

**TYRONE TOWNSHIP  
REGULAR BOARD MEETING AGENDA  
DECEMBER 21, 2021 – 7:00 P.M.  
(810) 629-8631  
clerk@tyronetownship.us**

Board members will meet in person at the township hall. Residents are welcome to join either in person or via Zoom. Zoom details follow this agenda.

**CALL TO ORDER – PLEDGE OF ALLEGIANCE – 7:00 P.M.**

**ROLL CALL**

**APPROVAL OF AGENDA – OR CHANGES**

**APPROVAL OF CONSENT AGENDA**

Regular Board Meeting Minutes – December 7, 2021

Treasurer’s Report – November 30, 2021

Clerk’s Warrants and Bills – December 15, 2021

**COMMUNICATIONS**

1. Planning Commission Meeting Synopsis – December 14, 2021
2. Fire Service Run – December 15, 2021

**PUBLIC REMARKS**

**UNFINISHED BUSINESS**

**NEW BUSINESS**

1. Lake Urban Crossings PUD Preliminary Site Plan.

**MISCELLANEOUS BUSINESS**

**PUBLIC REMARKS**

**ADJOURNMENT**

\*\*\*\*\*

**Supervisor Mike Cunningham    Clerk Marcie Husted**

Please note: The Public Remarks section appears twice on the agenda - once after Communications and once before Adjournment. Anyone wishing to address the Township Board may do so at these times. The Tyrone Township Board of Trustees has established a policy limiting the time a person may address the Township Board at a regular or at a special meeting during the Public Remarks section of the agenda to three minutes. The Board reserves the right to place an issue under the New Business section of the agenda if additional discussion is warranted or to respond later either verbally or in writing through an appropriately appointed Township Official. - Individuals with disabilities requiring auxiliary aids or services should contact the Tyrone Township Clerk at (810) 629-8631 at least seven days prior to the meeting.

## Join Zoom Meeting

<https://us02web.zoom.us/j/89357770331?pwd=dFhiZTIQZ0wvVHgzaW1DSXl5d0YxZz09>

Meeting ID: 893 5777 0331

Passcode: 558570

One tap mobile

+13126266799,,89357770331#,,,,\*558570# US (Chicago)

+16465588656,,89357770331#,,,,\*558570# US (New York)

Dial by your location

+1 312 626 6799 US (Chicago)

+1 646 558 8656 US (New York)

+1 301 715 8592 US (Washington DC)

+1 346 248 7799 US (Houston)

+1 669 900 9128 US (San Jose)

+1 253 215 8782 US (Tacoma)

Meeting ID: 893 5777 0331

Passcode: 558570

Find your local number: <https://us02web.zoom.us/u/kccipo97pI>

# **CONSENT AGENDA**

Regular Board Meeting Minutes – December 7, 2021

Treasurer's Report – November 30, 2021

Clerk's Warrants and Bills – December 15, 2021

**TYRONE TOWNSHIP  
REGULAR BOARD MEETING  
APPROVED MINUTES – DECEMBER 7, 2021 – PAGE 1**

**CALL TO ORDER**

Supervisor Cunningham called the meeting of the Tyrone Township Board to order with the Pledge of Allegiance on December 7, 2021 at 7:00 p.m. at the Tyrone Township Hall.

**ROLL CALL**

Present: Supervisor Mike Cunningham, Clerk Marcella Husted, Treasurer Jennifer Eden, Trustees Herman Ferguson, Kurt Schulze, Zach Tucker and David Walker.

**APPROVAL OF AGENDA – OR CHANGES**

Trustee Walker moved to approve the agenda as presented. (Trustee Tucker seconded.) The motion carried; all ayes.

**APPROVAL OF CONSENT AGENDA**

**Regular Board Meeting Minutes - November 2, 2021**

**Treasurer's Report - October 31, 2021**

**Clerk's Warrants and Bills – November 30, 2021**

Trustee Walker moved to approve the consent agenda as presented. (Trustee Ferguson seconded.) The motion carried; all ayes.

**COMMUNICATIONS**

1. Letter from Greg Duberg- November 3, 2021
2. Livingston County Sheriff's Report – October 31, 2021
3. Hartland Senior Center Annual Report 2021
4. Fire Service Report
5. Planning Commission Special Meeting Synopsis-November 30, 2021
6. Planning Commission Approved Meeting Minutes- June 8, 2021
7. Planning Commission Approved Meeting Minutes- July 13, 2021
8. Livingston County Sheriff's Report- November 30, 2021

Trustee Walker moved to receive and place on file Communications #1-8 as presented. (Trustee Ferguson seconded.) The motion carried; all ayes.

**PUBLIC REMARKS**

Don Peitz reminded everyone it was Pearl Harbor Remembrance Day.

**UNFINISHED BUSINESS**

None.

**NEW BUSINESS**

1. Treasurer's request to attend the MMTA Winter Workshop.

Trustee Walker moved to approve the Treasurer's request to attend the Michigan Municipal Treasurers Association (MMTA). (Trustee Tucker seconded.) The motion carried; all ayes.



**TYRONE TOWNSHIP  
REGULAR BOARD MEETING  
APPROVED MINUTES – DECEMBER 7, 2021 – PAGE 2**

**2. Resolution to authorize negotiating for summer tax collection with schools.**

RESOLUTION #211201  
TYRONE TOWNSHIP, LIVINGSTON COUNTY

TO AUTHORIZE NEGOTIATING FOR  
SUMMER TAX COLLECTION WITH SCHOOLS

WHEREAS, Act 333, Public Acts of Michigan, 1982, provides that townships may negotiate the collection of summer property taxes upon request of the local school districts; and

WHEREAS, in previous years school districts within the boundaries of Tyrone Township have requested one-half or all of the tax levy;

WHEREAS, school districts within the boundaries of Tyrone Township have indicated they will request one-half or all of the 2022 tax levy, including debt services; and

WHEREAS, the 2022 summer property tax collection shall not be an additional expense to Tyrone Township;

NOW, THEREFORE, BE IT RESOLVED THAT:

1. The negotiations for the collection of the 2022 summer school tax, as certified by school districts within Tyrone Township, are authorized.
2. The Supervisor, Mike Cunningham, and Treasurer, Jennifer Eden, are authorized and directed to negotiate on behalf of Tyrone Township.
3. These taxes will be levied commencing July 1, 2022.
4. Should an agreement not be determined to cover reasonable expenses, Tyrone Township will not be responsible for the collection of the above tax.

RESOLVED BY: Trustee Walker  
SUPPORTED BY: Trustee Tucker

VOTE: Walker, yes; Schulze, yes; Ferguson, yes; Tucker, yes; Cunningham, yes; Eden, yes; Husted, yes.

ADOPTION DATE: December 7, 2021

**TYRONE TOWNSHIP  
REGULAR BOARD MEETING  
APPROVED MINUTES – DECEMBER 7, 2021 – PAGE 3**

**CERTIFICATION OF THE CLERK**

The undersigned, being the duly qualified and acting Clerk of Tyrone Township, Livingston County, Michigan, hereby certifies that (1) the foregoing is a true and complete copy of a resolution adopted by the Township Board at a regular meeting, held on December 7, 2021, at which meeting a quorum was present and remained throughout, (2) the original thereof is on file in the records in my office, (3) the meeting was conducted, and public notice thereof was given, pursuant to and in full compliance with the Open Meetings Act (Act No. 267, Public Acts of Michigan, 1976, as amended) and (4) minutes of such meeting were kept and will be or have been made available as required thereby.



\_\_\_\_\_  
Marcella Husted  
Tyrone Township Clerk

**3. Sewer rates for 2022.**

Trustee Walker moved to accept the Livingston Regional Sanitary Sewer rates for 2022 as presented. (Trustee Schulze seconded.) The motion carried; all ayes. The rates were presented as follows:

	<b><u>2021 Rates</u></b>
Readiness to Serve	\$52.00 per month/connection
Grinder Surcharge	\$20.00 per month per grinder
Flow Rate	\$4.16 per 1000 gallons
	<b><u>2022 Rates</u></b>
Readiness to Serve	\$25.79 per month (\$77.36 per quarter) per Residential Equivalent Unit (REU)
Grinder Surcharge	\$20.00 per month per grinder
Flow Rate	\$4.16 per 1000 gallons

**4. Discussion on COVID-19 policy.**

Supervisor Cunningham updated the board that current legislation, created to accommodate medical conditions and allowed members of boards and commissions to participate in meetings electronically, expires at the end of December.

**PUBLIC REMARKS**

Scott Dietrich asked why township residents pay taxes to Mott Community College; he thinks the money should go to roads and schools.

Greg Duberg asked how to proceed regarding the letter he submitted. The Supervisor told him to contact the Planning and Zoning Department.

**TYRONE TOWNSHIP  
REGULAR BOARD MEETING  
APPROVED MINUTES – DECEMBER 7, 2021 – PAGE 4**

Don Peitz said there is a tree in the right of way of a US-23 off ramp that needs to be removed. He thinks if the township sent a letter to the state (MDOT) it may carry more weight than just a resident.

**MISCELLANEOUS BUSINESS**

None.

**ADJOURNMENT**

Trustee Walker moved to adjourn. (Trustee Schulze seconded.) The motion carried; all ayes. The meeting adjourned at 7:22 p.m.

DRAFT

12/14/2021  
JMM

**TYRONE TOWNSHIP TREASURER'S REPORT**  
Period ending November, 2021

TOWNSHIP FUNDS	Interest Ckg	INVESTMENTS ICS	Int Rate	MICHIGAN CLASS	Int Rate Monthly AVG	FLG PEG CD matures 8/9/22	Int rate	Grand Totals Each Fund
General 101	\$1,851,089.60	\$ 2,431,262.55	2.22%					\$ 4,282,352.15
Tech Fund 141	\$51,781.85	\$ 5,000.00	2.22%					\$56,781.85
Building & Site 145	\$136,722.87	\$ 7,500.00	2.22%					\$144,222.87
Parks/Recreation 208	\$5,934.23		0.40%					\$5,934.23
Liquor Control 212	\$1,458.60		0.40%					\$1,458.60
Road 245	\$394,204.66	\$ 44,224.80	2.22%	\$261,963.97	1.00%			\$ 700,393.43
Revolving 246	\$164,513.95	\$ 97,500.00	0.40%	\$192,440.60	1.00%			\$ 454,454.55
Right of Way 259	\$31,878.56		0.40%					\$31,878.56
Peg 274	\$189,064.67					\$ 194,450.42	0.20%	\$383,515.09
Lk Tyrone Grant 281			0.40%					\$0.00
<b>Special Assessments</b>								
Jayne Hill Lts 218	\$1,516.36		0.40%					\$1,516.36
Walnut Shores Lts 219	\$737.21		0.40%					\$737.21
Shannon Glen Rubbish 225	\$3,075.17							\$3,075.17
Jayne Hill Rubbish Removal 226	\$6,785.08		0.40%					\$6,785.08
Apple Orchard Rubbish Removal 230	\$2,289.34							\$2,289.34
Great Oaks Dr 232	\$8,489.16		0.40%					\$8,489.16
Laurel Springs Rubbish removal 233	\$3,955.00							\$3,955.00
Silver Lake Rubbish Removal 234	\$3,786.28							\$3,786.28
Parkin Lane Snow 238	\$16,355.64		0.40%					\$16,355.64
<b>Account Totals</b>	<b>\$2,873,638.23</b>	<b>\$ 2,585,487.35</b>		<b>\$454,404.57</b>		<b>\$ 194,450.42</b>		<b>\$ 6,107,980.57</b>
<b>Health Flex Spending 101</b>		<b>The State Bank</b>						<b>Health Flex Total</b>
FSA Account (\$10K loan to Open)		\$ 11,522.56	0.00%					\$ 11,522.56
								\$ 11,522.56
<b>Public Safety- 205</b>								
Public Safety 205 - State Bank checking		\$ 212,198.56	0.40%					\$ 212,198.56
Public Safety 205- State Bank Savings		\$ 6,403.02						\$ 6,403.02
Public Safety 205 - Level One Bank		\$ 205,430.91	0.40%					\$ 205,430.91
Public Safety ICS- 205 State Bank		\$ 774,195.00	2.22%					\$ 774,195.00
								\$ 1,198,227.49
<b>SEWER O&amp;M CHECKING ACCT- 590</b>								
Sewer Operation and Maintenance CK (5710)		\$ 197,209.59	0.70%					\$ 197,209.59
Sewer Operation and Maintenance SV (4865)		\$ 82,852.18	1.39%					\$ 82,852.18
CIBC- O&M CD(matures 8/6/22)(6337)		\$ 163,084.77	0.20%					\$ 163,084.77
O&M CDARS (matures 8/11/2022)(2729)		\$ 144,261.04	1.50%					\$ 144,261.04
O&M CDARS (matures 8/10/2022)(4710)		\$ 146,335.94	0.20%					\$ 146,335.94
								\$ 733,743.52
<b>TYRONE TOWNSHIP SEWER 2003- 599</b>								
Debt Service 599 Flagstar Bank		\$ 425,295.25	0.6%					\$ 425,295.25
Flagstar CDARS 2003 (matures 4/21/2022)(0817)		\$ 547,547.96	0.15%					\$ 547,547.96
Flagstar CD 2003 (matures 3/29/2021)(3879)		\$ 1,000,000.00	0.25%					\$ 1,000,000.00
Flagstar CDARS 2003 Fund Martures 9/15/22)(6804		\$ 469,180.07	0.15%					\$ 469,180.07
								\$ 2,442,023.28
<b>TRUST &amp; AGENCY- 701</b>								
Township Trust and Agency 701 Savings		\$ 1,514.17	0.18%					\$ 1,514.17
Township Trust and Agency 701 Checking		\$ 31,182.01	0.00%					\$ 31,182.01
								\$ 32,696.18
<b>Road Improvements-</b>								
Parkin Lane Rd 2010 (858)		\$ 16,753.81	0.70%					\$ 16,753.81
Lake Shannon 2018 (863)		\$ 297,702.10	0.70%					\$ 297,702.10
Laurel springs (864)		\$ 48,970.04	0.70%					\$ 48,970.04
Irish Hills (865)		\$ 179,124.71						\$ 179,124.71
CIBC- Parkin Lane CD(matures 8/9/2022)		\$ 127,853.69	0.20%					\$ 127,853.69
								\$ 670,404.35
								\$ 5,088,617.38
<b>Total Township Monies</b>								<b>\$ 11,196,597.95</b>

Check Date	Bank	Check	Vendor Name	Description	Amount
Bank 001 STATE BANK COMMON ACCOUNT					
12/01/2021	001	22939	CHASE CARD SERVICE	CREDIT CARD	325.16
12/01/2021	001	22940	CONSUMERS ENERGY	TWP HALL ELECTRIC 10.22.21 - 11.21.21	457.39
12/01/2021	001	22941	HARRIS & LITERSKI ATTORNEYS AT	LEGAL - OCT 2021	3,073.50
12/01/2021	001	22942	LIVINGSTON COUNTY SHERIFF'S DEPT	STATE LIQUOR ENF ANNUAL FEES	1,458.60
12/01/2021	001	22943	MACKLIN MECHANICAL COMPANY	FALL HVAC MAINTENANCE	1,190.00
12/01/2021	001	22944	RICOH USA, INC.	COPIER LEASE 9.28.21 - 10.27.21	248.42
12/01/2021	001	22945	SHRED-IT USA	SHREDDING	69.83
12/01/2021	001	22946	VOYA INSTITUTIONAL TRUST COMPANY	EMPLOYEE CONTRIBUTIONS 12.1.21	160.00
12/01/2021	001	22947	WATER TECH	ANNUAL WATER TESTING	97.00
12/07/2021	001	22948	AT&T MOBILITY	TWP SUPV CELL - NOV 2021	79.15
12/07/2021	001	22949	CONSUMERS ENERGY	STREET LIGHTS - NOV 21	106.94
				LED STREET LIGHTS - NOV 21	130.40
					<u>237.34</u>
12/07/2021	001	22950	DOUGIE'S DISPOSAL & RECYCLING	TRASH REMOVAL - QUARTERLY - LAUREL SPRIN	1,400.00
				TRASH REMOVAL - QUARTERLY	1,599.00
				TRASH REMOVAL - QUARTERLY	4,840.00
					<u>7,839.00</u>
12/07/2021	001	22951	LIVINGSTON COUNTY TREASURER	DOG LICENSE NOVEMBER 2021 (#3626 - 3637)	237.00
12/07/2021	001	22952	REPUBLIC SERVICES#237	TRASH REMOVAL - 12.1.21 - 12.31.21	442.96
12/07/2021	001	22953	SUNSET MAINTENANCE, LLC	4 CLEANING SERVICES NOV 2021	560.00
12/07/2021	001	22954	VIEW NEWSPAPER GROUP	PUBLICATIONS NOV 2021	641.04

001 TOTALS:

Total of 16 Checks:	17,116.39
Less 1 Void Checks:	248.42
Total of 15 Disbursements:	<u>16,867.97</u>

Bank 022 STATE BANK - PUBLIC SAFETY checking

12/01/2021	022	1275	CHASE CARD SERVICE	CREDIT CARD - PUBLIC SAFETY	26.89
12/01/2021	022	1276	HARTLAND AREA FIRE DEPARTMENT	6 FIRE RUNS 11.1.21 - 11.15.21	8,682.00

022 TOTALS:

Total of 2 Checks:	8,708.89
Less 0 Void Checks:	0.00
Total of 2 Disbursements:	<u>8,708.89</u>

Bank 102 SEWER O&M CHECKING 590

12/07/2021	102	452	LIVINGSTON COUNTY DRAIN COMM.	SEWER O&M 10.28.21 - 11.24.21	67,235.17
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102 TOTALS:

Total of 1 Checks:	67,235.17
Less 0 Void Checks:	0.00
Total of 1 Disbursements:	<u>67,235.17</u>

Bank 108 TAX FUND FLAGSTAR

12/15/2021 12:15 PM  
User: MHUSTED  
DB: Tyrone

CHECK REGISTER FOR TYRONE TOWNSHIP  
CHECK DATE FROM 11/30/2021 - 12/15/2021

Page: 2/2

Check Date	Bank	Check	Vendor Name	Description	Amount
12/01/2021	108	3094	FENTON SCHOOLS	SUMMER TAX DISB 11.16.21 - 11.30.21	2,646.28
12/01/2021	108	3095	GISD	SUMMER TAX DISB 11.16.21 - 11.30.21	1,255.03
12/01/2021	108	3096	HARTLAND CONSOLIDATED SCHOOLS	SUMMER TAX DISB 11.16.21 - 11.30.21	2,177.27
12/01/2021	108	3097	LESA	SUMMER TAX DISB 11.16.21 - 11.30.21	2,394.84
12/01/2021	108	3098	LIBERTY TITLE AGENCY	2021 Sum Tax Refund 4704-03-101-002	30.09
12/01/2021	108	3099	LINDEN COMMUNITY SCHOOLS	SUMMER TAX DISB 11.16.21 - 11.30.21	3,067.42
12/01/2021	108	3100	LIVINGSTON COUNTY TREASURER	SUMMER TAX DISB 11.16.21 - 11.30.21	18,096.93

108 TOTALS:

Total of 7 Checks:	29,667.86
Less 0 Void Checks:	0.00
Total of 7 Disbursements:	29,667.86

Bank 112 FLAGSTAR CHECKING - SA ROAD IMPROVEMENTS

12/01/2021	112	1066	US BANK	LAKE SHANNON - INTEREST PAYMENT	12,268.75
12/07/2021	112	1067	HUNTINGTON NATIONAL BANK	INTEREST PAYMENT	7,282.50
12/07/2021	112	1068	THE STATE BANK	INTEREST PAYMENT - IRISH HILLS	9,964.50
				INTEREST PAYMENT - LAUREL SPRINGS	2,625.00

112 TOTALS:

Total of 3 Checks:	32,140.75
Less 0 Void Checks:	0.00
Total of 3 Disbursements:	32,140.75

REPORT TOTALS:

Total of 29 Checks:	154,869.06
Less 1 Void Checks:	248.42
Total of 28 Disbursements:	154,620.64

# **COMMUNICATION #1**

Planning Commission Regular Meeting  
Synopsis-December 14, 2021

**TYRONE TOWNSHIP PLANNING COMMISSION  
REGULAR MEETING SYNOPSIS  
December 14, 2021 7:00 p.m.**

**Note: This meeting was held at the Tyrone Township Hall  
And via remote access (Zoom)**

**PRESENT:** Kurt Schulze, Rich Erickson, Jon Ward, Garrett Ladd, Bill Wood, and Chet Shultz

**ABSENT:** Steve Krause

**OTHERS PRESENT:** Ross Nicholson and Zach Michels

**CALL TO ORDER:** The meeting was called to order at 7:00 by Chairman Erickson.

**PLEDGE OF ALLEGIANCE:**

**CALL TO THE PUBLIC:** The Planning Commission heard several questions and comments from members of the public.

**APPROVAL OF THE AGENDA:** Approved as presented.

**APPROVAL OF THE MINUTES:** Deferred

**OLD BUSINESS:**

- 1) **Master Plan Discussion:** Zach Michels read through and elaborated on a document he had prepared designed to outline the master planning process and aid the Planning Commission. He asked the Planning Commission for specific direction on several items from the document. The Planning Commission discussed and provided direction to Zach Michels.
- 2) **PC Action List:** The Planning Commission went through the latest version of the Action List and made several updates.

**NEW BUSINESS:**

- 1) **Sight Lines:** The Planning Commission discussed the current Zoning Ordinance sight line regulations and discussed possible ways to resolve the deficiencies in the text. The Planning Commission tasked Zach Michels with providing sample text and various examples of how municipalities regulate waterfront views.

**CALL TO THE PUBLIC:** The Planning Commission heard several questions and comments from members of the public.

**MISCELLANEOUS BUSINESS:** Next workshop meeting scheduled for 12/22/2021 at 6:00 pm.



**ADJOURNMENT:** The meeting was adjourned at 9:28 by Chairman Erickson.

# **COMMUNICATION #2**

Fire Service Report – December 15, 2021

**EMERGENCY SERVICES BILLED TO TYRONE TOWNSHIP**

	CITY OF FENTON		FENTON TWP		HARTLAND		MONTHLY \$ TOTALS	BILLABLE
	# RUNS	\$1,447.00	# RUNS	\$1,447.00	# RUNS	\$1,447.00		
	# MEDICAL	\$400.00	# MEDICAL	\$400.00	# MEDICAL	\$400.00		
	#EXCEPTION	\$500.00	#EXCEPTION	\$500.00	#EXCEPTION	\$500.00		
Apr-21	(3) 14	\$20,258	(1) 9	\$13,023	(1) 15	\$21,705	\$54,986	5 \$7,235
May-21	8	\$11,576	(2) 12	\$17,364	(1) 14	\$15,917	\$44,857	3 \$4,341
Jun-21	(5) 1 EXCP 15	\$20,758	11	\$15,917	(1) 17	\$24,599	\$61,774	6 \$8,682
Jul-21	(1) 12	\$17,364	(1) 10	\$14,470	10	\$14,470	\$46,304	2 \$2,894
Aug-21	(7) 1 MED 17	\$24,599	9	\$13,023	(8) 14	\$20,258	\$57,880	15 1 MED (rev) \$20,658
Sep-21	(9) 23	\$33,281	(1) 5	\$7,235	(9) 9	\$13,023	\$53,539	13 (rev) \$18,811
Oct-21	(8) 23	\$33,281	(3) 9	\$13,023	10	\$14,470	\$60,774	11 \$15,917
Nov-21	(2) 14	\$20,258	5	\$7,235	(1) 6			
Dec-21								
Jan-22								
Feb-22								
Mar-22								
Excp								
MED								
<b>YTD TOTALS</b>		<b>\$181,375</b>		<b>\$101,290</b>		<b>\$124,442</b>	<b>\$379,614</b>	<b>\$78,538</b>
<b>YTD RUNS</b>	126		70		88			55
<b>YTD Excp</b>	1							(12-15-21 Sept revision)
<b>YTD MED</b>	1				Partial numbers			1



**CITY OF FENTON FIRE RUNS  
COLLECTION ACCOUNTS**

INCIDENT DATE	INCIDENT #	BALANCE	STATUS
Feb-16	53	\$1,391.00	COLLECTIONS
Feb-16	62	\$1,391.00	COLLECTIONS
Mar-16	76	\$1,391.00	COLLECTIONS
Aug-15	283	\$350.00	COLLECTIONS
Oct-15	354	\$390.00	COLLECTIONS
Jun-16	197	\$1,391.00	COLLECTIONS
Jun-16	225	\$1,391.00	COLLECTIONS
Jun-16	226	\$1,391.00	COLLECTIONS
Jul-16	285	\$1,391.00	COLLECTIONS
Jul-16	296	\$1,391.00	COLLECTIONS
Sep-16	371	\$1,391.00	COLLECTIONS
Aug-16	436	\$1,391.00	COLLECTIONS
Nov-16	461	\$1,391.00	COLLECTIONS
Jan-17	49	\$1,391.00	COLLECTIONS
Mar-17	371	\$1,391.00	COLLECTIONS
Mar-17	120	\$400.00	COLLECTIONS
Mar-17	125	\$1,391.00	COLLECTIONS
Jun-17	235	\$1,405.00	COLLECTIONS
Jul-17	318	\$400.00	COLLECTIONS
Jul-17	328	\$1,405.00	COLLECTIONS
Oct-17	431	\$1,405.00	COLLECTIONS
Nov-17	468	\$1,405.00	COLLECTIONS
Nov-17	483	\$1,405.00	COLLECTIONS
Jan-18	22	\$1,405.00	COLLECTIONS
Jan-18	27	\$1,405.00	COLLECTIONS
Mar-18	117	\$1,405.00	COLLECTIONS
Jul-18	296	\$1,419.00	COLLECTIONS
Nov-18	438	\$1,419.00	COLLECTIONS
Nov-18	484	\$1,419.00	COLLECTIONS
Apr-18	161	\$1,024.00	COLLECTIONS
Aug-19	327	\$1,319.00	COLLECTIONS
Oct-19	401	\$1,419.00	COLLECTIONS
Nov-19	447	\$1,261.00	COLLECTIONS
Dec-19	486	\$1,419.00	COLLECTIONS
Dec-19	499	\$400.00	COLLECTIONS
Feb-20	70	\$1,419.00	COLLECTIONS
Jun-20	177	\$1,433.00	COLLECTIONS
Jun-20	220	\$1,433.00	COLLECTIONS
Aug-20	286	\$1,433.00	COLLECTIONS
Jul-17	306	\$485.00	COLLECTIONS
Nov-20	391	\$1,433.00	COLLECTIONS
Nov-20	416	\$1,433.00	COLLECTIONS
Jan-21	2	\$1,433.00	COLLECTIONS



## FENTON TOWNSHIP OUTSTANDING FIRE RUNS

INCIDENT DATE	INCIDENT #	BALANCE	STATUS
Jul-17	17380	\$400.00	COLLECTIONS
Aug-18	18450	\$1,419.00	COLLECTIONS
Oct-18	18528	\$1,419.00	COLLECTIONS
Oct-18	18534	\$1,419.00	COLLECTIONS
Dec-18	18628	\$1,419.00	COLLECTIONS
Jun-21	19296	\$392.00	COLLECTIONS
Jun-19	19310	\$709.50	COLLECTIONS
Jun-19	19310	\$709.50	COLLECTIONS
Jul-19	19397	\$1,419.00	COLLECTIONS
Jul-19	19403	\$216.64	COLLECTIONS
Aug-19	19469	\$1,419.00	COLLECTIONS
Nov-19	19608	\$1,419.00	COLLECTIONS
Jul-20	20284	\$1,433.00	COLLECTIONS
Sep-20	20419	\$566.50	PAYMENT PLAN
Apr-21	21193	\$1,368.30	COLLECTIONS
May-21	21243	\$247.00	PAYMENT PLAN
Jul-21	21377	\$481.00	SPLIT BILL/PAY PLAN
Oct-21	21564	\$1,447.00	INVOICED
Oct-21	21567	\$1,447.00	INVOICED
Oct-21	21588	\$1,447.00	INVOICED







UNIVERSAL CREDIT SERVICES, INC  
 P.O. BOX 133  
 HARTLAND, MI 48353  
 800-931-3711

1

INVOICE 034197  
 11/30/21

RECEIVED  
 DEC 13 2021

No. 79

UN10  
 TYR001 TYRONE TOWNSHIP FIRERUNS  
 8420 RUNYAN LAKE RD  
 NNEDNN FENTON, MI 48430

Date	Name / Ref No.	Sts	COLLECTIONS		Our Comm	Remain Princ	Net Amt Due
			Pd You	Pd Us			
11/09	DURISH, LAURA 0019061400	PDC		79.00		392.00	79.00-
11/09	DURISH, LAURA 0019061400	PDC		21.00	21.00	392.00	
11/22	MOONEY, BRANDON MICHAEL 0021042200	PDC		39.50		1368.00	39.50-
11/22	MOONEY, BRANDON MICHAEL 0021042200	PDC		10.50	10.50	1368.00	
11/11	WELTER, ADAM 19403	PDC		15.80		216.64	15.80-
11/11	WELTER, ADAM 19403	PDC		4.20	4.20	216.64	
	*SubTotals*				35.70		134.30-
	*SubTotals*			170.00			

Gross Collections This Cycle.....\$170.00

Check No. 017160 Enclosed.....\$134.30



UNIVERSAL CREDIT SERVICES, INC  
 P.O. BOX 133  
 HARTLAND, MI 48353  
 800-931-3711

1

INVOICE 034198  
 11/30/21

\* RECAP \*

No. 79

UN10  
 TYR001 TYRONE TOWNSHIP FIRERUNS  
 8420 RUNYAN LAKE RD  
 NNEDNN FENTON, MI 48430

RECEIVED  
 DEC 13 2021

Date	Name / Ref No.	Sts	COLLECTIONS Pd You Pd Us	Our Comm	Remain Princ	Net Amt Due
11/01	* Previous Balance Forward					405.16

Open Invoices:

Number	Date	Amount	Ttl Paid	Last Paid	LastDate	Amount Due
032987	03/01/21	401.24	.00	.00		401.24
033110	04/01/21	397.32	.00	.00		397.32
034093	11/01/21	405.16	.00	.00		405.16
000001	02/18/21	401.24	.00	.00		401.24
						1604.96

1604.96

405.16

\*Totals\* 35.70 134.30-  
 \*Totals\* 170.00

Gross Collections This Cycle.....\$170.00  
 Total Enclosed Checks.....\$134.30  
 Unpaid Previous Balance.....\$405.16  
 Please Remit Your Payment.....\$405.16

# **NEW BUSINESS #1**

Lake Urban Crossings PUD Preliminary Site Plan.

Township Board  
Tyrone Township  
8420 Runyan Lake Road  
Fenton, MI 48430

**Subject: Agenda Request, Lake Urban Crossings Preliminary PUD Plan  
Recommendation for Approval**

Dear Township Board Members:

At our Planning Commission meeting held 11/30/2021 the Planning Commission supported a favorable recommendation of the Preliminary Site Plan for Lake Urban Crossing PUD application.

**Motion:**

*Kurt Schulze made a motion to recommend Township Board approval of the Lake Urban Crossing preliminary PUD application conditional upon items 1-10, excluding item #3, from the potential conditions section of the Carlisle Wortman Associates review letter dated 11/04/2021 (at the bottom of page #27).*

*Steve Krause supported the motion. Motion carried 3:2. Votes: Yes- Shultz, Schulze, Krause / No- Erickson, Ladd.*

**Summary:**

The applicant proposes 88 total lots being built in 2 phases of construction. Phase 1 consists of 42 lots, with entrance from Runyan Lake Rd North of White Lake and Phase 2 consists of 46 lots with entrance from White Lake Rd east of Runyan Lake Rd.

There were many items that the Planning Commission reviewed in the 11/30/2021 meeting and agreed with allowing as part of Preliminary concept approval. These items are listed in the Carlisle Wortman Planning Report dated 11/4/2021 on page 26 and 27.

Other items of note are that the applicant did provide a Traffic Impact Study for the years 2016- 2020 and also agreed to remove 4 lots that border Tyrone Hills

subdivision as well as agreeing that they will put a cul-de-sac at the end of Valencia as directed by the Fire Department. The required public hearing was held on 08/10/2021 at 7:30 pm.

Regards,

*Rich Erickson*

Chairman -Tyrone Township Planning Commission



PROPERTY DESCRIPTIONS:

PARCEL 4704-03-300-020
A PARCEL OF LAND LOCATED IN SECTIONS 3, 4 & 10, T4N-R6E, TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 3; THENCE, ALONG THE WEST LINE OF SAID SECTION 3, N02°13'15"E 470.44 FEET (PREVIOUSLY RECORDED AS 486.33 FEET) TO THE POINT OF BEGINNING; THENCE N65°37'27"W 46.69 FEET (PREVIOUSLY RECORDED AS 47.28 FEET); THENCE N05°07'27"E 539.49 FEET; THENCE S52°05'06"E 47.73 FEET; THENCE N37°52'29"E 200.00 FEET; THENCE N52°05'06"W 217.80 FEET TO THE CENTERLINE OF RUNYAN LAKE ROAD; THENCE ALONG SAID CENTERLINE OF ROAD, N37°52'28"E 64.28 FEET; THENCE N02°13'15"E, 3.47 FEET TO THE NORTHWEST CORNER OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 3; THENCE ALONG THE NORTH LINE OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SAID SECTION 3, S88°20'05"E 2667.30 FEET TO THE NORTH-SOUTH 1/4 LINE OF SAID SECTION 3; THENCE, ALONG SAID NORTH-SOUTH 1/4 LINE, S02°27'26"W 1351.31 FEET TO THE SOUTH 1/4 CORNER OF SAID SECTION 3, ALSO THE NORTH 1/4 CORNER OF SAID SECTION 10; THENCE, ALONG THE SOUTH LINE OF SAID SECTION 3, ALSO THE NORTH LINE OF SAID SECTION 10, N89°11'05"W 665.42 FEET; THENCE, ALONG THE EAST LINE OF THE EAST 1/2 OF THE NE 1/4 OF THE NW 1/4 OF SAID SECTION 10, S02°08'22"W 796.29 FEET TO A POINT ON THE PHYSICAL CENTERLINE OF WHITE LAKE ROAD AS LOCATED ON 04/29/04; THENCE, ALONG SAID CENTERLINE THE FOLLOWING 5 COURSES: (1) N63°15'06"W 103.35 FEET, (2) N67°15'52"W 129.30 FEET, (3) N69°15'13"W 222.75 FEET, (4) N68°42'53"W 327.42 FEET, (5) N67°58'43"W 292.71 FEET; THENCE N20°48'33"E 450.97 FEET (PREVIOUSLY RECORDED AS 460.0 FEET); THENCE N65°37'27"W 1219.96 FEET TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 89.586 ACRES OF LAND AND IS SUBJECT TO THOSE PARTS NOW USED AS RUNYAN LAKE ROAD AND WHITE LAKE ROAD.

PARCEL 4704-10-100-024
SEC. 10 T4N, R6E, 20 FT. ON W AND N SIDES OF E 1/2 OF NE 1/4 OF NW 1/4 LYING N OF HWY. 1A
PARCEL 4704-10-100-025
SEC 10 T4N R6E ALL THAT PART OF E 1/2 OF NE 1/4 OF NW 1/4, LYING NLY OF WHITE LAKE RD, EXC THE N 20 FT & THE W 20 FT THEREOF 17 AC M/L
PARCEL 4704-10-200-025
SEC 10 T4N R63 W 13 AC OF NLY 15 AC OF W 1/2 OF NE 1/4 32 RODS (528 FT) N & S ON E BOUNDARY LINE & 28 RODS (462 FT) N & S ON W BOUNDARY LINE
PARCEL 4704-03-400-001
SEC. 3 T4N, R6E, SW 1/4 OF SE 1/4 40A

FLOOD PLAIN NOTE:

THIS PROPERTY IS LOCATED IN AN AREAS OF MINIMAL FLOODING, NOT WITHIN A STUDIED FLOOD ZONE, PER FLOOD INSURANCE RATE MAP NO. 26093C0125D AND IS NOT A PRINTED PANEL.

WETLAND NOTE:

ACCORDING TO THE FINAL WETLAND INVENTORY MAPS OF MICHIGAN, THERE ARE WETLANDS ON AND THIS PROPERTY. THE WESTERLY 90 ACRE WETLANDS HAVE BEEN FLAGGED BY ASTI ENVIRONMENTAL, INC ON MARCH 20, 2017, AND THE EASTERLY 80 ACRES FLAGGED BY MARX WETLANDS, LLC ON SEPTEMBER 7, 2018, AND THE WETLAND AREAS FLAGGED ARE AS SHOWN ON THIS SURVEY. BOTH REPORTS WILL BE MADE AVAILABLE UPON REQUEST.

PROJECT NARRATIVE:

IT IS NOT ANTICIPATED THAT THERE WILL BE ANY SUBSTANTIAL INCREASE IN DUST, ODOR, SMOKE, FUMES, NOISE, OR LIGHTS. THE DEVELOPER AND CONTRACTOR WILL BE REQUIRED TO COMPLY WITH ANY APPLICABLE ZONING ORDINANCE REQUIREMENTS REGARDING THESE ITEMS.

EXISTING ZONING INFORMATION:

ACCORDING TO THE CURRENT TYRONE TOWNSHIP ZONING ORDINANCE & MAP, THIS PROPERTY IS CURRENTLY ZONED RE (RURAL ESTATES), AND IS SUBJECT TO THE FOLLOWING CONDITIONS:

- 1) MINIMUM LOT SIZE = 76,230 SFT OR 1.75 ACRES
2) MINIMUM LOT WIDTH = 200 FEET
3) FRONT SETBACK = 100 FEET
4) SIDE SETBACK = 20 FEET, TOTAL = 40 FEET
5) REAR SETBACK = 75 FEET
6) MAXIMUM BUILDING HEIGHT = 30 FEET
7) MAXIMUM LOT COVERAGE = 25%

PROPOSED P.U.D. DEVELOPMENT STANDARDS:

THE PROPOSED LAKE URBAN CROSSING PLANNED UNIT DEVELOPMENT (P.U.D.) WILL BE SUBJECT TO THE FOLLOWING CONDITIONS:

- 1) MINIMUM LOT SIZE = 21,780 SFT OR 0.50 ACRES (PHASE 1)
MINIMUM LOT SIZE - 18,000 SFT OR 0.41 ACRES (PHASE 2)
2) MINIMUM LOT WIDTH = 90 FEET (W/SEWER)
3) FRONT SETBACK = 35 TO 50 FEET
4) SIDE SETBACK = 15 FEET, TOTAL = 30 FEET
5) REAR SETBACK = 35 FEET
6) OPEN WATER SETBACK = 50 FEET
7) MAXIMUM BUILDING HEIGHT = 30 FEET
8) MAXIMUM LOT COVERAGE = 35%

STANDARD NOTES FOR SITE PLANS:

A. EXTENSION OF PUBLIC UTILITIES: ALL PUBLIC SANITARY SEWER SHALL BE EXTENDED TO THE FURTHEST LIMITS OF THE PROPERTY, INCLUDING CORNER LOTS, WITH THE PIPE SIZE AND MATERIAL APPROVED BY TYRONE TOWNSHIP. THE REQUIREMENTS TO EXTEND THE PUBLIC SANITARY SEWER ALONG BOTH PROPERTY LINES WILL BE REVIEWED.

