



## STATION FLATS JSP 23-02

### JSP23-02 STATION FLATS

Public hearing at the request of Cypress Partners, LLC for recommendation to the City Council for Amendment of the Consent Judgment that governs development of the property. The subject property is located on the east side of Wixom Road, south of Grand River Avenue (Section 17). The applicant is proposing 157 apartment units in a four-story building. The Consent Judgment permits retail uses conforming to the B-2 Community Business standards. The proposed use is most consistent with the RM-2 High-Density Multiple Family Residential District.

### Required Action

Recommend approval/denial, or postpone the Concept Plan and Amendment to the Consent Judgment to the City Council.

REVIEW	RESULT	DATE	COMMENTS
Planning	<b>Approval Not recommended</b>	6-12-23	<p><b>Deviations to RM-2 standards:</b></p> <ul style="list-style-type: none"> <li>• <b>Reduction in parking setbacks along the north and west for the out-lots</b> <i>(Supported as adjacent to other parking areas of center)</i></li> <li>• <b>Maximum percentage of efficiency and 1-bedroom units exceeded.</b> <i>(Supported as a balance in unit mix is provided)</i></li> <li>• <b>Maximum length of building exceeds 360 feet (368 feet proposed)</b> <i>(Supported as pedestrian entrances present)</i></li> <li>• <b>Buildings not oriented 45 degrees to property lines</b> <i>(Supported due to buildable area available)</i></li> <li>• <b>Exceeding 30% paved areas in required yard setbacks</b> <i>(Supported due to buildable area available)</i></li> <li>• <b>Lack of 5-foot sidewalk along access drives</b> <i>(Supported as access drive is existing and site constraints)</i></li> <li>• <b>Entranceway signage exceed maximum area allowed by sign code</b></li> <li>• Items to be addressed on the Preliminary Site Plan submittal</li> </ul>
Engineering	Approval recommended	5-26-23	<ul style="list-style-type: none"> <li>• Items to be addressed on the Preliminary Site Plan submittal</li> </ul>
Landscaping	<b>Approval Not recommended</b>	5-22-23	<ul style="list-style-type: none"> <li>• <b>Lack of screening berm between commercial and residential uses</b> <i>(Not supported by staff unless additional screening is provided)</i></li> </ul>

			<ul style="list-style-type: none"> <li>• <b>Two bays of parking greater than 15 spaces without a landscaped island</b> <i>(Not supported by staff)</i></li> <li>• <b>Insufficient area provided for tree health</b> <i>(Not supported by staff)</i></li> <li>• Items to be addressed on the Preliminary Site Plan submittal</li> </ul>
Traffic	<b>Approval Not recommended</b>	5-26-23	<ul style="list-style-type: none"> <li>• <b>Deficiency of 68 parking spaces (315 required, 247 proposed)</b> <i>(Not supported at this time - Parking analysis required to justify reduction.)</i></li> <li>• Confirmation of overall parking count for existing and proposed uses, and for specifics required in Consent Judgment with the next plan submittal.</li> <li>• <b>Off-street parking less than 25 feet from the building, and less than 20 feet from the property line</b> <i>(Supported)</i></li> <li>• <b>Reduced width of maneuvering aisle</b> <i>(Not supported)</i></li> <li>• Items to be addressed on the Preliminary Site Plan submittal</li> </ul>
Wetland	Approval recommended	5-24-23	<ul style="list-style-type: none"> <li>• <b>City of Novi Wetland buffer authorization required</b></li> <li>• Items to be addressed on the Preliminary Site Plan submittal</li> </ul>
Woodland	<b>Approval Not recommended</b>	5-23-23	<ul style="list-style-type: none"> <li>• <b>City of Novi Woodland permit required for removal of woodland replacement trees.</b></li> <li>• Items to be addressed on the Preliminary Site Plan submittal</li> </ul>
Façade	<b>Approval Not recommended</b>	5-22-23	<ul style="list-style-type: none"> <li>• <b>Section 9 Façade waiver for wood siding (0% permitted, up to 34% proposed)</b> <i>(Not supported as design does not qualify for use of material. Applicant is advised to consider alternate materials or reduce the amount)</i></li> </ul>
Fire	Approved with conditions	5-17-23	<ul style="list-style-type: none"> <li>• Items to be addressed in the Preliminary Site Plan submittal</li> </ul>

## **Motion Sheet**

### **Postpone – Amendment of Consent Judgement and Concept Plan**

In the matter of JSP23-02 Station Flats, motion to **postpone making a recommendation** of the proposed Amendment to the Consent Judgment and Concept Plan... *(in order to allow the applicant time to further review items discussed during the public hearing, provide a parking analysis to justify the reduction in parking spaces, and to work toward greater compliance with the requirements of the Zoning Ordinance.)*

**-OR-**

### **Recommend Denial – Amendment of Consent Judgement and Concept Plan**

In the matter of JSP23-02 Station Flats, motion to **recommend denial** of the proposed Amendment to the Consent Judgment and Concept Plan for the following reasons:

1. *The proposed use is not consistent with the City's Master Plan for Land Use and the Consent Judgment for the property.*
2. *The proposed development is not consistent with the requirements of the Zoning Ordinance for multiple-family developments as evident by the number of deviations and variances indicated in the staff and consultant's review letters.*
3. *Future residents would not be adequately buffered from adjacent commercial uses. The proposed use is generally inconsistent with existing surrounding development in terms of building relationships, access, and parking locations.*
4. *(Add any additional reasons...)*

**-OR-**

### **Recommend Approval – Amendment of Consent Judgement and Concept Plan**

In the matter of JSP23-02 Station Flats, motion to **recommend approval** of the proposed Amendment to the Consent Judgment and Concept Plan based on the following findings, City Council deviations, and conditions:

1. *The proposed amendment to the Consent Judgement will replace 100,000 square feet of retail development potential with 157 residential units. [The estimated number of daily vehicle trips is 717 for the 157 multiple family units, which is significantly less than the estimated number of trips for a retail use (shopping plaza: 9,109 daily trips; Supermarket: 8,878 daily trips). Therefore, the proposed change will have less impact on the road network compared to the use permitted by the current Consent Judgment.]*
2. *The proposed buildings are buffered by landscaping and preserved wetland areas on the east and south, and set back from Wixom Road on the east.*
3. *The proposed development could help provide for missing middle housing needs that are walkable to the commercial areas, which is recommended in the City's 2016 Master Plan for Land Use.*
4. *Per Sec. 3.8.3, the Planning Commission finds that a proper relationship exists between local streets and any proposed service roads, driveways and parking areas to encourage pedestrian and vehicular traffic safety.*

5. *The proposed Concept Plan would require the following amendments to current conditions of the Consent Judgment:*
  - a. Gross Building Area – Retail (Item 12, A, Consent Judgment): Per the Consent Judgment, Retail “B,” which is proposed to be located on the subject property, shall not exceed 100,000 square feet in total square footage. The proposed development is estimated to be 183,300 square feet, with no more than 157 multiple-family residential units.
  - b. Parking (Item 12, E, Consent Judgment): Per the Consent Judgment, a total of 1,725 parking spaces shall be provided between Retail A, B, and C. A revised total of 1,470 spaces are proposed for Retail A and C, and the proposed residential use. Applicant is asked to provide an overall parking count for the entire site at the time of the next submittal to ensure that there will be sufficient parking for the proposed and remaining uses, and to verify the proposed changes to the Consent Judgment.
6. The proposed Concept plan will require City Council to approve deviations for the following:
  - a. Deviation from Sec. 3.1.7.D and Sec. 3.6.2.B to permit a reduction in parking setbacks along the north side property line for the out-lots (20 feet required, 10 feet proposed) and the western front property line (75 feet required, 45 feet proposed).
  - b. Deviation from Sec. 3.8.1.B.ii for exceeding the maximum percentage of efficiency (10% permitted, 15.3% proposed) and one-bedroom units (33% permitted, 42.6% proposed).
  - c. Deviation from Sec. 3.8.2.C for exceeding the maximum building length of 180 feet, and 360 feet, (368 feet proposed) as the building includes common areas with capacity of at least 50 people and the building is set back an additional 125 feet from a property line abutting residential (the building is greater than 500 feet from any abutting residential district).
  - d. Deviation from Sec. 3.8.2.D to allow the building to not be oriented 45 degrees to the property lines, due to the available area for construction and constraints of the property;
  - e. Deviation from Sec. 3.8.2.E to allow off-street parking, maneuvering lanes, service drives and loading areas to exceed 30% of the required yard area (48% proposed), due to the available area for construction and constraints of the property, with the condition that required landscaping and usable open space is able to be provided;
  - f. Deviation from Sec. 3.8.2.F for parking closer than 25 feet (17 feet proposed) to a wall of a dwelling structure that contains openings involving living areas and closer than 20 feet (10 feet proposed) from a property line, due to the unique location of the development within a retail shopping area;
  - g. Deviation from Sec. 3.8.2.G for the absence of a 5-foot sidewalk along the existing access drive to the Wixom Road sidewalk, as the previously approved

design of the shopping center did not include room for a sidewalk to be provided;

- h. Deviation from Sec. 5.2.12.A for a deficiency of 68 parking spaces (315 required, 247 provided), provided that the applicant submits a parking analysis that demonstrates the parking is adequate for the anticipated need. The parking analysis will need to be reviewed and approved by the City's Traffic Consultant.
- i. Deviation from Sec. 5.3.2 for a reduction in the minimum drive aisle width (24 feet required, 22 feet proposed) in the out-lot parking areas, only if alternative layouts cannot be accommodated and fire access is not impeded.
- j. Landscape deviation from Sec. 5.5.3.B.ii and iii for lack of screening berm between commercial and residential use on the north side.
- k. Landscape deviation from Sec. 5.5.3.C for two bays of parking greater than 15 spaces without a landscaped island.
- l. Deviation from City Code Section 28.3 for a proposed entranceway sign to permit a larger sign area than allowed (24 square feet permitted, 115 square feet proposed).
- m. The findings of compliance with Ordinance standards in the staff and consultant review letters and the conditions and the items listed in those letters being addressed on the Preliminary Site Plan; and
- n. *(additional comments here if any)*

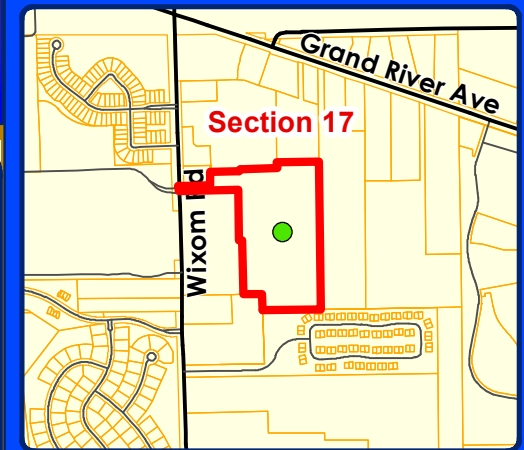
*(because the plan is otherwise in compliance with Article 3, Article 4 and Article 5 of the Zoning Ordinance and all other applicable provisions of the Ordinance.)*

**MAPS**  
**Location**  
**Zoning**  
**Future Land Use**  
**Natural Features**


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# JSP21-51 STATION FLATS

## LOCATION



**LEGEND**


 Subject Property



**City of Novi**  
Dept. of Community Development  
City Hall / Civic Center  
45175 W Ten Mile Rd  
Novi, MI 48375  
cityofnovi.org

Map Author: Christian Carroll  
Date: 6/15/22  
Project: JSP21-51 STATION FLATS  
Version #: 1

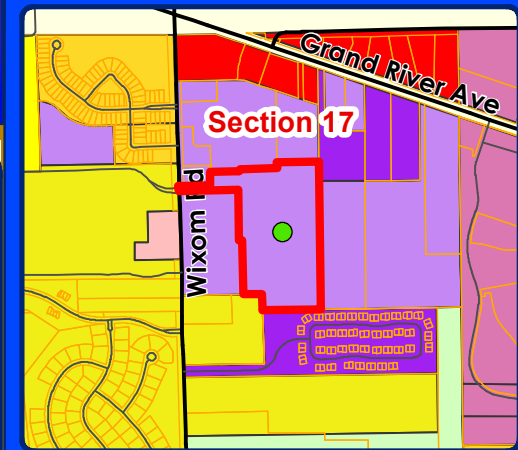
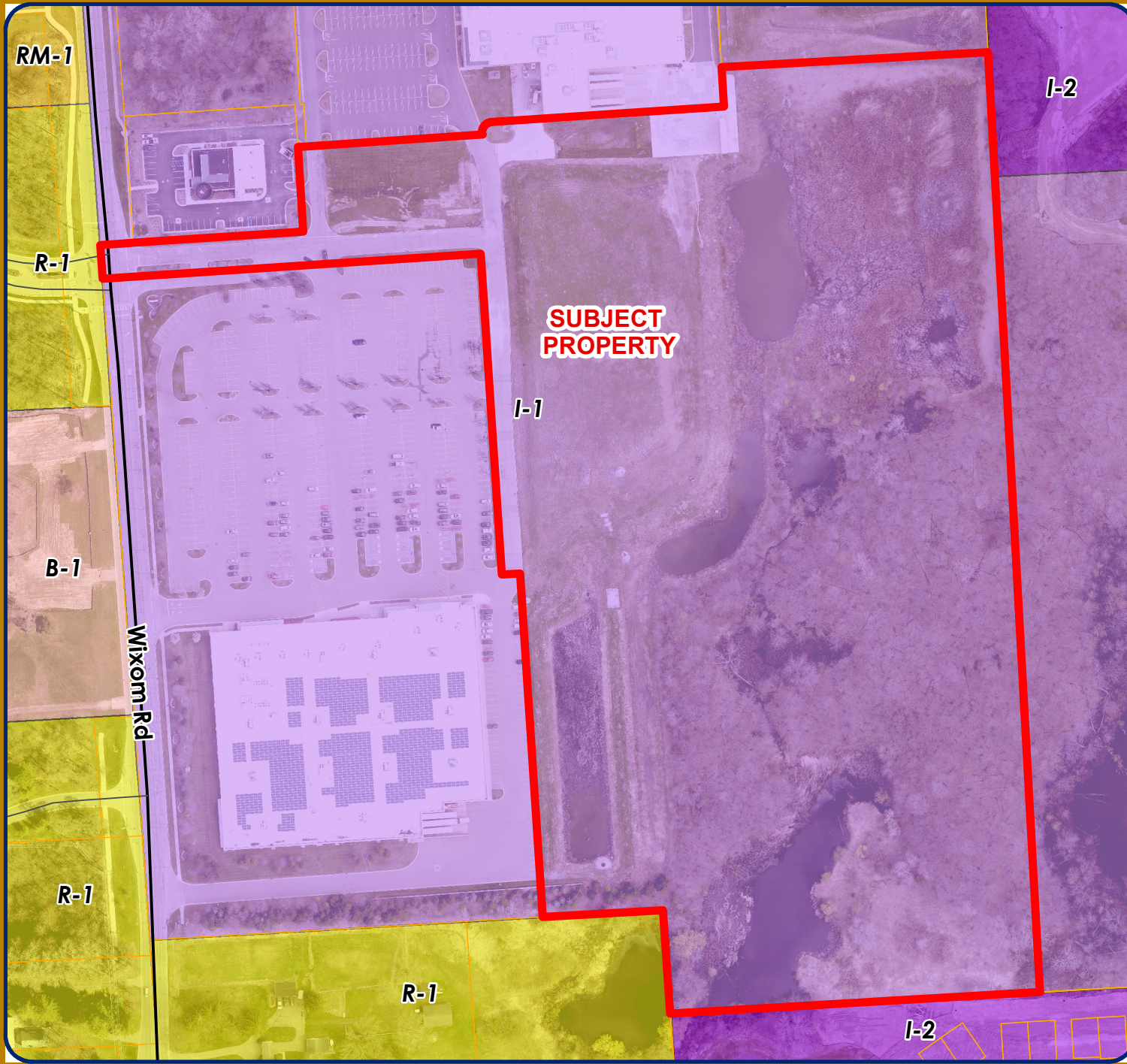
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1 inch = 216 feet



**MAP INTERPRETATION NOTICE**

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

# JSP21-51 STATION FLATS ZONING



**LEGEND**

- R-A: Residential Acreage
- R-1: One-Family Residential District
- R-4: One-Family Residential District
- RM-1: Low-Density Multiple Family
- B-1: Local Business District
- B-2: Community Business District
- B-3: General Business District
- I-1: Light Industrial District
- I-2: General Industrial District
- OSC: Office Service Commercial
- Subject Property

**City of Novi**  
 Dept. of Community Development  
 City Hall / Civic Center  
 45175 W Ten Mile Rd  
 Novi, MI 48375  
[cityofnovi.org](http://cityofnovi.org)

Map Author: Christian Carroll  
 Date: 6/15/22  
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 Version #: 1

Feet  
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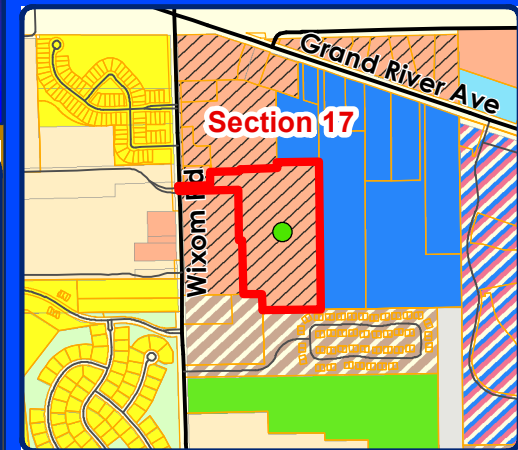
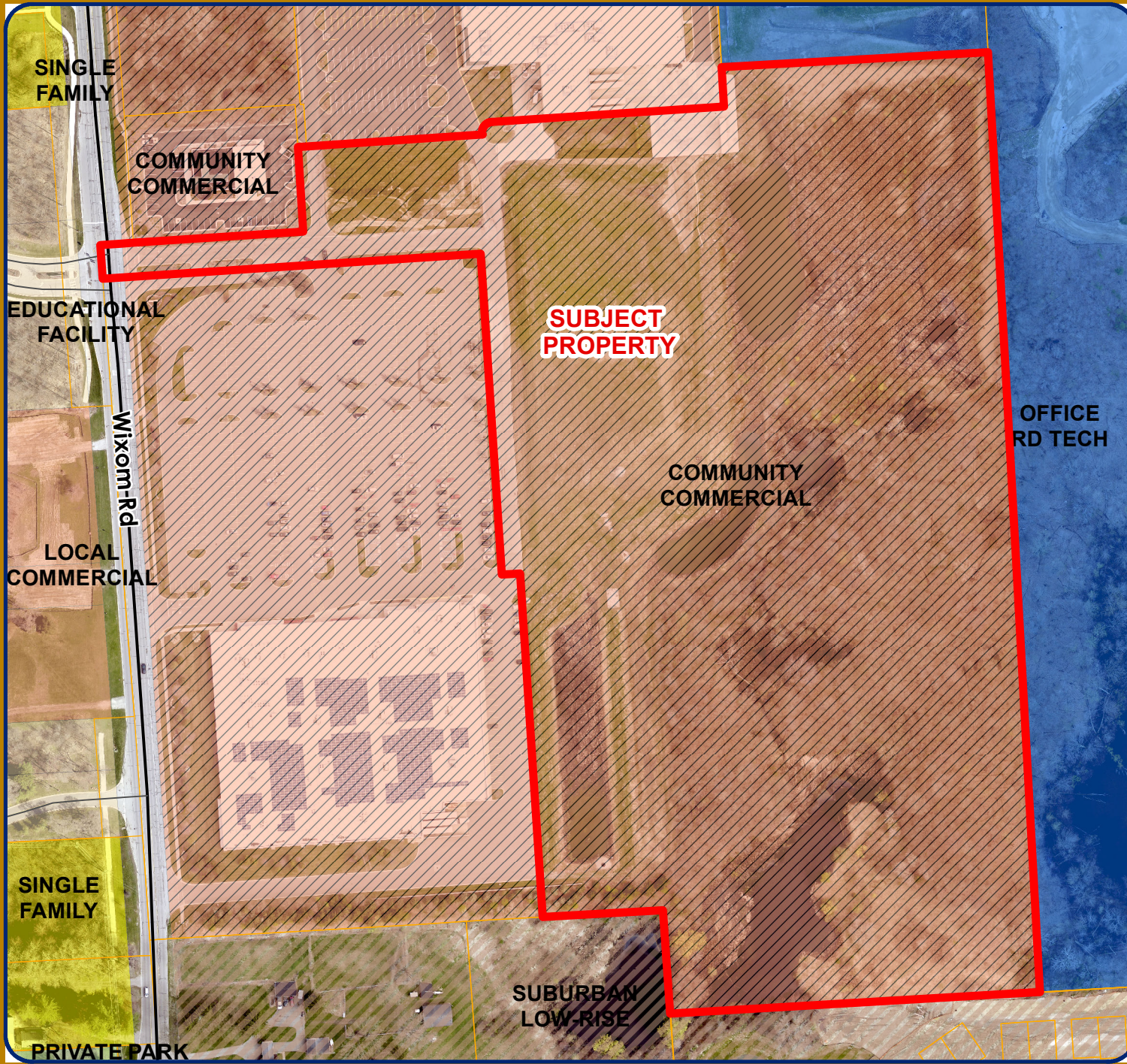
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# JSP21-51 STATION FLATS

## FUTURE LAND USE



**LEGEND**

- Single Family
- Suburban Low-Rise
- Office Research Development Technology
- Office Commercial
- Local Commercial
- Community Commercial
- Educational Facility
- Public
- Public Park
- Private Park
- Utility
- Subject Property

**City of Novi**  
Dept. of Community Development  
City Hall / Civic Center  
45175 W Ten Mile Rd  
Novi, MI 48375  
cityofnovi.org

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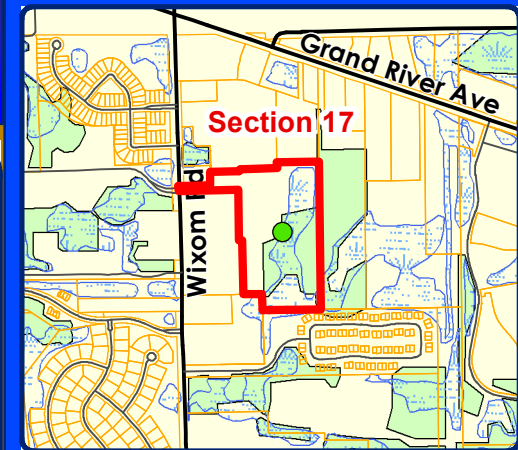
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# JSP21-51 STATION FLATS


