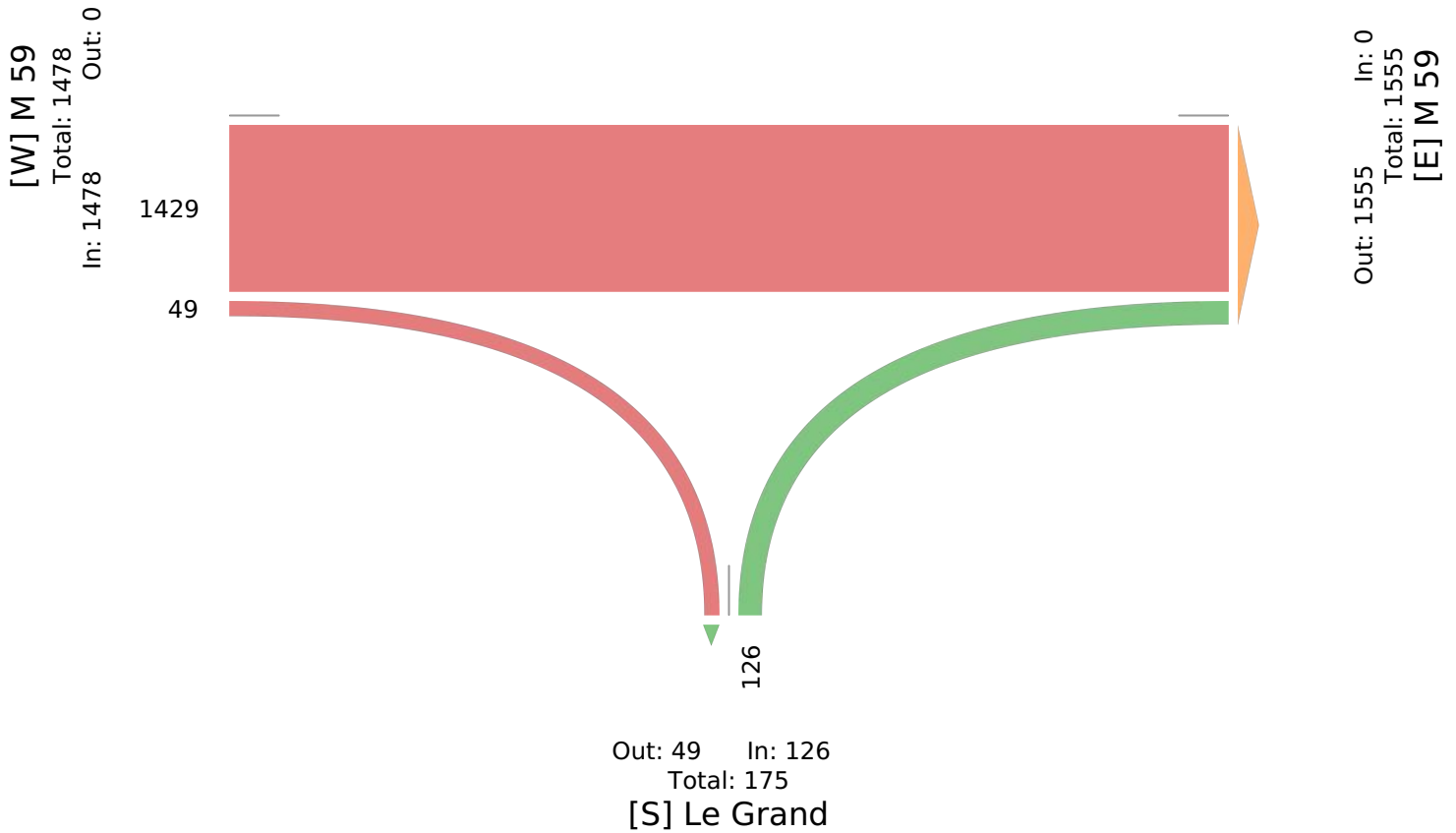
AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877562, Location: 42.64847, -83.537354

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



M-59 (Highland Road) and Le Grand Ct - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877562, Location: 42.64847, -83.537354

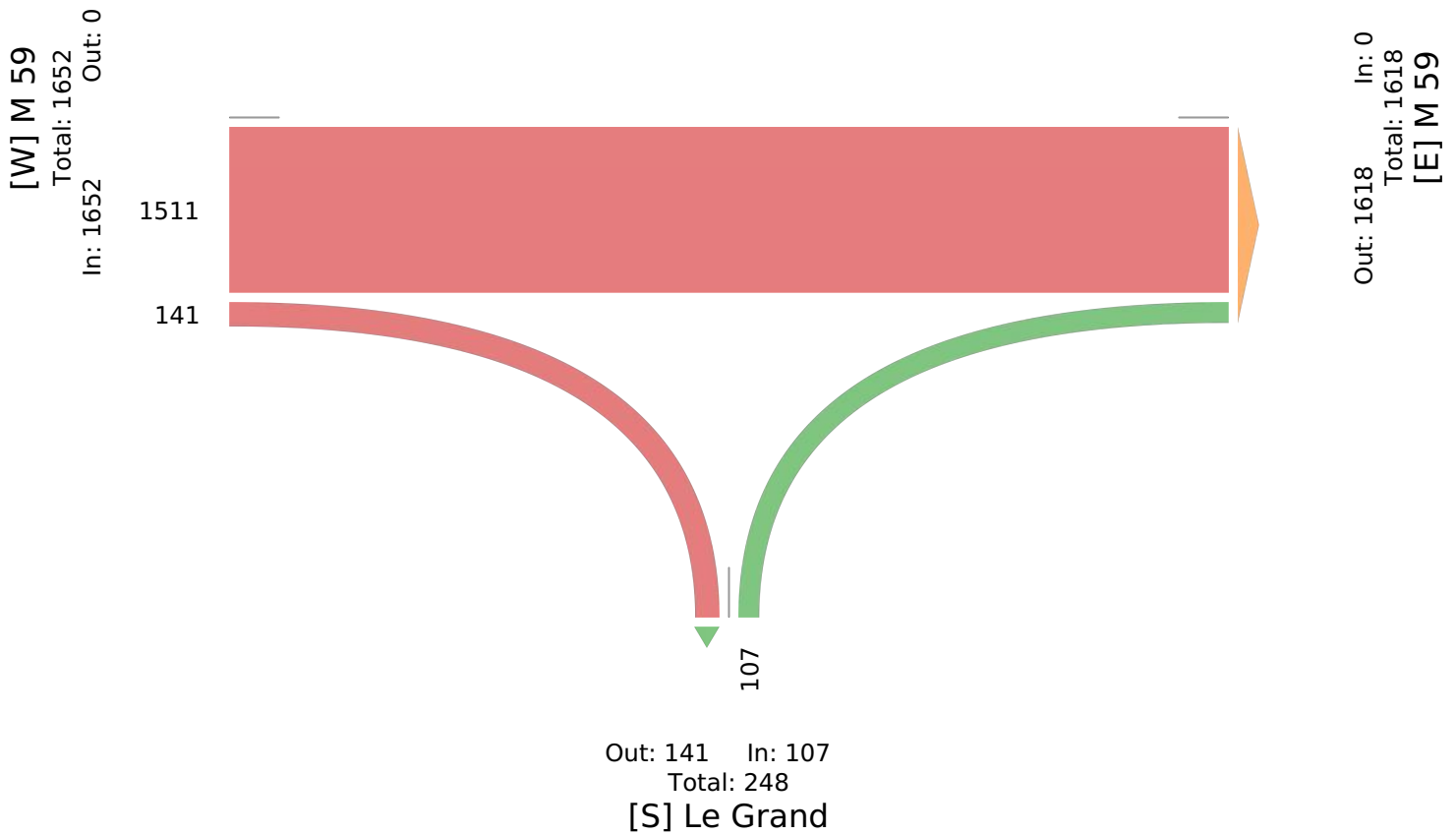
Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	M 59 Eastbound				M 59 Westbound				Le Grand Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 4:45PM	366	32	0	398	0	0	0	0	0	23	0	23	421
5:00PM	394	39	0	433	0	0	0	0	0	36	0	36	469
5:15PM	367	36	0	403	0	0	0	0	0	26	0	26	429
5:30PM	384	34	0	418	0	0	0	0	0	22	0	22	440
Total	1511	141	0	1652	0	0	0	0	0	107	0	107	1759
% Approach	91.5%	8.5%	0%	-	0%	0%	0%	-	0%	100%	0%	-	-
% Total	85.9%	8.0%	0%	93.9%	0%	0%	0%	0%	0%	6.1%	0%	6.1%	-
PHF	0.959	0.904	-	0.954	-	-	-	-	-	0.743	-	0.743	0.938
Lights	1476	138	0	1614	0	0	0	0	0	103	0	103	1717
% Lights	97.7%	97.9%	0%	97.7%	0%	0%	0%	-	0%	96.3%	0%	96.3%	97.6%
Articulated Trucks	9	0	0	9	0	0	0	0	0	0	0	0	9
% Articulated Trucks	0.6%	0%	0%	0.5%	0%	0%	0%	-	0%	0%	0%	0%	0.5%
Buses and Single-Unit Trucks	26	3	0	29	0	0	0	0	0	4	0	4	33
% Buses and Single-Unit Trucks	1.7%	2.1%	0%	1.8%	0%	0%	0%	-	0%	3.7%	0%	3.7%	1.9%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Le Grand Ct - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877562, Location: 42.64847, -83.537354

Section 9, Item B.



M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Hill Southbound				Int
	L	T	U	App	T	R	U	App	L	R	U	App	
2021-09-30 7:00AM	0	0	0	0	177	1	0	178	0	8	0	8	186
7:15AM	0	0	0	0	193	4	0	197	0	4	0	4	201
7:30AM	0	0	0	0	245	12	0	257	0	8	0	8	265
7:45AM	0	0	0	0	250	31	0	281	0	26	0	26	307
Hourly Total	0	0	0	0	865	48	0	913	0	46	0	46	959
8:00AM	0	0	0	0	242	7	0	249	0	13	0	13	262
8:15AM	0	0	0	0	254	6	0	260	0	4	0	4	264
8:30AM	0	0	0	0	232	0	0	232	0	8	0	8	240
8:45AM	0	0	0	0	232	2	0	234	0	4	0	4	238
Hourly Total	0	0	0	0	960	15	0	975	0	29	0	29	1004
4:00PM	0	0	0	0	423	8	0	431	0	7	0	7	438
4:15PM	0	0	0	0	463	5	0	468	0	10	0	10	478
4:30PM	0	0	0	0	490	5	0	495	0	8	0	8	503
4:45PM	0	0	0	0	473	8	0	481	0	9	0	9	490
Hourly Total	0	0	0	0	1849	26	0	1875	0	34	0	34	1909
5:00PM	0	0	0	0	473	11	0	484	0	11	0	11	495
5:15PM	0	0	0	0	480	11	0	491	0	17	0	17	508
5:30PM	0	0	0	0	494	15	0	509	0	9	0	9	518
5:45PM	0	0	0	0	462	23	0	485	0	20	0	20	505
Hourly Total	0	0	0	0	1909	60	0	1969	0	57	0	57	2026
Total	0	0	0	0	5583	149	0	5732	0	166	0	166	5898
% Approach	0%	0%	0%	-	97.4%	2.6%	0%	-	0%	100%	0%	-	-
% Total	0%	0%	0%	0%	94.7%	2.5%	0%	97.2%	0%	2.8%	0%	2.8%	-
Lights	0	0	0	0	5389	141	0	5530	0	162	0	162	5692
% Lights	0%	0%	0%	-	96.5%	94.6%	0%	96.5%	0%	97.6%	0%	97.6%	96.5%
Articulated Trucks	0	0	0	0	47	2	0	49	0	0	0	0	49
% Articulated Trucks	0%	0%	0%	-	0.8%	1.3%	0%	0.9%	0%	0%	0%	0%	0.8%
Buses and Single-Unit Trucks	0	0	0	0	147	6	0	153	0	4	0	4	157
% Buses and Single-Unit Trucks	0%	0%	0%	-	2.6%	4.0%	0%	2.7%	0%	2.4%	0%	2.4%	2.7%

*L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Hill

Total: 315

In: 166 Out: 149

166

149

[W] MI 59

Total: 5749

In: 0 Out: 5749

5583

Out: 0 In: 5732

Total: 5732

[E] MI 59

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Hill Southbound				Int
	L	T	U	App	T	R	U	App	L	R	U	App	
2021-09-30 7:30AM	0	0	0	0	245	12	0	257	0	8	0	8	265
7:45AM	0	0	0	0	250	31	0	281	0	26	0	26	307
8:00AM	0	0	0	0	242	7	0	249	0	13	0	13	262
8:15AM	0	0	0	0	254	6	0	260	0	4	0	4	264
Total	0	0	0	0	991	56	0	1047	0	51	0	51	1098
% Approach	0%	0%	0%	-	94.7%	5.3%	0%	-	0%	100%	0%	-	-
% Total	0%	0%	0%	0%	90.3%	5.1%	0%	95.4%	0%	4.6%	0%	4.6%	-
PHF	-	-	-	-	0.975	0.452	-	0.931	-	0.490	-	0.490	0.894
Lights	0	0	0	0	934	52	0	986	0	50	0	50	1036
% Lights	0%	0%	0%	-	94.2%	92.9%	0%	94.2%	0%	98.0%	0%	98.0%	94.4%
Articulated Trucks	0	0	0	0	17	0	0	17	0	0	0	0	17
% Articulated Trucks	0%	0%	0%	-	1.7%	0%	0%	1.6%	0%	0%	0%	0%	1.5%
Buses and Single-Unit Trucks	0	0	0	0	40	4	0	44	0	1	0	1	45
% Buses and Single-Unit Trucks	0%	0%	0%	-	4.0%	7.1%	0%	4.2%	0%	2.0%	0%	2.0%	4.1%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Hill

Total: 107

In: 51 Out: 56

51

56

991

[W] MI 59

Total: 1042

In: 0

Out: 1042

Out: 0

In: 1047

Total: 1047

[E] MI 59

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Hill Southbound				Int
	L	T	U	App	T	R	U	App	L	R	U	App	
2021-09-30 5:00PM	0	0	0	0	473	11	0	484	0	11	0	11	495
5:15PM	0	0	0	0	480	11	0	491	0	17	0	17	508
5:30PM	0	0	0	0	494	15	0	509	0	9	0	9	518
5:45PM	0	0	0	0	462	23	0	485	0	20	0	20	505
Total	0	0	0	0	1909	60	0	1969	0	57	0	57	2026
% Approach	0%	0%	0%	-	97.0%	3.0%	0%	-	0%	100%	0%	-	-
% Total	0%	0%	0%	0%	94.2%	3.0%	0%	97.2%	0%	2.8%	0%	2.8%	-
PHF	-	-	-	-	0.966	0.652	-	0.967	-	0.713	-	0.713	0.978
Lights	0	0	0	0	1878	58	0	1936	0	56	0	56	1992
% Lights	0%	0%	0%	-	98.4%	96.7%	0%	98.3%	0%	98.2%	0%	98.2%	98.3%
Articulated Trucks	0	0	0	0	9	1	0	10	0	0	0	0	10
% Articulated Trucks	0%	0%	0%	-	0.5%	1.7%	0%	0.5%	0%	0%	0%	0%	0.5%
Buses and Single-Unit Trucks	0	0	0	0	22	1	0	23	0	1	0	1	24
% Buses and Single-Unit Trucks	0%	0%	0%	-	1.2%	1.7%	0%	1.2%	0%	1.8%	0%	1.8%	1.2%

* L: Left, R: Right, T: Thru, U: U-Turn

M-59 (Highland Road) and Hill Road - TMC

Thu Sep 30, 2021

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877561, Location: 42.648831, -83.53738

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Hill

Total: 117

In: 57 Out: 60

57

60

1909

[W] MI 59

Total: 1966

In: 0

Out: 1966

Out: 0

In: 1969

Total: 1969

[E] MI 59

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
2021-09-30 7:00AM	344	0	344	172	10	182	526
7:15AM	328	0	328	185	13	198	526
7:30AM	340	0	340	224	22	246	586
7:45AM	397	0	397	254	15	269	666
Hourly Total	1409	0	1409	835	60	895	2304
8:00AM	345	0	345	243	14	257	602
8:15AM	327	0	327	243	13	256	583
8:30AM	312	0	312	232	9	241	553
8:45AM	342	0	342	221	16	237	579
Hourly Total	1326	0	1326	939	52	991	2317
4:00PM	319	0	319	397	25	422	741
4:15PM	382	0	382	425	40	465	847
4:30PM	374	0	374	465	23	488	862
4:45PM	372	0	372	454	28	482	854
Hourly Total	1447	0	1447	1741	116	1857	3304
5:00PM	378	0	378	420	41	461	839
5:15PM	370	0	370	444	40	484	854
5:30PM	376	0	376	447	35	482	858
5:45PM	357	0	357	426	41	467	824
Hourly Total	1481	0	1481	1737	157	1894	3375
Total	5663	0	5663	5252	385	5637	11300
% Approach	100%	0%	-	93.2%	6.8%	-	-
% Total	50.1%	0%	50.1%	46.5%	3.4%	49.9%	-
Lights	5490	0	5490	5078	374	5452	10942
% Lights	96.9%	0%	96.9%	96.7%	97.1%	96.7%	96.8%
Articulated Trucks	65	0	65	56	0	56	121
% Articulated Trucks	1.1%	0%	1.1%	1.1%	0%	1.0%	1.1%
Buses and Single-Unit Trucks	108	0	108	118	11	129	237
% Buses and Single-Unit Trucks	1.9%	0%	1.9%	2.2%	2.9%	2.3%	2.1%

*T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
Thu Sep 30, 2021
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 877565, Location: 42.648726, -83.539668



EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	340	0	340	224	22	246	586
7:45AM	397	0	397	254	15	269	666
8:00AM	345	0	345	243	14	257	602
8:15AM	327	0	327	243	13	256	583
Total	1409	0	1409	964	64	1028	2437
% Approach	100%	0%	-	93.8%	6.2%	-	-
% Total	57.8%	0%	57.8%	39.6%	2.6%	42.2%	-
PHF	0.887	-	0.887	0.949	0.727	0.955	0.915
Lights	1346	0	1346	912	60	972	2318
% Lights	95.5%	0%	95.5%	94.6%	93.8%	94.6%	95.1%
Articulated Trucks	30	0	30	17	0	17	47
% Articulated Trucks	2.1%	0%	2.1%	1.8%	0%	1.7%	1.9%
Buses and Single-Unit Trucks	33	0	33	35	4	39	72
% Buses and Single-Unit Trucks	2.3%	0%	2.3%	3.6%	6.3%	3.8%	3.0%

*T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
Thu Sep 30, 2021
AM Peak (7:30 AM - 8:30 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 877565, Location: 42.648726, -83.539668



EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 4:30PM	374	0	374	465	23	488	862
4:45PM	372	0	372	454	28	482	854
5:00PM	378	0	378	420	41	461	839
5:15PM	370	0	370	444	40	484	854
Total	1494	0	1494	1783	132	1915	3409
% Approach	100%	0%	-	93.1%	6.9%	-	-
% Total	43.8%	0%	43.8%	52.3%	3.9%	56.2%	-
PHF	0.988	-	0.988	0.959	0.805	0.981	0.989
Lights	1468	0	1468	1737	129	1866	3334
% Lights	98.3%	0%	98.3%	97.4%	97.7%	97.4%	97.8%
Articulated Trucks	10	0	10	17	0	17	27
% Articulated Trucks	0.7%	0%	0.7%	1.0%	0%	0.9%	0.8%
Buses and Single-Unit Trucks	16	0	16	29	3	32	48
% Buses and Single-Unit Trucks	1.1%	0%	1.1%	1.6%	2.3%	1.7%	1.4%

*T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877565, Location: 42.648726, -83.539668



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:00AM	339	1	340	175	10	185	525
7:15AM	339	2	341	185	13	198	539
7:30AM	353	2	355	230	22	252	607
7:45AM	407	5	412	257	15	272	684
Hourly Total	1438	10	1448	847	60	907	2355
8:00AM	344	3	347	243	13	256	603
8:15AM	340	2	342	246	13	259	601
8:30AM	309	4	313	233	9	242	555
8:45AM	341	3	344	220	16	236	580
Hourly Total	1334	12	1346	942	51	993	2339
4:00PM	322	2	324	401	25	426	750
4:15PM	378	2	380	437	40	477	857
4:30PM	370	8	378	469	23	492	870
4:45PM	368	3	371	458	27	485	856
Hourly Total	1438	15	1453	1765	115	1880	3333
5:00PM	387	4	391	438	42	480	871
5:15PM	368	9	377	459	40	499	876
5:30PM	380	3	383	463	34	497	880
5:45PM	350	4	354	446	41	487	841
Hourly Total	1485	20	1505	1806	157	1963	3468
Total	5695	57	5752	5360	383	5743	11495
% Approach	99.0%	1.0%	-	93.3%	6.7%	-	-
% Total	49.5%	0.5%	50.0%	46.6%	3.3%	50.0%	-
Lights	5541	53	5594	5183	373	5556	11150
% Lights	97.3%	93.0%	97.3%	96.7%	97.4%	96.7%	97.0%
Articulated Trucks	64	0	64	46	0	46	110
% Articulated Trucks	1.1%	0%	1.1%	0.9%	0%	0.8%	1.0%
Buses and Single-Unit Trucks	90	4	94	131	10	141	235
% Buses and Single-Unit Trucks	1.6%	7.0%	1.6%	2.4%	2.6%	2.5%	2.0%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201

Section 9, Item B.



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	353	2	355	230	22	252	607
7:45AM	407	5	412	257	15	272	684
8:00AM	344	3	347	243	13	256	603
8:15AM	340	2	342	246	13	259	601
Total	1444	12	1456	976	63	1039	2495
% Approach	99.2%	0.8%	-	93.9%	6.1%	-	-
% Total	57.9%	0.5%	58.4%	39.1%	2.5%	41.6%	-
PHF	0.887	0.600	0.883	0.949	0.716	0.955	0.912
Lights	1392	11	1403	927	59	986	2389
% Lights	96.4%	91.7%	96.4%	95.0%	93.7%	94.9%	95.8%
Articulated Trucks	27	0	27	11	0	11	38
% Articulated Trucks	1.9%	0%	1.9%	1.1%	0%	1.1%	1.5%
Buses and Single-Unit Trucks	25	1	26	38	4	42	68
% Buses and Single-Unit Trucks	1.7%	8.3%	1.8%	3.9%	6.3%	4.0%	2.7%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201



WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int	
	T	U	App	T	U	App		
Time								
	2021-09-30 4:45PM	368	3	371	458	27	485	856
	5:00PM	387	4	391	438	42	480	871
	5:15PM	368	9	377	459	40	499	876
	5:30PM	380	3	383	463	34	497	880
Total		1503	19	1522	1818	143	1961	3483
% Approach		98.8%	1.2%	-	92.7%	7.3%	-	-
% Total		43.2%	0.5%	43.7%	52.2%	4.1%	56.3%	-
PHF		0.971	0.528	0.973	0.982	0.851	0.982	0.989
Lights		1472	17	1489	1781	141	1922	3411
% Lights		97.9%	89.5%	97.8%	98.0%	98.6%	98.0%	97.9%
Articulated Trucks		12	0	12	14	0	14	26
% Articulated Trucks		0.8%	0%	0.8%	0.8%	0%	0.7%	0.7%
Buses and Single-Unit Trucks		19	2	21	23	2	25	46
% Buses and Single-Unit Trucks		1.3%	10.5%	1.4%	1.3%	1.4%	1.3%	1.3%

*T: Thru, U: U-Turn

WB M-59 (Highland Road) and EB to WB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877564, Location: 42.64915, -83.540201



EB M-59 (Highland Road) and WB to EB crossov... - TMC

Thu Sep 30, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 877563, Location: 42.650179, -83.543706



Section 9, Item B.

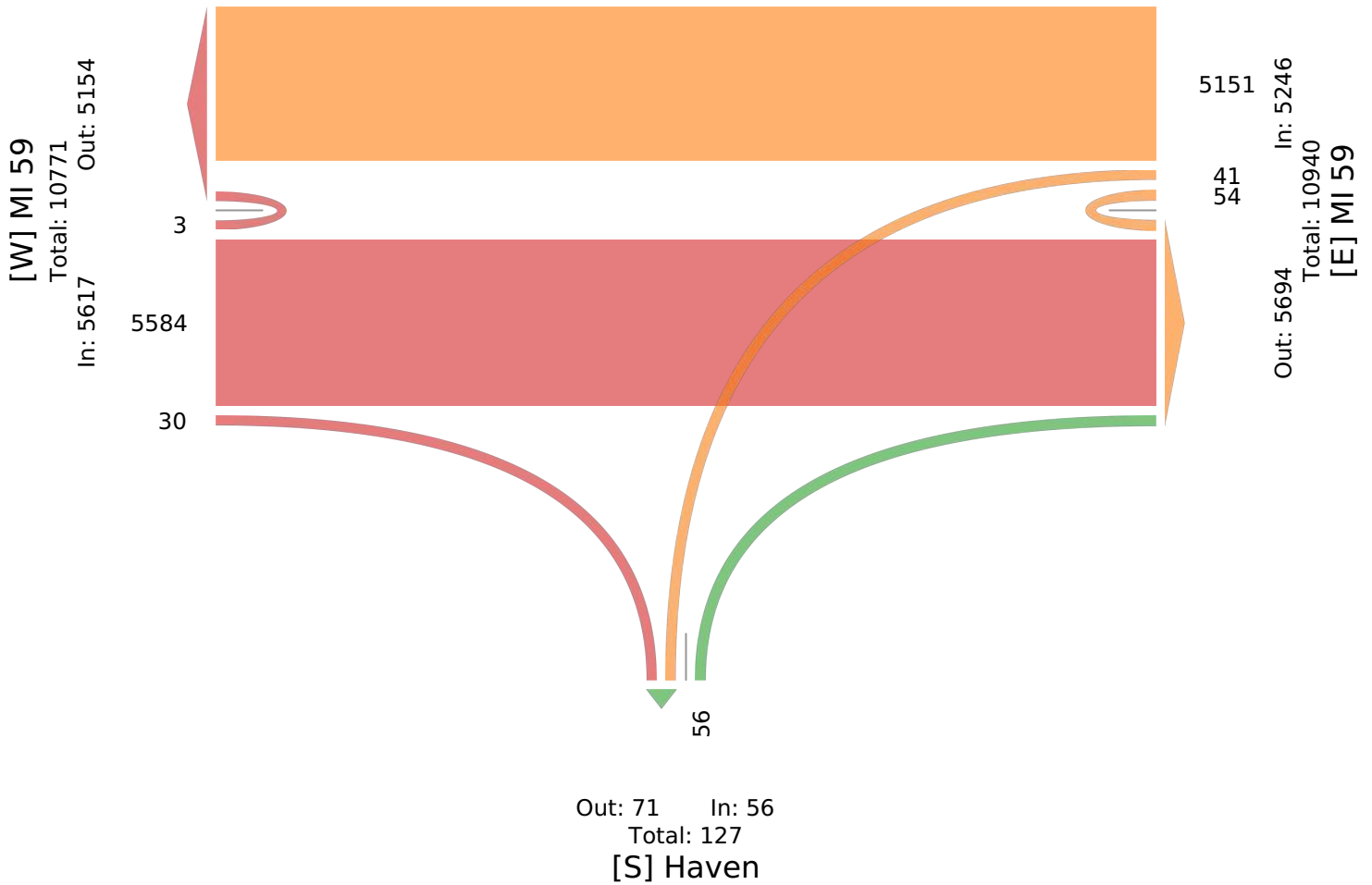
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Haven Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:00AM	327	1	0	328	2	170	2	174	0	1	0	1	503
7:15AM	332	1	0	333	1	185	2	188	0	0	0	0	521
7:30AM	335	1	0	336	3	226	0	229	0	1	0	1	566
7:45AM	384	1	1	386	1	256	3	260	0	1	0	1	647
Hourly Total	1378	4	1	1383	7	837	7	851	0	3	0	3	2237
8:00AM	346	2	0	348	3	235	3	241	0	1	0	1	590
8:15AM	321	0	0	321	2	230	1	233	0	2	0	2	556
8:30AM	314	2	0	316	1	225	4	230	0	1	0	1	547
8:45AM	335	2	0	337	1	216	2	219	0	3	0	3	559
Hourly Total	1316	6	0	1322	7	906	10	923	0	7	0	7	2252
4:00PM	317	0	0	317	3	371	7	381	0	6	0	6	704
4:15PM	378	3	0	381	2	428	2	432	0	3	0	3	816
4:30PM	376	3	2	381	4	432	2	438	0	8	0	8	827
4:45PM	364	1	0	365	3	445	3	451	0	1	0	1	817
Hourly Total	1435	7	2	1444	12	1676	14	1702	0	18	0	18	3164
5:00PM	382	2	0	384	2	427	5	434	0	3	0	3	821
5:15PM	350	1	0	351	3	451	5	459	0	13	0	13	823
5:30PM	386	5	0	391	5	438	7	450	0	6	0	6	847
5:45PM	337	5	0	342	5	416	6	427	0	6	0	6	775
Hourly Total	1455	13	0	1468	15	1732	23	1770	0	28	0	28	3266
Total	5584	30	3	5617	41	5151	54	5246	0	56	0	56	10919
% Approach	99.4%	0.5%	0.1%	-	0.8%	98.2%	1.0%	-	0%	100%	0%	-	-
% Total	51.1%	0.3%	0%	51.4%	0.4%	47.2%	0.5%	48.0%	0%	0.5%	0%	0.5%	-
Lights	5412	30	3	5445	40	4979	51	5070	0	55	0	55	10570
% Lights	96.9%	100%	100%	96.9%	97.6%	96.7%	94.4%	96.6%	0%	98.2%	0%	98.2%	96.8%
Articulated Trucks	64	0	0	64	1	53	1	55	0	0	0	0	119
% Articulated Trucks	1.1%	0%	0%	1.1%	2.4%	1.0%	1.9%	1.0%	0%	0%	0%	0%	1.1%
Buses and Single-Unit Trucks	108	0	0	108	0	119	2	121	0	1	0	1	230
% Buses and Single-Unit Trucks	1.9%	0%	0%	1.9%	0%	2.3%	3.7%	2.3%	0%	1.8%	0%	1.8%	2.1%

*L: Left, R: Right, T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 Full Length (7 AM-9 AM, 4 PM-6 PM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

Section 9, Item B.



EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

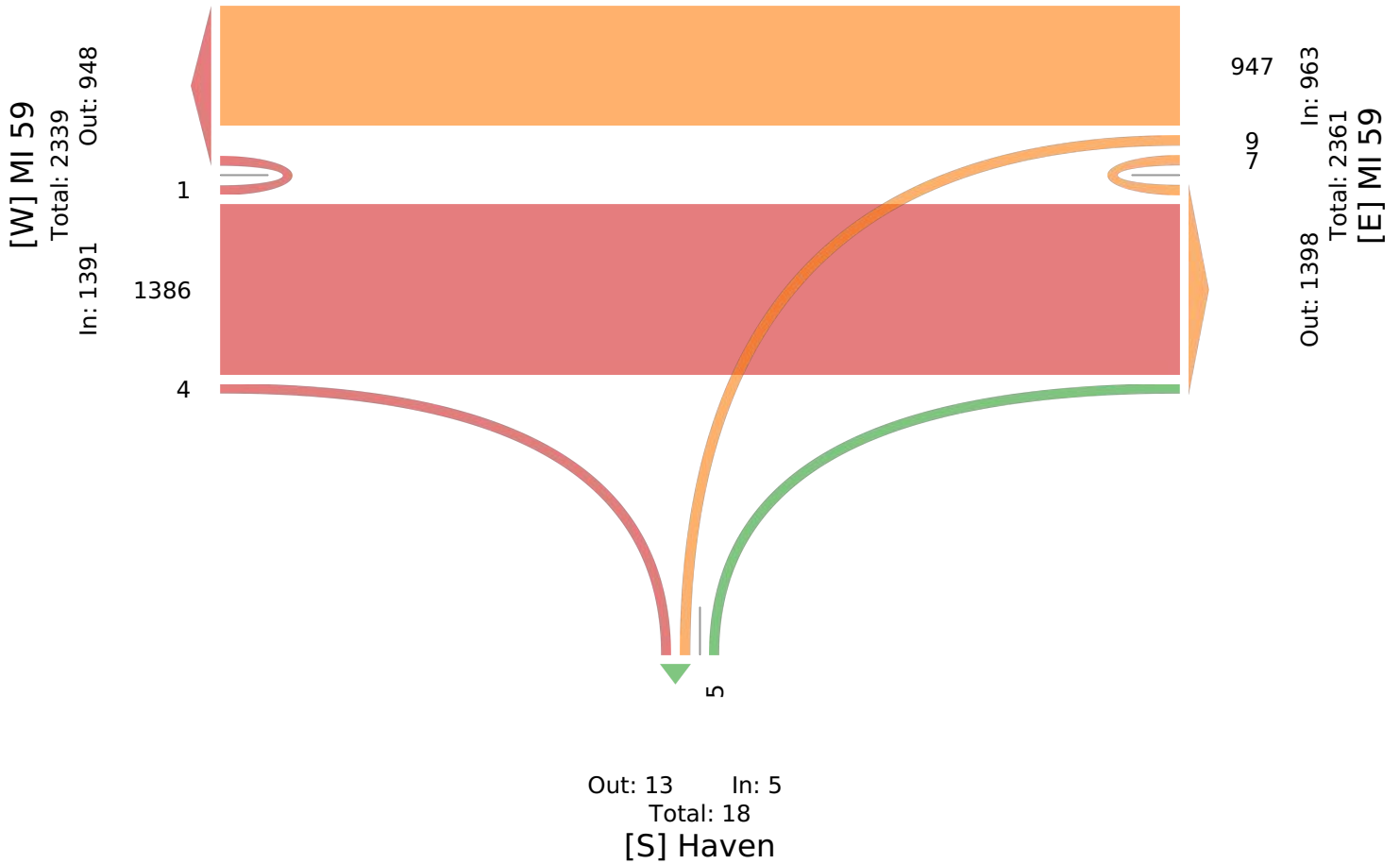
Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Haven Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 7:30AM	335	1	0	336	3	226	0	229	0	1	0	1	566
7:45AM	384	1	1	386	1	256	3	260	0	1	0	1	647
8:00AM	346	2	0	348	3	235	3	241	0	1	0	1	590
8:15AM	321	0	0	321	2	230	1	233	0	2	0	2	556
Total	1386	4	1	1391	9	947	7	963	0	5	0	5	2359
% Approach	99.6%	0.3%	0.1%	-	0.9%	98.3%	0.7%	-	0%	100%	0%	-	-
% Total	58.8%	0.2%	0%	59.0%	0.4%	40.1%	0.3%	40.8%	0%	0.2%	0%	0.2%	-
PHF	0.902	0.500	0.250	0.901	0.750	0.925	0.583	0.926	-	0.625	-	0.625	0.912
Lights	1321	4	1	1326	9	899	6	914	0	5	0	5	2245
% Lights	95.3%	100%	100%	95.3%	100%	94.9%	85.7%	94.9%	0%	100%	0%	100%	95.2%
Articulated Trucks	32	0	0	32	0	15	0	15	0	0	0	0	47
% Articulated Trucks	2.3%	0%	0%	2.3%	0%	1.6%	0%	1.6%	0%	0%	0%	0%	2.0%
Buses and Single-Unit Trucks	33	0	0	33	0	33	1	34	0	0	0	0	67
% Buses and Single-Unit Trucks	2.4%	0%	0%	2.4%	0%	3.5%	14.3%	3.5%	0%	0%	0%	0%	2.8%

* L: Left, R: Right, T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 AM Peak (7:30 AM - 8:30 AM)
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

Section 9, Item B.



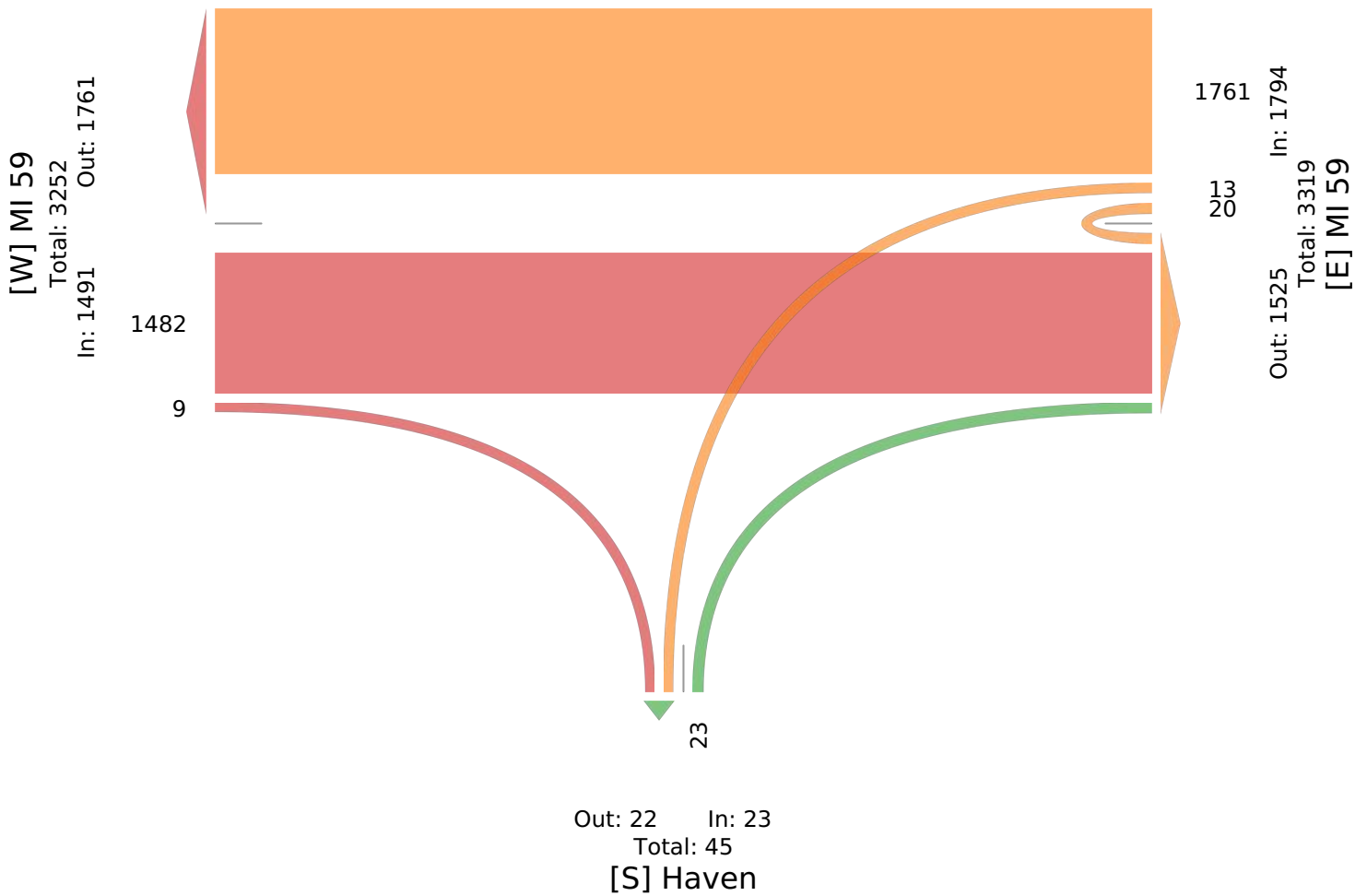
EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706

Provided by: Gewalt Hamilton Associates Inc.
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound				MI 59 Westbound				Haven Northbound				Int
	T	R	U	App	L	T	U	App	L	R	U	App	
2021-09-30 4:45PM	364	1	0	365	3	445	3	451	0	1	0	1	817
5:00PM	382	2	0	384	2	427	5	434	0	3	0	3	821
5:15PM	350	1	0	351	3	451	5	459	0	13	0	13	823
5:30PM	386	5	0	391	5	438	7	450	0	6	0	6	847
Total	1482	9	0	1491	13	1761	20	1794	0	23	0	23	3308
% Approach	99.4%	0.6%	0%	-	0.7%	98.2%	1.1%	-	0%	100%	0%	-	-
% Total	44.8%	0.3%	0%	45.1%	0.4%	53.2%	0.6%	54.2%	0%	0.7%	0%	0.7%	-
PHF	0.960	0.450	-	0.953	0.650	0.976	0.714	0.977	-	0.442	-	0.442	0.976
Lights	1451	9	0	1460	13	1725	19	1757	0	23	0	23	3240
% Lights	97.9%	100%	0%	97.9%	100%	98.0%	95.0%	97.9%	0%	100%	0%	100%	97.9%
Articulated Trucks	10	0	0	10	0	14	1	15	0	0	0	0	25
% Articulated Trucks	0.7%	0%	0%	0.7%	0%	0.8%	5.0%	0.8%	0%	0%	0%	0%	0.8%
Buses and Single-Unit Trucks	21	0	0	21	0	22	0	22	0	0	0	0	43
% Buses and Single-Unit Trucks	1.4%	0%	0%	1.4%	0%	1.2%	0%	1.2%	0%	0%	0%	0%	1.3%

* L: Left, R: Right, T: Thru, U: U-Turn

EB M-59 (Highland Road) and WB to EB crossov... - TMC
 Thu Sep 30, 2021
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
 All Movements
 ID: 877563, Location: 42.650179, -83.543706



Section 9, Item B.