B. SOIL EROSION: THE DEVELOPER SHALL SUBMIT A DETAILED SOIL EROSION AND SEDIMENTATION CONTROL PLAN AND OBTAIN AN ACT 451 PART 91, SOIL EROSION AND SEDIMENTATION CONTROL PERMIT. THIS INCLUDES THE PAYMENT OF FEES AND THE PROVIDING OF NECESSARY BONDS. NO EARTH CHANGES OR EXCAVATION SHALL BE STARTED PRIOR TO THE ISSUANCE OF THIS PERMIT. THE DEVELOPER SHALL PROTECT ALL EXISTING AND PROPOSED STORM SEWER FACILITIES ON AND ADJACENT TO THE SITE DURING EXCAVATION AND CONSTRUCTION. ALL SEDIMENT SHALL BE CONTAINED ON SITE. ANY SILT IN COUNTY DRAINS, STORM SEWER, CULVERTS, ETC. AS A RESULT OF THIS PROJECT, SHALL BE REMOVED BY THE DEVELOPER AT THE COST OF THE DEVELOPER.

C. FLOOD PLAIN OR WETLAND CONSTRUCTION: THE DEVELOPER SHALL APPLY TO THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) FOR A PERMIT FOR THE ALTERATION AND/OR OCCUPATION OF A FLOOD PLAIN OR FLOODWAY, AND/OR WETLANDS, AS REQUIRED UNDER PA 451. EVIDENCE OF THIS PERMIT MAY BE REQUIRED PRIOR TO PLAN APPROVAL BY TYRONE TOWNSHIP AND/OR LIVINGSTON COUNTY DRAIN COMMISSIONER (LDC).

D. NPDES STORM WATER DISCHARGE PERMIT: THE OWNER OF THE PROPERTY SHALL OBTAIN A NPDES STORM WATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES FROM EGLE AS REQUIRED UNDER PUBLIC ACT 451. THE NOTICE OF COVERAGE FORM SHALL BE SUBMITTED THROUGH LIVINGSTON COUNTY DRAIN COMMISSIONER WITH THE SOIL EROSION CONTROL PERMIT APPLICATION. ALL EGLE FEES SHALL ACCOMPANY THE NOTICE OF COVERAGE. EVIDENCE OF THIS PERMIT MAY BE REQUIRED PRIOR TO PLAN APPROVAL BY GDC-WWS. MORE THAN 5 ACRES WILL BE DISTURBED IN CONSTRUCTION OF THIS PROJECT, THEREFORE A NPDES STORM WATER DISCHARGE PERMIT WILL BE REQUIRED.

E. LIVINGSTON COUNTY PERMIT TO CONSTRUCT A PUBLIC UTILITY: AFTER THE APPROVAL OF THIS PRELIMINARY PLAT OR SITE PLAN, THE DEVELOPER SHALL SUBMIT A DETAILED PLAN FOR CONSTRUCTION OF ALL PUBLIC SANITARY SEWER. THE PLANS MUST HAVE TYRONE TOWNSHIP OR LDC APPROVAL, A S-PERMIT ISSUED, AND APPROVAL FROM THE EGLE PRIOR TO BEGINNING CONSTRUCTION.

F. LIVINGSTON COUNTY ROAD COMMISSION RIGHT-OF-WAY PERMIT: THE DEVELOPER SHALL OBTAIN A PERMIT FROM THE LIVINGSTON COUNTY ROAD COMMISSION TO PERFORM WORK WITHIN THE TOWNSHIP ROAD PUBLIC RIGHT-OF-WAY. ALL FEES FOR THE PERMIT, BONDS AND INSURANCES ARE THE RESPONSIBILITY OF THE DEVELOPER.

G. MUNICIPALITY SANITARY SEWER PERMIT: PRIOR TO THE ISSUANCE OF A ZONING PERMIT BY THE LOCAL MUNICIPALITY, THE DEVELOPER SHALL BE REQUIRED TO OBTAIN A SANITARY SEWER TAP-IN PERMIT FROM THE LOCAL MUNICIPALITY, IF AUTHORIZED.

H. STATE CONSTRUCTION PERMITS: THE SANITARY SEWER CONSTRUCTION PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY SHALL BE SUBMITTED TO THE EGLE AFTER APPROVAL OF TYRONE TOWNSHIP OR LDC. CONSTRUCTION SHALL NOT BEGIN UNTIL THESE STATE PERMITS ARE ISSUED.

UTILITY STATEMENT

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS THE SURVEYOR AND/OR ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR AND/OR ENGINEER FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR AND/OR ENGINEER HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

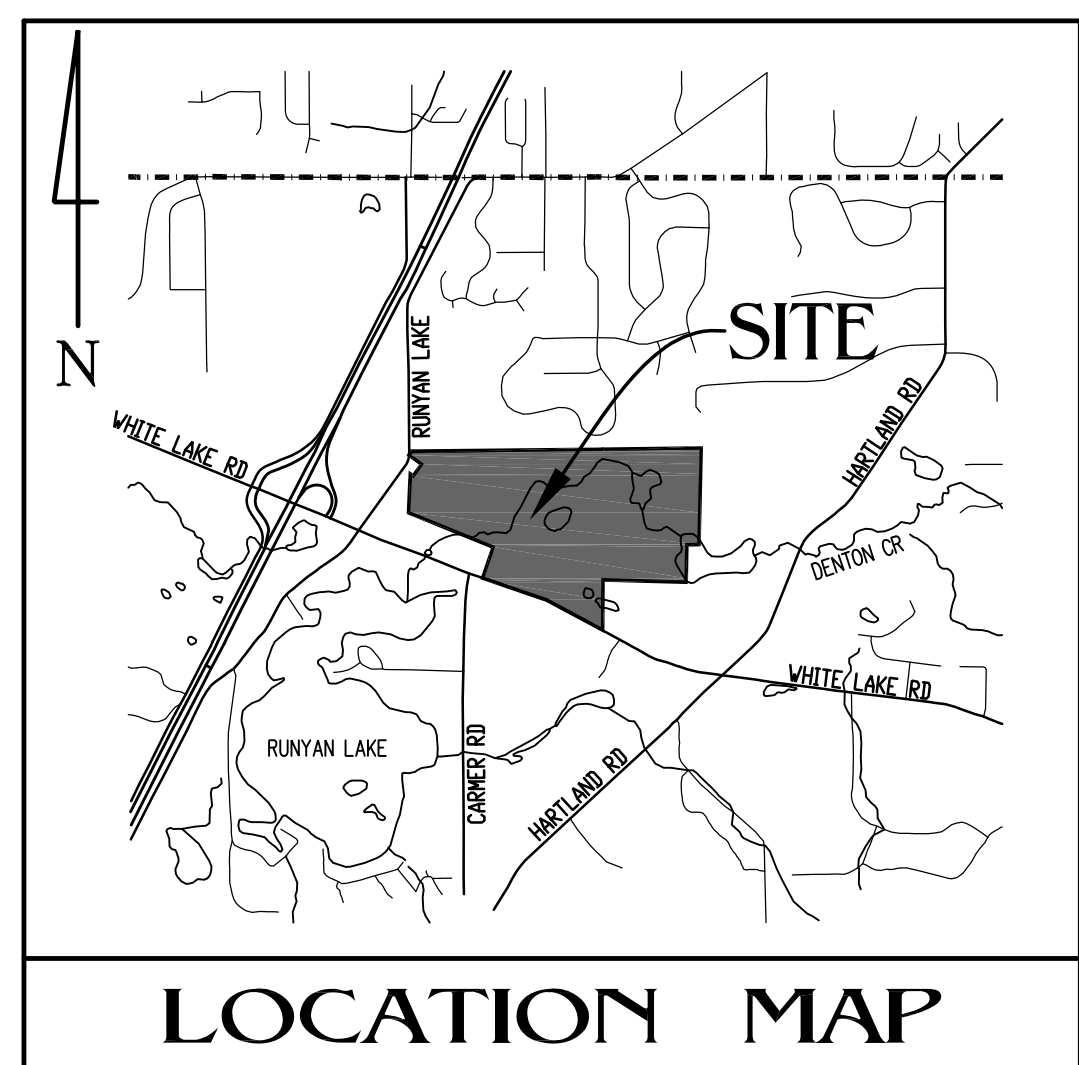
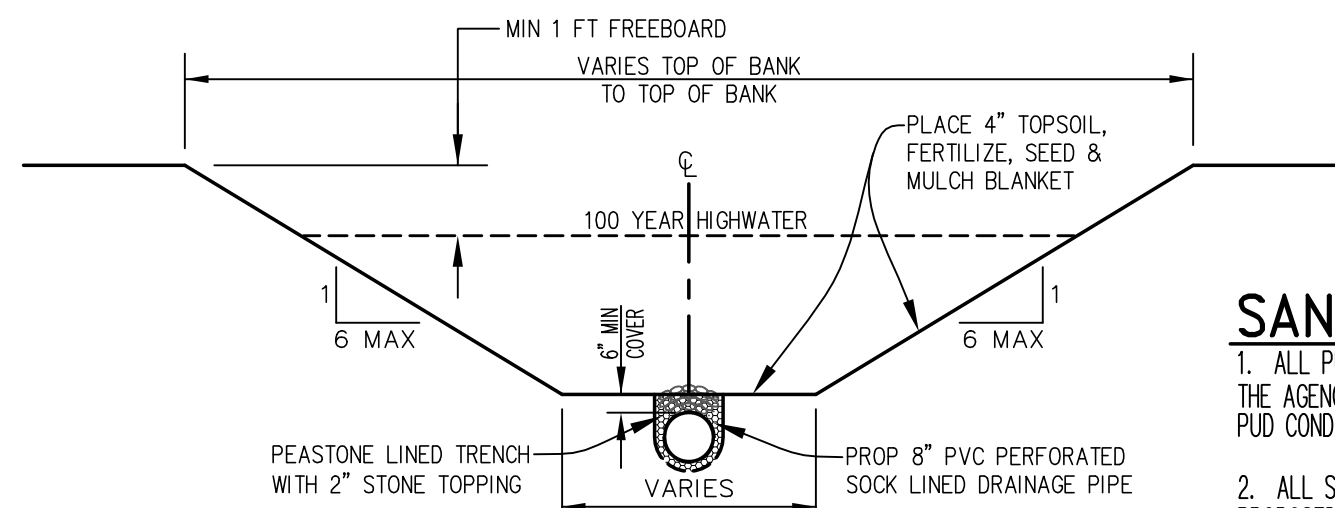
PRELIMINARY SITE P.U.D. CONDOMINIUM PLANS OF: LAKE URBAN CROSSINGS PART OF SECTIONS 3 & 10, T4N-R6E, TYRONE TOWNSHIP LIVINGSTON COUNTY, MICHIGAN

TITLE SHEET INDEX SHEET NO.

Table with 3 columns: TITLE, SHEET INDEX, SHEET NO.
COVER, NOTE & DETAIL SHEET - P-1
PRELIMINARY SITE CONDOMINIUM PLAN - P-2
SURVEY OF EXISTING CONDITIONS - P-3
PRELIMINARY SITE UTILITY PLAN - P-4
PRELIMINARY SITE OPEN SPACE PLAN - P-5
PRELIMINARY SITE LANDSCAPING PLAN - P-6
PRELIMINARY LIMITS OF CONSTRUCTION PLAN - P-7
PRELIMINARY FIRE TRUCK ROUTE PLAN - P-8
PRELIMINARY SOILS INFORMATION PLAN - P-9
PARALLEL SITE PLAN - P-10

LEGEND

Legend table listing symbols for FOUND IRON, SET IRON W/CAP NO. 55012, FOUND MONUMENT, EX SURFACE ELEVATION, EX SURFACE CONTOUR, EX ROAD SIGNS, EX UTILITY POLE, EX SERVICE PEDISTAL, EX MAILBOX, EX OVERHEAD POWERLINES, EX GAS, ELECTRIC & TELEPHONE, EX U.G. GAS MARKER, EX STORM SEWER, EX STORM MANHOLE, EX STORM CATCHBASINS, EX SANITARY SEWER, EX SANITARY MANHOLE, HOUSE, CONC, ASPH, EX, PROP STORM MANHOLE, PROP STORM CATCHBASIN, PROP STORM SEWER, PROP STORM DRAINAGE OUTLET STRUCTURE, PROP DRAINAGE SWALE, PROP STORM PIPE END SECTION, PROP DETENTION BASIN, PROP SANITARY MANHOLE, PROP SANITARY SEWER, PROP 6" SANITARY LEAD, PROP EASEMENT LINE, PROP DRAINAGE FLOW ARROW, SANITARY SEWER, STORM SEWER, EASEMENT, PROP LIGHT POLE, PROP DECIDUOUS TREE, PROP CONIFEROUS TREE

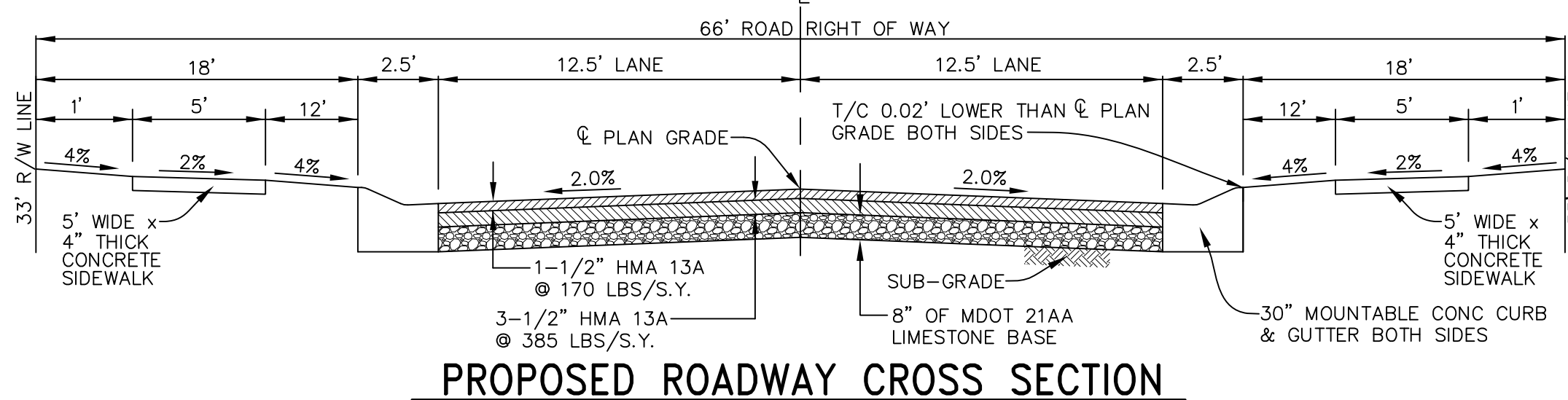


SANITARY SEWER & WATER WELL NOTES:

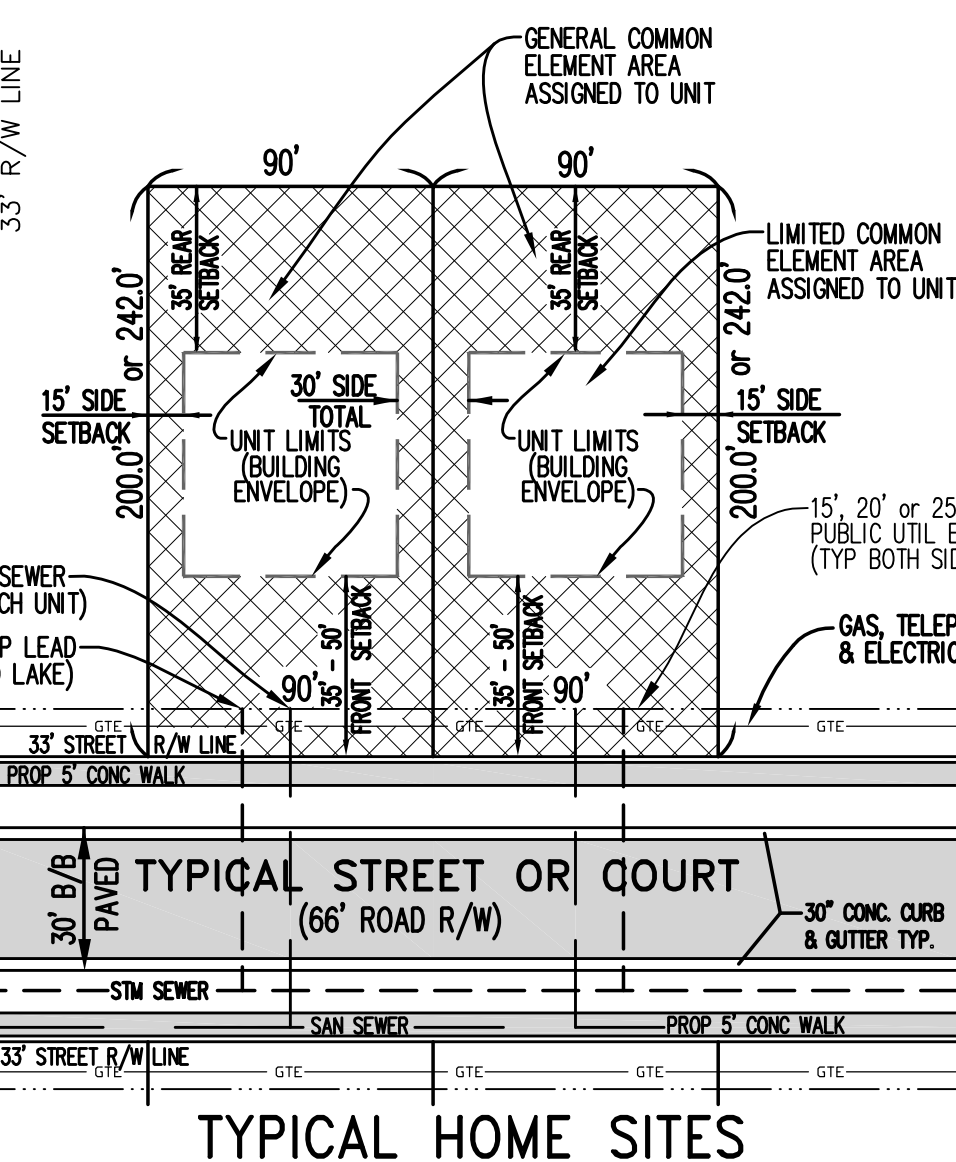
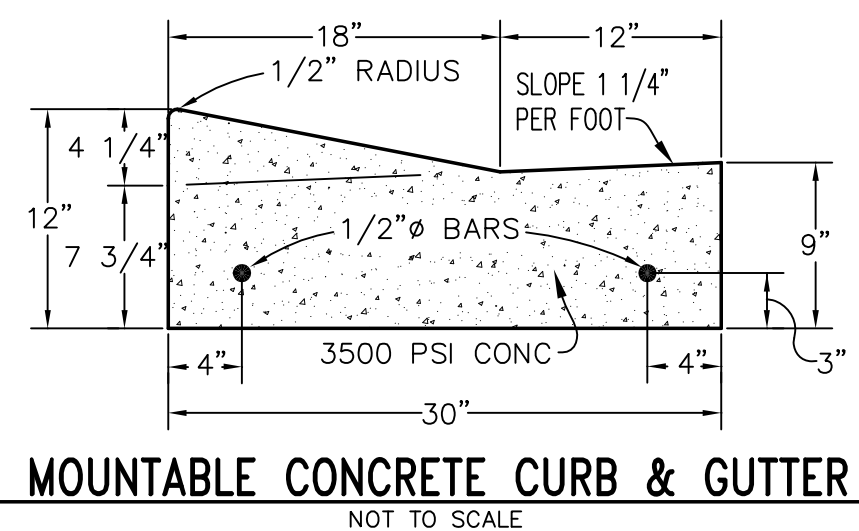
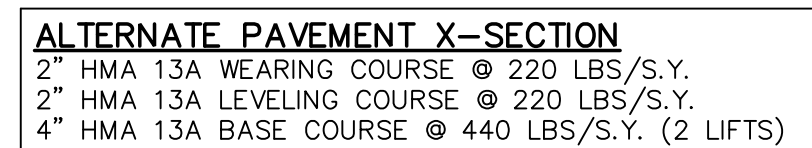
- 1. ALL PUBLIC SANITARY SEWERS SHALL BE LOCATED WITHIN PUBLIC ROAD RIGHT-OF-WAY OR SHALL HAVE AN EASEMENT GRANTED TO THE AGENCY AND/OR MUNICIPALITY FOR MAINTENANCE, REPAIR AND/OR REPLACEMENT. THE EASEMENTS WILL BE SHOWN ON THE FINAL PUD CONDOMINIUM DOCUMENTS.
2. ALL SANITARY SEWERS 8" OR LARGER PROPOSED FOR THIS PROJECT SHALL BE DESIGNED FOR AND BECOME A PUBLIC SYSTEM. PROPOSED 8" SANITARY SHALL BE SDR 26 PVC PIPE.
3. SANITARY SEWER SADDLE TAPS, WHEN NECESSARY, SHALL BE MADE BY LIVINGSTON COUNTY DRAIN COMMISSIONER AND/OR TYRONE TOWNSHIP UTILITIES DEPARTMENT. THE DEVELOPER SHALL OBTAIN THE REQUIRED MUNICIPALITY SANITARY SEWER PERMIT AND PAY THE REQUIRED FEE FOR A SADDLE TAP.
4. SANITARY SEWER SERVICE LEAD FROM THE PUBLIC MAIN LINE TO EACH LOT SHALL BE A 6" SDR 26 P.V.C. THERE SHALL BE A LEAD FOR EACH LOT. ALL SERVICE LEADS SHALL BE CONNECTED TO THE MAINLINE SEWER AND NOT AT A MANHOLE.
5. MAIN LINE SANITARY SEWER SHALL BE SIZED TO ACCOMMODATE ALL FLOWS. THE MINIMUM SIZE SHALL BE 8" WITH MANHOLES AT BENDS OR 400' SPACING.
6. ALL UNITS/LOTS SHALL HAVE INDIVIDUAL RESIDENTIAL WATER WELLS. ALL REQUIREMENTS TO INSTALL A WELL SHALL MEET LIVINGSTON COUNTY HEALTH DEPARTMENT STANDARDS AND REGULATIONS. THE APPLICATION WILL BE PICKED UP FROM THEIR OFFICE.
7. THIS PROJECT HAS BEEN DESIGNED USING THE LATEST LIVINGSTON COUNTY DRAIN COMMISSIONER AND/OR TYRONE TOWNSHIP CRITERIA. REVIEW THE NOTES, DETAILS AND DESIGN CAREFULLY BEFORE SUBMITTING A BID. FULL COMPLIANCE WITH THE NEW STANDARDS WILL BE REQUIRED.

SITE SPECIFIC NOTES:

- 1. ALL ROADS WILL BECOME PUBLIC ROADS BUILT TO MEET THE LIVINGSTON COUNTY ROAD COMMISSION STANDARDS AND SPECIFICATIONS, AND WILL BE DEDICATED TO THE ROAD COMMISSION UPON FINAL APPROVALS.
2. ALL DETENTION BASINS WILL BE DESIGNED AND BUILT PER THE LIVINGSTON COUNTY DRAIN COMMISSION (LDC), AND WILL BE PARTIALLY PRIVATE & PUBLIC SYSTEMS UPON FINAL APPROVALS.
3. ROADWAY SIDEWALKS ARE PROPOSED PER TYRONE TOWNSHIP PLANNING REQUEST, AND SHALL BE A MINIMUM OF 5 FEET WIDE, 1 FOOT INSIDE THE ROAD RIGHT-OF-WAY FOR THE ENTIRE PROJECT. (SEE DETAIL SHEET C-2 & C-4). ALL OTHER WALKWAYS/NATURE TRAILS ARE FOR THE USE OF THE PROPOSED DEVELOPMENT, AND SHALL BE MINIMUM 5' WIDE AND BE CONSTRUCTED OF EITHER COMPACTED LIMESTONE, ASPHALT, CONCRETE, OR WOOD CHIPS, AS PER THE REQUIREMENTS OF THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY (EGLE).
4. THE PLANNED UNIT DEVELOPMENT AND SPECIAL LAND USE REVIEW AND APPROVAL IS A TWO STEP PROCESS, FIRST PRELIMINARY APPROVALS, THEN FINAL SITE PLAN APPROVAL, BEFORE ANY PERMITS ARE ISSUED FOR THE PROJECT.
5. THE PLANNED UNIT DEVELOPMENT WILL CONSIST OF TWO DIFFERENT PHASES OF DEVELOPMENT. UPON APPROVAL OF THIS PRELIMINARY PLANNED UNIT DEVELOPMENT, CONSTRUCTION DRAWINGS WILL BE SUBMITTED SEPARATELY FOR EACH PHASE OF CONSTRUCTION.



PROPOSED ROADWAY CROSS SECTION



TYPICAL HOME SITES

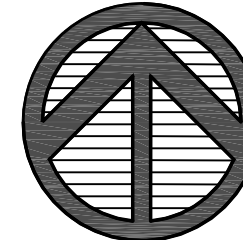


Table with project details: SCALE: NONE, OWNER/DEVELOPER: LAKE URBAN DEV, LLC, PART OF SECTIONS 3 & 10 TYRONE TOWNSHIP, T4N-R6E LININGSTON COUNTY, MICHIGAN, Fenton Land Surveying & Engineering, Inc, PRELIMINARY COVER SHEET FOR: LAKE URBAN CROSSINGS P.U.D., REVISIONS, DRN. BY: J.R.B., 05.27.2021, SHEET NO: P-1

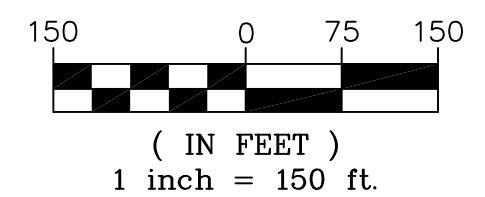


# PRELIMINARY OVERALL SITE PLAN LAYOUT LAKE URBAN CROSSINGS P.U.D.

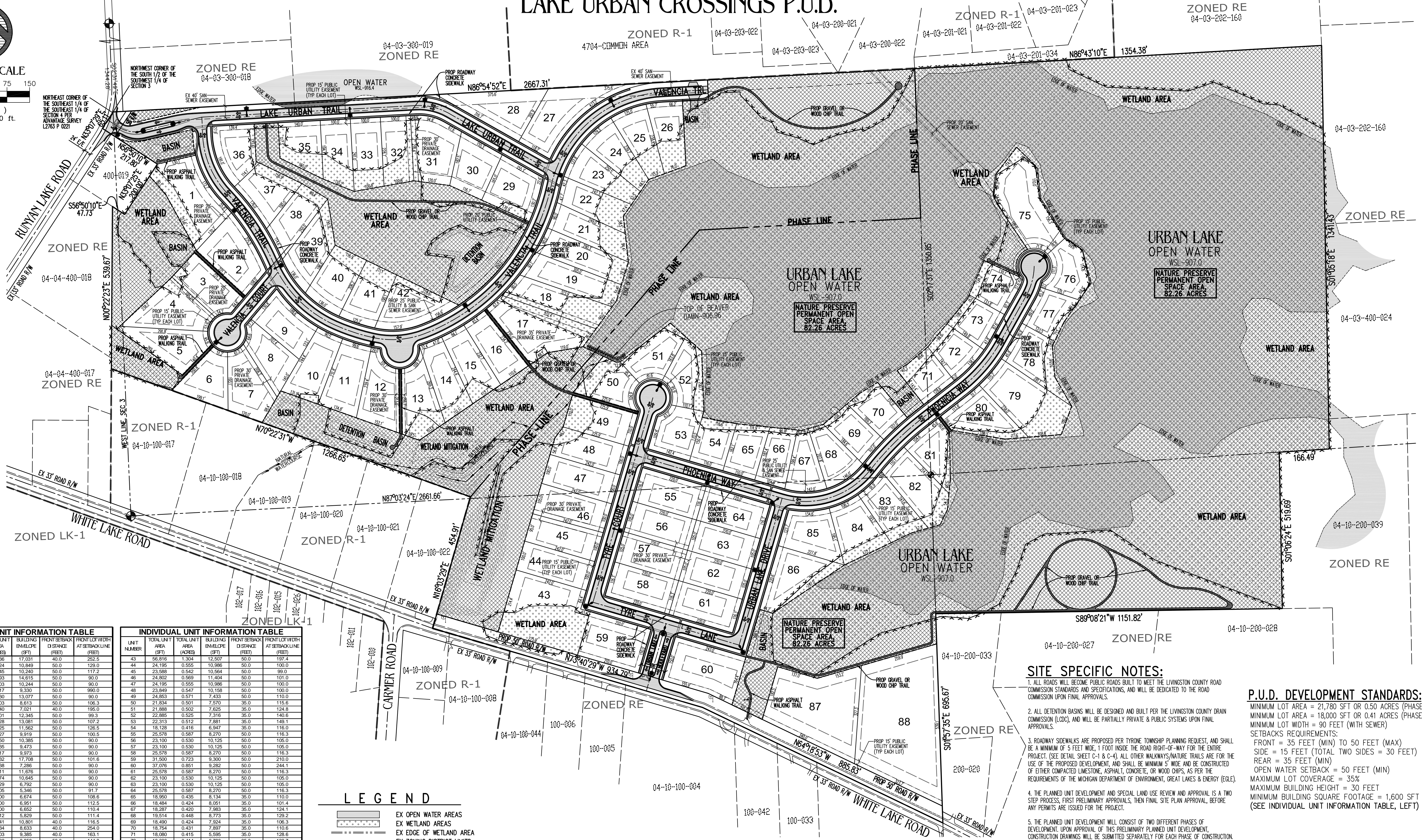
NORTH



GRAPHIC SCALE

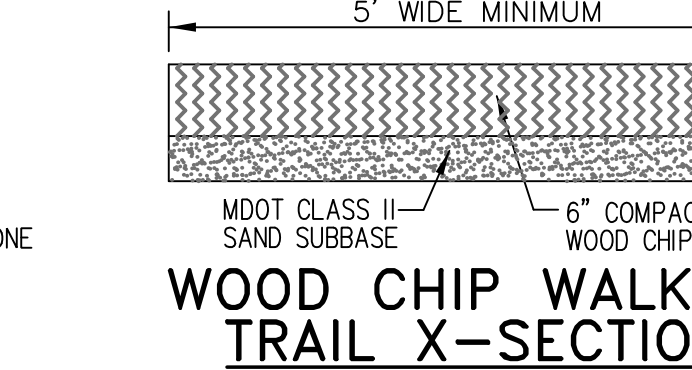
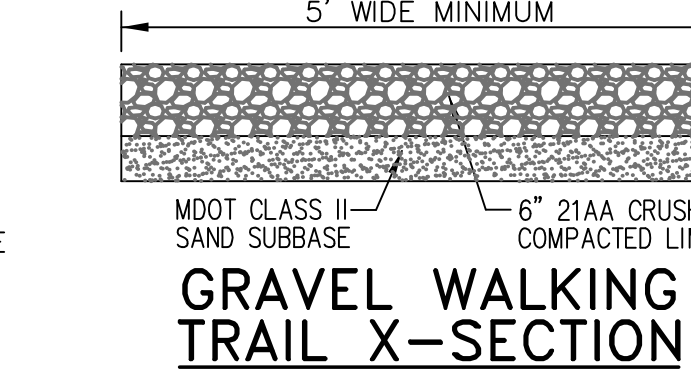
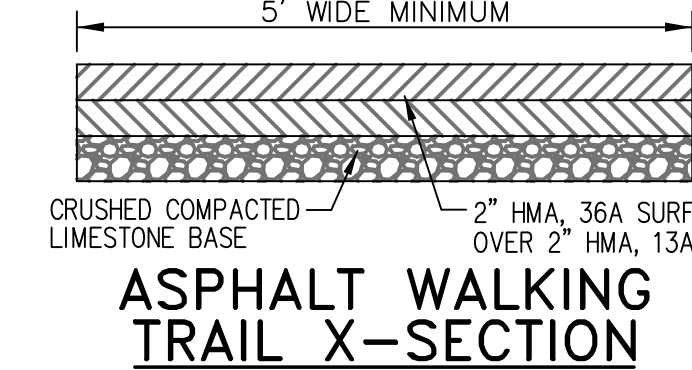
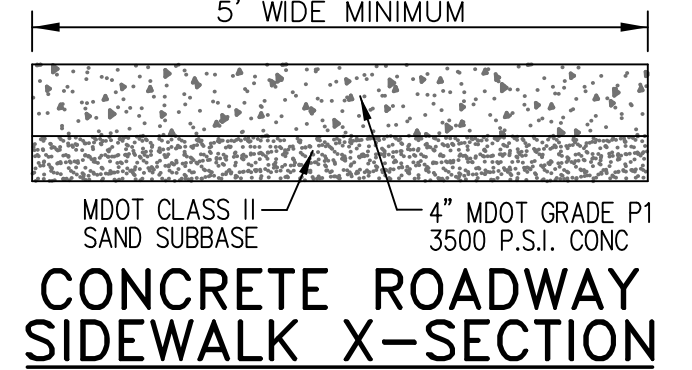
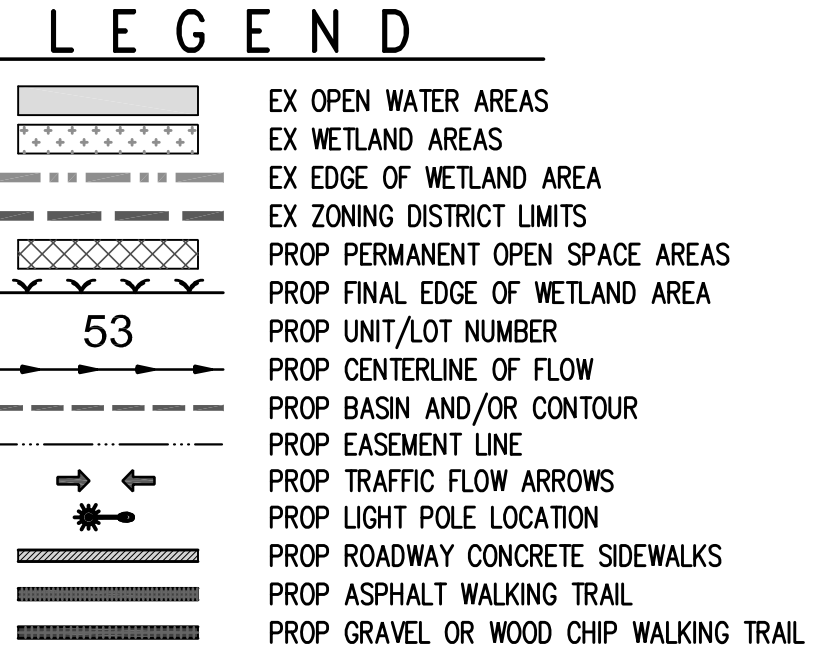


NORTHWEST CORNER OF THE SOUTH 1/4 OF THE SECTION 3  
NORTH EAST CORNER OF THE SOUTH 1/4 OF THE SECTION 4 PER ADJACENT SURVEY L2783 P 022



INDIVIDUAL UNIT INFORMATION TABLE						
UNIT NUMBER	TOTAL UNIT AREA (SFT)	TOTAL UNIT AREA (ACRES)	BUILDING ENVELOPE (SFT)	FRONT SETBACK (FEET)	FRONT LOT WIDTH AT SETBACKLINE (FEET)	FRONT LOT WIDTH AT SETBACKLINE (FEET)
1	40,777	0.936	17,031	40.0	252.5	40.0
2	31,535	0.724	10,849	50.0	129.0	50.0
3	23,726	0.545	10,240	50.0	117.2	50.0
4	30,168	0.693	14,615	50.0	90.0	50.0
5	26,272	0.603	10,244	50.0	90.0	50.0
6	22,516	0.517	9,330	50.0	99.0	50.0
7	27,432	0.630	13,071	50.0	90.0	50.0
8	21,912	0.503	8,613	50.0	106.3	50.0
9	23,533	0.540	7,021	40.0	195.0	50.0
10	26,160	0.601	12,345	50.0	99.3	50.0
11	27,360	0.628	13,061	50.0	107.2	50.0
12	27,230	0.625	11,562	50.0	126.5	50.0
13	27,319	0.627	9,919	50.0	100.5	50.0
14	23,975	0.550	10,385	50.0	90.0	50.0
15	23,267	0.535	9,473	50.0	90.0	50.0
16	22,526	0.517	9,973	50.0	90.0	50.0
17	40,616	0.932	17,708	50.0	101.6	50.0
18	27,813	0.638	7,296	50.0	90.0	50.0
19	26,652	0.611	11,076	50.0	90.0	50.0
20	26,015	0.574	10,645	50.0	90.0	50.0
21	23,045	0.529	6,792	50.0	90.0	50.0
22	21,987	0.505	5,346	50.0	91.7	50.0
23	21,762	0.500	6,674	50.0	106.6	50.0
24	21,785	0.500	6,961	50.0	112.5	50.0
25	21,792	0.500	6,652	50.0	110.4	50.0
26	22,284	0.512	5,829	50.0	111.4	50.0
27	36,638	0.841	10,801	40.0	116.5	50.0
28	31,974	0.734	8,633	40.0	254.0	50.0
29	26,247	0.603	9,385	40.0	163.1	50.0
30	23,178	0.532	8,859	50.0	144.3	50.0
31	30,875	0.709	14,265	50.0	167.4	50.0
32	22,254	0.511	6,296	50.0	100.0	50.0
33	23,485	0.539	8,536	50.0	100.0	50.0
34	21,788	0.500	8,356	50.0	100.0	50.0
35	21,841	0.501	5,241	50.0	140.0	50.0
36	22,592	0.519	6,859	40.0	139.6	50.0
37	23,990	0.551	7,909	50.0	167.9	50.0
38	22,105	0.507	9,079	50.0	111.9	50.0
39	26,122	0.600	10,367	50.0	133.9	50.0
40	26,130	0.577	9,952	50.0	131.5	50.0
41	23,562	0.541	7,975	50.0	122.0	50.0
42	27,499	0.631	9,278	40.0	234.2	50.0

INDIVIDUAL UNIT INFORMATION TABLE						
UNIT NUMBER	TOTAL UNIT AREA (SFT)	TOTAL UNIT AREA (ACRES)	BUILDING ENVELOPE (SFT)	FRONT SETBACK (FEET)	FRONT LOT WIDTH AT SETBACKLINE (FEET)	FRONT LOT WIDTH AT SETBACKLINE (FEET)
43	56,816	1.304	12,507	50.0	197.4	50.0
44	24,195	0.555	10,988	50.0	100.0	50.0
45	23,988	0.542	10,564	50.0	99.0	50.0
46	24,802	0.569	11,404	50.0	103.0	50.0
47	24,195	0.555	10,988	50.0	100.0	50.0
48	23,849	0.547	10,188	50.0	100.0	50.0
49	24,863	0.571	7,433	50.0	110.0	50.0
50	21,834	0.501	7,570	35.0	115.6	50.0
51	21,888	0.502	7,625	35.0	124.8	50.0
52	22,885	0.525	7,316	35.0	140.6	50.0
53	22,313	0.512	7,891	35.0	149.1	50.0
54	18,128	0.416	6,947	35.0	116.0	50.0
55	25,578	0.587	8,270	50.0	116.3	50.0
56	23,100	0.530	10,125	50.0	105.0	50.0
57	23,100	0.530	10,125	50.0	105.0	50.0
58	25,578	0.587	8,270	50.0	116.3	50.0
59	31,500	0.723	9,300	50.0	210.0	50.0
60	37,076	0.851	9,282	50.0	244.1	50.0
61	23,678	0.545	8,970	50.0	116.3	50.0
62	23,100	0.530	10,125	50.0	105.0	50.0
63	23,100	0.530	10,125	50.0	105.0	50.0
64	25,578	0.587	8,270	50.0	116.3	50.0
65	18,950	0.435	8,134	35.0	110.0	50.0
66	18,484	0.424	8,051	35.0	101.4	50.0
67	18,287	0.420	7,983	35.0	124.1	50.0
68	19,514	0.448	8,773	35.0	129.2	50.0
69	18,490	0.424	7,924	35.0	106.3	50.0
70	18,754	0.431	7,897	35.0	110.6	50.0
71	18,080	0.415	5,595	35.0	128.6	50.0
72	18,036	0.414	6,766	35.0	137.7	50.0
73	18,024	0.414	6,890	35.0	131.8	50.0
74	18,025	0.414	6,941	35.0	132.3	50.0
75	42,757	0.982	18,551	35.0	121.7	50.0
76	21,069	0.484	6,717	35.0	136.5	50.0
77	18,093	0.415	6,074	35.0	141.0	50.0
78	25,233	0.579	9,787	35.0	139.7	50.0
79	41,547	0.954	18,190	35.0	122.8	50.0
80	26,617	0.611	9,795	35.0	168.2	50.0
81	20,360	0.467	6,411	35.0	145.4	50.0
82	29,613	0.680	15,647	35.0	113.0	50.0
83	25,125	0.577	12,068	35.0	113.4	50.0
84	26,319	0.604	12,026	35.0	115.6	50.0
85	26,156	0.600	9,833	35.0	153.8	50.0
86	30,005	0.689	10,916	35.0	220.6	50.0
87	70,434	1.617	38,506	50.0	326.5	50.0
88	117,223	2.691	81,787	50.0	317.3	50.0



### SITE SPECIFIC NOTES:

- ALL ROADS WILL BECOME PUBLIC ROADS BUILT TO MEET THE LIVINGSTON COUNTY ROAD COMMISSION STANDARDS AND SPECIFICATIONS, AND WILL BE DEDICATED TO THE ROAD COMMISSION UPON FINAL APPROVALS.
- ALL DETENTION BASINS WILL BE DESIGNED AND BUILT PER THE LIVINGSTON COUNTY DRAIN COMMISSION (LDC), AND WILL BE PARTIALLY PRIVATE & PUBLIC SYSTEMS UPON FINAL APPROVALS.
- ROADWAY SIDEWALKS ARE PROPOSED PER TYRONE TOWNSHIP PLANNING REQUEST, AND SHALL BE A MINIMUM OF 5 FEET WIDE, 1 FOOT INSIDE THE ROAD RIGHT-OF-WAY FOR THE ENTIRE PROJECT. (SEE DETAIL SHEET C-1 & C-4). ALL OTHER WALKWAYS/NATURE TRAILS ARE FOR THE USE OF THE PROPOSED DEVELOPMENT, AND SHALL BE MINIMUM 5' WIDE AND BE CONSTRUCTED OF EITHER COMPACTED LIMESTONE, ASPHALT, CONCRETE, OR WOOD CHIPS, AS PER THE REQUIREMENTS OF THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES & ENERGY (EGLE).
- THE PLANNED UNIT DEVELOPMENT AND SPECIAL LAND USE REVIEW AND APPROVAL IS A TWO STEP PROCESS. FIRST PRELIMINARY APPROVALS, THEN FINAL SITE PLAN APPROVAL, BEFORE ANY PERMITS ARE ISSUED FOR THE PROJECT.
- THE PLANNED UNIT DEVELOPMENT WILL CONSIST OF TWO DIFFERENT PHASES OF DEVELOPMENT. UPON APPROVAL OF THIS PRELIMINARY PLANNED UNIT DEVELOPMENT, CONSTRUCTION DRAWINGS WILL BE SUBMITTED SEPARATELY FOR EACH PHASE OF CONSTRUCTION.