## NATURAL FEATURES




**SUBJECT  
PROPERTY**



**LEGEND**


-  WETLANDS
-  WOODLANDS
-  Subject Property



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# CONCEPT PLAN

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# The Station Flats

Wixom Rd between Grand River and 11 Mile Rd

Owner

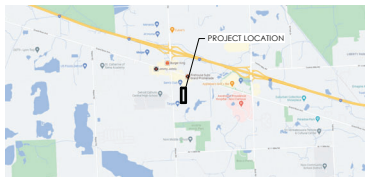
MF Novi, LLC.  
 280 W. Maple Rd, Suite 230  
 Birmingham, MI 48009  
 P.248.540.9300

Architect

Krieger | Klatt Architects Inc.  
 2120 E. 11 Mile Rd.  
 Royal Oak, MI 48067  
 P.248.414.9270  
 F.248.414.9275

Civil Engineer

PEA Group  
 2430 Rochester Court, Suite 100  
 Troy, MI 48063  
 P.844.813.2949



Civil Sheet Index		01-13-2023 Prelim. SPA		03-09-2023 Prelim. SPA REV		05-04-2023 SPA REV	
Sheet No.	Title						
C-1.1	Topographic Survey - North	*	*	*	*	*	*
C-1.2	Topographic Survey - South	*	*	*	*	*	*
C-1.3	Open Space Calculation Plan	*	*	*	*	*	*
C-1.4	Buffer Impact Plan	*	*	*	*	*	*
C-3.0	Preliminary Site Plan - Overall	*	*	*	*	*	*
C-3.1	Preliminary Site Plan - North	*	*	*	*	*	*
C-3.2	Preliminary Site Plan - South	*	*	*	*	*	*
C-4.1	Preliminary Grading Plan - North	*	*	*	*	*	*
C-4.2	Preliminary Grading Plan - South	*	*	*	*	*	*
C-6.1	Preliminary Utility Plan - North	*	*	*	*	*	*

Civil Sheet Index		01-13-2023 Prelim. SPA		03-09-2023 Prelim. SPA REV		05-04-2023 SPA REV	
Sheet No.	Title						
C-6.2	Preliminary Utility Plan - South	*	*	*	*	*	*
C-8.1	Storm Water Management Plan	*	*	*	*	*	*
C-9.1	Notes and Details	*	*	*	*	*	*
C-9.2	Details	*	*	*	*	*	*
C-10.0	Fire Truck Turning Plan	*	*	*	*	*	*
L-1.0	Preliminary Landscape Plan - Overall	*	*	*	*	*	*
L-1.1	Preliminary Landscape Plan - North	*	*	*	*	*	*
L-1.2	Preliminary Landscape Plan - South	*	*	*	*	*	*
L-1.3	Landscape Details	*	*	*	*	*	*
T-1.0	Tree Preservation Plan	*	*	*	*	*	*

Architectural Sheet Index		01-13-2023 Prelim. SPA		03-09-2023 Prelim. SPA REV		05-04-2023 SPA REV	
Sheet No.	Title						
G.001	Cover Sheet	*	*	*	*	*	*
A.100	First Floor Plan	*	*	*	*	*	*
A.101	Second Floor Plan	*	*	*	*	*	*
A.102	Third Floor Plan	*	*	*	*	*	*
A.103	Fourth Floor Plan	*	*	*	*	*	*
A.105	Roof Plan	*	*	*	*	*	*
A.200	Elevations	*	*	*	*	*	*
A.201	Courtyard Elevations	*	*	*	*	*	*
A.202	Material Board	*	*	*	*	*	*
A.300	Enlarged Plan & Sign Detail	*	*	*	*	*	*
A.400	Building Sections	*	*	*	*	*	*

**KRIEGER KLATT**  
**ARCHITECTS**  
 2120 E. 11 Mile Rd. | Royal Oak, MI 48067  
 P: 248.414.9270 F: 248.414.9275  
 www.kriegerklatt.com

**Client:**  
 MF Novi, LLC

280 W. Maple Rd, Suite 230  
 Birmingham, MI 48009

**Project:**

Station Flats  
 Wixom Rd  
 Novi, MI

Issued	Description	By
01-13-2023	Prelim. SPA	
03-09-2023	Prelim. SPA REV	
05-04-2023	SPA REV	

Seal:



**Note:**  
 Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

**North Arrow:**

**Sheet Title:**  
 Cover Sheet

**Project Number:**  
 22-022

**Scale:**

**Sheet Number:**  
**G.001**

PRELIMINARY NOT FOR CONSTRUCTION

**LEGAL DESCRIPTION**

(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

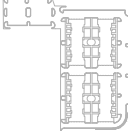
The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan

Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.36 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.00 feet, chord bears North 39 degrees 16 minutes 37 seconds East 23.26 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 59.31 feet; thence South 89 degrees 23 minutes 02 seconds East 399.93 feet; thence South 00 degrees 36 minutes 58 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 39 seconds West 354.26 feet; thence North 00 degrees 19 minutes 49 seconds West 156.00 feet; thence North 89 degrees 34 minutes 39 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 90 degrees 00 minutes 00 seconds West 587.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

- LEGEND**
- NOT FOUND
  - FOUND
  - FOUND
  - ◆ FOUND
  - BRASS PLUG SET
  - MONUMENT FOUND
  - MONUMENT SET
  - REC. CORNER FOUND
  - RECORDED
  - MEASURED
  - CALCULATED



**CAUTION!**  
 This document is not intended to provide construction information. It is for informational purposes only. It is not intended to be used as a construction permit or as a basis for any construction activity. It is the responsibility of the user to verify the information contained herein and to obtain all necessary permits and approvals from the appropriate authorities. The user assumes all liability for any and all consequences arising from the use of this document.



**CLIENT**  
 CYPRESS NOVI  
 WIXOM ROAD  
 NOVI, MICHIGAN

**PROJECT TITLE**  
 CYPRESS PARTNERS, LLC  
 280 WEST MAPLE ROAD, SUITE 230  
 FARMINGTON HILLS, MICHIGAN

**REVISIONS**

NO.	DATE	DESCRIPTION
1	12/05/2021	PRE-APPLICATION REVIEW
2	12/05/2021	PRE-SITE PLAN APPROVAL
3	06/05/2022	PRE-SITE PLAN APPROVAL

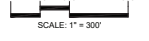
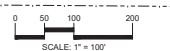
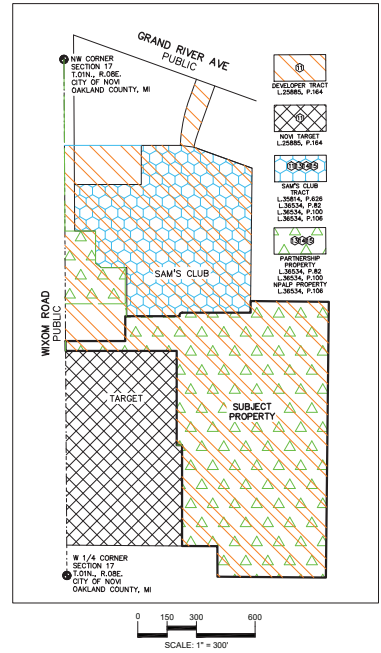
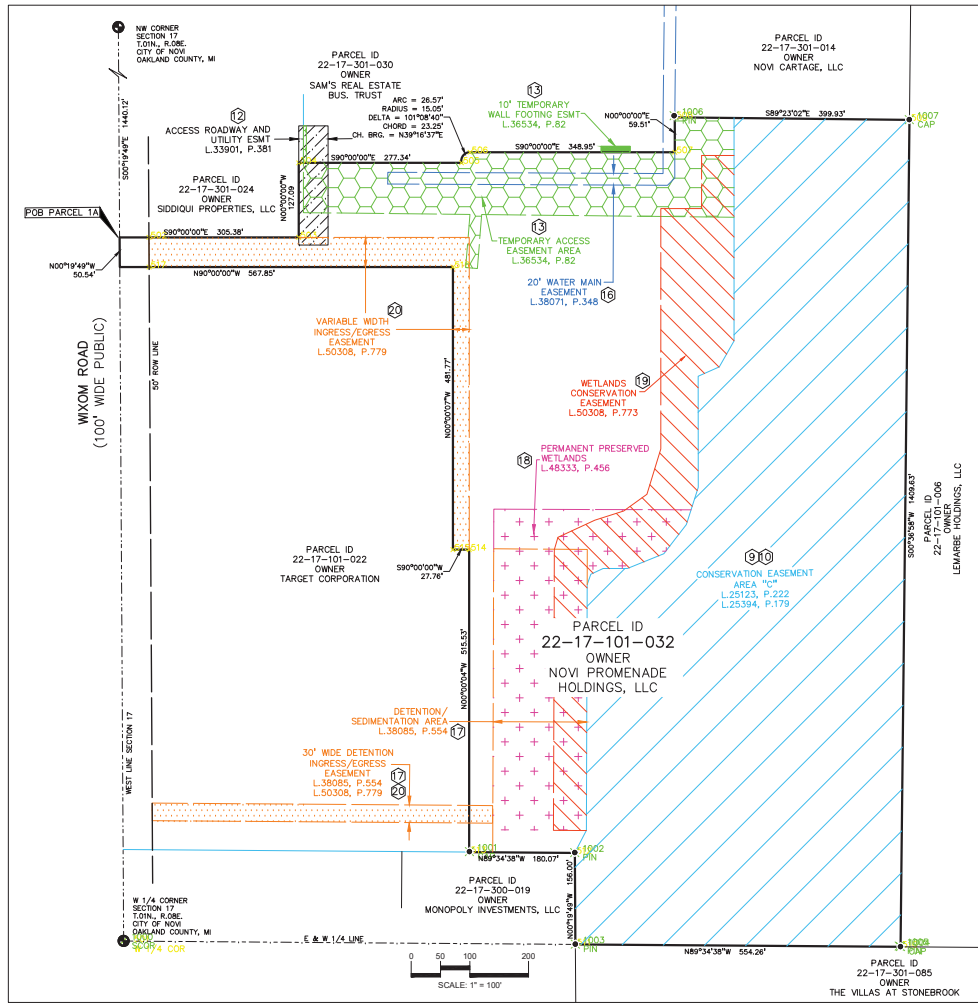
**ORIGINAL ISSUE DATE:**  
 SEPTEMBER 9, 2021  
**DRAWING TITLE**  
 ALTA SURVEY

**PEA JOB NO. 2021-0449**  
**P.M.** JPB  
**DN.** GWC  
**DES.**  
**DRAWING NUMBER:**

**C-1.0**

**SCHEDULE B-II EXCEPTIONS**  
 (Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

- Items 1-7, 21, and 22 are not plottable survey items.
- 8 Pole Line Permit granted to The Detroit Edison Company recorded in Liber 3514, Page 127, Oakland County Records. [DOES NOT AFFECT THE SUBJECT PROPERTY]
  - 9 Conservation Easement granted to the City of Novi recorded in Liber 25123, Page 222, Oakland County Records, and the terms, conditions and provisions contained therein. [AS PLOTTED]
  - 10 Conservation Easement granted to the Michigan Department of Environmental Quality recorded in Liber 25394, Page 179, Oakland County Records, and the terms, conditions and provisions contained therein. [AS PLOTTED]
  - 11 Terms, conditions and provisions contained in Operation and Easement Agreement recorded in Liber 22865, Page 184, as amended by First Amendment to Operation and Easement Agreement recorded in Liber 35094, Page 626, Oakland County Records. [AS PLOTTED]
  - 12 Terms, conditions and provisions contained in Access Roadway and Utility Easement Agreement recorded in Liber 33907, Page 381, Oakland County Records. [AS PLOTTED]
  - 13 Terms, conditions and provisions contained in Easement Agreement recorded in Liber 36534, Page 82, Oakland County Records. [AS PLOTTED]
  - 14 Terms, conditions and provisions contained in unrecorded Development Rights Agreement dated April 29, 2005, as evidenced by Memorandum of Development Rights Agreement recorded in Liber 36534, Page 100, Oakland County Records. [AS PLOTTED]
  - 15 Terms, conditions and provisions contained in Declaration as to Allocation of Common Area Maintenance Fee and Administration Fee recorded in Liber 36534, Page 106, Oakland County Records. [AS PLOTTED]
  - 16 Terms, conditions and provisions contained in Water System Easement Agreement recorded in Liber 38071, Page 348, Oakland County Records. [AS PLOTTED]
  - 17 Terms, conditions and provisions contained in Storm Drainage Facility Maintenance Easement Agreement recorded in Liber 38085, Page 504, Oakland County Records. [AS PLOTTED]
  - 18 Terms, provisions and stipulations contained in Consent Judgment entered July 19, 2001 in Oakland County Circuit Court Case No. 00-021098-CZ, as evidenced by Affidavit Providing Notice of Consent Judgment recorded September 12, 2001 in Liber 23808, Page 92, as modified by Amendment to Consent Judgment entered June 23, 2015 and recorded June 26, 2015 in Liber 48333, Page 456, Oakland County Records. [AS PLOTTED]
  - 19 Terms, conditions and provisions contained in Wetland Conservation Easement recorded in Liber 60308, Page 773, Oakland County Records. [AS PLOTTED]
  - 20 Terms, conditions and provisions contained in Storm Drainage Facility Maintenance Easement Agreement recorded in Liber 50308, Page 179, Oakland County Records. [AS PLOTTED]



S:\Projects\2021\0449-Cypress-Partners\01-ALTA-NOVI\02-C-1.0\A11-C-1.0.dwg

**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DIMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27300 WIXOM RD.)  
ELEV. = 986.57

BM #201  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27300 WIXOM RD.)  
ELEV. = 984.93

BM #202  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.)  
ELEV. = 985.19

**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan

Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.05 feet, chord bears North 39 degrees 16 minutes 37 seconds East 23.25 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 59.51 feet; thence South 89 degrees 23 minutes 02 seconds East 399.93 feet; thence South 00 degrees 36 minutes 59 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.26 feet; thence North 00 degrees 19 minutes 49 seconds West 158.00 feet; thence North 00 degrees 34 minutes 28 seconds West 180.07 feet; thence North 00 degrees 04 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 07 seconds West 481.77 feet; thence North 00 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

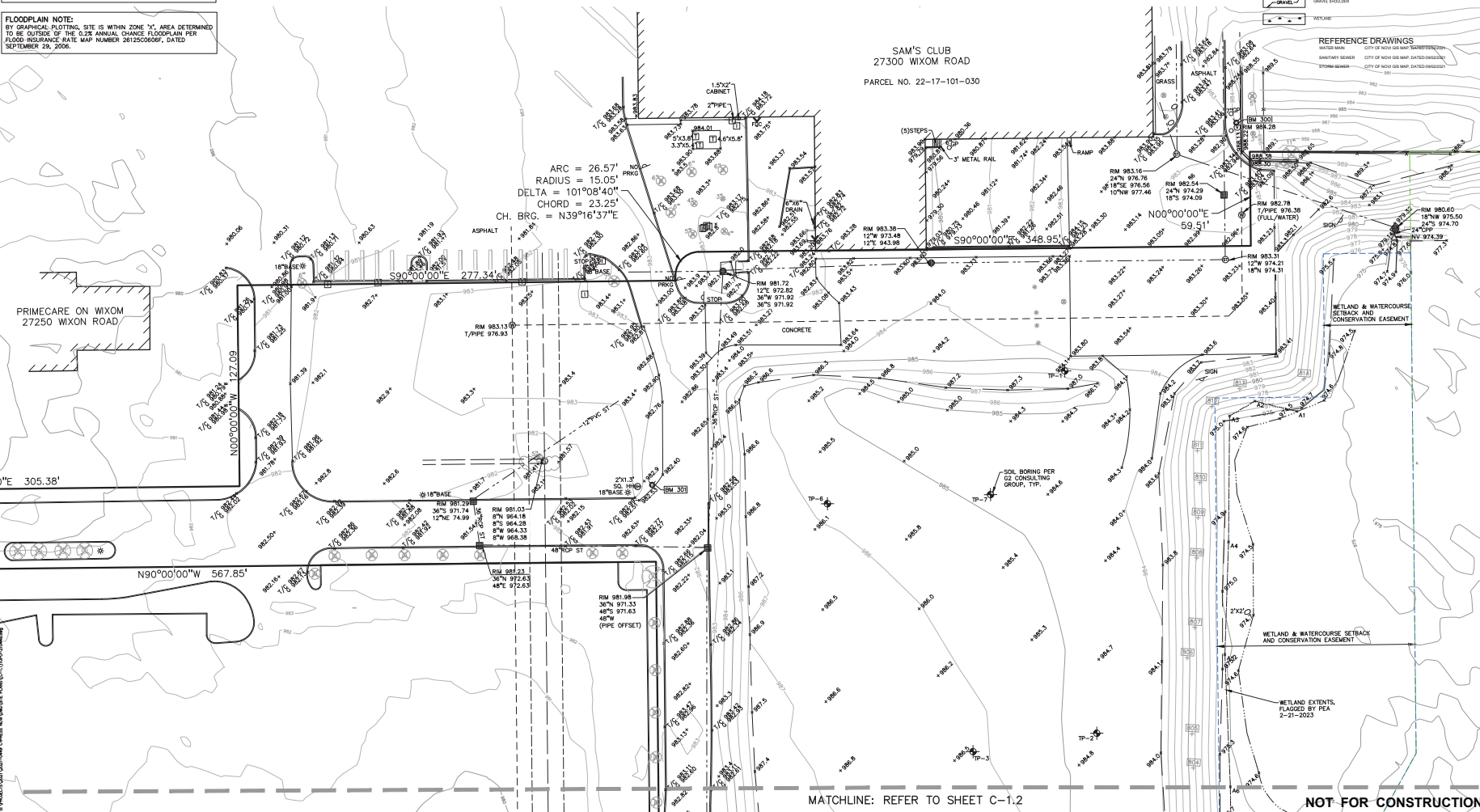
**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTERLINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK  
ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHWEST QUAD OF INTERSECTION OF WIXOM ROAD AND #27225 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB  
ELEV. 981.30

BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD  
ELEV. 975.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "A" AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C06067, DATED SEPTEMBER 29, 2006.



**LEGEND**

**NON FOUND**  
● BENCH PLUS SET  
● BENCH MINUS SET  
● WALL CORNER  
● WALL CORNER  
● WALL & CURB SET

**EXISTING**  
— 15\"/>



**REFERENCE DRAWINGS**

SANITARY SEWER CITY OF NOVI USE MAP DATED 08/2021  
STORM SEWER CITY OF NOVI USE MAP DATED 08/2021

SCALE: 1" = 30'

**811**

**CAUTION!**  
THIS DRAWING IS THE PROPERTY OF PEA GROUP. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREON. ANY REUSE OR MODIFICATION OF THIS DRAWING WITHOUT THE WRITTEN CONSENT OF PEA GROUP IS STRICTLY PROHIBITED. THE USER ASSUMES ALL LIABILITY FOR ANY ERRORS OR OMISSIONS IN THIS DRAWING.

**C-X-1**

**CLIENT**  
MF NOVI, LLC.  
280 WEST MAPLE RD., SUITE 230  
NOVI, MI 48240

**PROJECT TITLE**  
THE STATION FLATS  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MI 48240

**REVISIONS**

PRE-APPLICATION SUBMITTAL	1/13/2023
80% SUBMITTAL	3/20/2023
CITY COMMENTS	5/4/2023

**ORIGINAL ISSUE DATE:**  
DECEMBER 1, 2022

**DRAWING TITLE**  
TOPOGRAPHIC SURVEY - NORTH

**PEA JOB NO.** 2021-0449

P.M.	JPB
D.N.	SW5
D.E.S.	SW5

**DRAWING NUMBER:**

**C-1.1**

MATCHLINE: REFER TO SHEET C-1.2

NOT FOR CONSTRUCTION



**BENCHMARKS**  
(GPS DERIVED - NAVD88)

BM #200  
DIMELE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27500 WIXOM RD.)  
ELEV. - 986.57

BM #201  
DIMELE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27200 WIXOM RD.)  
ELEV. - 984.93

BM #202  
DIMELE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.)  
ELEV. - 985.19

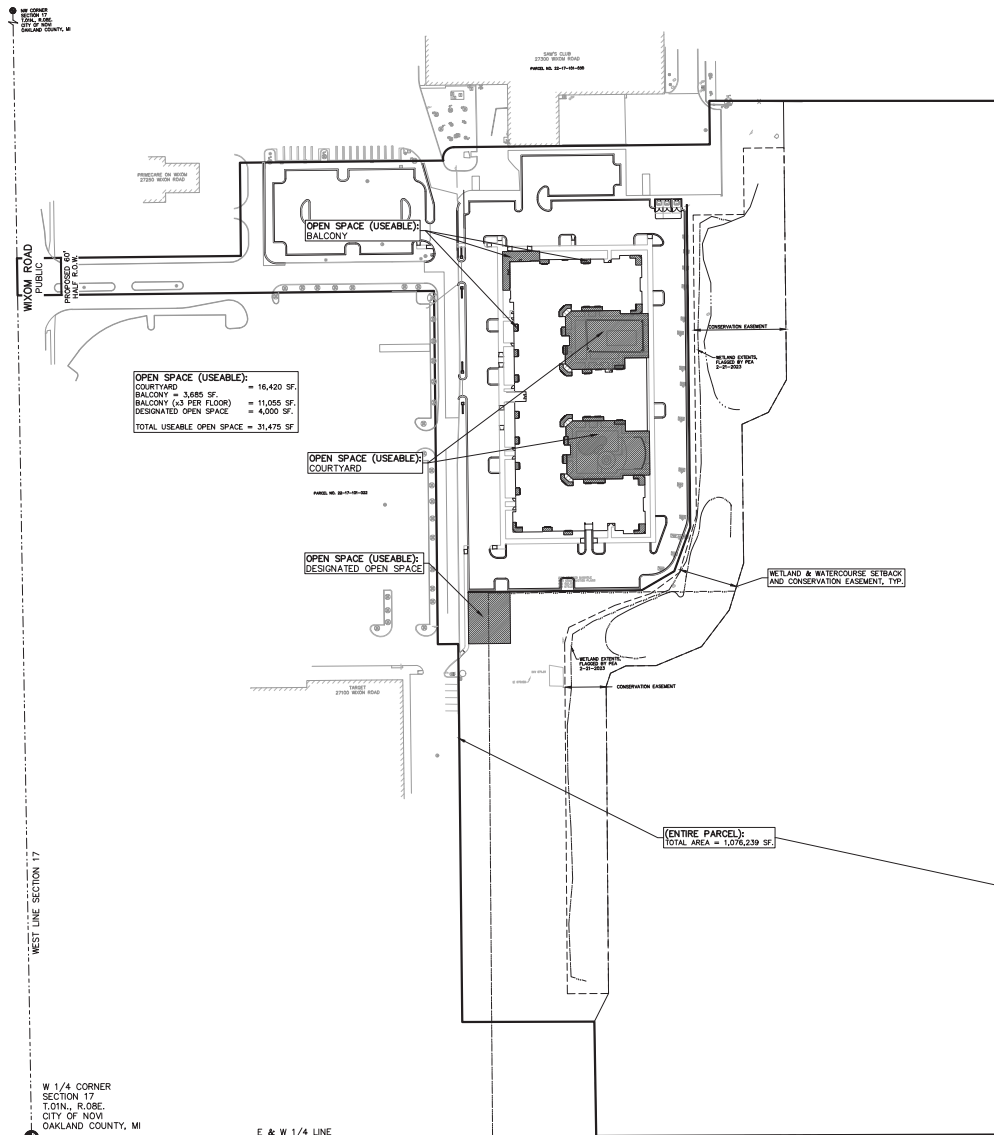
**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD88, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTRELINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK  
ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHEAST QUAD OF INTERSECTION OF WIXOM ROAD AND #27225 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB  
ELEV. 981.30

BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD  
ELEV. 976.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "C" AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0606F, DATED SEPTEMBER 29, 2006.