Existing Adj. Year: **2021**

Existing Adjustment Rate: **1.00**

Growth Rate: **0.5%**

Buildout Year: **2027**

Scenario: **AM Peak**

Bckgrd. Dev. A:

Bckgrd. Dev. B:

Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#1 - WB M-59 & EB Crossover (East of Hill Rd)	AM Peak 09/30/21		PHF	0.92			0.95			0.60										
			% Heavy	5%			6%			6%										
		2021	Existing	1516	0	0	978	0	69	0	0	0	0	0	0	0				
	2021	Existing Adj.	0	1516	0	0	978	0	69	0	0	0	0	0	0					
	2027	Background	0	1562	0	0	1008	0	71	0	0	0	0	0	0					
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	1562	0	0	1008	0	71	0	0	0	0	0	0					
		Site Generated		96			21		21											
		Pass By																		
		Total Site Gen	0	96	0	0	21	0	21	0	0	0	0	0	0					
		Total Future	0	1658	0	0	1029	0	92	0	0	0	0	0	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#2 - EB M-59 & Le Grand Court	AM Peak 09/30/21		PHF	0.91			0.79												
			% Heavy	4%			3%												
		2021	Existing	1459	49	0	0	0	0	126	0	0	0	0	0	0			
	2021	Existing Adj.	0	1459	49	0	0	0	126	0	0	0	0	0	0				
	2027	Background	0	1503	50	0	0	0	130	0	0	0	0	0	0				
		Bckgrd. Dev. A																	
		Bckgrd. Dev. B																	
		Bckgrd. Dev. C																	
		Total Background	0	1503	51	0	0	0	130	0	0	0	0	0	0				
		Site Generated		117															
		Pass By																	
		Total Site Gen	0	117	0	0	0	0	0	0	0	0	0	0	0				
		Total Future	0	1620	51	0	0	0	130	0	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#3 - WB M-59 & Hill Road	AM Peak 09/30/21		PHF	0.93			0.60												
			% Heavy	6%			2%												
		2021	Existing	991	56	0	0	0	51	0	0	0	0	0	0	0			
	2021	Existing Adj.	0	991	56	0	0	51	0	0	0	0	0	0	0				
	2027	Background	0	1021	58	0	0	104	0	0	0	0	0	0	0				
		Bckgrd. Dev. A																	
		Bckgrd. Dev. B																	
		Bckgrd. Dev. C																	
		Total Background	0	1021	58	0	0	104	0	0	0	0	0	0	0				
		Site Generated		7	35				104										
		Pass By																	
		Total Site Gen	0	7	35	0	0	0	104	0	0	0	0	0	0				
		Total Future	0	1028	93	0	0	0	104	0	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#4 - EB M-59 & WB Crossover (West of Hill Rd)	AM Peak 09/30/21		PHF	0.89			0.73												
			% Heavy	4%			6%												
		2021	Existing	1444	978	0	0	0	64	0	0	0	0	0	0	0			
	2021	Existing Adj.	0	1444	0	0	978	0	64	0	0	0	0	0	0				
	2027	Background	0	1488	0	0	1008	0	66	0	0	0	0	0	0				
		Bckgrd. Dev. A																	
		Bckgrd. Dev. B																	
		Bckgrd. Dev. C																	
		Total Background	0	1488	0	0	1008	0	66	0	0	0	0	0	0				
		Site Generated		53	47			64											
		Pass By																	
		Total Site Gen	0	53	47	0	0	64	0	0	0	0	0	0	0				
		Total Future	0	1541	0	0	1055	0	130	0	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#5 - WB M-59 & EB Crossover (West of Hill Rd)	AM Peak 09/30/21		PHF	0.89			0.60												
			% Heavy	4%			8%												
		2021	Existing	1444	978	12	0	0	0	0	0	0	0	0	0	0			
	2021	Existing Adj.	0	1444	0	0	978	0	12	0	0	0	0	0	0				
	2027	Background	0	1488	0	0	1008	0	12	0	0	0	0	0	0				
		Bckgrd. Dev. A																	
		Bckgrd. Dev. B																	
		Bckgrd. Dev. C																	
		Total Background	0	1488	0	0	1008	0	12	0	0	0	0	0	0				
		Site Generated		53	47	10													
		Pass By																	
		Total Site Gen	0	53	47	0	0	10	0	0	0	0	0	0	0				
		Total Future	0	1541	0	0	1055	0	22	0	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#6 - EB M-59 & Haven Road / WB Crossover	AM Peak 09/30/21		PHF	0.90			0.63			0.67									
			% Heavy	5%			0%			6%									
		2021	Existing	1444	4	0	947	0	5	7	9	0	0	0	0	0			
	2021	Existing Adj.	0	1444	4	0	947	0	5	7	9	0	0	0	0				
	2027	Background	0	1488	4	0	976	0	5	7	9	0	0	0	0				
		Bckgrd. Dev. A																	
		Bckgrd. Dev. B																	
		Bckgrd. Dev. C																	
		Total Background	0	1488	4	0	976	0	5	7	9	0	0	0	0				
		Site Generated		31	62			32											
		Pass By																	
		Total Site Gen	0	31	62	0	0	32	0	0	0	0	0	0	0				
		Total Future	0	1519	4	0	1038	0	5	39	9	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
#7 - Hill Rd & Driveway 1	AM Peak 09/30/21		PHF	0.92			0.92			0.92											
			% Heavy	2%			2%			2%											
			Existing							56				51							
		2021	Existing Adj.	0	0	0	0	0	0	0	0	56	0	0	51	0					
		2027	Background	0	0	0	0	0	0	0	0	58	0	0	53	0					
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	0	0	0	0	0	0	0	58	0	0	53	0					
			Site Generated				44			1		3	15		1						
			Pass By																		
			Total Site Gen	0	0	0	44	0	1	0	3	15	0	1	0						
			Total Future	0	0	0	44	0	1	0	61	15	0	54	0						

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#8 - Hill Rd & Driveway 2	AM Peak 09/30/21		PHF	0.92			0.92			0.92										
			% Heavy	2%			2%			2%										
			Existing							56				51						
		2021	Existing Adj.	0	0	0	0	0	0	0	0	56	0	0	51	0				
		2027	Background	0	0	0	0	0	0	0	0	58	0	0	53	0				
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	0	0	0	0	0	0	0	58	0	0	53	0				
			Site Generated	2		56				18	16				44	1				
			Pass By																	
			Total Site Gen	2	0	56	0	0	0	18	16	0	0	44	1					
			Total Future	2	0	56	0	0	0	18	74	0	0	97	1					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#9 - Hill Rd & Driveway 3	AM Peak 09/30/21		PHF	0.92			0.92			0.92										
			% Heavy	2%			2%			2%										
			Existing							56				51						
		2021	Existing Adj.	0	0	0	0	0	0	0	0	56	0	0	51	0				
		2027	Background	0	0	0	0	0	0	0	0	58	0	0	53	0				
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	0	0	0	0	0	0	0	58	0	0	53	0				
			Site Generated				4			1		33	2		100					
			Pass By																	
			Total Site Gen	0	0	0	4	0	1	0	33	2	0	100	0					
			Total Future	0	0	0	4	0	1	0	91	2	0	153	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#10 - WB M-59 & Driveway 4	AM Peak 09/30/21		PHF	0.92			0.95			0.92										
			% Heavy	5%			6%			2%										
			Existing					990												
		2021	Existing Adj.	0	0	0	0	990	0	0	0	0	0	0	0	0				
		2027	Background	0	0	0	0	1020	0	0	0	0	0	0	0	0				
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	0	0	0	1020	0	0	0	0	0	0	0	0				
			Site Generated				40		17						54					
			Pass By																	
			Total Site Gen	0	0	0	40	17	0	0	0	0	0	54	0					
			Total Future	0	0	0	40	17	0	0	0	0	0	54	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#11 - M-59 & Bogie Lake Road	AM Peak 09/30/21		PHF	0.92			0.95			0.92										
			% Heavy	5%			6%			2%										
			Existing		1516			795	166		55	200		61	183					
		2021	Existing Adj.	0	1516	0	0	795	166	0	55	200	0	61	183					
		2027	Background	0	1562	0	0	819	171	0	57	206	0	63	189					
			Bckgrd. Dev. A																	
			Bckgrd. Dev. B																	
			Bckgrd. Dev. C																	
			Total Background	0	1562	0	0	819	171	0	57	206	0	63	189					
			Site Generated		96			21												
			Pass By																	
			Total Site Gen	0	96	0	0	21	0	0	0	0	0	63	189					
			Total Future	0	1658	0	0	840	171	0	57	206	0	63	189					

Section 9, Item B.

Existing Adj. Year: **2021**

Existing Adjustment Rate: **1.00**
 Growth Rate: **0.5%**
 Buildout Year: **2027**
 Scenario: **PM Peak**

Bckgrd. Dev. A:
 Bckgrd. Dev. B:
 Bckgrd. Dev. C:

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
				PHF																	
#1 - WB M-59 & EB Crossover (East of Hill Rd)	PM Peak 09/30/21		PHF	0.92																	
			% Heavy	2%							5%										
		2021	Existing	1555	1933	57															
		2021	Existing Adj.	0	1555	1933	0	0	0	0	57	0	0	0	0	0	0				
		2027	Background	0	1602	0	0	0	1992	0	59	0	0	0	0	0	0				
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	1602	0	0	0	1992	0	59	0	0	0	0	0	0				
			Site Generated	47			98			50											
			Pass By																		
			Total Site Gen	0	47	0	0	0	98	0	50	0	0	0	0	0	0				
			Total Future	0	1649	0	0	0	2090	0	109	0	0	0	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
				PHF																	
#2 - EB M-59 & Le Grand Court	PM Peak 09/30/21		PHF	0.95										0.74							
			% Heavy	2%							4%										
		2021	Existing	1505	141	107															
		2021	Existing Adj.	0	1505	141	0	0	0	0	0	0	0	107	0	0	0				
		2027	Background	0	1551	145	0	0	0	0	0	0	110	0	0	0	0				
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	1551	145	0	0	0	0	0	0	0	110	0	0	0				
			Site Generated	97																	
			Pass By																		
			Total Site Gen	0	97	0	0	0	0	0	0	0	0	0	0	0	0				
			Total Future	0	1648	145	0	0	0	0	0	0	0	110	0	0	0				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
				PHF																	
#3 - WB M-59 & Hill Road	PM Peak 09/30/21		PHF	0.95										0.71							
			% Heavy	2%							2%										
		2021	Existing	1930	60	57															
		2021	Existing Adj.	0	0	0	0	0	1930	60	0	0	0	0	0	0	57				
		2027	Background	0	0	0	0	0	1989	62	0	0	0	0	0	59					
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	0	0	0	0	1989	62	0	0	0	0	0	59					
			Site Generated				34			114			68								
			Pass By																		
			Total Site Gen	0	0	0	0	0	34	114	0	0	0	0	0	68					
			Total Future	0	0	0	0	0	2023	176	0	0	0	0	0	127					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
				PHF																	
#4 - EB M-59 & WB Crossover (West of Hill Rd)	PM Peak 09/30/21		PHF	0.95										0.81							
			% Heavy	2%				3%						2%							
		2021	Existing	1514	1855	132															
		2021	Existing Adj.	0	1514	1855	0	0	0	0	0	0	0	0	132	0	0				
		2027	Background	0	1560	0	0	0	1911	0	0	0	0	136	0	0					
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	1560	0	0	0	1912	0	0	0	0	136	0	0					
			Site Generated	67			72			30											
			Pass By																		
			Total Site Gen	0	67	0	0	0	72	0	0	0	0	30	0	0					
			Total Future	0	1627	0	0	0	1984	0	0	0	0	166	0	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
				PHF																	
#5 - WB M-59 & EB Crossover (West of Hill Rd)	PM Peak 09/30/21		PHF	0.95										0.60							
			% Heavy	2%				2%			11%										
		2021	Existing	1514	1855	19															
		2021	Existing Adj.	0	1514	1855	0	0	0	0	19	0	0	0	0	0	0				
		2027	Background	0	1560	0	0	0	1911	0	20	0	0	0	0	0					
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	1560	0	0	0	1912	0	20	0	0	0	0	0					
			Site Generated	67			72			27											
			Pass By																		
			Total Site Gen	0	67	0	0	0	72	0	27	0	0	0	0	0					
			Total Future	0	1627	0	0	0	1984	0	47	0	0	0	0	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBU	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
				PHF																	
#6 - EB M-59 & Haven Road / WB Crossover	PM Peak 09/30/21		PHF	0.95										0.68							
			% Heavy	2%				2%			0%			4%							
		2021	Existing	1490	9	1841	23	20	13												
		2021	Existing Adj.	0	1490	9	0	1841	0	0	0	23	20	13	0	0					
		2027	Background	0	1535	9	0	1897	0	0	0	24	21	13	0						
			Bckgrd. Dev. A																		
			Bckgrd. Dev. B																		
			Bckgrd. Dev. C																		
			Total Background	0	1535	9	0	1898	0	0	0	24	21	13	0						
			Site Generated	77			57			17											
			Pass By																		
			Total Site Gen	0	77	0	0	57	0	0	0	0	17	0	0						
			Total Future	0	1612	9	0	1955	0	0	0	24	38	13	0						

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#7 - Hill Rd & Driveway 1	PM Peak 09/30/21		PHF					0.92			0.92			0.92						
			% Heavy					2%				2%			2%					
			Existing										60			57				
		Existing Adj.	0	0	0	0	0	0	0	0	0	60	0	0	57	0				
		Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Site Generated						30				1	52	1	2					
		Pass By																		
		Total Site Gen	0	0	0	30	0	0	0	0	1	52	1	2	0					
		Total Future	0	0	0	30	0	0	0	0	63	52	1	61	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#8 - Hill Rd & Driveway 2	PM Peak 09/30/21		PHF		0.92						0.92			0.92						
			% Heavy		2%							2%			2%					
			Existing										60			57				
		Existing Adj.	0	0	0	0	0	0	0	0	0	60	0	0	57	0				
		Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Site Generated	1		35						60	52			30	2				
		Pass By																		
		Total Site Gen	1	0	35	0	0	0	0	0	60	52	0	0	30	2				
		Total Future	1	0	35	0	0	0	0	0	60	114	0	0	89	2				

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#9 - Hill Rd & Driveway 3	PM Peak 09/30/21		PHF					0.92			0.92			0.92						
			% Heavy					2%				2%			2%					
			Existing										60			57				
		Existing Adj.	0	0	0	0	0	0	0	0	0	60	0	0	57	0				
		Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	0	0	0	0	0	0	62	0	0	59	0				
		Site Generated						3				112	2		65					
		Pass By																		
		Total Site Gen	0	0	0	3	0	0	0	0	112	2	0	65	0					
		Total Future	0	0	0	3	0	0	0	0	174	2	0	124	0					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#10 - WB M-59 & Driveway 4	PM Peak 09/30/21		PHF					0.92			0.92			0.92						
			% Heavy					2%				2%			2%					
			Existing						1874											
		Existing Adj.	0	0	0	0	1874	0	0	0	0	0	0	0	0	0				
		Background	0	0	0	0	1931	0	0	0	0	0	0	0	0	0				
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	0	0	0	1932	0	0	0	0	0	0	0	0	0				
		Site Generated						38	61						36					
		Pass By																		
		Total Site Gen	0	0	0	0	38	61	0	0	0	0	0	0	36					
		Total Future	0	0	0	0	1970	61	0	0	0	0	0	0	36					

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#11 - M-59 & Bogie Lake Road	PM Peak 09/30/21		PHF		0.94			0.95			0.92			0.92						
			% Heavy		2%			2%				2%			2%					
			Existing		1555				1715	225		75	200		73	218				
		Existing Adj.	0	1555	0	0	1715	225	0	75	200	0	73	218						
		Background	0	1602	0	0	1767	232	0	77	206	0	75	225						
		Bckgrd. Dev. A																		
		Bckgrd. Dev. B																		
		Bckgrd. Dev. C																		
		Total Background	0	1602	0	0	1767	232	0	77	206	0	75	225						
		Site Generated		47				98												
		Pass By																		
		Total Site Gen	0	47	0	0	98	0	0	0	0	0	0	0	0					
		Total Future	0	1649	0	0	1865	232	0	77	206	0	75	225						

OAKLAND COUNTY ROAD COMMISSION
 TRAFFIC - SAFETY DEPARTMENT
 SIGNAL WORK ORDER

Section 9, Item B.

LOCATION: Bogie LK & M-59 DATE: 1-17-17
 CITY/TOWNSHIP: White Lake BY: E Labiano
 COUNTY#: 4110 STATE#: 63041-01-029 CHARGES: WO 168612

PLEASE PERFORM THE FOLLOWING:

ELECTRICAL DEVICE: INSTALL MODERNIZE MAINTENANCE
 UNDERGROUND: _____
 EDISON OK: YES NO JOB#: _____
 COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4
SPLIT.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<input type="checkbox"/> CHANGE TIMING.....																
<input checked="" type="checkbox"/> CHANGE OFFSET.....	<input checked="" type="checkbox"/>															
<input type="checkbox"/> CHANGE CYCLE LENGTH.....																
<input checked="" type="checkbox"/> ADD DIAL/SPLIT.....													<input checked="" type="checkbox"/>			

CHANGE BREAKOUT OR EPROM: _____
 CHANGE HOURS OF OPERATION:
 OLD: 5am - Midnight
 NEW: 5:30am - 11pm
 REPROGRAM TBC (Traffic Events)
 INSTALL INTERCONNECT: TBC MINITROL TONE
 MBT OK: YES NO
 NO CHANGE - RECORD CORRECTION
 OTHER: Rev 23 Change

MDOT RETIMING - FINAL

APPROVED BY: [Signature] DATE: 1/17/17
 DATE INSTALLED: 1/21/17
 INSTALLED BY: Richardson

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

INTERSECTION: BOGIE LAKE & M-59

CITY/VILLAGE/TOWNSHIP: WHITE LAKE

COUNTY#: 4110 MDOT#: 63041-01-029 REV#: 23 DETROIT EDISON#: 1043

DRAWN BY: E Labiano APPROVED BY: [Signature] DATE DRAWN: 1/17/17

INSTALLED BY: _____ DATE INSTLD: 1/1

HOURS OF OPERATION: 7 DAYS: 5:30AM - 11:00PM

HOURS OF FLASHING: 7 DAYS: 11:00PM - 5:30AM

2. UTILITIES - 1. ACCESS

CODE: _____: 1642 CODE: Four digits (0000 - 9999)

4. UNIT DATA - 5. RING STRUCTURE

***** NOTE: INSERT ALL RING #'S FIRST, THEN NXT & CONCUR *****

CHANNEL:	RING	PHNXT	CONCURRENT PHASES																CHANNEL					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VEH	PED				
PHASE 1:			1																					
PHASE 2:	1	4		1																			2	9
PHASE 3:					1																			
PHASE 4:	1	2				1																	4	10
PHASE 5:							1																	
PHASE 6:								1																
PHASE 7:									1															
PHASE 8:										1														
PHASE 9:											1													
PHASE 10:												1												
PHASE 11:													1											
PHASE 12:														1										
PHASE 13:															1									
PHASE 14:																1								
PHASE 15:																	1							
PHASE 16:																					1			

CODES:
 RING Ring Number for Phase (1-4)
 PHNXT Phase Next In Ring (1-16)
 CONCUR PH Phases To Be Concurrent (0=NO, 1=YES)
 For vehicle channel & ped channel, enter "1" under channel# shown.

3. PHASE DATA - 1. BASIC TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE
Minimum Green		10		7													00-99
Passage																	0.0-9.9
Maximum #1		92		29													000-999
Maximum #2																	000-999
Yellow Clearance		4.7		4.3													3.0-9.9
Red Clearance		2.0		6.6													0.0-9.9

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

3. PHASE DATA - 3. PEDESTRIAN TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE (SEC)
Walk		7		7													00-99
Pedest Clearance		20		12													00-99
Flashing Walk																	
Extend Ped Clear		0		0													
Act Rest in Walk																	

3. PHASE DATA - 4. INITIALIZE & NON ACTUATED RESPONSE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Initial		4		1												
NA Response																

CODES: 0 1 2 3 4

Initial none inactive red yellow green

NA Response none to 1 to 2 both -----

3. PHASE DATA - 5. VEHICLE & PEDESTRIAN RECALLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vehicle Recall		3		3												
Pedestrian Recall		0		0												

CODES: 0 1 2 3 4

Vehicle none 1 call min max soft

Pedestrian none 1 call ped bot N.A. -----

3. PHASE DATA - 6. NONLOCK & MISC CONTROLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nonlock Memory																
Dual Entry																
Last Car Passage																
Conditional Service																

CODES: 0 = NO 1 = YES

3. PHASE DATA - 8. SPECIAL DETECTOR - 0. SPC 1-8 (Epac 300/M52)

Detector # on Print	1	2	3	4	5	6	7	8
EPAC/M52 "D" Connector	1	6	7	8	4	5	2	3
Assigned Phase								

CODES: 0 1 2 3 4

Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

See attached detection sheet for D-connector pin assignments

A. CONTROLS

	RANGE (SEC)
Extend Time	00-99
Delay Time	00-999

3. PHASE DATA - 8. SPECIAL DETECTOR - 2. VEH 9-16 (2070)

Detector # on Print	1	2	3	4	5	6	7	8
2070 "D" Connector	9	10	11	12	13	14	15	16
Assigned Phase								

CODES: 0 1 2 3 4

Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

See attached detection sheet for D-connector pin assignments

A. CONTROLS

	RANGE (SEC)
Extend Time	00-99
Delay Time	00-999

4. UNIT DATA - 1. STARTUP & MISCELLANEOUS

Start up time : 10 (00-99) State : 0 (0 = fl, 1 = red)
 Auto ped clear : 0 Red revert : 7.0 (2.0 - 9.9)
 Stop time reset : 0 (0 = No, 1 = Yes)

4. UNIT DATA - 2. REMOTE FLASH

Phase	1	2	3	4	5	6	7	8	A	B	C	D	E	F	G	H
FLASH																
YEL																
ALT																
ENTER				1												
EXIT		1														

Test A = Remote Flash: (0 = no & 1 = yes)

6. TIME BASE - 0. SPC FUNCTION MAPPING

FUNCTION NAME
 AS 8-15 = OLI - P FL G PHS
 AS 8-15 = OLI - P FL R PHS

SPC FUNC							
1	2	3	4	5	6	7	8

NOTE: Go up after entering to get this screen.

4. UNIT DATA - 6 ALT SEQ. 08-15

EPAC ALT SEQ (PHASE PAIR TO REVERSE)

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
08						
09						
10						
11						

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
12						
13						
14						
15						

4. UNIT DATA - 3. OVERLAP STANDARD

Phase	1	2	3	4	5	6	7	8	CH#
Overlap A				1					13
Overlap B									
Overlap C									
Overlap D									
Overlap E									
Overlap F									
Overlap G									
Overlap H									

Phase	1	2	3	4	5	6	7	8	CH#
Overlap I									
Overlap J									
Overlap K									
Overlap L									
Overlap M									
Overlap N									
Overlap O									
Overlap P									

Enter a "1" in the channel # shown.

0 = Phase not part of overlap; 1 = Phase part of overlap.

4. UNIT DATA - 4. OVERLAP SPECIAL

Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trail green	4															
Trail yellow	4.3															
Trail red	2.6															
-Green / -yellow (-G/Y)																
+Green (+GRN)																

- * Overlap green omitted by # - phase green; Overlap yellow omitted by # - phase yellow
- * For FYA operation, '-G/Y' entry defines the phase that is the green arrow
- * For FYA operation, '+GRN' entry is the thru phase opposing the FYA phase

4. UNIT DATA - 8. I/O MISCELLANEOUS

Ring#	1	2	3	4	CONN	MODE
Input Response	1				"D"	
Output Select	1				"D"	

Connector "D" : 0 = Standard & 1 = Alternate

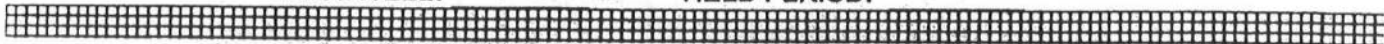
I/O Modes	INPUT	OUTPUT
"ABC" Connector		
"D" Connector		

Controller with Solo Detection:
 EPAC300/M52 enter "1" under D Conn Input
 2070 enter "0" under D Conn Input



5. COORDINATION DATA - 1. COORD SETUP

	0	1	2	3	4	5
OPER: <u>1</u>	FRE	AUT	MAN	-----	-----	-----
MODE: <u>2</u>	PRM	YLD	PYL	POM	SOM	FAC
MAX : <u>0</u>	INH	MX1	MX2	-----	-----	-----
CORR: <u>2</u>	DWL	MDW	SWY	SW+	-----	-----
OFST: _____	BEG	END OF GREEN				
FRCE: _____	PLN CYC LE TIME					
MX DWELL: _____	YIELD PERIOD:					



5. COORDINATION DATA - 2. MANUAL CONTROL

DIAL: _____ SPLIT: _____ OFFSET: _____ SYNC: _____

To set cycle zero in manual control enter "1" for sync then press "E".

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

Mode: 0 = actuated, 1 = coord phase, 2 = minimum recall, 3 = maximum recall,
 4 = pedestrian recall, 5 = maximum + pedestrian recall, 6 = phase omit,
 7 = dual coord phase.

Sequence: 00 - 15 (Unit data has definition)

Ring Lag: Ring offset from local cycle zero when not barrier locked to Ring #1.

Time: 00 - 99 seconds.

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 1 / SPLIT 1 CYCLE LENGTH: 110 sccs PROGRAM CYCLE LENGTH

PHASE	1	2	3	4	5	6	7	8
TIME		80		24				
MODE		1		3				

DIAL 1 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 1 CYCLE LENGTH: 90 sccs PROGRAM CYCLE LENGTH

PHASE	1	2	3	4	5	6	7	8
TIME		60		27				
MODE		1		3				

DIAL 2 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	42		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME	56		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 3 / SPLIT 1 CYCLE LENGTH: 120 SECS ^{PROGRAM} CYCLE LENGTH

PHASE	1	2	3	4	5	6	7	8
TIME		90		28				
MODE		1		3				

DIAL 3 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 1 CYCLE LENGTH: 110 SECS

PHASE	1	2	3	4	5	6	7	8
TIME		75		35				
MODE		1		3				

DIAL 4 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	93		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME	36		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
 PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

7. PREEMPT DATA - 1. ALL PREEMPTS

RING TIMES	1	2	3	4		
MIN GREEN/WALK						
OVERRIDE	FL	1/2	2/3	3/4	4/5	5/6
STATUS						
CODES	0 = NO, 1 = YES					

7. PREEMPT DATA - PREEMPT 1

1. MISC DATA: (0 = no, 1 = yes)

TEST..: ___ N-LOCK.: ___ LINK PR#.: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
EXIT								
CALLS								

2. INTERVAL TIMES:

SEL PED CLR: ___ TRK YEL CHG: ___
 SEL YEL CHG: ___ TRK RED CLR: ___
 SEL RED CLR: ___ DWELL GREEN: ___
 TRACK GREEN: ___ RET PED CLR: ___
 TRK PED CLR: ___ RET YEL CHG: ___
 RET YEL CLR: ___

3. VEHICLE STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)
 CYCLE [] [] [] [] [] [] [] []
 (0=no, 1=act, 2=min recall, 3=max recall)

4. PEDESTRIAN STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=dont wlk, 1=wlk, 2=flwlk, 3=dark)
 CYCLE [] [] [] [] [] [] [] []
 (0 = no, 1 = act, 2 = recall)

5. OVERLAP STATUS:

OVERLAP	A	B	C	D
TRK GRN				
DWELL				

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)
 CYCLE [] [] [] [] [] [] [] []
 (0 = no, 1 = act)

6. LOW PRIORITY: (0=no, 1=yes)

TEST..: ___ N-LOCK.: ___ SKIP.....: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 DWELL: ___ MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
DWELL								
CALLS								

SIGNAL PHASING

PHASE#	ROAD	PHASE	LOAD SW	FLASH
1				
2	M-59	A	2	A
3				
4	BOGIE LAKE (NEAR)	B	4	R
5				
6				
7				
8				
OLA	BOGIE LAKE (FAR)	C	5	R
OLB				
OLC				
OLD				
1PED				
2PED	M-59 PED	WA	6	
3PED				
4PED	BOGIE LAKE PED	WB	8	
5PED				
6PED				
7PED				
8PED				

Controller Information Sheet
For 4 Phase EPAC
Pole Mount Cabinet

Intersection: M-59 and Bogie Lake Rd
County No: 04110
State No: 63041-01-029
Prepared By: Rachel Jones
Date: 11-30-11

Phasing:

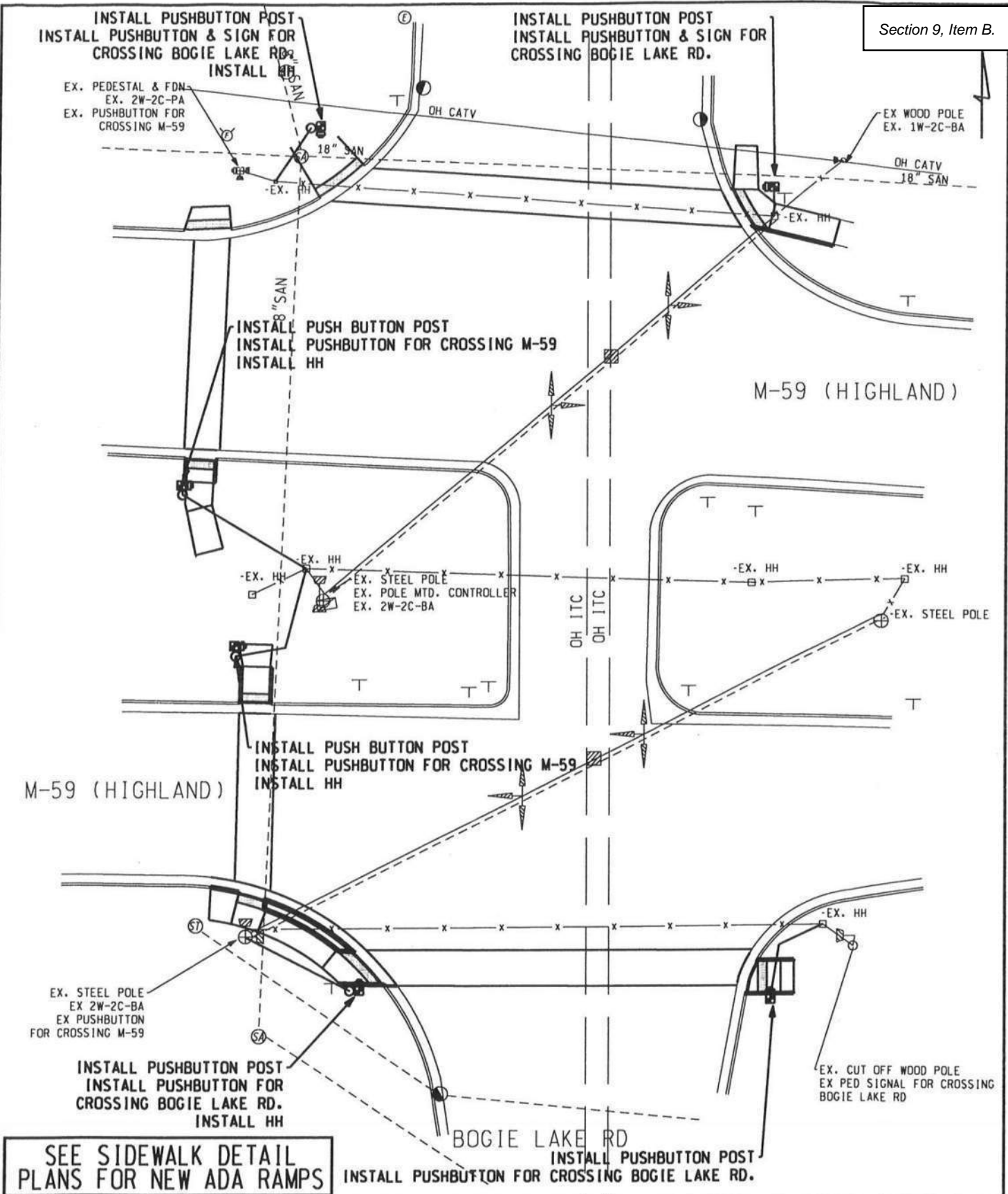
Load Switch 2:	M-59	A	FLA
Load Switch 4:	Bogie Lake Near	B	FLR
Load Switch 5:(OLA)	Bogie Lake Far	C	FLR
Load Switch 6:	M-59 Peds	WA	
Load Switch 8:	Bogie Lake Ped West	WB	

Jumpers:

121-213, 151-152, 153-154, 155-156, 158-159, 161-162, 164-165, 173-174,
175-176, 177-178, 179-180, 185-186, 223-224, 229-230, 233-PB1, 237-PB1,
241-242, 243-244, 245-246, 255-256, 257-258, 259-260, 261-262, 263-PB1,
268-269, 273-274.

Conflict Monitor: 4-5.

All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,4,5.
Minimum Flash = 4 + 2 + 1



SEE SIDEWALK DETAIL PLANS FOR NEW ADA RAMPS



AUTH. NO.	DRAWN DJP
CONT. SEC. 63041	DATE 03-08-11
REF. 110761	SCALE N.T.S.
PLAN 63041-01-029	SHEET 3 OF 4

M-59 (HIGHLAND) AT BOGIE LAKE RD
 WHITE LAKE TOWNSHIP
 OAKLAND COUNTY

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: M-59 & X/O W/O Ormond DATE: 07/28/20
CITY/TOWNSHIP: White Lake BY: Dawn Bierlein
COUNTY#: 4132 STATE#: 63041-01-113 CHARGES: X00058

PLEASE PERFORM THE FOLLOWING:

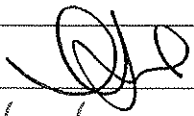
ELECTRICAL DEVICE: INSTALL MODERNIZE MAINTENANCE
 UNDERGROUND: _____
 EDISON OK: YES NO JOB#: _____
 COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
<input checked="" type="checkbox"/> CHANGE TIMING..(Mode).....	X					X					X								
<input type="checkbox"/> CHANGE OFFSET.....																			
<input type="checkbox"/> CHANGE CYCLE LENGTH.....																			
<input type="checkbox"/> ADD DIAL/SPLIT.....																			

CHANGE BREAKOUT OR EPROM: _____
 CHANGE HOURS OF OPERATION:
OLD: _____ JUL 30 2020
NEW: _____
 REPROGRAM TBC
 INSTALL INTERCONNECT: TBC MINITROL TONE
 MBT OK: YES NO
 NO CHANGE - RECORD CORRECTION
 OTHER 3.5 Veh recalls-phase 4

(Rev 2)

(LOOPS HOOKED UP & WORKING)

APPROVED BY:  DATE: 7/28/20
DATE INSTALLED: 7/29/20
INSTALLED BY: D-8

INTERSECTION: EB M-59 (HIGHLAND) & X/O W/O ORMOND Section 9, Item B.

CITY/VILLAGE/TOWNSHIP: WHITE LAKE

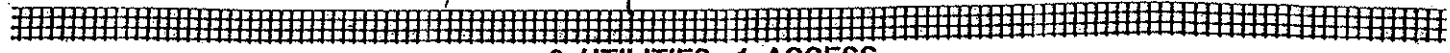
COUNTY#: 4132 MDOT#: 63041-01-113 REV#: 2 DETROIT EDISON#:

DRAWN BY: DAWN BIERLEIN APPROVED BY: _____ DATE DRAWN: 07/28/20

INSTALLED BY: _____ DATE INSTLD: 1 1

HOURS OF OPERATION: 7 DAYS: 5:30AM - 10:00pm

HOURS OF FLASHING: 7 DAYS: 10:00pm - 5:30am



2. UTILITIES - 1. ACCESS

CODE.....: 1642 CODE: Four digits (0000 - 9999)



2. UTILITIES - 6. LOAD DEFAULT

C - CHANGE CURRENT SOFTWARE OPTION

SELECT SOFTWARE OPTION _____ 1- FIO (TS1 ONLY); 2- TS2 (TS2 ONLY)



4. UNIT DATA - 5. RING STRUCTURE

*** NOTE: INSERT ALL RING #'S FIRST, THEN NXT & CONCUR ***

CHANNEL:	RING	PHNXT	CONCURRENT PHASES																CHANNEL		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VEH	PED	
PHASE 1:			1																		
PHASE 2:	1	4		1																2	
PHASE 3:					1																
PHASE 4:	1	2				1														4	
PHASE 5:							1														
PHASE 6:								1													
PHASE 7:									1												
PHASE 8:										1											
PHASE 9:											1										
PHASE 10:												1									
PHASE 11:													1								
PHASE 12:														1							
PHASE 13:															1						
PHASE 14:																1					
PHASE 15:																	1				
PHASE 16:																		1			

CODES:

- RING Ring Number for Phase (1-4)
- PHNXT Phase Next in Ring (1-16)
- CONCUR PH Phases To Be Concurrent (0=NO, 1=YES)

For vehicle channel & ped channel, enter "1" under channel# shown.