### P.U.D. DEVELOPMENT STANDARDS:

- MINIMUM LOT AREA = 21,780 SFT OR 0.50 ACRES (PHASE 1)
- MINIMUM LOT AREA = 18,000 SFT OR 0.41 ACRES (PHASE 2)
- MINIMUM LOT WIDTH = 90 FEET (WITH SEWER)
- SETBACKS REQUIREMENTS:
  - FRONT = 35 FEET (MIN) TO 50 FEET (MAX)
  - SIDE = 15 FEET (TOTAL TWO SIDES = 30 FEET)
  - REAR = 35 FEET (MIN)
  - OPEN WATER SETBACK = 50 FEET (MIN)
  - MAXIMUM LOT COVERAGE = 35%
  - MAXIMUM BUILDING HEIGHT = 30 FEET
  - MINIMUM BUILDING SQUARE FOOTAGE = 1,600 SFT (SEE INDIVIDUAL UNIT INFORMATION TABLE, LEFT)

SCALE: 1"=150'  
JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
LIVINGSTON COUNTY, MICHIGAN

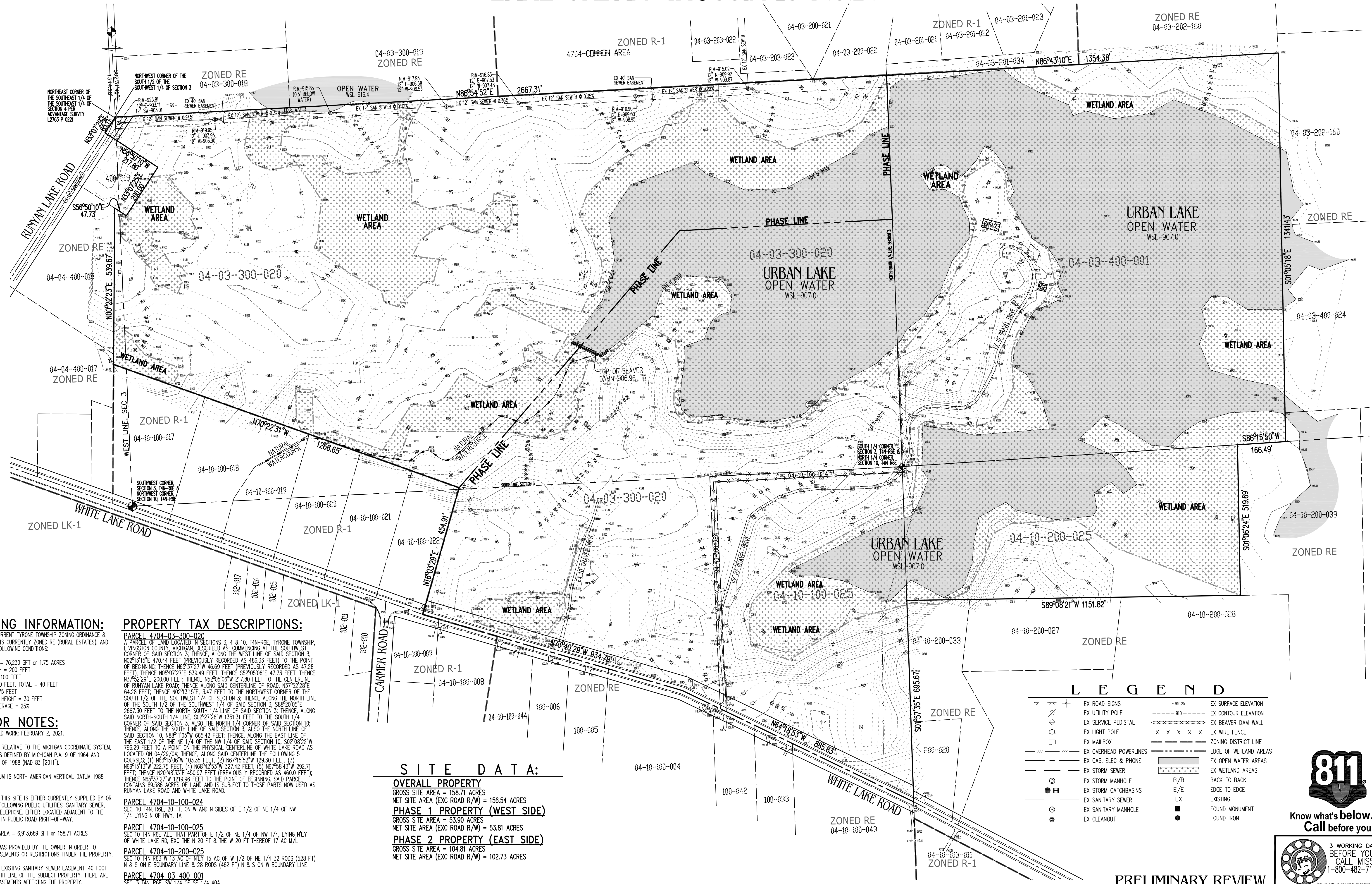
**F&E** Fenton Land Surveying & Engineering, Inc  
14165 N. FENTON ROAD, SUITE 101A, FENTON, MI 48430  
PHONE: 810.354.8115 EMAIL: INFO@FENTONLSE.COM

PRELIMINARY OVERALL SITE PLAN LAYOUT FOR:  
**LAKE URBAN CROSSINGS P.U.D. CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	05.27.2021	SHEET NO:
08.09.2021	DSN BY:	J.R.B.	"	<b>P-2</b>
10.06.2021	CHK'D BY:	J.P.W.	"	
10.25.2021	APPR BY:	J.B.M.	"	



# SURVEY OF EXISTING CONDITIONS LAKE URBAN CROSSINGS P.U.D.



### EX ZONING INFORMATION:

ACCORDING TO THE CURRENT TYRONE TOWNSHIP ZONING ORDINANCE & MAP, THIS PROPERTY IS CURRENTLY ZONED RE (RURAL ESTATES), AND IS SUBJECT TO THE FOLLOWING CONDITIONS:

- 1) MINIMUM LOT SIZE = 76,230 SFT OR 1.75 ACRES
- 2) MINIMUM LOT WIDTH = 200 FEET
- 3) FRONT SETBACK = 100 FEET
- 4) SIDE SETBACK = 20 FEET, TOTAL = 40 FEET
- 5) REAR SETBACK = 75 FEET
- 6) MAXIMUM BUILDING HEIGHT = 30 FEET
- 7) MAXIMUM LOT COVERAGE = 25%

### SURVEYOR NOTES:

1. DATE OF LAST FIELD WORK: FEBRUARY 2, 2021.
2. THE BEARINGS ARE RELATIVE TO THE MICHIGAN COORDINATE SYSTEM, SOUTH ZONE (2113) AS DEFINED BY MICHIGAN P.A. 9 OF 1964 AND AMENDED BY P.A. 154 OF 1988 (NAD 83 [2011]).
3. THE VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).
4. PER OBSERVATION, THIS SITE IS EITHER CURRENTLY SUPPLIED BY OR HAS ACCESS TO THE FOLLOWING PUBLIC UTILITIES: SANITARY SEWER, GAS, ELECTRIC, AND TELEPHONE. EITHER LOCATED ADJACENT TO THE SUBJECT SITE OR WITHIN PUBLIC ROAD RIGHT-OF-WAY.
5. TOTAL PROPERTY AREA = 6,913,689 SFT OR 158.71 ACRES
6. NO TITLE POLICY WAS PROVIDED BY THE OWNER IN ORDER TO DETERMINE IF ANY EASEMENTS OR RESTRICTIONS HINDER THE PROPERTY.
7. THERE IS ONLY AN EXISTING SANITARY SEWER EASEMENT, 40 FOOT WIDE, ALONG THE NORTH LINE OF THE SUBJECT PROPERTY. THERE ARE NO OTHER EXISTING EASEMENTS AFFECTING THE PROPERTY.

### PROPERTY TAX DESCRIPTIONS:

**PARCEL 4704-03-300-020**  
A PARCEL OF LAND LOCATED IN SECTIONS 3, 4 & 10, T4N-R6E, TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN, DESCRIBED AS: COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 3; THENCE ALONG THE WEST LINE OF SAID SECTION 3, N02°13'15"E 470.44 FEET (PREVIOUSLY RECORDED AS 486.33 FEET) TO THE POINT OF BEGINNING; THENCE N65°37'27"W 46.69 FEET (PREVIOUSLY RECORDED AS 47.28 FEET); THENCE N05°07'27"E 539.49 FEET; THENCE S02°05'06"E 47.73 FEET; THENCE N37°52'29"E 200.00 FEET; THENCE N02°05'06"W 217.80 FEET TO THE CENTERLINE OF RUNYAN LAKE ROAD; THENCE ALONG SAID CENTERLINE OF ROAD, N37°52'28"E 64.28 FEET; THENCE N02°13'15"E, 3.47 FEET TO THE NORTHWEST CORNER OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 3; THENCE ALONG THE NORTH LINE OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SAID SECTION 3, S88°20'03"E 2667.30 FEET TO THE NORTH-SOUTH 1/4 LINE OF SAID SECTION 3; THENCE, ALONG SAID NORTH-SOUTH 1/4 LINE, S02°27'26"W 1351.31 FEET TO THE SOUTH 1/4 CORNER OF SAID SECTION 3, ALSO THE NORTH 1/4 CORNER OF SAID SECTION 10; THENCE, ALONG THE SOUTH LINE OF SAID SECTION 3, ALSO THE NORTH LINE OF SAID SECTION 10, N89°11'05"W 668.42 FEET; THENCE, ALONG THE EAST LINE OF THE EAST 1/2 OF THE NE 1/4 OF THE NW 1/4 OF SAID SECTION 10, S02°08'22"W 796.29 FEET TO A POINT ON THE PHYSICAL CENTERLINE OF WHITE LAKE ROAD AS LOCATED ON 04/29/04; THENCE, ALONG SAID CENTERLINE OF THE FOLLOWING S COURSES: (1) N63°50'06"W 103.35 FEET, (2) N67°15'52"W 129.30 FEET, (3) N69°15'13"W 222.75 FEET, (4) N68°42'53"W 327.42 FEET, (5) N67°58'43"W 292.71 FEET; THENCE N20°48'33"E 450.97 FEET (PREVIOUSLY RECORDED AS 460.0 FEET); THENCE N65°37'27"W 1219.96 FEET TO THE POINT OF BEGINNING. SAID PARCEL CONTAINS 80.586 ACRES OF LAND AND IS SUBJECT TO THOSE PARTS NOW USED AS RUNYAN LAKE ROAD AND WHITE LAKE ROAD.

**PARCEL 4704-10-100-024**  
SEC. 10 T4N-R6E, 20 FT. ON W AND N SIDES OF E 1/2 OF NE 1/4 OF NW 1/4 LYING N OF HWY. 1A

**PARCEL 4704-10-100-025**  
SEC. 10 T4N-R6E, ALL THAT PART OF E 1/2 OF NE 1/4 OF NW 1/4 LYING NLY OF WHITE LAKE RD, EXC. THE N 20 FT & THE W 20 FT THEREOF 17 AC W/L

**PARCEL 4704-10-200-025**  
SEC. 10 T4N-R6E, W 1/2 OF NE 1/4 OF NW 1/4 AC OF W 1/2 OF NE 1/4 32 RODS (528 FT) N & S ON E BOUNDARY LINE & 28 RODS (462 FT) N & S ON W BOUNDARY LINE

**PARCEL 4704-03-400-001**  
SEC. 3 T4N-R6E, SW 1/4 OF SE 1/4 40A

### SITE DATA:

**OVERALL PROPERTY**  
GROSS SITE AREA = 158.71 ACRES  
NET SITE AREA (EXC ROAD R/W) = 156.54 ACRES

**PHASE 1 PROPERTY (WEST SIDE)**  
GROSS SITE AREA = 53.90 ACRES  
NET SITE AREA (EXC ROAD R/W) = 53.81 ACRES

**PHASE 2 PROPERTY (EAST SIDE)**  
GROSS SITE AREA = 104.81 ACRES  
NET SITE AREA (EXC ROAD R/W) = 102.73 ACRES

### LEGEND

	EX ROAD SIGNS		EX SURFACE ELEVATION
	EX UTILITY POLE		EX CONTOUR ELEVATION
	EX SERVICE PEDISTAL		EX BEAVER DAM WALL
	EX LIGHT POLE		EX WIRE FENCE
	EX MAILBOX		ZONING DISTRICT LINE
	EX OVERHEAD POWERLINES		EDGE OF WETLAND AREAS
	EX GAS, ELEC & PHONE		EX OPEN WATER AREAS
	EX STORM SEWER		EX WETLAND AREAS
	EX STORM MANHOLE		BACK TO BACK
	EX STORM CATCHBASINS		EDGE TO EDGE
	EX SANITARY SEWER		EXISTING
	EX SANITARY MANHOLE		FOUND MONUMENT
	EX CLEANOUT		FOUND IRON



Know what's below.  
Call before you dig.

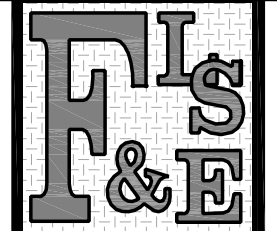


PRELIMINARY REVIEW

SCALE: 1"=150'  
JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
LIVINGSTON COUNTY, MICHIGAN



Fenton Land Surveying & Engineering, Inc  
14165 N. FENTON ROAD, SUITE 101A, FENTON, MI 48430  
PHONE: 810.354.8115 EMAIL: INFO@FENTONLSE.COM

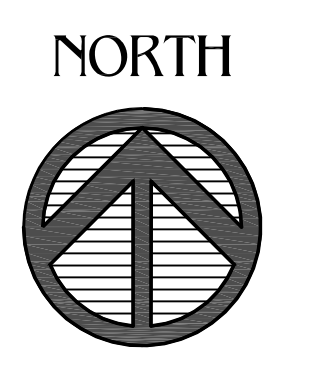
SURVEY OF EXISTING CONDITIONS FOR:  
**LAKE URBAN CROSSINGS P.U.D.**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	05.27.2021	SHEET NO:
08.04.2021	DSN BY:	J.R.B.	"	P-3
10.06.2021	CHK'D BY:	J.P.W.	"	
10.25.2021	APPR BY:	J.B.M.	"	

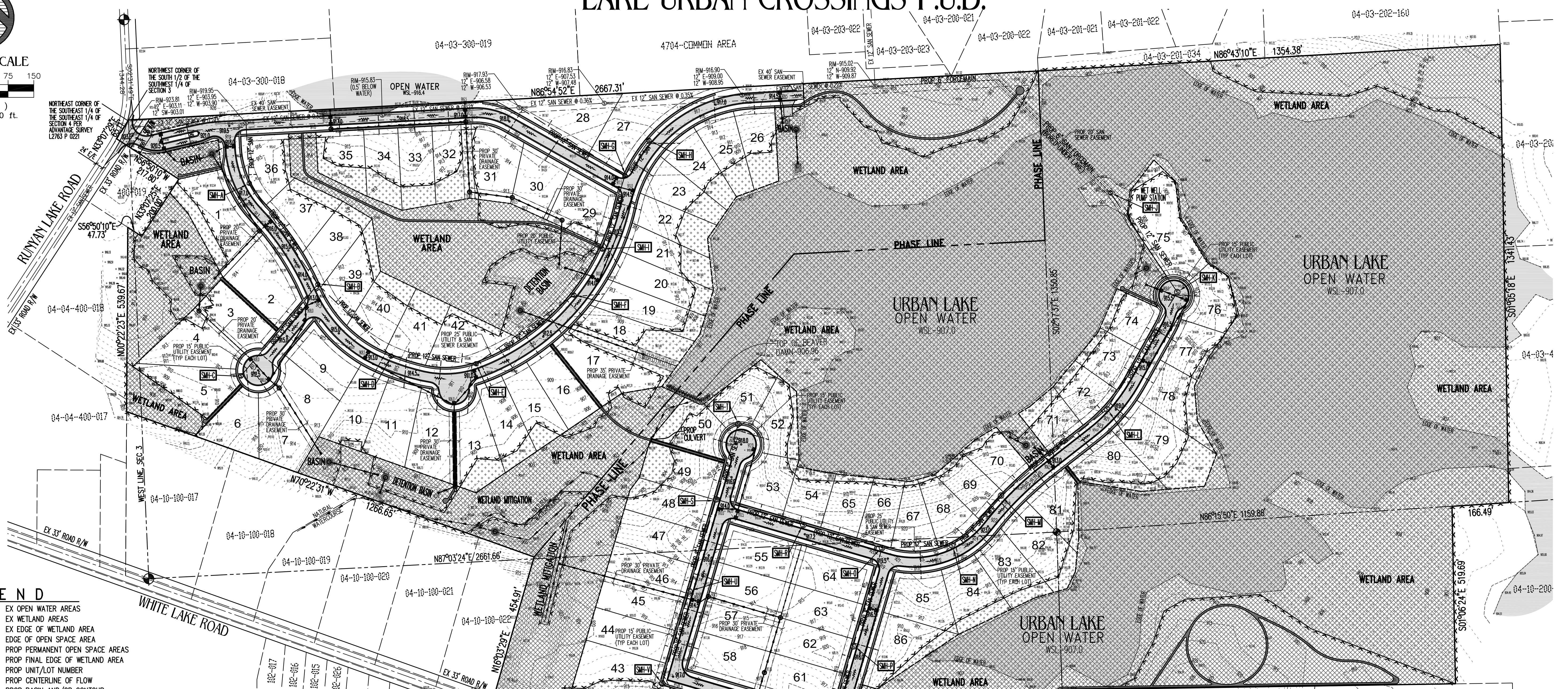
FILE: JOBS: 2020/20-290-WL/DWG/20-290-EX SURVEY.DWG - P.3



# PRELIMINARY SITE UTILITY PLAN LAYOUT LAKE URBAN CROSSINGS P.U.D.



GRAPHIC SCALE  
150 0 75 150  
( IN FEET )  
1 inch = 150 ft.

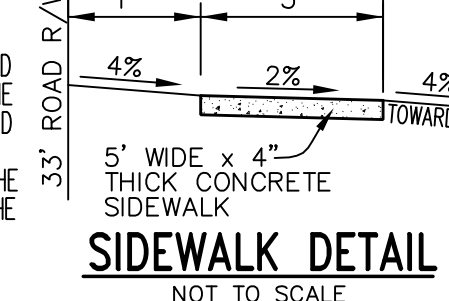
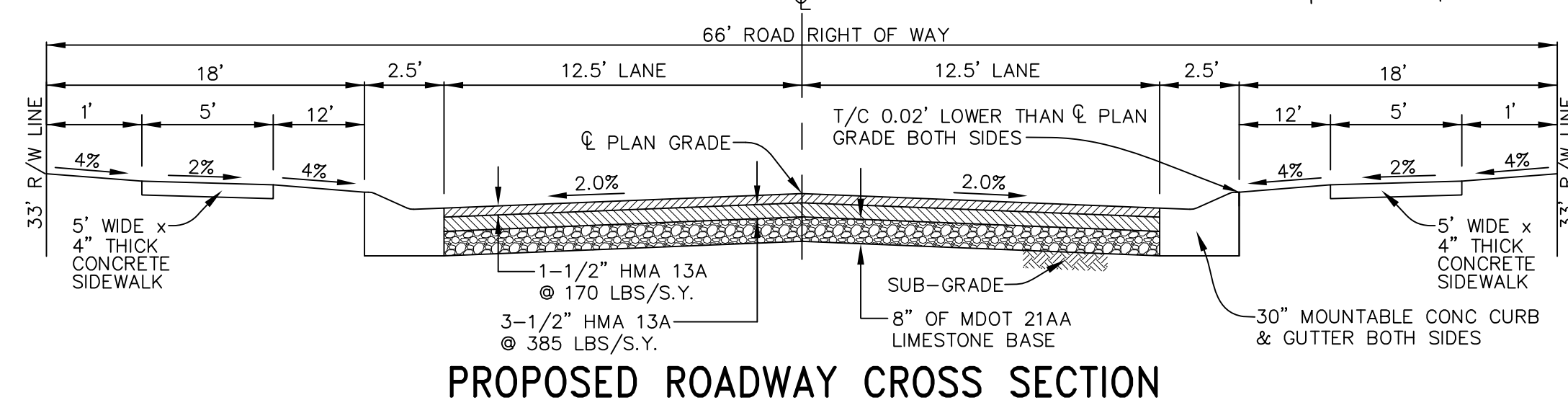
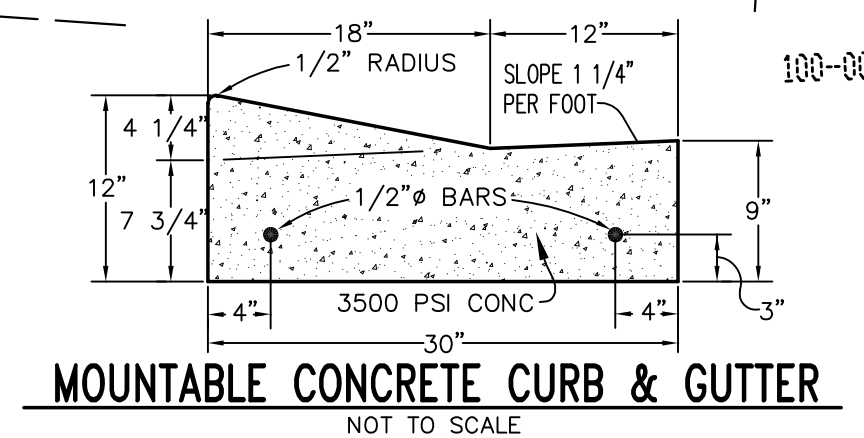


## LEGEND

- EX OPEN WATER AREAS
- EX WETLAND AREAS
- EX EDGE OF WETLAND AREA
- EDGE OF OPEN SPACE AREA
- PROP PERMANENT OPEN SPACE AREAS
- PROP FINAL EDGE OF WETLAND AREA
- PROP UNIT/LOT NUMBER
- PROP CENTERLINE OF FLOW
- PROP BASIN AND/OR CONTOUR
- PROP EASEMENT LINE
- PROP ROADWAY CONCRETE SIDEWALKS
- PROP ASPHALT WALKING TRAIL
- PROP GRAVEL OR WOOD CHIP WALKING TRAIL
- PROP STORM MANHOLES
- PROP STORM SEWER LINE
- PROP SURFACE ELEVATION
- PROP DRAINAGE FLOW ARROW
- PROP SANITARY MANHOLE
- PROP SANITARY SEWER LINE
- PROP SANITARY LEAD LINE
- PROP SANITARY MANHOLE LETTER

SANITARY SEWER MH LETTER	RIM ELEVATION	INVERT (S)
EX SAN MH	EX-919.95	EX 12" E-W-903.90, PROP 12" S-904.00
SMH-A	917.50	12" N-SE-904.38
SMH-B	914.00	12" NW-SE-SW-905.17
SMH-C	913.00	12" NE-905.95
SMH-D	914.00	12" NW-E-905.83
SMH-E	912.00	12" W-NE-906.38
SMH-F	903.50	12" SW-907.16
EX SAN MH	EX-917.93	EX 12" E-W-906.55, PROP 12" SE-906.60
SMH-G	914.50	12" NW,S,NE-907.41
SMH-H	916.00	12" SW-907.68
SMH-I	915.00	12" N-907.90
EX SAN MH	EX-915.02	EX 12" N-W-909.90, PROP 6" FM E-910.00
SMH-J (PS)	909.50	PROP 6" FM NW-902.00, 12" SE-900.94 (PUMP STA)
SMH-K	915.50	12" NW,SW-901.71
SMH-L	918.50	12" NE,SW-902.59
SMH-M	919.50	12" NE,SW-903.47
SMH-N	921.50	12" NE-W-903.92
SMH-O	920.00	12" E-W-904.37, 8" SW-904.37
SMH-P	918.00	8" NE-SW-907.37
SMH-Q	918.00	8" NE-909.98
SMH-R	917.50	12" E-W-904.85
SMH-S	914.50	12" E-905.45, 8" NE,SW-905.50
SMH-T	918.50	8" SW-907.80
SMH-U	915.00	8" NE-SW-907.18
SMH-V	917.00	8" NE-908.96

SANITARY SEWER STRUCTURE SCHEDULE



## GENERAL CONSTRUCTION NOTES:

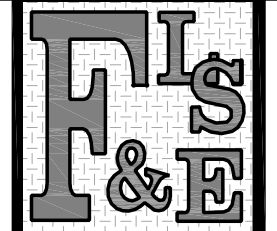
- ALL SITE CONSTRUCTION WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2012 MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE LATEST MDOT STANDARD ROAD PLANS, AND THE LATEST TYRONE TOWNSHIP ZONING ORDINANCE AND ENGINEERING DESIGN STANDARDS. COPIES OF ALL MDOT DOCUMENTS MAY BE OBTAINED FROM THEIR WEBSITE (WWW.MICHIGAN.GOV/MDOT).
- THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO GRADE THE SITE TO THE GRADES SHOWN ON THE PLANS OR SPECIFIED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION, EMBANKMENT, AND THE FURNISHING AND PLACING OF ALL BORROW MATERIAL REQUIRED TO OBTAIN THE SPECIFIED GRADES.
- ALL WORK NECESSARY TO COMPLETE THIS PROJECT SHALL CONFORM TO ALL RELATED TYRONE TOWNSHIP & LIVINGSTON COUNTY CODES AND ORDINANCES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, INSURANCE AND BONDS PRIOR TO CONSTRUCTION, INCLUDING THE PAYMENT OF ANY FEES, REQUIRED BY ANY FEDERAL, STATE, LOCAL, OR PRIVATE ORGANIZATIONS.
- SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE EMPLOYED IN ACCORDANCE WITH THE SOIL EROSION CONTROL PLAN, AND SHALL MEET THE APPROVAL OF THE LDCO-SESC AND/OR TYRONE TOWNSHIP SOIL EROSION CONTROL DEPARTMENT. CONTRACTOR SHALL OBTAIN SOIL EROSION CONTROL PERMIT FROM LDCO-SESC DEPARTMENT.
- CONTRACTOR SHALL NOTIFY ALL APPROPRIATE UTILITY COMPANIES PRIOR TO PERFORMING WORK, AND SHALL OBTAIN ANY REQUIRED PERMITS OR APPROVALS PRIOR TO PERFORMING WORK.
- THREE (3) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT MISS DIG UTILITY PROTECTION SERVICE (1-800-482-7171) TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED IN ACCORDANCE WITH THE UTILITY OWNERS REQUIREMENTS AT THE CONTRACTORS EXPENSE.
- PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO EXPOSE ALL EXISTING UTILITIES THAT CROSS THE PROPOSED CONSTRUCTION IN ORDER TO DETERMINE IF A VERTICAL CONFLICT EXISTS BETWEEN THE EXISTING UTILITY AND THE PROPOSED CONSTRUCTION. ALL LABOR REQUIRED TO UNCOVER THE EXISTING UTILITY SHALL BE CONSIDERED AS BEING INCLUDED IN THE COST OF CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE DEPTH AND HORIZONTAL LOCATIONS OF ALL UTILITIES IN SUFFICIENT TIME SUCH THAT ANY CONFLICTS CAN BE RESOLVED BEFORE WORK IS STARTED IN THAT PORTION OF THE PROJECT. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE VARIOUS UTILITY OWNERS TO LOCATE, REMOVE AND REPLACE OR RELOCATE THEIR FACILITIES. ALL COST FOR THIS WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- PRIOR TO BIDDING, THE CONTRACTOR AND SUBCONTRACTORS SHALL MAKE A PERSONAL INVESTIGATION OF THE SITE AND EXISTING SURFACE AND SUBSURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACCOUNT THEMSELVES WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUBSURFACE SOIL AND GROUND WATER CONDITIONS. OTHERWISE, IF DETERMINED NECESSARY BY THE CONTRACTOR, WILL BE INCIDENTAL TO THE COST OF CONSTRUCTION.
- ALL FILL ON THE PROPERTY SHALL BE ADEQUATELY COMPACTED BY ROLLING TO PROVIDE A SURFACE SATISFACTORY FOR THE PROPER INSTALLATION OF THE PROPOSED WORK. BEFORE COMMENCING PAVING WORK, THE PAVING CONTRACTOR MUST MAKE CERTAIN THAT THE SURFACES TO BE COVERED ARE IN PROPER CONDITION. SURFACES NOT ACCEPTABLE SHALL BE REPORTED TO THE OWNER IMMEDIATELY. THE APPLICATION OF PAVING MATERIALS SHALL BE HELD TO BE AN ACCEPTANCE OF THE SURFACES AND WORKING CONDITIONS BY THE PAVING CONTRACTOR WHO WILL BE HELD RESPONSIBLE FOR THE RESULTS. ANY UNSTABLE LIMESTONE BASE OR ASPHALT PAVEMENT MUST BE REMOVED AND REPLACED BY THE CONTRACTOR AT THEIR COST AS REQUIRED BY THE OWNER AND/OR ENGINEER.
- CONTRACTOR SHALL REMOVE ALL EXISTING STRUCTURES, TREES, BRUSH, FENCES, SLABS, DRIVEWAYS AND/OR SIDEWALKS THAT ARE AFFECTED BY THE PROPOSED WORK. VISIT SITE TO DETERMINE EXTENT OF REMOVAL WORK WHICH MAY OR MAY NOT BE SHOWN ON PLANS.
- THE CONTRACTOR MUST PROVIDE ALL MEASURES REQUIRED FOR TRAFFIC CONTROL DURING CONSTRUCTION AS REQUIRED BY TYRONE TOWNSHIP AND IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2011 EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AS AMENDED, AND SECTION 802 OF THE 2012 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. THE CONTRACTOR MUST PLACE PLASTIC DRUMS, TEMPORARY SIGNING, LIGHTED ARROWS, YELLOW CONSTRUCTION WARNING TAPE, AND ANY OTHER MEASURES REQUIRED TO PROTECT THE PUBLIC DURING CONSTRUCTION.
- ALL TRAFFIC SIGNS SHALL CONFORM WITH THE REQUIREMENTS OF THE 2011 EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AS AMENDED, AND SECTION 810 OF THE 2012 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- THE CONTRACTOR SHALL CONTROL NOISE, CARRY OUT A PROGRAM OF DUST CONTROL AND SHALL ALLOW NO ON-SITE BURNING WITHOUT APPROVAL FROM LOCAL FIRE DEPARTMENT.

## PRELIMINARY REVIEW

SCALE: 1"=150'  
JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
LIVINGSTON COUNTY, MICHIGAN



Fenton Land Surveying & Engineering, Inc  
14165 N. FENTON ROAD, SUITE 101A, FENTON, MI 48430  
PHONE: 810.354.8115 EMAIL: INFO@FENTONLSE.COM

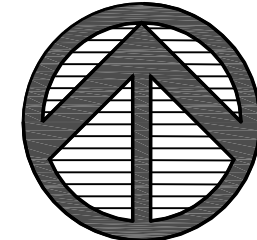
PRELIMINARY SITE UTILITY PLAN LAYOUT FOR:  
**LAKE URBAN CROSSINGS P.U.D. CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	05.27.2021	SHEET NO:
08.04.2021	DSN BY:	J.R.B.	"	P-4
10.06.2021	CHK'D BY:	J.P.W.	"	
10.25.2021	APPR BY:	J.B.M.	"	

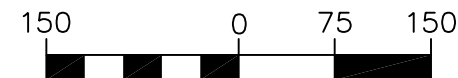
FILED: JOBS: 2020/20-290-WL/DWG/20-290 UTILITY PLAN LAYOUT.DWG - P-4



NORTH



GRAPHIC SCALE

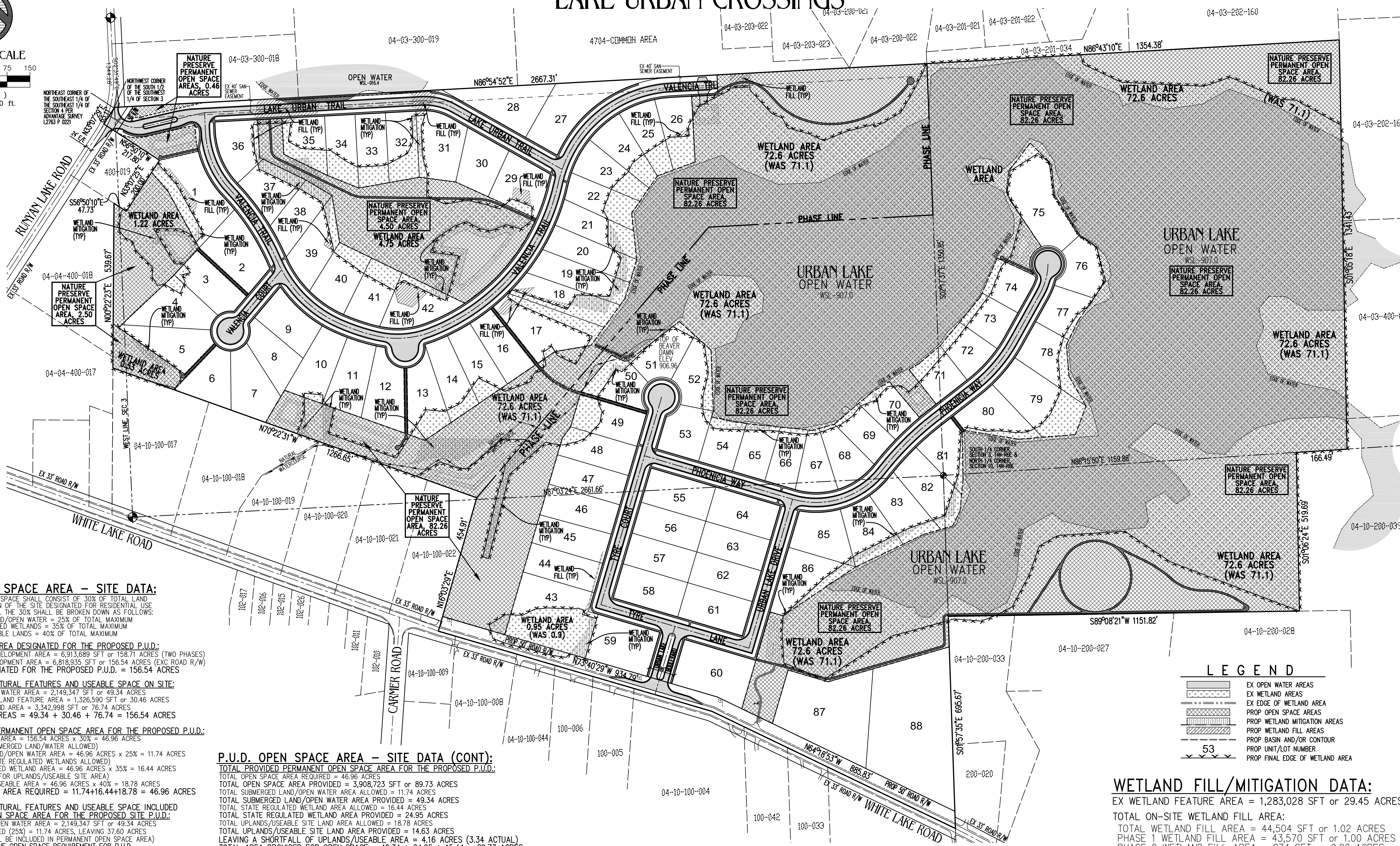


( IN FEET )  
1 inch = 150 ft.