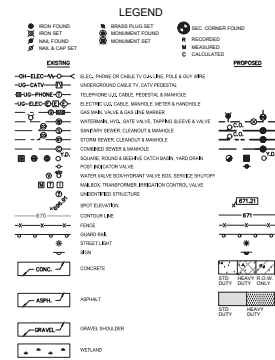


**OPEN SPACE (USEABLE):**  
COURTYARD = 16,420 SF  
BALCONY = 3,695 SF  
BALCONY (1/3 PER FLOOR) = 11,055 SF  
DESIGNATED OPEN SPACE = 4,000 SF  
TOTAL USEABLE OPEN SPACE = 31,475 SF

**(ENTIRE PARCEL):**  
TOTAL AREA = 1,076,239 SF

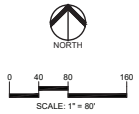
W 1/4 CORNER  
SECTION 17  
T.01N., R.08E.  
CITY OF NOVI  
OAKLAND COUNTY, MI

E. & W. 1/4 LINE

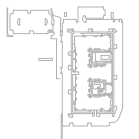


**LEGEND**  
USEABLE OPEN SPACE [Symbol]  
**OPEN SPACE CALCULATION**  
REQUIRED OPEN SPACE = 200 SF x 157 UNITS = 31,400 SF.  
USEABLE OPEN SPACE = APPROXIMATELY 31,475 SF.

**REFERENCE DRAWINGS**  
SANITARY SEWER CITY OF NOVI GIS MAP, DATED 08/20/2021  
STORM SEWER CITY OF NOVI GIS MAP, DATED 08/20/2021  
STORM SEWER CITY OF NOVI GIS MAP, DATED 08/20/2021



**CAUTION!**  
THIS DOCUMENT IS UNDESIGNED OR UNDESIGNED UNDER THE PROFESSIONAL SEAL OF A PROFESSIONAL ENGINEER OR ARCHITECT. ANY REVISIONS TO THIS DOCUMENT WITHOUT THE PROFESSIONAL SEAL OF THE ORIGINAL DESIGNER OR ARCHITECT ARE UNDESIGNED OR UNDESIGNED UNDER THE PROFESSIONAL SEAL OF A PROFESSIONAL ENGINEER OR ARCHITECT.



**CLIENT**  
MF NOVI, LLC.  
280 WEST MAPLE RD., SUITE 230  
OAKLAND, MI 48866

**PROJECT TITLE**  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

PRE-APPLICATION SUBMITTAL	1/13/2022
SPA SUBMITTAL	3/9/2023
CITY COMMENTS	5/4/2023

ORIGINAL ISSUE DATE:  
DECEMBER 1, 2022  
**DRAWING TITLE**  
**USEABLE OPEN SPACE CALCULATION PLAN**

PEA JOB NO.	2021-0449
P.M.	JPE
DN.	AJM
DES.	SW5

DRAWING NUMBER:  
**C-1.3**

NOT FOR CONSTRUCTION





**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DINLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27300 WIXOM RD.)  
ELEV. - 986.57'

BM #201  
DINLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27300 WIXOM RD.)  
ELEV. - 984.93'

BM #202  
DINLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.)  
ELEV. - 985.19'

CITY OF NOW (REFERENCE BENCHMARKS)  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTERLINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK  
ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHWEST QUAD OF INTERSECTION OF WIXOM ROAD AND #27255 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB  
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BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD  
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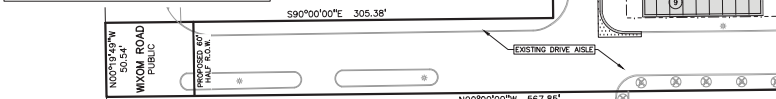
**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN 30' X AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0606G, DATED SEPTEMBER 29, 2006.

**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan  
Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curb to the right, radius 15.25 feet, chord bears North 39 degrees 16 minutes 37 seconds East 23.25 feet; distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 59.51 feet; thence South 89 degrees 23 minutes 02 seconds East 379.51 feet; thence South 00 degrees 36 minutes 58 seconds West 1405.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.26 feet; thence North 00 degrees 19 minutes 49 seconds West 126.00 feet; thence North 89 degrees 34 minutes 38 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 80 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

ARC = 26.57'  
RADIUS = 15.05'  
DELTA = 101°08'40"  
CHORD = 23.25'  
CH. BRG. = N39°16'37"E

PRIMECARE ON WIXOM  
27250 WIXOM ROAD



**SITE DATA TABLE:**

SITE AREA: 24.71 ACRES (1,076,239 S.F.) GROSS  
8.64 ACRES (376,534 S.F.) NET

TAX ID: 22-17-101-032

ZONING: CONSENT JUDGEMENT

PROPOSED ZONING: CONSENT JUDGEMENT

EXISTING USE: VACANT LAND

PROPOSED USE: RESIDENTIAL, MULTI-FAMILY

UNIT MIX

LIVE/WORK (VARIES) - (7 TOTAL) RATIO = 4.4%
1 STUDIO (600 S.F.) - (24 TOTAL) RATIO = 15.0%
1 BEDROOM (720 S.F.) - (60 TOTAL) RATIO = 43.1%
1 BEDROOM (880 S.F.) - (84 TOTAL) RATIO = 36.3%
3 BEDROOM (1,600 S.F.) - (2 TOTAL) RATIO = 1.3%
TOTAL LIVING UNITS = 157

BUILDING HEIGHT ALLOWED = 3'  
BUILDING HEIGHT PROPOSED = 5' (+)

MAXIMUM BUILDING PERCENTAGE OF LOT COVERAGE = 25%  
PROPOSED BUILDING LOT COVERAGE = 4.24%

MAXIMUM BUILDING LENGTH = 180.00'  
PROPOSED BUILDING LENGTH = 379.4' (+)

**YARD SETBACK CALCULATION:**

TOTAL YARD SETBACK AREA = 164,966 SF  
TOTAL PAVED YARD AREA = 79,125 SF  
PERCENTAGE YARD SETBACK REQUIRED = 30%  
PERCENTAGE YARD SETBACK PROPOSED = 47.96%

**DEVIATIONS REQUESTED:**

- BUILDING HEIGHT
- BUILDING LENGTH
- PARKING LOCATED WITHIN 25'
- OF A DWELLING STRUCTURE
- PEDESTRIAN CONNECTIVITY
- WETLAND BUFFER SETBACK
- REDUCTION IN DRIVE AISLE
- WIDTH
- MINIMUM DISTANCE FOR OFF-STREET PARKING
- REDUCTION IN THE NUMBER OF PARKING SPACES
- PEDESTRIAN SIDEWALK ON ONE SIDE OF THE DRIVE
- IRREGULAR PARKING ON A MAJOR DRIVE
- EXCEEDING 300 YARD SETBACK REQUIREMENT
- BUILDING ORIENTATION
- OFF-STREET PARKING CLOSER THAN 20' FROM A PROPERTY LINE

**GENERAL NOTES:**

- THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
  2. REFER TO SHEET C-10.1 AND C-10.2 FOR ON-SITE PAVING DETAILS.
  3. REFER TO LATEST A.D.O.T. DETAIL R-28 FOR SIDEWALK RAMP DETAILS.
  4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF NOW CURRENT STANDARDS AND REGULATIONS.
  5. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
  6. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGUN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
  7. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND/OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.
  8. ALL PARKING SPACE PAINTMENT MARKINGS SHALL BE 4" WHITE WITH THE EXCEPTION OF THE BARRIER FREE PARKING SPACES.
  9. PROVIDE 4" BLUE STRIPE FOR BARRIER FREE PARKING SPACES AND WHITE FOR BARRIER FREE PARKING SPACES. NOTE THAT WHERE A BARRIER FREE PARKING SPACE ADJUTS A NON-BARRIER FREE SPACE, THE TWO SPACES SHALL BE SEPARATED BY A WHITE AND BLUE STRIPE.
  10. SIGNS NOTE TO BE MOUNTED ON BUILDING FACING SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 5 FEET AND A MAXIMUM MOUNTING HEIGHT OF 7 FEET.

**SETBACK REQUIREMENTS:**

BM-2 ZONING DISTRICT	REQUIRED	PROVIDED
FRONT SETBACK (WEST)	50'	104.09'
SIDE SETBACK (NORTH)	75'	142.99'
SIDE SETBACK (SOUTH)	75'	691.79'
REAR SETBACK (EAST)	75'	484.55'
WETLAND SETBACK	25'	1.06'

**PARKING CALCULATIONS:**

TOTAL PARKING REQUIRED: 1,519.39 SPACES PER DWELLING UNIT (PER ITC STANDARDS)

TOTAL PARKING REQUIRED: 157 UNITS x 1,519.39 SPACES = 237,682 or 238 SPACES REQUIRED

TOTAL PROPOSED PARKING SPACES = 247 OPEN SPACES (INCLUDES 8 H/C SPACES)

RETAIL PARKING FOR BUILDINGS A, B AND C REQUIRED = 1,725 SPACES

RETAIL "X" (TARGET) PROVIDED = 598 SPACES

RETAIL "M" (SAM'S CLUB) PROVIDED = 625 SPACES

RM-2 "C" (PROPOSED BUILDING) = 249 SPACES

TOTAL PARKING FOR BUILDINGS A, B AND C = 1,470 SPACES (DEVIATION OF 255 SPACES)

**OFF-STREET PARKING**

REQUIRED - NO CLOSER THAN 20' FROM ROW AND PROPERTY LINE  
PROPOSED - 10' FROM PROPERTY LINE. (+)

REQUIRED - NO CLOSER THAN 25' TO ANY WALL OF A DWELLING STRUCTURE THAT CONTAINS OPENINGS OR VENTILATING AREAS.  
PROPOSED - 8.17' FROM DWELLING STRUCTURE. (+)

REQUIRED - 25' SETBACK FROM WETLAND  
PROPOSED - 1.02' SETBACK FROM WETLAND (+)

**PEDESTRIAN CONNECTIVITY**

REQUIRED - 5' SIDEWALKS ON BOTH SIDES OF PRIVATE DRIVE  
PROVIDED - 7' SIDEWALK ON ONE SIDE ONLY (+)

**BICYCLE PARKING**

REQUIRED - 1 SPACE FOR EACH 5 UNITS = 180 UNITS / 5 = 32 PLUS 25% OF BIVE SPACES SHOULD BE COVERED  
PROVIDED - 32 (INCL. 8 INTERIOR SPACES)

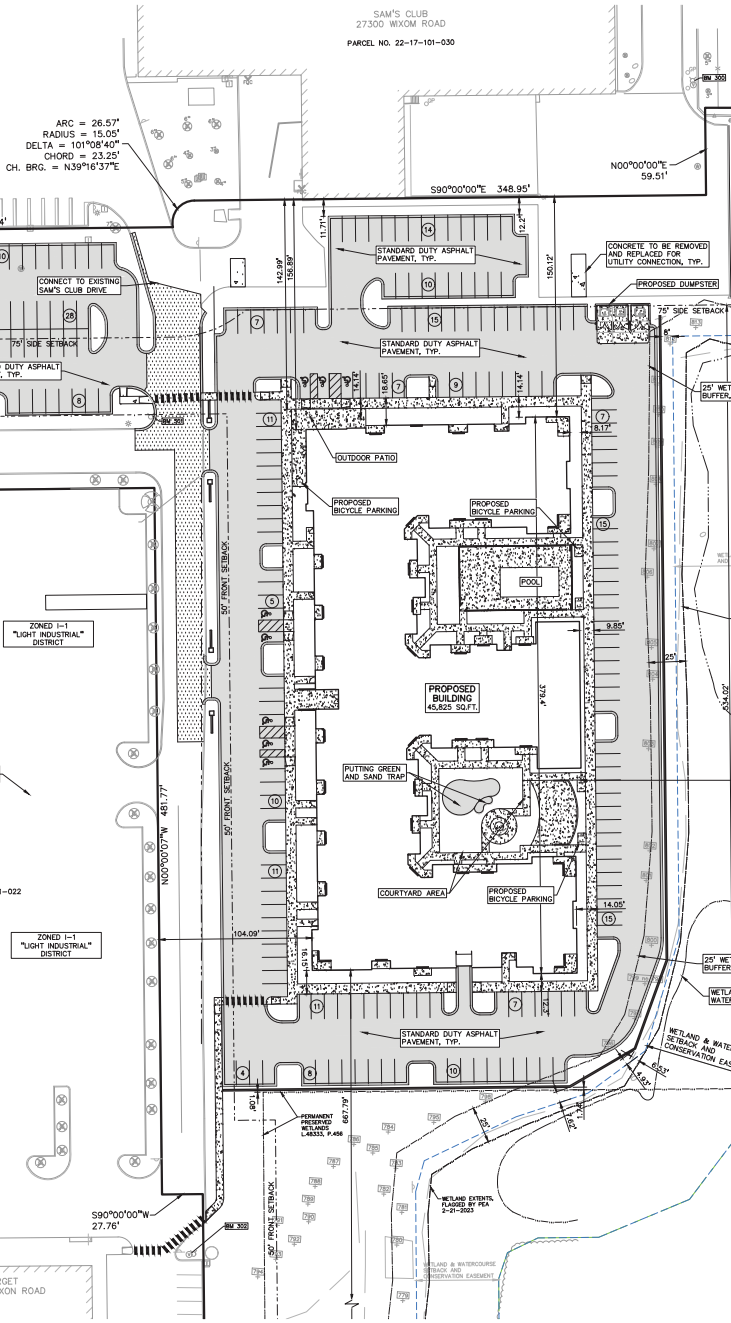
(+) DEVIATIONS REQUESTED

**SOIL INFORMATION**

CAPAC SANDY LOAM, 0 TO 4 PERCENT SLOPES

BY: [Signature] DATE: [Date] CHECKED: [Signature] DATE: [Date] SCALE: 1"=40'

17/10/2023 10:50 AM - 04/10/2023 10:50 AM



**LEGEND**

NON-FOUND	BRICK PLUS SET	DECOR CORNER FOUND
FOUND	MOVEMENT FOUND	MEASURED
WALL FOUND	WALL & COP SET	RECALCULATED
EXISTING		PROPOSED
CONCRETE		
ASPHALT		
GRAVEL		

**REFERENCE DRAWINGS**

SANITARY DESIGN CITY OF NOW GIS MAP DATED 08/2021  
STORM DESIGN CITY OF NOW GIS MAP DATED 08/2021

**PEA GROUP**  
t. 844.813.2949  
www.peagroup.com

STATE OF MICHIGAN  
PROFESSIONAL ENGINEER  
NO. 12005

NORTH

0 20 40 80  
SCALE: 1" = 40'

**811**

**CAUTION!**  
ALL UTILITIES SHOWN ARE BASED ON RECORD DRAWINGS AND FIELD SURVEY. VERIFY ALL UTILITIES BEFORE EXCAVATING. CALL 811 FOR A PRELIMINARY UTILITY LOCATOR REPORT.

CLIENT  
**MF NOVI, LLC.**  
285 WEST MAPLE RD., SUITE 230  
NOVI, MICHIGAN 48240

PROJECT TITLE  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

PRE-APPLICATION SUBMITTAL	1/13/2023
DPA SUBMITTAL	3/5/2023
CITY COMMENTS	5/4/2023

ORIGINAL ISSUE DATE:  
DECEMBER 1, 2022

DRAWING TITLE  
**PRELIMINARY SITE PLAN-OVERALL**

PEA JOB NO.	2021-0449
P.M.	JPB
D.N.	AJM
D.E.S.	SW5
DRAWING NUMBER:	SW5

**C-3.0**

**CITY OF NOW FIRE DEPARTMENT NOTES:**

1. ALL WEATHER ACCESS ROADS CAPABLE OF SUPPORTING 35 TONS ARE TO BE PROVIDED FOR FIRE APPARATUS PRIOR TO CONSTRUCTION ABOVE THE FOUNDATION.
2. ALL WATER MAINS AND FIRE HYDRANTS ARE TO BE INSTALLED AND BE IN SERVICE PRIOR TO CONSTRUCTION ABOVE THE FOUNDATION.
3. THE BUILDING ADDRESS IS TO BE POSTED FACING THE STREET THROUGHOUT THE CONSTRUCTION. THE ADDRESS IS TO BE AT LEAST 3 INCHES HIGH ON CONTRASTING BACKGROUND.

**NOT FOR CONSTRUCTION**

**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DUMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27300 WIXOM RD.) ELEV. = 986.57

BM #201  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27300 WIXOM RD.) ELEV. = 984.93

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DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.) ELEV. = 982.19

**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 300 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTERLINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHWEST QUAD OF INTERSECTION OF WIXOM ROAD AND #27225 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB ELEV. 981.30

BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD ELEV. 975.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "C" AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0606F, DATED SEPTEMBER 29, 2006.

**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.25 feet, chord bears North 39 degrees 16 minutes 37 seconds East 23.25 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 50.51 feet; thence South 90 degrees 00 minutes 00 seconds East 399.93 feet; thence South 00 degrees 36 minutes 58 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.26 feet; thence North 00 degrees 19 minutes 49 seconds West 158.00 feet; thence North 00 degrees 34 minutes 08 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 07 seconds West 481.77 feet; thence North 00 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 49 seconds 50.54 feet to beginning.

**DETECTABLE WARNING PLATE NOTE:**

AS SHOWN ON THIS SHEET, SOME SIDEWALK RAMPS WILL REQUIRE DETECTABLE WARNING PLATES TO BE INSTALLED. DETECTABLE WARNING PLATES SHOULD BE EAST JORDAN TURF-AST IN NATURAL FINISH OR BLACK ASPHALTIC DIP FINISH, OR APPROVED EQUAL.

**GENERAL NOTES:**

- THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
- ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
- REFER TO LATEST M.D.O.T. DETAIL R-26 FOR SIDEWALK RAMP DETAILS.
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- ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, METERS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.
- ALL PARKING SPACE PAVEMENT MARKINGS SHALL BE 4" WHITE WITH THE EXCEPTION OF THE BARRIER FREE PARKING SPACES.
- PROVIDE 4" BLUE STRIPING FOR BARRIER FREE PARKING SPACES AND WHITE FOR BARRIER FREE PARKING SYMBOL. NOTE THAT WHERE A BARRIER FREE PARKING SPACE ADJUTS A NON-BARRIER FREE SPACE, THE TWO SPACES SHALL BE SEPARATED BY ADJUTING BLUE AND WHITE STRIPES.
- SIGNS NOTED TO BE MOUNTED ON BUILDING FACADE SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 5 FEET AND A MAXIMUM MOUNTING HEIGHT OF 7 FEET.
- NO "PARKING-FREE LANE" SIGNS SHALL BE POSTED ALONG ALL FIRE LANES AT 100' FOOT INTERVALS OR AS DIRECTED BY THE FIRE OFFICIAL.
- REFER TO NOTES & DETAILS SHEET FOR ON-SITE PAVING DETAILS.
- REFER TO NOTES & DETAILS SHEET FOR ON-SITE SIDEWALK RAMP DETAILS.

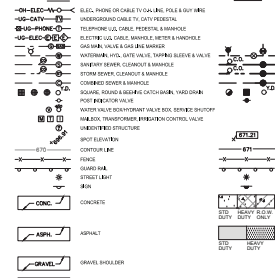
**SIDEWALK RAMP LEGEND:**

- SIDEWALK RAMP "TYPE R" (R)
  - SIDEWALK RAMP "TYPE P" (P)
  - SIDEWALK RAMP "TYPE D" (D)
  - CURB DROP ONLY (C)
- REFER TO LATEST M.D.O.T. R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

**SIGN LEGEND:**

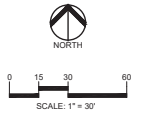
- "NO PARKING FIRE LANE" SIGN (1)
  - "STOP" SIGN (2)
  - "BARRIER FREE PARKING" SIGN (3)
  - "VAN ACCESSIBLE" SIGN (4)
  - "CROSSWALK" SIGN (5)
  - "DO NOT ENTER" SIGN (6)
- REFER TO DETAIL SHEET FOR SIGN DETAILS

**LEGEND**

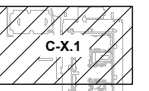


**REFERENCE DRAWINGS**

- SANITARY SEWER CITY OF NOVI GIS MAP, DATED 08/2021
- STORM SEWER CITY OF NOVI GIS MAP, DATED 08/2021



**CAUTION!**  
THIS DOCUMENT IS THE PROPERTY OF PEA GROUP. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF PEA GROUP.