3. PHASE DATA - 1. BASIC TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE
Minimum Green		10		7													00-99
Passage																	0.0-9.9
Maximum #1		96		30													000-999
Maximum #2																	000-999
Yellow Clearance		5.0		3.0													3.0-9.9
Red Clearance		1.2		2.2													0.0-9.9

Section 9, Item B.

3. PHASE DATA - 3. PEDESTRIAN TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Walk																
Pedest Clearance																
Flashing Walk																
Extend Ped Clear																
Act Rest in Walk																

00-99
00-99

(0-no, 1-Y+R, 2-Y)

3. PHASE DATA - 4. INITIALIZE & NON ACTUATED RESPONSE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Initial		4		1												
NA Response																

CODES: 0 1 2 3 4
 Initial none inactive red yellow green
 NA Response none to 1 to 2 both

3. PHASE DATA - 5. VEHICLE & PEDESTRIAN RECALLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vehicle Recall		3		0												
Pedestrian Recall																

CODES: 0 1 2 3 4
 Vehicle none 1 call min max soft
 Pedestrian none 1 call ped bot N. A.

3. PHASE DATA - 6. NONLOCK & MISC CONTROLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nonlock Memory																
Dual Entry																
Last Car Passage																
Conditional Service																

CODES: 0 = NO 1 = YES

3. PHASE DATA - 7. SPECIAL SEQUENCE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Omit																
-Yel																
Ocal																

3. PHASE DATA - 8. SPECIAL DETECTOR - 0. SPC 1-8 (TS1 ONLY)

Detector # on Print	1	2	3	4	5	6	7	8
Assigned Phase	4	4						
EPAC M52 D-CONNECTOR	1	6	7	8	4	5	2	3

A. CONTROLS

RANGE (SEC)

Extend Time																
Delay Time																

00-99
00-999

3. PHASE DATA - 8. SPECIAL DETECTOR - 1. VEH 1-8 OR 2.VEH 9-16 (TS2 ONLY)

Detector # on Print	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Assigned Phase																

CODES: 0 1 2 3 4
 Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

A. CONTROLS

RANGE (SEC)

Extend Time																
Delay Time																

00-99
00-999

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

4. UNIT DATA - 1. STARTUP & MISCELLANEOUS

Start up time : 10 (00-99) State : 0 (0 = fl, 1 = red)
 Auto ped clear : 0 Red revert : 7.0 (2.0 - 9.9)
 Stop time reset : 0 (0 = No, 1 = Yes)

4. UNIT DATA - 2. REMOTE FLASH

Phase	1	2	3	4	5	6	7	8	A	B	C	D	E	F	G	H
FLASH																
YEL																
ALT																
ENTER				1												
EXIT		1														

Test A = Remote Flash: (0 = no & 1 = yes)

6. TIME BASE - 0. SPC FUNCTION MAPPING

FUNCTION NAME
 AS 8-15 = OLI - P FL G PHS
 AS 8-15 = OLI - P FL R PHS

SPC FUNC							
1	2	3	4	5	6	7	8

NOTE: Go up after entering to get this screen.

4. UNIT DATA - 6. ALT SEQ. 08-15
EPAC ALT SEQ (PHASE PAIR TO REVERSE)

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
08						
09						
10						
11						

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
12						
13						
14						
15						

4. UNIT DATA - 3. OVERLAP STANDARD

Phase	1	2	3	4	5	6	7	8	CH#
Overlap A									
Overlap B									
Overlap C									
Overlap D									
Overlap E									
Overlap F									
Overlap G									
Overlap H									

Phase	1	2	3	4	5	6	7	8	CH#
Overlap I									
Overlap J									
Overlap K									
Overlap L									
Overlap M									
Overlap N									
Overlap O									
Overlap P									

Enter a "1" in the channel # shown.

0 = Phase not part of overlap; 1 = Phase part of overlap.

4. UNIT DATA - 4. OVERLAP SPECIAL

Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trail green																
Trail yellow																
Trail red																
-Green / -yellow (-G/Y)																
+Green (+GRN)																

- * Overlap green omitted by # - phase green; Overlap yellow omitted by # - phase yellow
- * For FYA operation, '-G/Y' entry defines the phase that is the green arrow
- * For FYA operation, '+GRN' entry is the thru phase opposing the FYA phase

4. UNIT DATA - 8. I/O MISCELLANEOUS

Ring#	1	2	3	4	CONN	MODE
Input Response	1				"D"	
Output Select	1				"D"	

Connector "D" : 0 = Standard & 1 = Alternate

I/O Modes	INPUT	OUTPUT
"ABC" Connector		
"D" Connector		

Controller with Solo Detection:
 EPAC300/M52 enter "1" under D Conn Input
 2070 enter "0" under D Conn Input



5. COORDINATION DATA - 1. COORD SETUP

	0	1	2	3	4	5
OPER: <u>1</u>	FRE	AUT	MAN	-----	-----	-----
MODE: <u>0</u>	PRM	YLD	PYL	POM	SOM	FAC
MAX : <u>0</u>	INH	MX1	MX2	-----	-----	-----
CORR: <u>2</u>	DWL	MDW	SWY	SW+	-----	-----
OFST: _____	BEG END OF GREEN					
FRCE: _____	PLN CYC LE TIME					
MX DWELL: _____	YIELD PERIOD:					



5. COORDINATION DATA - 2. MANUAL CONTROL

DIAL: _____ SPLIT: _____ OFFSET: _____ SYNC: _____

To set cycle zero in manual control enter "1" for sync then press "E".



5. COORDINATION DATA - 3. DIAL/SPLIT DATA

Mode: 0 = actuated, 1 = coord phase, 2 = minimum recall, 3 = maximum recall,
 4 = pedestrian recall, 5 = maximum + pedestrian recall, 6 = phase omit,
 7 = dual coord phase.

Sequence: 00 - 15 (Unit data has definition)

Ring Lag: Ring offset from local cycle zero when not barrier locked to Ring #1.

Time: 00 - 99 seconds.

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 1 / SPLIT 1 CYCLE LENGTH: 110 Secs

PHASE	1	2	3	4	5	6	7	8
TIME		85		25				
MODE		1		0				

DIAL 1 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 1 CYCLE LENGTH: 90 Secs

PHASE	1	2	3	4	5	6	7	8
TIME		60		30				
MODE		1		0				

DIAL 2 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	40		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME	31		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 3 / SPLIT 1 CYCLE LENGTH: 120 secs

PHASE	1	2	3	4	5	6	7	8
TIME		96		24				
MODE		1		0				

DIAL 3 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 1 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	82		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
 PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER Epac300, Mod 52 and 2070

Section 9, Item B.

7. PREEMPT DATA - 1. ALL PREEMPTS

RING TIMES	1	2	3	4	
MIN GREEN/WALK					
OVERRIDE	FL	1/2	2/3	3/4	4/5
STATUS					
CODES	0 = NO, 1 = YES				

7. PREEMPT DATA - PREEMPT 1

1. MISC DATA: (0 = no, 1 = yes)

TEST..: ___ N-LOCK.: ___ LINK PR#..: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 MXCALL: ___ LOCK OUT: ___

RING	1	2	3	4	5	6	7	8
EXIT								
CALLS								

2. INTERVAL TIMES:

SEL PED CLR : ___ TRK YEL CHG : ___
 SEL YEL CHG : ___ TRK RED CLR : ___
 SEL RED CLR : ___ DWELL GREEN: ___
 TRACK GREEN: ___ RET PED CLR : ___
 TRK PED CLR : ___ RET YEL CHG : ___
 RET YEL CLR : ___

4. PEDESTRIAN STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=dont wlk, 1=wlk, 2=flwlk, 3=dark)

CYCLE								
-------	--	--	--	--	--	--	--	--

(0 = no, 1 = act, 2 = recall)

5. OVERLAP STATUS:

OVERLAP	A	B	C	D
TRK GRN				
DWELL				

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)

CYCLE								
-------	--	--	--	--	--	--	--	--

(0 = no, 1 = act)

3. VEHICLE STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)

CYCLE								
-------	--	--	--	--	--	--	--	--

(0=no, 1=act, 2=min recall, 3=max recall)

6. LOW PRIORITY: (0=no, 1=yes)

TEST..: ___ N-LOCK.: ___ SKIP.....: ___
 DELAY: ___ EXTEND: ___ DURATION: ___
 DWELL: ___ MXCALL: ___ LOCK OUT: ___

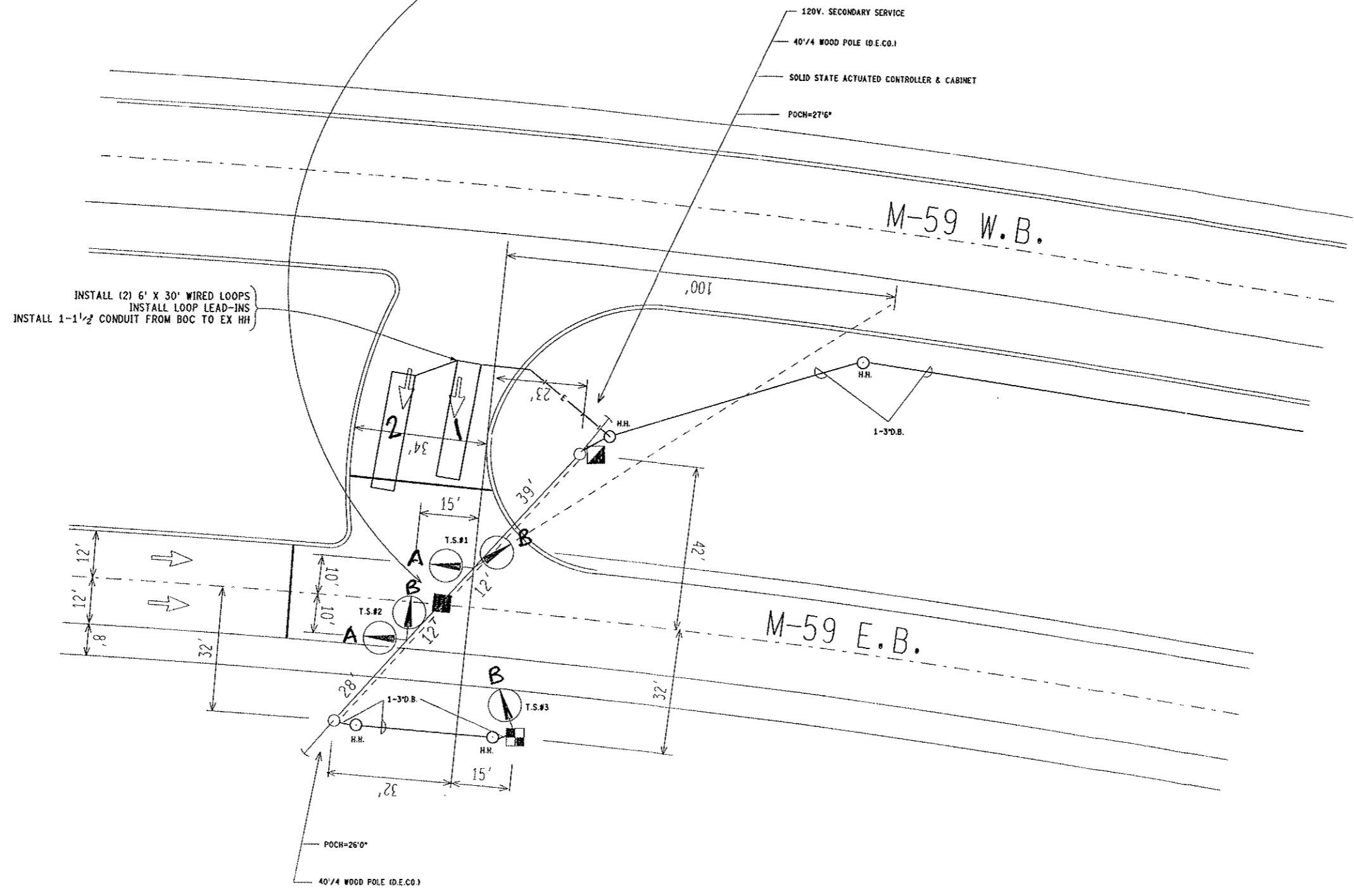
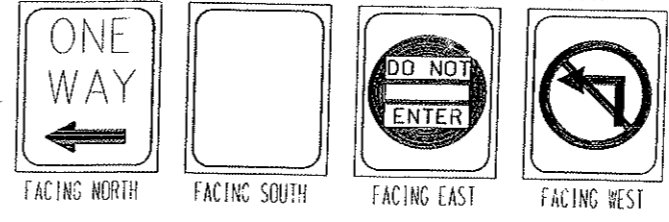
RING	1	2	3	4	5	6	7	8
DWELL								
CALLS								

SIGNAL PHASING

PHASE#	ROAD	PHASE	LOAD SW	FLASH
1				
2	EB M-59	A	2	A
3				
4	X10 W10 ORMOND	B	4	R
5				
6				
7				
8				
OLA				
OLB				
OLC				
OLD				
1PED				
2PED				
3PED				
4PED				
5PED				
6PED				
7PED				
8PED				

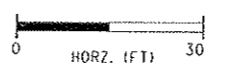


24"X30" 4-WAY ILLUMINATED CASE SIGN



64132

FINAL ROW PLAN REVISIONS		SUBMITTAL DATE:	
NO.	DATE	NO.	DATE



DATE: 2/27/20	CS: 63041
DESIGN UNIT: SIGNALS	JN:
TSC: OAKLAND	TWA#17774

TRAFFIC SIGNAL CONSTRUCTION SHEET	
M-59 (HIGHLAND) EB @ X-OVER W OF ORMOND RD	
WHITE LAKE TWP, OAKLAND COUNTY	
DRAWING	SHEET
SIGNAL	SECTION
M-59	
CON001	

SIGNALS	
OPENINGS:	19
CYCLIC WATTS:	2250
STEADY WATTS:	300
PLAN:	63041-01-113

Appendix 2

Existing LOS Output Reports

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	978	69	0
Future Vol, veh/h	0	0	0	978	69	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	92
Heavy Vehicles, %	2	2	6	6	6	5
Mvmt Flow	0	0	0	1029	115	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 515
Stage 1	-	- 0
Stage 2	-	- 515
Critical Hdwy	-	- 6.92
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	- 5.92
Follow-up Hdwy	-	- 3.56
Pot Cap-1 Maneuver	0	- 480
Stage 1	0	-
Stage 2	0	- 553
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 480
Mov Cap-2 Maneuver	-	- 480
Stage 1	-	-
Stage 2	-	- 553

Approach	WB	NB
HCM Control Delay, s	0	14.8
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	480	-
HCM Lane V/C Ratio	0.24	-
HCM Control Delay (s)	14.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.9	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1459	49	0	0	0	126
Future Vol, veh/h	1459	49	0	0	0	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1603	54	0	0	0	159

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	802
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	325
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	325
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	26.3
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	325	-	-
HCM Lane V/C Ratio	0.491	-	-
HCM Control Delay (s)	26.3	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.6	-	-

HCM 6th TWSC
3: WB M-59 (Highland Rd) & Hill Rd

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	991	56	0	51
Future Vol, veh/h	0	0	991	56	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	6	6	2	2
Mvmt Flow	0	0	1066	60	0	85

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	13.9
HCM LOS		B

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	491
HCM Lane V/C Ratio	-	-	0.173
HCM Control Delay (s)	-	-	13.9
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.6

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1444	0	0	64	0
Future Vol, veh/h	0	1444	0	0	64	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	92	92	73	95
Heavy Vehicles, %	4	4	2	2	6	6
Mvmt Flow	0	1622	0	0	88	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	811	-
Stage 1	-	-	0	-
Stage 2	-	-	811	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	309	0
Stage 1	0	-	-	0
Stage 2	0	-	387	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	309	-
Mov Cap-2 Maneuver	-	-	309	-
Stage 1	-	-	-	-
Stage 2	-	-	387	-

Approach	EB	SB
HCM Control Delay, s	0	21.2
HCM LOS		C

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	309
HCM Lane V/C Ratio	-	0.284
HCM Control Delay (s)	-	21.2
HCM Lane LOS	-	C
HCM 95th %tile Q(veh)	-	1.1

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	978	12	0
Future Vol, veh/h	0	0	0	978	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1029	20	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 515
Stage 1	-	- 0
Stage 2	-	- 515
Critical Hdwy	-	- 6.96
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.96
Follow-up Hdwy	-	- 3.58
Pot Cap-1 Maneuver	0	- 475 0
Stage 1	0	- - 0
Stage 2	0	- 548 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 475 -
Mov Cap-2 Maneuver	-	- 475 -
Stage 1	-	- - -
Stage 2	-	- 548 -

Approach	WB	NB
HCM Control Delay, s	0	12.9
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	475	-
HCM Lane V/C Ratio	0.042	-
HCM Control Delay (s)	12.9	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.1	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1444	4	0	0	0	0	0	5	7	9	0
Future Vol, veh/h	0	1444	4	0	0	0	0	0	5	7	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	14688	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	6
Mvmt Flow	0	1604	4	0	0	0	0	0	8	10	13	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	802	802	1608	-		
Stage 1	-	-	-	-	-	-	-	0	0	-		
Stage 2	-	-	-	-	-	-	-	802	1608	-		
Critical Hdwy	-	-	-	-	-	-	6.9	7.62	6.62	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.62	5.62	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.56	4.06	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	331	268	100	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	335	156	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	331	262	100	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	262	100	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	327	156	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.1	36.7
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	331	-	-	137
HCM Lane V/C Ratio	0.024	-	-	0.174
HCM Control Delay (s)	16.1	-	-	36.7
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	0.6

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	76
Average Queue (ft)	34
95th Queue (ft)	63
Link Distance (ft)	32
Upstream Blk Time (%)	13
Queuing Penalty (veh)	10
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	127
Average Queue (ft)	44
95th Queue (ft)	92
Link Distance (ft)	269
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	71
Average Queue (ft)	20
95th Queue (ft)	46
Link Distance (ft)	450
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	82
Average Queue (ft)	33
95th Queue (ft)	66
Link Distance (ft)	34
Upstream Blk Time (%)	13
Queuing Penalty (veh)	9
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	44
Average Queue (ft)	9
95th Queue (ft)	34
Link Distance (ft)	49
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	29	56
Average Queue (ft)	4	15
95th Queue (ft)	18	44
Link Distance (ft)	507	51
Upstream Blk Time (%)		1
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	10
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	12
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	10
Average Queue (ft)	0
95th Queue (ft)	7
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 19

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	1933	57	0
Future Vol, veh/h	0	0	0	1933	57	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	71	94
Heavy Vehicles, %	2	2	2	2	5	2
Mvmt Flow	0	0	0	2035	80	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1018
Stage 1	-	- 0
Stage 2	-	- 1018
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 228
Stage 1	0	- - 0
Stage 2	0	- 303
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 228
Mov Cap-2 Maneuver	-	- 228
Stage 1	-	- -
Stage 2	-	- 303

Approach	WB	NB
HCM Control Delay, s	0	29.1
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	228	-
HCM Lane V/C Ratio	0.352	-
HCM Control Delay (s)	29.1	-
HCM Lane LOS	D	-
HCM 95th %tile Q(veh)	1.5	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1505	141	0	0	0	107
Future Vol, veh/h	1505	141	0	0	0	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1584	148	0	0	0	145

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	792
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	328
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	328
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	24.4
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	328	-	-
HCM Lane V/C Ratio	0.441	-	-
HCM Control Delay (s)	24.4	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	2.2	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1930	60	0	57
Future Vol, veh/h	0	0	1930	60	0	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	0	0	2032	63	0	80

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1016
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- - 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- - 3.32
Pot Cap-1 Maneuver	-	- 0 236
Stage 1	-	- 0 -
Stage 2	-	- 0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- - 236
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	27.9
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	236
HCM Lane V/C Ratio	-	-	0.34
HCM Control Delay (s)	-	-	27.9
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.4

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1514	0	0	132	0
Future Vol, veh/h	0	1514	0	0	132	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	95
Heavy Vehicles, %	2	2	2	2	2	3
Mvmt Flow	0	1594	0	0	163	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	797	-
Stage 1	-	-	0	-
Stage 2	-	-	797	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	324	0
Stage 1	0	-	-	0
Stage 2	0	-	404	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	324	-
Mov Cap-2 Maneuver	-	-	324	-
Stage 1	-	-	-	-
Stage 2	-	-	404	-

Approach	EB	SB
HCM Control Delay, s	0	26.8
HCM LOS		D

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	324
HCM Lane V/C Ratio	-	0.503
HCM Control Delay (s)	-	26.8
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	2.7

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	1855	19	0
Future Vol, veh/h	0	0	0	1855	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	95
Heavy Vehicles, %	2	2	2	2	11	2
Mvmt Flow	0	0	0	1953	32	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 977
Stage 1	-	- 0
Stage 2	-	- 977
Critical Hdwy	-	- 7.02
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.02
Follow-up Hdwy	-	- 3.61
Pot Cap-1 Maneuver	0	- 233
Stage 1	0	- - 0
Stage 2	0	- 305
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 233
Mov Cap-2 Maneuver	-	- 233
Stage 1	-	- -
Stage 2	-	- 305

Approach	WB	NB
HCM Control Delay, s	0	22.9
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	233	-
HCM Lane V/C Ratio	0.136	-
HCM Control Delay (s)	22.9	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.5	-

HCM 6th TWSC
6: Haven Rd & EB M-59 (Highland Road)

2021 Existing

Section 9, Item B.

PM Peak Hour

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1490	9	0	0	0	0	0	23	20	13	0
Future Vol, veh/h	0	1490	9	0	0	0	0	0	23	20	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	16224	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	60	60	60	68	68	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	4	4	2
Mvmt Flow	0	1568	9	0	0	0	0	0	38	29	19	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	784	784	1577	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	784	1577	-
Critical Hdwy	-	-	-	-	-	6.9	7.58	6.58	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.54	4.04	-
Pot Cap-1 Maneuver	0	-	-	0	0	340	280	106	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	348	165	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	340	248	106	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	106	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	309	165	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.9	36.5
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	340	-	-	162
HCM Lane V/C Ratio	0.113	-	-	0.3
HCM Control Delay (s)	16.9	-	-	36.5
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	1.2

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	90
Average Queue (ft)	43
95th Queue (ft)	83
Link Distance (ft)	32
Upstream Blk Time (%)	38
Queuing Penalty (veh)	22
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	128
Average Queue (ft)	39
95th Queue (ft)	85
Link Distance (ft)	270
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	127
Average Queue (ft)	35
95th Queue (ft)	88
Link Distance (ft)	941
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	87
Average Queue (ft)	55
95th Queue (ft)	88
Link Distance (ft)	34
Upstream Blk Time (%)	41
Queuing Penalty (veh)	55
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	58
Average Queue (ft)	16
95th Queue (ft)	47
Link Distance (ft)	48
Upstream Blk Time (%)	2
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	EB	NB	SB
Directions Served	R	R	LT
Maximum Queue (ft)	4	41	56
Average Queue (ft)	0	14	23
95th Queue (ft)	3	38	51
Link Distance (ft)		507	51
Upstream Blk Time (%)			2
Queuing Penalty (veh)			1
Storage Bay Dist (ft)	280		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	4
95th Queue (ft)	23
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	84
Average Queue (ft)	7
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	37
Average Queue (ft)	2
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	1
95th Queue (ft)	13
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 79

Appendix 3

Background LOS Output Reports

1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1008	71	0
Future Vol, veh/h	0	0	0	1008	71	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	92	92
Heavy Vehicles, %	2	2	2	6	5	5
Mvmt Flow	0	0	0	1061	77	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 531
Stage 1	-	- 0
Stage 2	-	- 531
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 471
Stage 1	0	- - 0
Stage 2	0	- 546
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 471
Mov Cap-2 Maneuver	-	- 471
Stage 1	-	- -
Stage 2	-	- 546

Approach	WB	NB
HCM Control Delay, s	0	14.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	471	-
HCM Lane V/C Ratio	0.164	-
HCM Control Delay (s)	14.1	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.6	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Background

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1503	51	0	0	0	130
Future Vol, veh/h	1503	51	0	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1652	56	0	0	0	165

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	826
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	313
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	313
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	28.6
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	313	-	-
HCM Lane V/C Ratio	0.526	-	-
HCM Control Delay (s)	28.6	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.9	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1021	58	0	53
Future Vol, veh/h	0	0	1021	58	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	6	6	2	2
Mvmt Flow	0	0	1098	62	0	88

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	14.2
HCM LOS		B

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	480
HCM Lane V/C Ratio	-	-	0.184
HCM Control Delay (s)	-	-	14.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.7

4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

AM Peak Hour

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1488	0	0	66	0
Future Vol, veh/h	0	1488	0	0	66	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	92	92	73	92
Heavy Vehicles, %	2	4	2	2	6	2
Mvmt Flow	0	1672	0	0	90	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	836	-
Stage 1	-	-	0	-
Stage 2	-	-	836	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	298	0
Stage 1	0	-	-	0
Stage 2	0	-	376	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	298	-
Mov Cap-2 Maneuver	-	-	298	-
Stage 1	-	-	-	-
Stage 2	-	-	376	-

Approach	EB	SB
HCM Control Delay, s	0	22.3
HCM LOS		C

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	298
HCM Lane V/C Ratio	-	0.303
HCM Control Delay (s)	-	22.3
HCM Lane LOS	-	C
HCM 95th %tile Q(veh)	-	1.2

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Background

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1008	12	0
Future Vol, veh/h	0	0	0	1008	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1061	20	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	531
Stage 1	-	0
Stage 2	-	531
Critical Hdwy	-	6.96
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	5.96
Follow-up Hdwy	-	3.58
Pot Cap-1 Maneuver	0	464
Stage 1	0	-
Stage 2	0	537
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	464
Mov Cap-2 Maneuver	-	464
Stage 1	-	-
Stage 2	-	537

Approach	WB	NB
HCM Control Delay, s	0	13.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	464	-
HCM Lane V/C Ratio	0.043	-
HCM Control Delay (s)	13.1	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.1	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1488	4	0	0	0	0	0	5	7	9	0
Future Vol, veh/h	0	1488	4	0	0	0	0	0	5	7	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	1084909568	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	92
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	2
Mvmt Flow	0	1653	4	0	0	0	0	0	8	10	13	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	827	827	1657	-		
Stage 1	-	-	-	-	-	-	-	0	0	-		
Stage 2	-	-	-	-	-	-	-	827	1657	-		
Critical Hdwy	-	-	-	-	-	-	6.9	7.62	6.62	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.62	5.62	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.56	4.06	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	319	257	93	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	324	147	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	319	251	93	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	251	93	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	316	147	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.6	39.5
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	319	-	-	128
HCM Lane V/C Ratio	0.025	-	-	0.187
HCM Control Delay (s)	16.6	-	-	39.5
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	0.7

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	87
Average Queue (ft)	36
95th Queue (ft)	68
Link Distance (ft)	32
Upstream Blk Time (%)	15
Queuing Penalty (veh)	11
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	136
Average Queue (ft)	52
95th Queue (ft)	104
Link Distance (ft)	270
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	89
Average Queue (ft)	22
95th Queue (ft)	59
Link Distance (ft)	449
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	EB	SB
Directions Served	T	L
Maximum Queue (ft)	7	81
Average Queue (ft)	0	36
95th Queue (ft)	5	63
Link Distance (ft)	133	33
Upstream Blk Time (%)		18
Queuing Penalty (veh)		13
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	40
Average Queue (ft)	8
95th Queue (ft)	32
Link Distance (ft)	49
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	28	54
Average Queue (ft)	6	12
95th Queue (ft)	24	39
Link Distance (ft)	507	53
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	17
Average Queue (ft)	1
95th Queue (ft)	11
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	26
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 24

1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

PM Peak Hour

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1992	59	0
Future Vol, veh/h	0	0	0	1992	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	71	94
Heavy Vehicles, %	2	2	2	2	5	2
Mvmt Flow	0	0	0	2097	83	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1049
Stage 1	-	- 0
Stage 2	-	- 1049
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 218 0
Stage 1	0	- - 0
Stage 2	0	- 292 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 218
Mov Cap-2 Maneuver	-	- 218
Stage 1	-	- -
Stage 2	-	- 292

Approach	WB	NB
HCM Control Delay, s	0	31.3
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	218	-
HCM Lane V/C Ratio	0.381	-
HCM Control Delay (s)	31.3	-
HCM Lane LOS	D	-
HCM 95th %tile Q(veh)	1.7	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Background

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1551	145	0	0	0	110
Future Vol, veh/h	1551	145	0	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1633	153	0	0	0	149

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	817
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	315
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	315
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	26.2
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	315	-	-
HCM Lane V/C Ratio	0.472	-	-
HCM Control Delay (s)	26.2	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.4	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1989	62	0	59
Future Vol, veh/h	0	0	1989	62	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2094	65	0	83

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1047
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- - 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- - 3.32
Pot Cap-1 Maneuver	-	- 0 225
Stage 1	-	- 0 -
Stage 2	-	- 0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- - 225
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	30.1
HCM LOS		D

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	225
HCM Lane V/C Ratio	-	-	0.369
HCM Control Delay (s)	-	-	30.1
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	1.6

4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

PM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1560	0	0	136	0
Future Vol, veh/h	0	1560	0	0	136	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1642	0	0	168	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	821	-
Stage 1	-	-	0	-
Stage 2	-	-	821	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	313	0
Stage 1	0	-	-	0
Stage 2	0	-	393	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	313	-
Mov Cap-2 Maneuver	-	-	313	-
Stage 1	-	-	-	-
Stage 2	-	-	393	-

Approach	EB	SB
HCM Control Delay, s	0	29.1
HCM LOS		D

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	313
HCM Lane V/C Ratio	-	0.536
HCM Control Delay (s)	-	29.1
HCM Lane LOS	-	D
HCM 95th %tile Q(veh)	-	3

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1912	20	0
Future Vol, veh/h	0	0	0	1912	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	95
Heavy Vehicles, %	2	2	2	2	11	2
Mvmt Flow	0	0	0	2013	33	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1007
Stage 1	-	- 0
Stage 2	-	- 1007
Critical Hdwy	-	- 7.02
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.02
Follow-up Hdwy	-	- 3.61
Pot Cap-1 Maneuver	0	- 222 0
Stage 1	0	- - 0
Stage 2	0	- 294 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 222 -
Mov Cap-2 Maneuver	-	- 222 -
Stage 1	-	- - -
Stage 2	-	- 294 -

Approach	WB	NB
HCM Control Delay, s	0	24.1
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	222	-
HCM Lane V/C Ratio	0.15	-
HCM Control Delay (s)	24.1	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.5	-

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1535	9	0	0	0	0	0	24	21	13	0
Future Vol, veh/h	0	1535	9	0	0	0	0	0	24	21	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	16736	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	95	95	92	92	92	60	60	60	95	95	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	2	2	2
Mvmt Flow	0	1616	9	0	0	0	0	0	40	22	14	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	808	808	1625	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	808	1625	-
Critical Hdwy	-	-	-	-	-	6.9	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.52	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	328	272	101	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	341	159	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	328	239	101	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	239	101	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	299	159	-

Approach	EB	NB	SB
HCM Control Delay, s	0	17.5	34.6
HCM LOS		C	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	328	-	-	157
HCM Lane V/C Ratio	0.122	-	-	0.228
HCM Control Delay (s)	17.5	-	-	34.6
HCM Lane LOS	C	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	0.8

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	98
Average Queue (ft)	41
95th Queue (ft)	82
Link Distance (ft)	32
Upstream Blk Time (%)	36
Queuing Penalty (veh)	22
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	126
Average Queue (ft)	43
95th Queue (ft)	89
Link Distance (ft)	269
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	100
Average Queue (ft)	32
95th Queue (ft)	76
Link Distance (ft)	940
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	91
Average Queue (ft)	55
95th Queue (ft)	91
Link Distance (ft)	34
Upstream Blk Time (%)	37
Queuing Penalty (veh)	51
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	56
Average Queue (ft)	18
95th Queue (ft)	48
Link Distance (ft)	48
Upstream Blk Time (%)	2
Queuing Penalty (veh)	1
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	38	53
Average Queue (ft)	11	25
95th Queue (ft)	32	51
Link Distance (ft)	507	51
Upstream Blk Time (%)		1
Queuing Penalty (veh)		1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	43
Average Queue (ft)	3
95th Queue (ft)	24
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	74
Average Queue (ft)	7
95th Queue (ft)	38
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	23
Average Queue (ft)	2
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	27
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 75

Appendix 4

Trip Generation Calculations

Land Use: 210

Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077, 1078, 1079

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

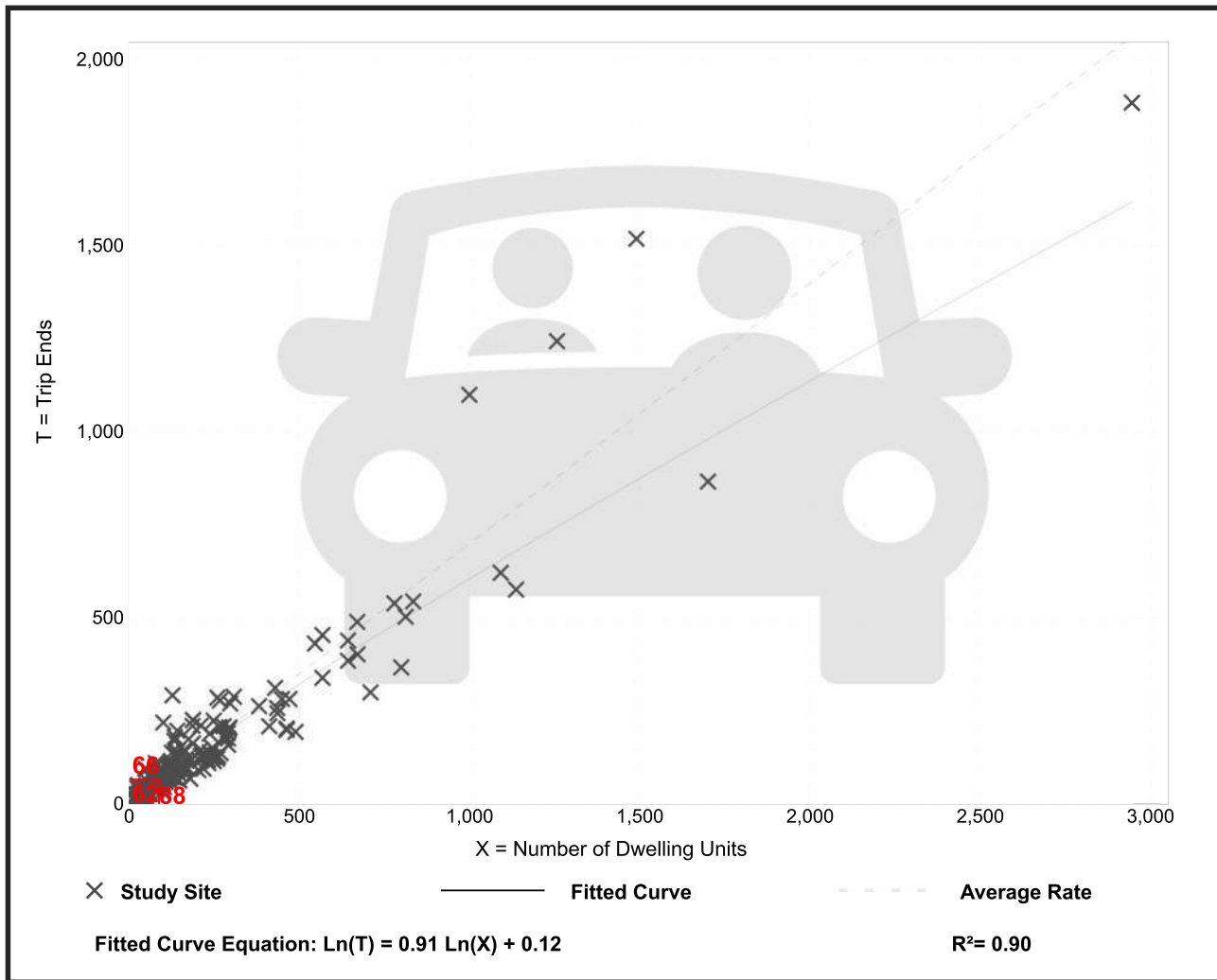
Setting/Location: General Urban/Suburban

Number of Studies: 192
 Avg. Num. of Dwelling Units: 226
 Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



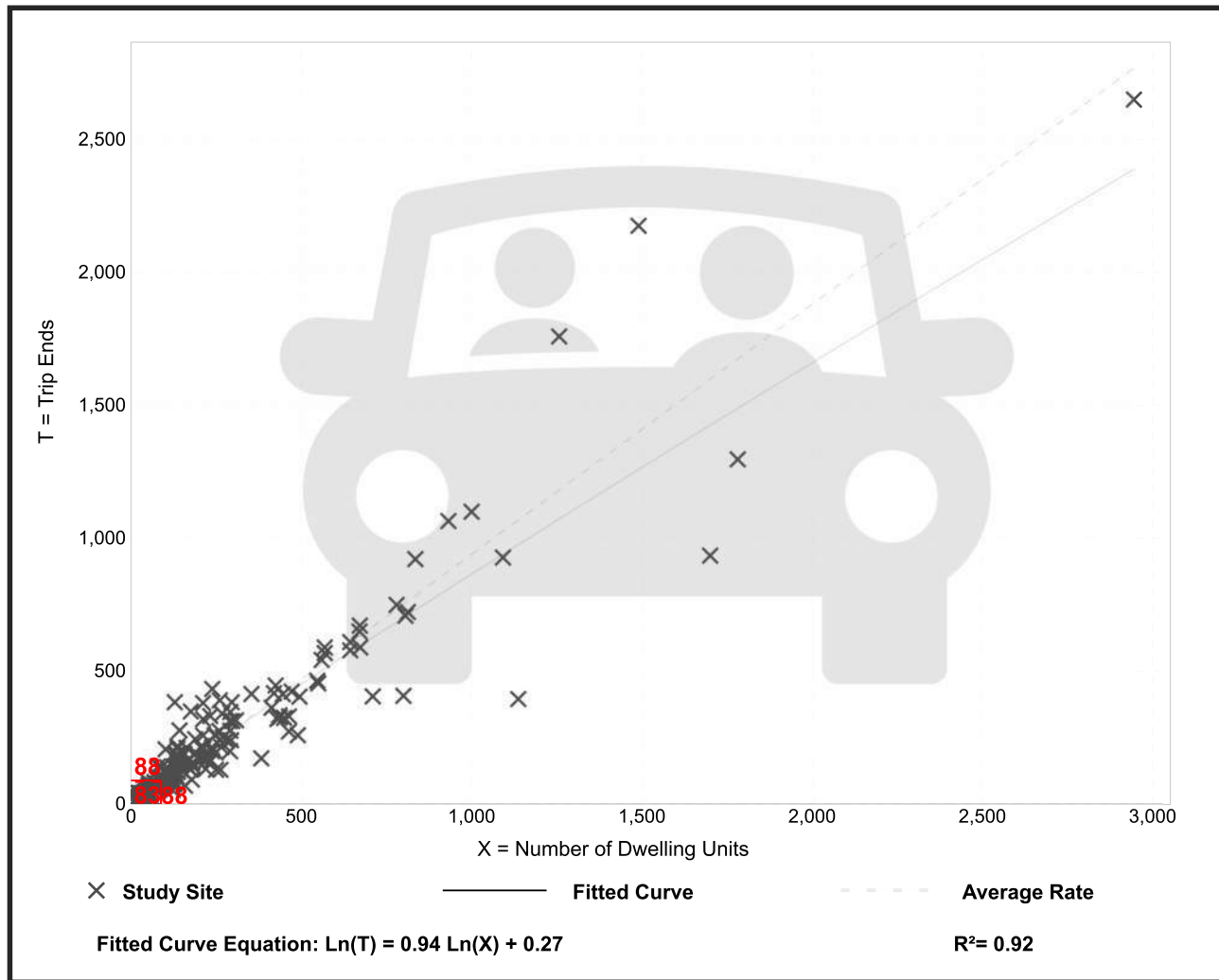
Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 208
 Avg. Num. of Dwelling Units: 248
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing (210)