NORTHEAST CORNER OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 4 PER ADVANTAGE SURVEY L2763 P. 022

NORTHWEST CORNER OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 3

# PRELIMINARY SITE OPEN SPACE PLAN LAKE URBAN CROSSINGS



### P.U.D. OPEN SPACE AREA - SITE DATA:

THE P.U.D. OPEN SPACE AREA SHALL CONSIST OF 30% OF TOTAL LAND AREA OF THAT PORTION OF THE SITE DESIGNATED FOR RESIDENTIAL USE. THE 30% SHALL BE BROKEN DOWN AS FOLLOWS:  
1. SUBMERGED LAND/OPEN WATER = 25% OF TOTAL MAXIMUM  
2. STATE REGULATED WETLANDS = 35% OF TOTAL MAXIMUM  
3. UPLANDS/USEABLE LANDS = 40% OF TOTAL MAXIMUM

TOTAL PROPERTY AREA DESIGNATED FOR THE PROPOSED P.U.D.:  
TOTAL GROSS SITE DEVELOPMENT AREA = 6,913,689 SFT or 158.71 ACRES (TWO PHASES)  
TOTAL NET SITE DEVELOPMENT AREA = 6,818,935 SFT or 156.54 ACRES (EXC ROAD R/W)  
TOTAL AREA DESIGNATED FOR THE PROPOSED P.U.D. = 156.54 ACRES

TOTAL AREA OF NATURAL FEATURES AND USEABLE SPACE ON SITE:  
SUBMERGED LAND/OPEN WATER AREA = 2,149,347 SFT or 49.34 ACRES  
STATE REGULATED WETLAND FEATURE AREA = 1,326,590 SFT or 30.46 ACRES  
UPLANDS/USEABLE LAND AREA = 3,342,998 SFT or 76.74 ACRES  
TOTAL SPECIFIED AREAS = 49.34 + 30.46 + 76.74 = 156.54 ACRES

TOTAL REQUIRED PERMANENT OPEN SPACE AREA FOR THE PROPOSED P.U.D.:  
TOTAL NET P.U.D. SITE AREA = 156.54 ACRES x 30% = 46.96 ACRES  
(25% MAXIMUM OF SUBMERGED LAND/WATER ALLOWED)  
TOTAL SUBMERGED LAND/OPEN WATER AREA = 46.96 ACRES x 25% = 11.74 ACRES  
(35% MAXIMUM OF STATE REGULATED WETLANDS ALLOWED)  
TOTAL STATE REGULATED WETLAND AREA = 46.96 ACRES x 35% = 16.44 ACRES  
(REMAINING 40% USED FOR UPLANDS/USEABLE SITE AREA)  
TOTAL UPLAND/USEABLE AREA = 46.96 ACRES x 40% = 18.78 ACRES  
TOTAL OPEN SPACE AREA REQUIRED = 11.74 + 16.44 + 18.78 = 46.96 ACRES

TOTAL AREA OF NATURAL FEATURES AND USEABLE SPACE INCLUDED IN PERMANENT OPEN SPACE AREA FOR THE PROPOSED P.U.D.:  
EX SUBMERGED LAND/OPEN WATER AREA = 2,149,347 SFT or 49.34 ACRES  
MAXIMUM AREA ALLOWED (25%) = 11.74 ACRES, LEAVING 37.60 ACRES  
(ALL 49.34 ACRES WILL BE INCLUDED IN PERMANENT OPEN SPACE AREA)  
MEETS OR EXCEEDS THE OPEN SPACE REQUIREMENT FOR P.U.D.  
EX STATE REGULATED WETLAND FEATURE AREA = 1,086,814 SFT or 24.95 ACRES  
MAXIMUM AREA ALLOWED (35%) = 16.44 ACRES, LEAVING 851 ACRES  
(ALL 24.95 ACRES WILL BE INCLUDED IN PERMANENT OPEN SPACE AREA)  
MEETS OR EXCEEDS THE OPEN SPACE REQUIREMENT FOR P.U.D.  
REMAINING UPLANDS/USEABLE LAND AREA = 672,562 SFT or 15.44 ACRES  
MAXIMUM AREA ALLOWED (40%) = 18.78 ACRES, PROVIDING 15.44 ACRES  
(ONLY 14.63 ACRES OF UPLANDS/USEABLE (15.44 ACRES TOTAL) WILL BE INCLUDED IN PERMANENT OPEN SPACE AREA, COMPRISED OF 113.81 ACRES OF TRUE UPLAND/USEABLE AREAS AND 1.63 ACRES OF BASIN AREA, A MAX OF 50% OF BASIN AREA ALLOWED = 70,797 SFT x 50% = 35,399 SFT or 0.815 ACRES.  
A SHORTFALL OF 18.78 - 13.81 = 4.97 ACRES (3.34 ACTUAL) DOES NOT MEET MINIMUM REQUIREMENT FOR OPEN SPACE FOR P.U.D.

### P.U.D. OPEN SPACE AREA - SITE DATA (CONT):

TOTAL PROVIDED PERMANENT OPEN SPACE AREA FOR THE PROPOSED P.U.D.:  
TOTAL OPEN SPACE AREA REQUIRED = 46.96 ACRES  
TOTAL OPEN SPACE AREA PROVIDED = 3,908,723 SFT or 89.73 ACRES  
TOTAL SUBMERGED LAND/OPEN WATER AREA ALLOWED = 11.74 ACRES  
TOTAL SUBMERGED LAND/OPEN WATER AREA PROVIDED = 49.34 ACRES  
TOTAL STATE REGULATED WETLAND AREA ALLOWED = 16.44 ACRES  
TOTAL STATE REGULATED WETLAND AREA PROVIDED = 24.95 ACRES  
TOTAL UPLANDS/USEABLE SITE LAND AREA ALLOWED = 18.78 ACRES  
TOTAL UPLANDS/USEABLE SITE LAND AREA PROVIDED = 14.63 ACRES  
LEAVING A SHORTFALL OF UPLANDS/USEABLE AREA = 4.16 ACRES (3.34 ACTUAL)  
TOTAL AREA PROVIDED FOR OPEN SPACE = 49.34 + 24.95 + 15.44 = 89.73 ACRES  
OF WHICH ONLY 88.92 ACRES CAN BE USED DUE TO 50% OF BASIN AREA APPLIED.

NOTE: THE PLANNING COMMISSION MAY RECOMMEND, AND THE TOWNSHIP BOARD MAY APPROVE, MODIFICATIONS OF THE 30 PERCENT REQUIREMENT IF IT FINDS THAT THE SITE CHARACTERISTICS, SURROUNDING NATURAL FEATURES, AND PROPOSED DESIGN FEATURES AND USES LEND THEMSELVES TO DIFFERENT OPEN SPACE AREA REQUIREMENTS.

THE OWNER IS ASKING FOR APPROVALS FOR THE MODIFICATION OF THE OPEN SPACE DUE TO THE CHARACTERISTICS, THE SURROUNDING NATURAL FEATURES, AND THE PROPOSED DESIGN FEATURES AS SHOWN ON THESE PLANS, CREATING A 89.73 ACRE PERMANENT OPEN SPACE AREA FOR THE PROPOSED P.U.D. (88.92 ACRES CREDITED) NEARLY TWICE THE AMOUNT THAT IS REQUIRED BASED ON TOWNSHIP REQUIREMENTS.

LEGEND	
	EX OPEN WATER AREAS
	EX WETLAND AREAS
	EX EDGE OF WETLAND AREA
	PROP OPEN SPACE AREAS
	PROP WETLAND MITIGATION AREAS
	PROP WETLAND FILL AREAS
	PROP BASIN AND/OR CONTOUR
	PROP UNIT/LOT NUMBER
	PROP FINAL EDGE OF WETLAND AREA

### WETLAND FILL/MITIGATION DATA:

EX WETLAND FEATURE AREA = 1,283,028 SFT or 29.45 ACRES  
TOTAL ON-SITE WETLAND FILL AREA:  
TOTAL WETLAND FILL AREA = 44,504 SFT or 1.02 ACRES  
PHASE 1 WETLAND FILL AREA = 43,570 SFT or 1.00 ACRES  
PHASE 2 WETLAND FILL AREA = 934 SFT or 0.02 ACRES  
TOTAL ON-SITE WETLAND MITIGATION AREA:  
TOTAL WETLAND MITIGATION AREA = 88,066 SFT or 2.02 ACRES  
PHASE 1 WETLAND MITIGATION AREA = 60,502 SFT or 1.39 ACRES  
PHASE 2 WETLAND MITIGATION AREA = 27,564 SFT or 0.63 ACRES  
PROP WETLAND FEATURE AREA = 1,326,590 SFT or 30.46 ACRES

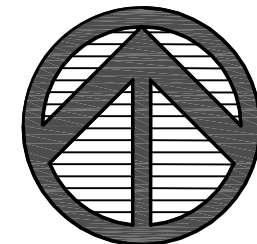
### PRELIMINARY REVIEW

SCALE: 1"=150'	OWNER/DEVELOPER: <b>LAKE URBAN DEV, LLC</b> C/O WILSON & LINO 8273 S SAGINAW ST, GRAND BLANC, MI 48439 CONTACT: 810.244.6302	PART OF SECTIONS 3 & 10 TYRONE TOWNSHIP, T4N-R6E LIVINGSTON COUNTY, MICHIGAN		Fenton Land Surveying & Engineering, Inc 14165 N. FENTON ROAD, SUITE 101A, FENTON, MI 48430 PHONE: 810.354.8115 EMAIL: INFO@FENTONLSE.COM	PRELIMINARY SITE OPEN SPACE PLAN FOR: <b>LAKE URBAN CROSSINGS CONDOMINIUM</b> PART OF SECTIONS 3 & 10, T4N-R6E, TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN	<table border="1"> <tr> <th>REVISIONS</th> <th>DRN. BY:</th> <th>J.R.B.</th> <th>05.27.2021</th> <th>SHEET NO:</th> </tr> <tr> <td>08.04.2021</td> <td>DSN BY:</td> <td>J.R.B.</td> <td>"</td> <td rowspan="3">P-5</td> </tr> <tr> <td>10.19.2021</td> <td>CHK'D BY:</td> <td>J.P.W.</td> <td>"</td> </tr> <tr> <td></td> <td>APPR BY:</td> <td>J.B.M.</td> <td>"</td> </tr> </table>	REVISIONS	DRN. BY:	J.R.B.	05.27.2021	SHEET NO:	08.04.2021	DSN BY:	J.R.B.	"	P-5	10.19.2021	CHK'D BY:	J.P.W.	"		APPR BY:	J.B.M.	"
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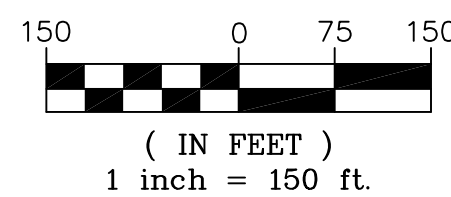
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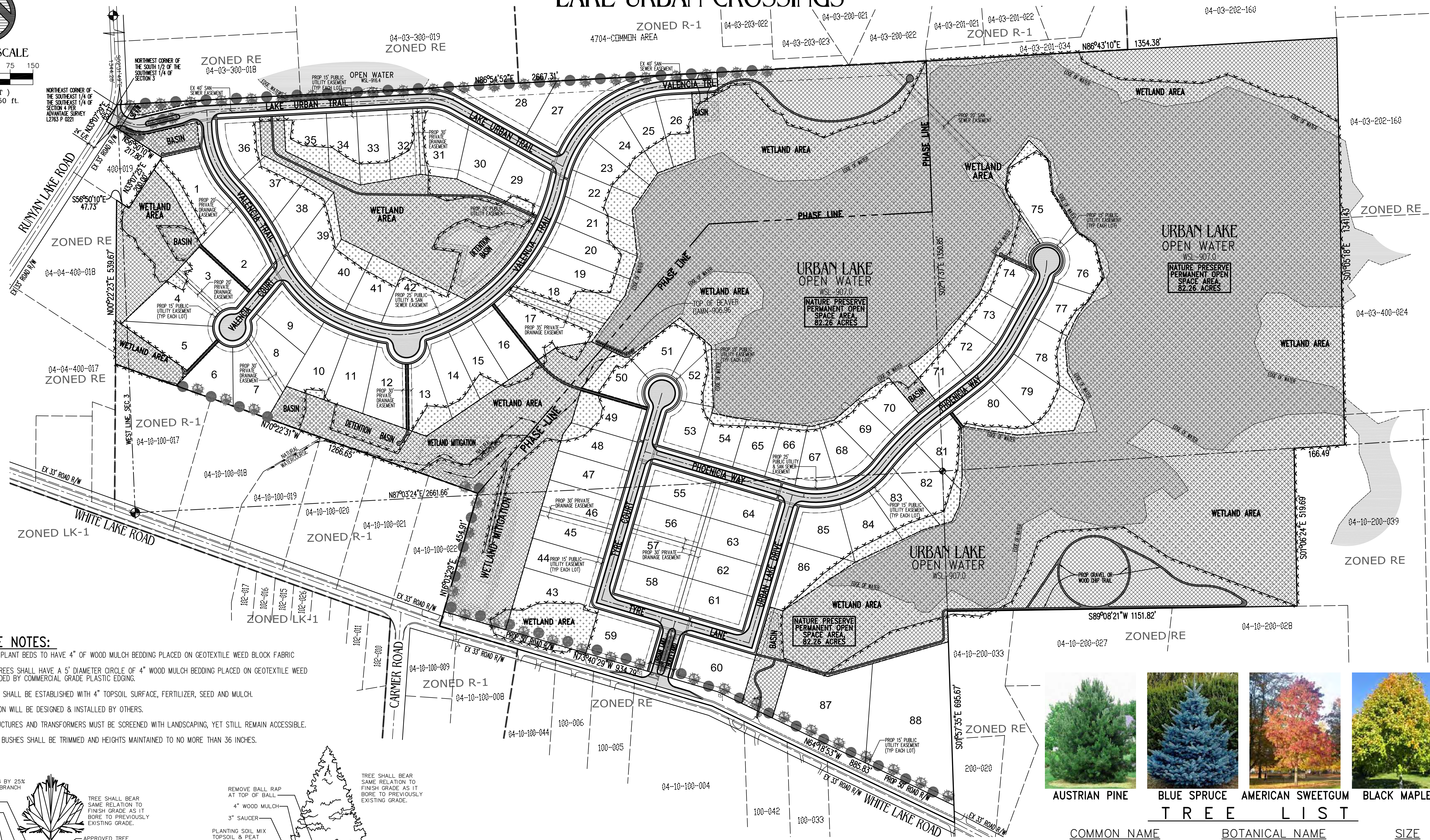
NORTH



GRAPHIC SCALE

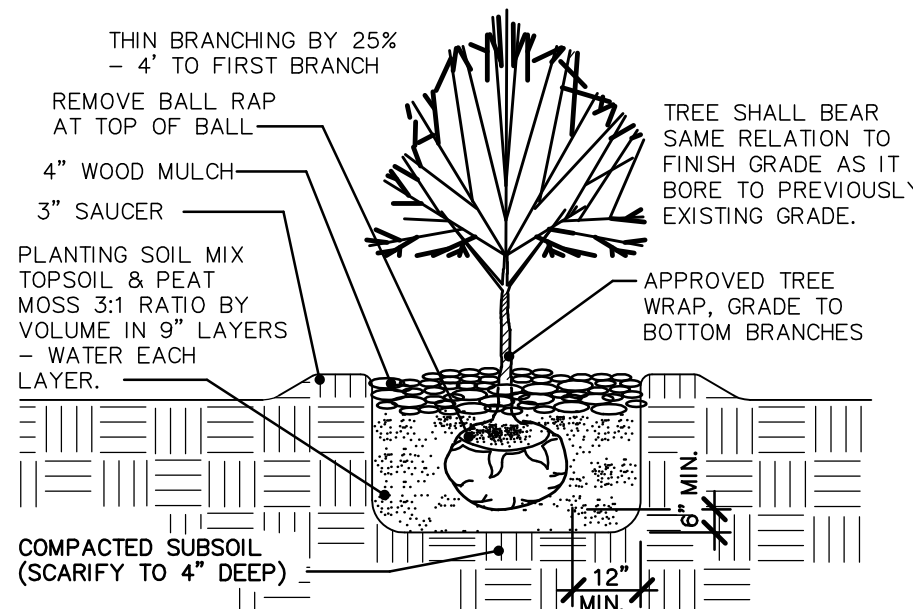


# PRELIMINARY SITE LANDSCAPING PLAN LAKE URBAN CROSSINGS

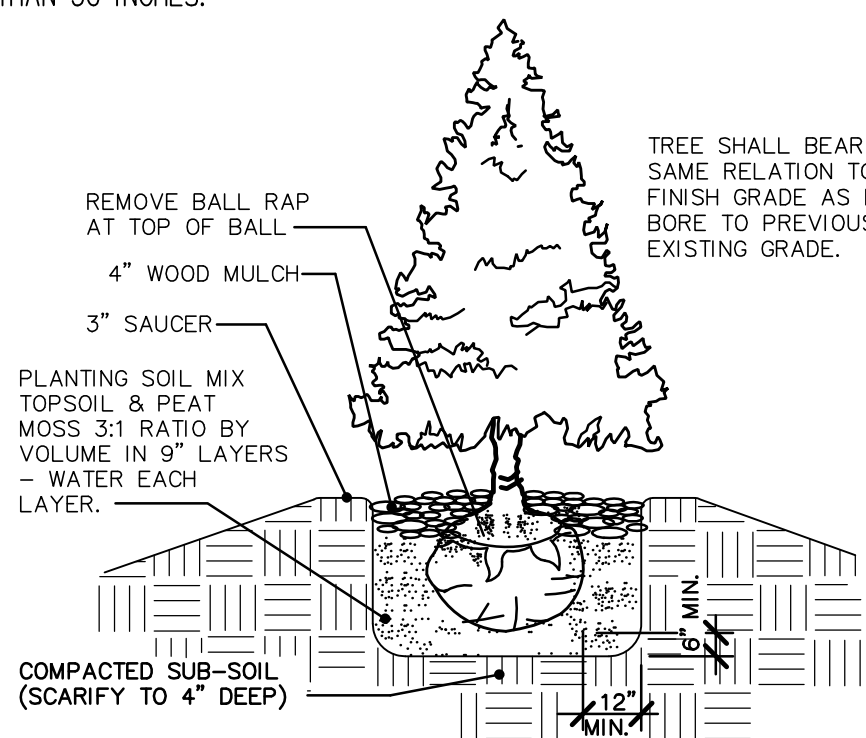


### LANDSCAPE NOTES:

1. ALL CORNER LOT PLANT BEDS TO HAVE 4" OF WOOD MULCH BEDDING PLACED ON GEOTEXTILE WEED BLOCK FABRIC - 4" TO FIRST BRANCH
2. ALL NEW LAWN TREES SHALL HAVE A 5' DIAMETER CIRCLE OF 4" WOOD MULCH BEDDING PLACED ON GEOTEXTILE WEED BLOCK FABRIC BOUNDED BY COMMERCIAL GRADE PLASTIC EDGING.
3. ALL LAWN AREAS SHALL BE ESTABLISHED WITH 4" TOPSOIL SURFACE, FERTILIZER, SEED AND MULCH.
4. ON-SITE IRRIGATION WILL BE DESIGNED & INSTALLED BY OTHERS.
5. ALL UTILITY STRUCTURES AND TRANSFORMERS MUST BE SCREENED WITH LANDSCAPING, YET STILL REMAIN ACCESSIBLE.
6. ALL SHRUBS AND BUSHES SHALL BE TRIMMED AND HEIGHTS MAINTAINED TO NO MORE THAN 36 INCHES.



TREE PLANTING DETAIL



EVERGREEN PLANTING DETAIL

### LANDSCAPE REQUIRED:

#### GREENBELT BUFFER:

- A) 1 TREE PER 50 FEET OF ROAD FRONTAGE
- B) 1 TREE PER 50 FEET OF ADJACENT SITE BUFFER



AUSTRIAN PINE BLUE SPRUCE AMERICAN SWEETGUM BLACK MAPLE  
**TREE LIST**

COMMON NAME	BOTANICAL NAME	SIZE
AUSTRIAN PINE	PINUS NIGRA	6' HGT
BLUE SPRUCE	PICEA PUNGENS GLAUCA	6' HGT
BLACK MAPLE	ACER NIGRUM	2" CALIPER
AMERICAN SWEETGUM	LIQUIDAMBAR STYRACIFLUA	2" CALIPER

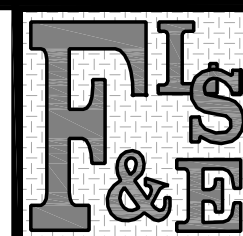
### PRELIMINARY REVIEW

SCALE: 1"=150'

JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
LINGSTON COUNTY, MICHIGAN



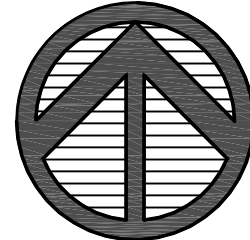
Fenton Land Surveying & Engineering, Inc  
14165 N. FENTON ROAD, SUITE 101A, FENTON, MI 48430  
PHONE: 810.354.8115 EMAIL: INFO@FENTONLSE.COM

PRELIMINARY SITE LANDSCAPING PLAN FOR:  
**LAKE URBAN CROSSINGS CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	08.04.2021	SHEET NO:
10.06.2021	DSN BY:	J.R.B.	"	P-6
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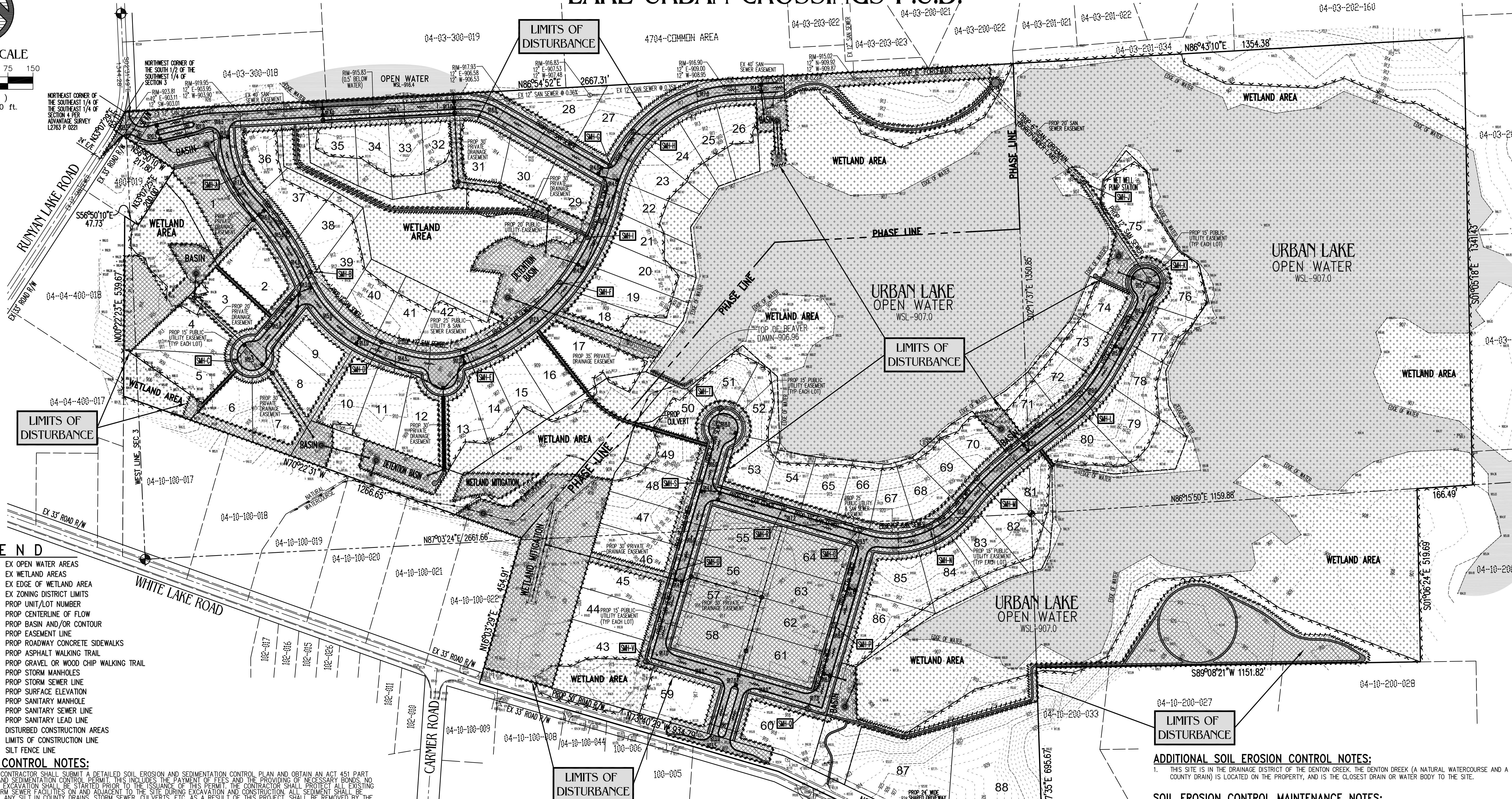
NORTH



GRAPHIC SCALE  
150 0 75 150  
( IN FEET )  
1 inch = 150 ft.

AREA OF DISTURBANCE = 36.5 ACRES

# PRELIMINARY LIMITS OF CONSTRUCTION PLAN LAKE URBAN CROSSINGS P.U.D.



### LEGEND

- EX OPEN WATER AREAS
- EX WETLAND AREAS
- EX EDGE OF WETLAND AREA
- EX ZONING DISTRICT LIMITS
- PROP UNIT/LOT NUMBER
- PROP CENTERLINE OF FLOW
- PROP BASIN AND/OR CONTOUR
- PROP EASEMENT LINE
- PROP ROADWAY CONCRETE SIDEWALKS
- PROP ASPHALT WALKING TRAIL
- PROP GRAVEL OR WOOD CHIP WALKING TRAIL
- PROP STORM MANHOLES
- PROP STORM SEWER LINE
- PROP SURFACE ELEVATION
- PROP SANITARY MANHOLE
- PROP SANITARY SEWER LINE
- PROP SANITARY LEAD LINE
- DISTURBED CONSTRUCTION AREAS
- LIMITS OF CONSTRUCTION LINE
- SILT FENCE LINE

### SOIL EROSION CONTROL NOTES:

1. SOIL EROSION: THE CONTRACTOR SHALL SUBMIT A DETAILED SOIL EROSION AND SEDIMENTATION CONTROL PLAN AND OBTAIN AN ACT 451 PART 91 SOIL EROSION AND SEDIMENTATION CONTROL PERMIT. THIS INCLUDES THE PAYMENT OF FEES AND THE PROVIDING OF NECESSARY BONDS. NO EARTH CHANGES OR EXCAVATION SHALL BE STARTED PRIOR TO THE ISSUANCE OF THIS PERMIT. THE CONTRACTOR SHALL PROTECT ALL EXISTING AND PROPOSED STORM SEWER FACILITIES ON AND ADJACENT TO THE SITE DURING EXCAVATION AND CONSTRUCTION. ALL SEDIMENT SHALL BE CONTAINED ON SITE. ANY SILT IN COUNTY DRAINS, STORM SEWER, CULVERTS, ETC. AS A RESULT OF THIS PROJECT, SHALL BE REMOVED BY THE CONTRACTOR AT THE COST OF THE CONTRACTOR.
2. ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF TYRONE TOWNSHIP AND THE LIVINGSTON COUNTY DRAIN COMMISSIONERS. THE CONTRACTOR SHALL OBTAIN A SOIL EROSION AND SEDIMENTATION CONTROL PERMIT OR WAIVER FROM THEM PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS.
3. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES MUST BE PLACED PRIOR TO OR AS THE FIRST STEP IN CONSTRUCTION. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
4. CONTRACTOR SHALL PLACE AND MAINTAIN ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY TYRONE TOWNSHIP, LOCAL AND AS SHOWN ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS ALL PERMANENT EROSION CONTROL MEASURES HAVE BEEN COMPLETED AND APPROVED BY THE TYRONE TOWNSHIP AND LDCD.
5. EROSION AND ANY SEDIMENT CREATED FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN ANY DRAINAGE FACILITIES. DRAINAGE FACILITIES INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, AND PONDS.
6. ALL MUD, DIRT, AND DEBRIS TRACKED ONTO EXISTING ROADS FROM THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR. ALL MUD, DIRT, AND DEBRIS TRACKED OR SPILLED ONTO PAVED SURFACES WITHIN THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
7. CONTRACTOR MUST IMPLEMENT APPROPRIATE MEASURES AS REQUIRED TO CONTROL DUST AT ALL TIMES, AS APPROVED BY TYRONE TOWNSHIP AND LDCD.
8. 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.
9. FAILURE TO COMPLY WITH ALL APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL REQUIREMENTS MAY RESULT IN WORK STOPPAGE BY TYRONE TOWNSHIP AND LDCD.
10. CONTRACTOR MUST IMMEDIATELY HAUL AWAY ALL EXCAVATED DIRT TO AN APPROVED OFF-SITE LOCATION, OR TEMPORARILY STORE THE MATERIAL ON THE SITE. ALL STORED MATERIAL MUST BE PROTECTED TO PREVENT EROSION.
11. THE CONTRACTOR MUST PROVIDE A WRITTEN SCHEDULE INDICATING THE TIMING AND SEQUENCING OF ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND CONSTRUCTION ITEMS, INCLUDING THE INSTALLATION OF ALL PERMANENT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES.
12. APPROXIMATELY 36.5 ACRES WILL BE DISTURBED IN CONSTRUCTION OF THIS PROJECT, THEREFORE A NPDES STORM WATER DISCHARGE PERMIT WILL BE REQUIRED.

### ADDITIONAL SOIL EROSION CONTROL NOTES:

1. THIS SITE IS IN THE DRAINAGE DISTRICT OF THE DENTON CREEK. THE DENTON CREEK (A NATURAL WATERCOURSE AND A COUNTY DRAIN) IS LOCATED ON THE PROPERTY, AND IS THE CLOSEST DRAIN OR WATER BODY TO THE SITE.

### SOIL EROSION CONTROL MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING ANY PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE, AND THE BARRIER IS STILL REQUIRED, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE CLEANED AND MAINTAINED AS REQUIRED SUCH THAT THE MEASURES ARE EFFECTIVE AND IN PROPER WORKING ORDER AT ALL TIMES.
4. ALL MUD/DIRT TRACKED ONTO ROADS OR THE PARKING LOT FROM THE SITE DUE TO CONSTRUCTION, SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
5. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES, BOTH PERMANENT AND TEMPORARY, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

### SOIL EROSION CONTROL CONSTRUCTION SEQUENCE:

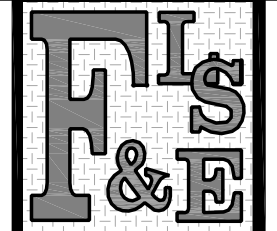
1. PLACE ALL TEMPORARY SOIL EROSION CONTROL MEASURES AS PER THESE PLANS.
2. SAWCUT & REMOVE PAVEMENT AREAS, AS SHOWN ON THESE PLANS.
3. CONSTRUCT ALL PROPOSED UTILITIES AND THE DETENTION BASINS, AS SHOWN ON THESE PLANS.
4. CONST PROPOSED BUILDINGS, PAVEMENT AREAS, CURBS, AND DRIVEWAY APPROACHES, AS SHOWN ON THESE PLANS.
5. PLACE 4" TOPSOIL, FERTILIZER, SEED, AND MULCH TO RESTORE ALL DISTURBED TURF AREAS.
6. REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES AFTER ALL SITE CONSTRUCTION HAS BEEN COMPLETED, AND ALL NEW TURF AREAS HAVE BEEN FULLY ESTABLISHED.
7. CONTRACTOR SHALL KEEP STREET AND ALL OTHER PAVEMENT CLEAN AT ALL TIMES, AND PREVENT DUST POLLUTION.

FILE: JOBS 2020/20-290-WL/DWG/20-290 LIMITS OF CONSTRUCTION - P-7

SCALE: 1"=150'  
JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST. GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
LIVINGSTON COUNTY, MICHIGAN



Fenton Land Surveying & Engineering, Inc  
14165 N. FENTON ROAD, SUITE 101A, FENTON, MI 48430  
PHONE: 810.354.8115 EMAIL: INFO@FENTONLSE.COM

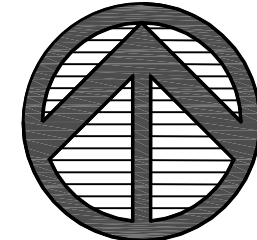
PRELIMINARY LIMITS OF CONSTRUCTION PLAN FOR:  
**LAKE URBAN CROSSINGS P.U.D. CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	10.25.2021	SHEET NO:
	DSN BY:	J.R.B.	"	P-7
	CHK'D BY:	J.P.W.	"	
	APPR BY:	J.B.M.	"	

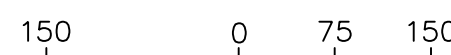
### PRELIMINARY REVIEW



NORTH



GRAPHIC SCALE

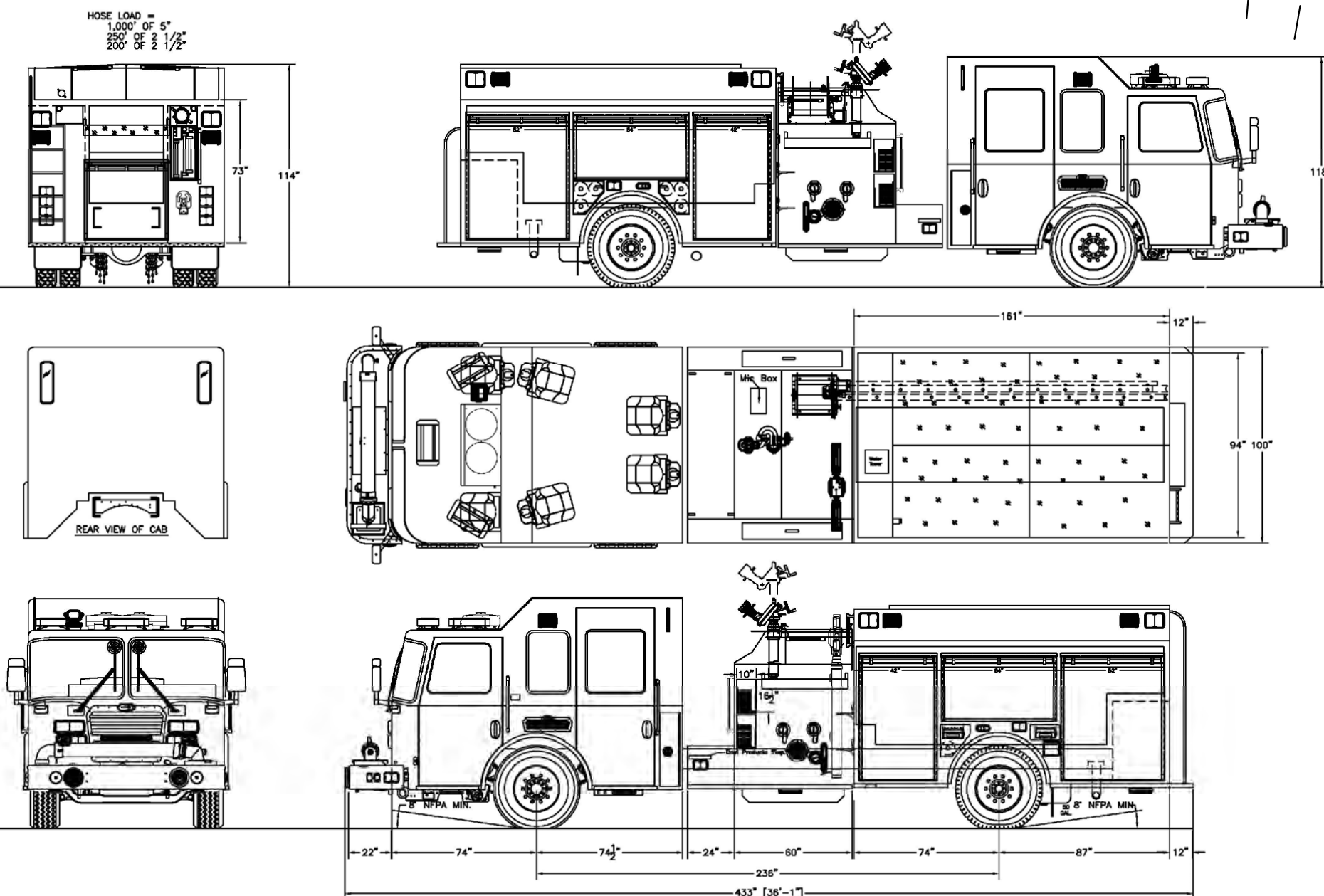
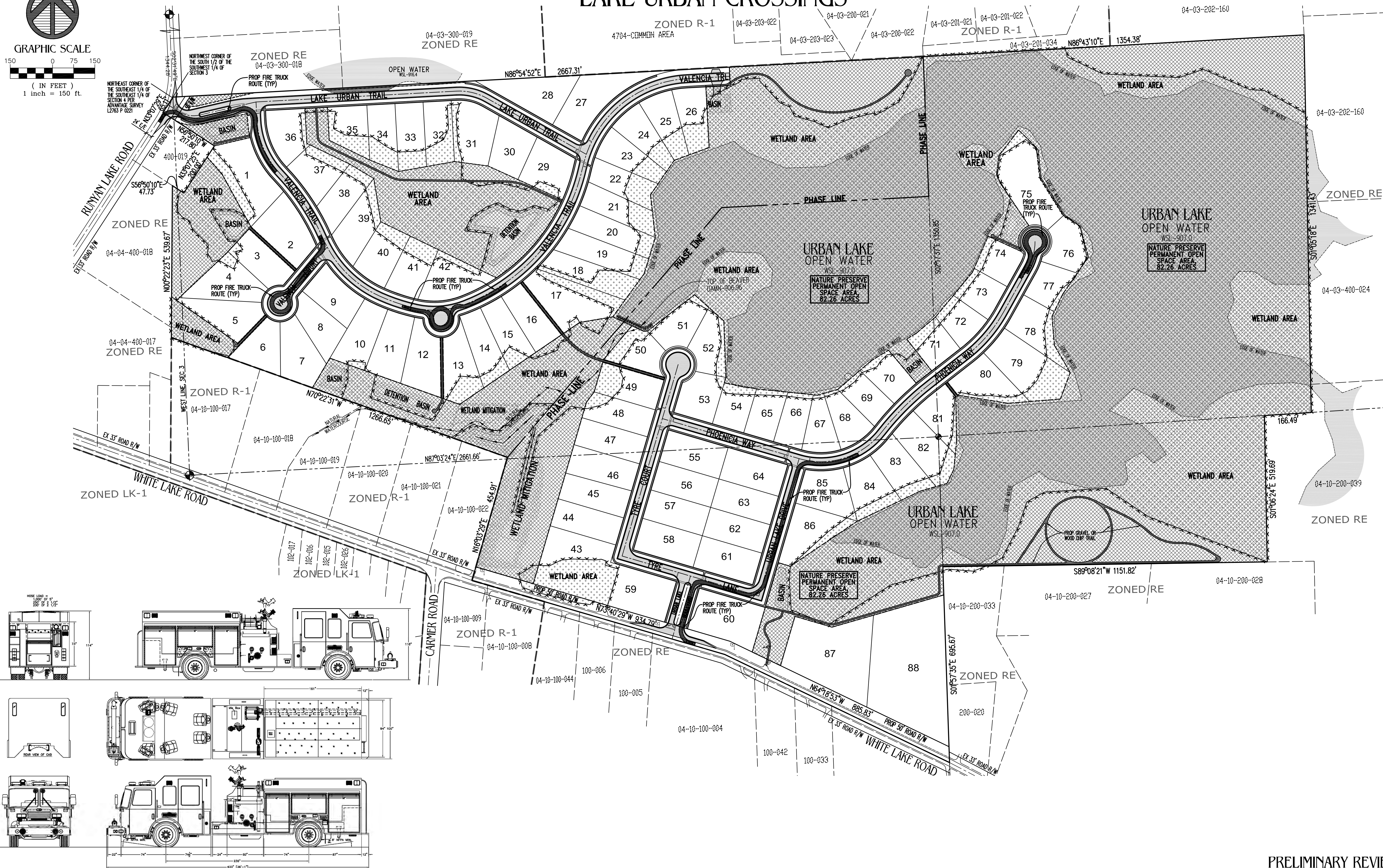


( IN FEET )  
1 inch = 150 ft.