CLIENT  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

PROJECT TITLE  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/13/2023
2	SPA SUBMITTAL	3/9/2023
3	CITY COMMENTS	5/4/2023

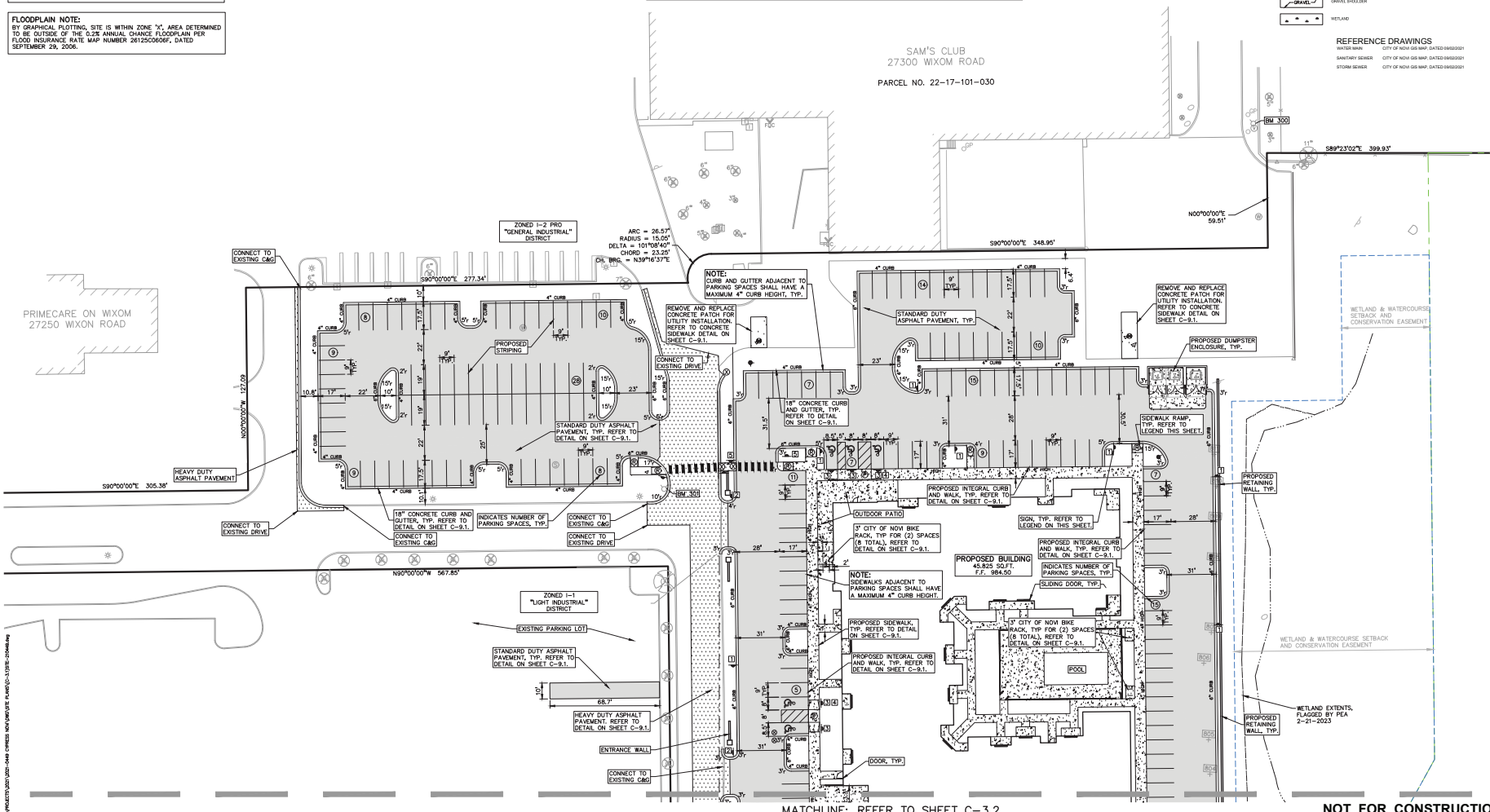
ORIGINAL ISSUE DATE:  
DECEMBER 1, 2022

DRAWING TITLE  
**PRELIMINARY SITE PLAN-NORTH**

PEA JOB NO. 2021-0449

P.M.	JPB
D.N.	AJM
D.S.	SW5

DRAWING NUMBER:  
**C-3.1**



MATCHLINE: REFER TO SHEET C-3.2

NOT FOR CONSTRUCTION

**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DUMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAMS CLUB (27500 WXOM RD.).  
ELEV. - 986.57

BM #201  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAMS CLUB (27500 WXOM RD.).  
ELEV. - 984.93

BM #202  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WXOM RD.).  
ELEV. - 982.19

**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAMS CLUB GAS STATION, 36 FEET EAST OF CENTRAL LINE OF WXOM ROAD AND 3 FEET WEST OF SIDEWALK.  
ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHEAST QUAD OF INTERSECTION OF WXOM ROAD AND #27225 WXOM ROAD, 1 FOOT EAST OF BACK OF CURB.  
ELEV. 981.30

BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD.  
ELEV. 975.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "C" AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C06067, DATED SEPTEMBER 29, 2006.

**LEGAL DESCRIPTION**

(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)  
The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan

Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.95 feet, chord bears North 39 degrees 16 minutes 37 seconds East, 23.25 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 59.51 feet; thence South 89 degrees 23 minutes 02 seconds East, 399.93 feet; thence South 00 degrees 36 minutes 56 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.26 feet; thence North 00 degrees 19 minutes 49 seconds West 156.00 feet; thence North 89 degrees 34 minutes 38 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 00 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

**SIDEWALK RAMP LEGEND:**

- SIDEWALK RAMP "TYPE R"
  - SIDEWALK RAMP "TYPE P"
  - SIDEWALK RAMP "TYPE D"
  - CURB DROP ONLY
- REFER TO LATEST MOOT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

**SIGN LEGEND:**

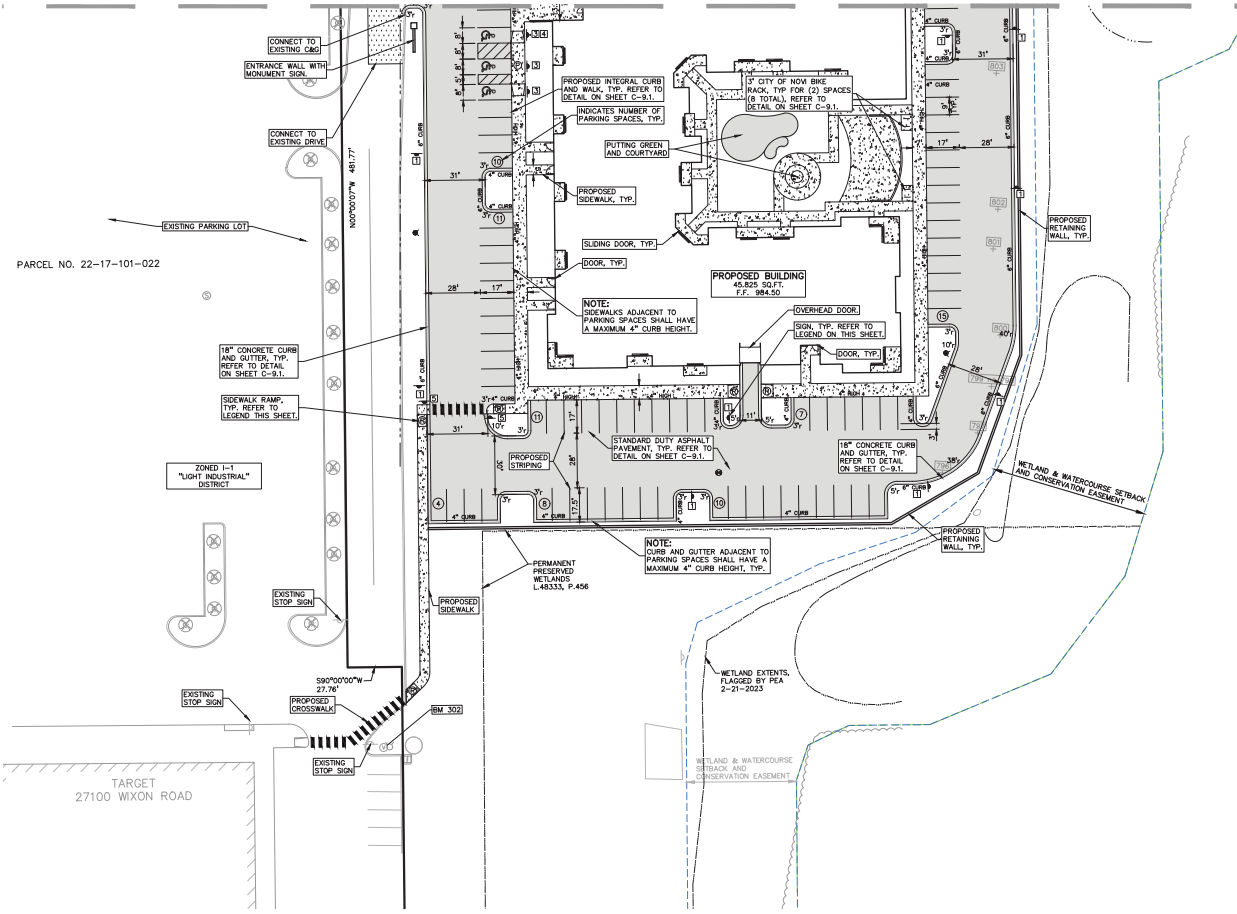
- 'NO PARKING FIRE LANE' SIGN
  - 'STOP' SIGN
  - 'BARRIER FREE PARKING' SIGN
  - 'VAN ACCESSIBLE' SIGN
  - 'CROSSWALK' SIGN
  - 'DO NOT ENTER' SIGN
- REFER TO DETAIL SHEET FOR SIGN DETAILS

**LEGEND**

- NON FOUND
- AS FOUND
- WALL EXISTING
- WALL & CAP SET
- BRICK PLUS SET
- MONUMENT FOUND
- MEASURED
- CALCULATED
- SEC. CORNER FOUND
- EXISTING
- PROPOSED
- ELEC. PHONE OR CABLE TV CABLE, POLE & DUCT (SEE UNDERGROUND CABLE TV CITY RECORDS)
- TELEPHONE VAULT, CABLE, FIBERGLASS & PIPEHOLE
- ELECTRICAL VAULT, MANHOLE, REFER TO HATCHES
- GAS VAULT, VALVE, GAS LINE MANHOLE
- WATER VAULT, VALVE, WATER MAIN, REFER TO HATCHES
- STORM DRAIN, CLEANOUT & MANHOLE
- COVERED STORM DRAIN
- POST FIRE ALARM VALVE
- SQUARE BOARD & RED BRICK CATCH BASIN, VASIS DRAIN
- WATER VALVE (SEE HYDRANT VALVE BOX REFER TO DUCTWORK)
- MANHOLE, TRANSFORMER, FIBERGLASS CONTROL VALVE
- MANHOLE STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- SIGN BASE
- STREET LIGHT
- BRICK
- CONC. CONCRETE
- ASPHL. ASPHALT
- GRAVEL SHOULDER
- GRAVEL
- WETLAND
- EXISTING DUTY
- PROPOSED DUTY

**REFERENCE DRAWINGS**

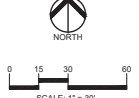
- SANITARY SEWER CITY OF NOVI GIS MAP, DATED 08/20/21
- STORM SEWER CITY OF NOVI GIS MAP, DATED 08/20/21



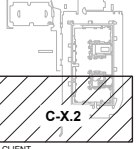
MATCHLINE: REFER TO SHEET C-3.1

PARCEL NO. 22-17-101-022

TARGET  
27100 WXOM ROAD



**CAUTION!**  
ALL UTILITIES SHOWN ARE BASED ON BEST AVAILABLE INFORMATION. APPROVED BY THE ENGINEER OR SURVEYOR. APPROVED BY THE OWNER. THE USER SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION AND BE RESPONSIBLE FOR ANY DAMAGE TO UTILITIES.



CLIENT  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

PROJECT TITLE  
**THE STATION FLATS**  
WXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

REVISONS	
PRE-APPLICATION SUBMITTAL	1/13/2023
SIPA SUBMITTAL	3/9/2023
CITY COMMENTS	5/4/2023

ORIGINAL ISSUE DATE:  
DECEMBER 1, 2022  
DRAWING TITLE  
**PRELIMINARY SITE PLAN-SOUTH**

PEA JOB NO.	2021-0449
P.M.	JPB
DN.	AJM
DES.	SW5
DRAWING NUMBER:	

**C-3.2**

NOT FOR CONSTRUCTION

**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DUMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAMS CLUB (27300 WIXOM RD.).  
ELEV. - 986.57

BM #201  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAMS CLUB (27300 WIXOM RD.).  
ELEV. - 984.93

BM #202  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.).  
ELEV. - 985.19

**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan

Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner, thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.25 feet, chord bears North 39 degrees 16 minutes 37 seconds East 23.25 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 50.51 feet; thence South 89 degrees 23 minutes 02 seconds East 399.93 feet; thence South 00 degrees 36 minutes 59 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.26 feet; thence North 00 degrees 19 minutes 49 seconds West 158.00 feet; thence North 89 degrees 34 minutes 38 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 90 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

**SYMBOLS: GRADING**

PROPOSED SPOT ELEVATION:  
TYPICALLY TOP OF PAVEMENT IN PAVED AREAS; BUTTER GRADE IN CURB LINES.

PROPOSED CONTOUR LINE

ABBREVIATIONS:  
T/C = TOP OF CURB  
G = GUTTER GRADE  
T/P = TOP OF PAVEMENT  
T/S = TOP OF SIDEWALK  
T/W = TOP OF WALL  
B/W = BOTTOM OF WALL  
F.G. = FINISH GRADE  
RM = RIM ELEVATION

**SIDEWALK RAMP LEGEND:**

SIDEWALK RAMP 'TYPE R' (RAMP)

SIDEWALK RAMP 'TYPE P' (P)

SIDEWALK RAMP 'TYPE D' (D)

CURB DROP ONLY

REFER TO LATEST MDT R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

**RETAINING WALL NOTE:**  
TOP OF WALL (T/W) AND BOTTOM OF WALL (B/W) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE.

**LEGEND**

**EXISTING**

- NON-FOUND
- BRIDGE PLUS SET
- MOVEMENT FOUND
- MOVEMENT SET
- MEASURED
- MEASURED
- CALCULATED

**PROPOSED**

- REC. CORNER FOUND
- MEASURED
- MEASURED
- CALCULATED

**CONSTRUCTION**

- CONC. CONCRETE
- ASPH. ASPHALT
- GRAVEL SHOULDER
- WETLAND

**REFERENCE DRAWINGS**

- SANITARY SEWER CITY OF NOVI GIS MAP DATED 08/2020
- STORM SEWER CITY OF NOVI GIS MAP DATED 08/2020

**PEA GROUP**  
t. 844.813.2949  
www.peagroup.com

**STATE OF MICHIGAN**  
PROFESSIONAL ENGINEER  
NO. 28005

**811**

**CAUTION!**  
THIS DRAWING IS THE PROPERTY OF PEA GROUP, INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF PEA GROUP, INC.

**C-X-1**

**CLIENT**  
MF NOVI, LLC.  
280 WEST MAPLE RD., SUITE 230  
NOVI, MICHIGAN

**PROJECT TITLE**  
THE STATION FLATS  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

PRE-APPLICATION SUBMITTAL	1/13/2023
0/PA SUBMITTAL	9/20/23
CITY COMMENTS	9/4/2023

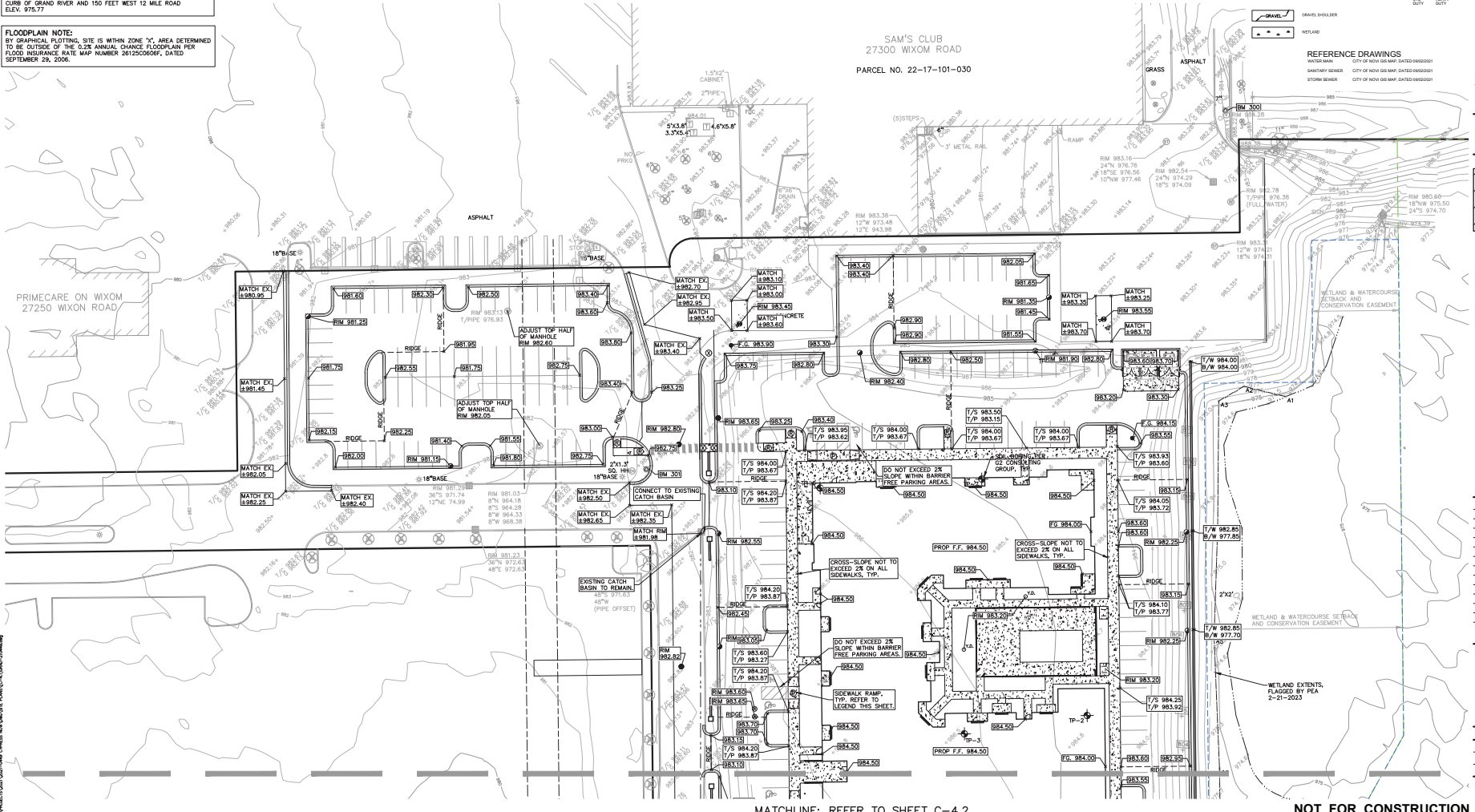
**ORIGINAL ISSUE DATE:**  
DECEMBER 1, 2022

**DRAWING TITLE**  
PRELIMINARY GRADING PLAN-NORTH

**PEA JOB NO.** 2021-0449  
**P.M.** JPB  
**D.N.** AJM  
**DES.** SW/S  
**DRAWING NUMBER:**

**C-4.1**

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE 'C' AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0607, DATED SEPTEMBER 29, 2006.



MATCHLINE: REFER TO SHEET C-4.2

NOT FOR CONSTRUCTION

**BENCHMARKS**  
(GPS DERIVED - NAVD88)

BM #200  
DUMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAMS CLUB (27200 WIXOM RD.)  
ELEV. = 986.37

BM #201  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAMS CLUB (27200 WIXOM RD.)  
ELEV. = 984.93

BM #202  
DUMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.)  
ELEV. = 982.19

**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD88, HORIZ. DATUM NAVD83)

BM #711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAMS CLUB GAS STATION, 36 FEET EAST OF CENTERLINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK  
ELEV. 974.22

BM #712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHWEST QUAD OF INTERSECTION OF WIXOM ROAD AND #27225 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB  
ELEV. 981.30

BM #713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD  
ELEV. 975.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN 30% IC AREA DETERMINED TO BE OUTSIDE OF THE 0.25 ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C06067, DATED SEPTEMBER 29, 2006.

**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

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Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.25 feet, chord bears North 39 degrees 16 minutes 37 seconds East, 23.25 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 59.51 feet; thence South 89 degrees 23 minutes 02 seconds East, 399.93 feet; thence South 00 degrees 36 minutes 56 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.28 feet; thence North 00 degrees 19 minutes 49 seconds West 158.00 feet; thence North 00 degrees 34 minutes 28 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 00 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

**SYMBOLS: GRADING**

PROPOSED SPOT ELEVATION:  
TYPICALLY TOP OF PAVEMENT IN PAVED AREAS; GUTTER GRADE IN CURB LINES

PROPOSED CONTOUR LINE

ABBREVIATIONS:  
1/2" = TOP OF CURB  
C = GUTTER GRADE  
T/P = TOP OF PAVEMENT  
1/2" = TOP OF SIDEWALK  
B/W = BOTTOM OF WALL  
F/W = FINISH ELEVATION  
R/M = RIM ELEVATION

**RETAINING WALL NOTE:**  
TOP OF WALL (T/W) AND BOTTOM OF WALL (B/W) GRADES ARE THE FINISH GRADE AT THE TOP AND BOTTOM OF THE RETAINING WALL, NOT ACTUAL TOP AND BOTTOM OF THE WALL STRUCTURE.

**SIDEWALK RAMP LEGEND:**

SIDEWALK RAMP 'TYPE R'  
SIDEWALK RAMP 'TYPE P'  
SIDEWALK RAMP 'TYPE D'  
CURB DROP ONLY

REFER TO LATEST MOOT #=28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

**LEGEND**

**EXISTING**

- NON FOUND
- FOUND
- WALL EXISTING
- WALL & CURB SET
- ELEC. POLE OR CABLE TV/CABLE RAIL POLE & DUCT
- UNDERGROUND CABLE TV DUCT
- ELECTRICAL DUCT
- ELECTRICAL DUCT
- WATER MAIN
- SEWER MAIN
- STORM SEWER
- CONCRETE
- ASPHALT
- GRAVEL SHOULDER
- GRAVEL
- VEGETATION

**PROPOSED**

- ELEC. POLE OR CABLE TV/CABLE RAIL POLE & DUCT
- UNDERGROUND CABLE TV DUCT
- ELECTRICAL DUCT
- ELECTRICAL DUCT
- WATER MAIN
- SEWER MAIN
- STORM SEWER
- CONCRETE
- ASPHALT
- GRAVEL SHOULDER
- GRAVEL
- VEGETATION

**REFERENCE DRAWINGS**

- SANITARY SEWER CITY OF NOVI GIS MAP, DATED 08/2021
- STORM SEWER CITY OF NOVI GIS MAP, DATED 08/2021

**PEA GROUP**

1.844.813.2949  
www.peagroup.com

STATE OF MICHIGAN  
PROFESSIONAL ENGINEER  
NO. 26005

NORTH

0 15 30 60  
SCALE: 1" = 30'

**811**

**CAUTION!**  
CALL BEFORE YOU DIG. CALL 811 OR VISIT 811.MI.GOV. ALWAYS CALL AT LEAST 48 HOURS BEFORE YOU DIG. ALWAYS CALL AT LEAST 48 HOURS BEFORE YOU DIG. ALWAYS CALL AT LEAST 48 HOURS BEFORE YOU DIG.