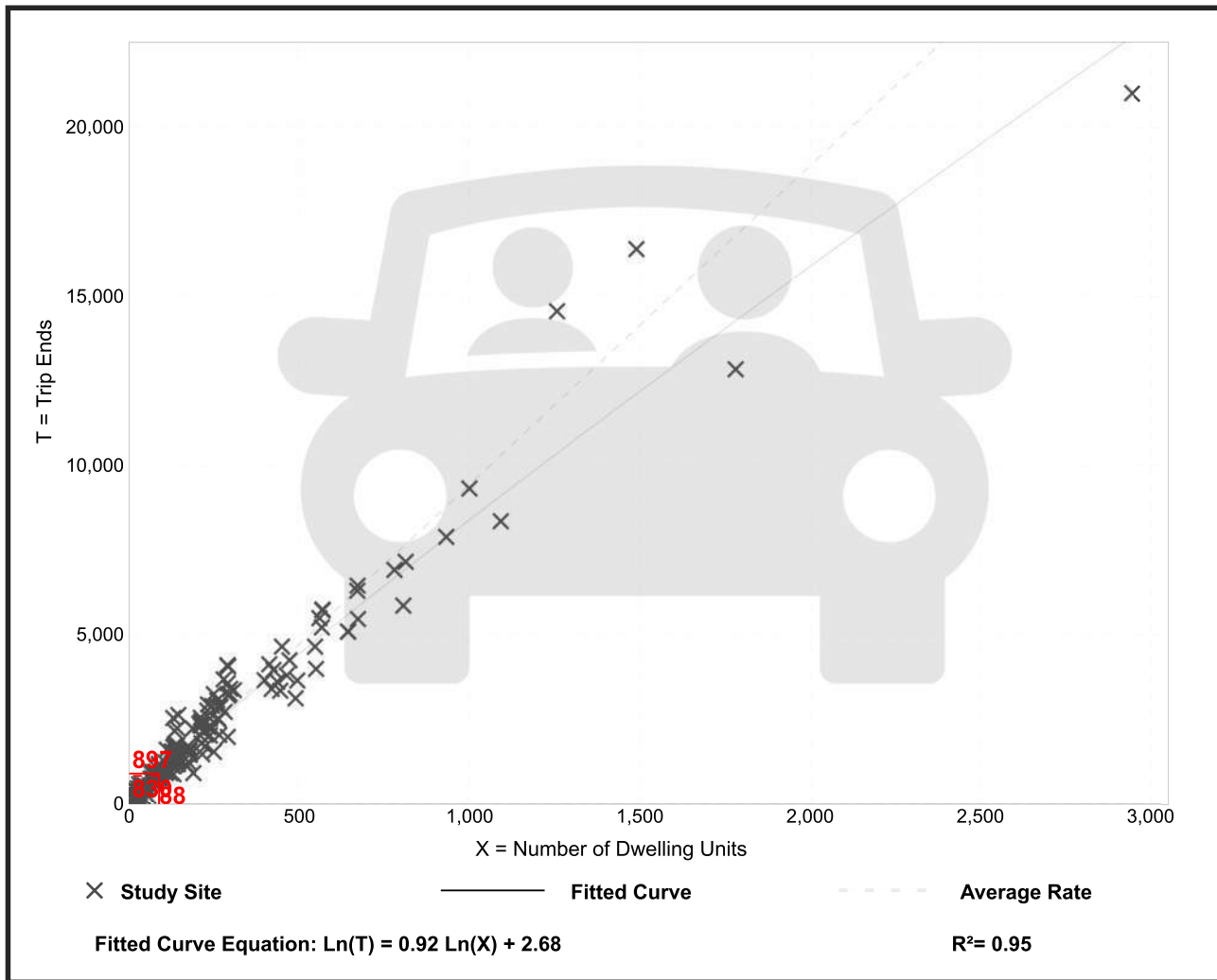
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Land Use: 220

Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.
- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.
- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.
- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

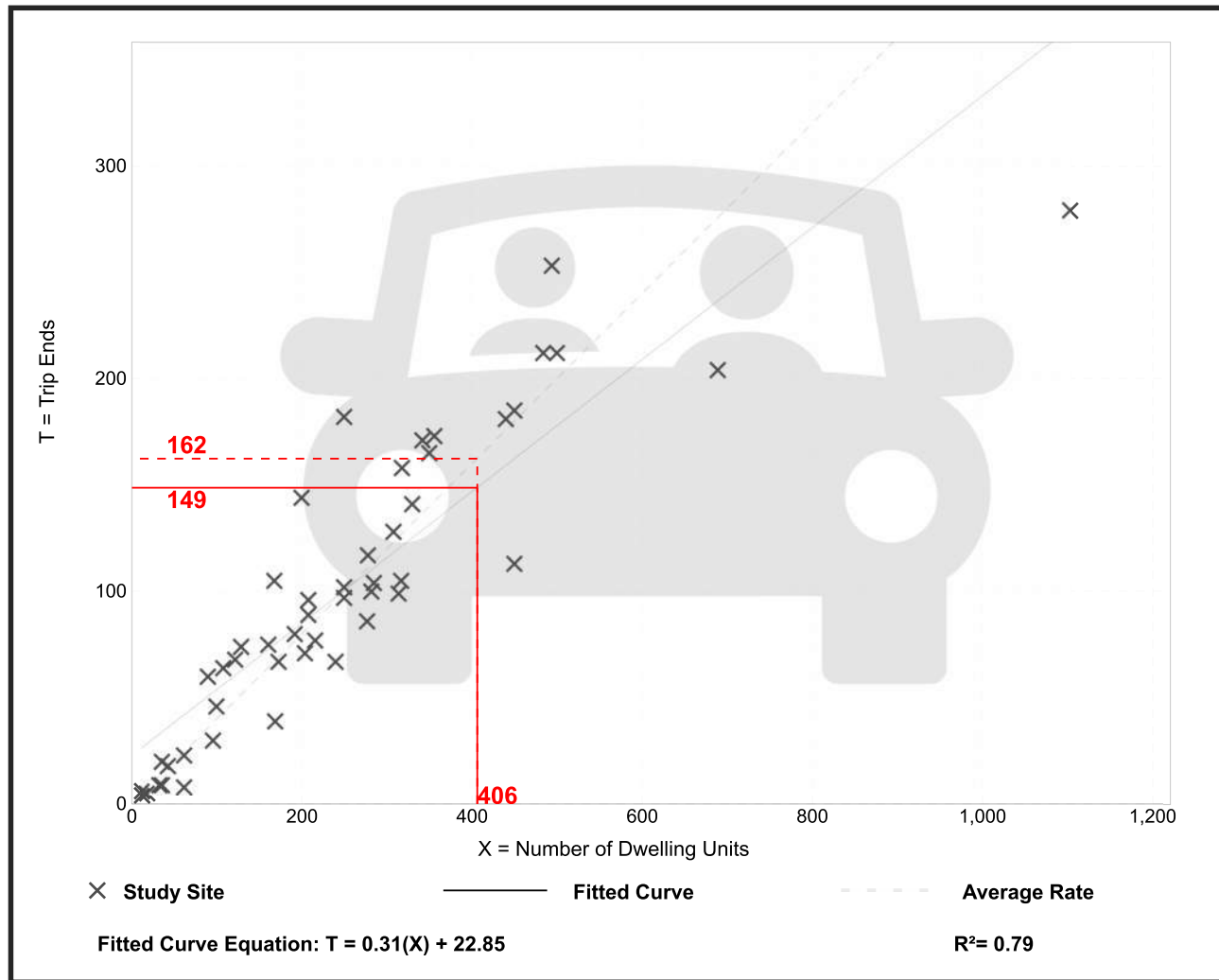
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban
 Number of Studies: 49
 Avg. Num. of Dwelling Units: 249
 Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



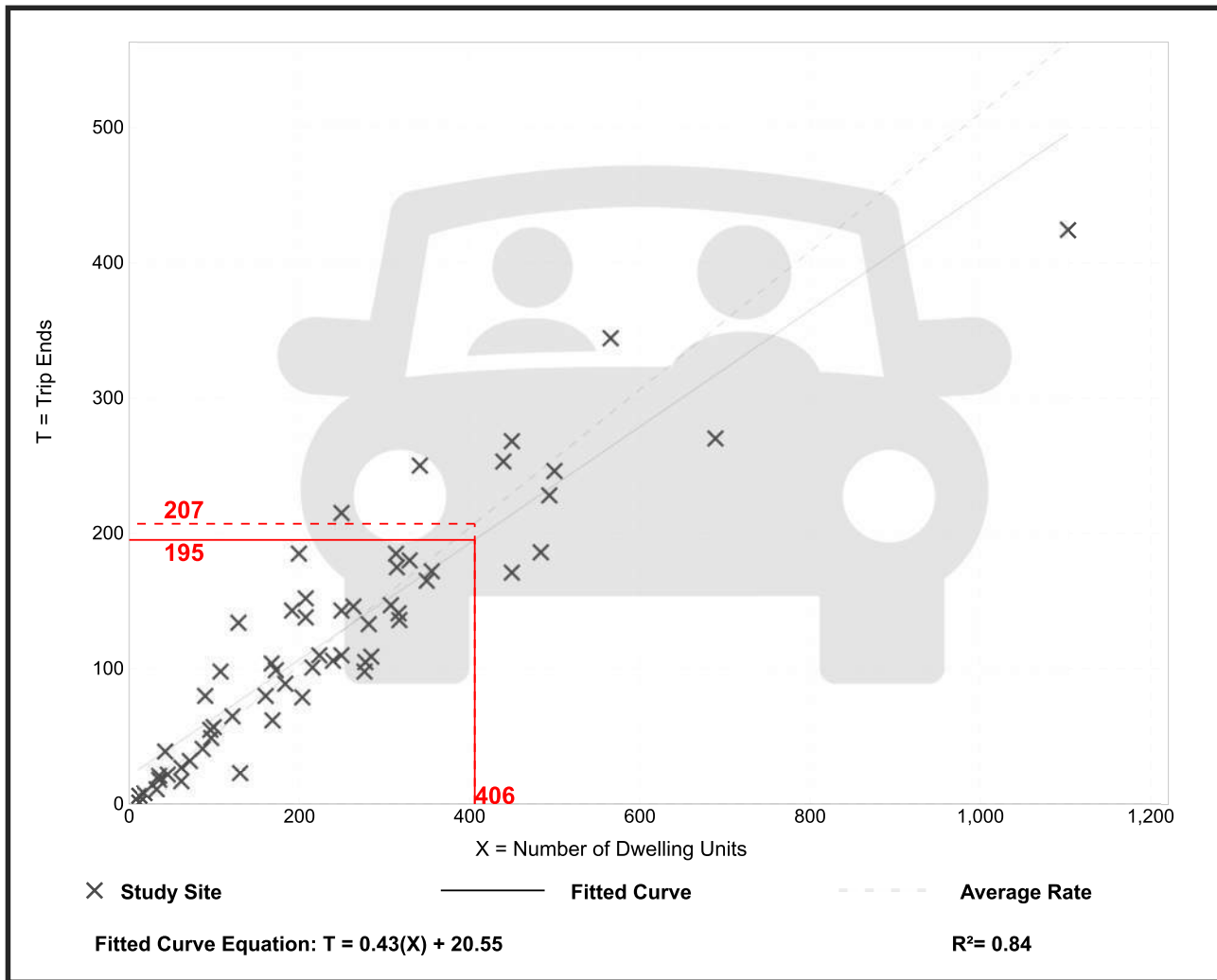
Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 59
 Avg. Num. of Dwelling Units: 241
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

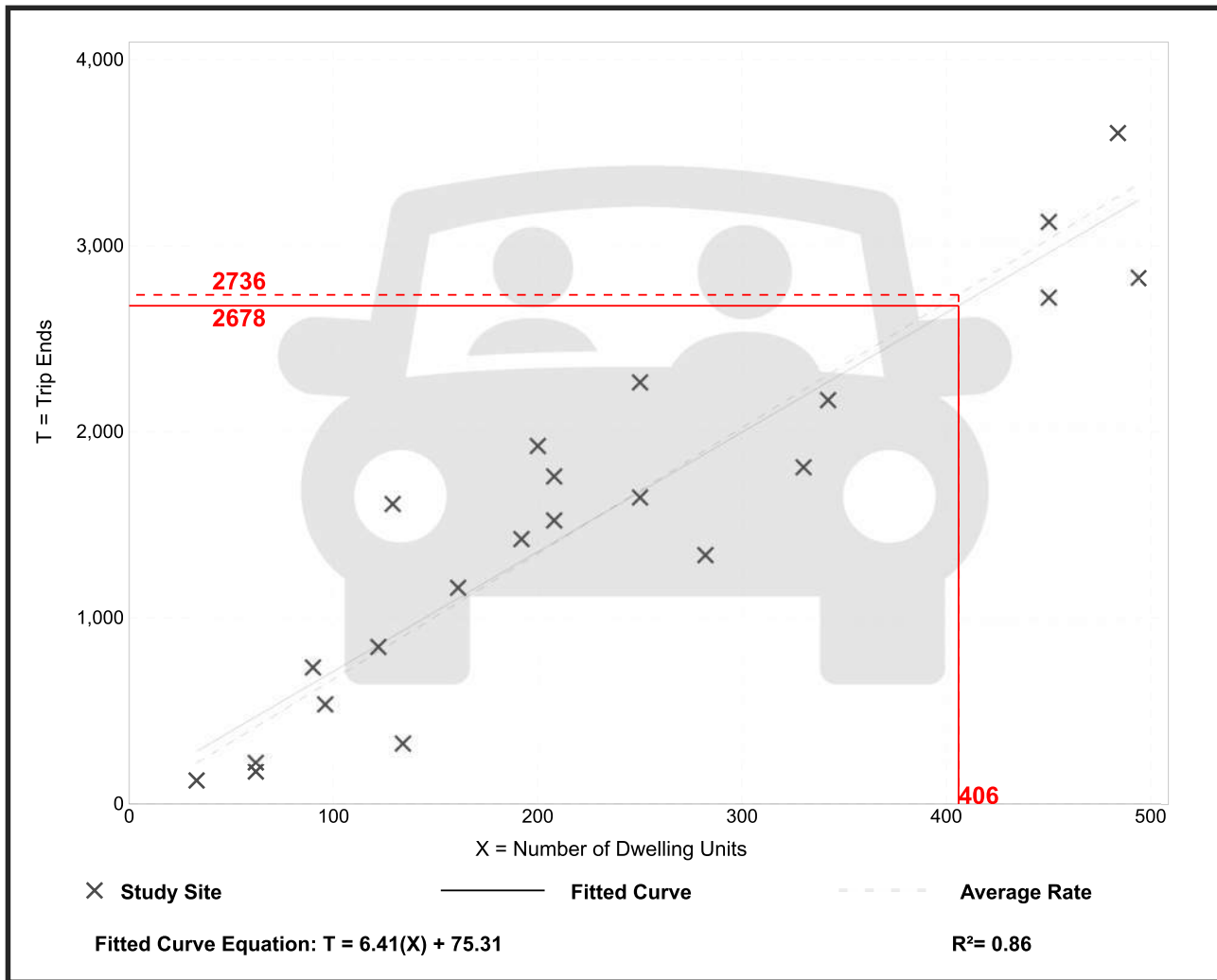
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 229
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

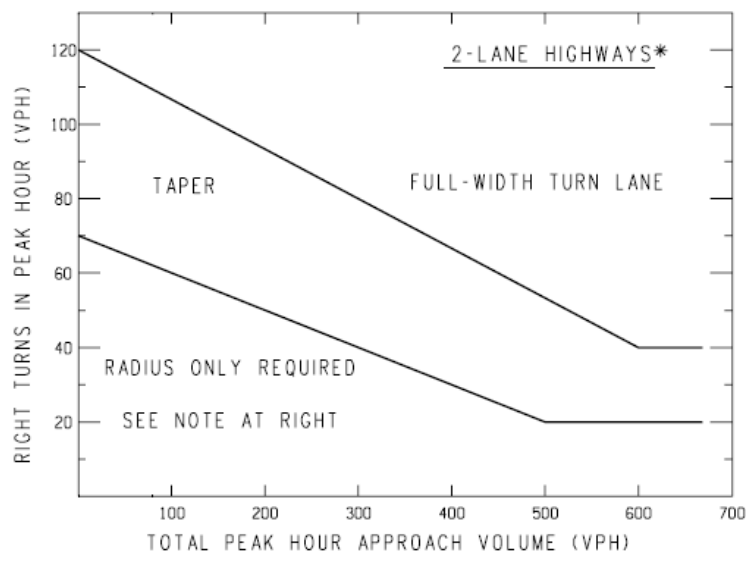
Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



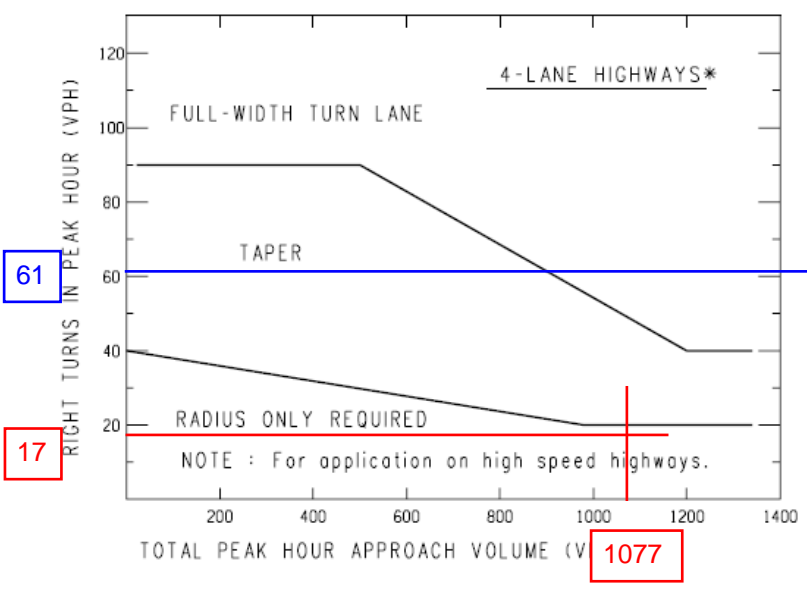
Appendix 5

Turn Lane Warrant



NOTE: For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour
 Right turns = Peak hour
 Right turns - 20



WB M-59 (Highland Road) and Driveway 4
 AM Peak Hour
 PM Peak Hour

*If a center left-turn lane exists (ie 3 or 5 lane roadway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

61

17

1077

2031

Sample Problem: The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hous is 100 vph. Determine if a right turn lane is recommended.

Solution: Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

Appendix 6

Future LOS Output Reports

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↘	
Traffic Vol, veh/h	0	0	0	1029	92	0
Future Vol, veh/h	0	0	0	1029	92	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	60	92
Heavy Vehicles, %	2	2	2	6	6	5
Mvmt Flow	0	0	0	1083	153	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 542
Stage 1	-	- 0
Stage 2	-	- 542
Critical Hdwy	-	- 6.92
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	- 5.92
Follow-up Hdwy	-	- 3.56
Pot Cap-1 Maneuver	0	- 461
Stage 1	0	-
Stage 2	0	- 536
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 461
Mov Cap-2 Maneuver	-	- 461
Stage 1	-	-
Stage 2	-	- 536

Approach	WB	NB
HCM Control Delay, s	0	16.7
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	461	-
HCM Lane V/C Ratio	0.333	-
HCM Control Delay (s)	16.7	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	1.4	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1620	51	0	0	0	130
Future Vol, veh/h	1620	51	0	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1780	56	0	0	0	165

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	890
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	284
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	284
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	33.8
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	284	-	-
HCM Lane V/C Ratio	0.579	-	-
HCM Control Delay (s)	33.8	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	3.4	-	-

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1028	93	0	157
Future Vol, veh/h	0	0	1028	93	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	8	8	2	2
Mvmt Flow	0	0	1105	100	0	262

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	21.3
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	477
HCM Lane V/C Ratio	-	-	0.549
HCM Control Delay (s)	-	-	21.3
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.3

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1541	0	0	130	0
Future Vol, veh/h	0	1541	0	0	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	92	92	73	92
Heavy Vehicles, %	2	4	2	2	6	2
Mvmt Flow	0	1731	0	0	178	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	866	-
Stage 1	-	-	0	-
Stage 2	-	-	866	-
Critical Hdwy	-	-	6.92	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.92	-
Follow-up Hdwy	-	-	3.56	-
Pot Cap-1 Maneuver	0	-	285	0
Stage 1	0	-	-	0
Stage 2	0	-	362	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	285	-
Mov Cap-2 Maneuver	-	-	285	-
Stage 1	-	-	-	-
Stage 2	-	-	362	-

Approach	EB	SB
HCM Control Delay, s	0	36.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	285
HCM Lane V/C Ratio	-	0.625
HCM Control Delay (s)	-	36.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	3.9

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1055	22	0
Future Vol, veh/h	0	0	0	1055	22	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1111	37	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 444
Stage 1	-	- 0
Stage 2	-	- 444
Critical Hdwy	-	- 5.86
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.16
Follow-up Hdwy	-	- 3.88
Pot Cap-1 Maneuver	0	- 567
Stage 1	0	- - 0
Stage 2	0	- 546
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 567
Mov Cap-2 Maneuver	-	- 567
Stage 1	-	- -
Stage 2	-	- 546

Approach	WB	NB
HCM Control Delay, s	0	11.8
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	567	-
HCM Lane V/C Ratio	0.065	-
HCM Control Delay (s)	11.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.2	-

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Future Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	1084905472	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	6
Mvmt Flow	0	1688	4	0	0	0	0	0	8	58	13	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	844	844	1692	-		
Stage 1	-	-	-	-	-	-	-	0	0	-		
Stage 2	-	-	-	-	-	-	-	844	1692	-		
Critical Hdwy	-	-	-	-	-	-	6.9	7.62	6.62	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.62	5.62	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.56	4.06	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	311	250	88	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	316	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	311	244	88	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	244	88	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	308	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.9	36.8
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	311	-	-	183
HCM Lane V/C Ratio	0.026	-	-	0.391
HCM Control Delay (s)	16.9	-	-	36.8
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	1.7

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	1	61	15	0	54
Future Vol, veh/h	44	1	61	15	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	1	66	16	0	59

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	133	74	0	0	82	0
Stage 1	74	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	861	988	-	-	1515	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	861	988	-	-	1515	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	863	1515
HCM Lane V/C Ratio	-	-	0.057	-
HCM Control Delay (s)	-	-	9.4	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

HCM 6th TWSC
8: Hill Rd & Driveway 2

2027 Future

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	56	18	74	97	1
Future Vol, veh/h	2	56	18	74	97	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	61	20	80	105	1

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	226	106	106	0	0
Stage 1	106	-	-	-	-
Stage 2	120	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	762	948	1485	-	-
Stage 1	918	-	-	-	-
Stage 2	905	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	751	948	1485	-	-
Mov Cap-2 Maneuver	751	-	-	-	-
Stage 1	905	-	-	-	-
Stage 2	905	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	940	-	-
HCM Lane V/C Ratio	0.013	-	0.067	-	-
HCM Control Delay (s)	7.5	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	91	2	0	153
Future Vol, veh/h	4	1	91	2	0	153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	1	99	2	0	166

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	266	100	0	0	101	0
Stage 1	100	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	723	956	-	-	1491	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	723	956	-	-	1491	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1491
HCM Lane V/C Ratio	-	-	0.007	-
HCM Control Delay (s)	-	-	9.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection

Int Delay, s/veh 0.7

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1060	17	0	54
Future Vol, veh/h	0	0	1060	17	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	92
Heavy Vehicles, %	2	2	5	5	2	2
Mvmt Flow	0	0	1116	18	0	59

Major/Minor Major2 Minor2

Conflicting Flow All	-	0	-	558
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	473
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	473
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach WB SB

HCM Control Delay, s	0	13.7
HCM LOS		B

Minor Lane/Major Mvmt WBT SBLn1

Capacity (veh/h)	-	473
HCM Lane V/C Ratio	-	0.124
HCM Control Delay (s)	-	13.7
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.4

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	83
Average Queue (ft)	39
95th Queue (ft)	68
Link Distance (ft)	32
Upstream Blk Time (%)	18
Queuing Penalty (veh)	16
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	185
Average Queue (ft)	61
95th Queue (ft)	132
Link Distance (ft)	269
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	99
Average Queue (ft)	41
95th Queue (ft)	77
Link Distance (ft)	924
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	107
Average Queue (ft)	60
95th Queue (ft)	102
Link Distance (ft)	34
Upstream Blk Time (%)	40
Queuing Penalty (veh)	54
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	17
95th Queue (ft)	44
Link Distance (ft)	49
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	21	64
Average Queue (ft)	2	30
95th Queue (ft)	13	59
Link Distance (ft)	507	53
Upstream Blk Time (%)		4
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	55
Average Queue (ft)	25
95th Queue (ft)	49
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	58	17
Average Queue (ft)	28	1
95th Queue (ft)	52	8
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	WB
Directions Served	T
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	64
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	19
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB	WB
Directions Served	L	T
Maximum Queue (ft)	136	57
Average Queue (ft)	18	2
95th Queue (ft)	94	41
Link Distance (ft)		564
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	2	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	48
Average Queue (ft)	3
95th Queue (ft)	24
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 75

HCM 6th TWSC
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	4.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Vol, veh/h	0	0	0	2090	109	0
Future Vol, veh/h	0	0	0	2090	109	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	95	95	71	92
Heavy Vehicles, %	2	2	2	2	5	2
Mvmt Flow	0	0	0	2200	154	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 1100
Stage 1	-	- 0
Stage 2	-	- 1100
Critical Hdwy	-	- 6.9
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 5.9
Follow-up Hdwy	-	- 3.55
Pot Cap-1 Maneuver	0	- 202
Stage 1	0	- - 0
Stage 2	0	- 274
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 202
Mov Cap-2 Maneuver	-	- 202
Stage 1	-	- -
Stage 2	-	- 274

Approach	WB	NB
HCM Control Delay, s	0	63.7
HCM LOS		F

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	202	-
HCM Lane V/C Ratio	0.76	-
HCM Control Delay (s)	63.7	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	5.1	-

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1648	145	0	0	0	110
Future Vol, veh/h	1648	145	0	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1735	153	0	0	0	149

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	868
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	292
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	292
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	29.4
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	292	-	-
HCM Lane V/C Ratio	0.509	-	-
HCM Control Delay (s)	29.4	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.7	-	-

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	2023	176	0	127
Future Vol, veh/h	0	0	2023	176	0	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2129	185	0	179

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1065
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 219
Stage 1	-	0 -
Stage 2	-	0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 219
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	68.2
HCM LOS		F

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	219
HCM Lane V/C Ratio	-	-	0.817
HCM Control Delay (s)	-	-	68.2
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	6.1

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↑	
Traffic Vol, veh/h	0	1627	0	0	166	0
Future Vol, veh/h	0	1627	0	0	166	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1713	0	0	205	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	857	-
Stage 1	-	-	0	-
Stage 2	-	-	857	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	296	0
Stage 1	0	-	-	0
Stage 2	0	-	376	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	296	-
Mov Cap-2 Maneuver	-	-	296	-
Stage 1	-	-	-	-
Stage 2	-	-	376	-

Approach	EB	SB
HCM Control Delay, s	0	40.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	296
HCM Lane V/C Ratio	-	0.692
HCM Control Delay (s)	-	40.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	4.8

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1984	47	0
Future Vol, veh/h	0	0	0	1984	47	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	2	11	4
Mvmt Flow	0	0	0	2088	78	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 835
Stage 1	-	- 0
Stage 2	-	- 835
Critical Hdwy	-	- 5.92
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.22
Follow-up Hdwy	-	- 3.91
Pot Cap-1 Maneuver	0	- 355 0
Stage 1	0	- - 0
Stage 2	0	- 331 0
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 355
Mov Cap-2 Maneuver	-	- 355
Stage 1	-	- -
Stage 2	-	- 331

Approach	WB	NB
HCM Control Delay, s	0	18
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	355	-
HCM Lane V/C Ratio	0.221	-
HCM Control Delay (s)	18	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.8	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Future Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	17248	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	63	63	60	68	68	68
Heavy Vehicles, %	5	2	2	2	2	2	0	0	0	4	4	4
Mvmt Flow	0	1697	9	0	0	0	0	0	40	56	19	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	849	849	1706	-		
Stage 1	-	-	-	-	-	-	-	-	0	0		
Stage 2	-	-	-	-	-	-	-	-	849	1706		
Critical Hdwy	-	-	-	-	-	-	6.9	7.58	6.58	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.58	5.58	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.54	4.04	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	308	251	89	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	318	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	308	218	89	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	218	89	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	277	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	18.4	46.4
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	308	-	-	159
HCM Lane V/C Ratio	0.13	-	-	0.472
HCM Control Delay (s)	18.4	-	-	46.4
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	2.2

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	0	63	52	1	61
Future Vol, veh/h	30	0	63	52	1	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	0	68	57	1	66

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	165	97	0	0	125	0
Stage 1	97	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	826	959	-	-	1462	-
Stage 1	927	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	825	959	-	-	1462	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	825	1462
HCM Lane V/C Ratio	-	-	0.04	0.001
HCM Control Delay (s)	-	-	9.5	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
8: Hill Rd & Driveway 2

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	35	60	114	89	2
Future Vol, veh/h	1	35	60	114	89	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	65	124	97	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	352	98	99	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	646	958	1494	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	616	958	1494	-	-	-
Mov Cap-2 Maneuver	616	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	943	-	-
HCM Lane V/C Ratio	0.044	-	0.041	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

HCM 6th TWSC
9: Hill Rd & Driveway 3

2027 Future

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	3	0	174	2	0	124
Future Vol, veh/h	3	0	174	2	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	0	189	2	0	135

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	325	190	0	0	191	0
Stage 1	190	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	669	852	-	-	1383	-
Stage 1	842	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	669	852	-	-	1383	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	891	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	669	1383
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	10.4	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1970	61	0	36
Future Vol, veh/h	0	0	1970	61	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2141	66	0	39

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1071
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	0 0 217
Stage 1	-	0 0 -
Stage 2	-	0 0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 217
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	25.2
HCM LOS		D

Minor Lane/Major Mvmt	WBT SBLn1
Capacity (veh/h)	- 217
HCM Lane V/C Ratio	- 0.18
HCM Control Delay (s)	- 25.2
HCM Lane LOS	- D
HCM 95th %tile Q(veh)	- 0.6

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	111
Average Queue (ft)	67
95th Queue (ft)	111
Link Distance (ft)	32
Upstream Blk Time (%)	67
Queuing Penalty (veh)	77
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	174
Average Queue (ft)	53
95th Queue (ft)	135
Link Distance (ft)	269
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	345
Average Queue (ft)	130
95th Queue (ft)	314
Link Distance (ft)	933
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	96
Average Queue (ft)	61
95th Queue (ft)	96
Link Distance (ft)	34
Upstream Blk Time (%)	49
Queuing Penalty (veh)	83
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	WB	NB
Directions Served	T	L
Maximum Queue (ft)	6	68
Average Queue (ft)	0	36
95th Queue (ft)	4	67
Link Distance (ft)	131	49
Upstream Blk Time (%)		13
Queuing Penalty (veh)		7
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	38	55
Average Queue (ft)	13	31
95th Queue (ft)	33	59
Link Distance (ft)	507	51
Upstream Blk Time (%)		7
Queuing Penalty (veh)		4
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	19
95th Queue (ft)	46
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	44	35
Average Queue (ft)	23	5
95th Queue (ft)	48	23
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	14
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	WB	SB
Directions Served	T	R
Maximum Queue (ft)	8	19
Average Queue (ft)	0	1
95th Queue (ft)	5	10
Link Distance (ft)	64	288
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB	EB	EB
Directions Served	L	T	T
Maximum Queue (ft)	205	162	117
Average Queue (ft)	46	11	6
95th Queue (ft)	168	103	79
Link Distance (ft)		465	465
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)	3	0	
Queuing Penalty (veh)	22	0	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	89
Average Queue (ft)	14
95th Queue (ft)	56
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	80
Average Queue (ft)	11
95th Queue (ft)	50
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	51
Average Queue (ft)	5
95th Queue (ft)	29
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 192

Appendix 7

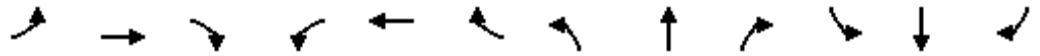
Future Improvement LOS Output Reports

HCM 6th Signalized Intersection Summary
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑				
Traffic Volume (veh/h)	0	0	0	0	1029	0	92	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	1029	0	92	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach				No		No						
Adj Sat Flow, veh/h/ln				0	1906	0	1906	1969	0			
Adj Flow Rate, veh/h				0	1083	0	153	0	0			
Peak Hour Factor				0.95	0.95	0.92	0.60	0.92	0.92			
Percent Heavy Veh, %				0	6	0	6	2	0			
Cap, veh/h				0	2776	0	201	0	0			
Arrive On Green				0.00	0.25	0.00	0.11	0.00	0.00			
Sat Flow, veh/h				0	3813	0	1875	0	0			
Grp Volume(v), veh/h				0	1083	0	153	0	0			
Grp Sat Flow(s),veh/h/ln				0	1811	0	1875	0	0			
Q Serve(g_s), s				0.0	22.3	0.0	7.1	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	22.3	0.0	7.1	0.0	0.0			
Prop In Lane				0.00		0.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	2776	0	201	0	0			
V/C Ratio(X)				0.00	0.39	0.00	0.76	0.00	0.00			
Avail Cap(c_a), veh/h				0	2776	0	517	0	0			
HCM Platoon Ratio				1.00	0.33	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	0.93	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	16.2	0.0	39.1	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.4	0.0	5.9	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	10.6	0.0	3.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	16.6	0.0	45.0	0.0	0.0			
LnGrp LOS				A	B	A	D	A	A			
Approach Vol, veh/h					1083			153				
Approach Delay, s/veh					16.6			45.0				
Approach LOS					B			D				
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		75.2		14.8								
Change Period (Y+Rc), s		* 6.2		* 5.2								
Max Green Setting (Gmax), s		* 54		* 25								
Max Q Clear Time (g_c+I1), s		24.3		9.1								
Green Ext Time (p_c), s		7.7		0.7								
Intersection Summary												
HCM 6th Ctrl Delay				20.1								
HCM 6th LOS				C								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future Improved

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1620	51	0	0	0	130
Future Vol, veh/h	1620	51	0	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	79	79
Heavy Vehicles, %	4	4	2	2	3	3
Mvmt Flow	1780	56	0	0	0	165

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	890
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.33
Pot Cap-1 Maneuver	-	-	0	284
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	284
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	33.8
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	284	-	-
HCM Lane V/C Ratio	0.579	-	-
HCM Control Delay (s)	33.8	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	3.4	-	-

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1028	93	0	157
Future Vol, veh/h	0	0	1028	93	0	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	93	93	60	60
Heavy Vehicles, %	2	2	8	8	2	2
Mvmt Flow	0	0	1105	100	0	262

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	21.3
HCM LOS		C

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	477
HCM Lane V/C Ratio	-	-	0.549
HCM Control Delay (s)	-	-	21.3
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	3.3

4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

AM Peak Hour

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↘	
Traffic Vol, veh/h	0	1541	0	0	130	0
Future Vol, veh/h	0	1541	0	0	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	89	92	92	73	92
Heavy Vehicles, %	2	4	2	2	6	2
Mvmt Flow	0	1731	0	0	178	0
Major/Minor	Major1		Minor2			
Conflicting Flow All	-	0			866	-
Stage 1	-	-			0	-
Stage 2	-	-			866	-
Critical Hdwy	-	-			6.92	-
Critical Hdwy Stg 1	-	-			-	-
Critical Hdwy Stg 2	-	-			5.92	-
Follow-up Hdwy	-	-			3.56	-
Pot Cap-1 Maneuver	0	-			285	0
Stage 1	0	-			-	0
Stage 2	0	-			362	0
Platoon blocked, %	-					
Mov Cap-1 Maneuver	-	-			285	-
Mov Cap-2 Maneuver	-	-			285	-
Stage 1	-	-			-	-
Stage 2	-	-			362	-
Approach	EB			SB		
HCM Control Delay, s	0			36.6		
HCM LOS				E		
Minor Lane/Major Mvmt	EBT SBLn1					
Capacity (veh/h)	- 285					
HCM Lane V/C Ratio	- 0.625					
HCM Control Delay (s)	- 36.6					
HCM Lane LOS	- E					
HCM 95th %tile Q(veh)	- 3.9					

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1055	22	0
Future Vol, veh/h	0	0	0	1055	22	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	5	8	4
Mvmt Flow	0	0	0	1111	37	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	- 444
Stage 1	-	- 0
Stage 2	-	- 444
Critical Hdwy	-	- 5.86
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- 6.16
Follow-up Hdwy	-	- 3.88
Pot Cap-1 Maneuver	0	- 567
Stage 1	0	- - 0
Stage 2	0	- 546
Platoon blocked, %		-
Mov Cap-1 Maneuver	-	- 567
Mov Cap-2 Maneuver	-	- 567
Stage 1	-	- -
Stage 2	-	- 546

Approach	WB	NB
HCM Control Delay, s	0	11.8
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	567	-
HCM Lane V/C Ratio	0.065	-
HCM Control Delay (s)	11.8	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.2	-

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Future Vol, veh/h	0	1519	4	0	0	0	0	0	5	39	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	1084905472	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	63	63	63	67	67	67
Heavy Vehicles, %	5	5	5	2	2	2	0	0	0	6	6	6
Mvmt Flow	0	1688	4	0	0	0	0	0	8	58	13	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	844	844	1692	-		
Stage 1	-	-	-	-	-	-	-	0	0	-		
Stage 2	-	-	-	-	-	-	-	844	1692	-		
Critical Hdwy	-	-	-	-	-	-	6.9	7.62	6.62	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.62	5.62	-		
Follow-up Hdwy	-	-	-	-	-	-	3.3	3.56	4.06	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	311	250	88	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	316	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	311	244	88	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	244	88	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	308	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.9	36.8
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	311	-	-	183
HCM Lane V/C Ratio	0.026	-	-	0.391
HCM Control Delay (s)	16.9	-	-	36.8
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	1.7

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	1	61	15	0	54
Future Vol, veh/h	44	1	61	15	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	1	66	16	0	59

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	133	74	0	0	82	0
Stage 1	74	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	861	988	-	-	1515	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	861	988	-	-	1515	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	964	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	863	1515
HCM Lane V/C Ratio	-	-	0.057	-
HCM Control Delay (s)	-	-	9.4	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	56	18	74	97	1
Future Vol, veh/h	2	56	18	74	97	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	61	20	80	105	1