NORTHEAST CORNER OF THE SOUTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 4 PER ADVANTAGE SURVEY L2763 P 022

NORTHWEST CORNER OF THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 3

# PRELIMINARY FIRE TRUCK ROUTE PLAN LAKE URBAN CROSSINGS



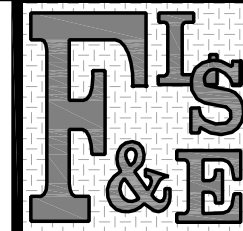
ELSE JOBS: 2020-20-290-WL/DWG/20-290 FIRE TRUCK ROUTE PLANNING - P-8

SCALE: 1"=150'

JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
LININGSTON COUNTY, MICHIGAN



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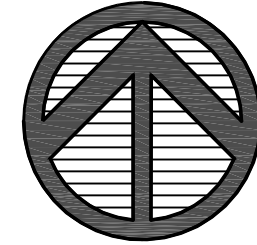
PRELIMINARY FIRE TRUCK ROUTE PLAN FOR:  
**LAKE URBAN CROSSINGS CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	10.25.2021	SHEET NO:
	DSN BY:	J.R.B.	"	P-8
	CHK'D BY:	J.P.W.	"	
	APPR BY:	J.B.M.	"	

PRELIMINARY REVIEW

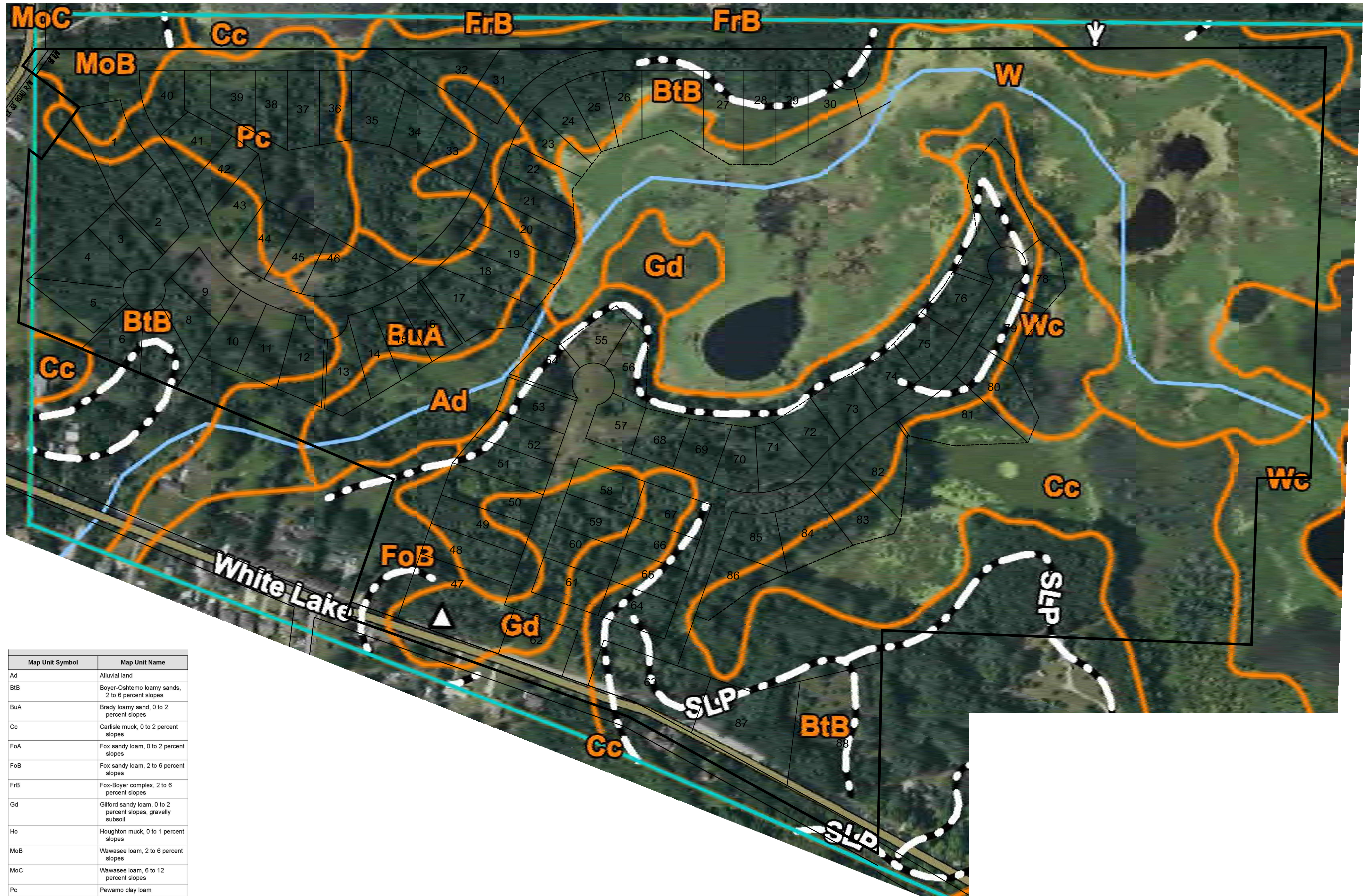


NORTH



GRAPHIC SCALE  
150 0 75 150  
( IN FEET )  
1 inch = 150 ft.

# PRELIMINARY SOILS INFORMATION PLAN LAKE URBAN CROSSINGS P.U.D.



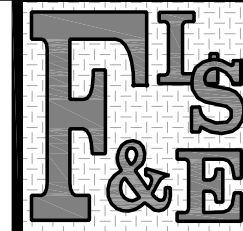
Map Unit Symbol	Map Unit Name
Ad	Alluvial land
BtB	Boyer-Oshtemo loamy sands, 2 to 6 percent slopes
BuA	Brady loamy sand, 0 to 2 percent slopes
Cc	Carlisle muck, 0 to 2 percent slopes
FoA	Fox sandy loam, 0 to 2 percent slopes
FoB	Fox sandy loam, 2 to 6 percent slopes
FrB	Fox-Boyer complex, 2 to 6 percent slopes
Gd	Gilford sandy loam, 0 to 2 percent slopes, gravelly subsoil
Ho	Houghton muck, 0 to 1 percent slopes
MoB	Wawasee loam, 2 to 6 percent slopes
MoC	Wawasee loam, 6 to 12 percent slopes
Pc	Pewamo clay loam
W	Water
Wc	Warners loam
Totals for Area of Interest	

FILE: JOBS\_2020/20-290-WL/DWG/20-290 SITE SOILS INFO.DWG - P-9

SCALE: 1"=150'  
JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
CONTACT: 810.244.6302

PART OF SECTIONS 3 & 10  
TYRONE TOWNSHIP, T4N-R6E  
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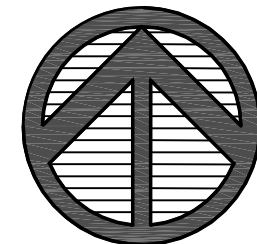
PRELIMINARY SOILS INFORMATION PLAN FOR:  
**LAKE URBAN CROSSINGS P.U.D. CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	10.25.2021	SHEET NO:
	DSN BY:	J.R.B.	"	P-9
	CHK'D BY:	J.P.W.	"	
	APPR BY:	J.B.M.	"	

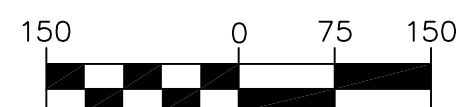
PRELIMINARY REVIEW



NORTH



GRAPHIC SCALE



( IN FEET )  
1 inch = 150 ft.

# PARALLEL SITE PLAN LAYOUT LAKE URBAN ESTATES

## LEGEND

- PROPOSED HOMES
- EX WETLAND AREAS
- PROP DRAIN OUTLETS W/SEDIMENT BASINS
- PROP STORM SEWER
- PROP SANITARY MANHOLE
- PROP SANITARY SEWER LINE
- PROP LANDSCAPE TREES



### WESTERLY SIDE FUTURE SITE INFORMATION:

ACCORDING TO THE CURRENT TYRONE TOWNSHIP FUTURE MASTER PLAN, THE WESTERLY HALF OF THIS PROPERTY (WEST OF PHASE LINE) IS TO BE ZONED R-2 (RURAL ESTATES), AND IS SUBJECT TO THE FOLLOWING CONDITIONS:

- 1) MINIMUM LOT SIZE = 21,780 SFT OR 0.50 ACRES
- 2) MINIMUM LOT WIDTH = 110 FEET
- 3) FRONT SETBACK = 50 FEET
- 4) SIDE SETBACK = 15 FEET, TOTAL = 30 FEET
- 5) REAR SETBACK = 35 FEET
- 6) MAXIMUM BUILDING HEIGHT = 30 FEET
- 7) MAXIMUM LOT COVERAGE = 30%
- 8) TOTAL NUMBER OF LOTS/UNITS = 52 UNITS
- 9) PUBLIC ROADS W/CONC CURB & GUTTER (66' R/W) = 5,045 FEET
- 10) ALL LOTS/UNITS WILL HAVE A PUBLIC SANITARY SEWER LEAD
- 11) PROPOSED 5' CONCRETE WALKS ALONG BOTH SIDES OF ROAD

NOTE: ALL THE HOMES IN THIS WEST PART MEET THE MINIMUM PROPERTY SETBACKS, AND ARE MINIMUM 2,000 SFT HOMES (40'x50' TYP), WITH 625 SFT ATTACHED GARAGES (25'x25' TYP) ON EACH OF THE 52 LOTS.

### EASTERLY SIDE FUTURE SITE INFORMATION:

ACCORDING TO THE CURRENT TYRONE TOWNSHIP FUTURE MASTER PLAN, THE EASTERLY HALF OF THIS PROPERTY (EAST OF PHASE LINE) IS TO BE ZONED RE (RURAL ESTATES), AND IS SUBJECT TO THE FOLLOWING CONDITIONS:

- 1) MINIMUM LOT SIZE = 76,230 SFT OR 1.75 ACRES
- 2) MINIMUM LOT WIDTH = 200 FEET
- 3) FRONT SETBACK = 100 FEET + PRIVATE ROADS ALLOW FOR A 50 FOOT FRONT SETBACK (SEE TYRONE TWP SCHEDULE OF REGULATIONS, FOOTNOTE BB)
- 4) SIDE SETBACK = 20 FEET, TOTAL = 40 FEET
- 5) REAR SETBACK = 75 FEET
- 6) MAXIMUM BUILDING HEIGHT = 30 FEET
- 7) MAXIMUM LOT COVERAGE = 25%
- 8) TOTAL NUMBER OF LOTS/UNITS = 25 UNITS
- 9) PRIVATE ROADS W/DITCHES & CULVERTS (50' R/W) = 2,938 FEET
- 10) ALL LOTS/UNITS WILL HAVE A PUBLIC SANITARY SEWER LEAD
- 11) PROPOSED 5' CONCRETE WALKS ALONG BOTH SIDES OF ROAD

NOTE: ALL THE HOMES IN THIS EAST PART MEET THE MINIMUM PROPERTY SETBACKS, AND ARE MINIMUM 2,000 SFT HOMES (40'x50' TYP), WITH 625 SFT ATTACHED GARAGES (25'x25' TYP) ON EACH OF THE 25 LOTS.

THIS PARALLEL PLANS CONSISTS OF 77 NUMBERED LOTS/UNITS  
77 x 15% INCREASE = 11.55 + 77 = 88.55 OR 88 UNITS IN PROPOSED P.U.D.

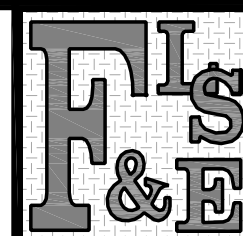
FILED: 2019/20-290-WL/DWG/20-290 PARALLEL SITE PLANDWG - P-10

SCALE: 1"=150'

JOB NO. 20-290

OWNER/DEVELOPER:  
**LAKE URBAN DEV, LLC**  
C/O WILSON & LINO  
8273 S SAGINAW ST, GRAND BLANC, MI 48439  
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PART OF SECTIONS 3 & 10  
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PARALLEL SITE PLAN LAYOUT FOR:  
**LAKE URBAN ESTATES CONDOMINIUM**  
PART OF SECTIONS 3 & 10, T4N-R6E,  
TYRONE TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

REVISIONS	DRN. BY:	J.R.B.	06.10.2021	SHEET NO:
06.24.2021	DSN BY:	J.R.B.	"	P-10
10.22.2021	CHK'D BY:	J.P.W.	"	
	APPR BY:	J.B.M.	"	



**Carlisle | Wortman**  
ASSOCIATES, INC.

117 NORTH FIRST STREET SUITE 70 ANN ARBOR, MI 48104 734.662.2200 734.662.1935 FAX

November 4, 2021

## **Preliminary Site Plan/Planned Unit Development Review for Tyrone Township, Michigan**

### **PETITION INTRODUCTION**

**Applicant:** David McLane, AMAG LLC (agent)  
**Owner:** Lake Urban Crossings LLC  
**Project Name:** Lake Urban Crossings  
**Plan Date:** October 25, 2021  
**Request:** Review of Preliminary Site Plan/Planned Unit Development

### **PETITION DESCRIPTION**

The applicant is requesting review and approval of a preliminary site plan/planned unit development for a residential site condominium in 2 phases. The proposed project calls for 88 single-family houses on a site of roughly 158 acres.

Residential planned unit developments may be approved as a special land use at this location. Because the project calls for dividing the properties as a site condominium, site plan approval is also required.

Review and approval takes places in two steps.

The Planning Commission first reviews the preliminary planned unit development and preliminary site plan. The focus of planned unit development review at this time is to determine compliance with criteria for planned unit developments, review the parallel plan, determine approved uses, and general approval of the design concept.

The focus of reviewing the site plan at this time is to review issues raised in consultant reviews, recommend changes for the final site plan, and determine initial compliance with site plan review standards.



The Planning Commission provides recommendation to the Township Board, which makes the ultimate decision.

Preliminary approval allows an applicant to submit a final planned unit development and site plan application. It does not vest any rights for approval of final plans.

Final approval may consider individual phases of a project or the whole project.

Planned unit developments are an optional development tool intended to encourage innovative site plan designs that provide a recognizable benefit for the users of the development and the community that might not otherwise be possible using conventional zoning. They allow the Township to modify developmental standards, such as setbacks or lot area. Planned unit developments are not intended as a method for avoiding ordinance standards.

For residential planned unit developments requesting more lots than would be allowed with a conventional development, a parallel plan showing how the property could be developed according to the zoning district consistent with the Future Land Use map must be provided.

This parallel plan is reviewed by the Planning Commission to determine if it would be feasible, and it serves as the basis for number of lots allowed in the final planned unit development. This project is requesting additional lots, so a parallel plan is required. The most recent parallel plan, Sheet P-10, is dated October 22, 2021.

The purpose of this review is to provide guidance and feedback to the Planning Commission as part of its preliminary review. It summarizes important decisions for the Planning Commission to make and provides some potential conditions for preliminary approval.

## PROPERTY INFORMATION

<b>Address:</b>	n/a, Runyan Lake Road, White Lake Road
<b>Location:</b>	North side of White Lake Road, east of Runyan Lake Road, south of Hills of Tyrone West
<b>Parcel Number:</b>	04-03-300-001/020, 04-10-100-024/025, 04-10-200-025
<b>Lot Area:</b>	~158 acres
<b>Frontage:</b>	~70 feet along Runyan Lake Road ~1,835 along White Lake Road
<b>Existing Land Use:</b>	Undeveloped woodlands, wetlands, and water

## Aerial of the Site



## ZONING

The property is currently within the RE Rural Estate district.

The parallel plan should be prepared based on the zoning districts that correspond with the Future Land Use Map.

According to Table 11.1, the western portion of the site would be in either the R-1 Single Family Residential or R-2 Single Family Residential district. The eastern portion of the property would be located within the RE Rural Estate district. *(The Township Board recently adopted a zoning text amendment to make the corresponding districts in Table 11.1 consistent with what is outlined in the Master Plan.)*

The intents of those districts are below.

**Zoning per Master Plan:** **R-2 Single Family Residential**

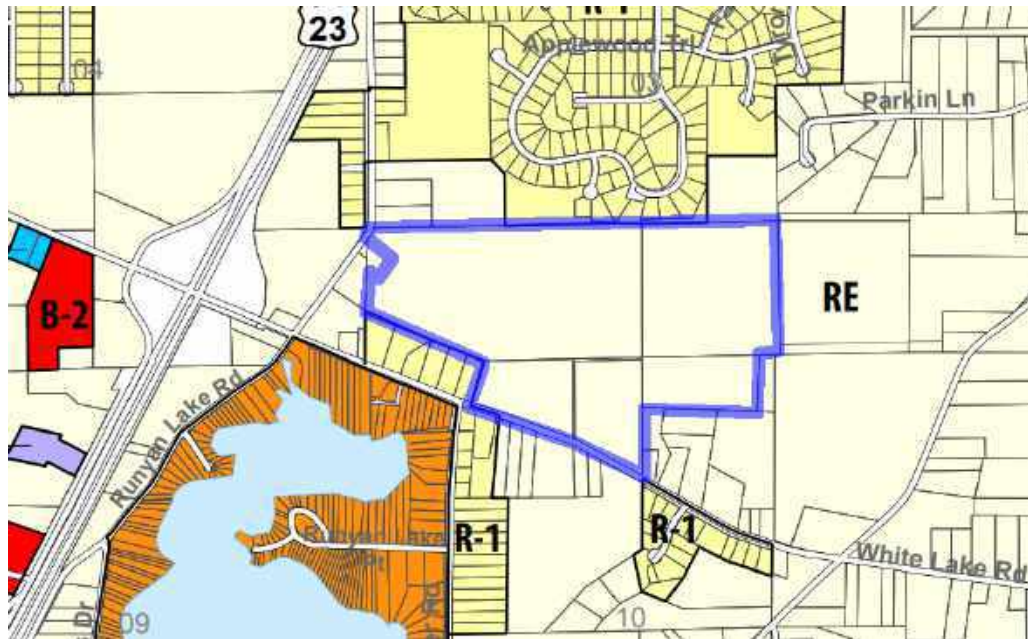
*western portion* The intent of the R-2 district is the same as in the R-1 district, except that the district is intended for areas served with public sewer and water, or locations adjacent to urbanizing centers in which public sewer and water is expected in the foreseeable future. In order to preserve natural features and to provide design flexibility in the R-2 District, cluster development shall be permitted as described in Article 8.

**Zoning per Master Plan:** **RE Rural Estate**

*eastern portion* The intent of the RE Rural Estate District is to provide a transitional area between the FR District and other more intense land utilization districts. However, the RE District will generally maintain the same types of land uses permitted in the FR District. The primary difference between the two districts is that the RE District permits the creation

*and use of smaller lots than the FR District. In order to preserve natural features and to provide design flexibility in the FR and RE Districts, cluster development shall be permitted as described in Article 8.*

### Current Zoning Map



**Comments:** *For planned unit developments, the zoning district in which it is located becomes less important for developmental standards (lot area, setbacks, etc) because modified developmental standards could be approved for the project.*

*This project calls for modified standards for lot size, setbacks, and lot coverages. If approved, these modified developmental standards would become the standard for review/approval of future improvements within the project.*

*The underlying zoning district could have an impact on potential uses within the development. As a practical matter, however, most master deeds limit use to single-family residential uses.*

### FUTURE LAND USE MAP

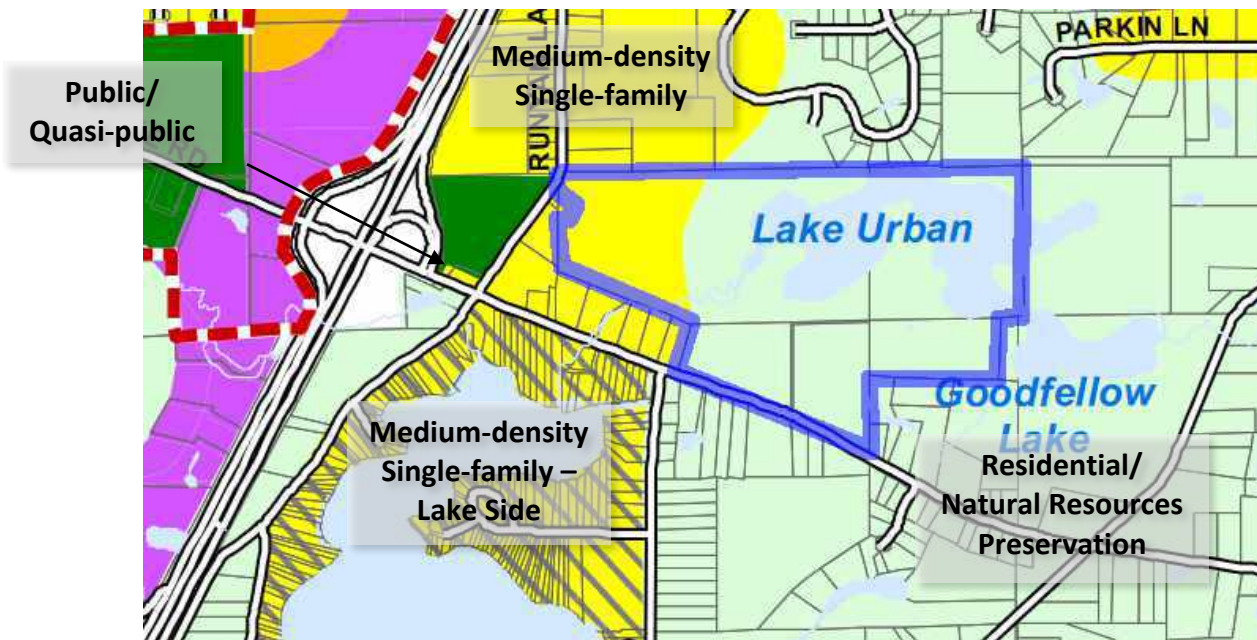
The western portion of the site is located within the Medium Density Single Family Detached Residential area. The eastern portion of the site is located within the Residential/Natural Resources Preservation area.

The boundary between these two areas cuts through the property, running roughly north and south from an interior property corner. At previous meetings, the Planning Commission said it was comfortable using the northern boundary of Urban Lake to demarcate the boundary, as it is common to use natural features as boundaries, and that practice has been used in other areas of the Future Land Use Map.

**Future Land Use Map western portion Medium Density Single Family Detached Residential**  
*This classification is intended to provide a transitional residential density between Low and High Density Residential. Lots will generally range from 0.5 acre to 1.5 acres per dwelling unit. This designation has been applied to land in and around existing residential subdivisions and near planned commercial areas. Medium density development should be encouraged to locate near areas that already have the infrastructure and amenities to support it.*

**Future Land Use Map eastern portion Residential/Natural Resource Preservation**  
*As noted on the Opportunities and Constraints Map, Tyrone possesses a wealth of significant natural resources and features. These include woodlands, wetlands, natural water bodies, and areas with steep slopes and scenic vistas. The Future Land Use Plan's Residential/Natural Resource Preservation designation is located in areas that possess one or more of these significant natural features. It is intended to allow residential development at the very low density of a minimum of 3 acres per dwelling unit. Residential uses will be developed in a planned manner that preserves the attractive natural features of Tyrone Township.*

**Future Land Use Map**



**Comments:** *The boundary between the Medium-density Single-Family Residential and Residential/Natural Resources Preservation areas cuts through the property.*

*The boundary, as shown in the Future Land Use Map, is different from what was used to prepare the parallel plan. The parallel plan instead uses a boundary that follows the northern shore of Lake Urban. At an earlier meeting, the Planning Commission determined that the use of the natural feature as the boundary would be appropriate.*



## NATURAL RESOURCES

- Topography:** Due to the size of the property, there are a variety of topographies present.
- Waterbodies:** A significant portion of the site consists of Lake Urban. Additionally, Denton Creek flows through the site, connecting Lake Urban and Runyan Lake.
- Wetlands:** There are significant wetland areas within the site that are adjacent and connected to Denton Creek and Lake Urban.
- Woodland:** A significant portion of the site that is not a waterbody is currently woodlands.
- Soils:** The site has a variety of soils, ranging from loamy sands to clay loam to muck.

**Comments:** *Both the parallel plan and proposed planned unit development plan require some filling of identified wetland areas. Because the wetlands on the site are considered state-regulated wetlands, filling would require issuance of permits from the Michigan Department of Environment, Great Lakes, and Energy.*

*Soils on some lots may require greater engineering for construction of structures, such as helical piers. Review of construction details is typically done during zoning/building permit review.*

## AREA, WIDTH, HEIGHT, & SETBACKS

Residential developments must be planned to meet the developmental standards for the zoning district in which it is located.

For planned unit developments, however, an applicant can propose modifications from developmental standards. If approved, those modified developmental standards would become the developmental standards for the project

The standards for the current zoning district, the zoning districts corresponding with the Future Land Use Map, and the proposed standards for the planned unit development are outlined below.

**Developmental Standards**

	RE Rural Estate current	R-2 Single Family western portion per Master Plan	RE Rural Estate eastern portion per Master Plan	Proposed PUD	Complies
Lot Area (min)	1.75 acres	21,780 sf	1.75 acres	21,870 sf (phase 1) 18,000 sf (phase 2)	Yes
<i>Parallel Plan -&gt;</i>		<i>21,794 sf</i>	<i>1.75 acres</i>		Yes
Lot Width (min)	200 feet	110 feet	200 feet	90 feet	Yes
<i>Parallel Plan -&gt;</i>		<i>110 feet</i>	<i>200 feet</i>		Yes
Lot Coverage (max)	25 percent	30 percent	25 percent	35 percent	Likely
Setbacks					
Front	100 feet	50 feet	50/100 feet	35/50 feet	Yes
<i>Parallel Plan -&gt;</i>		<i>50 feet</i>	<i>50/100 feet</i>		Yes
Side	20 feet	15 feet	20 feet	15 feet	Yes
<i>Parallel Plan -&gt;</i>		<i>15 feet</i>	<i>20 feet</i>		Yes
Rear	75 feet	35 feet	75 feet	35 feet	Yes
<i>Parallel Plan -&gt;</i>		<i>35 feet</i>	<i>75 feet</i>		Yes
Natural Features	50 feet	50 feet	50 feet	50 feet	Yes
<i>Parallel Plan -&gt;</i>		<i>50 feet</i>	<i>50 feet</i>		Yes

**Comments:** *The proposed lots in the parallel appear to meet, or could with some minor adjustments, the developmental standards for the R-2 Single Family Residential district in the northwestern portion of the site and the RE Rural Estate district in the southeastern portion of the site.*

*The proposed lots in the planned unit development appear to be consistent with the proposed developmental standards for the planned unit development. Lot coverage on individual lots would be reviewed as part of zoning permit review.*

**ACCESS & CIRCULATION**

The parallel plan shows 1 access point from Runyan Lake Road to the west for the western/northern portion of the development and 1 access point from White Lake Road to the south for the eastern/southern portion of the development. Additionally, 2 lots would have direct access from White Lake Road.

The proposed planned unit development would have access from Runyan Lake Road to the west and from White Lake Road from the south. The Runyan Lake Road access will serve the northern/western portion with 42 lots. The White Lake access will serve the southern/eastern portion with 44 lots. Two lots will have direct access from White Lake Road with a shared driveway.

As noted in §11.02(E) Access, planned unit developments “shall be located so that it can be accessed from a paved County primary road able to safely serve the proposed development without adverse impact on the community.”

While it has been offered that the above standard requires planned unit developments to only have direct access from a paved county primary road, the plain language used here and the language used in other sections of the Zoning Ordinance offer different guidance.

The definition section states that “shall” is always mandatory and not discretionary. “Can” is not defined in the ordinance, but its common meaning is “to be able to” or “to be permitted to.” Based on the plain language, a planned unit development must be located so it is able to have access from a paved county road.

Developmental standards for other uses provide different guidance. For example, cemeteries and open storage yard must have “direct access” to certain types of roads. Churches, colleges, golf courses, and contractors limited storage have some variation of “all access shall be directly to” certain types of roads.

It is our interpretation that the location of the proposed planned unit development is consistent with the access standard, as it is written in the Zoning Ordinance.

The access point for each phase has a boulevard or partial boulevard and will provide access to more than 30 but less than 50 dwelling units. In general, private roads with a single point of access are limited to 30 dwelling units. Boulevard entrances have previously been considered as providing multiple access points. Additionally, planned unit developments may have up to 50 dwelling units with a single access point.

Based on the number of proposed units and likely trip generation, a traffic impact statement, as described in Table 23.1 Requirements for Various Types of Traffic Impact Studies, will be required as part of final approval. Some basic information has been provided by the applicant by email.

The site plan calls for the internal roads to be public roads, dedicated to the Livingston County Road Commission. It appears that the proposed internal roads are generally consistent with the design standards, but we defer further comment to the Township Engineer.

**Items to be Addressed:** 1) We recommend the cul-de-sacs should be reconfigured so the center area is landscaped rather than paved. 2) The eastern end of Valencia will likely need to be reconfigured to provide a large-vehicle turnaround. 3) Before final site plan application, the applicant should secure the necessary permits from the Livingston County Road Commission. 4) Approval of the access and circulation by the Township Engineer and Fire Inspector.

## ESSENTIAL SERVICES

The proposed planned unit development will be served by public sanitary sewer.

Except where otherwise noted, the utilities will generally be buried within the street rights-of-way. Potential locations for above ground utility boxes are not shown at this time.

It is our understanding that the site has enough sewer taps available and that there would be adequate capacity to provide sewer service for the proposed number of lots.

The preliminary plan shows the approximate location of stormwater management improvements. In general, stormwater will be pretreated in a detention basin or other structure to remove sediment and pollutants and to manage flow rate before discharge into onsite wetlands.

**Items to be Addressed:** 1) The applicant should provide confirmation of capacity as part of final site plan submission. 2) The applicant should provide information about required permits from Livingston County and the Michigan Department of Environment, Great Lakes, and Energy at final site plan submission. 3) Calculations and details for stormwater management should be included in the final site plan. 4) The applicant should consult with the Post Master to determine if shared mailboxes will be required and include locations and details in the final site plan.

## LANDSCAPING & SCREENING

A landscaping plan is included on Sheet P-6.

It calls for planting 4 species of trees, including Austrian pine, blue spruce, American sweetgum, and black maple. Roughly 34 trees will be planted along White Lake Road, 43 trees along the northern lot line of the northern/western portion, and 16 along adjacent residential properties to the southwest.

We recommend that the applicant consider some changes to or additions to the proposed species, which could be included in the final site plan. Blue spruce are susceptible to disease. Other trees may be better suited for areas with wet soils, such as Douglas fir, balsam fir, and red maple.

Calculations used to determine the number of trees and description of location for specific trees are not included at this time, but preliminary site plan is intended to review if there is space available for landscaping with details tended to at final site plan.

The location of some of the proposed trees may have to be adjusted to accommodate clear-vision areas at the intersections and the shared private driveway for lots 87 and 88.

**Items to be Addressed:** 1) Applicant should consider changes or additions to proposed tree species. 2) Calculations, number of each specie, and identification of trees should be added to the final site plan. 3) Clear-vision areas, as defined in §21.39 of the Zoning Ordinance, should be added to the final site plan.

## LIGHTING

The site plan does not appear to show the location of or any details of any proposed outdoor lighting.

The Township may require street lighting for planned unit developments. At an earlier meeting, the applicant has stated they would be willing to install street lights and the location for street lights are shown on Sheet P-2.



**Items to be Addressed:** 1) The Planning Commission should determine if street lights will be required. 2) The location and details of existing and proposed outdoor lighting should be added to the final site plan, or a note should be added that there will be no exterior lighting.

## OUTDOOR ADVERTISING & SIGNS

The preliminary site plan does not indicate whether or not there will be any signs near the entrances at Runyan Lake or White Lake Road.

**Items to be Addressed:** The location and details of any signs should be added to the final site plan, or the applicant should confirm that no signs will be added.

## PLANNED UNIT DEVELOPMENT GENERAL REQUIREMENTS

§11.02 General Requirements provides minimum standards that all planned unit developments must comply with. Below is a review of those general requirements. In some cases, the requirement may have its own section of this report.

A. Location. A PUD may be approved at any location in the Township as a special use as specified in Table 11.1 and further subject to review and approval as provided herein.

**Comments:** The proposed planned unit development is a special land use at the proposed location.

B. Ownership. At the time of Preliminary PUD approval, the proposed development shall be under single ownership or control such that there is a single person or entity having responsibility for the development of the project. This provision shall not prohibit a transfer of ownership or control of separate parcels or phases following approval of the Preliminary PUD, however all phases and parcels shall continue to be subject to the approved Preliminary PUD plan and all of its terms and conditions.

**Comments:** It is our understanding that the proposed planned unit development is under single ownership or control at this time.

C. Minimum Area. The minimum area required for a PUD shall not be less than 20 contiguous acres of land...

**Comments:** The properties that are a part of the proposed planned unit development are significantly greater than 20 acres and are all contiguous.

D. Utilities. The PUD shall be located at a site that is able to provide adequate water and wastewater disposal service to the proposed development without adversely impacting the community and surrounding neighbors.

**Comments:** *If lots within the proposed project would be served by individual wells, Livingston County Health Department would require several test wells on the site (tests are typically done between preliminary and final site plans) and would require permits for each individual well.*

*The project will be served by a public sanitary sewer system.*

- E. Access. The PUD shall be located so that it can be accessed from a paved, County primary road able to safely serve the proposed development without adverse impact on the community.

**Comments:** *As noted in the "Access and Circulation" section of this report, it is our interpretation that the location of the proposed planned unit development is consistent with the access standard, as it is written in the Zoning Ordinance.*

*The proposed planned unit development would have access for 42 units from White Lake Road, less than the 52 units that would have access in the parallel plan, which is likely to reduce any adverse impacts on the use of that road.*

*A traffic impact statement, required as part of final site plan review, will provide more details about anticipated trip generation and distribution. The Planning Commission could also require a traffic impact study as part of preliminary review if it determines such a study is essential for review of the planned unit development at this phase.*

- F. Uses. The following uses may be permitted in PUDs...

**Comments:** *The proposed planned unit development will only have single-family residential uses, which is a permitted use in the current zoning district and the zoning districts consistent with the Future Land Use Map.*

- G. Residential Density / Parallel Plan. To assist the Planning Commission in determining the number of lots, units, or square footage permitted in a residential PUD or the residential component of a PUD, the applicant shall submit a parallel plan (see also Sections 11.04.B and 11.06.A.4) for the development. The parallel plan shall comply with the requirements for a site plan in Section 23.02, and shall show how the site could be reasonably developed in compliance with adopted zoning and subdivision ordinances and standards. The parallel plan should be drawn to contain the maximum number of lots or dwelling units allowable and reasonable per the dimensional and other Ordinance standards and practical engineering limitations that would apply to the site if zoned in accordance with the site's future land use designation (see Table 11.1). The Planning Commission shall review the parallel plan and determine the number of lots or dwelling units that could be constructed (based on adopted ordinances and standards, site conditions, engineering, cost and similar factors). For example, parallel plans showing lots with dwellings on extremely steep slopes, in bodies of water, or in a right-of-way will have these lots rejected, as they are not reasonable and do not meet ordinance requirements. This number, as recommended by the Planning Commission and approved by the Township Board, will be the base number of dwelling units allowable for the residential PUD. Any density bonus (see Section 11.02.H) granted by the Township Board will be applied to this base number. For residential PUDs which do not request a density bonus, the parallel plan requirement may be waived, subject to the determination of the Planning Commission.

**Comments:** *The proposed planned unit development is requesting a residential density bonus, so a parallel plan is required.*

*The proposed lots in the parallel plan appear to meet, or could meet with minor adjustments, the developmental standards for lots within the corresponding zoning districts. The parallel plan shows building envelopes with attached garage that are larger than the minimum required square footage for dwellings.*

- H. Residential Density Bonus. The number of units permitted in a residential PUD or the residential component of a PUD, as determined from the parallel plan may be increased at the discretion of the Planning Commission and the Township Board, in accordance with the following:
1. Each element listed in Section 11.02.H.2 below, is worth an additional, incremental bonus. The bonus for each element may range from 0% to 5% of the units identified on the parallel plan. The specific amount of the bonus shall depend on the degree to which the PUD has addressed that element and the impact the element has in contributing to the objectives sought to be achieved by the PUD. The maximum density increase any development may receive shall be 15% of the residential units identified on the parallel plan.
  2. For those residential PUDs eligible to receive a density bonus, the proposed development is required to meet or exceed one or more of the requirements of this section of the Ordinance.
    - a. Providing clustered development where a minimum of fifty percent (50%) of the gross land area of the development is protected open space.
    - b. Inclusion of a variety of building types, quality architecture, durable materials and superior site design.
    - c. Providing frontage transition areas along all public roads that are at least one hundred fifty (150) feet in depth with suitable landscaping.
    - d. Providing public amenities such as trails for non-motorized use, children's playgrounds, picnic facilities, or community centers.
    - e. Providing paths, trails, greenways, or other pedestrian and nonmotorized transportation facilities, accessible to the public, and connected to or creating a network of trails throughout the community.
    - f. Cleanup of site contamination.
    - g. On-site storm water management that relies upon natural systems to the greatest extent possible and preserves the quality and integrity of such systems.
    - h. Other similar elements as determined by the Planning Commission.