**C-X-2**

CLIENT  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
NOVI, MICHIGAN

PROJECT TITLE  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

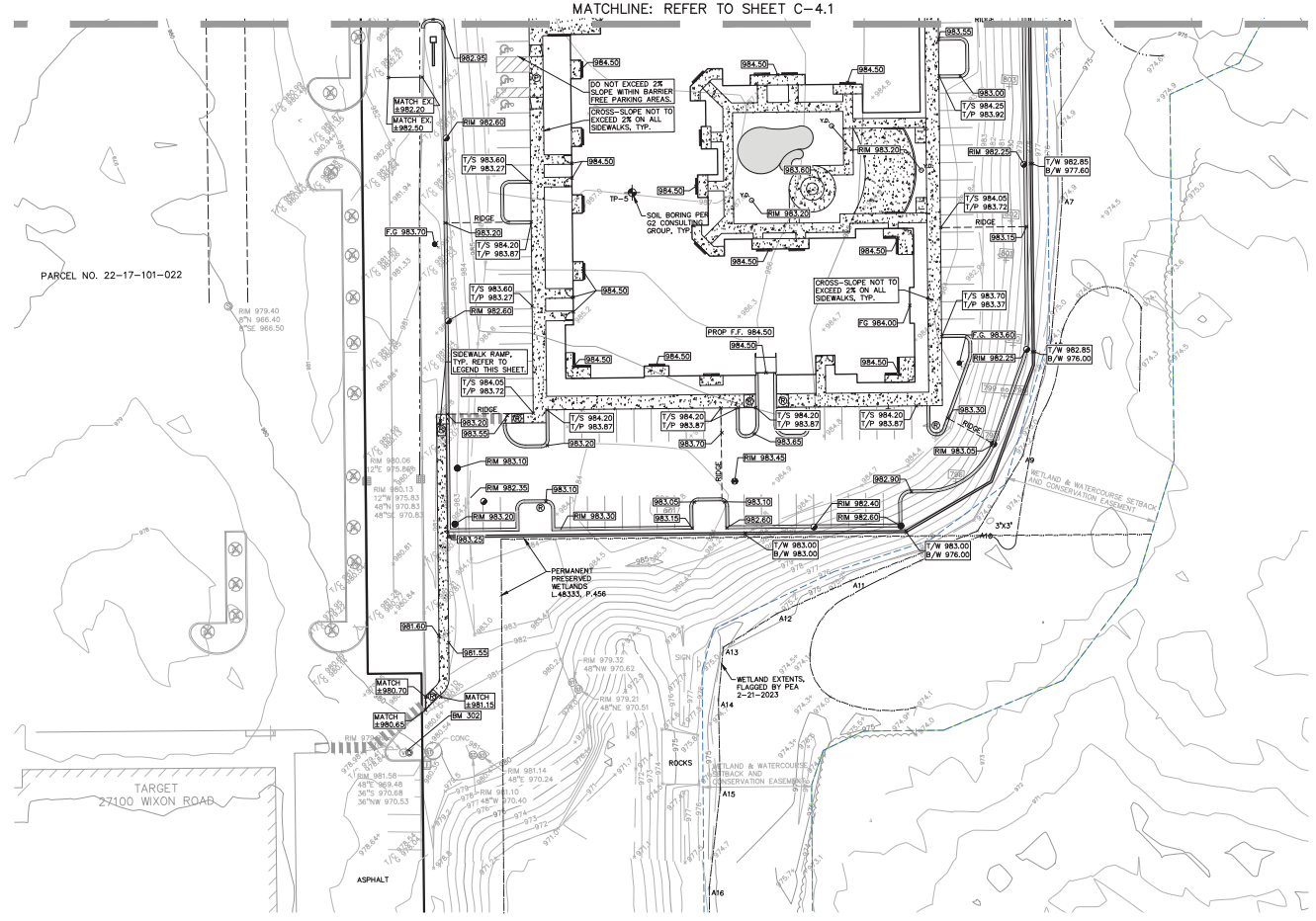
**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/13/2021
2	SPA SUBMITTAL	3/20/2021
3	CITY COMMENTS	5/4/2021

ORIGINAL ISSUE DATE:  
DECEMBER 1, 2022

DRAWING TITLE  
**PRELIMINARY GRADING PLAN-SOUTH**

PEA JOB NO. 2021-0449  
P.M. JPB  
D.N. AJM  
DES. SWS  
DRAWING NUMBER:  
**C-4.2**



S:\PROJECTS\2021\2021-0449-PEA-NOVI-FLATS-GRADING\DWG\C-4.2-GRADING-2024.dwg

NOT FOR CONSTRUCTION



**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DIMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27200 WIXOM RD.)  
ELEV. - 986.57

BM #201  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27200 WIXOM RD.)  
ELEV. - 984.93

BM #202  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.)  
ELEV. - 982.19

**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTRAL LINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK  
ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHWEST QUAD OF INTERSECTION OF WIXOM ROAD AND #27225 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB  
ELEV. 981.30

BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD  
ELEV. 975.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "C" AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C06067, DATED SEPTEMBER 29, 2006.

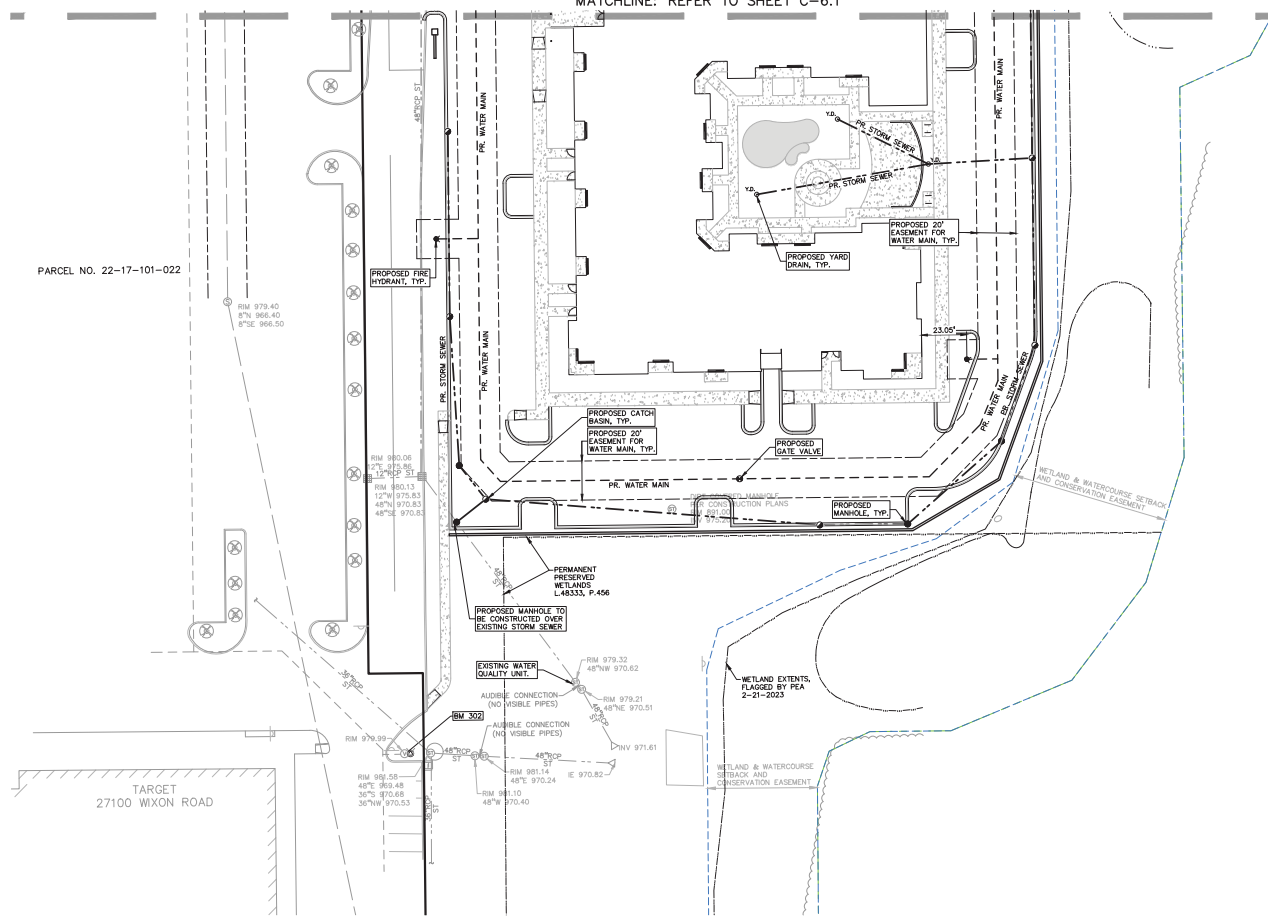
**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan

Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.25 feet, chord bears North 39 degrees 16 minutes 37 seconds East, 23.25 feet, distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 50.51 feet; thence South 89 degrees 23 minutes 02 seconds East, 399.93 feet; thence South 00 degrees 36 minutes 59 seconds West 1409.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.26 feet; thence North 00 degrees 19 minutes 49 seconds West 158.00 feet; thence North 89 degrees 34 minutes 38 seconds West 180.07 feet; thence North 00 degrees 04 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 00 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

PARCEL NO. 22-17-101-022

MATCHLINE: REFER TO SHEET C-6.1



**LEGEND**

**EXISTING**

- NON FOUND
- FOUND
- WALL EXISTING
- WALL & CURB SET
- BRICKS PLUS SET
- MONUMENT FOUND
- MONUMENT SET

**PROPOSED**

- ELEC. PHONE OR CABLE TV (CALL RAIL, POLE & DUCT) (RELOCATED) (NEW) (BY CITY REQUEST)
- TELEPHONE VAL. CAB. (FEEDS) (A) (MANHOLE)
- ELECTRIC VAL. CAB. (FEEDS) (A) (MANHOLE)
- ELECTRIC VAL. CAB. (FEEDS) (A) (MANHOLE)
- WATER VALVE (FEEDS) (A) (MANHOLE)
- STORM SEWER CLEANOUT & MANHOLE
- CONCRETE DRIVE & MANHOLE
- POST (BEFORE) (VALVE)
- SQUARE BOARD & REDDIE CATCH-BAR (VALVE) (DRINK)
- WATER VALVE (FEEDS) (A) (MANHOLE) (BEFORE) (DRINK)
- MANHOLE TRANSFORMER (FEEDS) (A) (MANHOLE) (BEFORE) (DRINK)
- MANHOLE (BEFORE) (DRINK)
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GRAVEL PAD
- STEEL BOLT
- BRN
- CONC.
- ASPH.
- GRAVEL SHOULDER
- GRAVEL
- WETLAND

**REFERENCE DRAWINGS**

- SANITARY SEWER CITY OF NOVI GIS MAP, DATED 08/20/21
- STORM SEWER CITY OF NOVI GIS MAP, DATED 08/20/21

**PEA GROUP**  
t. 844.813.2949  
www.peagroup.com

**STATE OF MICHIGAN**  
JAMES J. PEASLEY  
PROFESSIONAL ENGINEER  
NO. 26003

**NORTH**

0 15 30 60  
SCALE: 1" = 30'

**811**

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**C-X-2**

**CLIENT**  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

**PROJECT TITLE**  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

PRE-APPLICATION SUBMITTAL	1/13/2023
SPA SUBMITTAL	3/9/2023
CITY COMMENTS	5/4/2023

**CITY OF NOVI**

**ORIGINAL ISSUE DATE:**  
DECEMBER 1, 2022

**DRAWING TITLE**  
**PRELIMINARY UTILITY PLAN-SOUTH**

**PEA JOB NO.** 2021-0449  
**P.M.** JPB  
**DN.** AJM  
**DES.** SWS  
**DRAWING NUMBER:** C-6.2

NOT FOR CONSTRUCTION



**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DIMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27200 WIXOM RD.)  
ELEV. - 986.37

BM #201  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27200 WIXOM RD.)  
ELEV. - 984.93

BM #202  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.)  
ELEV. - 982.19

CITY OF NOW (REFERENCE BENCHMARKS)  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTERLINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK  
ELEV. 974.22

BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHEAST QUAD OF INTERSECTION OF WIXOM ROAD AND #27225 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB  
ELEV. 981.30

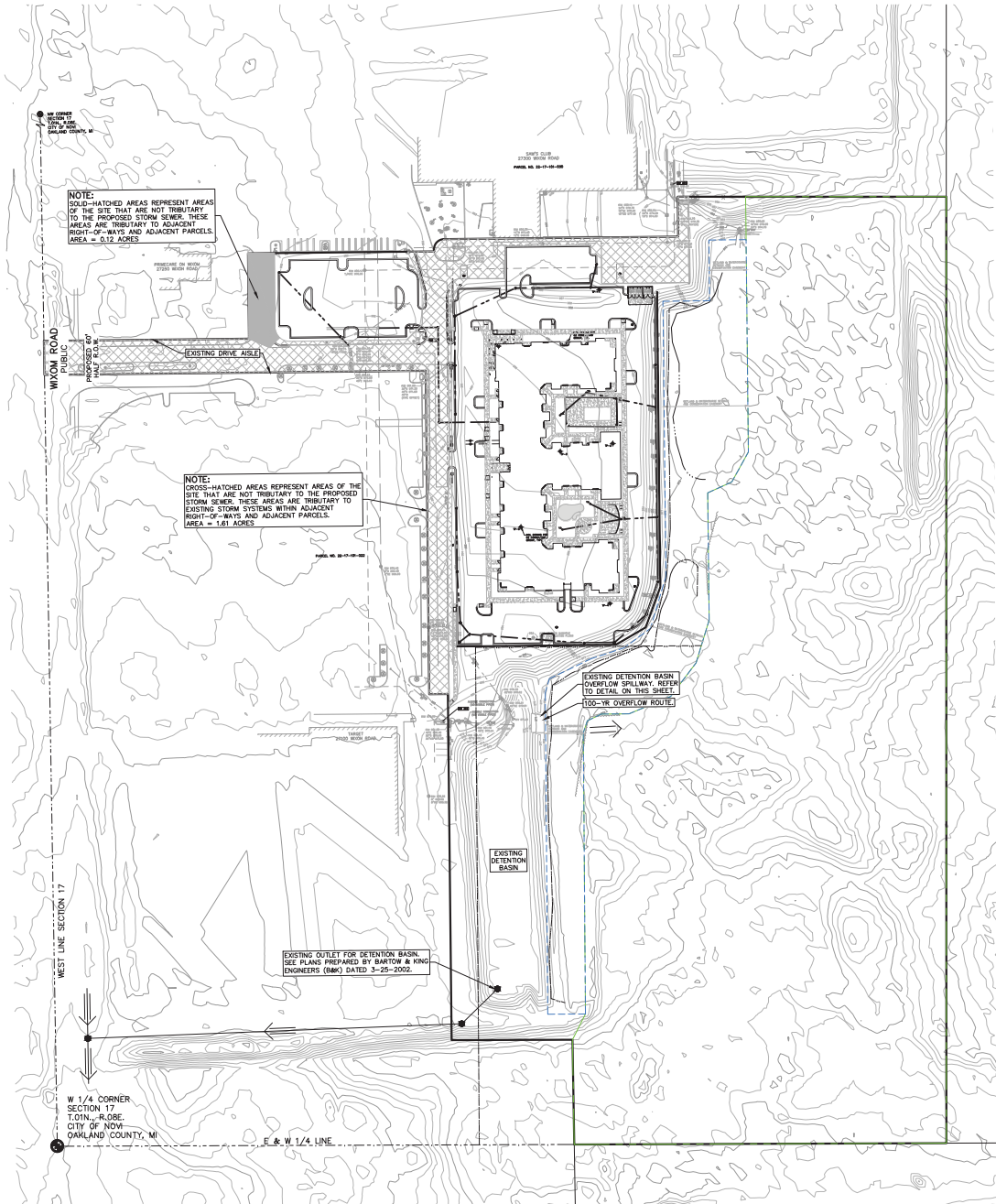
BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD  
ELEV. 976.77

**FLOODPLAIN NOTE:**  
BY GRAPHICAL PLOTTING, SITE IS WITHIN ZONE "C" AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C06067, DATED SEPTEMBER 29, 2006.

**NOTE:**  
SOLID-HATCHED AREAS REPRESENT AREAS OF THE SITE THAT ARE NOT TRIBUTARY TO THE PROPOSED STORM SEWER. THESE AREAS ARE TRIBUTARY TO ADJACENT RIGHT-OF-WAYS AND ADJACENT PARCELS.  
AREA = 0.12 ACRES

**NOTE:**  
CROSS-HATCHED AREAS REPRESENT AREAS OF THE SITE THAT ARE NOT TRIBUTARY TO THE PROPOSED STORM SEWER. THESE AREAS ARE TRIBUTARY TO EXISTING STORM SYSTEMS WITHIN ADJACENT RIGHT-OF-WAYS AND ADJACENT PARCELS.  
AREA = 1.61 ACRES

EXISTING OUTLET FOR DETENTION BASIN.  
SEE PLANS PREPARED BY BARTOW & KING ENGINEERS (B&K) DATED 3-25-2002.



**LEGEND**

● ROCK FOUND	○ BRASS PLUG SET	○ CONC. CORNER FOUND
○ IRON SET	○ IRON CORNER FOUND	■ MEASURED
○ WALL EXISTING	○ MONUMENT SET	○ MEASURED
○ WALL & TOP SET		○ CALCULATED

**EXISTING**

- OH-ELEC— OH-ELEC: PHONE OR CABLE TV ON LINE, POLE & DUCT W/RE UNDERGROUND/CABLE TV OVERHEAD
- US-CABLE— TELEPHONE U.S. CABLE, RESIDENTIAL & BUSINESS
- US-PHONE— TELEPHONE U.S. CABLE, RESIDENTIAL & BUSINESS
- GAS— GAS MAIN, WATER, SEWER & MARIJUANA
- WATERSHED— W/RE: GATE VALVE, TAPPING SUBSEA & VALVE
- SANITARY SEWER— CLEANOUT & MANHOLE
- STORM SEWER— CLEANOUT & MANHOLE
- CONCRETE— CONCRETE
- SQUARE BOARD & BEEHIVE CATCH BASIN, VHS DOWN
- POST REDUCING/STAIR
- WATER VALVE, BACKFLOW PREVENTER VALVE BOX, SERVICE SHED/OUTLET
- MANHOLE, TRANSFORMER, INVERTATION CONTROL VALVE
- UNBUILT/UNDER CONSTRUCTION

**PROPOSED**

- STORM SEWER
- SANITARY SEWER
- STREET LIGHT
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- SURVEY LINE
- STREET LIGHT
- SIGN
- CONC. CONCRETE
- ASPHALT ASPHALT
- GRAVEL SHOULDER
- GRAVEL GRAVEL
- WETLAND

**REFERENCE DRAWINGS**

- SANITARY SEWER CITY OF NOW GIS MAP, DATED 08/03/2011
- STORM SEWER CITY OF NOW GIS MAP, DATED 08/03/2011

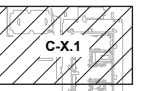
**PEA GROUP**  
t. 844.813.2949  
www.peagroup.com



**811**

SCALE: 1" = 80'

**CAUTION!**  
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**STORM WATER MANAGEMENT:**

PER THE CONSTRUCTION PLANS PREPARED BY BARTOW & KING ENGINEERS (B&K) (DATED 3-25-2002), THE AREA OF PROPOSED "STATION FLATS" DEVELOPMENT WAS INCLUDED IN THE TRIBUTARY AREA FOR THE SIZING OF THE DETENTION BASIN FOR THE OVERALL "NOW PROMENADE" DEVELOPMENT. THIS BASIN WAS RECONFIGURED IN 2015, BUT THE BASIN IS STILL SIZED TO HANDLE THE FLOW FROM THIS PROPOSED DEVELOPMENT. THEREFORE, NO STORM WATER DETENTION IS REQUIRED.

PER THE "B&K" PLANS THIS EXISTING BASIN PROVIDED 232,000 CUBIC FEET OF STORAGE FOR A 100 YEAR EVENT. THE OUTLET STRUCTURE HAS BEEN SIZED TO RESTRICT THE OUTFLOW TO 7.22 CFS.

THE EXISTING STORM SEWER CONVEYANCE SYSTEM HAS A PRE-TREATMENT STRUCTURE AT THE POINT OF DISCHARGE IN TO THE DETENTION BASIN.

CLIENT  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

PROJECT TITLE  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

PRE-APPLICATION SUBMITTAL	1/13/2021
BPA SUBMITTAL	3/9/2021
CITY COMMENTS	5/4/2021

ORIGINAL ISSUE DATE:  
DECEMBER 1, 2022

DRAWING TITLE  
**STORM WATER MANAGEMENT PLAN**

PEA JOB NO.	2021-0449
P.M.	JPB
DN.	AJM
DES.	SWS

DRAWING NUMBER:  
**C-8.1**

NOT FOR CONSTRUCTION

**BENCHMARKS**  
(GPS DERIVED - NAVD83)

BM #200  
DIMPLE IN ARROW ON A HYDRANT LOCATED NEAR THE NORTHEAST PROPERTY CORNER, APPROX. 63' EAST FROM THE EAST WALL OF SAM'S CLUB (27300 WIXOM RD.).  
ELEV. - 986.57'

BM #201  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 180' SOUTHWEST FROM THE SOUTHWEST BUILDING CORNER OF SAM'S CLUB (27300 WIXOM RD.).  
ELEV. - 984.93'

BM #202  
DIMPLE IN ARROW ON A HYDRANT LOCATED APPROX. 67' EAST FROM THE NORTHEAST BUILDING CORNER OF TARGET (27100 WIXOM RD.).  
ELEV. - 982.19'

**CITY OF NOVI (REFERENCE BENCHMARKS)**  
(VERT. DATUM NAVD83, HORIZ. DATUM NAVD83)

BM #1711  
X ON NORTH RM OF GATEWELL LOCATED 200 FEET NORTH OF ENTRANCE TO SAM'S CLUB GAS STATION, 36 FEET EAST OF CENTERLINE OF WIXOM ROAD AND 3 FEET WEST OF SIDEWALK.  
ELEV. 974.22'

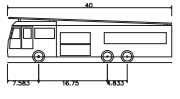
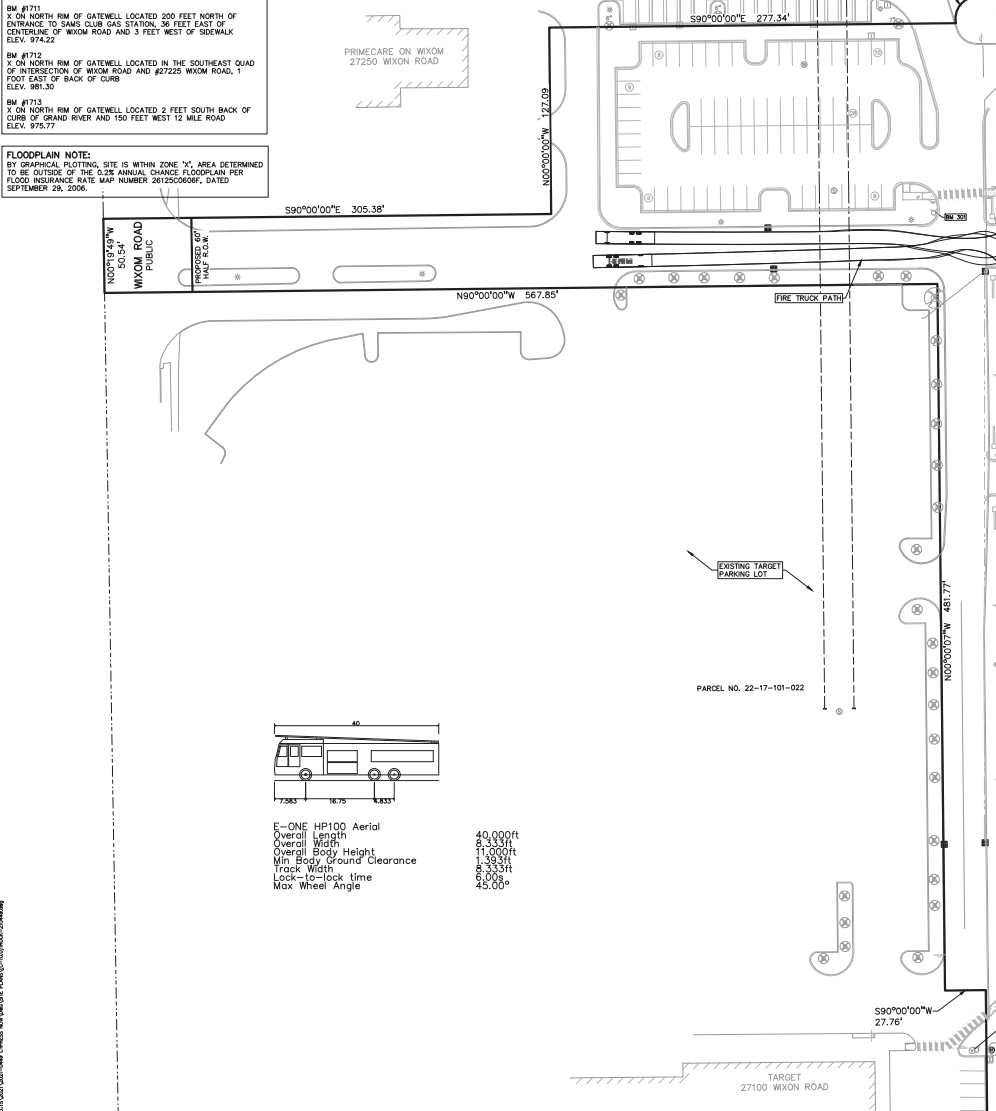
BM #1712  
X ON NORTH RM OF GATEWELL LOCATED IN THE SOUTHWEST QUAD OF INTERSECTION OF WIXOM ROAD AND #27255 WIXOM ROAD, 1 FOOT EAST OF BACK OF CURB.  
ELEV. 981.30'