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	226	106	106	0	-
Stage 1	106	-	-	-	-
Stage 2	120	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	762	948	1485	-	-
Stage 1	918	-	-	-	-
Stage 2	905	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	751	948	1485	-	-
Mov Cap-2 Maneuver	751	-	-	-	-
Stage 1	905	-	-	-	-
Stage 2	905	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	940	-	-
HCM Lane V/C Ratio	0.013	-	0.067	-	-
HCM Control Delay (s)	7.5	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	91	2	0	153
Future Vol, veh/h	4	1	91	2	0	153
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	1	99	2	0	166

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	266	100	0	0	101	0
Stage 1	100	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	723	956	-	-	1491	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	723	956	-	-	1491	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1491
HCM Lane V/C Ratio	-	-	0.007	-
HCM Control Delay (s)	-	-	9.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1060	17	0	54
Future Vol, veh/h	0	0	1060	17	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	92	92
Heavy Vehicles, %	2	2	5	5	2	2
Mvmt Flow	0	0	1116	18	0	59

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0
Stage 1	-	-
Stage 2	-	-
Critical Hdwy	-	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	-	-
Pot Cap-1 Maneuver	-	0
Stage 1	-	0
Stage 2	-	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	-
Mov Cap-2 Maneuver	-	-
Stage 1	-	-
Stage 2	-	-

Approach	WB	SB
HCM Control Delay, s	0	13.7
HCM LOS		B

Minor Lane/Major Mvmt	WBT	SBLn1
Capacity (veh/h)	-	473
HCM Lane V/C Ratio	-	0.124
HCM Control Delay (s)	-	13.7
HCM Lane LOS	-	B
HCM 95th %tile Q(veh)	-	0.4

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	WB	WB	NB
Directions Served	T	T	LT
Maximum Queue (ft)	38	50	84
Average Queue (ft)	3	4	41
95th Queue (ft)	21	23	73
Link Distance (ft)	2262	2262	35
Upstream Blk Time (%)			17
Queuing Penalty (veh)			16
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	142
Average Queue (ft)	54
95th Queue (ft)	107
Link Distance (ft)	269
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	122
Average Queue (ft)	44
95th Queue (ft)	90
Link Distance (ft)	924
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	SB
Directions Served	L
Maximum Queue (ft)	104
Average Queue (ft)	54
95th Queue (ft)	94
Link Distance (ft)	34
Upstream Blk Time (%)	36
Queuing Penalty (veh)	49
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	52
Average Queue (ft)	16
95th Queue (ft)	45
Link Distance (ft)	49
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	29	62
Average Queue (ft)	4	32
95th Queue (ft)	19	61
Link Distance (ft)	507	53
Upstream Blk Time (%)		4
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	50
Average Queue (ft)	23
95th Queue (ft)	47
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	50	34
Average Queue (ft)	28	2
95th Queue (ft)	51	15
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	24
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	SB
Directions Served	R
Maximum Queue (ft)	22
Average Queue (ft)	1
95th Queue (ft)	16
Link Distance (ft)	288
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	5
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	66
Average Queue (ft)	7
95th Queue (ft)	38
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	60
Average Queue (ft)	4
95th Queue (ft)	26
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 68

HCM 6th Signalized Intersection Summary
 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑				
Traffic Volume (veh/h)	0	0	0	0	2090	0	109	0	0	0	0	0
Future Volume (veh/h)	0	0	0	0	2090	0	109	0	0	0	0	0
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach				No		No						
Adj Sat Flow, veh/h/ln				0	1969	0	1922	1969	0			
Adj Flow Rate, veh/h				0	2200	0	154	0	0			
Peak Hour Factor				0.95	0.95	0.92	0.71	0.92	0.92			
Percent Heavy Veh, %				0	2	0	5	2	0			
Cap, veh/h				0	3005	0	191	0	0			
Arrive On Green				0.00	0.27	0.00	0.10	0.00	0.00			
Sat Flow, veh/h				0	3938	0	1875	0	0			
Grp Volume(v), veh/h				0	2200	0	154	0	0			
Grp Sat Flow(s),veh/h/ln				0	1870	0	1875	0	0			
Q Serve(g_s), s				0.0	64.4	0.0	9.6	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	64.4	0.0	9.6	0.0	0.0			
Prop In Lane				0.00		0.00	1.00		0.00			
Lane Grp Cap(c), veh/h				0	3005	0	191	0	0			
V/C Ratio(X)				0.00	0.73	0.00	0.81	0.00	0.00			
Avail Cap(c_a), veh/h				0	3005	0	388	0	0			
HCM Platoon Ratio				1.00	0.33	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	0.58	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	32.3	0.0	52.7	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.9	0.0	7.8	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln				0.0	32.1	0.0	5.0	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				0.0	33.3	0.0	60.5	0.0	0.0			
LnGrp LOS				A	C	A	E	A	A			
Approach Vol, veh/h					2200			154				
Approach Delay, s/veh					33.3			60.5				
Approach LOS					C			E				
Timer - Assigned Phs		2		4								
Phs Duration (G+Y+Rc), s		102.6		17.4								
Change Period (Y+Rc), s		* 6.2		* 5.2								
Max Green Setting (Gmax), s		* 84		* 25								
Max Q Clear Time (g_c+I1), s		66.4		11.6								
Green Ext Time (p_c), s		13.7		0.6								
Intersection Summary												
HCM 6th Ctrl Delay				35.1								
HCM 6th LOS				D								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th TWSC
2: Le Grand Court & EB M-59 (Highland Road)

2027 Future Improved

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑				↑
Traffic Vol, veh/h	1648	145	0	0	0	110
Future Vol, veh/h	1648	145	0	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	92	92	74	74
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	1735	153	0	0	0	149

Major/Minor	Major1		Minor1	
Conflicting Flow All	0	0	-	868
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.98
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.34
Pot Cap-1 Maneuver	-	-	0	292
Stage 1	-	-	0	-
Stage 2	-	-	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	292
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	NB
HCM Control Delay, s	0	29.4
HCM LOS		D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	292	-	-
HCM Lane V/C Ratio	0.509	-	-
HCM Control Delay (s)	29.4	-	-
HCM Lane LOS	D	-	-
HCM 95th %tile Q(veh)	2.7	-	-

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	2023	176	0	127
Future Vol, veh/h	0	0	2023	176	0	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	300	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	95	95	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2129	185	0	179

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1065
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- 3.32
Pot Cap-1 Maneuver	-	- 0 219
Stage 1	-	- 0 -
Stage 2	-	- 0 -
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- - 219
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	68.2
HCM LOS		F

Minor Lane/Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	219
HCM Lane V/C Ratio	-	-	0.817
HCM Control Delay (s)	-	-	68.2
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	6.1

HCM 6th TWSC
 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

2027 Future Improved

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↑	
Traffic Vol, veh/h	0	1627	0	0	166	0
Future Vol, veh/h	0	1627	0	0	166	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	95	92	92	81	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1713	0	0	205	0

Major/Minor	Major1		Minor2	
Conflicting Flow All	-	0	857	-
Stage 1	-	-	0	-
Stage 2	-	-	857	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	296	0
Stage 1	0	-	-	0
Stage 2	0	-	376	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	296	-
Mov Cap-2 Maneuver	-	-	296	-
Stage 1	-	-	-	-
Stage 2	-	-	376	-

Approach	EB	SB
HCM Control Delay, s	0	40.6
HCM LOS		E

Minor Lane/Major Mvmt	EBT	SBLn1
Capacity (veh/h)	-	296
HCM Lane V/C Ratio	-	0.692
HCM Control Delay (s)	-	40.6
HCM Lane LOS	-	E
HCM 95th %tile Q(veh)	-	4.8

HCM 6th TWSC
 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

2027 Future Improved

Section 9, Item B.

PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	0	1984	47	0
Future Vol, veh/h	0	0	0	1984	47	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	3	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	95	60	88
Heavy Vehicles, %	2	2	5	2	11	4
Mvmt Flow	0	0	0	2088	78	0

Major/Minor	Major2	Minor1
Conflicting Flow All	-	835
Stage 1	-	0
Stage 2	-	835
Critical Hdwy	-	5.92
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	6.22
Follow-up Hdwy	-	3.91
Pot Cap-1 Maneuver	0	355
Stage 1	0	-
Stage 2	0	331
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	355
Mov Cap-2 Maneuver	-	355
Stage 1	-	-
Stage 2	-	331

Approach	WB	NB
HCM Control Delay, s	0	18
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	355	-
HCM Lane V/C Ratio	0.221	-
HCM Control Delay (s)	18	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.8	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑		↑	
Traffic Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Future Vol, veh/h	0	1612	9	0	0	0	0	0	24	38	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	280	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	10849	17248	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	92	92	92	63	63	60	68	68	68
Heavy Vehicles, %	5	2	2	2	2	2	0	0	0	4	4	4
Mvmt Flow	0	1697	9	0	0	0	0	0	40	56	19	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	849	849	1706	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	849	1706	-
Critical Hdwy	-	-	-	-	-	6.9	7.58	6.58	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.54	4.04	-
Pot Cap-1 Maneuver	0	-	-	0	0	308	251	89	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	318	142	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	308	218	89	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	218	89	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	277	142	-

Approach	EB	NB	SB
HCM Control Delay, s	0	18.4	46.4
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	308	-	-	159
HCM Lane V/C Ratio	0.13	-	-	0.472
HCM Control Delay (s)	18.4	-	-	46.4
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	2.2

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	0	63	52	1	61
Future Vol, veh/h	30	0	63	52	1	61
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	0	68	57	1	66

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	165	97	0	0	125	0
Stage 1	97	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	826	959	-	-	1462	-
Stage 1	927	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	825	959	-	-	1462	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	825	1462
HCM Lane V/C Ratio	-	-	0.04	0.001
HCM Control Delay (s)	-	-	9.5	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	35	60	114	89	2
Future Vol, veh/h	1	35	60	114	89	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	38	65	124	97	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	352	98	99	0	0
Stage 1	98	-	-	-	-
Stage 2	254	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	646	958	1494	-	-
Stage 1	926	-	-	-	-
Stage 2	788	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	616	958	1494	-	-
Mov Cap-2 Maneuver	616	-	-	-	-
Stage 1	882	-	-	-	-
Stage 2	788	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	943	-	-
HCM Lane V/C Ratio	0.044	-	0.041	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	3	0	174	2	0	124
Future Vol, veh/h	3	0	174	2	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	0	189	2	0	135

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	325	190	0	0	191
Stage 1	190	-	-	-	-
Stage 2	135	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	669	852	-	-	1383
Stage 1	842	-	-	-	-
Stage 2	891	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	669	852	-	-	1383
Mov Cap-2 Maneuver	669	-	-	-	-
Stage 1	842	-	-	-	-
Stage 2	891	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	669	1383
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	10.4	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑	↑		↑
Traffic Vol, veh/h	0	0	1970	61	0	36
Future Vol, veh/h	0	0	1970	61	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Stop
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	1	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2141	66	0	39

Major/Minor	Major2	Minor2
Conflicting Flow All	-	0 - 1071
Stage 1	-	- -
Stage 2	-	- -
Critical Hdwy	-	- - 6.94
Critical Hdwy Stg 1	-	- -
Critical Hdwy Stg 2	-	- -
Follow-up Hdwy	-	- - 3.32
Pot Cap-1 Maneuver	-	0 0 217
Stage 1	-	0 0 -
Stage 2	-	0 0 -
Platoon blocked, %	-	
Mov Cap-1 Maneuver	-	- - 217
Mov Cap-2 Maneuver	-	- -
Stage 1	-	- -
Stage 2	-	- -

Approach	WB	SB
HCM Control Delay, s	0	25.2
HCM LOS		D

Minor Lane/Major Mvmt	WBT SBLn1
Capacity (veh/h)	- 217
HCM Lane V/C Ratio	- 0.18
HCM Control Delay (s)	- 25.2
HCM Lane LOS	- D
HCM 95th %tile Q(veh)	- 0.6

Intersection: 1: EB to WB Crossover - East of Hill & WB M-59 (Highland Rd)

Movement	WB	WB	NB
Directions Served	T	T	LT
Maximum Queue (ft)	186	192	101
Average Queue (ft)	61	73	62
95th Queue (ft)	147	167	101
Link Distance (ft)	2252	2252	35
Upstream Blk Time (%)			49
Queuing Penalty (veh)			54
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Le Grand Court & EB M-59 (Highland Road)

Movement	NB
Directions Served	R
Maximum Queue (ft)	170
Average Queue (ft)	49
95th Queue (ft)	119
Link Distance (ft)	269
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: WB M-59 (Highland Rd) & Hill Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	231
Average Queue (ft)	94
95th Queue (ft)	203
Link Distance (ft)	933
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: EB M-59 (Highland Road) & WB to EB Crossover West of Hill Rd

Movement	EB	SB
Directions Served	T	L
Maximum Queue (ft)	10	102
Average Queue (ft)	0	68
95th Queue (ft)	7	101
Link Distance (ft)	133	34
Upstream Blk Time (%)		58
Queuing Penalty (veh)		98
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: EB to WB Crossover WEst of Hill & WB M-59 (Highland Rd)

Movement	NB
Directions Served	L
Maximum Queue (ft)	69
Average Queue (ft)	37
95th Queue (ft)	67
Link Distance (ft)	49
Upstream Blk Time (%)	14
Queuing Penalty (veh)	8
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Haven Rd & EB M-59 (Highland Road)

Movement	NB	SB
Directions Served	R	LT
Maximum Queue (ft)	35	56
Average Queue (ft)	12	28
95th Queue (ft)	32	57
Link Distance (ft)	507	51
Upstream Blk Time (%)		3
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Hill Rd & Driveway 1

Movement	WB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	22
95th Queue (ft)	46
Link Distance (ft)	575
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Hill Rd & Driveway 2

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	58	40
Average Queue (ft)	24	6
95th Queue (ft)	52	28
Link Distance (ft)	330	422
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Hill Rd & Driveway 3

Movement	WB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	2
95th Queue (ft)	13
Link Distance (ft)	280
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: WB M-59 (Highland Rd) & Driveway 4

Movement	SB
Directions Served	R
Maximum Queue (ft)	20
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	288
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: EB M-59 (Highland Road) & EB to WB Crossover - East of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	90
Average Queue (ft)	15
95th Queue (ft)	62
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: WB to EB Crossover West of Hill Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	122
Average Queue (ft)	23
95th Queue (ft)	90
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: EB M-59 (Highland Road) & EB to WB Crossover WEst of Hill

Movement	EB
Directions Served	L
Maximum Queue (ft)	63
Average Queue (ft)	7
95th Queue (ft)	34
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 600: Haven Rd & WB M-59 (Highland Rd)

Movement	WB
Directions Served	L
Maximum Queue (ft)	35
Average Queue (ft)	2
95th Queue (ft)	14
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 162

Appendix 8

Signal Warrants

Summary of Warrants

Spot Number:	0		
Major Street:	WB M-59	Minor Street:	X-over east of Hill Road
Intersection:	WB M-59 at X-over east of Hill Road		
City/Twp:	White Lake Twp		
Date Performed:	5/25/2022	Performed By:	Fishbeck
Date Volumes Collected:	9/30/2021		

Warrant	Condition	Is Warrant Met
Data Validation Error		NO
WARRANT 1: Eight-Hour Vehicular Volume		YES
	Condition A	NO
	Condition B	YES
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	NO
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold) HAWK	NO
	(Threshold) RRFB	NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

Issue to Be Addressed by Signalization:

0

TRAFFIC SIGNAL WARRANT ANALYSIS DATA ENTRY
ONLY ENTER DATA IN YELLOW CELLS

Spot Number:

MAJOR STREET: at MINOR STREET:

Intersection of: at over east of Hill Rd

Analysis Date: 5/25/2022 by Feedback

DIRECTION: E-W N-S

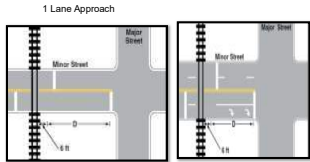
Data Collection Date: 9/30/2021

City/Twp: White Lake Twp

Is the intersection within an isolated community? Yes or No	NO
DO NOT ENTER ANY VALUE IN THIS BOX	
Discount for Right Turn Volume (or Lefts at Crossovers)?	NO
Percent Reduction in NB Right Turn Volumes	
Percent Reduction in SB Right Turn Volumes	
Percent Reduction in EB Right Turn Volumes	
Percent Reduction in WB Right Turn Volumes	
Have Other Remedial Measures Been Tried (Warrant 1 A&B)?	NO
Have Other Remedial Measures Been Tried (Warrant 7)?	NO
Are there 5 or more Crashes Susceptible to Correction by Signalization in a 12 Month Period?	
Review Peak Hour Warrant?	YES
Peak Hour Stop Delay (Vehicle Hours)	0.1
Number of Intersection Approaches	2
Peak Hour	17:00 - 18:00
Has a Study been Conducted that Demonstrates a Need for Signalization Based on a Lack of Signal Coordination (Warrant 6)?	NO
Has a Study been Conducted that Demonstrates a Need for Signalization Based on a the Need to Encourage Concentration and Organization of Traffic Flow (Warrant 8)?	NO

Pedestrian Warrant Information	
Distance to nearest Signal or Stop Sign on Major Road (ft)	
Is the 15th Percentile Speed of Pedestrians Less than 3.5ft/sec?	
DO NOT ENTER ANY VALUE IN THIS BOX	
Number of Gaps for School Crossings	
Duration of Gap Study (minutes)	
Width of Street (feet)	
Number of School Children per Group	
Number of School Children	
Crosswalk Length	
Is Pedestrian Sight Distance Sufficient?	

Grade Crossing Information	
Clear Storage Distance (Enter Greater than 140 if no Railroad Present)	
Number of Approach Lanes Crossing Tracks	
Peak Hour for Train Crossings (If not known, use Peak Vehicle Hour)	
Trains Crossings per Day? (Use 3-5 if Unknown)	
Percentage of High Occupancy Buses (Use 0% if Unknown)?	
Percentage of Tractor Trailers? (Use 7.6% to 12.5% if Unknown)	



Issue to Be Addressed by Signalization:

	X-over east of Hill Road				WB M-59			
	NORTHBOUND		SOUTHBOUND		EASTBOUND		WESTBOUND	
Number of lanes	1		0		0		2	
SPEED LIMIT OR 85th Percentile MPH	25						55	
	Direction # NB		Direction # SB		Direction # EB		Direction # WB	
	Machine #1	Manual Counts	Machine #1	Manual Counts	Machine #1	Manual Counts	Machine #1	Manual Counts
Traffic Counts	Machine Major Vol #1	PED COUNT S/L/EG	Machine Minor Vol #2	PED COUNT N/L/EG	Machine Major Vol #3	PED COUNT W/L/EG	Machine Major Vol #4	PED COUNT E/L/EG
00:01 - 01:00								
01:00 - 02:00								
02:00 - 03:00								
03:00 - 04:00								
04:00 - 05:00								
05:00 - 06:00								
06:00 - 07:00	54						518	
07:00 - 08:00	104						883	
08:00 - 09:00	51						989	
09:00 - 10:00	75						886	
10:00 - 11:00	58						958	
11:00 - 12:00	79						1071	
12:00 - 13:00	67						1302	
13:00 - 14:00	73						1303	
14:00 - 15:00	96						1495	
15:00 - 16:00	94						1803	
16:00 - 17:00	119						2035	
17:00 - 18:00	150						2566	
18:00 - 19:00	116						1695	
19:00 - 20:00								
20:00 - 21:00								
21:00 - 22:00								
22:00 - 23:00								
23:00 - 00:00								

Were the machine and manual counts taken on the same day?

Ratio: MANUAL/ Machine NB: 1.00, MANUAL/ Machine SB: 1.00, MANUAL/ Machine EB: 1.00, MANUAL/ Machine WB: 1.00

Input Check: Manual Counts, Machine Counts, Manual Counts, Machine Counts

Is data correct? YES

HELP

If a count has been input during at least one of the hours, if columns are correct, ignore this error. Help may need to be used to calculate.

Check Machine Counts - A 2.00 ratio has been entered for at least one hour. Columns are correct, ignore this error. Help may need to be used to calculate.

Check Manual Counts - The ratio between the manual counts and machine counts is not of normal range. Please check columns. If columns are correct, ignore this error.

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 1: Eight-Hour Vehicular Volume**

Intersection:	WB M-59 @ X-over east of Hill Road		
Date	5/25/2022	by	Fishbeck

2	: No. of Lanes on Major St?
1	: No. of Lanes on Minor St?
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: if answer 4 is Yes, then what is the of the population isolated community?
NO	: Have other remedial measures been tried?

USE 70% WARRANTS 1A AND 1B. DO NOT USE COMBINATION OF A & B

Time	Major Volume (Both Apr.)	Minor Volume (One Apr.)	Condition A Major Volume	Condition A Minor Volume	Warrant Condition A Met?	Condition B Major Volume	Condition B Minor Volume	Warrant Condition B Met?	Combination Major A	Combination Minor A	Combination Major B	Combination Minor B	Warrant Condition A&B met?
00:01 - 01:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
01:00 - 02:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
02:00 - 03:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
03:00 - 04:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
04:00 - 05:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
05:00 - 06:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
06:00 - 07:00	516	64	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
07:00 - 08:00	893	104	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
08:00 - 09:00	989	63	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
09:00 - 10:00	986	75	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
10:00 - 11:00	928	66	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
11:00 - 12:00	1071	79	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
12:00 - 13:00	1302	67	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
13:00 - 14:00	1303	77	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
14:00 - 15:00	1495	96	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
15:00 - 16:00	1803	94	420	105	NO	630	53	YES	N/A	N/A	N/A	N/A	N/A
16:00 - 17:00	2005	119	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
17:00 - 18:00	2066	150	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
18:00 - 19:00	1595	116	420	105	YES	630	53	YES	N/A	N/A	N/A	N/A	N/A
19:00 - 20:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
20:00 - 21:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
21:00 - 22:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
22:00 - 23:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A
23:00 - 00:00	0	0	420	105	NO	630	53	NO	N/A	N/A	N/A	N/A	N/A

Number of Hours that met the warrant 1A =	3
Number of Hours that met the warrant 1B =	12
Number of Hours that met the warrant 1 A & B =	0

A. Is the Minimum Vehicular Volume Warrant Met? (Condition A)	NO
B. Is the Interruption of Continuous Traffic Met? (Condition B)	YES
C. Combination of Warrants A and B Criteria Met?	N/A

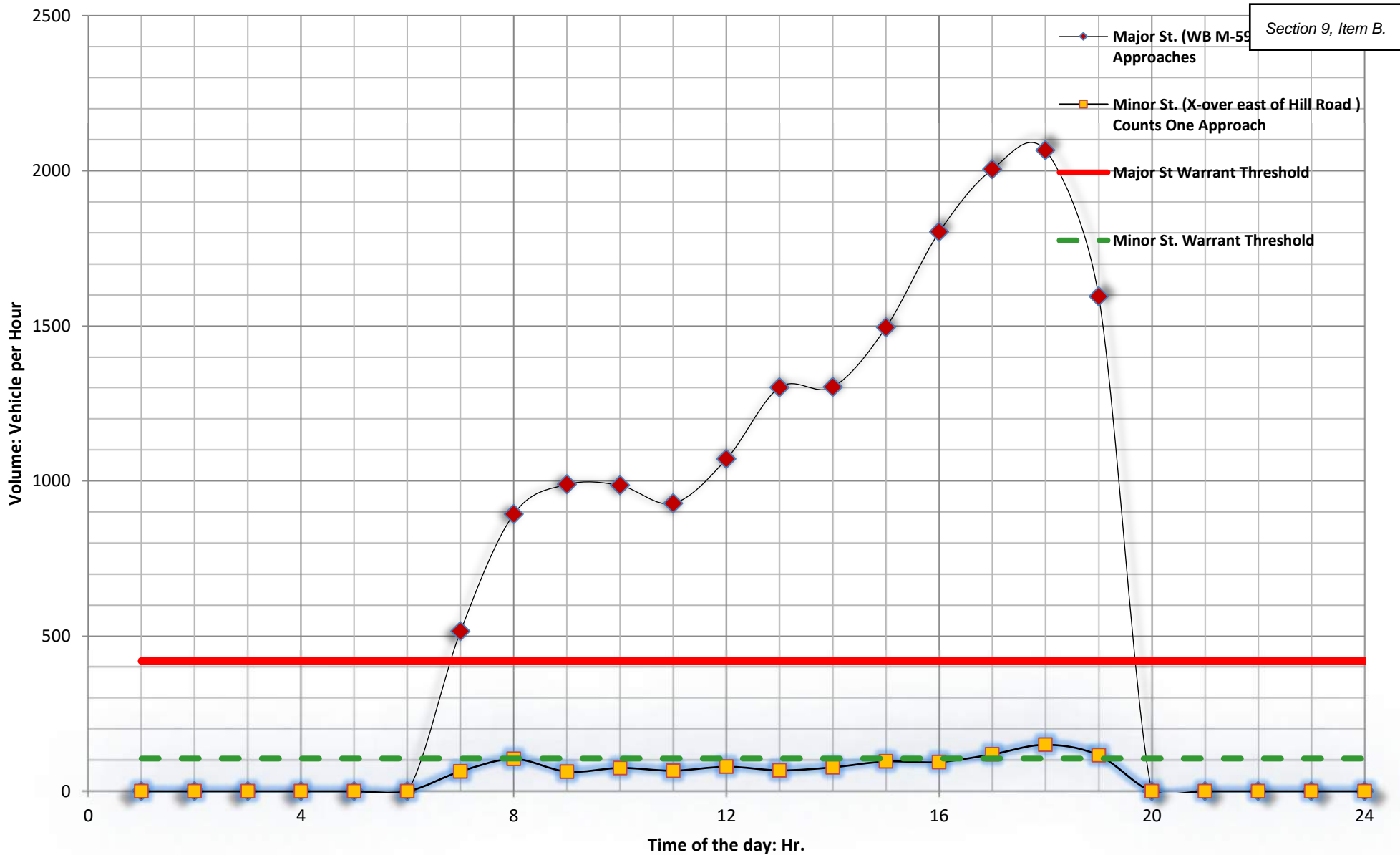


FIGURE 1: WARRANT 1A

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

WB M-59 @ X-over east of Hill Road

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 3

Does this intersection meet Warrant 1A for signal installation? NO

Data Collection Date: 9/30/21

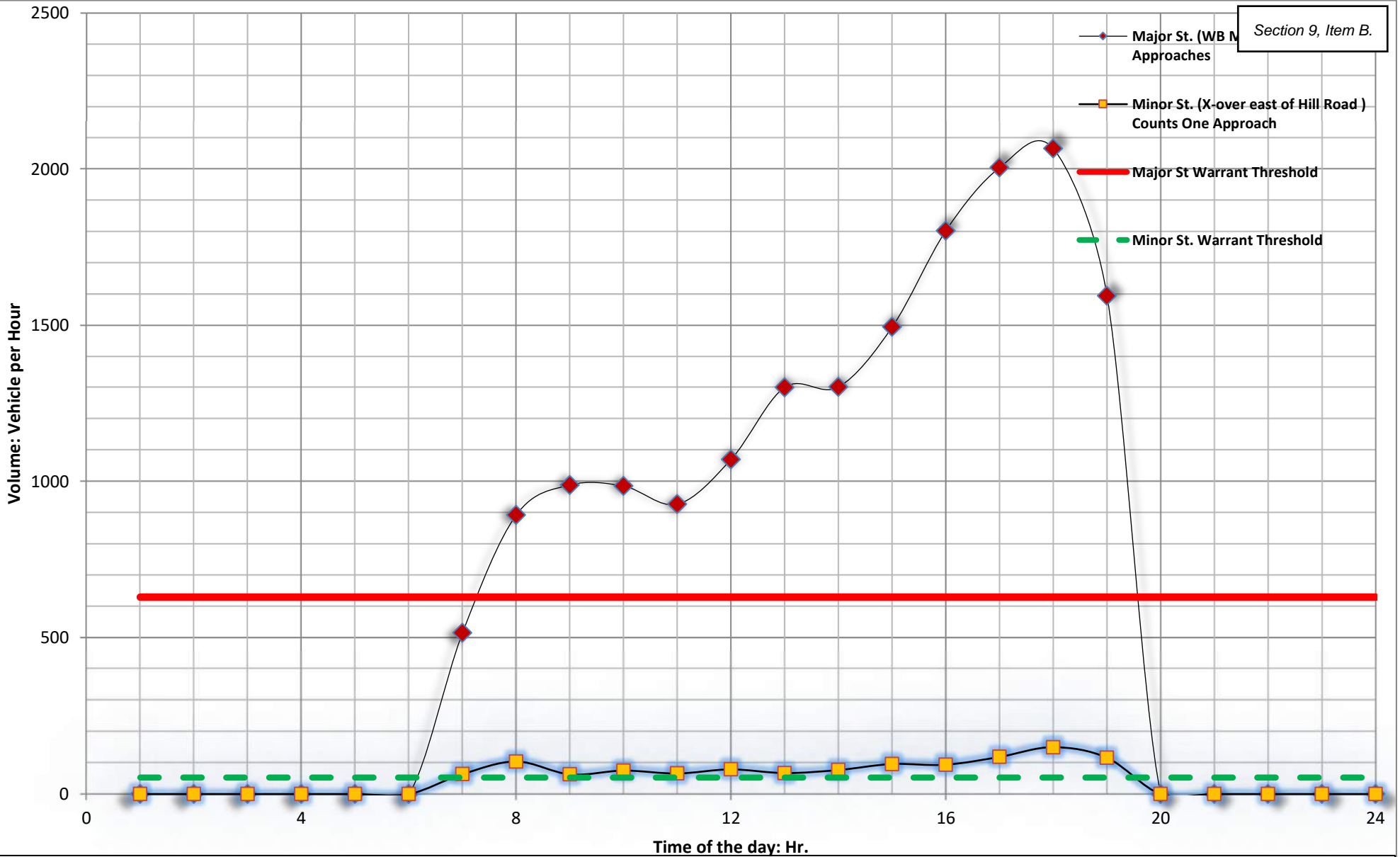


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number:

WB M-59 @ X-over east of Hill Road

NO. OF LANES ON MAJOR ST.? 2

NO. OF LANES ON MINOR ST.? 1

Number of Hours that met the Warrant: 12

Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 9/30/21

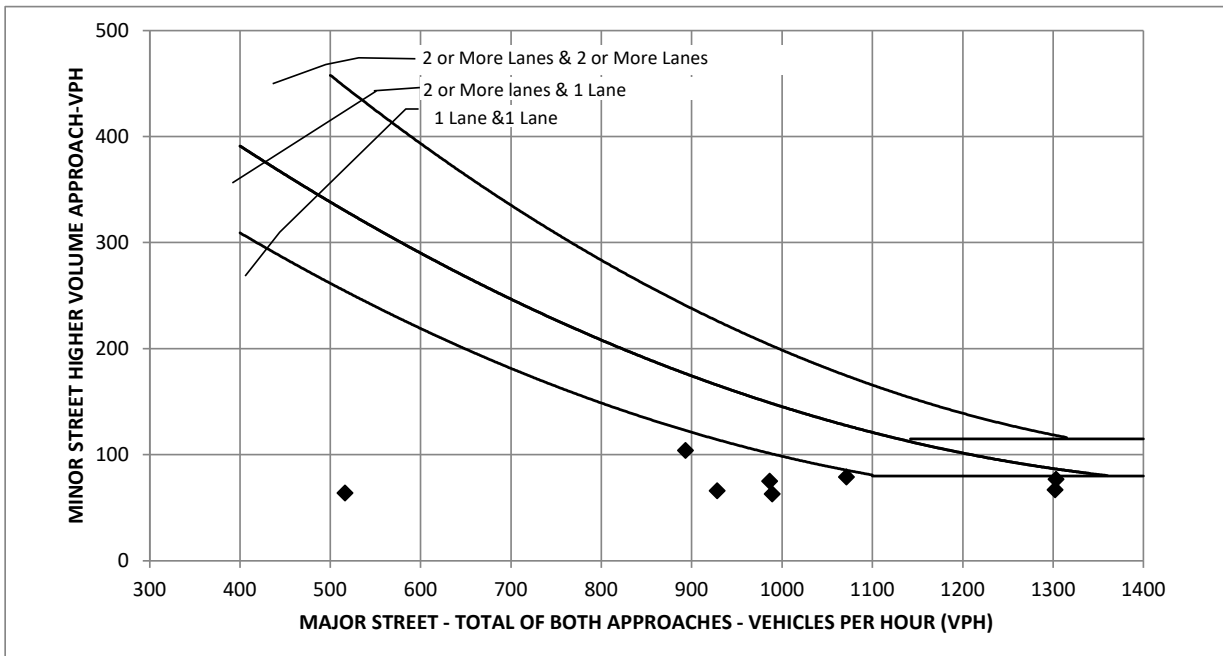
717

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	0
Intersection:	WB M-59 @ X-over east of Hill Road
Date	5/25/2022 by Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

DO NOT USE THIS GRAPH - USE 70% GRAPH

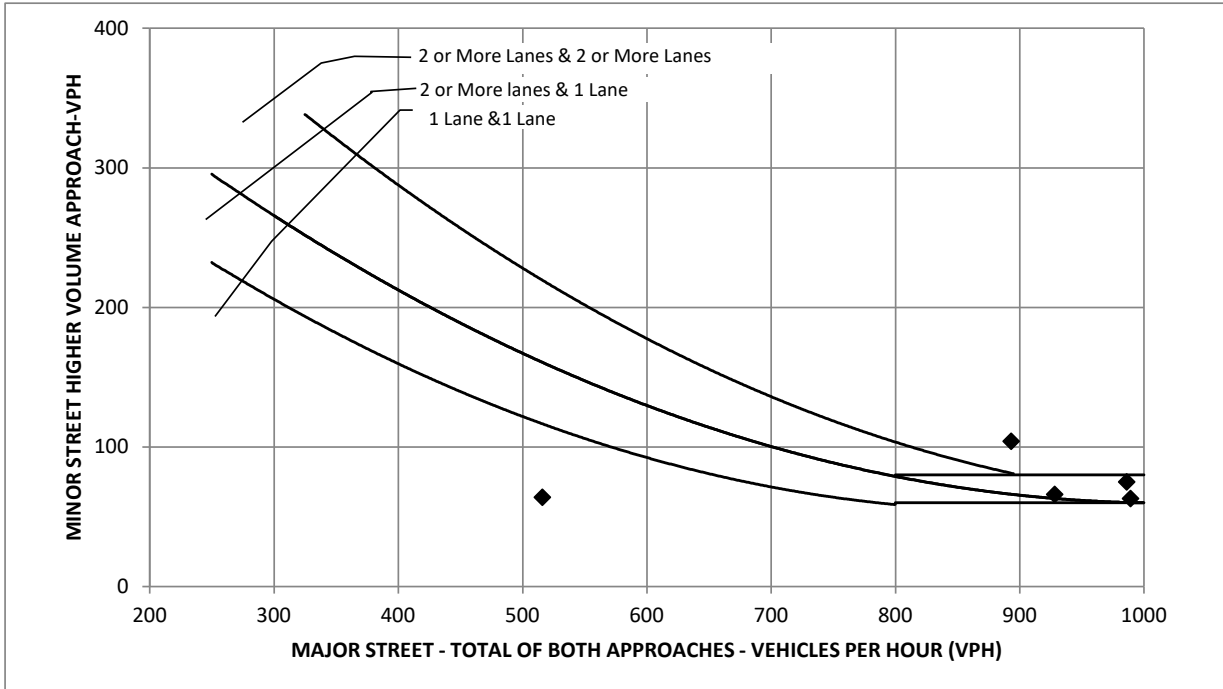


How Many Hours Are Met	5
Is Warrant 2 (100%) Met?	N/A

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	0
Intersection:	WB M-59 @ X-over east of Hill Road
Date	5/25/20222 by Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	12
Is Warrant (70%) Met?	YES

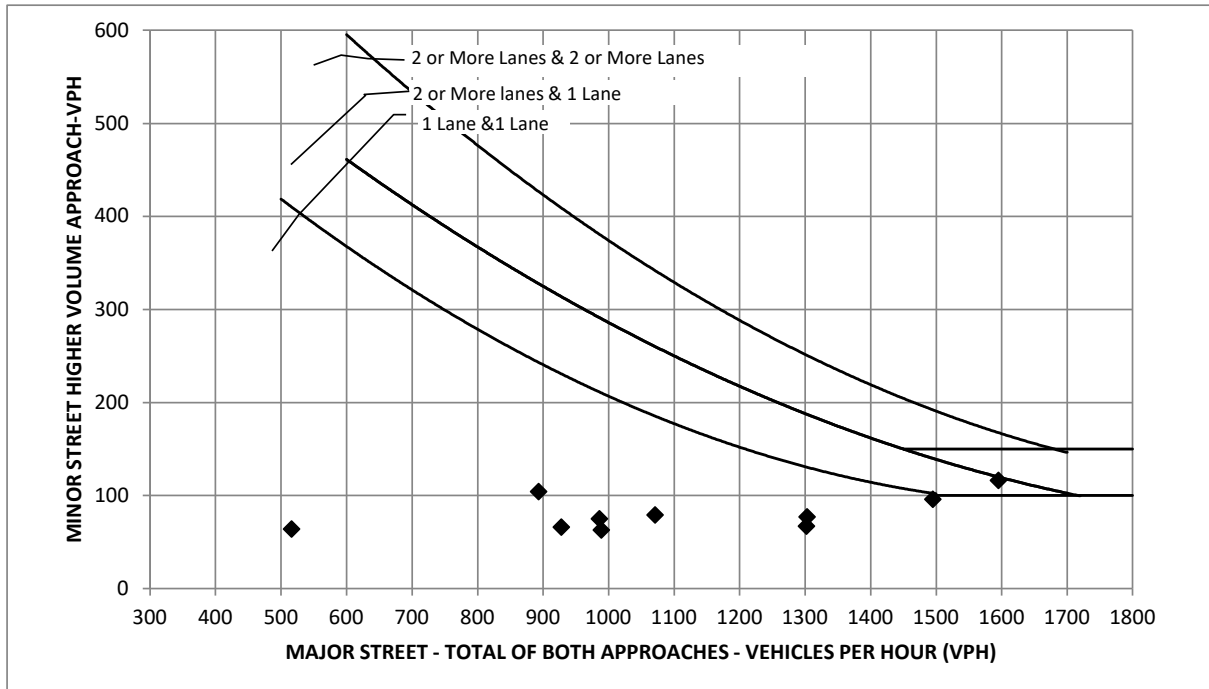
Michigan Manual of Uniform Traffic Control Devices Worksheet for Signal Warrants (Section 4C) WARRANT 3 A: Peak-Hour Vehicular Volume														
Spot Number:	0													
Intersection:	WB M-59 @ X-over east of Hill Road													
Date	5/25/2022	by Fishbeck												
NOT MET	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">0.13</td> <td>: Total Stop Time Delay (hrs)</td> </tr> <tr> <td style="text-align: center;">1</td> <td>: Minor Street Approach Lanes</td> </tr> <tr> <td style="text-align: center;">2</td> <td>: Total Approaches</td> </tr> <tr> <td style="text-align: center;">150</td> <td>: Minor Approach Volume</td> </tr> <tr> <td style="text-align: center;">2216</td> <td>: Total Entering Volume</td> </tr> <tr> <td style="text-align: center;">17:00 - 18:00</td> <td>: Peak Hour</td> </tr> </table>		0.13	: Total Stop Time Delay (hrs)	1	: Minor Street Approach Lanes	2	: Total Approaches	150	: Minor Approach Volume	2216	: Total Entering Volume	17:00 - 18:00	: Peak Hour
0.13	: Total Stop Time Delay (hrs)													
1	: Minor Street Approach Lanes													
2	: Total Approaches													
150	: Minor Approach Volume													
2216	: Total Entering Volume													
17:00 - 18:00	: Peak Hour													
Is Warrant 3 A Met?		NO												