**Comments:** *The proposed planned unit development is requesting a residential density bonus, so a parallel plan is required.*

*Based on comments from the applicant, it is our understanding that they are requesting additional lots for items b (superior architecture/design), d (non-motorized trails), and g (stormwater management with natural features).*

*The Planning Commission should determine if it believes the elements are satisfied and, if so, what incremental bonus from 0% to 5% the planned unit development qualifies for.*

- I. Development Standards and Flexibility. The purpose of this Section is to ensure that PUDs are compatible with adjacent properties and the Township. All development standards of this Ordinance

and the requirements of the zoning district corresponding to the site’s future land use designation (see Table 11.1) shall be followed in the design of PUDs. However, modifications to any of these standards may be approved as part of a Preliminary PUD plan provided that such modifications are determined by the Township Board to be consistent with the purpose and intent of this Article, are consistent with sound planning and design, are necessary for the preservation of significant features or open space on the site, or are otherwise necessary to result in a higher quality design.

**Comments:** *The proposed planned unit development is proposing modification of several district standards, as noted in the table below.*

**Current and Proposed Developmental Standards**

	<b>RE Rural Estate current</b>	<b>R-2 Single Family western portion per Master Plan</b>	<b>RE Rural Estate eastern portion per Master Plan</b>	<b>Proposed PUD Standards</b>
<b>Lot Area (min)</b>	1.75 acres	21,780 sf	1.75 acres	21,870 sf (phase 1) 18,000 sf (phase 2)
<b>Lot Width (min)</b>	200 feet	110 feet	200 feet	90 feet
<b>Lot Coverage (max)</b>	25 percent	30 percent	25 percent	35 percent
<b>Front</b>	100 feet	50 feet	50/100 feet	35/50 feet
<b>Side</b>	20 feet	15 feet	20 feet	15 feet
<b>Rear</b>	75 feet	35 feet	75 feet	35 feet

*The proposed modification of minimum lot area and width would allow for more area to be included within open space. Including wetland areas within common open space areas tends to provide greater protection than if wetland areas are within individual lots. The associated modifications to setbacks and lot coverage are likely necessary to develop lots with typical dwellings on the proposed lots.*

*A table should be added to the preliminary plan listing the proposed developmental modifications requested as part of the planned unit development, the specific section of the Zoning Ordinance, and the reasons and mechanisms used to protect the public health, safety, and welfare in place of the original standards.*

- J. Phasing. Where a project is proposed for construction in phases, the project shall be so designed that each phase, when completed, shall be capable of standing on its own in terms of services and facilities, and shall contain the necessary components to ensure protection of natural resources and the health, safety, and welfare of the users of the planned unit development and residents of the community. A phase shall not be substantially dependent upon subsequent phases for safe and convenient vehicular and pedestrian access.

**Comments:** As noted in Phasing Schedule and Timeline on Sheet P-1, the project is proposed for construction in 2 phases. Phase 1 would include lots 1-42 and would begin in spring 2022. Phase 2 would begin in spring 2024.

Each phase is generally able to stand on its own. Some utility improvements to support Phase 2 are located within the boundaries of Phase 1 and should be completed while those improvements are being made.

Walking trails within the open spaces of Phase 2 should be completed as part of Phase 1 or a performance guarantee adequate to cover costs of construction should be provided to the Township.

K. Open Space. 1. Residential. PUDs containing a residential component shall provide and maintain open space at a minimum of 30 percent of the total land area of the portion of the site that is designated for residential use. However, the Planning Commission may recommend, and the Township Board may approve, modifications of the 30 percent requirement if it finds that the site characteristics, surrounding natural features, and proposed design features and uses lend themselves to different open space area requirements. For residential uses, open space shall conform to the requirements of Section 21.51 of this Ordinance, however up to 50% of the area of storm water basins which utilize best management practices to provide for an aesthetic site amenity may be considered to be open space, at the discretion of the Planning Commission and Township Board based on review of the specific solution.

**Comments:** Unfortunately, the Zoning Ordinance does not define "total land area." The calculations provided by the applicant for 156.54 acres is consistent with the definition for net lot area, excluding rights-of-way. Without further guidance from the Zoning Ordinance, this number appears appropriate to use, provided that rights-of-way for the adjacent public streets are excluded and the rights-of-way for the internal, proposed streets are included.

A minimum of 30% of the total land area must be provided as open space, which would be 46.96 acres. A maximum of 25% (11.74 acres) can come from submerged lands. A maximum of 35% (16.43 acres) can come from wetlands. The rest of the open space would need to be upland.

The calculations on Sheet P-5 states the open space would include 49.34 acres of submerged land/open water, 24.95 acres of state-regulated wetland, and 15.44 acres of upland. Based on the limitations above, the submerged lands and wetlands would be allowed to contribute a maximum of 28.17 acres. With the upland, a total of 43.61 acres of open space would be provided, according to the Zoning Ordinance, roughly 3.35 acres short of the required open space. (The calculations on Sheet P-5 incorrectly limit upland to 40% of the required open space, but there is no limit on upland contribution.)

It is not clear if the calculations for open space include storm water basins. This should be noted on the site plan.

The Township may approve for non-contiguous open space, as outlined in §11.02(K)(3)f. The non-contiguous space would have to be located within Tyrone Township and would have to be protected in perpetuity with a recorded instrument. We are unaware if the applicant has investigated securing open space outside of the proposed planned unit development.

*The Township may modify the 30% open space area requirement if it finds that the site characteristics, surrounding natural features, and proposed design features lend themselves to different open space requirements.*

*We recommend the applicant examine securing non-contiguous open space before the Township consider reducing the open space area requirement.*

- L. Emergency Access. The configuration of buildings, driveways, and other improvements shall permit convenient and direct emergency vehicle access. A PUD in excess of 50 dwelling units and/or 500 average daily vehicle trips shall, at the discretion of the Township Board, provide at a minimum of two points of ingress and egress.

**Comments:** *The proposed road system would allow direct access to all of the proposed lots. Sheet P-8 shows fire apparatus access through most of the site. It is likely that a turnaround will be required at the eastern end of Valencia.*

*Lots 87 and 88 will have direct access from White Lake through a shared private driveway.*

*The planned unit development will have more than 50 dwelling units, but no access point will provide access for more than 50 dwelling units. Additionally, the access points for the roads serving each phase will have a full or partial boulevard segment.*

*We defer further comment to the Township Engineer and Fire Inspector.*

- M. Site Circulation. The vehicular and pedestrian circulation system within each development shall accommodate, where appropriate, the movement of vehicles, bicycles, and pedestrians throughout the proposed development and to and from surrounding areas in a safe and convenient manner. Sidewalks and streets shall be connected into the overall Township network and shall be extended to adjacent undeveloped properties to provide future connections. Any improvements, if necessary, shall be at the applicant's expense. Private roads shall comply with the standards in Article 24. PUDs must also satisfy the Access Management Standards in Section 21.54.

**Comments:** *The planned unit development would include a vehicular access system to provide primary access to most of the lots. It appears that the proposed geometry, except as noted otherwise, appears to be consistent with the applicable standards and would allow access by fire apparatus (and school buses and garbage trucks). The proposed road system is not designed to connect with adjacent properties, but most of the adjacent properties are already developed or connections would be limited due to wetlands or water.*

*The planned unit development would include a separate pedestrian circulation system, with sidewalks along the proposed streets and a variety of pathways to and within open space. There is also a proposed pedestrian connection spanning the river that divides the 2 phases.*

- N. Streets. All public and private streets within a PUD shall comply with the applicable standards of the Livingston County Road Commission and Tyrone Township.

**Comments:** *It appears that the proposed streets within the planned unit development would comply with the applicable standards. We note that a large vehicle turnaround of some type is likely necessary for the eastern end of Valencia.*

*We defer further comment to the Township Engineer and the Livingston County Road Commission.*

- O. Infrastructure Improvements. All infrastructure improvements, including roads, water, wastewater, storm water drainage, street lights, and street signage, within and adjacent to the PUD and necessary to serve the site, shall be provided by the developer as a part of the development of the site. All such infrastructure shall be subject to the approval and meet the requirements of the Fire Department and all other agencies with authority.

**Comments:** *Details and approvals for the various responsible agencies above are typically obtained following preliminary approval. Any final approval should be conditioned on receiving those approvals and providing a performance guarantee to ensure installation of any infrastructure improvements.*

- P. Availability and Capacity of Public Services. The proposed type and intensity of use shall not exceed the existing or planned capacity of existing public services and facilities, including police and fire protection, traffic capacity of the public roads, drainage and storm water management facilities, and capacity of existing or planned water and sanitary sewer facilities. The expansion or provision of public services shall not create an unreasonable burden on the Township. Approval of the appropriate County agencies, other agencies with authority, Fire Department and the Township Engineer shall be required for all facilities necessary for the development.

**Comments:** *It is our understanding that the proposed single-family residential use and proposed number of units would not exceed the existing or planned capacity for public services. Addition information about traffic would be required as part of final site plan approval.*

*We defer further comment to the applicable agencies.*

- Q. Utilities. All utilities except electrical transmission lines constructed or relocated within the site, including: electrical service lines, appurtenances and accessories, shall be placed underground. Any utility pad or transformer, where required to be placed above ground because of size or function, shall be fully screened or obscured by mature landscaping and/or a decorative masonry wall, or may be fully enclosed in a dedicated building constructed consistent with these regulations.

**Comments:** *The planned unit development calls for burying utilities throughout the project. Specific locations and easements are typically described as part of final site plan review. It appears that there is adequate space for utilities within the proposed rights-of-way and existing easements.*

- R. Landscaping. Landscaping, screening and buffering shall be required. A landscaping plan shall be submitted with both the Preliminary and Final PUD plans consistent with the requirements in Article 21A.

**Comments:** *A landscaping plan has been submitted as Sheet P-6. It shows the rough location of proposed plantings and the types of trees to be planted.*

*The applicant should consider changes or additions to proposed tree species. Calculations, number of each specie, and identification of trees should be added to the final site plan. Clear-vision areas, as defined in §21.39 of the Zoning Ordinance, should be added to the final site plan*

*The plan generally demonstrates that it is possible to provide landscaping*

- S. Parking and Loading. Parking and loading facilities in a PUD shall comply with the standards in Article 25. However, the numerical requirements for parking may be modified, based on evidence that other standards would be more reasonable because of the level of current or future employment, the level of current or future customer traffic, shared parking by uses that have peak parking demands that do not overlap, and other considerations. A decision to reduce the number of parking spaces shall be based on technical information provided by a qualified planning, parking or traffic consultant, that verifies that the reduction will not impair the functioning of the developments served, or have an adverse impact on traffic flow on or adjacent to the development.

**Comments:** *Parking for the proposed single-family houses would be provided on each lot, on the driveways or within the garages.*

- T. Conditions of Construction. The hours of construction activity shall be stated on the PUD plan and shall be determined based on the scale and schedule of construction, and proximity to and type of adjacent developments. Noise, dust, odors, traffic and other impacts of construction of the PUD shall be limited so as to not create negative impacts for the Township or surrounding area. The applicant shall present a plan for review that includes specific measures to ensure that construction operations do not create nuisance conditions. The Township Board may place reasonable limitations on hours and other construction activities to prevent potential negative impacts.

**Comments:** *Hours of construction and nuisance mitigation measures should be added to the final site plan.*

## PARALLEL PLAN REVIEW

The Parallel Plan review process, noted below, is outlined in §11.02(G) Residential Density/Parallel Plan.

To assist the Planning Commission in determining the number of lots, units, or square footage permitted in a residential PUD or the residential component of a PUD, the applicant shall submit a parallel plan (see also Sections 11.04.B and 11.06.A.4) for the development. The parallel plan shall comply with the requirements for a site plan in Section 23.02, and shall show how the site could be reasonably developed in compliance with adopted zoning and subdivision ordinances and standards. The parallel plan should be drawn to contain the maximum number of lots or dwelling units allowable and reasonable per the dimensional and other Ordinance standards and practical engineering limitations that would apply to the site if zoned in accordance with the site's future land use designation (see Table 11.1).

The Planning Commission shall review the parallel plan and determine the number of lots or dwelling units that could be constructed (based on adopted ordinances and standards, site conditions, engineering, cost and similar factors). For example, parallel plans showing lots with



dwelling units on extremely steep slopes, in bodies of water, or in a right-of-way will have these lots rejected, as they are not reasonable and do not meet ordinance requirements. This number, as recommended by the Planning Commission and approved by the Township Board, will be the base number of dwelling units allowable for the residential PUD. Any density bonus (see Section 11.02.H) granted by the Township Board will be applied to this base number. For residential PUDs which do not request a density bonus, the parallel plan requirement may be waived, subject to the determination of the Planning Commission.

**Comments:** *The proposed residential planned unit development would include additional lots, so review and approval of a parallel plan is required. A parallel plan, dated October 22, 2021, is included as Sheet P-10.*

*The parallel plan shows lots that could be developed using the standards for the zoning districts that are consistent with the Future Land Use Map.*

*This parallel plan includes building footprints, showing the potential location for houses on each of the lots.*

*The lots appear to be generally feasible or could be feasible with minor adjustments; none of the lots call for dwellings on extremely steep slopes, in bodies of water, or within rights-of-way.*

*It appears that all of the lots would meet the lot area and width standards. The proposed house locations appear to meet the setback standards, and it appears that the lot coverage standards would be met.*

## APPLICABLE DECISION CRITERIA

The proposed planned unit development requires site plan, special land use, and planned unit development review. The decision criteria for those approvals are examined below.

Standards for site plan review are outlined in §23.03 Standards for Site Plan Review, and a description of information that must be included in a site plan is outlined in §23.02 Site Plan Information. Comments addressing these standards are included throughout this report and below.

A. Required Information. That all required information has been provided.

**Comments:** *The site plan is generally complete for preliminary review, except as otherwise noted, or may be eligible for waivers. At this time the applicant has submitted elements of but not a completed impact statement, as outlined in §23.04 Requirements for Impact Statement. At this time, the applicant has submitted elements of but not a complete traffic impact statement, as outlined in §23.05 Traffic Impact.*

*The plans are drawn at a scale of 1" = 150'. Any scale greater than 1" = 100' requires Planning Commission waiver upon determination that the requirement is clearly unnecessary for substantial review.*

B. Zoning District Conformity. That the proposed development conforms to all regulations of the zoning district in which it is located.

**Comments:** *The proposed planned unit development appears to conform with the regulations for the RE Rural Estate district or with modifications proposed as part of the planned unit development.*

- C. Legal Applicant. That the applicant may legally apply for site plan review, including authorization from the owner.

**Comments:** *To the best of our knowledge, the applicant is legally authorized to apply for site plan review.*

- D. Infrastructure. That the plan meets the specifications of Tyrone Township for fire and police protection, water supply, sewage disposal or treatment, storm drainage, and other public facilities and services, and has been approved by the Township's designated Fire Marshal and/or professional consultants where appropriate.

**Comments:** *It is our understanding that full review by the listed agencies has not been completed at this time. Typically, these reviews are completed between preliminary and final review or as a condition of final approval.*

- E. Suitable Soils. That soils not suited to development will be protected or altered in an acceptable manner.

**Comments:** *The soils that are less suitable for development are generally located within open spaces and will not be developed.*

- F. Soil Erosion. That the proposed development will not cause soil erosion or sedimentation problems.

**Comments:** *The proposed planned unit development does not appear likely to cause soil erosion or sedimentation problems following construction. During construction, soil erosion and sedimentation control measures will be required to prevent erosion and sedimentation.*

- G. Floodplains. That the proposed development properly respects floodways and/or floodplains on or in the vicinity of the subject property.

**Comments:** *The proposed planned unit development is not located within a floodway or floodplain. However, the open water will be located within open space with limited development in the immediate vicinity.*

- H. Drainage. That the drainage plan for the proposed development is adequate to handle anticipated storm water runoff and will not cause runoff onto neighboring property or overloading of water courses in the area.

**Comments:** *The preliminary site plan shows the location for some stormwater management improvements, including swales and detention basins. Calculations for sizing of these improvements is typically included as part of final site plan review. The stormwater will eventually be discharged into wetland areas and then flow downstream. Typically, discharge permits require stormwater management to discharge at the same rate as before the property was developed.*

*We defer additional comment to the Township Engineer.*

- I. Coordinated Improvements. That the proposed development is coordinated with improvements serving the subject property and with the other development in the general vicinity.

**Comments:** *We are not aware of any improvements in the general vicinity that would require coordination with the proposed planned unit development.*

- J. Site Lighting. That outside lighting will not adversely affect adjacent or neighboring properties or traffic on adjacent streets (see Section 21.37) and that adequate lighting will be provided as determined appropriate by the Planning Commission upon the advice of the Township expert to protect the public health, safety and welfare.

**Comments:** *The preliminary site plan includes interior street lighting. Specific details of the lighting and a photometric plan have not been provided at this time. The proposed locations are not likely to cause significant negative impact on adjacent properties or streets, as they will be screened by structures and landscaping. Additional information should be provided as part of final site plan review.*

- K. Garbage and Refuse. That outdoor storage of garbage and refuse is contained, screened from view, and located so as not to be a nuisance to the subject property or neighboring properties.

**Comments:** *It is our understanding that garbage would be stored and collected using individual bins, typical for residential developments.*

- L. Grading or Filling. That grading or filling will not destroy the character of the property or the surrounding area and will not adversely affect the adjacent or neighboring properties.

**Comments:** *The preliminary plan for the proposed planned unit development shows the limits of disturbed areas on Sheet P-7. This area will include some grading and filling adjacent to neighboring properties, but it is not clear that the proposed work would create a negative impact.*

*We defer further comment to the Township Engineer.*

- M. Traffic. That vehicular and pedestrian traffic within the site as well as to and from the site is both convenient and safe and includes berms, barriers, and sidewalks necessary to protect adjacent property from vehicle lights.

**Comments:** *The applicant has not provided a complete traffic impact statement at this time, but the proposed planned unit development is likely to provide a better distribution of traffic than a conventional development. Internally, the site provides streets and vehicular circulation that appears to be convenient and safe. Because adjacent dwellings are not currently shown on the preliminary site plan, it is difficult to determine if any additional screening might be necessary to protect them from vehicle lights.*

*We defer further comment to the Township Engineer and Livingston County Road Commission.*

- N. Parking. That parking layout will not adversely affect the flow of traffic within the site or to and from the adjacent streets and adjacent properties.

**Comments:** *The proposed planned unit development does not include any parking areas, beyond residential driveways.*

O. Governmental Agencies. That the plan meets the standards of other government agencies, where applicable, and that the approval of these agencies has been obtained or is assured.

**Comments:** *The applicant has provided a review from the Livingston County Road Commission. We are not aware of other reviews or approvals from other agencies. Typically, these reviews are completed between preliminary and final review or as a condition of final approval.*

P. Public Streets. That the plan provides for the proper expansion of existing public streets serving the site, where applicable.

**Comments:** *We are unaware of requirements for expansion of existing public streets and defer further comment to the Livingston County Road Commission.*

Q. Phased Development. That all phased developments are ordered in a logical sequence so that any individual phase will not depend in any way upon a subsequent phase for adequate access, public utility services, drainage or erosion control.

**Comments:** *The proposed planned unit development will take place in 2 phases. Phase 1 does not appear to require any improvements from Phase 2 in order to function; there are some improvements to open space that are shown in Phase 2 that should be completed as part of Phase 1 or a performance guarantee should be provided.*

R. Landscaping. The Planning Commission and/or Township Board may further require landscaping, fences and walls in pursuance of these objectives and shall be provided and maintained in accord with any use to which they are appurtenant.

**Comments:** *The preliminary site plan shows potential landscaping that appears to be generally consistent with the Zoning Ordinance standards. Notes for improvements to the landscaping are included in the "Landscaping & Screening" section of this report.*

S. Screening. The Planning Commission shall have some latitude in specifying the walls, fences, greenbelts as they apply to a phased development if the particular phase of development and construction work is far enough removed from adjacent properties to afford the screening, etc., as otherwise required.

**Comments:** *The proposed planned unit includes screening along White Lake Road and along adjacent residential properties where lots are proposed. The Planning Commission should provide guidance to the applicant if alternative screening is desired.*

T. Sound Planning. The proposed site plan must be in accord with the spirit and purpose of this ordinance and not be inconsistent with or contrary to the objectives sought to be accomplished by this ordinance and principles of sound planning.

**Comments:** *The proposed planned unit development is located on a challenging property. It appears to preserve greater natural areas than a conventional development would and provides greater pedestrian circulation than a typical development. It would provide a better distribution of traffic between the adjacent streets and would support connection with a sanitary sewer system. Ideally, it would include vehicular and pedestrian connections with adjacent properties and developments and a greater variety of housing options, but the surrounding properties are already developed and the Zoning Ordinance does not require a mix of housing options.*

U. Developmental Impacts. Plans shall provide sufficient information, text, detail and/or other assurances necessary to satisfy the Planning Commission and Township Board that areas required to be protected from the impacts of the development (such as topsoil, trees, and other natural features) have been properly designated on the plans, and that these areas have been properly protected, in accordance with Section 21.A.8 before commencement of any building, operations, or development.

**Comments:** *The proposed planned unit development includes areas that would be preserved in their natural state or with little disturbance. Sheet P-7 shows the limits of disturbed areas.*

V. Natural Watercourses. The development will not substantially reduce the natural retention storage capacity of any watercourse, thereby increasing the magnitude and volume of flood at other locations.

**Comments:** *It does not appear that the proposed planned unit development will substantially reduce the natural retention storage capacity of a watercourse because the watercourse and adjacent wetlands are generally located within open space and will generally be preserved in their natural state.*

*We defer further comment to the Township Engineer.*

W. Conditions for Excavation. The soil and subsoil conditions are suitable for excavation and site preparation and the drainage is designed to prevent erosion and environmentally deleterious surface runoff.

**Comments:** *We defer comment to the Township Engineer.*

X. Natural Features. The development will not detrimentally affect or destroy natural features such as ponds, streams, wetland, hillsides or wooded areas, but will preserve and incorporate such features into the development's site design.

**Comments:** *The proposed planned unit development will preserve significant areas of water, wetland, and woodlands. Areas proposed for streets and other infrastructure and for individual lots are likely to have trees removed and some grading.*

Y. Site Topography. The location of natural features and the characteristics of site topography have been considered in the designing and siting of all physical improvements.

**Comments:** *The design of the planned unit development and limits of individual lots appears to consider the natural features on the site.*

- Z. Current Standards. That if the site has existing improvements, all site conditions have been brought up to the current standards of this ordinance.

**Comments:** *There are no existing improvements on the site. This standard does not apply.*

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The general review standards for special land uses are outlined in §22.04 General Review Standards for All Special Land Uses and are included below. Comments addressing these standards are included throughout this report and below.

Special land uses require an applicant to submit a statement of use, as outlined in §22.02(B)(2) Statement of Use. To the best of our knowledge, such a statement has not been provided at this time.

**Comments:** *The applicant should provide a statement of use, consistent with §22.02(B)(2) Statement of use.*

- A. Master Plan. The special land use will be consistent with the goals, objectives, and future land use plan described in the Township's Master Plan.

**Comments:** *The Future Land Use Map calls residential dwellings in this area with lots sizes ranging between half an acre and 3 acres. The Master Plan calls for cluster-style developments in these areas.*

*The proposed planned unit development would preserve more natural features than a conventional development and would allow more lots within an area served by sanitary sewer.*

- B. Zoning District. The special land use will be consistent with the stated intent of the zoning district.

**Comments:** *The proposed use planned unit development is a special land use in the Planned Commercial Industrial district.*

- C. Neighborhood Compatibility. The special land use will be designed, constructed, operated and maintained to be compatible with, and not significantly alter, the existing or intended character of the general vicinity in consideration of environmental impacts, views, aesthetics, noise, vibration, glare, air quality, drainage, traffic, property values or similar impacts.

**Comments:** *The proposed residential planned unit development appears to be generally consistent with the surrounding residential developments. It would have smaller setbacks for individual lots, but it would have a larger area of the site preserved in a natural state.*

- D. Environment. The special land use will not significantly impact the natural environment.

**Comments:** *The development of any property from a natural state to a developed state will have an impact on the natural environment. The extensive wetland areas within the open space are more likely to be protected than they would be within individual lots and are likely to provide better stormwater management.*

- E. Public Services. The special land use can be served adequately by public facilities and services such as police and fire protection, drainage structures, water and sewage facilities, refuse disposal and schools.

**Comments:** *It appears that the proposed planned unit development should adequately be served by public facilities and services. Additional information would be provided and reviewed as part of final site plan review.*

*We defer additional comment to the applicable public facility and service agencies.*

- F. Traffic. The proposed use shall be of a nature that will make vehicular and pedestrian traffic no more hazardous than is normal for the district involved, taking into consideration the following...

**Comments:** *The proposed planned unit development appears likely provide better vehicular circulation on the adjacent streets than a conventional plan because it would reduce the number of lots accessing Runyan Lake and increase the number of lots accessing White Lake. Additional information would be available as part of a traffic impact statement.*

*The proposed planned unit development would include an extensive internal pedestrian circulation system, with more sidewalks and trailways than other residential developments in the area.*

- G. Additional Development. The proposed use shall be such that the location and height of buildings or structures, and the location, nature and height of walls, fences, and landscaping will not interfere with or discourage the appropriate development and use of adjacent land and buildings or unreasonably affect their value.

**Comments:** *It does not appear that the proposed planned unit development would interfere with the development or use of adjacent properties. While the loss of completely natural area may affect the value of adjacent properties, it is not clear that the proposed planned unit development would unreasonably affect the value beyond a conventional development at this site.*

- H. Health, Safety and Welfare. The proposed use shall be designed, located, planned, and operated to protect the public health, safety, and welfare.

**Comments:** *If the Planning Commission determines that the proposed planned unit development is consistent with the standards in the Zoning Ordinance or qualifies for modifications or waivers, it should not create a negative impact on public health, safety, or welfare.*

---

Standards for planned unit development review are outlined in §11.08 Standards for PUD Approval and are included below. Comments addressing these standards are included throughout this report and below.

- A. Documentation is complete, unless a requirement is specifically waived by the Township Board.

**Comments:** *Documentation for preliminary review appears to be generally complete for preliminary review, except as otherwise noted, or may be eligible for waivers.*

B. Satisfies the standards of this article.

**Comments:** *The proposed planned unit development appears to generally meet the standards of the Planned Unit Development Article, except where otherwise noted, or may be eligible for waivers. The largest question is related to open space.*

C. Satisfies the standards and requirements of the Zoning Ordinance, including site plan requirements, unless specifically noted modifications have been granted.

**Comments:** *The proposed planned unit development appears to meet the standards of the Zoning Ordinance, if noted modifications and waivers have been granted by the Planning Commission and Township Board.*

D. Satisfies the goals and objectives of the Master Plan.

**Comments:** *The proposed planned unit development appears to preserve more natural features than a conventional development, provide more pedestrian circulation, and would locate more dwellings in an area served by public services (sanitary sewer).*

E. Does not adversely affect and is compatible with adjacent property areas.

**Comments:** *The proposed single-family dwelling use of the planned unit development appears to be consistent with the surrounding developed areas, which are primarily single-family dwellings.*

F. Does not result in a significant increase in demand for public services or facilities when compared to the development that would otherwise be permitted in that district, unless the proposal contains an acceptable plan for providing necessary services.

**Comments:** *The proposed planned unit development would result in 11 more lots that appear likely reasonable as part of an otherwise permitted development. It does not appear likely that the additional 11 single-family houses would result in a significant increase in demand for public services or facilities.*

G. Protects the natural environment as well or better than conventional development could have at the same location.

**Comments:** *It appears that the proposed planned unit development is more likely to protect and preserve natural features on the site than a conventional development. A significant portion of the wetlands will be located within common open space instead of within individual lots.*

H. Establishes a safe and efficient circulation system that is integrated into the existing and potential future road network, provides for the pedestrian, and minimizes impacts of parking, loading, and access areas.

**Comments:** *The proposed circulation system reduces the number of access points, and the planned unit development would allow for fewer lots accessing Runyan Lake Road than a conventional development. Ideally, the road system would have a connection between the 2 phases and to adjacent developments,*



*but a connection would require extensive improvements within wetland areas and the adjacent properties do not provide ready access.*

- I. Creates coordinated, visually appealing development by emphasizing the relationship between building form, signage, landscaping, and the overall theme of the development.

**Comments:** *It is difficult to provide guidance on this review standard. The applicant has provided renderings for proposed architecture and general landscaping information, but no information is provided about signage or "overall theme."*

## SUMMARY & COMMENTS

The applicant is requesting preliminary approval at this time. The purpose of preliminary approval is to determine if the project is generally consistent with the Zoning Ordinance. Preliminary approval grants the applicant the ability to submit an application for final site plan approval; it does not create any vested rights in final approval.

The application is generally complete, but there is some information that has not been fully provided at this time. If the Planning Commission determines any missing information is not eligible for waivers or is necessary for its preliminary review, it should postpone action and direct the applicant to provide the information. Missing information that the Planning Commission does not determine is necessary for its preliminary review could be added to plans submitted for final approval.

The Planning Commission could make a favorable recommendation to the Township Board, with or without conditions, if it determines decision criteria and developmental standards are met or would be met with conditions.

The Planning Commission could postpone action if it determines there are significant or too many changes or conditions that would be necessary to receive a favorable recommendation. If this is the case, it should direct the applicant to prepare revisions based on its review and provide guidance as to what information or standards it would be comfortable with waiving.

The Planning Commission could make an unfavorable recommendation to the Township Board if it determines decision criteria and developmental standards are not met or could not easily be met with changes or conditions. The application would still be forwarded to the Township Board.

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The list below includes items that require Planning Commission determinations. *(Although the Planning Commission has discussed some of these determinations previously, it is best practice to confirm them at time of review.)*


1. The Planning Commission should determine if the 1" = 150' scale is adequate for substantial review of the preliminary plan.
2. The Planning Commission should determine whether or not to waive all or a part the requirement to show the location of existing structures within 500 feet of the lot as part preliminary review.

3. The Planning Commission should determine if it will require a traffic impact statement, as outlined in Table 23.1 Requirements for Various Types of Traffic Impact Studies, as part of preliminary review.
  4. The Planning Commission should determine if a statement of use is necessary for preliminary review.
  5. The Planning Commission should determine if the parallel plan is reasonably feasible.
  6. The Planning Commission should determine if the proposed developmental standard modifications are consistent with sound planning and design, are necessary for the preservation of significant features or open space on the site or are otherwise necessary to result in a higher-quality design.
  7. The Planning Commission should determine if the criteria for additional residential lots are satisfied and, if so, what incremental bonus from 0% to 5% the planned unit development qualifies for.
  8. The Planning Commission should determine if the site characteristics, surrounding natural features, and proposed design features lend themselves to a reduced open space requirement.
  9. The Planning Commission should consider whether or not it would recommend using non-contiguous property to satisfy open space area if a waiver is not granted from the 30% minimum.
  10. The Planning Commission should determine if alternative screening would be warranted.
  11. The Planning Commission should determine if the criteria for preliminary site plan, special land use, and planned unit developments are satisfied.
- 

The list below includes potential conditions of approval for the Planning Commission to consider. Additional potential conditions could also be identified at the Planning Commission meeting. Conditions associated with final review/approval have not been included below but are identified throughout this report.

1. *The applicant should provide a statement of use, consistent with §22.02(B)(2) Statement of use.*
2. *Special land use approval should only be effective upon approval of the final planned unit development and final site plan.*
3. *A table should be added to the preliminary plan listing the proposed developmental modifications requested as part of the planned unit development, the specific section of the Zoning Ordinance, and the reasons and mechanisms used to protect the public health, safety, and welfare in place of the original standards.*
4. *The cul-de-sacs should be reconfigured so the center is landscaped.*
5. *The eastern end of Valencia should be reconfigured to provide a large-vehicle turnaround.*
6. *Approval of access and circulation by the Township Engineer and Fire Inspector.*
7. *Changes or additions should be made to proposed tree species.*
8. *The site plan should include a description of the criteria proposed for residential density bonus.*
9. *Open space calculations on Sheet P-5 should be corrected. (There is no maximum contribution of upland area and additional details about stormwater basins.)*
10. *The applicant shall conduct a preapplication meeting with the Township before submitting an application for final approvals.*

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CARLISLE/WORTMAN ASSOC., INC.  
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Planner

**TRAFFIC IMPACT STUDY**  
**FOR**  
**LAKE URBAN CROSSING PUD**  
**TYRONE TOWNSHIP, MICHIGAN**

**November 2021**



*Prepared for*  
Lake Urban Dev, LLC

*Prepared by:*



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## **TECHNICAL APPENDIX**

Appendix A - Traffic Data

Appendix B - Crash Data

Appendix C - Existing Condition LOS Computations (Synchro Printouts)

Appendix D - Background Condition LOS Computations (Synchro Printouts)

Appendix E - Build-Out Condition LOS Computations (Synchro Printouts)

## 1. INTRODUCTION

### 1.1. PURPOSE

C&A Engineers, LLC (C&AE) conducted a traffic impact study (TIS) for the proposed Lake Urban Crossing PUD located in the NE quadrant of the White Lake Road and Runyan Lake Road Intersection, in Tyrone Township Michigan. The purpose of this study is to evaluate the impact on the existing road system from the additional vehicular traffic generated by the proposed PUD. The TIS has been prepared in accordance Tyrone Township and the Livingston County Road Commission (LCRC) guidelines.

The assessment documented in this traffic impact analysis is based on a review of existing traffic volumes, recent crash data, and the anticipated traffic generating characteristics of the proposed project. The study examines existing and projected traffic operations (both with and without the proposed PUD) at key intersections in the vicinity of the project site. The study area was selected based on a review of the surrounding roadway network and expected trip generating characteristics of the proposed project. This study provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the adjacent roadway volumes are greatest.

### 1.2. PROJECT DESCRIPTION

The site (**Figure 1**) is located in the NE quadrant of the NE quadrant of the White Lake Road and Runyan Lake Road Intersection, in Tyrone Township. The proposed PUD will be developed in two phases, Phase I (West Side) will comprise of 46 Units, constructed between the Spring of 2022 through the Spring of 2024. Phase II (East Side) will comprise of 42 Units, constructed between the Spring of 2025 through the Spring of 2027. Access to the Phase I of the PUD will be provided off of Runyan Lake Road north of the White Lake Road intersection. Access to Phase II, will be provided off of White Lake Road just east of Carmer Road. **Figure 2** illustrates the proposed site plan.

### 1.3. STUDY AREA

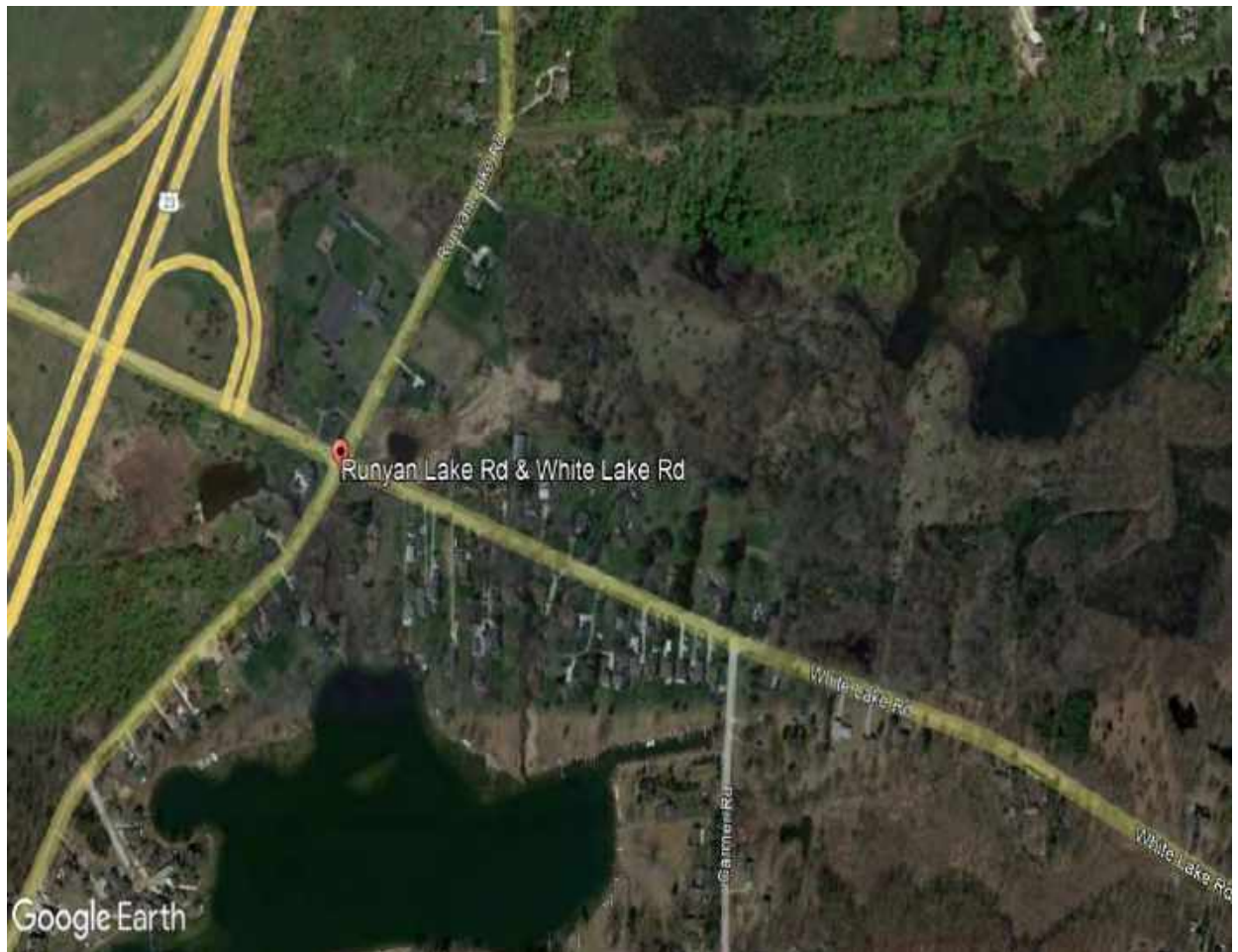
The study area for this project includes key intersections and adjacent roadways that maybe affected by this project. The specific study area includes the intersection and roadway segments listed below.