BM #1713  
X ON NORTH RM OF GATEWELL LOCATED 2 FEET SOUTH BACK OF CURB OF GRAND RIVER AND 150 FEET WEST 12 MILE ROAD.  
ELEV. 975.77'

**LEGAL DESCRIPTION**  
(Per ATA National Title Group File No. 63-21794529-SCM, Commitment Date August 03, 2021)

The land referred to in this commitment is described as follows: City of Novi, County of Oakland, State of Michigan  
Part of the Northwest 1/4 of Section 17, Town 1 North, Range 8 East, beginning at a point distant South 00 degrees 19 minutes 49 seconds East 1440.12 feet from the Northwest Section corner; thence South 90 degrees 00 minutes 00 seconds East 305.38 feet; thence North 00 degrees 00 minutes 00 seconds West 127.09 feet; thence South 90 degrees 00 minutes 00 seconds East 277.34 feet; thence along curve to the right, radius 15.25 feet, chord bears North 39 degrees 16 minutes 37 seconds East, 23.25 feet; distance of 26.57 feet; thence South 90 degrees 00 minutes 00 seconds East 348.95 feet; thence North 00 degrees 00 minutes 00 seconds East 59.51 feet; thence South 89 degrees 23 minutes 02 seconds East, 39.93 feet; thence South 00 degrees 36 minutes 58 seconds West 1405.63 feet; thence North 89 degrees 34 minutes 38 seconds West 554.28 feet; thence North 00 degrees 19 minutes 49 seconds West 158.00 feet; thence North 89 degrees 34 minutes 38 seconds West 180.07 feet; thence North 00 degrees 00 minutes 04 seconds West 515.53 feet; thence South 90 degrees 00 minutes 00 seconds West 27.76 feet; thence North 00 degrees 00 minutes 07 seconds West 481.77 feet; thence North 90 degrees 00 minutes 00 seconds West 567.85 feet; thence North 00 degrees 19 minutes 49 seconds West 50.54 feet to beginning.

**FLOODPLAIN NOTE:**  
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E - ONE HP100 Aerial  
Overall Length 40.000ft  
Overall Width 8.333ft  
Overall Height 11.000ft  
Min. Body Ground Clearance 4.350ft  
Track Width 8.000ft  
Lock-to-Lock Time 9.00s  
Max Wheel Angle 45.00°

SAM'S CLUB  
27300 WIXOM ROAD  
PARCEL NO. 22-17-101-030

**LEGEND**

**EXISTING**

- NON FOUND
- FOUND
- WALL EXISTING
- WALL & CURB SET
- BRICKS PLUS SET
- MONUMENT FOUND
- MONUMENT SET
- REC. CORNER FOUND
- MEASURED
- MEASURED & CALCULATED

**PROPOSED**

- ELEC. POLE OR CABLE TO GUY WIRE, POLE & GUY WIRE
- UNDERGROUND CABLE TO GUY WIRE
- TELEPHONE W/ALC. FEEDS, A/B W/ALC.
- ELECTRIC GUY WIRE, W/ALC. FEEDS, A/B W/ALC.
- GAS MAIN, VALVE, GAS FEED W/ALC.
- NATURAL GAS, GUY WIRE, TAPPING BLEED & VALVE
- SEWER MAIN, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- CONCRETE DRIVE & MANHOLE
- POST FOUND OR VALVE
- SIGNAL FOUND & REDUCED CATCH-BASIN, VALVE FOUND
- WATER VALVE, REAR/HAND VALVE BOX, SERVICE DUCT/POST
- MANHOLE TRANSFORMER, HYDRANT CONTROL VALVE
- MANHOLE STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- GRADE PAIR
- STREET LIGHT
- RAIN
- CONC.
- ASPH.
- GRAVEL
- GRAVEL SHOULDER
- WETLAND

**REFERENCE DRAWINGS**

- WETLAND & WATERCOURSE SERVICE AND CONSERVATION EASEMENT CITY OF NOVI GIS MAP, DATED 08/20/21
- SANITARY SEWER CITY OF NOVI GIS MAP, DATED 08/20/21
- STORM SEWER CITY OF NOVI GIS MAP, DATED 08/20/21

**SCALE:** 1" = 40'

**811**

**CAUTION!**  
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**C-X.1**  
**C-X.2**

**CLIENT**  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

**PROJECT TITLE**  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/13/2021
2	SP4 SUBMITTAL	3/9/2021
3	CITY COMMENTS	5/4/2021

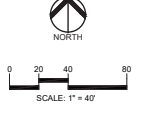
**ORIGINAL ISSUE DATE:**  
DECEMBER 1, 2022

**DRAWING TITLE**  
**FIRE TRUCK TURNING PLAN**

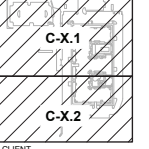
**PEA JOB NO.** 2021-0449  
**P.M.** JPB  
**DN.** AJM  
**DES.** SWS

**DRAWING NUMBER:**  
**C-10.0**

**PEA GROUP**  
T. 844.813.2949  
www.peagroup.com



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**CLIENT**  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

**PROJECT TITLE**  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MICHIGAN

**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/13/2021
2	SP4 SUBMITTAL	3/9/2021
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**ORIGINAL ISSUE DATE:**  
DECEMBER 1, 2022

**DRAWING TITLE**  
**FIRE TRUCK TURNING PLAN**

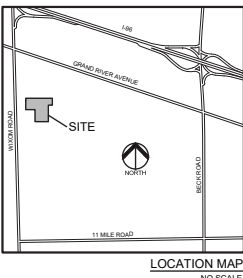
**PEA JOB NO.** 2021-0449  
**P.M.** JPB  
**DN.** AJM  
**DES.** SWS

**DRAWING NUMBER:**  
**C-10.0**

**NOT FOR CONSTRUCTION**



Map Unit Symbol	Map Unit Name	Acres in ACP	Percent of ACP
10B	Medium sandy loam, 1 to 6 percent slopes	4.8	29.7%
11B	Coarse sandy loam, 0 to 4 percent slopes	10.4	66.8%
27	Houghton and Adair tracts	0.5	3.5%
Totals for Area of Interest		15.8	100.0%



**SITE DATA TABLE:**

SITE AREA: 24.78 ACRES (1,079,271 SF) NET AND GROSS  
 TAX ID: 22-17-101-032  
 ZONING: I-1 LIGHT INDUSTRIAL  
 PROPOSED RE-ZONE: RM-1 LOW DENSITY MULTIPLE-FAMILY  
 EXISTING USE: VACANT LAND  
 PROPOSED USE: RESIDENTIAL, MULTI-FAMILY

**LANDSCAPE CALCULATION-ENTIRE SITE:**  
 PER CITY OF NOV ZONING ORDINANCE (AMENDED 6.22.17) - ENTIRE SITE  
 BEZIAN, NOVEMBER 2015-2018

**INTERIOR PARKING LOT LANDSCAPE**

REQUIRED LOT 1:  
 SF OF PAVED AREA UNDER 50,000 SF = 21,676 SF x 7.5% = 1,626 SF  
 1,626/200 = 8 CANOPY TREES REQUIRED

REQUIRED LOT 2:  
 SF OF PAVED AREA UNDER 50,000 SF = 18,454 SF x 7.5% = 1,384 SF  
 1,384/200 = 7 CANOPY TREES REQUIRED

REQUIRED LOT 3:  
 SF OF PAVED AREA UNDER 50,000 SF = 11,512 SF x 7.5% = 863 SF  
 863/200 = 5 CANOPY TREES REQUIRED

PROVIDED LOT 1:  
 2,633 SF OF INTERIOR LANDSCAPE ISLAND AREA  
 8, 3" CAL. DEC. TREES ALSO COUNTING AS MULTIFAMILY TREES

PROVIDED LOT 2:  
 7,720 SF OF INTERIOR LANDSCAPE ISLAND AREA  
 7, 3" CAL. DEC. TREES ALSO COUNTING AS MULTIFAMILY TREES

PROVIDED LOT 3:  
 1,164 SF OF INTERIOR LANDSCAPE ISLAND AREA  
 5, 3" CAL. DEC. TREES ALSO COUNTING AS MULTIFAMILY TREES

**PERIMETER PARKING LOT TREES**

REQUIRED LOT 1:  
 DECIDUOUS TREE PER 35 LF  
 606 LF/35 = 17 TREES

REQUIRED LOT 2:  
 DECIDUOUS TREE PER 35 LF  
 498 LF/35 = 14 TREES

REQUIRED LOT 3:  
 DECIDUOUS TREE PER 35 LF  
 205 LF/35 = 6 TREES

PROVIDED LOT 1:  
 1 EXISTING TREE TO REMAIN AND 16 TREES ALSO COUNTING AS MULTIFAMILY TREES  
 101 ADDITIONAL SHRUBS ADDED PER NOV REVIEW LETTER DATED 2.28.2022

PROVIDED LOT 2:  
 14 TREES ALSO COUNTING AS MULTIFAMILY TREES

PROVIDED LOT 3:  
 6 TREES ALSO COUNTING AS MULTIFAMILY TREES

**INTERIOR ROADWAY TREES**

REQUIRED: 1 DECIDUOUS TREE PER 35 LF ON OUTER ROAD EDGE, DEDUCTING CLEAR VISION ZONE

1,125 LF / 35 = 32 TREES  
 PROVIDED: 32 TREES

**MULTI-FAMILY FOUNDATION PLANTINGS**

REQUIRED: A MIX OF SHRUBS, SUB-CANOPY TREES, GROUNDCOVERS, PERENNIALS, ANNUALS AND/OR ORNAMENTAL GRASSES PROVIDED AT THE FRONT OF EACH GROUND FLOOR UNIT COVERING 35% OF BUILDING FACADE.

1,238 LF x .35 = 418 LF REQUIRED  
 PROVIDED: 1,100 LF

**UNIT TREE PLANTINGS**

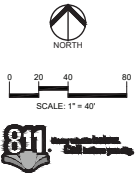
REQUIRED: 1 DECIDUOUS TREES OR LARGE EVERGREENS PER EACH DWELLING UNIT ON THE FIRST FLOOR. 35 FIRST FLOOR UNITS x 3 = 105 TREES, WITH UP TO 20% SUB CANOPY TREES FOR DIVERSITY

PROVIDED: 32 LARGE EVERGREENS, 13 DECIDUOUS, 16 SUB CANOPY, 38 PERIMETER PARKING TREES COUNTING AS UNIT TREES, AND 20 INTERIOR PARKING TREES COUNTING AS UNIT TREES

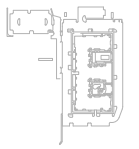
**NOTE:**  
 7 OVERHEAD UTILITY LINES  
 HIGHLAND DRAINAGE WAS COMPLETED ON 2/20/2023



- KEY**
- INTERIOR PARKING TREES COUNTING AS MULTI-FAMILY TREES
  - PARKING PERIMETER TREES COUNTING AS MULTI-FAMILY TREES
  - INTERIOR ROADWAY TREES
  - MULTI-FAMILY LANDSCAPE TREES
  - ADDITION TREES PER CITY COMMENT
  - EXISTING TREE
  - TREE PROTECTION FENCING
  - FOUNDATION PLANTS TO BE DETAILED AT CONSTRUCTION
  - SHRUBS
  - IRRIGATED SEED LAWN
  - NONIRRIGATED SEED LAWN
  - ECONOMY PRAIRIE SEED MIX BY EROSION MAT
  - FOUNDATION PLANTS TO BE DETAILED AT CONSTRUCTION
  - IRRIGATED SEED LAWN
  - NONIRRIGATED SEED LAWN
  - ECONOMY PRAIRIE SEED MIX BY EROSION MAT



**CAUTION!**  
 THIS PLAN IS PRELIMINARY AND SUBJECT TO CHANGE WITHOUT NOTICE. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND CONDITIONS OF THE SITE PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.



CLIENT  
**MF NOVI, LLC.**  
 280 WEST MAPLE RD. SUITE 230  
 GOSHEN, IN 46540

PROJECT TITLE  
**THE STATION FLATS**  
 WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
 48061-0000

**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/13/2023
2	SPA SUBMITTAL	3/9/2023
3	CITY COMMENTS	5/4/2023

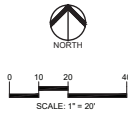
ORIGINAL ISSUE DATE:  
 DECEMBER 1, 2022  
 DRAWING TITLE  
**PRELIMINARY LANDSCAPE PLAN-OVERALL**

PEA JOB NO. 2021-0449

P.M.	JPB
D.N.	AEM
D.S.	LAW

DRAWING NUMBER:  
**L-1.0**

**NOT FOR CONSTRUCTION**



**CAUTION!**  
 This drawing is not to be used for construction without the approval of the engineer of record. Any changes to this drawing must be approved in writing by the engineer of record. The engineer of record is not responsible for any errors or omissions in this drawing.



**L-1.0**

**CLIENT**  
**MF NOVI, LLC.**  
 280 WEST MAPLE RD., SUITE 230  
 GRAND RAPIDS, MI 49508

**PROJECT TITLE**  
**THE STATION FLATS**  
 WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
 NOVI, MI 48240

**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/18/2023
2	SPA SUBMITTAL	3/9/2023
3	CITY COMMENTS	5/4/2023

**ORIGINAL ISSUE DATE:**  
 DECEMBER 1, 2022

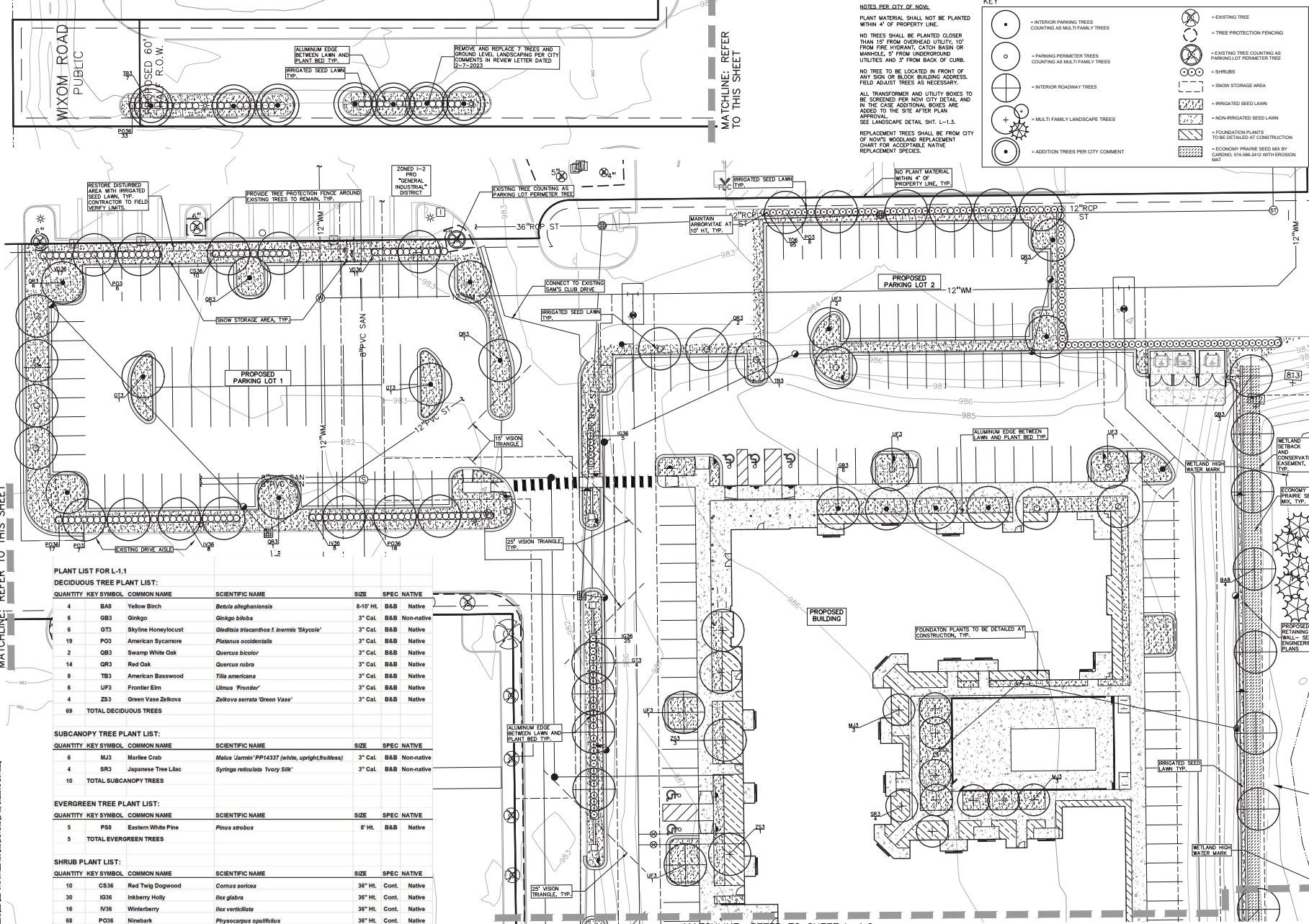
**DRAWING TITLE**  
**PRELIMINARY LANDSCAPE PLAN-NORTH**

**PEA JOB NO.** 2021-0449  
**P.M.** JPB  
**DN.** AEH  
**DES.** LAW  
**DRAWING NUMBER:**

**KEY**

- Interior Parking Trees (Counting as Multifamily Trees)
- Parking Perimeter Trees (Counting as Multifamily Trees)
- Interior Roadway Trees
- Multifamily Landscape Trees
- Addition Trees per City Comment
- Existing Tree
- Tree Protection Fencing
- Existing Tree Counting as Parking Lot Perimeter Tree
- Shrub
- Snow Storage Area
- Irrigated Seed Lawn
- Non-Irrigated Seed Lawn
- Foundation Plants to be Detailed at Construction
- Economy Prairie Seed Mix by Garding, 31A-98B-2412 with Erosion Mat

**NOTES PER CITY OF NOVI:**  
 PLANT MATERIAL SHALL NOT BE PLANTED WITHIN 4' OF PROPERTY LINE.  
 NO TREES SHALL BE PLANTED CLOSER THAN 15' FROM OVERHEAD UTILITY, 10' FROM FIRE HYDRANT, CATCH BASIN OR MANHOLE, 5' FROM UNDERGROUND UTILITIES AND 7' FROM BACK OF CURB.  
 NO TREE TO BE LOCATED IN FRONT OF ANY SIGN OR BLOCK BUILDING ADDRESS. FIELD ADJUST TREES AS NECESSARY.  
 ALL TRANSFORMER AND UTILITY BOXES TO BE SCREENED PER NOVI CITY DETAIL AND IN THE CASE ADDITIONAL BOXES ARE ADDED TO THE SITE AFTER PLAN APPROVAL, SEE LANDSCAPE DETAIL SHT. L-1.3.  
 REPLACEMENT TREES SHALL BE FROM CITY OF NOVI'S HOODLAND REPLACEMENT CHART FOR ACCEPTABLE NATIVE REPLACEMENT SPECIES.