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(100%): Peak-Hour Vehicular Volume**

Spot Number:	0
Intersection:	WB M-59 @ X-over east of Hill Road
Date	5/25/2022 by Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

DO NOT USE THIS GRAPH - USE 70% GRAPH

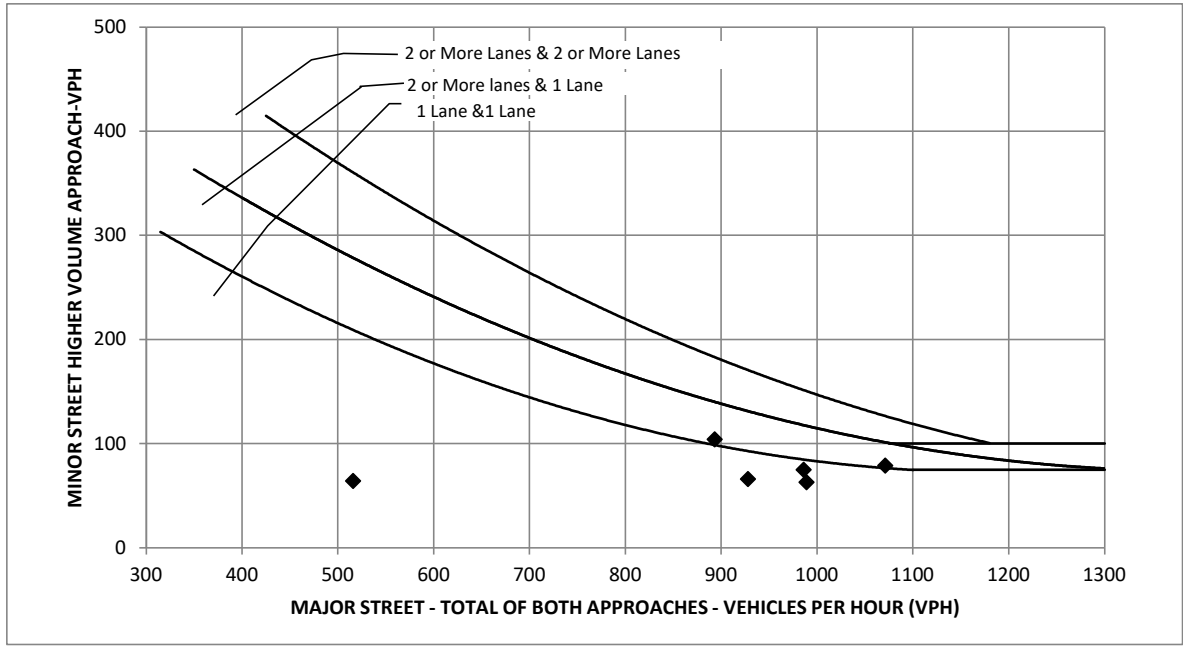


How Many Hours Are Met	3
Is Warrant 3 B (100%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	0		
Intersection:	WB M-59 @ X-over east of Hill Road		
Date	5/25/20222	by	Fishbeck

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
55	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	8
Is Warrant (70%) Met?	YES

WB M-59 Merged - TMC

Thu Sep 30, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
2021-09-30 6:00AM	159	4	163	71	0	71	234
6:15AM	223	5	228	120	0	120	348
6:30AM	282	4	286	119	0	119	405
6:45AM	338	8	346	163	0	163	509
Hourly Total	1002	21	1023	473	0	473	1496
7:00AM	357	12	369	164	0	164	533
7:15AM	354	8	362	188	0	188	550
7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
Hourly Total	1440	69	1509	844	0	844	2353
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
8:30AM	306	4	310	225	0	225	535
8:45AM	362	8	370	229	0	229	599
Hourly Total	1356	32	1388	940	0	940	2328
9:00AM	320	10	330	240	0	240	570
9:15AM	299	5	304	232	0	232	536
9:30AM	299	6	305	232	0	232	537
9:45AM	284	11	295	225	0	225	520
Hourly Total	1202	32	1234	929	0	929	2163
10:00AM	236	5	241	182	0	182	423
10:15AM	249	7	256	212	0	212	468
10:30AM	253	2	255	253	0	253	508
10:45AM	251	10	261	226	0	226	487
Hourly Total	989	24	1013	873	0	873	1886
11:00AM	263	4	267	223	0	223	490
11:15AM	254	10	264	236	0	236	500
11:30AM	293	8	301	251	0	251	552
11:45AM	251	8	259	297	0	297	556
Hourly Total	1061	30	1091	1007	0	1007	2098
12:00PM	262	4	266	322	0	322	588
12:15PM	295	11	306	289	0	289	595
12:30PM	334	6	340	313	0	313	653
12:45PM	219	9	228	295	0	295	523
Hourly Total	1110	30	1140	1219	0	1219	2359
1:00PM	257	12	269	299	0	299	568
1:15PM	277	11	288	302	0	302	590
1:30PM	248	6	254	299	0	299	553
1:45PM	275	11	286	320	0	320	606
Hourly Total	1057	40	1097	1220	0	1220	2317
2:00PM	289	8	297	297	0	297	594
2:15PM	272	15	287	372	0	372	659
2:30PM	322	12	334	363	0	363	697
2:45PM	334	16	350	365	0	365	715
Hourly Total	1217	51	1268	1397	0	1397	2665
3:00PM	315	13	328	403	0	403	731
3:15PM	325	17	342	399	0	399	741
3:30PM	337	5	342	458	0	458	800
3:45PM	313	8	321	428	0	428	749
Hourly Total	1290	43	1333	1688	0	1688	3021
4:00PM	297	9	306	423	0	423	729
4:15PM	372	8	380	463	0	463	843
4:30PM	345	9	354	497	0	497	843
4:45PM	348	14	362	466	0	466	843

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Section 9, Item B.	
	T	U	App	T	U	App	Int	
Time								
Hourly Total	1362	40	1402	1849	0	1849	3251	
5:00PM	416	9	425	478	0	478	903	
5:15PM	396	20	416	490	0	490	906	
5:30PM	377	14	391	499	0	499	890	
5:45PM	364	15	379	426	0	426	805	
Hourly Total	1553	58	1611	1893	0	1893	3504	
6:00PM	301	14	315	438	0	438	753	
6:15PM	319	12	331	360	0	360	691	
6:30PM	281	13	294	368	0	368	662	
6:45PM	258	14	272	306	0	306	578	
Hourly Total	1159	53	1212	1472	0	1472	2684	
Total	15798	523	16321	15804	0	15804	32125	
% Approach	96.8%	3.2%	-	100%	0%	-	-	
% Total	49.2%	1.6%	50.8%	49.2%	0%	49.2%	-	
Lights	15281	499	15780	15227	0	15227	31007	
% Lights	96.7%	95.4%	96.7%	96.3%	0%	96.3%	96.5%	
Articulated Trucks	161	3	164	186	0	186	350	
% Articulated Trucks	1.0%	0.6%	1.0%	1.2%	0%	1.2%	1.1%	
Buses and Single-Unit Trucks	356	21	377	391	0	391	768	
% Buses and Single-Unit Trucks	2.3%	4.0%	2.3%	2.5%	0%	2.5%	2.4%	

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

Full Length ()

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 Merged - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int
	T	U	App	T	U	App	
Time							
2021-09-30 7:30AM	354	19	373	236	0	236	609
7:45AM	375	30	405	256	0	256	661
8:00AM	365	10	375	238	0	238	613
8:15AM	323	10	333	248	0	248	581
Total	1417	69	1486	978	0	978	2464
% Approach	95.4%	4.6%	-	100%	0%	-	-
% Total	57.5%	2.8%	60.3%	39.7%	0%	39.7%	-
PHF	0.945	0.575	0.917	0.955	-	0.955	0.932
Lights	1354	65	1419	923	0	923	2342
% Lights	95.6%	94.2%	95.5%	94.4%	0%	94.4%	95.0%
Articulated Trucks	27	0	27	20	0	20	47
% Articulated Trucks	1.9%	0%	1.8%	2.0%	0%	2.0%	1.9%
Buses and Single-Unit Trucks	36	4	40	35	0	35	75
% Buses and Single-Unit Trucks	2.5%	5.8%	2.7%	3.6%	0%	3.6%	3.0%

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 Merged - TMC

Thu Sep 30, 2021

Midday Peak (11:45 AM - 12:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int	
	T	U	App	T	U	App		
Time								
	2021-09-30 11:45AM	251	8	259	297	0	297	556
	12:00PM	262	4	266	322	0	322	588
	12:15PM	295	11	306	289	0	289	595
	12:30PM	334	6	340	313	0	313	653
Total		1142	29	1171	1221	0	1221	2392
% Approach		97.5%	2.5%	-	100%	0%	-	-
% Total		47.7%	1.2%	49.0%	51.0%	0%	51.0%	-
PHF		0.855	0.659	0.861	0.948	-	0.948	0.916
Lights		1098	27	1125	1171	0	1171	2296
% Lights		96.1%	93.1%	96.1%	95.9%	0%	95.9%	96.0%
Articulated Trucks		16	0	16	21	0	21	37
% Articulated Trucks		1.4%	0%	1.4%	1.7%	0%	1.7%	1.5%
Buses and Single-Unit Trucks		28	2	30	29	0	29	59
% Buses and Single-Unit Trucks		2.5%	6.9%	2.6%	2.4%	0%	2.4%	2.5%

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

Midday Peak (11:45 AM - 12:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 Merged - TMC

Thu Sep 30, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	MI 59 Eastbound			MI 59 Westbound			Int	
	T	U	App	T	U	App		
Time								
	2021-09-30 4:45PM	348	14	362	466	0	466	828
	5:00PM	416	9	425	478	0	478	903
	5:15PM	396	20	416	490	0	490	906
	5:30PM	377	14	391	499	0	499	890
Total		1537	57	1594	1933	0	1933	3527
% Approach		96.4%	3.6%	-	100%	0%	-	-
% Total		43.6%	1.6%	45.2%	54.8%	0%	54.8%	-
PHF		0.924	0.713	0.938	0.968	-	0.968	0.973
Lights		1506	54	1560	1897	0	1897	3457
% Lights		98.0%	94.7%	97.9%	98.1%	0%	98.1%	98.0%
Articulated Trucks		11	1	12	16	0	16	28
% Articulated Trucks		0.7%	1.8%	0.8%	0.8%	0%	0.8%	0.8%
Buses and Single-Unit Trucks		20	2	22	20	0	20	42
% Buses and Single-Unit Trucks		1.3%	3.5%	1.4%	1.0%	0%	1.0%	1.2%

*T: Thru, U: U-Turn

WB M-59 Merged - TMC

Thu Sep 30, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 917131, Location: 42.648859, -83.535424



Section 9, Item B.

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



WB M-59 at EB to WB X-over, east of Hill Road

Leg	MI 59			MI 59			Growth to 2027		Growth Rate
	Eastbound		Westbound	X-over east of Hill Road		M-59			
Direction	Thru	U-Turn	App Total	Thru	U-Turn	App Total	Int	Total	
Start Time	Thru	U-Turn	App Total	Thru	U-Turn	App Total	Int	Total	
2021-09-30 06:00:00	1002	21	1023	473	0	473	1496		0.005
2021-09-30 07:00:00	1440	69	1509	844	0	844	2353		1.0304
2021-09-30 08:00:00	1356	32	1388	940	0	940	2328		
2021-09-30 09:00:00	1202	32	1234	929	0	929	2163		
2021-09-30 10:00:00	989	24	1013	873	0	873	1886		
2021-09-30 11:00:00	1061	30	1091	1007	0	1007	2098		
2021-09-30 12:00:00	1110	30	1140	1219	0	1219	2359		
2021-09-30 13:00:00	1057	40	1097	1220	0	1220	2317		
2021-09-30 14:00:00	1217	51	1268	1397	0	1397	2665		
2021-09-30 15:00:00	1290	43	1333	1688	0	1688	3021		
2021-09-30 16:00:00	1362	40	1402	1849	0	1849	3251		
2021-09-30 17:00:00	1553	58	1611	1893	0	1893	3504		
2021-09-30 18:00:00	1159	53	1212	1472	0	1472	2684		
Grand Total	15798	523	16321	15804	0	15804	32125		
% Approach	96.8%	3.2%		100.0%	0.0%				
% Total	49.2%	1.6%	50.8%	49.2%	0.0%	49.2%			
Lights	15281	499	15780	15227	0	15227	31007		
% Lights	96.7%	95.4%	96.7%	96.3%	0.0%	96.3%	96.5%		
Articulated Trucks	161	3	164	186	0	186	350		
% Articulated Trucks	1.0%	0.6%	1.0%	1.2%	0.0%	1.2%	1.1%		
Buses and Single-Unit Trucks	356	21	377	391	0	391	768		
% Buses and Single-Unit Trucks	2.3%	4.0%	2.3%	2.5%	0.0%	2.5%	2.4%		

Daily Trip Generation for Mixed Use Development

Land Use Code	210			220			210			220		
	Single-Family Detached Housing			Multifamily Housing (Low-Rise)			Single-Family Detached Housing			Multifamily Housing (Low-Rise)		
Subcategory				Not Close to Rail Transit								
Setting	General Urban/Suburban			General Urban/Suburban								
Time Period	Weekday			Weekday								
# Data Sites	7			6								
	% of 24-Hour Vehicle Trips			% of 24-Hour Vehicle Trips								
Time	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
12:00 - 1:00 AM	0.3%	0.5%	0.2%	0.7%	0.9%	0.4%						
1:00 - 2:00 AM	0.2%	0.2%	0.1%	0.4%	0.5%	0.3%						
2:00 - 3:00 AM	0.2%	0.3%	0.1%	0.4%	0.4%	0.4%						
3:00 - 4:00 AM	0.2%	0.2%	0.2%	0.4%	0.4%	0.3%						
4:00 - 5:00 AM	0.6%	0.3%	0.8%	0.9%	0.3%	1.4%						
5:00 - 6:00 AM	1.2%	0.5%	2.0%	1.6%	0.5%	2.6%						
6:00 - 7:00 AM	3.7%	1.6%	5.8%	4.2%	1.4%	6.9%	33	17	16	111	56	55
7:00 - 8:00 AM	6.5%	3.1%	10.0%	6.5%	2.0%	10.8%	59	15	44	173	42	131
8:00 - 9:00 AM	6.2%	3.8%	8.5%	5.8%	3.1%	8.5%	55	14	41	156	37	119
9:00 - 10:00 AM	4.6%	3.3%	5.8%	3.9%	2.9%	4.9%	41	21	20	104	52	52
10:00 - 11:00 AM	4.9%	4.2%	5.6%	3.6%	2.4%	4.8%	44	22	22	96	48	48
11:00 - 12:00 PM	5.3%	5.4%	5.1%	4.3%	3.8%	4.7%	47	24	23	115	58	57
12:00 - 1:00 PM	5.7%	5.7%	5.7%	4.3%	4.5%	4.1%	51	26	25	116	58	58
1:00 - 2:00 PM	6.1%	6.1%	6.0%	4.2%	4.0%	4.4%	54	27	27	112	56	56
2:00 - 3:00 PM	6.6%	7.1%	6.1%	5.2%	5.6%	4.9%	59	30	29	141	71	70
3:00 - 4:00 PM	7.5%	8.7%	6.2%	6.1%	6.9%	5.3%	67	34	33	164	82	82
4:00 - 5:00 PM	8.9%	10.5%	7.4%	7.9%	10.1%	5.6%	80	50	30	210	132	78
5:00 - 6:00 PM	8.7%	10.0%	7.3%	9.5%	11.4%	7.6%	78	49	29	254	160	94
6:00 - 7:00 PM	7.2%	8.5%	5.9%	8.2%	9.7%	6.7%	64	32	32	220	110	110
7:00 - 8:00 PM	5.1%	6.1%	4.2%	6.4%	8.1%	4.7%						
8:00 - 9:00 PM	4.6%	6.1%	3.1%	5.9%	7.7%	4.2%						
9:00 - 10:00 PM	3.3%	4.4%	2.3%	4.4%	6.0%	2.7%						
10:00 - 11:00 PM	1.6%	2.1%	1.0%	3.5%	4.7%	2.4%						
11:00 - 12:00 AM	1.0%	1.3%	0.6%	1.9%	2.5%	1.4%						

LUC	Number of Units	Weekday, number of trips	Peak hour	Distribution (Entering/Exiting)
210	88	897	AM	26/74
			PM	63/37
220	406	2678	AM	24/76
			PM	63/37

		AM		PM	
		Entering	Exiting	Entering	Exiting
East	M-59	0.4	0.6	0.55	0.45
West	M-59	0.58	0.38	0.43	0.54

Using crossover

WB entering

EB Entering

Total			EB	WB
Total	Entering	Exiting	Entering	Entering
144	73	71	42	29
232	57	175	33	23
211	51	160	30	20
145	73	72	42	29
140	70	70	41	28
162	82	80	48	33
167	84	83	36	46
166	83	83	36	46
200	101	99	43	56
231	116	115	50	64
290	182	108	78	100
332	209	123	90	115
284	142	142	61	78

Summary of Traffic Counts for Traffic Signal Warrant for WB M-59 and Crossover east of Hill Road

	2027		Trip Generation		Total	
	WB	NB	WB	NB	WB	NB
6:00:00	487	22	29	42	516	64
7:00:00	870	71	23	33	893	104
8:00:00	969	33	20	30	989	63
9:00:00	957	33	29	42	986	75
10:00:00	900	25	28	41	928	66
11:00:00	1038	31	33	48	1071	79
12:00:00	1256	31	46	36	1302	67
13:00:00	1257	41	46	36	1303	77
14:00:00	1439	53	56	43	1495	96
15:00:00	1739	44	64	50	1803	94
16:00:00	1905	41	100	78	2005	119
17:00:00	1951	60	115	90	2066	150
18:00:00	1517	55	78	61	1595	116

WHITE LAKE TOWNSHIP TOWNSHIP BOARD

REPORT OF THE COMMUNITY DEVELOPMENT DEPARTMENT

TO: Township Board

FROM: Justin Quagliata, Staff Planner

DATE: July 15, 2022

RE: Performance Guarantee Agreement – Carter’s Plumbing

CAMQ Properties LLC (CAMQ) owns the property addressed as 10431 Highland Road, and the building and site are proposed to be occupied by Carter’s Plumbing. In April 2022 the Township was made aware of unpermitted construction activity within the building. The Building Official, after a site visit, required Carter’s Plumbing to apply for the necessary permits for such work. On June 9, 2022 the Director of Public Services witnessed excavation of the ground and the installation of a stormwater system. Such improvements were being made without site plan review and approval by the Township, and without the proper agency permits. Piping, structures, and other elements of the drain system were ordered removed. The site is a registered contaminated facility and a Declaration of Restrictive Covenant (DRC) for a Restricted Non-Residential Corrective Action relating to the property is in effect. Enforcement of the DRC is completed by the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

Any change of use/new occupancy must be reviewed and approved by the Township. Completion of required site improvements – including, but not limited to, parking lot paving, utilities, exterior lighting, landscaping, sidewalks, and fencing – is a requirement for a Certificate of Occupancy. Carter’s Plumbing is requesting Township Board approval to occupy the building and site prior to the completion of the following:

- Submission of an engineered site plan for the parking lot which includes the layout, design and construction including paving, stormwater drainage, wetlands protection, landscaping and screening and fencing (subject to approval by the Township and concurrence by the Michigan Department of Environment, Great Lakes, and Energy per applicable law).
- Connection to the municipal sanitary sewer system.
- Compliance with the Township’s code of ordinances and zoning ordinances, the DRC, and other applicable laws.

Carter's Plumbing is also proposing the temporary placement of gravel (see attached gravel plan) to serve as a parking area on the west side of the building. The gravel plan does not meet the requirements of the zoning ordinance to even be reviewed by the Township. Additionally, the zoning ordinance requires the entire parking area, including parking spaces and maneuvering lanes, to be provided with asphalt or concrete surfacing; gravel parking lots are prohibited. In the short-term, filling the trench dug on the property with the removed soils, disposing of the stockpiled broken pavement at a landfill, and covering the site in gravel is acceptable to EGLE. The long-term solution is repaving with asphalt in a manner that would encapsulate the contamination/prevent it from migrating and manage stormwater. When a site plan is submitted, the Township Engineering Consultant will have to consider whether managing parking lot runoff by sheet flow rather than subgrade stormwater structures is appropriate given the requirements of the DRC. However, the proposed improvements must be completed in compliance with Township ordinances and other applicable requirements, including the Oakland County stormwater engineering design standards. Although there are restrictions associated with the former underground storage tank regulated by EGLE, those restrictions do not eliminate the need for compliance with requirements from any other entities, nor does the DRC supersede any other entities' authority, regardless of level. EGLE's concurrence with the proposed gravel plan and related activities is not a substitute for compliance with other requirements.

In order to occupy the building and site prior to the completion of required site improvements, Carter's Plumbing is requesting Township Board approval of a Performance Guarantee Agreement (attached). As outlined in the Agreement, a \$100,000 guarantee would be deposited with the Township to ensure completion of the improvements. The Agreement was prepared by the Petitioner's legal counsel, and reviewed by the Township Attorney and staff. **If the Township Board approves the Agreement, as a condition the Board must also prescribe the period of time within which the improvements must be completed. Exhibit C will also need to be updated with a clean certificate of insurance (photo of the certificate is unacceptable).**

Attachments

1. Declaration of Restrictive Covenant for a Restricted Non-Residential Corrective Action (State I.D.# RC-RRD-213-10-042).
2. Site photos taken on June 9, 2022.
3. Performance Guarantee Agreement.

RECEIVED
OAKLAND COUNTY
REGISTER OF DEEDS

2015 AUG 18 PM 2:20

166901
LIBER 48510 PAGE 245
\$46.00 MISC RECORDING
\$4.00 REMONUMENTATION
08/18/2015 02:25:28 P.M. RECEIPT# 98494
PAID RECORDED - OAKLAND COUNTY
LISA BROWN, CLERK/REGISTER OF DEEDS

**DECLARATION OF RESTRICTIVE COVENANT
FOR A RESTRICTED NON-RESIDENTIAL CORRECTIVE ACTION**

MDEQ Reference No: RC-RRD-213-10-042

This Declaration of Restrictive Covenant (Restrictive Covenant) has been recorded with the Oakland County Register of Deeds to protect public health, safety, and welfare, and the environment by prohibiting or restricting activities that could result in unacceptable exposure to regulated substances present at the Property located at 10431 Highland Road, Charter Township of White Lake, Oakland County, Michigan and legally described in the attached Exhibit 2 (Legal Description of the Property). Exhibit 3 (Survey of Property) provides a survey of the Property that is subject to the land and/or resource use restrictions specified in this Restrictive Covenant.

The Property is associated with the Former Oscar W. Larson Company Property (Facility ID Number 00013183 for which a Closure Report (CR) was completed under Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), MCL 324.21301 *et seq.* Corrective actions that were implemented to address environmental contamination are fully described in the CR dated August 19, 2015. A copy of the CR is available from the Michigan Department of Environmental Quality (MDEQ), Remediation and Redevelopment Division (RRD) District Office.

The Property described contains regulated substances in excess of the concentrations developed as the unrestricted residential cleanup criteria under Section 21304a(2) of the NREPA. The MDEQ recommends that prospective purchasers or users of this Property undertake appropriate due diligence prior to acquiring or using this Property, and undertake appropriate actions to comply with the requirements of Section 21304c of the NREPA.

Part 213 requires the recording of this Restrictive Covenant with the Oakland County Register of Deeds based upon the corrective action measures for the site to: 1) restrict unacceptable exposures to regulated substances located on the Property; 2) assure that the use of the Property is consistent with the exposure assumptions used to develop cleanup criteria under Section 21304a(2) of the NREPA; and 3) assure the exposure control measures relied upon in the CR are effective.

The restrictions contained in this Restrictive Covenant are based upon information available at the time the corrective action was implemented by the Oscar W. Larson Company. Failure of the corrective action to achieve and maintain the cleanup criteria, exposure controls, and requirements specified in the CR; future changes in the environmental condition of the Property; changes in the cleanup criteria developed under Section 21304a(2) of the NREPA; the discovery of environmental conditions at the Property that were not accounted for in the CR; or use of the Property in a manner inconsistent with the restrictions described herein may result in this Restrictive Covenant not being protective of public health, safety, and welfare, and the environment. The adequacy of the corrective action undertaken pursuant to the CR may not have been reviewed by the MDEQ.

13P
R

OK - AN

Definitions

For the purposes of this Restrictive Covenant, the following definitions shall apply:

"MDEQ" means the Michigan Department of Environmental Quality, its successor entities, and those persons or entities acting on its behalf.

"Owner" means at any given time the then-current title holder of all or any portion of the Property.

"Property" means the real property as described in Exhibit 2 (Legal Description of the Property) of this Restrictive Covenant that is subject to the restrictions, terms and conditions described herein.

All other terms used in this document which are defined in Part 3, Definitions, of the NREPA and Part 213 of the NREPA, shall have the same meaning in this document as in Part 3 and Part 213 of the NREPA, as of the date this Restrictive Covenant is filed.

Summary of Environmental Conditions and Corrective Action.

Hazardous substances including benzene, toluene, ethyl benzene, xylenes, naphthalene and trimethylbenzenes were released from an underground storage tank system resulting in contamination of the Property. Soil and groundwater contamination remain present at levels that do not allow for an unrestricted use of the Property. Specifically, concentrations of regulated substances remain present in the groundwater in excess of the nonresidential drinking water cleanup criteria. This potential exposure risk has been addressed by preventing the use of the groundwater for ingestion and irrigation.

Residual (or mobile) Light Nonaqueous-Phase Liquid (LNAPL), including gasoline were properly characterized using a Conceptual Site Model in accordance with American Society for Testing and Materials (ASTM) designation E 2531-06 E1, and will remain in place. The LNAPL exists below the ground surface at a depth of 1.5 to 4 feet. The location of the LNAPL in the attached Exhibit 3 (Survey of the Property and Limits of Land or Resource Use Restrictions) describes and provides the location of the institutional control and the horizontal and vertical extent of the LNAPL is shown in Exhibit 3-1. The restrictions provided for in this Restrictive Covenant serve to prevent unacceptable exposure to hazardous substances as a result of the conditions created by the presence of the LNAPL soil and/or groundwater contaminant concentrations that exceed the unrestricted residential criteria under Section 21304a(2) of the NREPA.

NOW THEREFORE,**1. Declaration of Land or Resource Use Restrictions.**

The Oscar W. Larson Company, with the express written permission of the Owner of the Property hereby declares and covenants that the Property shall be subject to the following restrictions and conditions:

- a. **Prohibited Land Uses:** The Owner shall prohibit all uses of the Property as described in Exhibit 3 (Survey of Property and Limits of Land or Resource Use Restrictions) that are not compatible with or are inconsistent with the assumptions and basis for the nonresidential cleanup criteria established pursuant to Section 21304a(2) of the NREPA. Uses that are compatible with nonresidential cleanup criteria are generally described in Exhibit 4 (Description of Allowable Uses). At the time of recording of this Restrictive Covenant, the Charter Township zoning code designation allowed for the following residential uses that are not compatible with the nonresidential cleanup criteria and are therefore prohibited by this Restrictive Covenant (Special Land Uses - Nursery School, Group Adult and Child Care Centers). Cleanup criteria for land-use based response activities are located in the Government Documents Section of the State of Michigan Library.
- b. **Prohibited Activities to Eliminate Unacceptable Exposures to Regulated Substances.** The Owner shall prohibit activities on the Property that may result in exposures above levels established in the CR. These prohibited activities include
- 1) The construction and use of wells or other devices on the Property to extract groundwater for consumption, irrigation, or any other purpose, except as provided below:
 - a) Wells and other devices constructed for the purpose of evaluating groundwater quality or to remediate subsurface contamination associated with a release of regulated substances into the environment are permitted provided the construction of the wells or devices complies with all applicable local, state, and federal laws and regulations and does not cause or result in a new release, exacerbation of existing contamination, or any other violation of local, state, or federal laws or regulations.
 - b) Short-term dewatering for construction purposes is permitted provided the dewatering, including management and disposal of the groundwater, is conducted in accordance with all applicable local, state, and federal laws and regulations and does not cause or result in a new release, exacerbation of existing contamination, or any other violation of local, state, and federal environmental laws and regulations.
 - 2) The construction of new structures, unless such construction incorporates engineering controls designed to eliminate the potential for subsurface vapor phase hazardous substances to migrate into the new structure at concentrations greater than applicable criteria; or, unless prior to construction of any structure, an evaluation of the potential for any hazardous substance to volatilize into indoor air assures the protection of persons who may be present in the buildings and is in compliance with Section 21304c of the NREPA.
- c. **Prohibited Activities to Ensure Effectiveness and Integrity of the Corrective Action.** The Owner shall prohibit activities on the Property that may interfere with any element of the CR, including the performance of operation and maintenance activities, monitoring, or other measures necessary to ensure the effectiveness and integrity of the CR.

2. Contaminated Soil Management. The Owner shall manage all soils, media, and/or debris located on the Property in accordance with the applicable requirements of Sections 21304b of the NREPA; Part 111, Hazardous Waste Management, of the NREPA; Subtitle C of the Resource Conservation and Recovery Act, 42 USC Section 6901 *et seq.*; the administrative rules promulgated thereunder; and all other relevant state and federal laws.

3. Access. The Owner grants to the MDEQ and the Oscar W. Larson Company, and their designated representatives, the right to enter the Property at reasonable times for the purpose of determining and monitoring compliance with the CR, including the right to take samples, inspect the operation and maintenance of the corrective action measures and inspect any records relating to them, and to perform any actions necessary to maintain compliance with Part 213 and the CR. The right of access provided to the Oscar W. Larson Company above is not required under Part 213 for the corrective action to be considered approved. This provision was agreed to by the Owner at the time the Restrictive Covenant was recorded. Accordingly, The MDEQ will not enforce the Owner's obligation to provide access to Oscar W. Larson Company.

4. Conveyance of Property Interest. A conveyance of title, easement, or other interest in the Property shall not be consummated by the Owner without adequate and complete provision for compliance with the terms of the CR, and this Restrictive Covenant. A copy of this Restrictive Covenant shall be provided to all future owners, heirs, successors, lessees, easement holders, assigns, and transferees by the person transferring the interest in accordance with Section 21310a(2)(c) of the NREPA.

5. Audits Pursuant to Section 21315 of the NREPA. This Restrictive Covenant is subject to audits in accordance with the provisions of Section 21315 of the NREPA, and such an audit may result in a finding by the MDEQ that this Restrictive Covenant is not protective of the public health, safety, and welfare, and the environment.

6. Term of Restrictive Covenant. This Restrictive Covenant shall run with the Property and is binding on the Owner; future owners; and their successors and assigns, lessees, easement holders, and any authorized agents, employees, or persons acting under their direction and control. This Restrictive Covenant shall continue in effect until it is determined that the regulated substances no longer present an unacceptable risk to the public health, safety, or welfare, or the environment. Improper modification or rescission of any restriction necessary to prevent unacceptable exposure to regulated substances may result in the need to perform additional corrective actions by those parties responsible for performing corrective action at the Property or to comply with Section 21304c of the NREPA.

7. Enforcement of Restrictive Covenant. The State of Michigan, through the MDEQ, and the Oscar W. Larson Company may individually enforce the restrictions set forth in this Restrictive Covenant by legal action in a court of competent jurisdiction

8. Severability. If any provision of this Restrictive Covenant is held to be invalid by any court of competent jurisdiction, the invalidity of that provision shall not affect the validity of any other provision of this Restrictive Covenant, which shall continue unimpaired and in full force and effect.

9. Authority to Execute Restrictive Covenant. The undersigned person executing this Restrictive Covenant is the Owner, or has the express written permission of the Owner Amcomm Telecommunications, and represents and certifies that he or she is duly authorized and has been empowered to execute and record this Restrictive Covenant.

IN WITNESS WHEREOF, the Oscar W. Larson Company has caused this Restrictive Covenant, RC-RRD-213-10-042, to be executed on this 17th day of August, 2015.

Oscar W. Larson Company

By: James C. Lintol
Signature

Name: James C. Lintol
Print or Type Name

Its: EVP
Title

STATE OF MICHIGAN
COUNTY OF OAKLAND

The foregoing instrument was acknowledged before me this date, August 17, 2015 by Mr. James Lintol, EVP of the Oscar W. Larson Company, a corporation within the State of Michigan, on behalf of the corporation.

Stacy Anne Roberts
Notary Public Signature
STACY ANNE ROBERTS Printed Name

STACY ANNE ROBERTS
Notary Public, Oakland County, Michigan
My Commission Expires Oct. 12, 2016

Prepared by:
Jerome Meyer - Senior Project Scientist - Innovative Environmental Solutions, Inc.

When recorded return to:
Jerome Meyer - Innovative Environmental Solutions, Inc. - 510 Brighton Rd, Howell, MI 48843

EXHIBIT 1

CONSENT OF OWNER

I, John Ramonaitis, Member of High-Five Investments, LLC, the current and legal Owner of the Property, do hereby consent to the recording of this Restrictive Covenant, RC-RRD-213-10-042, and authorize the Oscar W. Larson Company to file the Restrictive Covenant with the Oakland County Register of Deeds for recording.

High-Five Investments, LLC

By: [Signature]
Signature
Name: John Ramonaitis
Print or Type Name
Its: Vice President
Title

STATE OF MICHIGAN
COUNTY OF OAKLAND

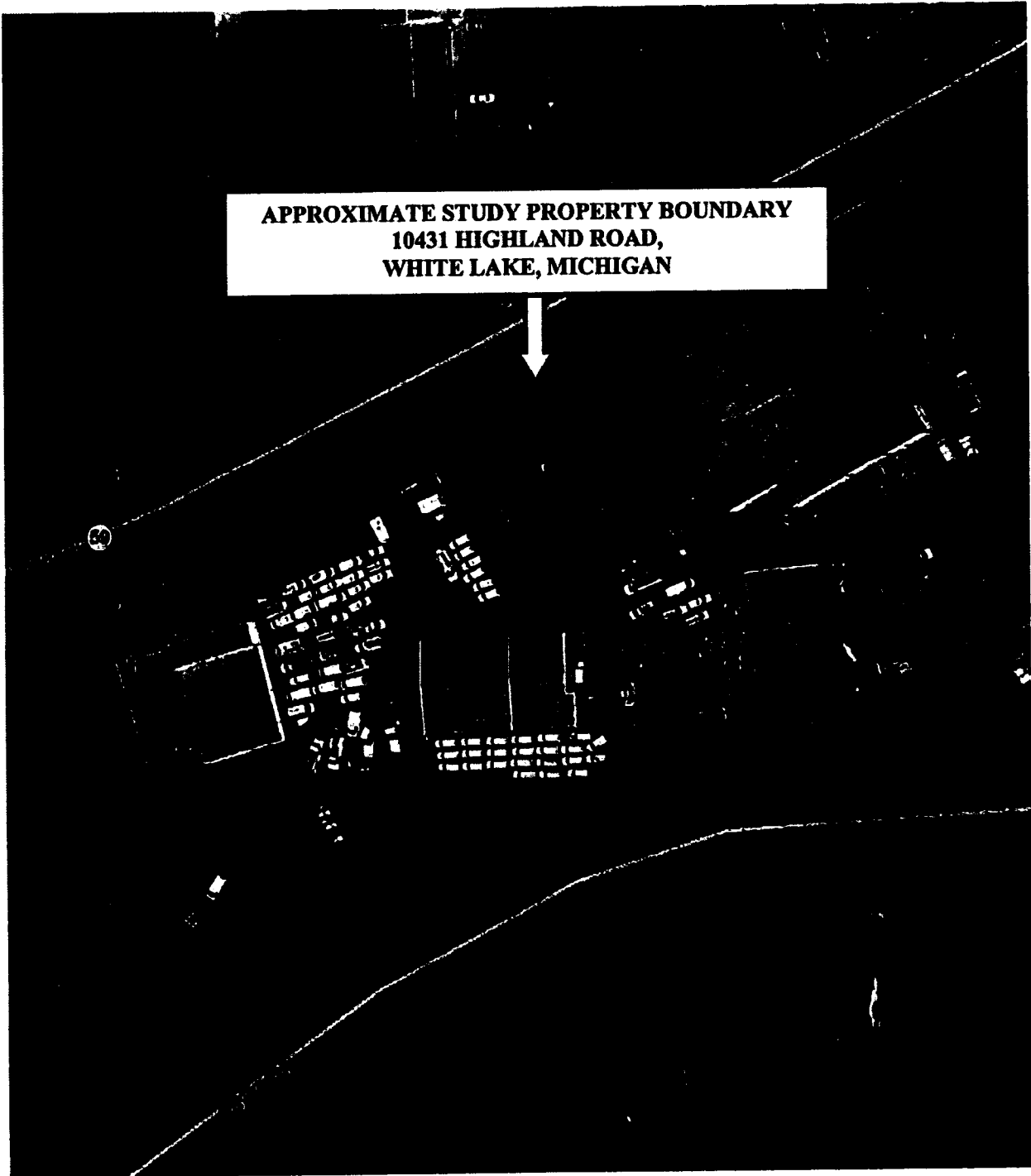
The foregoing instrument was acknowledged before me this date, August 17, 2015 by Mr. John Ramonaitis ^{VP} of High-Five Investments, LLC, a Limited Liability Corporation within the State of Michigan, on behalf of the corporation.

JESSICA PAYNTER
Notary Public - Michigan
Oakland County
My Commission Expires Apr 5, 2018
Acting in the County of Oakland

[Signature]
Notary Public Signature
Jessica Paynter Printed Name

EXHIBIT 2

LEGAL DESCRIPTION OF PROPERTY



SCALE UNKNOWN



INNOVATIVE
ENVIRONMENTAL SOLUTIONS, INC.

**2015 AERIAL PHOTOGRAPH WITH
PLAT MAP OVERLAY**

AMCOMM TELECOMMUNICATIONS
(FORMER OSCAR W. LARSON PROPERTY)
10431 HIGHLAND ROAD
WHITE LAKE, MICHIGAN

PROJECT: 20131079	DATE: 7/XX/15	PLATE: 1	SCALE: SEE ABOVE
----------------------	------------------	-------------	---------------------

LEGAL DESCRIPTION FOR THE
AMCOMM TELECOMMUNICATION, INC. PROPERTY
10431 HIGHLAND ROAD, WHITE LAKE, MICHIGAN

The legal description of the property is as follows:

T3N, R8E, SEC 22 LARSON ACRES LOTS 3, 4 & 5, ALSO LOTS 13 & 14, ALSO PART OF
LOT 15 BEG AT SW LOT COR, TH E 3.70 FT, TH N 07-35-41 W 30.41 FT, TH S 31.20 FT
TO BEG 6-7-01 FR003,004,005,012&013

The parcel identification number for the property, according to the White Lake Township
Assessor's Office, is as follows: 12-22-252022.