#### Intersections

- White Lake Road at Runyan Lake Road
- White Lake Road at Carmer Road

#### Road Segments

- White Lake Road
- Carmer Road
- Runyan Lake Road



**Figure 1 Project Site**







## 1.4. STUDY ANALYSIS METHODOLOGY

This section documents the methodologies and assumptions used to conduct the traffic impact study for the PUD. This section includes the analysis condition, analysis time periods and level of service analysis methodologies and steps. **Table 1** presents a summary of the analysis condition.

**TABLE 1: ANALYSIS CONDITIONS**

Conditions	DESCRIPTION
Existing Conditions	The analysis of Existing Condition was based on existing traffic data at the key intersections as well as count data collected.
Background Conditions	Future traffic forecasts without the proposed development were projected for the 2024 & 2027 Background Conditions by forecasting future traffic by applying a three percent annual growth to the existing count data collected.
Build Conditions	This traffic scenario provides an assessment of operating conditions under 2024 & 2027 Build Condition with the addition of Project-generated traffic and transportation network infrastructure proposed by the Project.

## 1.5. LEVEL OF SERVICE ANALYSIS METHODOLOGY

The intersections and roadway segments in the study area were analyzed using procedures consistent with the Highway Capacity Manual. At intersections, the Level of Service (LOS) is based on the average delay experienced by motorists traveling through the intersection. **Table 2** and **Table 3** displays the average delay range for each LOS category associated with signalized and unsignalized intersections.

Signalized intersection operations are evaluated based on the appropriate jurisdiction's LOS standards (i.e., minimum threshold for acceptable operations). An acceptable LOS for signalized intersections is defined as LOS D or better during a peak period. The HCM 2010 method evaluates signalized intersection operations based on average control delay for all vehicles at the intersection, which can be correlated to a LOS **Table 2**.

**TABLE 2: SIGNALIZED INTERSECTION LEVEL OF SERVICE**

Level of Service	Description (for signalized intersections)	Avg Delay <sup>1</sup> (Seconds)
A	Operations with low delay occurring with favorable traffic signal progression and/or short cycle lengths.	< 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	>20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and individual cycle failures are noticeable.	> 35 to 55
E	Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or exceptionally long cycle lengths.	> 80

Note: 1. Average delay expressed in seconds per vehicle.

Source: Highway Capacity Manual (Transportation Research Board, 2010)

The operations of the unsignalized intersections were evaluated using HCM 2010. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At twoway or side-street-controlled intersections, the average control delay is calculated for each stopped movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. **Table 3** summarizes the relationship between delay and LOS for unsignalized intersections.

**TABLE 3: UN-SIGNALIZED INTERSECTION LEVEL OF SERVICE**

Level of Service	Description (for unsignalized intersection)	Average Delay <sup>1</sup> (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delays.	10.1 to 15.0
C	Average traffic delays.	15.1 to 25.0
D	Long traffic delays.	25.1 to 35.0
E	Exceptionally long traffic delays.	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Note: 1. Average delay expressed in seconds per vehicle.

Source: Highway Capacity Manual (Transportation Research Board, 2010)

The study intersections were analyzed using Synchro/SimTraffic analysis software. This software program analyzes the interaction of vehicles, pedestrians, traffic signals, and the roadway configuration. By modeling individual vehicles, the analysis can account for the effect of queue spillbacks on upstream lanes and intersections, delay to unbalanced lane utilization, and interaction between intersections due to signal coordination.

## 1.6. ANALYSIS STEPS

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the project study area. As part of this inventory, manual turning movement counts were collected at key intersections during the weekday morning and weekday afternoon peak hours. A field visit was also completed to document intersection and roadway geometries and available sight distances at the project site driveway. Crash data for the study area intersections was obtained from the SEMCOG and used to determine if the study area has any existing traffic safety deficiencies.

The second step of the study builds upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with any planned future developments that could influence traffic volumes at the study area intersections were assessed. Consistent with the Township and LCRC traffic impact study guidelines, the 2021 Existing traffic volumes were forecasted to the future years of 2024 and 2027 to determine Background (without project) conditions and Buildout (with project) conditions.

The third step of this study determined if measures were necessary to improve existing or future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the proposed project site.

## 1.7. SIGNIFICANCE CRITERIA

The following thresholds of significance have been used to determine whether implementing the proposed PUD would result in a adverse transportation impact. The PUD would have a adverse impact if one of the following conditions were to occur.

1. Causes the intersection to reduce by two or more LOS categories during the AM/PM peak hours.
2. Worsen an unacceptable roadway operations to a significant degree during the weekday AM/PM peak hours.

## 2. EXISTING CONDITIONS

C&A Engineers on November 10, 2021, conducted peak-hour vehicular turning movement count (TMC) survey, (Appendix A) at the key intersection identified above in the Study Area section of the report, from 7:00AM to 9:00AM, and 3:00PM to 7:00PM, which are the confirmed peak AM, Noon and PM period identifies by from historical traffic data for the key intersections.

### 2.1. ROADWAY SEGMENTS

The principal roadways in the PUD study area are described briefly below. The description includes the physical characteristics, adjacent land uses, and traffic control devices along these roadways.

✚ White Lake Road is a northwest-southeast, 2-lane roadway, which intersects with both Runyan Lake Road and Carmer Road. The White Lake Road and Runyan Lake Road intersection has four approaches and is un-signalized, with stop control on the Runyan Lake Road approaches. The White Lake Road and Carmer Road intersection is un-signalized T-intersection, with stop control on the Carmer Road approach. The posted speed limit is 35 MPH near Runyan Lake Road and 45 MPH near Carmer Road.

✚ Runyan Lake Road is a northeast-southwest, 2-lane roadway, which intersect with White Lake Road. The posted speed limit is 40 MPH in the vicinity of the PUD.

✚ Carmer Road is a north-south, two-lane roadway, which terminates at White Lake Road. The posted speed limit is 40 MPH.

### 2.2. CRASH ANALYSIS

Below is summary of the crashes data obtained from SEMCOG (**Appendix B**) for the last five-years (January 1, 2016 – December 31, 2020), at each of the key intersection. **Tables 4, 5, 6 and 7**, illustrate crashes based on type, severity, road condition, weather, and year.

✚ White Lake Road at Runyan Lake Road: There were ten (10) crashes reported at the intersection during the study period, with a breakdown of five (5) angle type crashes, two (2) single-vehicle type crashes, and one (1) head-on left crash and one (1) other type crash. One (1) fatal crash occurred at the intersection.

✚ White Lake Road at Carmer Road: There was only one (1) single vehicle type crash reported at the intersection, resulting in property damage.

The majority of the angle type crashes were the result failure to stop. The following countermeasures may reduce these types of crashes.

- Overlay existing pavement
- Install intersection ahead signs
- Install street lighting

**TABLE 4, CRASHES BY TYPE**

Location	Crashes By Type											Total
	Single Veh	Head-On	Head-Left	Angle	Rear-End	Rear-Left	Rear-Right	Swipe-Same	Swipe Opp	Backing	Other	
White Lake Rd at Runyan Lake Rd	2	0	1	5	1	0	0	0	0	0	1	10
White Lake Rd at Carmer Rd	1	0	0	0	0	0	0	0	0	0	0	1

**TABLE 5, CRASHES BY SEVERITY**

Location	Severity					Total
	Fatal	A-Level	B-Level	C-Level	PDO	
White Lake Rd at Runyan Lake Rd	1	0	2	1	6	10
White Lake Rd at Carmer Rd	0	0	0	0	1	1

**TABLE 6, CONDITION**

Location	Road Condition						Weather Condition						Total
	Dry	Ice	Wet	Snow	Other	Total	Clear	Cloudy	Snowing	Rain	Unknown	Uncoded / Error	
White Lake Rd at Runyan Lake Rd	8	2	0	0	0	10	7	2	1	0	0	0	10
White Lake Rd at Carmer Rd	1	0	0	0	0	1	1	0	0	0	0	0	1

**TABLE 7, CRASHES BY YEAR**

Location	Year					Total
	2016	2017	2018	2019	2021	
White Lake Rd at Runyan Lake Rd	1	5	2	2	0	10
White Lake Rd at Carmer Rd	0	1	0	0	0	1

### 2.3. EXISTING INTERSECTION VOLUMES & LANE CONFIGURATIONS

The operation of the study intersection was evaluated for the highest one-hour volume during the weekday AM/PM peak hour periods. Existing TMC were collected on November 10, 2021. A summary of count data, and intersection TMC conducted for this study can be found in **Appendix A**.

### 2.4. INTERSECTIONS LEVEL OF SERVICE ANALYSIS

The results of the LOS analysis for study intersections under Existing Conditions are presented in **Table 8**, the corresponding LOS calculation sheets are included in **Appendix C**. The LOS analysis indicates that all of the key intersections currently operate at an acceptable LOS A during the both the AM and PM peak hours.

**TABLE 8: EXISTING CONDITIONS INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Method	Movement	AM Peak Period			PM Peak Period		
				Approach Delay	Approach LOS	Intersection LOS	Approach Delay	Approach LOS	Intersection LOS
1	White Lk Rd at Runyan Lk Rd	Un-Signalized	EB	1.1	A	A (3.3)	1.1	A	A (3.1)
			WB	1.6	A		1.0	A	
			SB	10.2	B		13.0	B	
			NB	12.8	B		14.7	B	
2	White Lk Rd at Carmer Rd	Un-Signalized	EB	0.0	A	A (1.7)	0.0	A	A (1.6)
			WB	1.0	A		0.5	A	
			NB	10.7	B		12.6	B	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

## 3. BACKGROUND CONDITIONS

The Background scenarios represents conditions prior to the completion of the PUD. To evaluate the potential impact of traffic generated by the proposed PUD on the surrounding roadway system, it is necessary to first develop estimates of the traffic condition in the area without the PUD. Traffic conditions without the PUD under this scenario reflect existing traffic counts with the addition with the addition of future growth in the buildout year. The existing roadway system and intersection geometries was used for the Background analysis.

### 3.1. BACKGROUND TRAFFIC VOLUMES

Traffic volumes for years 2024 and 2027 Background Conditions comprise of existing volumes forecasted to projected build-out years of 2024 and 2027 utilizing an applicable growth rate. In order to determine the applicable growth rate for the existing traffic volumes to projected build-out year, historical traffic count data and population forecasts publish by SEMCOG were used to estimate future growth for the study area. Based on this data a 3% annual growth was determined, thus a 1.09 and 1.19 growth factors were used for years 2024 and 2027 respectively in the Synchro models.

### 3.2. BACKGROUND INTERSECTIONS LEVEL OF SERVICE ANALYSIS

The results of the LOS analysis for year 2024 and 2027 Background Conditions are summarized in **Tables 9 and 10** and detailed calculations are provided in Appendix D. The LOS analysis indicates that all of the key intersections in 2024 will operate at an acceptable LOS A during both the AM and PM peak hours. It should also be noted, that all the approaches operate at an acceptable LOS B or better.

In 2027 the key intersections will operate at an acceptable LOS A during both the AM and PM peak hours. It should also be noted, that all the approaches operate at an acceptable LOS B or better.

**TABLE 9: 2024 BACKGROUND CONDITION INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Method	Movement	AM Peak Period			PM Peak Period		
				Approach Delay	Approach LOS	Intersection LOS	Approach Delay	Approach LOS	Intersection LOS
1	White Lk Rd at Runyan Lk Rd	Un-Signalized	EB	1.1	A	A (3.5)	1.1	A	A (3.3)
			WB	1.6	A		1.0	A	
			SB	10.5	B		14.0	B	
			NB	13.6	B		15.9	C	
2	White Lk Rd at Carmer Rd	Un-Signalized	EB	0.0	A	A (1.8)	0.0	A	A (1.7)
			WB	1.0	A		0.5	A	
			NB	11.0	B		13.3	B	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

**TABLE 10: 2027 BACKGROUND CONDITION INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Method	Movement	AM Peak Period			PM Peak Period		
				Approach Delay	Approach LOS	Intersection LOS	Approach Delay	Approach LOS	Intersection LOS
1	White Lk Rd at Runyan Lk Rd	Un-Signalized	EB	0.0	A	A (3.6)	1.2	A	A (3.5)
			WB	1.6	A		1.0	A	
			SB	11.0	B		15.3	C	
			NB	14.5	B		17.3	C	
2	White Lk Rd at Carmer Rd	Un-Signalized	EB	0.0	A	A (1.8)	0.0	A	A (1.8)
			WB	1.0	A		0.5	A	
			NB	11.3	B		14.2	B	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

## 4. BUILD CONDITIONS

### 4.1. TRIP GENERATION

Trip generation is a measure or forecast of the number of trips that begin or end at the project site. The traffic generated is a function of the extent and type of development proposed for the site. These trips will result in some traffic increases on the streets where they occur. Vehicular traffic generation characteristics for developments are estimated based on established rates. These rates identify the probable traffic generation of various land uses-based studies of developments in comparable settings. The rates used in this analysis were determined based on rates contained in the *Trip Generation, 9th Edition, published by the Institute of Transportation Engineers (ITE) for ITE Code for Residential PUD 270*. As shown in **Table 11**, the Phase I of the PUD is expected to generate at the Runyan Lake Road access drive 5 IN / 18 OUT trips, during the AM Peak and 19 IN / 10 OUT trips during the PM Peak. As shown in **Table 12**, Phase II of the PUD is expected to generate at White Lake Road access drive 5 IN / 17 OUT trips during the AM Peak and 17 IN / 9 OUT trips during the PM Peak.

**TABLE 11: PHASE I PROJECT TRIP GENERATION**

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates (Adjacent street traffic unless highlighted)								Units	Expected	Total Generated Trips			Total Distribution of Generated Trips					
		Weekday	AM	PM	Pass-By	AM In	AM Out	PM In	PM Out			Daily	AM Hour	PM Hour	AM In	AM Out	Pass-By	PM In	PM Out	Pass-By
Residential PUD 270	DU	7.50	0.51	0.62		22%	78%	65%	35%	DU	46.0	345	23	29	5	18	0	19	10	0

**TABLE 12: PHASE II PROJECT TRIP GENERATION**

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates (peak hours are for peak hour of adjacent street traffic unless highlighted)								Units	Expected	Total Generated Trips			Total Distribution of Generated Trips					
		Weekday	AM	PM	Pass-By	AM In	AM Out	PM In	PM Out			Daily	AM Hour	PM Hour	AM In	AM Out	Pass-By	PM In	PM Out	Pass-By
Residential PUD 270	DU	7.50	0.51	0.62		22%	78%	65%	35%	DU	42.0	315	21	26	5	17	0	17	9	0

### 4.2. BUILD-OUT CONDITIONS TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution and assignment is the process of identifying the probable destinations, directions, and traffic routes that project related traffic will likely affect. The distribution of the projected trips due to the PUD was based on existing traffic patterns in the study area. The AM/PM peak hour traffic directionality in the study area varied and was applied to the trip distribution percentages using the site access points. The trips distribution reports can be found in **Appendix F**.

### 4.3. BUILD-OUT CONDITIONS INTERSECTION LEVEL OF SERVICE ANALYSIS

The results of the LOS analysis for year 2024 and 2027 Build-out Conditions are summarized in **Table 13** and **Table 14** and detailed calculations are provided in **Appendix E**. In years 2024 and 2027 with the addition of project trips, the key intersections are expected to operate similar to the 2024 and 2027 Background Conditions during the both the AM and PM peak hours periods.



**TABLE 13: 2022 BUILD-OUT CONDITION INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Method	Movement	AM Peak Period			PM Peak Period		
				Approach Delay	Approach LOS	Intersection LOS	Approach Delay	Approach LOS	Intersection LOS
1	White Lk Rd at Runyan Lk Rd	Un-Signalized	EB	1.1	A	A (3.9)	1.3	A	A (3.5)
			WB	1.5	A		0.9	A	
			SB	12.7	B		14.6	B	
			NB	13.6	B		16.1	C	
2	White Lk Rd at Carmer Rd	Un-Signalized	EB	0.0	A	A (1.7)	0.0	A	A (1.8)
			WB	1.0	A		0.5	A	
			NB	11.1	B		13.6	B	
4	Runyan Lk Rd at Phase 1 Dr	Un-Signalized	WB	9.6	A	A (1.0)	9.4	A	A (0.5)
			NB	0.0	A		0.0	A	
			SB	0.1	A		0.2	A	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

**TABLE 14: 2026 BUILD-OUT CONDITION INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Method	Movement	AM Peak Period			PM Peak Period		
				15.1	Approach LOS	Intersection LOS	Approach Delay	Approach LOS	Intersection LOS
1	White Lk Rd at Runyan Lk Rd	Un-Signalized	EB	1.1	A	A (4.1)	1.3	A	A (3.9)
			WB	1.5	A		1.0	A	
			SB	14.2	B		17.1	C	
			NB	14.7	B		17.8	C	
2	White Lk Rd at Carmer Rd	Un-Signalized	EB	0.0	A	A (1.8)	0.0	A	A (1.9)
			WB	1.0	A		0.5	A	
			NB	11.7	B		14.8	B	
3	Runyan Lk Rd at Phase 1 Dr	Un-Signalized	WB	9.8	A	A (1.0)	9.6	A	A (0.5)
			NB	0.0	A		0.0	A	
			SB	0.1	A		0.2	A	
4	White Lk Rd at Phase 2 Dr	Un-Signalized	EB	0.1	A	A (0.5)	0.3	A	A (0.3)
			WB	0.0	A		0.0	A	
			SB	10.2	B		12.5	B	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

## 5. CONCLUSIONS

C&A Engineers has reached the following conclusions regarding the proposed Lake Urban Crossing PUD located in the NE quadrant of the White Lake Road and Runyan Lake Road intersection, in Tyrone Township. The proposed PUD will be developed in two phases, Phase I (West Side) will comprise of 46 Units, constructed between the Spring of 2022 through the Spring of 2024. Phase II (East Side) will comprise of 42 Units, constructed between the Spring of 2025 through the Spring of 2027. Access to the Phase I of the PUD will be provided off of Runyan Lake Road north of the White Lake Road intersection. Access to Phase II will be provided off of White Lake Road just east of Carmer Road.

Based on the analysis presented in this assessment, the Phase I of the PUD is expected to generate at the Runyan Lake Road access drive 5 IN / 18 OUT trips, during the AM Peak and 19 IN / 10 OUT trips during the PM Peak. Phase II of the PUD is expected to generate at White Lake Road access drive 5 IN / 17 OUT trips during the AM Peak and 17 IN / 9 OUT trips during the PM Peak.



The capacity analysis indicates that Phase I and Phase II of the proposed PUD would have a negligible impact on the operations of the study area intersections and adjacent roadway segments. In year 2024 with the addition of traffic generated by the PUD, the key intersections analyzed are expected to continue to operate at similar LOS ratings as the 2021 Existing and 2024 Background conditions. In year 2027 with the addition of traffic generated by the project, the key intersections analyzed are expected to continue to operate at similar LOS ratings as the 2021 Existing and 2027 Background conditions.

Based on a review of the conservative analysis contained within this traffic impact study, the proposed PUD is not expected to have a noticeable impact on the traffic operations of the study area roadways and intersections. Based on these findings, and the recommendations listed below, it is concluded that the site is particularly well suited for proposed PUD.

# Technical Appendix



# **Appendix - A**

## **TRAFFIC DATA**



Date: 10-Nov-21  
 Location: White Lk Rd at Runyan Lk Rd  
 Time Interval: 7AM-9AM; 11AM-1PM

Time	Runyan Lk Rd			White Lk Rd			Runyan Lk Rd			White Lk Rd		
	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
6:45 - 7:00	7	4	1	3	9	3	6	3	3	5	39	8
7:00 - 7:15	7	4	1	3	11	3	6	3	3	10	72	14
7:15 - 7:30	5	4	1	4	12	4	7	3	4	11	85	16
7:30 - 7:45	8	5	2	3	13	4	8	4	3	12	92	18
7:45 - 8:00	10	6	2	5	11	3	12	6	3	12	91	18
8:00 - 8:15	14	7	2	4	19	6	15	6	2	8	66	13
8:15 - 8:30	9	6	2	4	24	7	10	2	2	8	58	11
8:30 - 8:45	16	2	2	5	26	7	10	4	2	6	48	9
8:45 - 9:00	14	8	2	6	30	9	12	5	4	5	38	8
10:45 - 11:00	9	4	3	6	85	8	13	5	4	3	20	4
11:00 - 11:15	7	6	1	8	16	5	9	3	4	3	24	5
11:15 - 11:30	10	9	2	11	17	7	9	2	6	4	28	6
11:30 - 11:45	12	9	3	8	22	7	12	3	5	4	30	6
11:45 - 12:00	12	8	3	10	16	6	18	4	6	5	30	7
12:00 - 12:15	10	8	2	9	27	9	16	2	8	5	35	6
12:15 - 12:30	12	4	2	5	38	10	20	2	9	4	32	5
12:30 - 12:45	10	4	3	5	41	11	21	5	7	5	37	8
12:45 - 13:00	12	3	2	7	39	6	26	4	8	5	36	7
14:45 - 15:00	14	6	2	5	23	6	3	2	2	4	30	6
15:00 - 15:15	12	5	2	11	19	7	3	3	1	4	32	6
15:15 - 15:30	12	7	2	6	29	8	3	2	3	5	37	7
15:30 - 15:45	15	7	3	12	26	9	5	0	4	5	40	8
15:45 - 16:00	16	4	3	11	28	9	5	3	3	6	46	9
16:00 - 16:15	15	5	4	9	43	13	4	2	3	4	37	7
16:15 - 16:30	13	5	2	6	55	15	5	2	4	6	42	8
16:30 - 16:45	10	6	2	9	57	16	4	3	5	6	46	9
16:45 - 17:00	10	7	1	9	43	13	4	4	4	7	48	9
17:00 - 17:15	14	6	2	9	52	15	2	2	2	7	53	10
17:15 - 17:30	16	7	3	10	62	17	3	4	1	8	62	12
17:30 - 17:45	14	9	3	12	75	9	3	4	1	9	66	13
17:45 - 18:00	15	4	5	7	62	9	3	2	2	7	55	10
18:00 - 18:15	12	2	4	7	69	7	4	5	2	6	50	8
18:15 - 18:30	12	2	4	6	83	8	5	2	6	7	56	11
18:30 - 18:45	10	4	3	7	79	9	5	4	5	8	60	12
18:45 - 19:00	10	3	1	5	73	7	4	4	6	7	55	11

A.M. Peak Hour (Midnight to Noon)

Time	Runyan Lk Rd			White Lk Rd			Runyan Lk Rd			White Lk Rd		
	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
7:15 - 7:30	5	4	1	4	12	4	7	3	4	11	85	16
7:30 - 7:45	8	5	2	3	13	4	8	4	3	12	92	18
7:45 - 8:00	10	6	2	5	11	3	12	6	3	12	91	18
8:00 - 8:15	14	7	2	4	19	6	15	6	2	8	66	13
<b>7:15 - 8:15</b>	<b>37</b>	<b>22</b>	<b>7</b>	<b>16</b>	<b>55</b>	<b>17</b>	<b>42</b>	<b>19</b>	<b>12</b>	<b>43</b>	<b>334</b>	<b>65</b>

Peak Hour Factor: 0.934

P.M. Peak Hour (Noon to Midnight)

Time	Runyan Lk Rd			White Lk Rd			Runyan Lk Rd			White Lk Rd		
	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
17:15 - 17:30	16	7	3	10	62	17	3	4	1	8	62	12
17:30 - 17:45	14	9	3	12	75	9	3	4	1	9	66	13
17:45 - 18:00	15	4	5	7	62	9	3	2	2	7	55	10
18:00 - 18:15	12	2	4	7	69	7	4	5	2	6	50	8
<b>17:15 - 18:15</b>	<b>57</b>	<b>22</b>	<b>15</b>	<b>36</b>	<b>268</b>	<b>42</b>	<b>13</b>	<b>15</b>	<b>6</b>	<b>30</b>	<b>233</b>	<b>43</b>

Peak Hour Factor: 0.894



Date: 10-Nov-21  
 Location: White Lk Rd at Carmer Rd  
 Time Interval: 7AM-9AM; 11AM-1PM

Time	Carmer Rd			White Lk Rd			Carmer Rd			White Lk Rd		
	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
6:45 - 7:00	0	0	0	0	22	4	1	0	2	1	7	0
7:00 - 7:15	0	0	0	0	27	2	0	0	1	3	9	0
7:15 - 7:30	0	0	0	0	30	2	2	0	3	3	9	0
7:30 - 7:45	0	0	0	0	34	3	1	0	3	4	12	0
7:45 - 8:00	0	0	0	0	51	7	2	0	4	8	24	0
8:00 - 8:15	0	0	0	0	45	5	4	0	7	11	32	0
8:15 - 8:30	0	0	0	0	40	4	4	0	7	14	39	0
8:30 - 8:45	0	0	0	0	36	8	7	0	8	9	31	0
8:45 - 9:00	0	0	0	0	31	6	5	0	7	13	35	0
10:45 - 11:00	0	0	0	0	34	3	5	0	8	4	21	0
11:00 - 11:15	0	0	0	0	32	3	7	0	11	8	23	0
11:15 - 11:30	0	0	0	0	35	6	5	0	7	5	18	0
11:30 - 11:45	0	0	0	0	41	4	8	0	8	10	27	0
11:45 - 12:00	0	0	0	0	39	6	8	0	10	9	27	0
12:00 - 12:15	0	0	0	0	42	5	6	0	9	13	38	0
12:15 - 12:30	0	0	0	0	36	7	5	0	7	15	42	0
12:30 - 12:45	0	0	0	0	32	5	7	0	8	17	54	0
12:45 - 13:00	0	0	0	0	48	3	7	0	6	11	37	0
14:45 - 15:00	0	0	0	0	49	5	4	0	7	7	45	0
15:00 - 15:15	0	0	0	0	40	6	4	0	6	10	51	0
15:15 - 15:30	0	0	0	0	37	6	5	0	6	7	49	0
15:30 - 15:45	0	0	0	0	47	2	6	0	5	9	49	0
15:45 - 16:00	0	0	0	0	53	5	6	0	4	9	61	0
16:00 - 16:15	0	0	0	0	56	4	4	0	5	11	64	0
16:15 - 16:30	0	0	0	0	65	3	5	0	8	12	60	0
16:30 - 16:45	0	0	0	0	59	4	5	0	8	11	58	0
16:45 - 17:00	0	0	0	0	67	4	6	0	9	11	71	0
17:00 - 17:15	0	0	0	0	78	5	4	0	9	9	63	0
17:15 - 17:30	0	0	0	0	65	5	5	0	7	8	57	0
17:30 - 17:45	0	0	0	0	76	4	7	0	9	9	64	0
17:45 - 18:00	0	0	0	0	71	4	4	0	8	18	72	0
18:00 - 18:15	0	0	0	0	74	5	4	0	7	10	50	0
18:15 - 18:30	0	0	0	0	62	4	3	0	6	14	57	0
18:30 - 18:45	0	0	0	0	45	3	4	0	4	11	44	0
18:45 - 19:00	0	0	0	0	36	2	4	0	4	12	40	0

A.M. Peak Hour (Midnight to Noon)

Time	Carmer Rd			White Lk Rd			Carmer Rd			White Lk Rd		
	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
8:00 - 8:15	0	0	0	0	45	5	4	0	7	11	32	0
8:15 - 8:30	0	0	0	0	40	4	4	0	7	14	39	0
8:30 - 8:45	0	0	0	0	36	8	7	0	8	9	31	0
8:45 - 9:00	0	0	0	0	31	6	5	0	7	13	35	0
<b>8:00 - 9:00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>152</b>	<b>23</b>	<b>20</b>	<b>0</b>	<b>29</b>	<b>47</b>	<b>137</b>	<b>0</b>

Peak Hour Factor: 0.944

P.M. Peak Hour (Noon to Midnight)

Time	Carmer Rd			White Lk Rd			Carmer Rd			White Lk Rd		
	SB Right	SB Thru	SB Left	WB Right	WB Thru	WB Left	NB Right	NB Thru	NB Left	EB Right	EB Thru	EB Left
17:00 - 17:15	0	0	0	0	78	5	4	0	9	9	63	0
17:15 - 17:30	0	0	0	0	65	5	5	0	7	8	57	0
17:30 - 17:45	0	0	0	0	76	4	7	0	9	9	64	0
17:45 - 18:00	0	0	0	0	71	4	4	0	8	18	72	0
<b>17:00 - 18:00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>290</b>	<b>18</b>	<b>20</b>	<b>0</b>	<b>33</b>	<b>44</b>	<b>256</b>	<b>0</b>

Peak Hour Factor: 0.934

# **Appendix - B**

## **CRASH DATA**

# Crash and Road Data

## Intersection

Within distance from intersection:

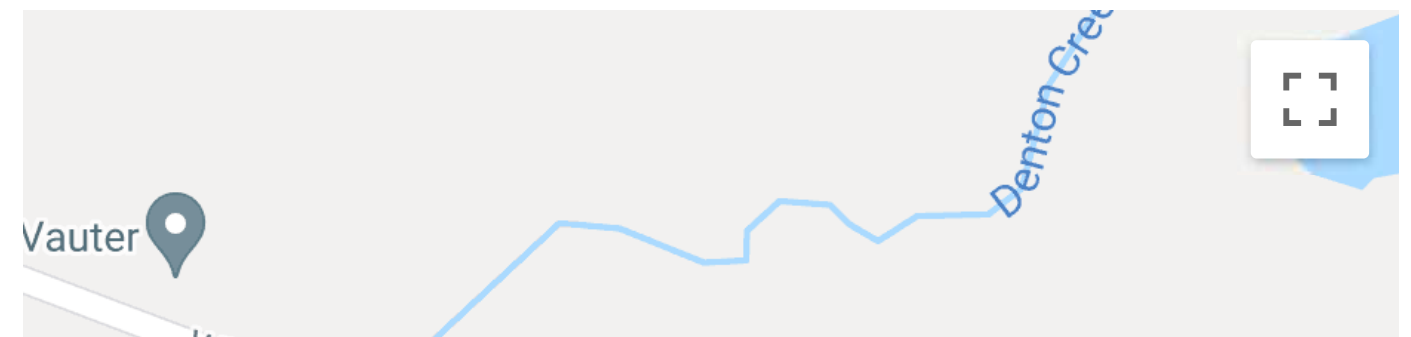
**White Lake Rd - Carmer Rd**  
**White Lake Rd - 931905 Mile 3.383**

**At:** Carmer Rd (937206 Mile 1.014)

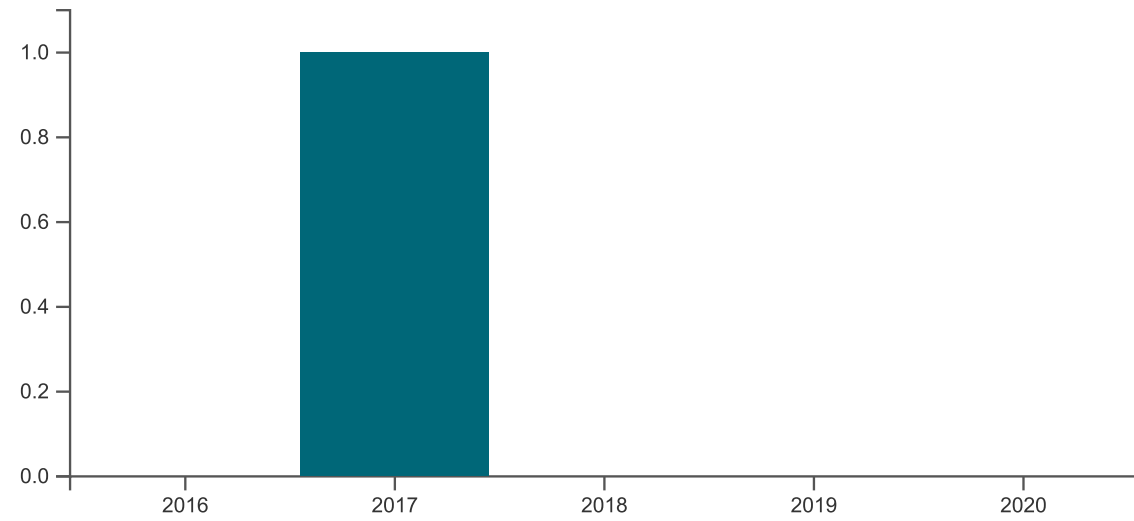
**Point ID:** 47000783

[VIEW DETAIL CRASH LIST](#)

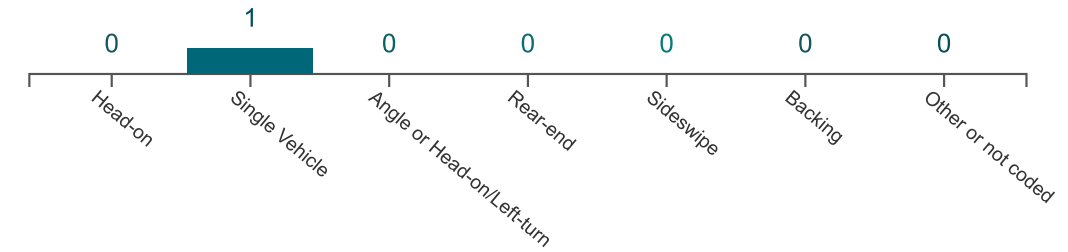
### Street View



## Crashes, 2016-2020



## Crashes by Type, 2016-2020



## Crash Type

Crash Type	2016	2017	2018	2019	2020	Percent of Crashes
Head On	0	0	0	0	0	0.0%
Single Vehicle	0	1	0	0	0	100.0%
Angle	0	0	0	0	0	0.0%
Head On/Left Turn	0	0	0	0	0	0.0%
Rear End	0	0	0	0	0	0.0%
Read End Left	0	0	0	0	0	0.0%
Rear End Right	0	0	0	0	0	0.0%
Total Crashes	0	1	0	0	0	100.0%

## Crash Severity

Crash Severity	2016	2017	2018	2019	2020	Percent of Crashes
Fatal	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0.0%
Other Injury	0	0	0	0	0	0.0%
Property Damage Only	0	1	0	0	0	100.0%
Total Crashes	0	1	0	0	0	100.0%



Crash Type	2016	2017	2018	2019	2020	Percent of Crashes
Sideswipe Opposite	0	0	0	0	0	0.0%
Sideswipe Same	0	0	0	0	0	0.0%
Backing	0	0	0	0	0	0.0%
Other/Unknown	0	0	0	0	0	0.0%
Total Crashes	0	1	0	0	0	100.0%

## Crash by Involvement

Crash by Involvement	2016	2017	2018	2019	2020	Percent of Crashes
Red-light Running	0	0	0	0	0	0.0%
Lane Departure	0	0	0	0	0	0.0%
Alcohol	0	0	0	0	0	0.0%
Drugs	0	0	0	0	0	0.0%
Deer	0	1	0	0	0	100.0%
Train	0	0	0	0	0	0.0%
Commercial Truck/Bus	0	0	0	0	0	0.0%
School Bus	0	0	0	0	0	0.0%
Emergency Vehicle	0	0	0	0	0	0.0%
Motorcycle	0	0	0	0	0	0.0%

<b>Crash by Involvement</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Percent of Crashes</b>
Intersection	0	0	0	0	0	0.0%
Work Zone	0	0	0	0	0	0.0%
Pedestrian	0	0	0	0	0	0.0%
Bicyclist	0	0	0	0	0	0.0%
Disctracted Driver	0	0	0	0	0	0.0%
Older Driver (65 and older)	0	0	0	0	0	0.0%
Young Driver (16 to 24)	0	0	0	0	0	0.0%

## Crash and Road Data

From:  To:   
Within distance from intersection:

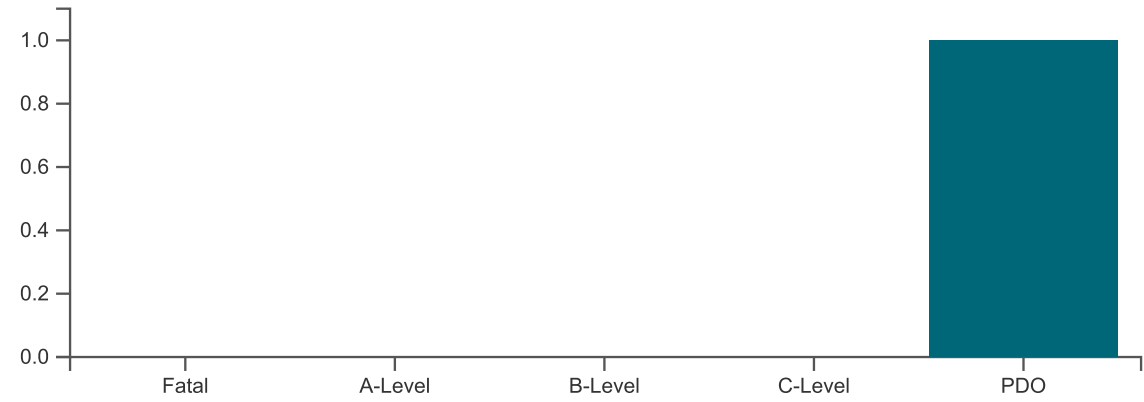
[DOWNLOAD RESULTS \(.CSV\)](#)

<b>Total Traffic Crashes:</b>	1
<b>Annual Crash Average:</b>	0
<b>Road:</b>	White Lake Rd 3.383
<b>Cross Road:</b>	Carmer Rd 1.014
<b>Point ID:</b>	47000783

### Street View



## Crashes by Severity



Crash By Severity	
Fatal	0
A-Level	0
B-Level	0
C-Level	0
Total ABC	0
PDO	1

Number Of Injuries	
Fatal	0
A-Level	0
B-Level	0
C-Level	0
Total ABC	0

Crashes By Type			
Uncoded	0	Rear-Left	0
Single Veh	1	Rear-Right	0
Head-On	0	Swipe-Same	0
Head-Left	0	Swipe-Opp	0
Angle	0	Backing	0
Rear-End	0	Other/Unknown	0

## Crash Details

**Search:**

ID	Road Name	Mile	PR	Date	DOW	Time	Severity	Type	Weather	Lighting	Road	Off	Units	Factor
<a href="#"><u>1096005</u></a>	White Lake Rd	3.355	931905	Jul 9, 2017	Sun	6pm	PDO	Single veh.	Clear	Dark	Dry	148	1	D

Showing 1 to 1 of 1 entries

1 - 1 of 1 « ‹ 1 › »

## Resources

[UD-10 Manual](#)

## Definition of Terms

### Severity

Fatal - a crash which resulted in at least one fatality

A-level - a crash in which the worst injury incurred was an A-level (serious) injury.

B-level - a crash in which the worst injury incurred was a B-level (minor) injury.

C-level - a crash in which the worst injury incurred was a C-level (possible) injury.

PDO - a crash which resulted in property damage only (no injuries).

### Crash Type:

Uncoded - crash type was coded improperly or not coded

Single veh. - a single vehicle crash

Head-on - a head-on crash

Head-left - a head-on/left-turn crash

Angle - an angle crash

Rear-end - a rear end crash

Rear-left - a rear-end/left-turn crash

Rear-right - a rear-end/right-turn crash

Swipe-same - a sideswipe/same direction crash

Swipe-opp. - a sideswipe/opposite direction crash

Backing - a backing up crash

Other - other or unknown crash type

### Factors:

A - alcohol involved in crash

B - bicycle involved in crash

L - lane departure involved in crash

M - motorcycle involved in crash

C - commercial truck involved in crash  
D - deer involved in crash  
E - EMS vehicle involved in crash  
F - elderly driver involved in crash  
G - drugs involved in crash  
H - distracted driver involved in crash  
I - intersection involved in crash

P - pedestrian involved in crash  
R - red light running involved in crash  
S - school bus involved in crash  
T - train involved in crash  
W - workzone involved in crash  
Y - young driver involved in crash

# Crash and Road Data

## Intersection

Within distance from intersection: 150 feet

White Lake Rd - Runyan Lake Rd

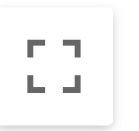
White Lake Rd - 931905 Mile 3.717

**At:** Runyan Lake Rd (937103 Mile 7.325)

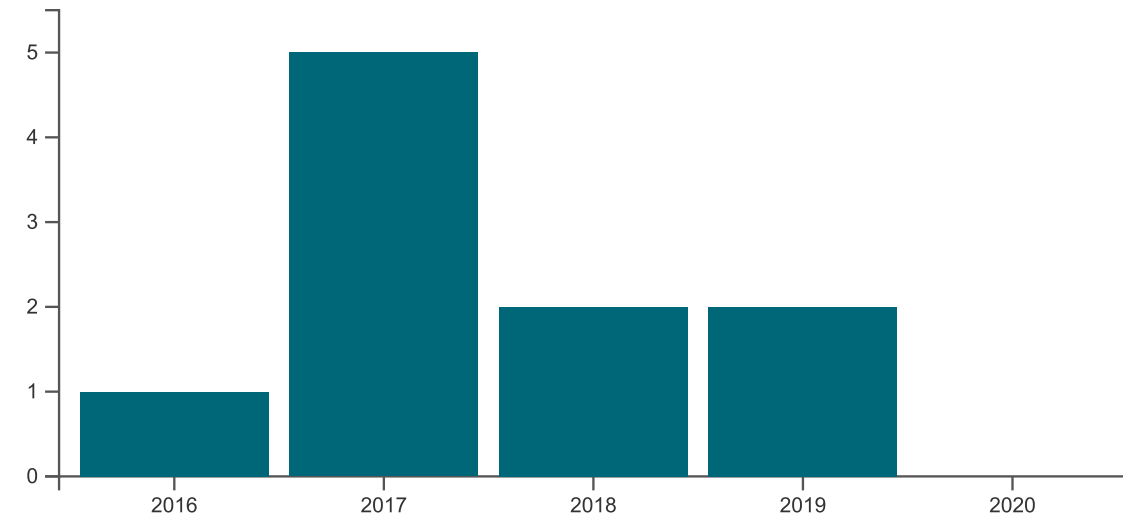
**Point ID:** 47000717

[VIEW DETAIL CRASH LIST](#)

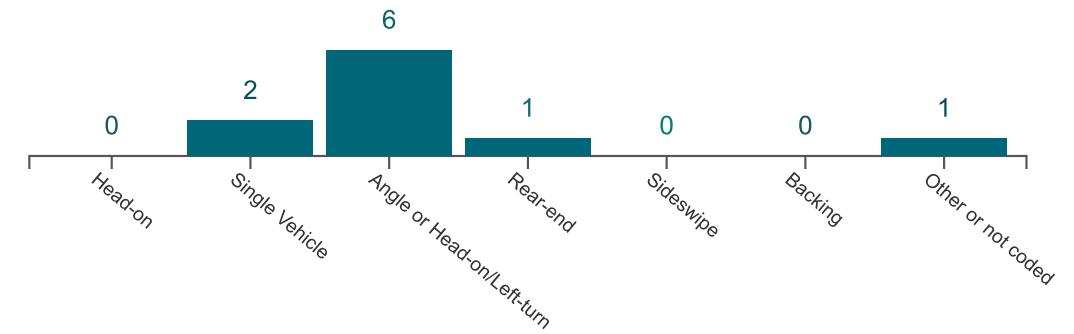
Street View



## Crashes, 2016-2020



## Crashes by Type, 2016-2020



## Crash Type

Crash Type	2016	2017	2018	2019	2020	Percent of Crashes
Head On	0	0	0	0	0	0.0%
Single Vehicle	1	1	0	0	0	20.0%
Angle	0	3	0	2	0	50.0%
Head On/Left Turn	0	1	0	0	0	10.0%
Rear End	0	0	1	0	0	10.0%
Read End Left	0	0	0	0	0	0.0%
Rear End Right	0	0	0	0	0	0.0%
Total Crashes	1	5	2	2	0	100.0%

## Crash Severity

Crash Severity	2016	2017	2018	2019	2020	Percent of Crashes
Fatal	0	0	0	1	0	10.0%
Serious Injury	0	0	0	0	0	0.0%
Other Injury	1	1	1	0	0	30.0%
Property Damage Only	0	4	1	1	0	60.0%
Total Crashes	1	5	2	2	0	100.0%



Crash Type	2016	2017	2018	2019	2020	Percent of Crashes
Sideswipe Opposite	0	0	0	0	0	0.0%
Sideswipe Same	0	0	0	0	0	0.0%
Backing	0	0	0	0	0	0.0%
Other/Unknown	0	0	1	0	0	10.0%
Total Crashes	1	5	2	2	0	100.0%

## Crash by Involvement

Crash by Involvement	2016	2017	2018	2019	2020	Percent of Crashes
Red-light Running	0	0	0	0	0	0.0%
Lane Departure	1	0	0	0	0	10.0%
Alcohol	0	0	0	1	0	10.0%
Drugs	0	0	0	0	0	0.0%
Deer	0	1	0	0	0	10.0%
Train	0	0	0	0	0	0.0%
Commercial Truck/Bus	0	1	0	0	0	10.0%
School Bus	0	1	0	0	0	10.0%
Emergency Vehicle	0	0	0	0	0	0.0%
Motorcycle	0	0	0	1	0	10.0%

<b>Crash by Involvement</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Percent of Crashes</b>
Intersection	0	4	2	2	0	80.0%
Work Zone	0	0	0	0	0	0.0%
Pedestrian	0	0	0	0	0	0.0%
Bicyclist	0	0	0	0	0	0.0%
Disctracted Driver	0	0	0	1	0	10.0%
Older Driver (65 and older)	0	1	1	0	0	20.0%
Young Driver (16 to 24)	1	1	2	2	0	60.0%

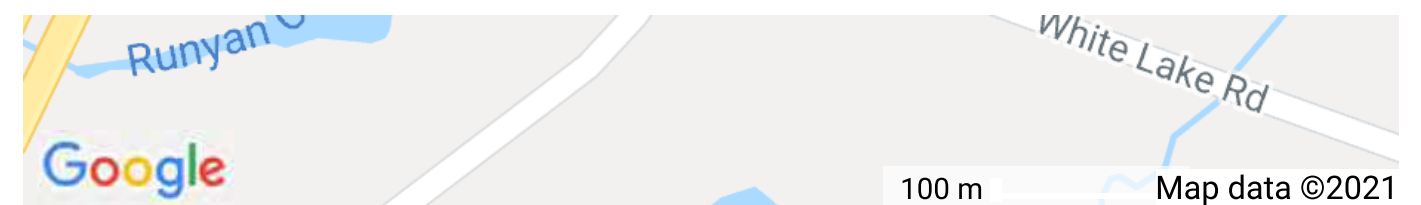
## Crash and Road Data

From:  To:   
Within distance from intersection:

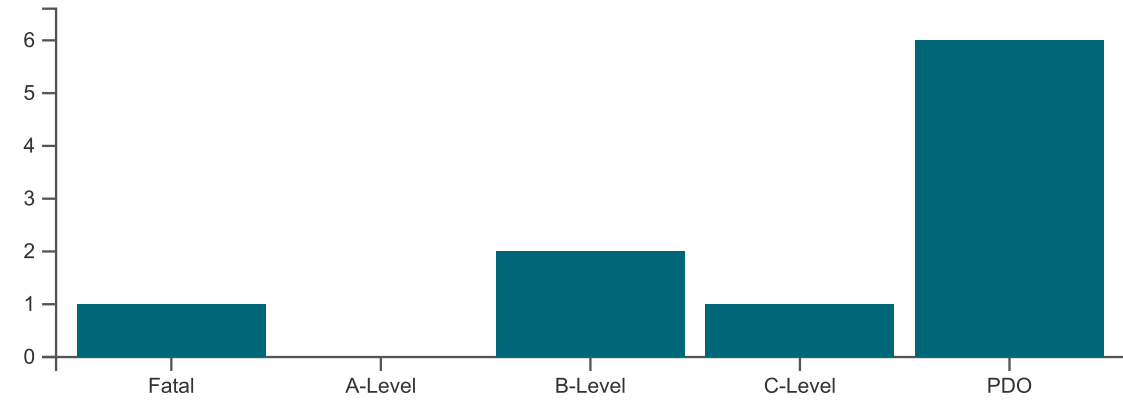
[DOWNLOAD RESULTS \(.CSV\)](#)

<b>Total Traffic Crashes:</b>	10
<b>Annual Crash Average:</b>	2
<b>Road:</b>	White Lake Rd 3.717
<b>Cross Road:</b>	Runyan Lake Rd 7.325
<b>Point ID:</b>	47000717

### Street View



## Crashes by Severity



Crash By Severity	
Fatal	1
A-Level	0
B-Level	2
C-Level	1
Total ABC	3
PDO	6

Number Of Injuries	
Fatal	1
A-Level	0
B-Level	2
C-Level	1
Total ABC	3

Crashes By Type			
Uncoded	0	Rear-Left	0
Single Veh	2	Rear-Right	0
Head-On	0	Swipe-Same	0
Head-Left	1	Swipe-Opp	0
Angle	5	Backing	0
Rear-End	1	Other/Unknown	1

## Crash Details

**Search:**

ID	Road Name	Mile	PR	Date	DOW	Time	Severity	Type	Weather	Lighting	Road	Off	Units	Factor
<a href="#"><u>1075918</u></a>	White Lake Rd	3.713	931905	Jul 6, 2017	Thu	5pm	B-level	Angle	Clear	Daylight	Dry	21	2	I
<a href="#"><u>1113983</u></a>	White Lake Rd	3.717	931905	Aug 18, 2017	Fri	11am	PDO	Angle	Cloudy	Daylight	Dry	0	2	F I Y
<a href="#"><u>1174943</u></a>	White Lake Rd	3.703	931905	Oct 28, 2017	Sat	7pm	PDO	Single veh.	Clear	Dark	Dry	74	1	D
<a href="#"><u>1496250</u></a>	Runyan Lake Rd	7.326	937103	Oct 11, 2018	Thu	3pm	PDO	Rear-end	Cloudy	Daylight	Dry	5	2	F I Y
<a href="#"><u>1560794</u></a>	White Lake Rd	3.708	931905	Dec 4, 2018	Tue	3pm	B-level	Other	Clear	Daylight	Dry	48	3	I Y
<a href="#"><u>1786048</u></a>	White Lake Rd	3.718	931905	Aug 15, 2019	Thu	4pm	PDO	Angle	Clear	Daylight	Dry	5	2	I Y
<a href="#"><u>1810341</u></a>	White Lake Rd	3.717	931905	Aug 3, 2019	Sat	6pm	Fatal	Angle	Clear	Daylight	Dry	0	2	A H I M Y
<a href="#"><u>9674608</u></a>	Runyan Lake Rd	7.311	937103	Apr 10, 2016	Sun	11am	C-level	Single veh.	Snow	Daylight	Icy	74	1	L Y
<a href="#"><u>9961197</u></a>	Runyan Lake Rd	7.326	937103	Feb 14, 2017	Tue	7am	PDO	Head-left	Clear	Dawn	Dry	5	2	I
<a href="#"><u>9966183</u></a>	Runyan Lake Rd	7.325	937103	Mar 2, 2017	Thu	8am	PDO	Angle	Clear	Daylight	Icy	0	2	C I S

Showing 1 to 10 of 10 entries

## Resources

[UD-10 Manual](#)

## Definition of Terms

## Severity

Fatal - a crash which resulted in at least one fatality

A-level - a crash in which the worst injury incurred was an A-level (serious) injury.

B-level - a crash in which the worst injury incurred was a B-level (minor) injury.

C-level - a crash in which the worst injury incurred was a C-level (possible) injury.

PDO - a crash which resulted in property damage only (no injuries).

## Crash Type:

Uncoded - crash type was coded improperly or not coded

Single veh. - a single vehicle crash

Head-on - a head-on crash

Head-left - a head-on/left-turn crash

Angle - an angle crash

Rear-end - a rear end crash

Rear-left - a rear-end/left-turn crash

Rear-right - a rear-end/right-turn crash

Swipe-same - a sideswipe/same direction crash

Swipe-opp. - a sideswipe/opposite direction crash

Backing - a backing up crash

Other - other or unknown crash type

## Factors:

A - alcohol involved in crash

B - bicycle involved in crash

C - commercial truck involved in crash

D - deer involved in crash

E - EMS vehicle involved in crash

F - elderly driver involved in crash

G - drugs involved in crash

H - distracted driver involved in crash

I - intersection involved in crash

L - lane departure involved in crash

M - motorcycle involved in crash

P - pedestrian involved in crash

R - red light running involved in crash

S - school bus involved in crash

T - train involved in crash

W - workzone involved in crash

Y - young driver involved in crash



# **Appendix - C**

## **EXISTING CONDITION**

## **SYNCHRO RESULTS**

Lake Urban Crossing  
3: Runyan Lk Rd & White Lake Rd

Existing Condition  
Timing Plan: AM Peak

Intersection										
Int Delay, s/veh	3.3									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Future Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	363	47	18	60	17	8	24	21	46

Major/Minor	Major1		Major2		Minor2		Minor1			
Conflicting Flow All	77	0	0	410	0	0	667	69	666	387
Stage 1	-	-	-	-	-	-	105	-	529	-
Stage 2	-	-	-	-	-	-	562	-	137	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.22	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	6.12	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	3.318	3.518	3.318
Pot Cap-1 Maneuver	1522	-	-	1149	-	-	372	994	373	661
Stage 1	-	-	-	-	-	-	901	-	533	-
Stage 2	-	-	-	-	-	-	512	-	866	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1522	-	-	1149	-	-	312	994	320	661
Mov Cap-2 Maneuver	-	-	-	-	-	-	312	-	320	-
Stage 1	-	-	-	-	-	-	846	-	500	-
Stage 2	-	-	-	-	-	-	429	-	793	-

Approach	EB		WB		SB		NE	
HCM Control Delay, s	1.1		1.6		10.2		12.8	
HCM LOS					B		B	

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	526	1522	-	-	1149	-	-	738
HCM Lane V/C Ratio	0.126	0.046	-	-	0.016	-	-	0.065
HCM Control Delay (s)	12.8	7.5	0	-	8.2	0	-	10.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.2



Lake Urban Crossing  
6: Carmer Rd & White Lake Rd

Existing Condition  
Timing Plan: AM Peak

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	137	47	23	152	29	20
Future Vol, veh/h	137	47	23	152	29	20
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, #	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	149	51	25	165	32	22

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	200	0	390
Stage 1	-	-	-	-	175
Stage 2	-	-	-	-	215
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1372	-	614
Stage 1	-	-	-	-	855
Stage 2	-	-	-	-	821
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1372	-	602
Mov Cap-2 Maneuver	-	-	-	-	602
Stage 1	-	-	-	-	855
Stage 2	-	-	-	-	805

Approach	EB	WB	NB
HCM Control Delay, s	0	1	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	688	-	-	1372	-
HCM Lane V/C Ratio	0.077	-	-	0.018	-
HCM Control Delay (s)	10.7	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lake Urban Crossing  
3: Runyan Lk Rd & White Lake Rd

Existing Condition  
Timing Plan: PM Peak

Intersection

Int Delay, s/veh 3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Future Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	48	262	34	47	301	40	17	25	17	15

Major/Minor	Major1	Major2	Minor2	Minor1
Conflicting Flow All	341	0	0	296
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1218	-	-	1265
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1218	-	-	1265
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.1	1	13	14.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	402	1218	-	-	1265	-	-	528
HCM Lane V/C Ratio	0.078	0.04	-	-	0.037	-	-	0.153
HCM Control Delay (s)	14.7	8.1	0	-	8	0	-	13
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-	-	0.5

Lake Urban Crossing  
6: Carmer Rd & White Lake Rd

Existing Condition  
Timing Plan: PM Peak

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	256	44	18	290	33	44
Future Vol, veh/h	256	44	18	290	33	44
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, #	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	278	48	20	315	36	48

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	326	0	657	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1234	-	430	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	710	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1234	-	421	738
Mov Cap-2 Maneuver	-	-	-	-	421	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	558	-	-	1234	-
HCM Lane V/C Ratio	0.15	-	-	0.016	-
HCM Control Delay (s)	12.6	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-



# **Appendix - D**

## **BACKGROUND CONDITIONS**

### **SYNCHRO RESULTS**

Lake Urban Crossing  
3: Runyan Lk Rd & White Lake Rd

2024 Background Condition  
Timing Plan: AM Peak

Intersection										
Int Delay, s/veh	3.5									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Future Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	77	396	51	20	65	19	8	26	23	50

Major/Minor	Major1		Major2		Minor2		Minor1			
Conflicting Flow All	84	0	0	447	0	0	727	75	726	422
Stage 1	-	-	-	-	-	-	115	-	576	-
Stage 2	-	-	-	-	-	-	612	-	150	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.22	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	6.12	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	3.318	3.518	3.318
Pot Cap-1 Maneuver	1513	-	-	1113	-	-	339	986	340	632
Stage 1	-	-	-	-	-	-	890	-	503	-
Stage 2	-	-	-	-	-	-	480	-	853	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1513	-	-	1113	-	-	277	986	285	632
Mov Cap-2 Maneuver	-	-	-	-	-	-	277	-	285	-
Stage 1	-	-	-	-	-	-	829	-	469	-
Stage 2	-	-	-	-	-	-	392	-	773	-

Approach	EB		WB		SB		NE	
HCM Control Delay, s	1.1		1.6		10.5		13.6	
HCM LOS					B		B	

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	493	1513	-	-	1113	-	-	701
HCM Lane V/C Ratio	0.147	0.051	-	-	0.018	-	-	0.074
HCM Control Delay (s)	13.6	7.5	0	-	8.3	0	-	10.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0.1	-	-	0.2

Lake Urban Crossing  
6: Carmer Rd & White Lake Rd

2024 Background Condition  
Timing Plan: AM Peak

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	137	47	23	152	29	20
Future Vol, veh/h	137	47	23	152	29	20
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, #	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	162	56	27	180	34	24

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	218	0	424
Stage 1	-	-	-	-	190
Stage 2	-	-	-	-	234
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1352	-	587
Stage 1	-	-	-	-	842
Stage 2	-	-	-	-	805
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1352	-	574
Mov Cap-2 Maneuver	-	-	-	-	574
Stage 1	-	-	-	-	842
Stage 2	-	-	-	-	787

Approach	EB	WB	NB
HCM Control Delay, s	0	1	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	662	-	-	1352	-
HCM Lane V/C Ratio	0.088	-	-	0.02	-
HCM Control Delay (s)	11	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lake Urban Crossing  
3: Runyan Lk Rd & White Lake Rd

2024 Background Condition  
Timing Plan: PM Peak

Intersection										
Int Delay, s/veh	3.3									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Future Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	285	37	51	328	44	18	27	18	16
Major/Minor	Major1	Major2		Minor2			Minor1			
Conflicting Flow All	372	0	0	322	0	0	879	350	911	304
Stage 1	-	-	-	-	-	-	452	-	410	-
Stage 2	-	-	-	-	-	-	427	-	501	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.22	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	6.12	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	3.318	3.518	3.318
Pot Cap-1 Maneuver	1186	-	-	1238	-	-	268	693	255	736
Stage 1	-	-	-	-	-	-	587	-	619	-
Stage 2	-	-	-	-	-	-	606	-	552	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1186	-	-	1238	-	-	228	693	194	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	228	-	194	-
Stage 1	-	-	-	-	-	-	555	-	585	-
Stage 2	-	-	-	-	-	-	542	-	447	-
Approach	EB	WB		SB			NE			
HCM Control Delay, s	1.1	1		14			15.9			
HCM LOS				B			C			
Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1		
Capacity (veh/h)	365	1186	-	-	1238	-	-	486		
HCM Lane V/C Ratio	0.094	0.044	-	-	0.042	-	-	0.181		
HCM Control Delay (s)	15.9	8.2	0	-	8	0	-	14		
HCM Lane LOS	C	A	A	-	A	A	-	B		
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-	-	0.7		

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	256	44	18	290	33	44
Future Vol, veh/h	256	44	18	290	33	44
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, #	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	303	52	21	344	39	52

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	355	0	715	329
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	386	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1204	-	397	712
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1204	-	388	712
Mov Cap-2 Maneuver	-	-	-	-	388	-
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	524	-	-	1204	-
HCM Lane V/C Ratio	0.174	-	-	0.018	-
HCM Control Delay (s)	13.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-



**Intersection**

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Future Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	84	432	56	22	71	21	9	28	25	54

Major/Minor	Major1	Major2	Minor2	Minor1
Conflicting Flow All	92	0	0	488
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1503	-	-	1075
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1503	-	-	1075
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.1	1.6	11	14.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	459	1503	-	-	1075	-	-	659
HCM Lane V/C Ratio	0.172	0.056	-	-	0.02	-	-	0.086
HCM Control Delay (s)	14.5	7.5	0	-	8.4	0	-	11
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-	-	0.3

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	137	47	23	152	29	20
Future Vol, veh/h	137	47	23	152	29	20
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, #	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	177	61	30	197	38	26

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	238	0	465
Stage 1	-	-	-	-	208
Stage 2	-	-	-	-	257
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1329	-	556
Stage 1	-	-	-	-	827
Stage 2	-	-	-	-	786
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1329	-	542
Mov Cap-2 Maneuver	-	-	-	-	542
Stage 1	-	-	-	-	827
Stage 2	-	-	-	-	766

Approach	EB	WB	NB
HCM Control Delay, s	0	1	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	632	-	-	1329	-
HCM Lane V/C Ratio	0.1	-	-	0.022	-
HCM Control Delay (s)	11.3	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection										
Int Delay, s/veh	3.5									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Future Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	312	40	56	358	48	20	29	20	17

Major/Minor	Major1		Major2		Minor2		Minor1			
Conflicting Flow All	406	0	0	352	0	0	959	382	993	332
Stage 1	-	-	-	-	-	-	494	-	446	-
Stage 2	-	-	-	-	-	-	465	-	547	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.22	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	6.12	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	3.318	3.518	3.318
Pot Cap-1 Maneuver	1153	-	-	1207	-	-	237	665	224	710
Stage 1	-	-	-	-	-	-	557	-	591	-
Stage 2	-	-	-	-	-	-	578	-	521	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1153	-	-	1207	-	-	196	665	163	710
Mov Cap-2 Maneuver	-	-	-	-	-	-	196	-	163	-
Stage 1	-	-	-	-	-	-	522	-	554	-
Stage 2	-	-	-	-	-	-	509	-	409	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.2	1	15.3	17.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	330	1153	-	-	1207	-	-	444
HCM Lane V/C Ratio	0.113	0.05	-	-	0.047	-	-	0.217
HCM Control Delay (s)	17.3	8.3	0	-	8.1	0	-	15.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-	-	0.8

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	256	44	18	290	33	44
Future Vol, veh/h	256	44	18	290	33	44
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, #	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	331	57	23	375	43	57

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	388	0	781
Stage 1	-	-	-	-	360
Stage 2	-	-	-	-	421
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1170	-	363
Stage 1	-	-	-	-	706
Stage 2	-	-	-	-	662
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1170	-	354
Mov Cap-2 Maneuver	-	-	-	-	354
Stage 1	-	-	-	-	706
Stage 2	-	-	-	-	645

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	489	-	-	1170	-
HCM Lane V/C Ratio	0.204	-	-	0.02	-
HCM Control Delay (s)	14.2	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-



# **Appendix - E**

## **BUILDOUT CONDITION**

### **SYNCHRO RESULTS**

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	100	0	0	66
Future Vol, veh/h	17	2	100	5	1	66
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	20	2	118	6	1	78

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	201	121	0	0	124	0
Stage 1	121	-	-	-	-	-
Stage 2	80	-	-	-	-	-
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	788	930	-	-	1463	-
Stage 1	904	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	787	930	-	-	1463	-
Mov Cap-2 Maneuver	787	-	-	-	-	-
Stage 1	904	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	800	1463
HCM Lane V/C Ratio	-	-	0.028	0.001
HCM Control Delay (s)	-	-	9.6	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Lake Urban Crossing  
3: Runyan Lk Rd & White Lk Rd

2024 Build Condition  
Timing Plan: AM Peak

Intersection										
Int Delay, s/veh	3.9									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Future Vol, veh/h	67	334	43	17	55	19	19	24	19	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	396	51	20	65	23	23	28	23	50

Major/Minor	Major1	Major2	Minor2	Minor1
Conflicting Flow All	88	0	0	447
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1508	-	-	1113
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1508	-	-	1113
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.1	1.5	12.7	13.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	490	1508	-	-	1113	-	-	536
HCM Lane V/C Ratio	0.147	0.053	-	-	0.018	-	-	0.13
HCM Control Delay (s)	13.6	7.5	0	-	8.3	0	-	12.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0.1	-	-	0.4

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	137	47	23	152	29	20
Future Vol, veh/h	146	50	23	154	30	20
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, #	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	173	59	27	182	36	24

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	232	0	439	203
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	236	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1336	-	575	838
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1336	-	562	838
Mov Cap-2 Maneuver	-	-	-	-	562	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	647	-	-	1336	-
HCM Lane V/C Ratio	0.092	-	-	0.02	-
HCM Control Delay (s)	11.1	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-



Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	0	94	0	94
Future Vol, veh/h	9	1	0	112	2	94
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	11	1	0	133	2	111

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	182	67	0	0	133	0
Stage 1	67	-	-	-	-	-
Stage 2	115	-	-	-	-	-
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	807	997	-	-	1452	-
Stage 1	956	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	806	997	-	-	1452	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	822	1452
HCM Lane V/C Ratio	-	-	0.014	0.002
HCM Control Delay (s)	-	-	9.4	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Lake Urban Crossing  
3: Runyan Lk Rd & White Lk Rd

2024 Build Condition  
Timing Plan: PM Peak

Intersection										
Int Delay, s/veh	3.5									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Future Vol, veh/h	51	233	30	42	268	45	19	23	16	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	276	36	50	318	53	23	27	19	15

Major/Minor	Major1		Major2		Minor2		Minor1			
Conflicting Flow All	371	0	0	312	0	0	876	345	908	294
Stage 1	-	-	-	-	-	-	445	-	414	-
Stage 2	-	-	-	-	-	-	431	-	494	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.22	7.12	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	6.12	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	6.12	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	3.318	3.518	3.318
Pot Cap-1 Maneuver	1188	-	-	1248	-	-	269	698	256	745
Stage 1	-	-	-	-	-	-	592	-	616	-
Stage 2	-	-	-	-	-	-	603	-	557	-
Platoon blocked, %		-	-		-	-				
Mov Cap-1 Maneuver	1188	-	-	1248	-	-	228	698	194	745
Mov Cap-2 Maneuver	-	-	-	-	-	-	228	-	194	-
Stage 1	-	-	-	-	-	-	556	-	578	-
Stage 2	-	-	-	-	-	-	536	-	450	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.3	0.9	14.6	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	359	1188	-	-	1248	-	-	469
HCM Lane V/C Ratio	0.096	0.051	-	-	0.04	-	-	0.202
HCM Control Delay (s)	16.1	8.2	0	-	8	0	-	14.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0.1	-	-	0.7

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	256	44	18	290	33	44
Future Vol, veh/h	259	45	18	297	35	44
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, #	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	307	53	21	352	41	52

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	360	0	728
Stage 1	-	-	-	-	334
Stage 2	-	-	-	-	394
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1199	-	390
Stage 1	-	-	-	-	725
Stage 2	-	-	-	-	681
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1199	-	381
Mov Cap-2 Maneuver	-	-	-	-	381
Stage 1	-	-	-	-	725
Stage 2	-	-	-	-	666

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	513	-	-	1199	-
HCM Lane V/C Ratio	0.182	-	-	0.018	-
HCM Control Delay (s)	13.6	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

**Intersection**

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Future Vol, veh/h	65	334	43	17	55	16	7	22	19	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	84	432	56	22	71	21	9	28	25	54

Major/Minor	Major1	Major2	Minor2	Minor1
Conflicting Flow All	92	0	0	488
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1503	-	-	1075
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1503	-	-	1075
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.1	1.6	11	14.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	459	1503	-	-	1075	-	-	659
HCM Lane V/C Ratio	0.172	0.056	-	-	0.02	-	-	0.086
HCM Control Delay (s)	14.5	7.5	0	-	8.4	0	-	11
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-	-	0.3

Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	137	47	23	152	29	20
Future Vol, veh/h	137	47	23	152	29	20
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, #	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	177	61	30	197	38	26

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	238	0	465 208
Stage 1	-	-	-	-	208 -
Stage 2	-	-	-	-	257 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1329	-	556 832
Stage 1	-	-	-	-	827 -
Stage 2	-	-	-	-	786 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1329	-	542 832
Mov Cap-2 Maneuver	-	-	-	-	542 -
Stage 1	-	-	-	-	827 -
Stage 2	-	-	-	-	766 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	632	-	-	1329	-
HCM Lane V/C Ratio	0.1	-	-	0.022	-
HCM Control Delay (s)	11.3	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection										
Int Delay, s/veh	3.5									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL	NER
Lane Configurations		↕			↕		↕		↕	
Traffic Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Future Vol, veh/h	43	233	30	42	268	36	15	22	15	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	312	40	56	358	48	20	29	20	17

Major/Minor	Major1	Major2	Minor2	Minor1
Conflicting Flow All	406	0	0	352
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1153	-	-	1207
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1153	-	-	1207
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	SB	NE
HCM Control Delay, s	1.2	1	15.3	17.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	330	1153	-	-	1207	-	-	444
HCM Lane V/C Ratio	0.113	0.05	-	-	0.047	-	-	0.217
HCM Control Delay (s)	17.3	8.3	0	-	8.1	0	-	15.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-	-	0.8


Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	256	44	18	290	33	44
Future Vol, veh/h	256	44	18	290	33	44
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, #	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	331	57	23	375	43	57

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	388	0	781 360
Stage 1	-	-	-	-	360 -
Stage 2	-	-	-	-	421 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1170	-	363 684
Stage 1	-	-	-	-	706 -
Stage 2	-	-	-	-	662 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1170	-	354 684
Mov Cap-2 Maneuver	-	-	-	-	354 -
Stage 1	-	-	-	-	706 -
Stage 2	-	-	-	-	645 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	489	-	-	1170	-
HCM Lane V/C Ratio	0.204	-	-	0.02	-
HCM Control Delay (s)	14.2	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-





**Appendix – F**  
**TRIP GENERATION, DISTRIBUTION**  
**AND**  
**ASSIGNMENT**

**Development: phase 1**

**Driveway: 1      Driveway 1 (Node 11)**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Origin 1 (Node 8) to Driveway 1 (Node 11)	10.00	1	10.00	2
2	Origin 2 (Node 4) to Driveway 1 (Node 11)	32.57	2	14.07	3
3	Origin 3 (Node 1) to Driveway 1 (Node 11)	6.60	0	8.37	2
4	Origin 4 (Node 7) to Driveway 1 (Node 11)	10.07	1	17.87	3
5	Origin 5 (Node 5) to Driveway 1 (Node 11)	40.76	2	49.70	9

**Development: Phase 1**

**Driveway: 1      Driveway 1 (Node 11)**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Origin 1 (Node 8) to Driveway 1 (Node 11)	10.00	2	10.00	1
2	Origin 2 (Node 4) to Driveway 1 (Node 11)	40.78	8	43.48	4
3	Origin 3 (Node 1) to Driveway 1 (Node 11)	3.76	1	5.20	1
4	Origin 4 (Node 7) to Driveway 1 (Node 11)	8.27	2	10.40	1
5	Origin 5 (Node 5) to Driveway 1 (Node 11)	37.19	7	30.92	3

**Development: phase 1**

**Driveway: 1      Driveway 1 (Node 11)**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Origin 1 (Node 8) to Driveway 1 (Node 11)	10.00	1	10.00	2
2	Origin 2 (Node 4) to Driveway 1 (Node 11)	32.57	2	14.07	3
3	Origin 3 (Node 1) to Driveway 1 (Node 11)	6.60	0	8.37	2
4	Origin 4 (Node 7) to Driveway 1 (Node 11)	10.07	1	17.87	3
5	Origin 5 (Node 5) to Driveway 1 (Node 11)	40.76	2	49.70	9

**Development: Phase 2**

**Driveway: 1      Driveway 1 (Node 10)**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Origin 1 (Node 8) to Driveway 1 (Node 10)	14.29	1	11.28	2
2	Origin 2 (Node 4) to Driveway 1 (Node 10)	42.29	2	38.21	6
3	Origin 3 (Node 1) to Driveway 1 (Node 10)	9.09	0	8.72	1
4	Origin 4 (Node 7) to Driveway 1 (Node 10)	4.33	0	11.79	2
5	Origin 5 (Node 5) to Driveway 1 (Node 10)	30.00	2	30.00	5

**Development: Phase 1**

**Driveway: 1      Driveway 1 (Node 11)**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Origin 1 (Node 8) to Driveway 1 (Node 11)	10.00	2	10.00	1
2	Origin 2 (Node 4) to Driveway 1 (Node 11)	40.78	8	43.48	4
3	Origin 3 (Node 1) to Driveway 1 (Node 11)	3.76	1	5.20	1
4	Origin 4 (Node 7) to Driveway 1 (Node 11)	8.27	2	10.40	1
5	Origin 5 (Node 5) to Driveway 1 (Node 11)	37.19	7	30.92	3

**Development: Phase 2**

**Driveway: 1      Driveway 1 (Node 10)**

Origin #	Route	To		From	
		Distribution %	Trips	Distribution %	Trips
1	Origin 1 (Node 8) to Driveway 1 (Node 10)	14.48	2	10.00	1
2	Origin 2 (Node 4) to Driveway 1 (Node 10)	40.68	7	41.71	4
3	Origin 3 (Node 1) to Driveway 1 (Node 10)	3.39	1	12.80	1
4	Origin 4 (Node 7) to Driveway 1 (Node 10)	11.46	2	5.49	0
5	Origin 5 (Node 5) to Driveway 1 (Node 10)	30.00	5	30.00	3

**TYRONE TOWNSHIP PLANNING COMMISSION  
REGULAR MEETING & PUBLIC HEARING SYNOPSIS  
August 10, 2021 7:00 p.m.**

**Note: This meeting was held at the Tyrone Township Hall  
Note: This meeting was recessed at 7:30 pm for a public hearing**

**PRESENT:** Kurt Schulze, Jon Ward, Dan Stickel, and Rich Erickson

**ABSENT:** Perry Green, Steve Krause, and Bill Wood

**OTHERS PRESENT:** Ross Nicholson

**CALL TO ORDER:** The meeting was called to order at 7:05 pm by Chairman Stickel.

**PLEDGE OF ALLEGIANCE:**

**CALL TO THE PUBLIC:** Chairman Stickel asked if there were any public comments not relating to an item on the agenda. Several public comments were received.

**APPROVAL OF THE AGENDA:** Approved as presented.

**APPROVAL OF THE MINUTES:**

- 1) 04/13/2021 Regular Meeting Minutes: Approved as presented.
- 2) 05/11/2021 Regular Meeting Minutes: Approved as presented.

**OLD BUSINESS:**

- 1) **Lake Urban Crossing Preliminary PUD:** The Planning Commission brought up the application documents and latest site plan up on the overhead screens. The applicant and authorized agent provided the Planning Commission and public in attendance with an overview and summary of their proposal. The Planning Commission briefly discussed the application. Chairman Stickel recessed the regular meeting and held a public hearing beginning at 7:31 pm to receive public comments regarding the proposed preliminary Planned Unit Development application. Public comments were received regarding concerns about potential impacts to property values, wildlife/environment, traffic, road conditions, stormwater runoff, loss of rural character, expansion of the public sanitary sewer system, etc... The public hearing was closed at 8:54 pm. Chairman Stickel resumed the regular meeting. No action was taken.

**NEW BUSINESS:**

- 1) **Vale Royal Barn Special Land Use Amendment:** The item was deferred.

**CALL TO THE PUBLIC:** Several public comments were received.

**MISCELLANEOUS BUSINESS:**

**ADJOURNMENT:** The meeting was adjourned at 9:04 by Chairman Stickel.

**TYRONE TOWNSHIP PLANNING COMMISSION  
REGULAR MEETING SYNOPSIS**

**November 30, 2021 7:00 p.m.**

**Note: This meeting was held at the Tyrone Township Hall  
And via remote access (Zoom)**

**PRESENT:** Kurt Schulze, Rich Erickson, Steve Krause, Garrett Ladd, and Chet Shultz

**ABSENT:** Jon Ward (present via Zoom) and Bill Wood

**OTHERS PRESENT:** Ross Nicholson and Zach Michels

**CALL TO ORDER:** The meeting was called to order at 7:00 by Chairman Erickson.

**PLEDGE OF ALLEGIANCE:**

**CALL TO THE PUBLIC:** The Planning Commission heard several questions and comments from members of the public.

**APPROVAL OF THE AGENDA:** Approved as presented.

**APPROVAL OF THE MINUTES:**

1) **06/08/2021 Regular Meeting Minutes:** Approved as presented.

2) **07/13/2021 Regular Meeting and Public Hearing Minutes:** Approved as presented.

**OLD BUSINESS:**

- 1) **Lake Urban Crossing Preliminary PUD Plan:** Zach Michels read through the latest review letter he had prepared for the application. The Planning Commission discussed the application. The Planning Commission recommended Township Board approval of the preliminary PUD plan with conditions.
  
- 2) **Master Plan Discussion:** Zach Michels read through and elaborated on a document he had prepared designed to outline the master planning process and aid the Planning Commission. The Planning Commission discussed and provided direction to Zach Michels. It was determined that Master Plan discussion will be included on each regular meeting agenda moving forward until the process has been completed.

**NEW BUSINESS:**

- 1) **Niemi Shared Private Driveway:** Zach Michels read through the latest review letter he had prepared for the application. The Planning Commission discussed the application. The Planning Commission provided direction to the applicant. The Planning Commission recommended scheduling the public hearing for the application. No action was taken.



**CALL TO THE PUBLIC:** The Planning Commission heard several questions and comments from members of the public.

**MISCELLANEOUS BUSINESS:** Zach Michels took a few moments to touch on several topics discussed earlier in the meeting.

**ADJOURNMENT:** The meeting was adjourned at 9:33 by Chairman Erickson.