EXHIBIT 3

SURVEY OF THE PROPERTY

OR

**SURVEY OF THE PROPERTY
AND LIMITS OF LAND OR RESOURCE USE RESTRICTIONS**

AND LIMITS OF LAND OR RESOURCE USE RESTRICTIONS

CERTIFICATE OF SURVEY

Thomas M. Smith
7559 Olde Sturbridge
Clarkston, MI 48016

PHONE 625-3276

SURVEY FOR OSCAR W. LARSON Co.
ADDRESS DIXIE HIGHWAY
SPRINGFIELD TWP., MI

DATE 9-4-97
JOB NO. 97-0904
REV. 9-16-97 (Add Bldgs)

I hereby certify that I surveyed and mapped the land described and delineated hereon. I have fully complied with the requirements of act 132 of 1970. The error of closure is no greater than 1 in 5000 and the bearings were established by: Recorded Plat. Field error of Closure 1:15,800.

THOMAS M. SMITH
L.L.S. NO. 31606

LEGEND	
⊙ = IRON FOUND	M = MEASURED
○ = IRON SET	*X* = FENCE
○ = MONUMENT FOUND	● = P.K. NAIL SET
R = RECORDED	P.R. = PRORATED DISTANCE

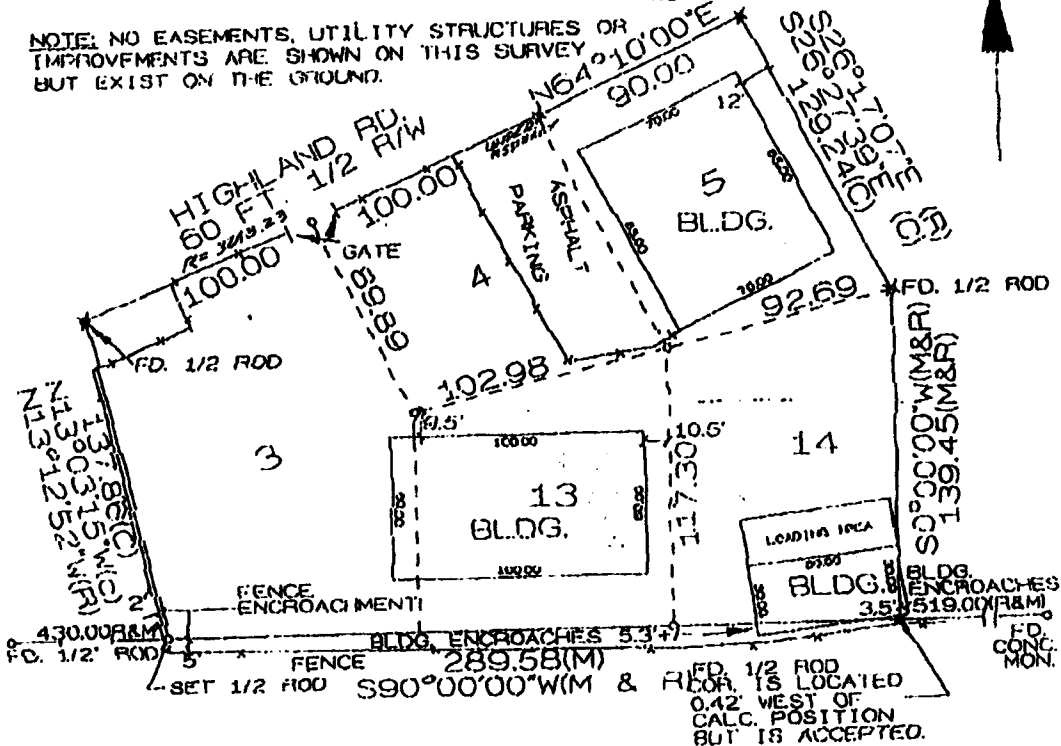


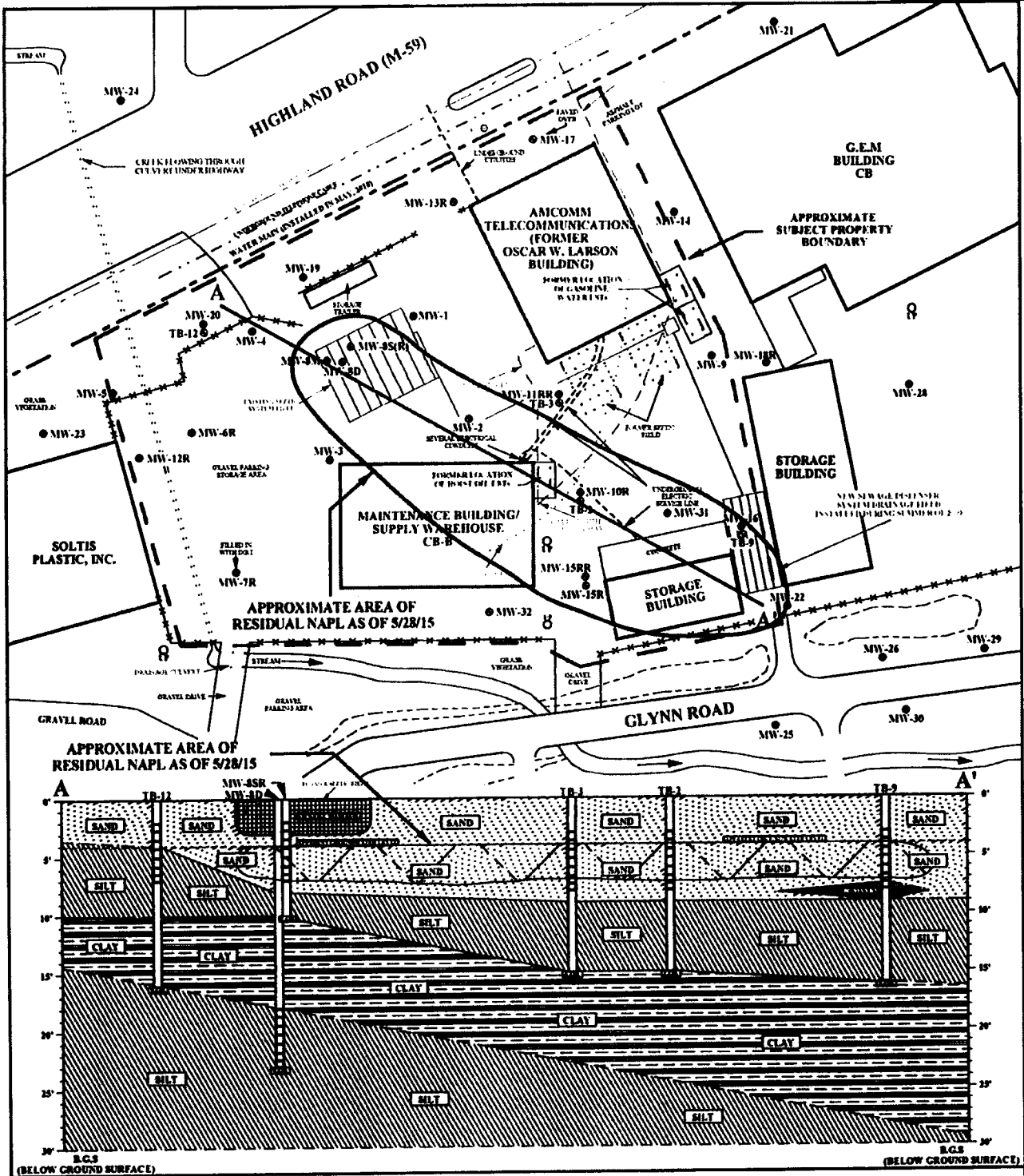
SCALE: 1"=50'

LOTS 3,4,5,13,14 LARSON ACRES, WHITE LAKE TWP., OAKLAND COUNTY, MICHIGAN, AS RECORDED IN LIBER 58, PAGE 12 OF PLATS, OAKLAND COUNTY RECORDS.

FD. IRON IN ASP. COR. IS 0.32' S.W. OF CALC. POSITION BUT IS ACCEPTED.

NOTE: NO EASEMENTS, UTILITY STRUCTURES OR IMPROVEMENTS ARE SHOWN ON THIS SURVEY BUT EXIST ON THE GROUND.





LEGEND

<p>CB - COMMERCIAL BUILDING</p> <p>⊕ - FIRE HYDRANT</p>	<p>⊕/⊕ - UTILITY POLE/LIGHT POLE</p> <p>⊕ - STORM DRAIN</p>
---	---

INNOVATIVE

ENVIRONMENTAL SOLUTIONS, INC.

MAP DEPICTING APPROXIMATE AREA OF RESIDUAL NAPL CONTAMINATION

AMCOMM TELECOMMUNICATIONS
(FORMER OSCAR W LARSON PROPERTY)
10431 HIGHLAND ROAD
WHITE LAKE, MICHIGAN

PROJECT: 20031079	DATE: 7/8/15	PLATE: EXHIBIT 3-1	SCALE: UNKNOWN
----------------------	-----------------	-----------------------	-------------------

EXHIBIT 4**DESCRIPTION OF ALLOWABLE USES**

Nonresidential Land Use: This land use is characterized by any use which is not residential in nature and is primarily characterized by industrial and commercial uses. Industrial uses typically involve manufacturing operations engaged in processing and manufacturing of materials or products. Other examples of industrial uses are utility companies, industrial research and development, and petroleum bulk storage. Commercial uses include any business or income-producing use such as commercial warehouses, lumber yards, retail gas stations, auto dealerships and service stations, as well as office buildings, banks, and medical/dental offices (not including hospitals). Commercial uses also include retail businesses whose principal activity is the sale of food or merchandise within an enclosed building and personal service establishments which perform services indoors such as health clubs, barber/beauty salons, photographic studios, etc.

Any residential use is specifically prohibited from the non-residential land use category. This would include the primary use of the property for human habitation and includes structures such as single family dwellings, multiple family structures, mobile homes, condominiums, and apartment buildings. Residential use is also characterized by any use which is intended to house, educate, or provide care for children, the elderly, the infirm, or other sensitive populations, and therefore could include day care centers, educational facilities, hospitals, elder care facilities, and nursing homes. The use of any accessory building or portion of an existing building as a dwelling unit permitted for a proprietor or storekeeper and their families, located in the same building as their place of occupation, or for a watchman or caretaker is also prohibited. Any authority that allows for residential use of the Property as a legal non-conforming is also restricted per the prohibitions contained in this restrictive covenant.



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDIATION AND REDEVELOPMENT DIVISION
PO BOX 30426, LANSING, MI 48909-7926, Phone 517-284-5087, Fax 517-241-9581

NOTICE TO LOCAL UNIT(S) OF GOVERNMENT OF LAND USE RESTRICTIONS

This information and form is required under Sections 21310a(5) and 21316 of Part 213, Leaking Underground Storage Tanks, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

INSTRUCTIONS: A person that implements corrective action activities that relies on land use restrictions shall provide notice of the land use restrictions that are part of the corrective action plan to the local unit of government in which the site is located within 30 days of filing of the land use restrictions with the county register of deeds.

- (1) Use this form to provide notice of land use restrictions that are part of the corrective action plan to the Local Unit(s) of Government (LUG).
- (2) Send the notice to the city, village, or township clerk. Provide a copy to the County/District Health Department if groundwater exceeds Tier 1 residential screening levels.
- (3) Submit a copy of the notice and proof of providing the notice with the Closure Report (EQP4452) to the appropriate RRD District Office. See www.michigan.gov/deqrrd_officemap for a complete list of RRD District and Field Offices.

This notice does not constitute a warranty or representation of any kind by the State of Michigan that the corrective actions performed in accordance with this notice will result in the achievement of the remedial criteria established by law, or that the property is suitable for any particular use.

OAKLAND COUNTY HEALTH DIVISION

Name of Local Unit of Government	Name of Local Unit of Government	Name of Local Unit of Government
----------------------------------	----------------------------------	----------------------------------

Notice to the Local Unit of Government Receiving this Form:

A corrective action plan for the site named below has been developed as a result of a release of regulated substances from an underground storage tank. This form and the attachments are to provide the local unit(s) of government notice of the land use restrictions that are part of the corrective action plan. A copy of the institutional control mechanism(s) in the form of a Corrective Action Notice to Register of Deeds, and/or Restrictive Covenant, and/or alternate mechanism is/are attached. The attached institutional control mechanism(s) describes the land use restrictions and the land where the restrictions apply.

Facility ID:

Owner or Operator: HIGH FIVE INVESTMENTS, LLC

Site Name: FORMER OSCAR W. WALSON COMPANY PROPERTY

Site Address: 10431 HIGHLAND ROAD City: WHITE LAKE TWP State: MI Zip:

Contact Person: MATT SCHULTZ

Phone Number: 248-698-8869 email: MSCHULTZ@AMCONN.COM

Mailing Address: 10431 HIGHLAND ROAD

City: WHITE LAKE TWP State MI Zip:

Qualified Underground Storage Tank Consultant: INNOVATIVE ENVIRONMENTAL SOLUTIONS, INC.

Address: 516 BRIGHTON ROAD

City: HOWELL State MI Zip:

Contact Person: JEROME MEYER

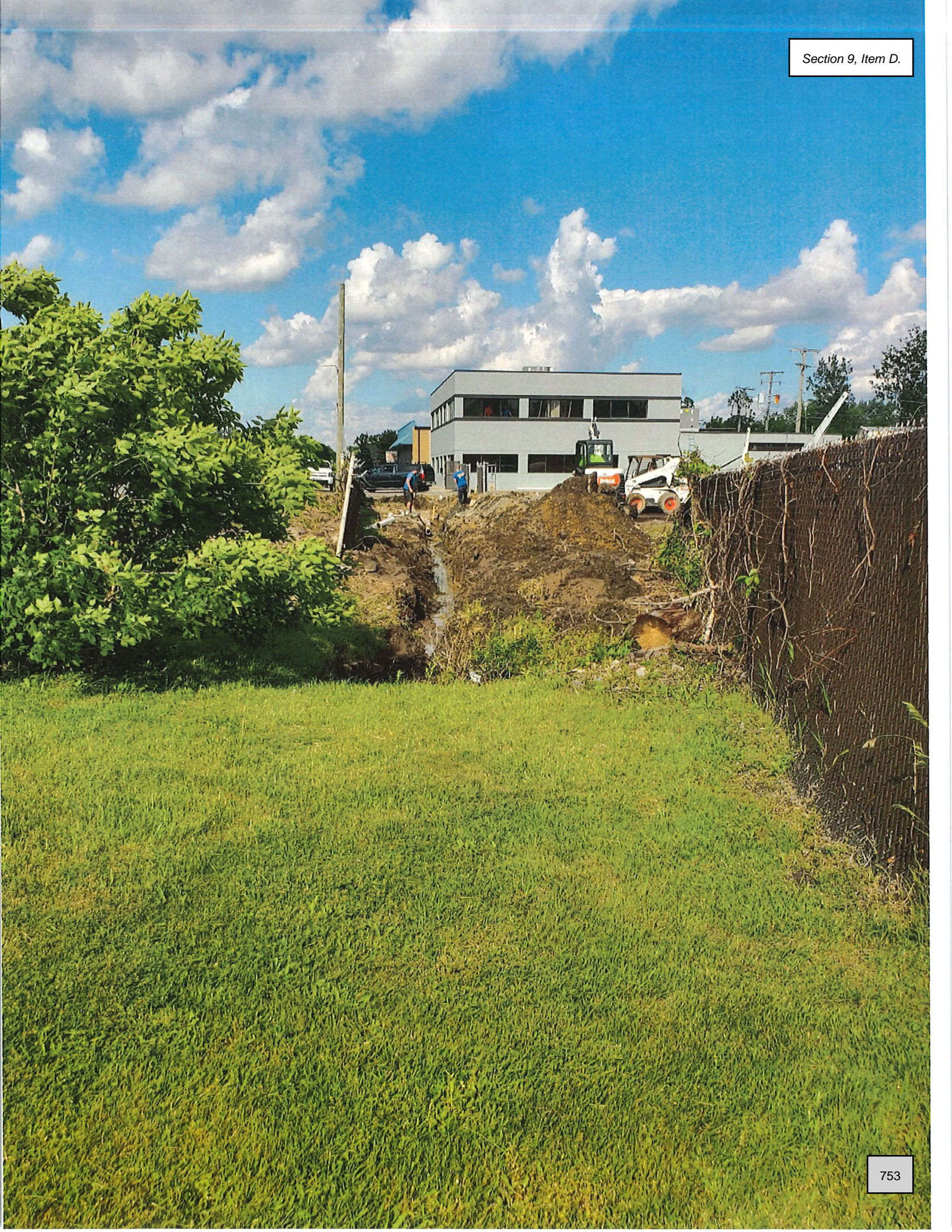
Phone Number: 517-548-7613 email: JMEYER@IES-ENVIRONMENTAL.COM

I hereby attest to the accuracy of the statements in this document and all attachments. I further certify that the language on this form has not been modified.

James C. Guntol
Owner or Operator Signature

8/17/15
Date









PERFORMANCE GUARANTEE AGREEMENT

THIS PERFORMANCE GUARANTEE AGREEMENT (this “Guarantee”) is made as of the 20th day of July 2022 (the “Effective Date”) by and between the Charter Township of White Lake (the “Township”), whose address is 7525 Highland Road, White Lake, Michigan 48383 and CAMQ Properties LLC, a Michigan limited liability company, whose address is 10431 Highland Road, White Lake, Michigan 48386 (“CAMQ”) (collectively referred to as the “Parties”).

RECITALS

WHEREAS CAMQ owns certain commercial property commonly known as 10431 Highland Road, White Lake, Michigan 48386 (the “Property”), as more particularly described on attached Exhibit A, which will be occupied by Carter’s Plumbing LLC (“Carter”) and has applied for various permits from the Township; and

WHEREAS CAMQ has contracted with Carter’s Plumbing LLC to make certain improvements to the Property as provided herein; and

WHEREAS CAMQ through Carter has applied for various permits to improve the Property, passed all inspections related to the main building and is seeking a temporary certificate of occupancy; and

WHEREAS CAMQ through Carter has hired KIEFT Engineering to prepare an engineered site plan for improvements to the Property; and

WHEREAS the parties acknowledge the existence of a Declaration of Restrictive Covenant for a Restricted Non-Residential Corrective Action relating to the Property which has been recorded with the Oakland County Register of Deeds on August 18, 2015 in Liber 48510 Page 245 (the “DRC”); and

WHEREAS the Township requires this Guarantee and a One Hundred Thousand Dollar (\$100,000.00) Cash Deposit to be delivered into escrow with the Township (the “Deposit”), before the issuance of a temporary certificate of occupancy, to ensure CAMQ completes the following improvements: 1) temporary placement of gravel in the parking area, if approved by the Township Board; 2) obtains an engineered site plan for the parking lot layout, design and construction, including paving, stormwater drainage, wetlands protection, landscaping and screening and fencing; 3) connects to the municipal sanitary sewer system; and 4) complies with the Township code of ordinances and zoning ordinances and other applicable law applicable to the improvements required under this Agreement; and

WHEREAS the Township has issued a Temporary Certificate of Occupancy to CAMQ for the Property on July____, 2022 conditioned upon the execution of this Guarantee by the Parties and delivery of the Deposit to the Township.

NOW THEREFORE, in consideration of the foregoing recitals and the mutual obligations of the Parties hereto, each of them does hereby covenant and agree as follows:

AGREEMENT

1. Obligations. CAMQ shall comply with the provisions of and perform and discharge the obligations contained in or arising from this Guarantee, as supplemented and amended from time to time by agreement of the Parties, including without limitation: 1) depositing in escrow with the Township the sum of One Hundred Thousand Dollars (\$100,000.00) via certified or cashier's check or their equivalent; 2) if approved by the Township Board, the temporary placement of gravel in the parking area as more fully described in attached Exhibit C (Temporary Gravel Plan); 3) submission of an engineered site plan for the Property's parking lot which includes the layout, design and construction including paving, stormwater drainage, wetlands protection, landscaping and screening and fencing (subject to approval by the Township and concurrence by the Michigan Department of Environment, Great Lakes, and Energy per applicable law); 4) connection to the municipal sanitary sewer system; and 5) compliance with the Township's code of ordinances and zoning ordinances, the DRC and other applicable laws. CAMQ shall complete all work identified in this Paragraph 1 within the time period established by the Township Board.

2. 2. Default; Right to Cure. If CAMQ defaults in the performance of its obligations under this Guarantee, the Township shall notify CAMQ in writing that it is in default, provided such notice details the specific reasons for the default and is delivered to CAMQ in accordance with the notice provisions contained in this Guarantee. If CAMQ fails to cure such claimed default or provide proof that it is not in default within thirty (30) days of receipt of such notice, then the Township shall have the right to pursue all legal or equitable remedies available to it, including but not limited to, the use of the Deposit to complete the improvements through contracts with third parties in accordance with applicable law, including specifically the right to enter upon the Property to make the improvements. In the event the Township uses the Guarantee to complete the required improvements, any amounts remaining after completion of the improvement(s) shall be applied first to the Township's administrative costs in completing the work. Any balance remaining after the cost of the improvement(s) and the Township's administrative costs, along with any interest earned on the Guarantee, shall be refunded to CAMQ. In the event of a default and the Guarantee is not sufficient to cover the cost of the incomplete improvement(s), CAMQ shall be required to pay to the Township the difference between the Guarantee and the cost of the completing the improvement(s) plus an administrative fee. An invoice shall be sent by the Township to CAMQ outlining the deficiency, and CAMQ shall pay to the Township the full balance within 30 days of receipt of such invoice.

3. Force Majeure. No party shall be liable or responsible to the other party, nor be deemed to have defaulted under or breached this Guarantee, for any failure or delay in fulfilling or performing any term of this Guarantee when and to the extent such failure or delay is caused by or results from acts beyond the affected party's reasonable control, including, without limitation: (1) acts of God; (2) flood, fire, earthquake, or explosion; (3) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot, or other civil unrest; (4) government order or law other than one related to enforcement of this Guarantee; (5) actions, embargoes, or blockades in effect on or after the date of this Guarantee; (6) action by any federal, state or county governmental authority; (7) national or regional emergency; (8) strikes, labor stoppages or slowdowns, or other industrial disturbances; and (9) pandemic, disease, or viral outbreak.

4. Indemnification. CAMQ agrees to indemnify, defend and hold harmless the Township including its trustees, directors, officials, agents and employees from and against any third party claims or damages involving bodily injury or property damage to the extent caused by CAMQ’s negligent acts or omissions relating to performance of any work required by this Guarantee.

5. Insurance. CAMQ’s contractor shall maintain the insurance specified in its Certificate of Insurance, which is attached as Exhibit D, and is required to name the Township as an additional insured on an endorsement to the policy of commercial general liability insurance. The Parties also agree to waive any rights of subrogation with respect to workers compensation, employer’s liability and commercial general liability insurance. Insurance as required in this Guarantee shall be maintained by CAMQ until a Final Certificate of Occupancy is obtained for the improvements covered by this Guarantee.

6. Other Rights. This Guarantee shall be in addition to, and not in substitution for, any rights or remedies that the Township may have relating to CAMQ arising under this Guarantee or otherwise, and CAMQ shall not be released from the obligations hereunder by reason of any time or forbearance granted by the Township.

7. Authority. The authorized representative executing this Guarantee on behalf of CAMQ hereby represents that s/he has full power and authority to bind CAMQ and acknowledges that s/he is making this representation with the understanding that the Township is relying on the representation.

8. Notice. Any notices or demands, consents required or allowed under this Agreement shall be in writing and shall be addressed as follows, or at such other address as CAMQ or Township may specify hereafter in writing by notice to the other party:

NOTICE TO THE TOWNSHIP

Sean O’Neil, AICP
Community Development Director
White Lake Township
7525 Highland Rd
White Lake, MI 48383
Phone: (248) 698 3300 x 172
Email: soneil@whitelaketwp.com

With a copy to:

Lisa J. Hamameh, Esq.
Rosati Schultz Joppich & Amtsbuechler
27555 Executive Drive Suite 250
Farmington Hills, MI 48331
Main Phone: 248.489.4100
Direct Dial: 248-482-8777
Fax: 248.489.1726
Email: Lhamameh@rsjalaw.com

NOTICE TO CAMQ

CAMQ Properties LLC
c/o Jessica Carter/Matthew Carter
6146 Windstone Lane
Clarkston, MI 48346
jessicac@callcartersplumbing.com
(248)376-0801

With a copy to:

Harvey W. Berman, Esq.
Bodman PLC
201 South Division Street
Suite 400
Ann Arbor, MI 48104
hberman@bodmanlaw.com
Direct Phone: (734) 930-2493
Fax: (734) 930-2494

Such notice or other communication may be (i) mailed by United States registered or certified mail, postage and charges prepaid, and may be deposited in a United States Post Office or a depository for the receipt of mail regularly maintained by the post office, (ii) sent by electronic mail i.e. email; or sent by national overnight delivery service like Federal Express. For purposes of this Guarantee, notices shall be deemed to have been “given” or “delivered” (a) upon personal delivery thereof or the third (3rd) Business Day after having been deposited in the United States mails or with a national overnight carrier as provided herein, or (b) if sent by electronic mail, on the next date following the transmission date so long as followed up with one of the other methods of notice.

9. Miscellaneous. This Guarantee shall be governed by the laws of the State of Michigan. This Guarantee constitutes the full, final and entire understanding of the parties and supersedes any oral statements or agreements to the contrary. This Guarantee shall not be modified unless agreed upon by the parties in a separate writing executed subsequent to this Agreement and may only be modified in a writing signed by the Parties. This Guarantee may be executed in multiple counterparts, each of which shall constitute an original agreement, but all of which shall constitute only one agreement. The signatures may be electronic and/or facsimiles rather than originals and shall be fully as effective as though all signatures were originals on the same copy. In the event any or a portion of the provisions of this Guarantee shall be held invalid, illegal or otherwise unenforceable by a Court, the remaining provisions of this Guarantee shall remain in full force and effect as if the invalid provision were not in existence.

IN WITNESS WHEREOF, the undersigned hereby execute this Agreement as of the Effective Date set forth above.

CAMQ, LLC, a Michigan limited liability company,

Name: Matthew Carter
Its: Authorized Representative

Charter Township of White Lake

Name: Rik Kowall
Its: Township Supervisor

Approved:

Lisa Hamameh, Township Attorney

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

Land situated in the Township of White Lake, County of Oakland, State of Michigan, described as follows:

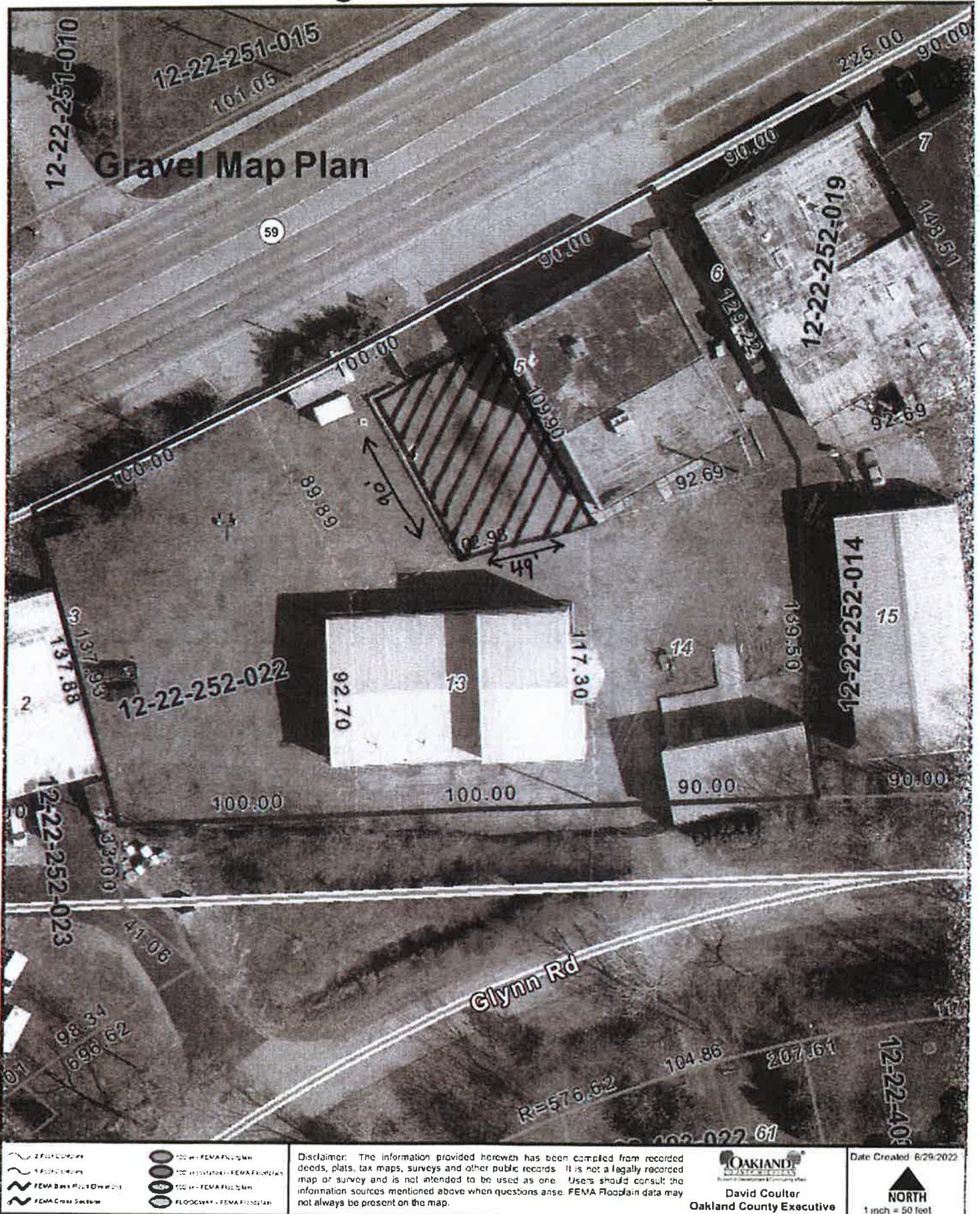
Lots 3, 4 and 5, ALSO Lots 13 and 14, ALSO part of Lot 15 of LARSON ACRES according to the plat thereof recorded in Liber 58 of Plats, page 12 of Oakland County Records: Beginning at the Southwest Lot corner, thence East 3.70 feet, thence North 07 degrees 35 minutes 41 seconds West 30.41 feet, thence South 31.20 feet to the Point of Beginning.

Tax Parcel Number: 12-22-252-022

EXHIBIT B
GRAVEL PLAN
(SEE ATTACHED)

10431 Highland Rd Gravel Proposal

Section 9, Item D.



10431 HIGHLAND ROAD GRAVEL PLAN NOTES

Purpose: To lay gravel to allow access and use of the main entrance to the premises. Following approval by White Lake Township of owner's forthcoming Engineered Site Plan, asphalt over the gravel base.

Materials: 21AA Limestone aggregate (gravel) base

Depth: Compact gravel base to 3"

Location: West side of the main office building where the asphalt was deteriorated and removed as more fully described on the Gravel Plan Map.

Dimensions: The dimensions of the area are 90' x 49' or 4,410 sq ft.

Other: See also a picture of location as existing as well as picture of the apron





EXHIBIT C
CERTIFICATE OF INSURANCE
(SEE ATTACHED)



NEW

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
04/07/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Brent Kigore Agency 1658 Mayfield Rd Lapeer, MI 48848	CONTACT Name: Brent Kigore Phone: 810-664-4773 FAX: 810-664-7181 E-Mail: Brent.Kigore@bnaam.com Address:
INSURED Carter's Plumbing LLC 8148 Windstone Ln Clarkston, MI 48348	INSURANCE AFFORDING COVERAGE INSURER 1: Farm Bureau General Insurance of MI 21547 INSURER 2: INSURER 3: INSURER 4: INSURER 5:

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

TYPE	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFF. DATE (MM/DD/YYYY)	POLICY EXP. DATE (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR (SEE AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PROD. <input type="checkbox"/> LOC <input type="checkbox"/> OTHER	N N S-3144757	05/03/2022	05/03/2023	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES \$ 50,000 VEH. EXP. (Per Occurrence) \$ 10,000 PERSONAL & ADV. INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS-COMP. AGG. \$ 2,000,000
A	AUTOMOBILE LIABILITY ANY AUTO <input type="checkbox"/> DRIVEN <input type="checkbox"/> MAINT. ONLY <input checked="" type="checkbox"/> SCHEDULED <input type="checkbox"/> POLICY <input type="checkbox"/> POLICY <input type="checkbox"/> POLICY ONLY	N N GAP-3144758	05/03/2022	05/03/2023	OWNERS SINGLE LIMIT \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS MADE				EACH OCCURRENCE \$ AGGREGATE \$
	WORKERS COMPENSATION AND EMPLOYERS LIABILITY MANAGERIAL/EXECUTIVE OFFICERS/EMPLOYEES EXCLUDED (Necessary in MI) 1 job, multiple jobs DESCRIPTION OF OPERATIONS below	N/A			E.S. EMPLOYER \$ E.S. DISBENR. EA EMPLOYEE \$ E.S. DISBENR. POLICY LIMIT \$

DESCRIPTION OF OPERATIONS, LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER Carter's Plumbing LLC 8148 Windstone Ln Clarkston, MI 48348	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE SHALL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Clairne L Lucite</i>
--	--

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
07/19/2022

Section 9, Item D.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER AUTOMATIC DATA PROCESSING INS AGCY 76250871 1 ADP BLVD M/S 625 ROSELAND NJ 07068	CONTACT NAME:		
	PHONE (A/C, No, Ext): (800) 524-7024	FAX (A/C, No):	
	E-MAIL ADDRESS:		
	INSURER(S) AFFORDING COVERAGE		
INSURED CARTERS PLUMBING LLC 2482 ORCHARD LAKE RD SYLVAN LAKE MI 48320-1532	INSURER A: Trumbull Insurance Company		NAIC# 27120
	INSURER B:		
	INSURER C:		
	INSURER D:		
	INSURER E:		
	INSURER F:		

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/Y YYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:						EACH OCCURRENCE	
							DAMAGE TO RENTED PREMISES (Ea occurrence)	
							MED EXP (Any one person)	
							PERSONAL & ADV INJURY	
							GENERAL AGGREGATE	
							PRODUCTS - COMP/OP AGG	
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/> AUTOS						COMBINED SINGLE LIMIT (Ea accident)	
							BODILY INJURY (Per person)	
							BODILY INJURY (Per accident)	
							PROPERTY DAMAGE (Per accident)	
	UMBRELLA LIAB EXCESS LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE	
							AGGREGATE	
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			76 WEG AK3MM9	02/24/2022	02/24/2023	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER	
							E.L. EACH ACCIDENT	\$500,000
							E.L. DISEASE -EA EMPLOYEE	\$500,000
							E.L. DISEASE - POLICY LIMIT	\$500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 Those usual to the Insured's Operations.

CERTIFICATE HOLDER For Informational Purposes 2482 ORCHARD LAKE RD SYLVAN LAKE MI 48320-1532	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Susan S. Castaneda</i>
--	---

Assessing Department

Memo

To: Township Board
From: David Hieber, Assessor
Date: June 28, 2022
Re: Intention Resolution for Emergency Sewer Connection 2022-02 SAD

Comments: Attached is the Intention Resolution for the Emergency Sewer Connection 2022-02 Special Assessment District. The Board agreed to establish these districts twice a year. The process requires your approval at three separate Township Board meetings, where you will consider the Intention, Establishment and the Confirming Resolutions. For this SAD there are two properties that were connected to the sanitary sewer system in 2022.

If you should have any questions or concerns regarding this request, please contact me at (248) 698-3300 ext. 117.

**CHARTER TOWNSHIP OF WHITE LAKE
OAKLAND COUNTY, MICHIGAN
RESOLUTION NO. 22-024**

**RESOLUTION OF THE TOWNSHIP BOARD OF THE CHARTER TOWNSHIP OF
WHITE LAKE, TENTATIVELY DECLARING ITS INTENTION TO ESTABLISH A
SPECIAL ASSESSMENT DISTRICT TO BE KNOWN AS
EMERGENCY SEWER HOOK-UP 2022-02**

At the regular meeting of the Township Board of the Charter Township of White Lake, County of Oakland, State of Michigan, held in the Township Annex, 7527 Highland Road, in accordance with the Open Meetings Act, Public Act 267 of 1976 as amended, on the 19th day of July, 2022 at 7:00 p.m. with those present and absent being:

PRESENT:

ABSENT:

The following preamble and resolution were offered by XXXXXX and seconded by XXXXXX.

WHEREAS, Section 3 of Act 188 of the Public Acts of Michigan of 1954, as amended (“Act 188”), provides that the Township Board may proceed and exercise the powers granted by Act 188 unless written objections to the proposed public improvement are filed at or before the public hearing with the Township Board by the record owners of land constituting more than 20% of the total land area in the proposed special assessment district; and

WHEREAS, the Township had numerous requests for connections to the Townships sewer systems from property owners of residential structures with failing septic systems or septic systems in imminent danger of failing; and

WHEREAS, the Township has determined that it is necessary for the protection of the health, safety and welfare of the public to expedite connections of residential structures with failing septic systems or septic systems in imminent danger of failing to the Township sewer systems; and

WHEREAS, the Township has determined that in order to expedite such connections, the Township will fund the cost for such connections in anticipation of collections from a special assessment district established for that purpose; and

WHEREAS, Act 188 provides the means to defray the cost of the Improvements by special assessments against properties benefited by the Improvements; and

WHEREAS, the Township Board has determined that the properties intended to be specially assessed are benefited by the Improvements.

Intention Resolution

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The Township Board intends to proceed with the Improvements pursuant to Act 188.
2. The preliminary plans showing the Improvements, their location, and an estimate of cost thereof have been obtained by the Township and have been filed with the Township Clerk.
3. The Township Board tentatively designates the Special Assessment District known as "Emergency Sewer Connections 2022-01" ("the District") consisting of certain parcels of land, the descriptions of which are set forth in the Notice of Hearing attached as **Exhibit A**, which descriptions are incorporated by reference, and against which parcels all or a portion of the cost of the improvement shall be assessed.
4. The Township Board shall hold a public hearing at the regular meeting of the Township Board on the 16th day of August 2022, at 7:00 p.m. in the Township Annex, located at 7527 Highland Road, White Lake, Michigan, 48383 to hear and consider objections to the proposed Improvements and to all other matters relating to the Improvements.
5. The Township Clerk is directed to publish the Notice of Hearing, attached as **Exhibit B**, in a newspaper circulating in the Township as required by Act 188 and to provide the notice by first class mail addressed to the record owner or party in interest of each parcel in the District.
6. All actions heretofore taken by Township officials, employees, and agents with respect to the Improvements and proceedings under Act 188 are hereby ratified and confirmed.

A vote on the foregoing resolution was taken and was as follows:

- Ayes:
- Nays:
- Absent:

THE RESOLUTION WAS ADOPTED BY ____.

Intention Resolution

Page 3

STATE OF MICHIGAN)
)ss
COUNTY OF OAKLAND)

I, the undersigned, the Clerk of the Charter Township of White Lake, County of Oakland, State of Michigan, do hereby certify that the foregoing is a true and correct copy of a resolution adopted at a regular meeting of the Township Board of said Township held on July 19, 2022, the original of which resolution is on file in my office. I further certify that notice of said meeting was given in accordance with the provisions of the Open Meetings Act, as amended.

IN WITNESS WHEREOF, I have hereunto affixed my official signature this 19th day of July, 2022.

Anthony L. Noble, Clerk
Charter Township of White Lake

Intention Resolution

EXHIBIT A

9140 Gale Road
1266 Castlewood Dr

12-11-426-008
12-34-329-040

Intention Resolution

EXHIBIT B

**CHARTER TOWNSHIP OF WHITE LAKE
COUNTY OF OAKLAND, MICHIGAN**

NOTICE OF PUBLIC HEARING

EMERGENCY SEWER CONNECTIONS 2022-02

NOTICE IS HEREBY GIVEN that the Township Board of the Charter Township of White Lake, Oakland County, Michigan, has determined to undertake certain improvements to the sanitary sewer system ("the Improvements") located within a special assessment district tentatively designated as Emergency Sewer Connections 2022-02 (the "District"), pursuant to Act 188 of the Public Acts of Michigan of 1954, MCL 41.721 *et seq.*, as amended ("Act 188").

DESCRIPTION OF PROPOSED SPECIAL ASSESSMENT DISTRICT

The Township Board has tentatively determined that all or part of the cost of said Improvements shall be specially assessed against each of the following described lots and parcels of land benefited by the Improvements and which together comprise the following proposed special assessment district:

EMERGENCY SEWER CONNECTIONS 2022-02

Address and parcels numbered:

Address	Parcel No.	Owner
9140 Gale Rd.	12-11-426-008	Darren Behmlander
1266 Castlewood Dr	12-34-329-040	Michael McFadden

TAKE NOTICE that the Township Board of the Charter Township of White Lake will hold a public hearing at a regular meeting of the Township Board on **August 16, 2022 at 7:00 p.m.**, at the White Lake Township Annex, 7527 Highland Road, White Lake, Michigan 48383 to hear and consider any objections to the proposed Improvements, the District and all other matters relating to said Improvements and the District.

Intention Resolution

TAKE FURTHER NOTICE that the Township Board of the Charter Township of White Lake has initiated these special assessment proceedings pursuant to Section 3 of Act 188, MCL 41.723, on the Township Board's own initiative, and that the Township Board may proceed with the proposed Improvements unless written objections to the Improvements are filed with the Township Board at or before the public hearing by the record owners of land constituting more than 20% of the total land area in the proposed special assessment district. MCL 41.723(1)(a).

TAKE FURTHER NOTICE that preliminary plans and estimates of cost for the Improvements are on file with the Township Clerk for public examination. Periodic redetermination of cost may be necessary without a change in the special assessment district. In such cases, redeterminations may be made without further notice to record owners or parties in interest in the property.

This Notice was authorized by the Township Board of the Charter Township of White Lake.

Anthony L. Noble, Clerk
Charter Township of White Lake

Rik Kowall, Supervisor
Anthony Noble, Clerk
Mike Roman, Treasurer



Trustees
Scott Ruggles
Michael Powell
Andrea C. Voorheis
Liz Fessler Smith

WHITE LAKE TOWNSHIP DEPARTMENT OF PUBLIC SERVICES

7525 Highland Road , White Lake, Michigan 48383-2900, (248) 698-3300 Ext 8, www.whitelaketwp.com

July 1, 2022

Honorable Board of Trustees
Charter Township of White Lake
7525 Highland Road
White Lake, MI 48383

RE: Peerless Midwest Well Maintenance One Year Contract Extension

Honorable Board of Trustees,

Oakland County has issued a one-year contract extension to Peerless Midwest for well and pump maintenance and repair with no increase in unit pricing.

In 2018, Peerless extended the Oakland County contract unit pricing which was approved at the February 20, 2018 Board of Trustees meeting not to exceed \$400,000. Once again Peerless Midwest has offered to extend the Oakland County contract pricing to White Lake for the extension.

An executive summary of our activities over the last four years through this contract are attached. A complete report of well and pump maintenance and repair may be viewed in DPS.

DPS requests the Board of Trustees approve a one-year extension of our Peerless Midwest contract not to exceed \$100,000.

Please feel free to call with any questions.

Sincerely,

A handwritten signature in black ink that reads 'Aaron Potter'.

Aaron D. Potter
Director, Dept. of Public Services
Charter Township of White Lake

2018



RECEIVED

MAR 12 2018

WHITE LAKE TOWNSHIP
CLERK'S OFFICE

March 9, 2018

White Lake Township
7525 Highland Road
White Lake, Mi 48383

Attn.: Mr. Aaron Potter
Superintendent

RE: Contract

Dear Aaron:

Enclosed please find the executed contract. We look forward to serving you

Very truly yours,

PEERLESS-MIDWEST, INC.

Michael J. Williams

MJW/rlk

2018

EXHIBIT A

35 Pages



OAKLAND COUNTY EXECUTIVE, L. BROOKS PATTERSON

COMPLIANCE OFFICE
PURCHASING

Compliance Office | Purchasing
248-868-0511 | purchasing@oakgov.com

Buyer: EJT

CONTRACT NUMBER: 005260

Event # 004119 B

CONTRACT between the COUNTY OF OAKLAND and CONTRACTOR

Not To Exceed Amount: \$700,000.00		Effective Date: 1/1/2018	Expiration Date: 12/31/2021
Contract Description:	WRC Well Maint Serv--M		
Contractor Information:		Contract Administrator:	
PEERLESS MIDWEST INC 55860 Russell Industrial Pkwy Mishawaka, IN 46545 Vendor No: 612			
Compliance Office Purchasing Information:		Contract Administrator Oakland County Using Department:	
Buyer: Edward Tucker OAKLAND COUNTY 2100 Pontiac Lake Rd Bldg 41W Waterford, MI 48328-0462 248-858-0511 purchasing@oakgov.com		Steven Korth Manager Water Resources Commissioner One Public Works Drive 95 W Waterford MI 48328-1907 korths@oakgov.com	

The Parties agree to the attached terms and conditions:

FOR THE CONTRACTOR:

SIGN: Michael J Williams
Michael J Williams (Dec 19, 2017)

FOR THE COUNTY:

SIGN: Steven Korth
Steven Korth (Dec 19, 2017)

Contract Administrator

CLA

SIGN: Scott N. Guzy
Scott N. Guzy (Dec 19, 2017)

Pamela L. Welpert, CPA, CIA, Compliance Officer
or

Scott N. Guzy, CPPO, MBA, Purchasing Admin

2018-2022
NOT TO EXCEED \$400,000.00

WELL MAINTENANCE AND SERVICE AGREEMENT
AN AGREEMENT BETWEEN THE CHARTER TOWNSHIP OF WHITE LAKE AND PEERLESS
MIDWEST INC.

THIS AGREEMENT is made between Peerless Midwest Inc. ("Contractor"), a private - cCorporation, with offices located at 55860 Russell Industrial Pkwy, Mishawaka, IN 46545, and the Township of White Lake ("Township"), a Michigan municipal corporation, with offices at 7525 Highland Rd, White Lake, MI 48383. In this Agreement, the Contractor and the Township may be referred to individually as "Party" or jointly as "Parties".

WHEREAS, the Contractor agrees to extend to the Township a Cooperative Purchasing Program under Contract No. 005260 (copy attached as Exhibit A) between the Contractor and Oakland County, Michigan ("County"), a Michigan municipal corporation, with offices located at 1 Public Works Drive 95 W, Waterford, MI 48328.

WHEREAS, the Contractor agrees to extend to the Township unit pricing contained in Contract 005260 as set forth in Exhibit B.

WHEREAS, the Contractor agrees to extend to the Township the effective dates contained in County Contract 005260.

IN CONSIDERATION, of the mutual promises, obligations, representations, and assurances in this Agreement, the Parties agree as follows:

1. The purpose of this Agreement is to create a blanket contract with the Contractor for service and repair of the Township's municipal wells and pumps.
2. The Contractor shall extend to the Township the terms, services, protections, conditions, and unit pricing (collectively, the "terms") contained in Contract 005260 between Contractor and the County as if the Township was the County under Contract 005260, substituting the Township in place of the County. Such terms include, but are not limited to, all warranties, indemnification and insurance protections under Contract 005260. The Contractor specifically agrees that the Township shall have the same rights, privileges and protections as provided under Sections 6.13 through 6.16, Section 7.1, 7.2 (no indemnity from Township), Section 8 (the Township shall be covered as an additional insured on all such insurance policies), Section 10.5 and Section 10.13 of Contract 005260. If the terms of this Agreement conflict with the terms of Contract 005260, the terms of this Agreement shall control.
3. All work performed under this Agreement will be at the direction of the Township.
4. Goods and services under this Agreement shall be provided on an as-needed basis and only at the request of the Township.
5. The effective dates of this Agreement shall be from this date, 3-08-2018 until 12-31-2021. This Agreement may be terminated as provided in Contract 005260.

- 6. This Agreement contains a Not to Exceed Maximum of \$400,000 aggregate for the duration of the Agreement.
- 7. Each Party shall comply with all federal, state, and local ordinances, regulations, administrative rules, and requirements applicable to its activities performed under this Agreement. Contractor is an independent contractor.
- 8. All work under this Agreement shall comply with Township standards.

For and in consideration of the mutual promises and representations set forth in this Agreement between the Contractor and the Township, the undersigned execute this Agreement on behalf of the Contractor and the Township, and by doing so legally obligate and bind the Contractor and the Township to the terms and conditions of this Agreement.

State of: Michigan
 County : Cass County

Robin Keavy
 Notary: Robin Keavy
 Expires: 7/5/2021 Date: 03.08.2018

PEERLESS MIDWEST INC.

By: Michael J. Williams
 Michael J. Williams, Deputy General Manager

TOWNSHIP OF WHITE LAKE

Date: 3/12/2018 By: Rik Kowall
 Rik Kowall, Township Supervisor

TOWNSHIP OF WHITE LAKE

Date: 3/12/18 By: Terrence E. Lilley
 Terrence Lilley, Township Clerk

54955:00001:3547931-1



OAKLAND COUNTY EXECUTIVE DAVID COULTER

Purchasing
(248) 858-0511 | purchasing@oakgov.com

Water Resources Commissioner

EJT

AMENDMENT OF CONTRACT 005260

AMENDMENT 02

AMENDMENT DATE: October 28, 2021

This AMENDMENT OF CONTRACT (hereafter this "Amendment") is made and entered into by and between the Contractor named and identified below, (hereafter "Contractor") and the COUNTY OF OAKLAND (hereafter "County") whose address is 2100 Pontiac Lake Rd, Waterford, MI 48328.

CONTRACTOR	ADDRESS
PEERLESS MIDWEST INC	55860 RUSSELL INDUSTRIAL PKWY
Vendor: 612	MISHAWAKA IN 46545

The County and Contractor agree and acknowledge that the purpose of this Amendment is to modify as provided herein and otherwise continue the present contractual relationship between the Parties as described in their current contract with the same contract number as above.

In consideration of the extension of the mutual promises, representations, assurances, agreements, and provisions in the Contract and this Amendment, the adequacy of which is hereby acknowledged by the Parties, the County and Contractor hereby agrees to amend the current Contract as follows:

- 1.0 The County and Contractor agree that any and all defined words or phrases in the current Contract between the parties will apply equally to and throughout the amendment.
- 2.0 The Parties agree that any and all other terms and conditions set forth in the current Contract between the Parties shall remain in full force and effect and shall not be modified, excepted, diminished, or otherwise changed or altered by this Amendment except as otherwise expressly provided for in this Amendment.
- 3.0 Description of Change:

Extend contract expiration date from 12/31/2021 to 12/31/2023

Add \$330,000.00 to the contract Not to Exceed (NTE) amount. The contract NTE will change from \$700,000.00 to \$1,030,000.00.



OAKLAND COUNTY EXECUTIVE DAVID COULTER

Purchasing

(248) 858-0511 | purchasing@oakgov.com

For and in consideration of the mutual assurances, promises, acknowledgments, warrants, representations, and agreements set forth in the Contract and this Amendment, and for other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, the undersigned hereby execute this Amendment on behalf of the County, and Contractor and by doing so legally obligate and bind the County and Contractor to the terms and conditions of the Contract and this Amendment.

THE CONTRACTOR:

SIGN / DATE: Cathy Lance
Cathy Lance (Oct 28, 2021 08:49 EDT)

PEERLESS MIDWEST INC

THE COUNTY OF OAKLAND:

SIGN / DATE: Scott N. Guzzy
Scott N. Guzzy (Oct 28, 2021 09:01 EDT)

Scott N. Guzzy, CPPO, MBA, Purchasing Administrator

CLA

Vendor Code Post Date	Vendor Name Activity	Inv/Check #	Description	Invoice Amt	Check Amt
PEERL	PEERLESS MIDWEST INC.				
04/25/2018	INVOICE	55232	ANNUAL WELL & PUMP TESTING AND SERVICE (7)	1,785.00	
04/27/2018	CHECK	WAT 6431			1,785.00
05/18/2018	INVOICE	55524	PULL AND INSPECT VILLAGE ACRES WELL #2 PUM	7,200.00	
05/18/2018	CHECK	WAT 6448			7,200.00
07/20/2018	INVOICE	56086	VILLAGE ACRES WELL 1-PULL, OVERHAUL, REINS	28,792.50	
07/20/2018	INVOICE	56067	VILLAGE ACRES WELL 1-DBLE DISC SURGE BLOCK	12,516.00	
07/20/2018	CHECK	WAT 6508			41,308.50
03/28/2019	INVOICE	471677	OVERHAUL ASPEN MEADOWS #2 WELL PUMP & MOTO	41,078.00	
03/29/2019	CHECK	WAT 6723			41,078.00
05/16/2019	INVOICE	476508	PULL OVERHAUL AND REINSTALL PUMP/MOTOR	22,108.62	
05/16/2019	CHECK	WAT 6756			22,108.62
07/11/2019	INVOICE	481946	TEST AND SERVICE (7) WELLS AND PUMPS	1,916.25	
07/11/2019	CHECK	WAT 6797			1,916.25
04/16/2020	INVOICE	505284	PULL OVERHAUL, REINSTALL PUMP AND MOTOR	24,000.00	
04/21/2020	CHECK	WAT 7053			24,000.00
06/18/2020	INVOICE	509402	NEW VSEM 40HP INVERTER DUTY RATED VHS MOTO	8,458.00	
06/18/2020	INVOICE	505468	SHOCK CHLORINATION AT LIBRARY SITE	220.00	
06/18/2020	CHECK	WAT 7096			8,458.00
06/18/2020	CHECK	GEN 85468			220.00
09/29/2020	INVOICE	516805-REVISED	ANNUAL TESTING & MTCE ON WELL & PUMP	2,231.25	
10/01/2020	CHECK	WAT 7197			2,231.25
04/16/2021	INVOICE	60119	VILLAGE ACRES #3-PULL OVERHAUL & REINSTALL	38,648.00	
04/16/2021	INVOICE	60118	VILLAGE ACRES #2-PULL OVERHAUL & REINSTALL	32,240.00	
04/16/2021	CHECK	WAT 7346			70,888.00
07/08/2021	INVOICE	61402	WEXFORD MANOR HYDRANT REPAIR	3,200.00	
07/08/2021	CHECK	GEN 87838			3,200.00
08/25/2021	INVOICE	62267	SUBURBAN KNOLLS WELL #2 ABANDONMENT	5,907.11	
08/25/2021	INVOICE	62266	SUBURBAN KNOLLS WELL #1 ABANDONMENT	7,097.65	
08/25/2021	INVOICE	62268	TWIN LAKES #2 ABANDONMENT	5,614.27	
08/26/2021	CHECK	WAT 7443	VOID (Orig Amt \$18,619.03)		
08/26/2021	CHECK	WAT 7449			18,619.03
11/10/2021	INVOICE	63424	GRASS LK WELL AND PUMP INSPECTION	350.00	
11/10/2021	INVOICE	63423	GRASS LK INSPECT AND LOCATE EXISTING TRANS	600.00	
11/10/2021	CHECK	TNA 14550			950.00
02/23/2022	INVOICE	64174	ANNUAL MAINT TESTING ON 5 WELLS	3,625.00	
02/24/2022	CHECK	WAT 7607			3,625.00
05/05/2022	INVOICE	66344	WELL ABANDONMENT/BAGY PARCEL	3,731.65	
05/05/2022	INVOICE	66343	WEXFORD WELL ABANDONMENT	4,960.15	
05/05/2022	CHECK	GEN 89779			4,960.15
05/05/2022	CHECK	GEN 89797			3,731.65
Total:				256,279.45	256,279.45
Net of 22 Invoices / 18 Checks					
Grand Total 22 invoices and 18 checks f				256,279.45	256,279.45


INTEROFFICE MEMORANDUM WHITE LAKE TOWNSHIP

Rik Kowall, Supervisor
Anthony L. Noble, Clerk
Mike Roman, Treasurer

Trustees
Scott Ruggles
Liz Fessler Smith
Andrea C. Voorheis
Michael Powell



OFFICE OF THE CLERK

TO: Board of Trustees
FROM: Anthony L. Noble 
SUBJECT: Introduction of Fee Ordinance #129 Amendment/First Reading
DATE: July 19, 2022

Recently Treasurer Roman and Township Attorney Hamameh determined that the non-sufficient fund (NSF) fee as listed in our ordinance was not consistent with current statute. I am therefore requesting this amendment to Ordinance #129 to keep our fee in line with statutory requirements.

The current charge is set at \$50 for NSF checks. According to Attorney Hamameh we should not be charging this much as the statute requires the Township to send a five-day bad check notice, utilizing the form in the statute. If the person responds and makes good on the check within seven days from date of mailing the five-day notice, they only have to pay a fee of \$25. The fee increases to \$35 if the check isn't cleared within 7 days, but is cleared within 30 days. Beyond 30 days, the Township may file a civil complaint against the maker, and if found responsible the penalty increases to all of the following: the amount of check; civil damages of twice the amount of the check or \$100, whichever is greater; and costs in the amount of \$250.

Based on this guideline Attorney Hamameh recommended instead of a set fee, we change the NSF line to read: "maximum permitted by law". This will ensure we maintain compliance and do not have to introduce and adopt our ordinance anytime this amount changes.

This conflict with statute only came to light after the Fee Ordinance was submitted last month for adoption which is why it was not included in the changes adopted last month. In addition to this amendment request, I want to let you all know that the Clerk's Office is working with the Law Department to modernizing this process. Currently, this arduous process is repeated multiple times a year due to situations just like this so when my deputy came to me several months ago with research, he had been doing to reduce the number of times we introduce and adopt fee ordinance amendments throughout the year, I was excited to look into updating the process as this past practice comes at a significant cost in dollars as well as man hours. We are working to bring before you a simplified process for our fee ordinance and I am happy to report that we will have a proposal for your review in the not too distant future.

**CHARTER TOWNSHIP OF WHITE LAKE
AN ORDINANCE TO AMEND SECTIONS 30 OF
ORDINANCE NO. 129, WHITE LAKE TOWNSHIP FEE ORDINANCE.**

THE CHARTER TOWNSHIP OF WHITE LAKE ORDAINS:

ARTICLE 1: AMENDMENT.

Section 30– Treasurer’s Office of Ordinance No. 129, The Fee Ordinance is hereby amended as follows:

SECTION 30 – TREASURER’S OFFICE

- A. Maps/Photographs/Copies
 - a. Township Map\$ 5.00
 - b. Zoning Map.....\$ 5.00
 - c. 8x14 and 11x14 Copies per page (no charge until \$5.00 or more\$ 10
 - d. Large Format Plotts 24” x 36”
 - Black and White.....\$3.50
 - Color\$6.00
 - e. Miscellaneous Copies per page (no charge until \$5.00 or more)\$.10
 - f. Labels per sheet.....\$1.00
 - g. Master Plan on digital media\$10.00

- B. Historical Society Remembrance Book \$35.00
- ~~C. Non-Sufficient Funds Return Check Fee\$50.00~~
- C. Non-Sufficient Funds Returned Check Fee(maximum permitted by law)
- E. Trailer Tax (per unit occupied) \$3.00
- F. Dog License
 - a. Spayed/Neutered\$ 15.00
 - b. Not Spayed/Neutered\$25.00
 - c. Senior Citizen Dog Spayed/Neutered\$ 14.00
 - d. Senior Citizen Dog Not Spayed/Neutered\$23.00
 - e. Non-resident administrative fee\$ 5.00
 - f. Delinquent License (after June 1)\$40.00
- G. Community Hall Rental\$200.00
 - a. Refundable security deposit.....\$200.00
 - b. Cancellation Fee (at least 1 week prior to event).....\$50.00
 - c. Art Classes/Activities (plus \$20.00 refundable key deposit).....\$25.00

- ARTICLE 2: SEVERABILITY.**
- ARTICLE 3: EFFECTIVE DATE.**
- ARTICLE 4: REPEALER.**
- ARTICLE 5: ADOPTION.**

GALE ISLAND LOTS – RIGHT OF FIRT REFUSAL

07-19-2022

Dear Board Members:

The following list of properties on Gale Island have been tax foreclosed by Oakland County.

No third-party claims have been made on these parcels, and White Lake Twp. can now exercise its right of first refusal on these parcels.

Please see the attached list of parcels as well as the purchase prices.

The total cost to purchase all 8 parcels comes to \$281,240.62

Please know that by purchasing these lots, we will recoup the \$153,238 spent on demolition and clean up on five of these lots.

Also please see the attached Resolution which must be approved in order to move forward.

Respectfully Yours,

Mike Roman

Treasurer – White Lake Twp.

Mike Roman

From: Kallabat, Zinnia Christine <kallabatz@oakgov.com>
Sent: Thursday, July 7, 2022 12:29 PM
To: Mike Roman
Cc: Lisa J. Hamameh; Rik Kowall; Anthony Noble
Subject: RE: Right of Refusal

Sounds good. Thanks for the update.

From: Mike Roman <MRoman@whitelaketwp.com>
Sent: Thursday, July 7, 2022 11:53 AM
To: Kallabat, Zinnia Christine <kallabatz@oakgov.com>
Cc: Lisa J. Hamameh <lhamameh@rsjalaw.com>; Rik Kowall <RKowall@whitelaketwp.com>; Anthony Noble <ANoble@whitelaketwp.com>
Subject: RE: Right of Refusal

CAUTION: This message is from a sender outside of the Oakland County organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Christine:

The resolution will come to our Board on July 19th.

Assuming approval of the resolution, I can mail or ACH money on July 20th.

Respectfully Yours,

Mike Roman

White Lake Twp. Treasurer
Phone: 248-698-3300 ext. 120
Email: Mroman@whitelaketwp.com

From: Kallabat, Zinnia Christine <kallabatz@oakgov.com>
Sent: Wednesday, July 6, 2022 4:47 PM
To: Mike Roman <MRoman@whitelaketwp.com>
Cc: Lisa J. Hamameh <lhamameh@rsjalaw.com>; Rik Kowall <RKowall@whitelaketwp.com>; Anthony Noble <ANoble@whitelaketwp.com>
Subject: RE: Right of Refusal

Good afternoon,

Now that the July 1st deadline for the Claims process has passed, we have the total amounts available by parcel based on your preference during Right of Refusal.

There were no claims made on the following properties you were interested in. Below are the properties with the amounts to purchase at minimum bid plus maintenance costs:

cvt	parcel #	Municipality Name	July amount	Maintenance cost	Total Amount due
Y	12-13-128-001	White Lake Township	\$5,829.15	\$25.00	\$5,854.15
Y	12-13-128-008	White Lake Township	\$46,102.07	\$25.00	\$46,127.07
Y	12-13-128-009	White Lake Township	\$908.31	\$25.00	\$933.31
Y	12-13-128-012	White Lake Township	\$55,815.49	\$25.00	\$55,840.49
Y	12-13-128-016	White Lake Township	\$52,779.47	\$25.00	\$52,804.47
Y	12-13-128-020	White Lake Township	\$60,851.99	\$25.00	\$60,876.99
Y	12-13-202-009	White Lake Township	\$5,558.42	\$25.00	\$5,583.42
Y	12-13-202-012	White Lake Township	\$53,195.72	\$25.00	\$53,220.72

Please let us know as soon as possible if you're still interested in the property as the land sale goes live this week. We'll also need to know when we can expect payment so we can be on the lookout for it.

Thanks!

Zinnia

From: Mike Roman <MRoman@whitelaketwp.com>
Sent: Thursday, June 16, 2022 11:33 AM
To: Kallabat, Zinnia Christine <kallabatz@oakgov.com>
Cc: Lisa J. Hamameh <lhamameh@rsjalaw.com>; Rik Kowall <RKowall@whitelaketwp.com>; Anthony Noble <ANoble@whitelaketwp.com>
Subject: RE: Right of Refusal

CAUTION: This message is from a sender outside of the Oakland County organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Christine:

White Lake Township intends to purchase the 8 parcels listed below and hi-lighted on the list attached.

Please let me know if you need any other information.

12-13-128-001
12-13-128-008
12-13-128-009
12-13-128-012
12-13-128-016
12-13-128-020
12-13-202-009
12-13-202-012

0.00 *
 5,854.15 +
 46,127.07 +
 933.31 +
 55,840.49 +
 52,804.47 +
 60,876.99 +
 5,583.42 +
 53,220.72 +
 281,240.62 *

**CHARTER TOWNSHIP OF WHITE LAKE
OAKLAND COUNTY, MICHIGAN
RESOLUTION NO. 22-025**

RESOLUTION APPROVING PURCHASE OF TAX FORECLOSED PROPERTY

At a regular meeting of the Township Board of the Charter Township of White Lake, Oakland County, Michigan, held in Township Annex, 7527 Highland Road, White Lake, Michigan, on the 19th day of July 2022, at 7:00 p.m. with those present and absent being,

PRESENT: _____

ABSENT: _____

The following preamble and resolution was offered by _____ and seconded by _____.

WHEREAS, the Township of White Lake (the “Township”) has received notice from the Oakland County Treasurer that certain properties within the Township have been foreclosed upon for unpaid property taxes, and that the redemption periods have expired without the properties having been redeemed; and

WHEREAS, under MCL 211.78m prior to public sale and following the State of Michigan, the Township has the right to purchase the foreclosed properties; and

WHEREAS, the following foreclosed properties have been identified as properties on which the Township has a recorded lien for dangerous building demolition costs in accordance with state law and township ordinance:

Parcel ID	Property Address	Assessed Value	Maximum Purchase Price
12-13-128-001		41,900	\$5,854.15
12-13-128-008		2,180	\$46,127.07
12-13-128-009		1,940	\$933.31
12-13-128-012	2525 GALE IS	41,790	\$55,840.49
12-13-128-016	2349 GALE IS	34,960	\$52,804.47
12-13-128-020	2335 GALE IS	50,630	\$60,876.99
12-13-202-009		39,680	\$5,583.42
12-13-202-012	2355 GALE IS	24,030	\$53,220.72

WHEREAS, acquiring the foreclosed properties is a public benefit because it will allow the Township to recover the costs expended to demolish the dangerous buildings formerly sited on the foreclosed properties; and

FIRST AMENDMENT EMPLOYMENT AGREEMENT

This Employment Agreement (the "Agreement") is made this 19th day of July, 2022, between the Township of White Lake (the "Township") and Aaron Potter (DPS Director).

The Township hereby desires to amend Aaron Potter; DPS Director, employment agreement and he hereby accepts such at-will employment in accordance with the terms and conditions of this Agreement.

1. Term. Employee's at-will employment under this Agreement shall commence on July 19th, 2022 (the "Effective Date") and shall continue up and until such time that either party exercise Section 6 of this Agreement.

2. Duties of DPS Director. Employee's duties are described on the attached job description which will be assigned by the Township Supervisor. These are general in nature and not exclusive. The Employee agrees to devote his full time, attention and best efforts to the performance of such duties. The Employee shall also perform such additional duties assigned by the Township, as are within the general realm of the DPS Director position with the Township as determined by the Township. **These additional responsibilities include the management and supervision of the Township's maintenance and custodial staff, in addition to managing the general township vehicle maintenance fleet.** The work schedule of the Employee shall normally be 8:00 a.m. to 4:30 p.m., or 8:30 a.m. to 5:00 p.m. Monday-Friday, however he will be required to respond to police emergencies or operational issues, as necessary, and attending board or committee meetings outside normal work hours, as directed by the Township Supervisor. The Township reserves the right to make adjustments to this provision as necessary.

3. Salary. Commencing with the Effective Date hereof, the Township agrees to pay the Employee a salary sufficient to provide the Employee annual compensation of \$ 102,901. The Employee shall be paid in equal installments, during the Township's regular payroll periods. The DPS Director is eligible for non-union increases approved by township board resolutions or motions.

4. Fringe Benefits. Commencing with the Effective Date hereof, the Township agrees to provide the Employee benefits as set forth in the White Lake Township Personnel and Procedure Manual. The Employee hereby acknowledges that these benefits which include: health insurance, paid time off, retirement benefits, and all other benefits are subject to adjustment and modification at the discretion of the White Lake Township Board of Trustees. Specifically, these include, but are not limited to: medical, dental, vision and group term life insurance. The Employee has been provided with a copy of the present benefits guide which are subject to change.

The Township will provide a 401 (A), which shall have immediate vesting, with an employer contribution of 9% and a mandatory employee contribution of 5%. No other pension benefits will be provided.

Additionally, for retirement purposes, the Employee is not entitled to retiree healthcare. Presently, the Township contributes \$100 per month to a healthcare savings plan. It has a 10-year vesting period.

Vacation time in his current contract will continue until year end. **Effective January 1, 2023 he will earn four (4) weeks' vacation annually at the beginning of each calendar year.**

Compensatory time may be earned not to exceed 40 hours in a calendar year. The DPS Director cannot utilize more than 40 hours of compensatory time per year. Time may be earned for after hour meetings and after work assignments. This time cannot be paid out if unused.

The Employee will also receive a cell phone issued by the Township. The Township reserves, however, the right to amend this and other benefits and may offer a stipend instead if the cell phone is discontinued at their discretion. **The employee will be allowed to take home a vehicle issued by the Township.**

5. Exempt. The position involved is an exempt position and is not entitled to overtime under the Fair Labor Standards Act.

6. At-Will Employee and Termination Without Cause. Employee shall serve at the pleasure of the Supervisor and Township. During his employment with the Township, the Employee acknowledges that this is an at-will appointment, and either the Township or Employee may terminate employment, with or without cause, at any time during the duration of this Agreement.

Upon termination of employment, the Employee shall return all documents, correspondence, files, papers or property of any kind, of all types of nature pertaining to the Township, which the Employee may have in his possession or control and a signed statement verifying return of all such property.

In the event the DPS Director is terminated for any reason other than for just cause the Township agrees to pay a lump sum cash payment equal to six (6) months compensation at the Department of Public Services Director's then current rate.

7. Performance Evaluation. The Township may conduct an evaluation of Employee's performance at its discretion. The evaluation shall be as determined by the Township Supervisor and/or Board of Trustees.

8. Arbitration. If a dispute arises concerning this Agreement or Employee's employment with the Employer, such dispute can be resolved only through binding arbitration pursuant to the terms of this arbitration provision. Within one hundred eighty (180) days of the event or occurrence which gives rise to the dispute, either Employee or the Employer may file a demand for arbitration with the American Arbitration Association ("AAA"). Such arbitration shall be conducted in accordance with AAA's labor and employment arbitration rules (except as modified herein). Such arbitration shall be heard by a single Michigan arbitrator. The determination of the arbitrator shall be binding upon both the Employer and Employee. All expenses, costs, administrative filing fees and arbitrator's fees shall be shared equally by the Employer and Employee. The parties further agree that they will comply with the terms of this arbitration provision and any award rendered by the arbitrator, and that a judgment of a court having jurisdiction may be entered upon the award as long as the arbitrator does not exceed their authority or jurisdiction. This arbitration agreement specifically includes, but is not limited to, statutory claims of employment discrimination.

9. Notices. All notices under this Agreement shall be given in writing.

10. Entire Agreement. This Agreement is the entire agreement of the parties and supersedes any prior written or oral understandings. No extrinsic or oral evidence may be used to modify, vary or construe its terms. No modification or waiver of any provision of this

Agreement shall be valid unless in writing and signed by the Employee, Township Supervisor and Township Clerk, upon prior authorization of the Township Board. Oral statements made by any representative or employee of the Township cannot alter the terms of this Agreement.

11. Reservation of Rights. This Agreement in no way limits, modifies or restricts the rights of the Township Supervisor or Board and all rights are specifically retained. No arbitrator has authority or jurisdiction to limit or alter in any way those rights.

12. Assignment. The Employee may not assign any of his rights or delegate any of his duties under this Agreement.

13. Severability. The provisions of this Agreement are severable, and if any provision of this Agreement shall be, for any reason, invalid or unenforceable, the remaining provisions shall nevertheless be valid, enforceable, and carried into effect.

14. Governing Law. This Agreement shall be governed by and interpreted under the laws of the State of Michigan.

15. Binding Effect. The rights and obligations of the parties shall accrue to the benefit of, and be binding upon, the parties and their respective heirs, executors, personal representatives and successors.

IN WITNESS WHEREOF, the undersigned have executed this Agreement on the day and date first above written.

WITNESS

WHITE LAKE TOWNSHIP

Human Resources Manager

Aaron Potter

Township Supervisor

Township Clerk

CHARTER TOWNSHIP OF WHITE LAKE

**JOB DESCRIPTION
DIRECTOR OF PUBLIC SERVICES**

**Exempt
Updated: July 1, 2022**

DEPARTMENT: Public Services

REPORTS TO: Township Supervisor

GENERAL STATEMENT OF DUTIES

Under the supervision of the Township Supervisor, the Director of Public Services is responsible for administrative, managerial and technical work in planning, organizing, direction and controlling all department operations; to assist in policy development and implementation, and the general management and control of the Department of Public Services. Responsible for operational planning; emergency response management and planning; formulating and administering departmental policies and procedures; oversight of contractual services; preparing specifications, bids and requests for proposals; assisting with departmental fiscal and budgetary matters and project recommendations and decisions of Public Service. Makes a variety of official contacts with contractors and government officials to plan, review, coordinate and facilitate departmental services.

EXAMPLES OF ESSENTIAL JOB FUNCTIONS

An employee in this classification may be called upon to do any or all of the following: (These examples do not include all of the tasks which the employee may be expected to perform. They are not to be limited to or intended to be an exhaustive list of all job duties to be performed by those within the classification)

- Determines work procedures, prepares work schedules, and expedites workflow.
- Assigns duties and examines work for exactness, neatness, and conformance to policies and procedures.
- Develops and implements special assessment districts (SAD) as necessary in cooperation with the Township Assessor and in accordance with the applicable laws.
- Oversees the preparation of engineering plans and specifications, bidding, competency of contractors and vendors, and the selection criteria for public works contracts.
- Oversees project management for the construction of public service projects including compliance with time and budget parameters for the project.
- Coordinates preparation and updates of the sanitary sewer, water, and storm drainage, system maps, GIS data base, and comprehensive plans.
- Oversees the maintenance of infrastructure and other records.
- Monitors inter-governmental actions affecting public services.
- Studies and standardizes public services department policies and procedures to improve efficiency and effectiveness of operations.
- Prepares and documents budget requests; oversees and administers adopted budget in public services department and ensures enterprise funds are managed appropriately.
- Plans, organizes, coordinates, supervises and evaluates programs, plans, services, staffing, equipment and infrastructure of the public services department.
- Evaluates public services department needs and formulates short and long range plans including transportation, street, water, sewer, drainage, facilities and park maintenance.

- Oversees public services department review of private project development plans for compliance with codes, regulations, and standards, adequacy of applications for permits and compliance with approved plans.
- Maintains regular contact with consulting engineers, construction project engineers, Township, County, State and Federal agencies, professional and technical groups and the general public regarding department activities and services.
- Develops programs, trains and supervises employees, including management and supervisory personnel performing the duties of maintenance, construction and repair of facilities.
- Enforces department work rules and regulations and labor contract provisions; assists in employee disciplinary proceedings. Maintains harmony amongst workers and resolves grievances.
- Supervision of all maintenance and custodial employees, part time and full time.
- Plans for and directs the annual maintenance and upkeep of township parks, grounds and facilities.
- Prepares bid specifications for various equipment, products and contracted services related to the ongoing maintenance and repair of facilities and grounds.
- Approves requisition of needed supplies for the department and maintains a variety of records relating to personnel, equipment and supplies.
- Advises Township Supervisor, attorney, engineer and other township officials in matters relating to department activities; provides information to various civic, school and public groups and individuals regarding department services.
- Ensures proper response to complaints regarding facilities, utilities and property maintenance including proper evaluation of the situation to determine cause of condition, corrective action needed, and potential for liability; provides an appropriate explanation of findings to property owners when required. Adjusts errors and complaints.
- Responsible for general maintenance and of all general township vehicles.
- Develops programs for the safety of maintenance workers and equipment operators; instructs appropriate individuals in proper safety procedures.
- Motivates and evaluates personnel; acts as a liaison between department staff and other management personnel.
- All other duties as assigned.

MINIMUM QUALIFICATIONS

- Bachelor's Degree in public administration, business, finance, accounting engineering or related field preferred. Five (5) years or more of supervisory experience in a related field will be accepted in lieu of a Bachelor's degree.
- Possession of a valid Michigan driver's license.
- S1 and/or S2 water distribution licenses desired. Candidate not currently possessing these licenses will be required to obtain them within two years from date of hire in order to maintain employment.
- D-2 certification for water treatment required.
- Experience with Civil Engineering and Construction desired.
- At least four (4) years of practical experience in administration.

- Demonstrated knowledge of work methods, procedures, and financial aspects of DPS activities, such as budgeting, personnel, purchasing, organizational principles, management techniques and presentations.
- At least three (3) years in a management level position in an environment working with the public.
- Strong oral, written and interpersonal communication skills.
- Demonstrated organizational skills and the ability to prioritize multiple tasks.
- Proficient in Excel, and MS Word and Outlook.

KNOWLEDGE/SKILLS

- Considerable knowledge of civil engineering principles, practices and methods as applicable to a municipal setting; thorough knowledge of applicable Township policies, laws, and regulations affecting division activities.
- Ability to guide, direct and motivate employees; ability to organize and supervise the activities of various crews performing construction and maintenance work; ability to communicate effectively, verbally and in writing; ability to establish and maintain effective working relationships with employees, other departments and the public.
- Familiarity with Township government, ordinance policies and procedures.
- Familiarity with departmental policies and procedures.
- Familiarity with applicable Michigan laws, case law, Rules and Regulations.
- Familiarity with computer operations utilizing a variety of software.

WORKING CONDITIONS AND PHYSICAL DEMANDS

- The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.
- While performing the duties of this job, the employee is regularly required to use hands and fingers to handle, feel or operate objects, tools or controls and reach with hands and arms. The employee frequently is required to stand and talk or hear. The employee is regularly required to walk, sit, climb or balance, stoop, kneel, crouch or crawl and smell.
- The employee must regularly lift and/or move up to 50 – 75 pounds. Specific vision abilities required by this job include close vision, distance vision, peripheral vision, depth perception and the ability to adjust focus.