MATCHLINE- REFER TO THIS SHEET

MATCHLINE: REFER TO SHEET L-1.2

**PLANT LIST FOR L-1.1**

**DECIDUOUS TREE PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
4	B48	Yellow Birch	<i>Betula alleghaniensis</i>	8-10' HL	B48	Native
6	QB3	Ginkgo	<i>Ginkgo biloba</i>	3" Cal.	B48	Non-native
6	GT3	Skyline Honeylocust	<i>Gleditsia triacanthos f. inermis 'Skycoke'</i>	3" Cal.	B48	Native
19	PO3	American Sycamore	<i>Platanus occidentalis</i>	3" Cal.	B48	Native
2	QB3	Swamp White Oak	<i>Quercus bicolor</i>	3" Cal.	B48	Native
14	QR3	Red Oak	<i>Quercus rubra</i>	3" Cal.	B48	Native
8	TB3	American Basswood	<i>Tilia americana</i>	3" Cal.	B48	Native
6	UF3	Frontier Elm	<i>Ulmus 'Frontier'</i>	3" Cal.	B48	Native
4	ZB3	Green Vase Zelkova	<i>Zelkova serrata 'Green Vase'</i>	3" Cal.	B48	Native
69		TOTAL DECIDUOUS TREES				

**SUBCANOPY TREE PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
6	MJ3	Marilee Crab	<i>Malus 'Jarmin' PP14337 (white, upright, fruitless)</i>	3" Cal.	B48	Non-native
4	SR3	Japanese Tree Lilac	<i>Syringa reticulata 'Ivory Silk'</i>	3" Cal.	B48	Non-native
10		TOTAL SUBCANOPY TREES				

**EVERGREEN TREE PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
5	PS8	Eastern White Pine	<i>Pinus strobus</i>	8' HL	B48	Native
5		TOTAL EVERGREEN TREES				

**SHRUB PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
10	CS36	Red Twig Dogwood	<i>Cornus sericea</i>	36" HL	Cont.	Native
30	IG36	Inkberry Holly	<i>Ilex glabra</i>	36" HL	Cont.	Native
16	IV36	Winterberry	<i>Ilex verticillata</i>	36" HL	Cont.	Native
68	PO36	Ninebark	<i>Physocarpus opulifolius</i>	36" HL	Cont.	Native
95	TO6	Emerald Green Arborvitae	<i>Thuja occidentalis 'Smaragd'</i>	6' HL	Cont.	Native
28	VD36	Arrowwood Viburnum	<i>Viburnum dentatum</i>	36" HL	Cont.	Native
247		TOTAL SHRUBS				

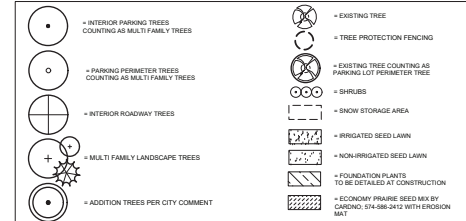
NOT FOR CONSTRUCTION

L-1.1

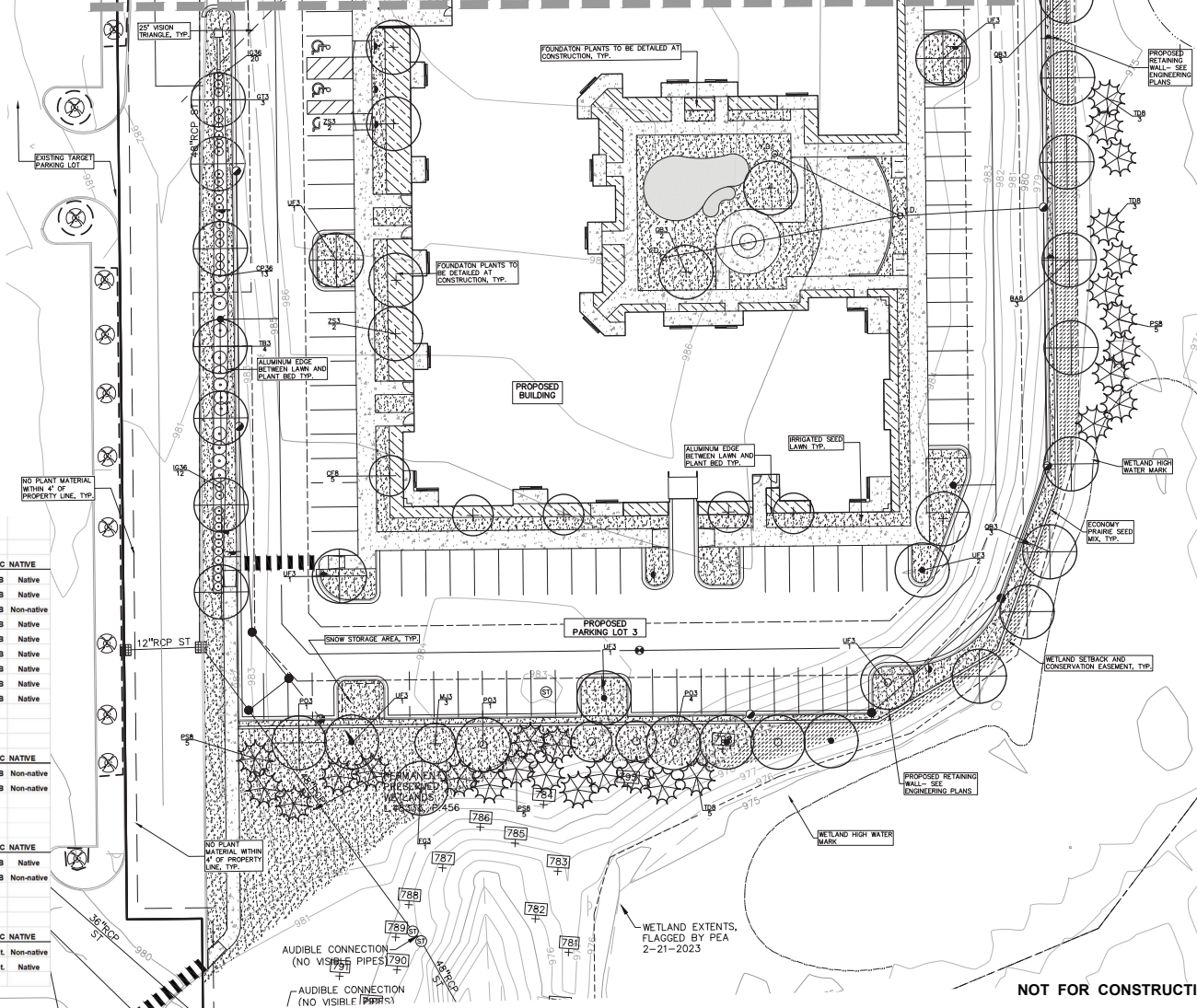
**GENERAL PLANTING NOTES PER CITY OF NOVI:**

- LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING SITE CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, PLAN SHALL GOVERN QUANTITIES. CONTACT LANDSCAPE ARCHITECT WITH ANY CONCERNS.
- CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION. UTILITIES TO BE MARKED BY WORKING ELECTRICAL GAS, TELEPHONE, CABLE, TELEVISION MAY BE LOCATED BY CALLING MISS GARDNER. CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFICATION OF SERVICES. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTRACTOR CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES ON THE JOB AND SHALL REPORT ANY UNACCEPTABLE JOB CONDITIONS TO OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT.
- ALL PLANT MATERIALS ARE TO BE NORTHERN NURSERY GROWN NO. 1, AND INSTALLED ACCORDING TO ACCEPTED PLANTING PROCEDURES. ALL PLANT MATERIAL SHALL CONFORM TO THE CURRENT (ANNUAL) STANDARDS FOR NURSERY STOCK. THEY SHALL BE PLANTED ACCORDING TO THE CITY OF NOVI PLANTING AND SPECIFICATIONS. THE CITY SHALL HAVE THE RIGHT TO INSPECT THE PLANT MATERIAL PRIOR TO PLANTING AND TO REJECT ANY PLANT MATERIALS DEEMED NOT TO MEET THE STANDARDS OF THE ZONING ORDINANCE.
- ALL TREES SHALL HAVE A CENTRAL LEADER AND A RADIAL BRANCHING STRUCTURE. PARK GRADE TREES ARE NOT ACCEPTABLE. ALL TREES SHALL BE BALLED AND BURLAPPED (B&B). ANY DECIDUOUS CANOPY TREE WITH BRANCHES THAT MIGHT TEND TO DEVELOP INTO "Y" CROTCHES SHALL BE SUBSPRINTED SO AS NOT TO BECOME DOMINANT BRANCHES.
- ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE-SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.
- ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.
- NO MAINTENANCE IS TO BE USED WITHIN THE DRIP LINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN THE DRIP LINE OF EXISTING TREES.
- MULCH SHALL BE NATURAL COLOR, FINELY SHREDDED HARDWOOD BARK FOR ALL PLANTINGS. 3" THICK FOR TREES IN 4'-FOOT DIAMETER CIRCLE WITH 3" PULLED AWAY FROM TRUNK. 2" THICK FOR SHRUBS AND SHRUB BEDS AND 2" THICK BARK MULCH FOR PERENNIALS.
- ALL LAWN AREAS SHALL RECEIVE 3" COMPACTED TOPSOIL.
- ALL PLANT MATERIALS SHALL BE MAINTAINED IN A HEALTHY GROWING CONDITION, INCLUDING WATERING, CULTIVATION, WEED CONTROL AND SOIL ENRICHMENTS AS MAY BE NECESSARY.
- ALL PLANT MATERIALS ARE TO BE INSTALLED IN A SOUND, WORKMAN-LIKE MANNER AND IN ACCORDANCE WITH THE CURRENT CITY OF NOVI PLANTING REQUIREMENTS.
- ALL PLANT MATERIAL SHALL BE INSTALLED BETWEEN MARCH 15TH AND NOVEMBER 15TH.
- ALL PLANT MATERIAL SHALL BE WARRANTED FOR 360 (3) FULL YEARS AFTER DATE OF ACCEPTANCE BY THE CITY OF NOVI. ALL UNHEALTHY AND DEAD MATERIAL SHALL BE REPLACED WITHIN 3 MONTHS OR DURING THE FIRST AVAILABLE GROWING SEASON, OR WHICH EVER COMES FIRST.
- A MINIMUM OF ONE WEED CONTROL CULTIVATION PER MONTH OCCURRING IN JUNE, JULY AND AUGUST IS TO BE PERFORMED DURING THE TWO-YEAR ESTABLISHMENT PERIOD.
- ANY SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED IN WRITING BY THE CITY OF NOVI PRIOR TO INSTALLATION.
- ALL TREE WRAP, STAKES, AND CUTS MUST BE REMOVED BY JULY 1ST, FOLLOWING THE FIRST WINTER SEASON AFTER INSTALLATION.
- ALL LANDSCAPE AREAS ARE TO BE MAINTAINED IN A HEALTHY GROWING CONDITION FREE OF DEBRIS AND REFUSE AND IN CONFORMANCE WITH THE APPROVED LANDSCAPE PLAN.
- ALL LANDSCAPE AREAS ARE TO BE WATERED BY A FULLY AUTOMATIC IRRIGATION SYSTEM.
- CONTRACTOR TO REMOVE ALL CONSTRUCTION DEBRIS AND EXCESS MATERIALS FROM THE SITE PRIOR TO FINAL ACCEPTANCE.
- PLANT MATERIALS, EXCEPT SOIL, GROUND COVER, AND CREEPING VINE TYPE PLANTINGS, SHALL NOT BE LOCATED WITHIN FOUR(4) FEET OF THE PROPERTY LINE.
- ALL TRANSFORMERS ARE TO BE SCREENED IN ACCORDANCE WITH THE CITY OF NOVI ORDINANCE AND SO AS NOT TO CONFLICT WITH D.T.E. RESTRICTIONS. (DETAIL THIS SHEET)
- ALL BEAMS MUST BE PLANTED WITH A COMBINATION OF TREES, SHRUBS, SOIL OR OTHER EVERGREEN GROUND COVERS.
- THE OWNER IS RESPONSIBLE FOR REQUEST OF FINAL INSPECTION AND ACCEPTANCE OF THE LANDSCAPE AT THE END OF THE 2-YEAR GUARANTEE PERIOD.
- THE PROVIDER OF THE FINANCIAL GUARANTEE FOR THE LANDSCAPE INSTALLATION SHALL BE FULLY RESPONSIBLE FOR COMPLETION OF THE LANDSCAPE INSTALLATION AND MAINTENANCE PER THE APPROVED LANDSCAPE PLAN AND APPLICABLE CITY ORDINANCES.

**KEY**



MATCHLINE: REFER TO SHEET L-1.1



**PLANT LIST FOR L-1.2**

**DECIDUOUS TREE PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
3	B&B	Yellow Birch	<i>Betula alleghaniensis</i>	8-10' Ht.	B&B	Native
1	FG3	American Beech	<i>Fagus grandifolia</i>	3" Cal.	B&B	Native
2	OB3	Ginkgo	<i>Ginkgo biloba</i>	3" Cal.	B&B	Non-native
3	GT3	Skyline Honeylocust	<i>Gleditsia tricanthos f. inermis 'Skyline'</i>	3" Cal.	B&B	Native
6	PO3	American Sycamore	<i>Platanus occidentalis</i>	3" Cal.	B&B	Native
6	OB3	Swamp White Oak	<i>Quercus bicolor</i>	3" Cal.	B&B	Native
4	TB3	American Basswood	<i>Tilia americana</i>	3" Cal.	B&B	Native
8	UF3	Frontier Elm	<i>Ulmus 'Frontier'</i>	3" Cal.	B&B	Native
4	Z33	Green Vase Zelkova	<i>Zelkova serrata 'Green Vase'</i>	3" Cal.	B&B	Native
37		TOTAL DECIDUOUS TREES				

**SUBCANOPY TREE PLANT LIST:**

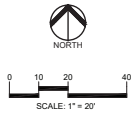
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
5	CF3	Flowering Dogwood	<i>Cornus florida</i>	3" Cal.	B&B	Non-native
3	MJ3	Marlee Crab	<i>Malus 'Jarmain' PP14337 (white, upright/fruitless)</i>	3" Cal.	B&B	Non-native
8		TOTAL SUBCANOPY TREES				

**EVERGREEN TREE PLANT LIST:**

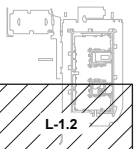
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
15	P&B	Eastern White Pine	<i>Pinus strobus</i>	8' Ht.	B&B	Native
12	TD&	Bald Cypress	<i>Taxodium distichum</i>	8' Ht.	B&B	Non-native
27		TOTAL EVERGREEN TREES				

**SHRUB PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	NATIVE
13	CP36	False Cypress	<i>Chamaecyparis pisifera</i>	36" Ht.	Cont.	Non-native
32	IG36	Inkberry Holly	<i>Ilex glabra</i>	36" Ht.	Cont.	Native
45		TOTAL SHRUBS				



**CAUTION!**  
This drawing is not to be used for construction without the approval of the design professional. It is the responsibility of the user to verify all information and conditions on site before construction begins.



CLIENT  
**MF NOVI, LLC.**  
280 WEST MAPLE RD., SUITE 230  
GRAND RAPIDS, MI 49508

PROJECT TITLE  
**THE STATION FLATS**  
WIXOM RD. BETWEEN GRAND RIVER AVE. AND 11 MILE RD.  
NOVI, MI 48240

**REVISIONS**

NO.	DESCRIPTION	DATE
1	PRE-APPLICATION SUBMITTAL	1/13/2023
2	SPA SUBMITTAL	3/9/2023
3	CITY COMMENTS	5/4/2023

CURRENT ISSUE DATE:  
DECEMBER 1, 2022

DRAWING TITLE  
**PRELIMINARY LANDSCAPE PLAN - SOUTH**

PEA JOB NO. 2021-0449  
P.M. JPB  
D.N. AEH  
DES. LAW  
DRAWING NUMBER:

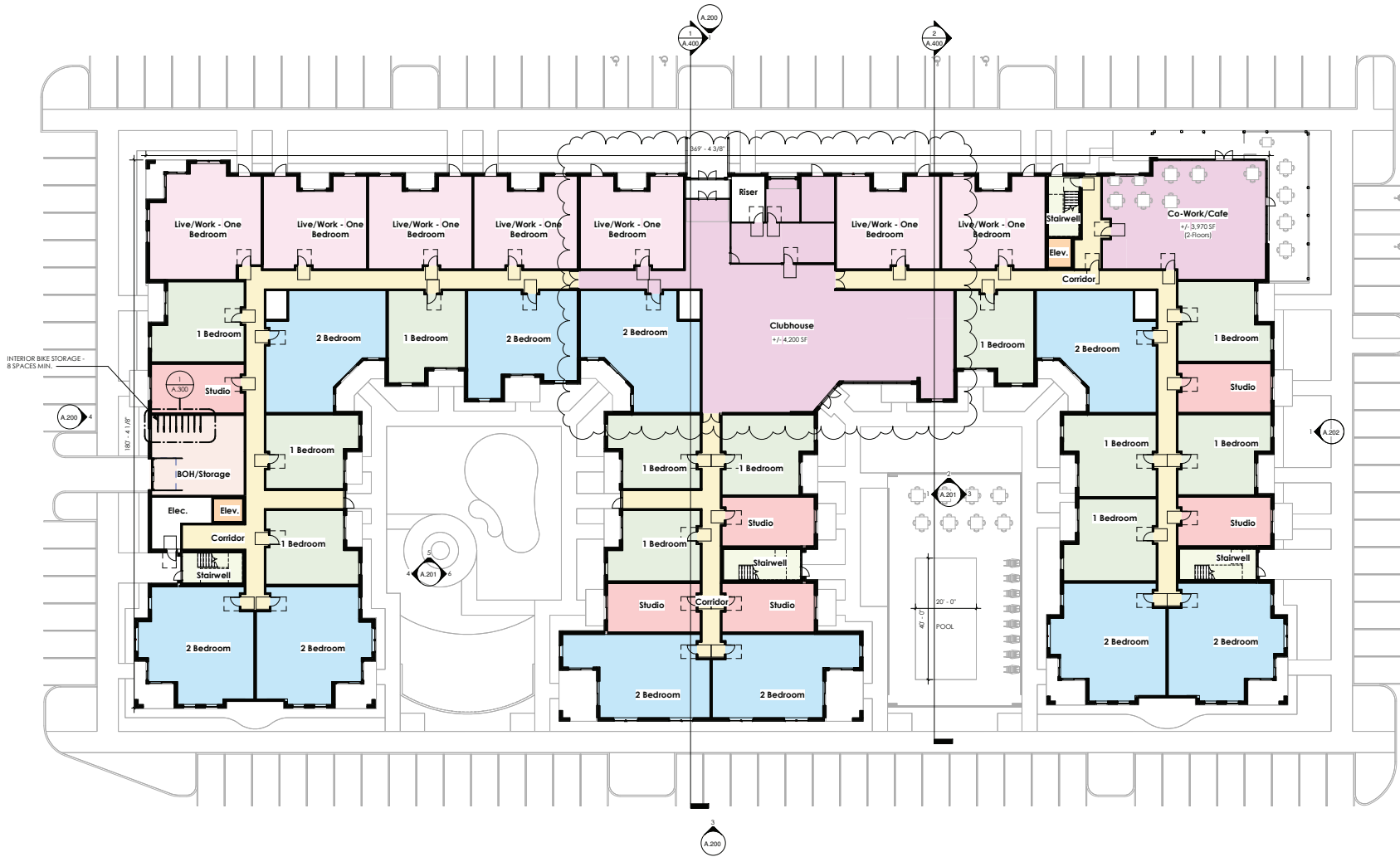
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**NOT FOR CONSTRUCTION**

Client:  
 MF Novi, LLC

Project:  
 Station Flats  
 Wixom Rd  
 Novi, MI

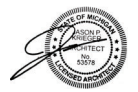
Issued	Description	By
01-13-2023	Prelim SPA	
03-09-2023	Prelim SPA REV	
4-12-2023	REV Unit Mix	
5-4-2023	SPA REV	



First Floor Plan  
 1/16" = 1'-0"

PRELIMINARY NOT FOR CONSTRUCTION

Scale:



Note:  
 Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:



Sheet Title:  
 First Floor Plan

Project Number:

22-022

Scale:

As indicated

Sheet Number:

A.100

UNIT MIX						
APARTMENT COMPLEX	Live/Work SF VARIES (2 ROOMS PER UNIT)	STUDIO - 500 SF (1 ROOM PER UNIT)	1 BEDROOM - 720 SF (2 ROOMS PER UNIT)	2 BEDROOM - 1,250 SF (3 ROOMS PER UNIT)	3 BEDROOM - 1,600 SF (4 ROOMS PER UNIT)	TOTAL
FIRST FLOOR	7	6	12	10	0	35
SECOND FLOOR	0	6	16	18	0	40
THIRD FLOOR	0	7	16	19	0	42
FOURTH FLOOR	0	5	16	17	2	40
TOTAL	7 (14 ROOMS)	24 (24 ROOMS)	60 (120 ROOMS)	64 (186 ROOMS)	2 (8 ROOMS)	157 (352 ROOMS TOTAL)
RATIO	5%	15%	38%	41%	1%	100%

MAX ROOM COUNT ALLOWED - 8.04 acres = 350,222.4 SF / 700 SF = 500 ROOMS ALLOWED ON SITE







Issued	Description	By
01-13-2023	Prelim SPA	
03-09-2023	Prelim SPA REV	
4-12-2023	REV Unit Mix	
5-4-2023	SPA REV	

Seal:



Note:  
Do not scale drawings. Use  
calculated dimensions only.  
Verify existing conditions in  
field.

North Arrow:

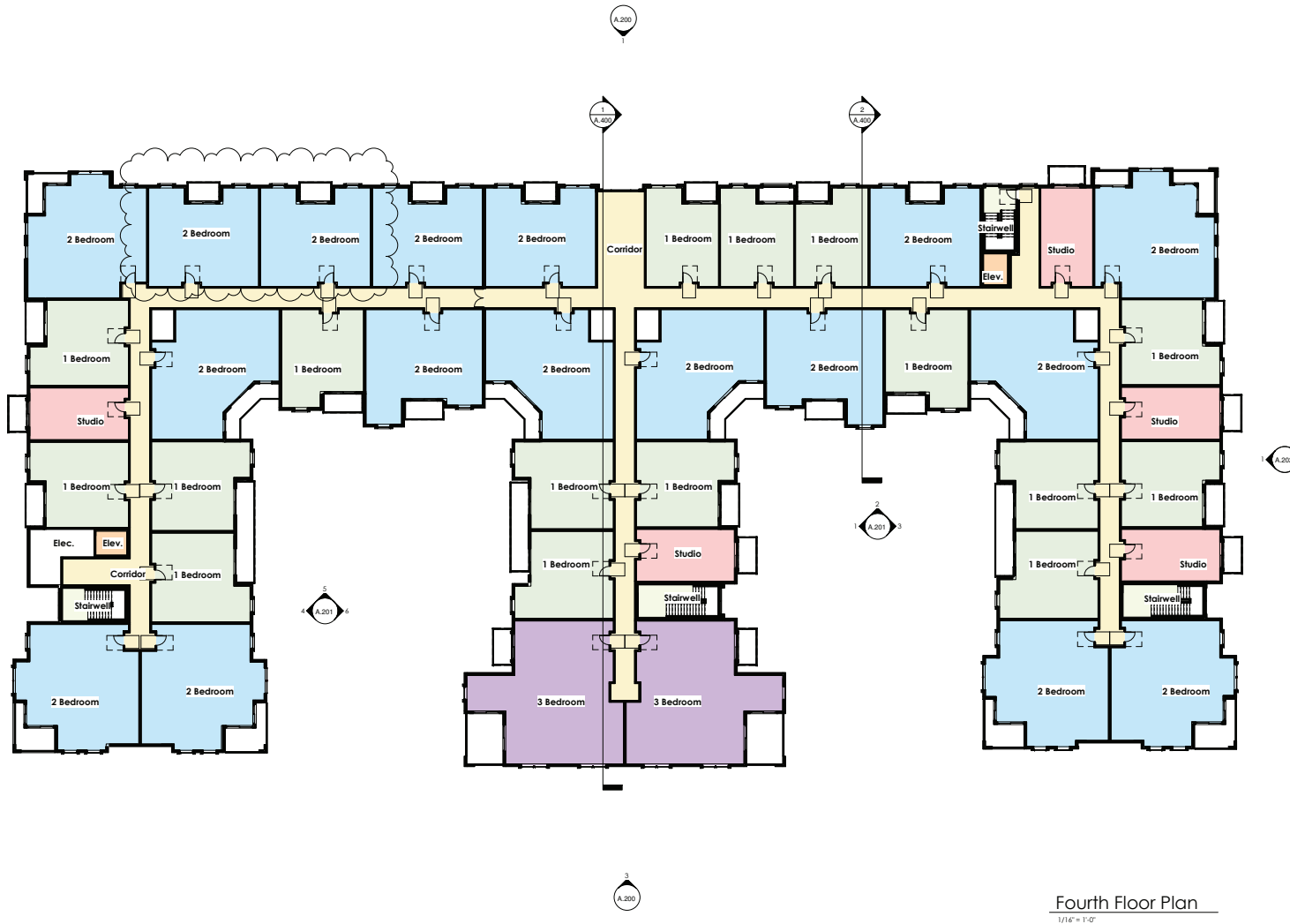


Sheet Title:  
Fourth Floor Plan

Project Number:  
22-022  
Scale:  
As indicated

Sheet Number:  
**A.103**

**PRELIMINARY NOT FOR CONSTRUCTION**



**Fourth Floor Plan**  
1/16" = 1'-0"

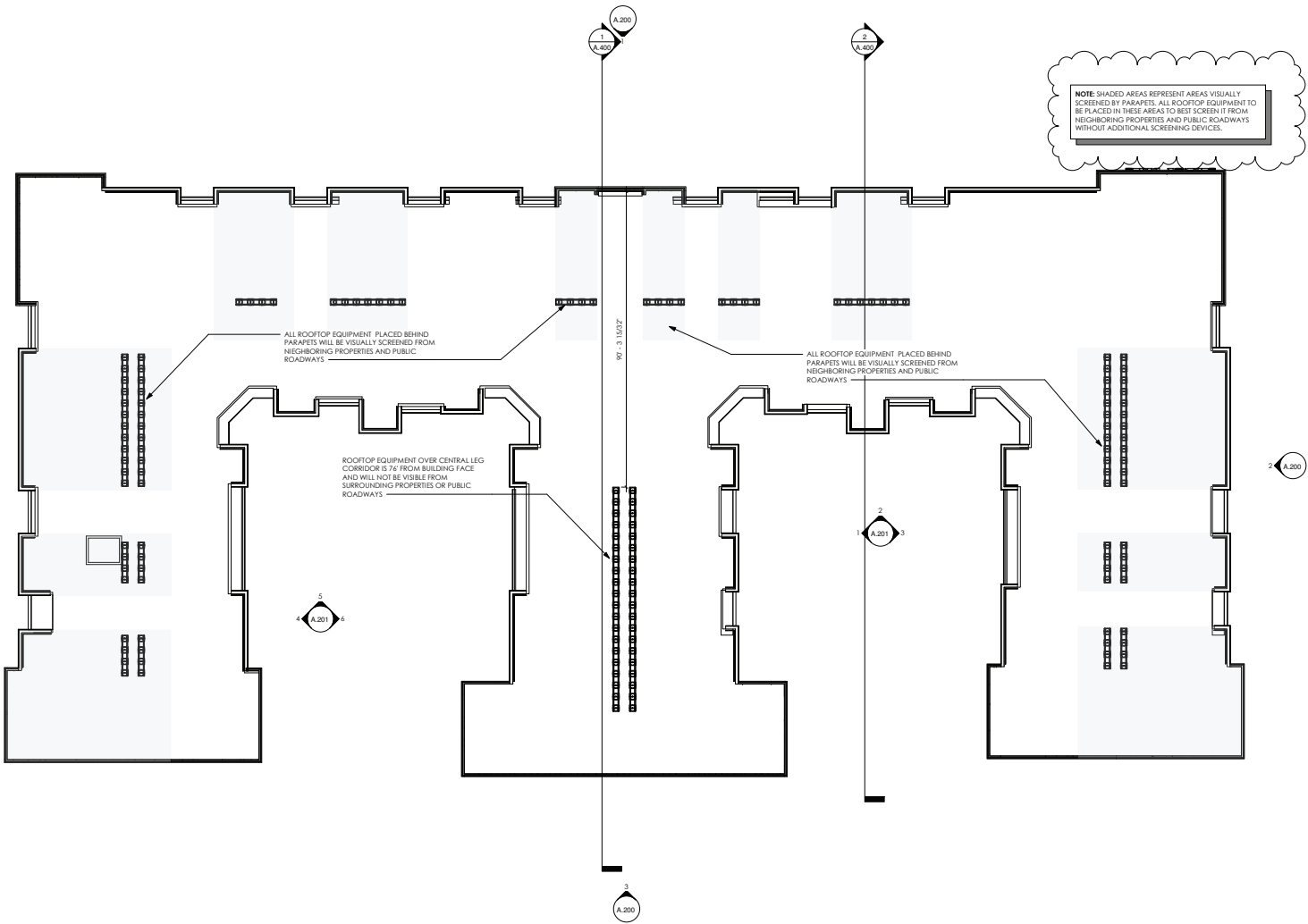
UNIT MIX						
APARTMENT COMPLEX	Live/Work SF VARIES (2 ROOMS PER UNIT)	STUDIO - 500 SF (1 ROOM PER UNIT)	1 BEDROOM - 720 SF (2 ROOMS PER UNIT)	2 BEDROOM - 1,250 SF (3 ROOMS PER UNIT)	3 BEDROOM - 1,600 SF (4 ROOMS PER UNIT)	TOTAL
FIRST FLOOR	7	6	12	10	0	35
SECOND FLOOR	0	6	16	18	0	40
THIRD FLOOR	0	7	16	19	0	42
FOURTH FLOOR	0	5	16	17	2	40
<b>TOTAL</b>	7 (14 ROOMS)	24 (24 ROOMS)	60 (120 ROOMS)	64 (186 ROOMS)	2 (8 ROOMS)	<b>157 (352 ROOMS TOTAL)</b>
<b>RATIO</b>	5%	15%	38%	41%	1%	<b>100%</b>

MAX ROOM COUNT ALLOWED - 8.04 acres = 350,222.4 SF / 700 SF = 500 ROOMS ALLOWED ON SITE

Client:  
 MF Novi, LLC

Project:  
 Station Flats  
 Wixom Rd  
 Novi, MI

NOTE: SHADED AREAS REPRESENT AREAS VISUALLY SCREENED BY PARAPETS. ALL ROOFTOP EQUIPMENT TO BE PLACED IN THESE AREAS TO BEST SCREEN IT FROM NEIGHBORING PROPERTIES AND PUBLIC ROADWAYS WITHOUT ADDITIONAL SCREENING DEVICES.



Roof Plan  
 1/16" = 1'-0"

Issued	Description	By
03-09-2023	Prim. SPA REV	
04-2023	SPA REV	

Seal:



Note:  
 Do not scale drawings. Use  
 calculated dimensions only.  
 Verify existing conditions in  
 field.

North Arrow:



Sheet Title:  
 Roof Plan

Project Number:  
 22-022

Scale:  
 1/16" = 1'-0"

Sheet Number:

A.105

PRELIMINARY NOT FOR CONSTRUCTION

DESCRIPTION	AREA SQFT	PERCENTAGE	MAX ALLOWED %
BRICK	3,458 SQFT	31%	MIN. 30% MAX 100%
STONE	2,405 SQFT	22%	MAX 50%
FAUX WOOD	923 SQFT	8%	MAX 50%
LAP SIDING	3,310 SQFT	30%	MAX 35%
METAL PANEL	837 SQFT	7%	MAX 50%

DESCRIPTION	AREA SQFT	PERCENTAGE	MAX ALLOWED %
BRICK	1,926 SQFT	34%	MIN. 30% MAX 100%
STONE	1,256 SQFT	21%	MAX 50%
FAUX WOOD	220 SQFT	10%	MAX 50%
LAP SIDING	1,980 SQFT	29%	MAX 25%
METAL PANEL	295 SQFT	6%	MAX 50%

DESCRIPTION	AREA SQFT	PERCENTAGE	MAX ALLOWED %
BRICK	2,057 SQFT	34%	MIN. 30% MAX 100%
STONE	1,386 SQFT	23%	MAX 50%
FAUX WOOD	543 SQFT	10%	MAX 50%
LAP SIDING	1,439 SQFT	27%	MAX 25%
METAL PANEL	328 SQFT	6%	MAX 50%

DESCRIPTION	AREA SQFT	PERCENTAGE	MAX ALLOWED %
BRICK	5,470 SQFT	42%	MIN. 30% MAX 100%
STONE	0 SQFT	0%	MAX 50%
FAUX WOOD	2,400 SQFT	19%	MAX 50%
LAP SIDING	4,404 SQFT	34%	MAX 25%
METAL PANEL	720 SQFT	5%	MAX 50%

Client:  
MF Novi, LLC

Project:  
Station Flats  
Wixom Rd  
Novi, MI



PRELIMINARY NOT FOR CONSTRUCTION

Issued	Description	By
01-18-2023	Prelim. SPA	
04-2023	SPA REV.	

Seal:



Note:  
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:  
Elevations

Project Number:  
22-022  
Scale:  
As indicated

Sheet Number:

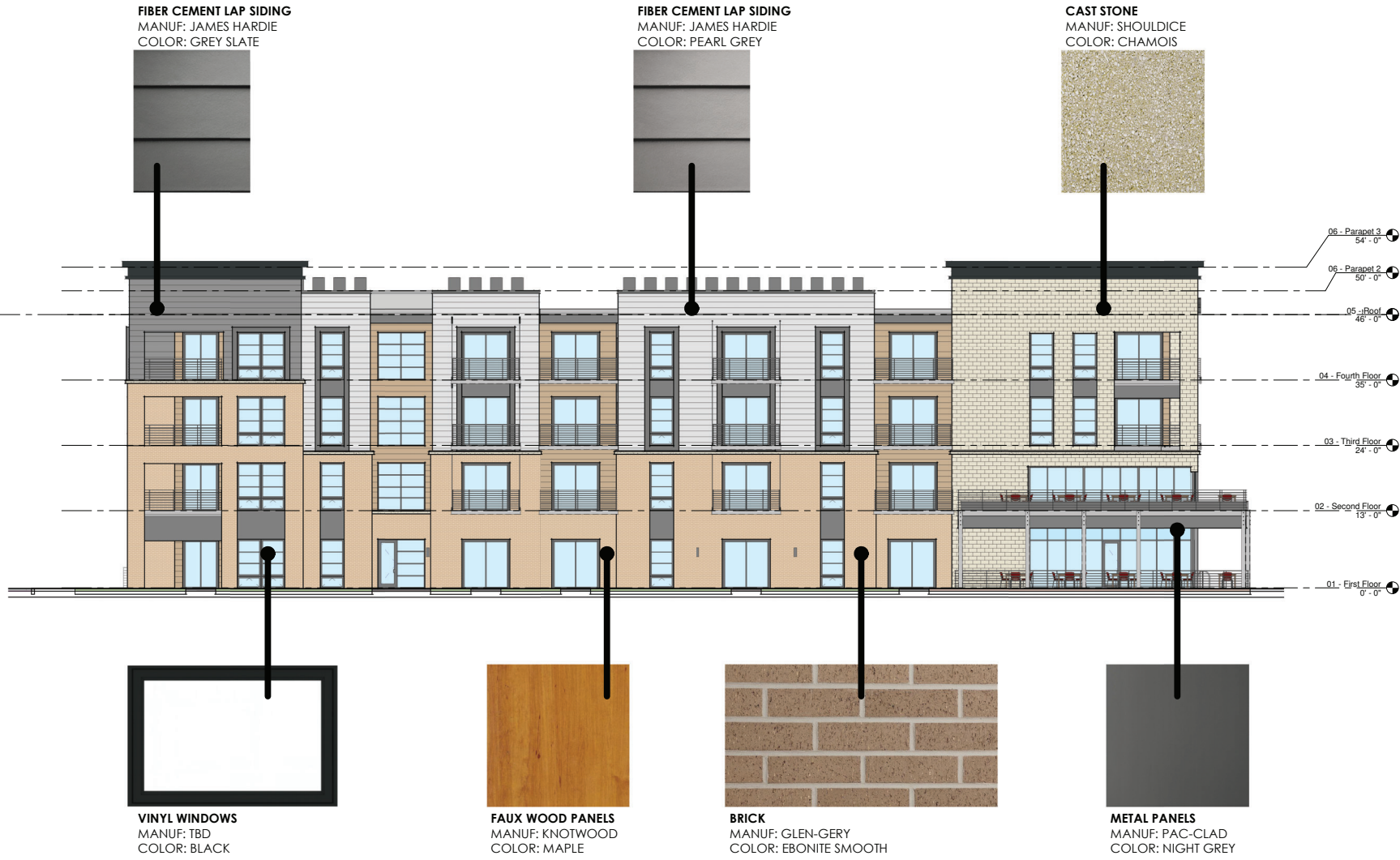
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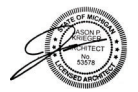
Client:  
 MF Novi, LLC

Project:  
 Station Flats  
 Wixom Rd  
 Novi, MI

Issued	Description	By
01-13-2023	Prim. SPA	
04-2023	SPA REV	



Scale:



Note:  
 Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.  
 North Arrow:

Sheet Title:  
 Material Board

Project Number:  
 22-022

Scale:  
 1/8" = 1'-0"

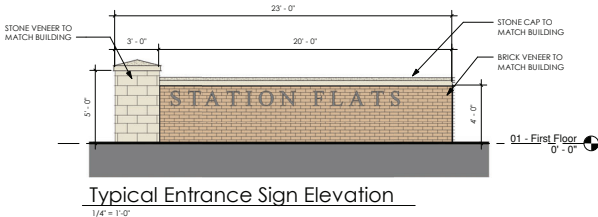
Sheet Number:  
**A.202**

Client:  
 MF Novi, LLC

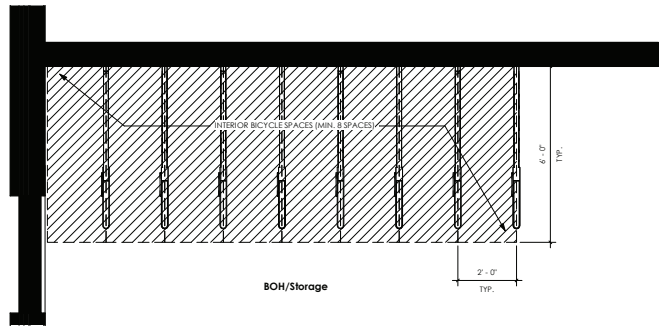
Project:  
 Station Flats  
 Wixom Rd  
 Novi, MI

PRELIMINARY NOT FOR CONSTRUCTION

Issued	Description	By
01-13-2023	Prelim. SPA	
04-2023	SPA REV	



Typical Entrance Sign Elevation  
 1/4" = 1'-0"



Enlarged Bicycle Storage Plan  
 1/2" = 1'-0"

Seal:



Note:  
 Do not scale drawings. Use  
 calculated dimensions only.  
 Verify existing conditions in  
 field.

North Arrow:



Sheet Title:  
 Enlarged Plan &  
 Sign Detail

Project Number:  
 22-022

Scale:

Sheet Number:  
**A.300**

Client:  
 MF Novi, LLC

Project:  
 Station Flats  
 Wixom Rd  
 Novi, MI

Issued	Description	By
03-08-2023	Prelim. SPA REV	
04-2023	SPA REV	

Seal:



Note:  
 Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:  
 Building Sections

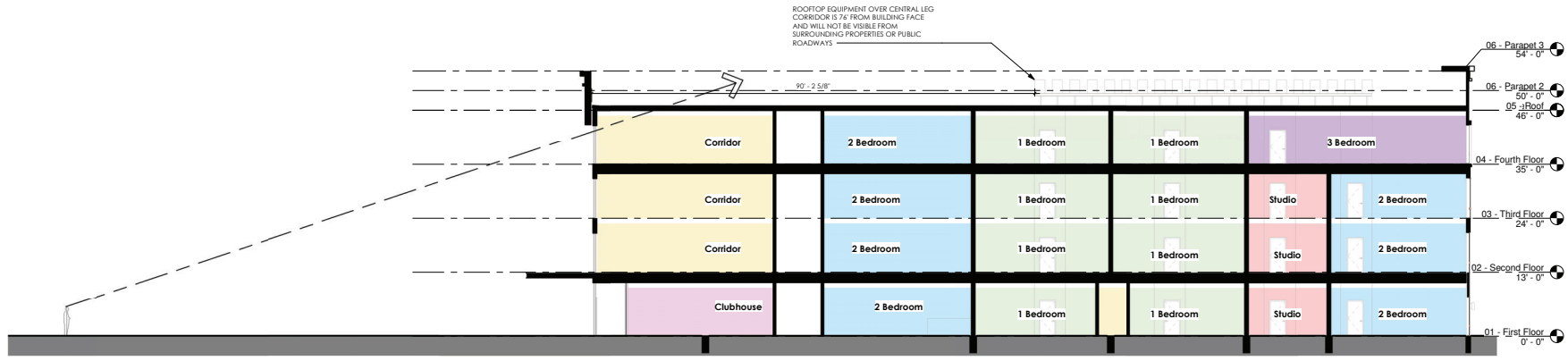
Project Number:  
 22-022

Scale:  
 3/32" = 1'-0"

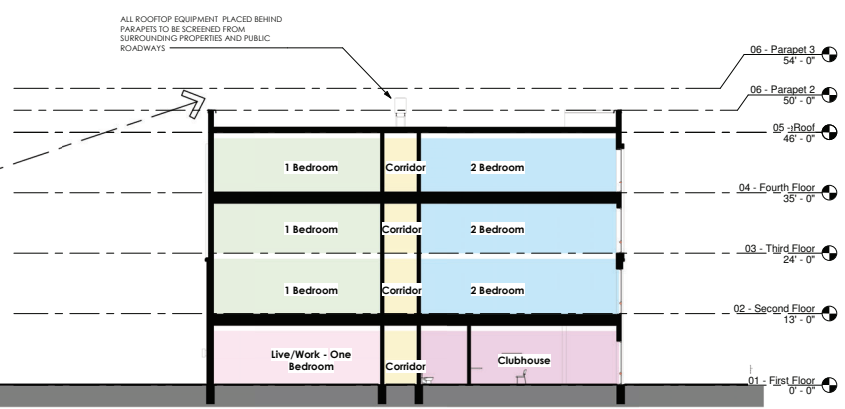
Sheet Number:

**A.400**

**PRELIMINARY NOT FOR CONSTRUCTION**



1 Building Section  
 3/32" = 1'-0"



2 Building Section  
 3/32" = 1'-0"

**APPLICANT NARRATIVE AND JUSTIFICATION**

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## Station Flats Land use Narrative

### **Location:**

Station Flats will be located on Wixom Rd. in between the Target and Sam's club and will be a 4-story state of the art multifamily residence consisting of 160 units. The entrance lines up with Catholic Central High School and it will be a significant improvement to the intersection and will complement the \$100M expansion.

### **Description:**

This residence will have 7 live/work units, 24 studios, 69 (1) Bedroom, 58 (2) Bedroom and 2 (3) Bedroom units. This development will improve the area by providing residential living to an area that was previously vacant for over 20 years. It will improve the customer base of the local businesses and will help the economy in the area. The shopping center has become very tired, and this development will significantly improve outlook of the immediate district. We have the backing of both Target and Sam's Club, and they fully support the development.

### **Other Info:**

Our previous submittal called for four separate, 3 story buildings of multi-family living consisting of 148 units which is now down to one, 4 story building. The revised design is a much more efficient use of the property and allows for better circulation and a much more robust amenity package. The developments amenity space will include a clubhouse, a pool and lounging area, co workspace, as well as a café/coffee shop tenant and dog run. In addition, some of the units will be designed as live-work units to accommodate residents looking to work from home. The project will also now be connected with sidewalks to the park just south of the property which will allow great connectivity between the uses along Wixom Rd. These types of mixed-use projects are being created nationally where retail centers are left unfinished and cities have recognized the merit of a residential retail mix.

March 10, 2022

Mr. Michael Parks, Managing Member  
Cypress Partners  
280 West Maple Road  
Suite 230  
Birmingham, MI 48009

**Subject: City of Novi Consent Judgement Amendment** for the 24.78-acre property on the east side of Wixom Road, south of Grand River Ave. (south of Sam's Club and east of Target) in the City of Novi, Oakland County, Michigan.

Dear Mr. Parks:

At your request, I have reviewed the above proposal to amend the Consent Judgement from July 19, 2001, and then amended June 23, 2015, for the above 24.78-acre parcel. The property is currently vacant and was intended to be developed for additional retail space facing the Target parking lot. The property is currently zoned I-1, Light Industrial but was approved for retail use through the Consent Judgement. Proposed is The Station Flats development with a 158-unit apartment complex in a single, four-story building, with 8 live-work units, 24 studio apartments, 67 one-bedroom units, 57 two-bedroom units, and 3 three-bedroom units. There are also two courtyards with a complex pool in one and a courtyard green with a walkway in the other. Parking spaces are located around the perimeter of the building along with a 72-space connecting lot to the northwest of the building. It is important to note that the proposed development occupies 5 acres +/- of the 24.78-acre site and the rest of the property remains as a conservation/wetland area.

This letter is submitted as an evaluation of the appropriateness of the proposed Consent Agreement amendment request, understanding the future land use designation for the site is Community Commercial. Moreover, this letter addresses why this project meets the Goals & Objectives in the Master Plan and the benefits outweigh those for commercial uses at that location.

The observations in this report are based upon 40 years' experience as a professional community planner, including work representing communities in Southeast Michigan. For the sake of conciseness, this letter will not re-state the existing land use, site conditions, zoning, and master plan designation for the subject and surrounding sites. Instead, it will focus on the key factors that relate to implementation of the Goals and Objectives in the Master Plan as well as zoning requirements. Based upon our review of the Consent Judgement, the proposed site plan and related materials, a visit to the site, and examination of the City of Novi Zoning Ordinance and Master Plan, we offer the following for your consideration:

## **ANALYSIS OF REQUEST**

The requested Consent Judgement amendment will allow for the change in zoning while committing to a specific development layout. In this case, a three-story, upscale multiple-family residential community with ancillary live-work space is being proposed and will abut primarily community

commercial developments to the north and west, and detention ponds/wetlands to the south and east. There are single-family residential uses to the south of this site, behind Target, but they will be a considerable distance from the proposed project. A more detailed examination of the site, market conditions, available land, and surrounding land uses indicates that the proposed multiple-family residential development will prove more beneficial to the community than a commercial use.

**Master Plan Goals.** One of the goals of the Master Plan states that “A variety of housing options will welcome younger residents and families as well as older residents to age in the community.” The corresponding Objective is to “Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly.” While the City has done a good job of providing a variety of housing types, the provision for additional upscale rental units in a key location will further the above goal and objective.

**Grand River Corridor Plan.** The subject site abuts the Grand River Corridor and one of the goals is “To Provide Housing Options. The City of Novi is well-known in the region for its thriving single-family neighborhoods, but alternative housing types can serve two segments of the population that may wish to live in a different setting: Millennials and Empty Nesters. Housing in the Grand River Corridor will provide small to medium-sized housing and will fit the low-maintenance needs of both age groups.” The proposed will also place additional residents in close proximity to businesses along the Grand River Corridor; further strengthening the future viability of those uses. This includes larger businesses like Sam’s Club and Target as well as the numerous retailers located in nearby shopping centers like the Grand Promenade and, farther to the east, the center where Kroger and Home Depot are located. The provision for eight (8) live-work spaces will also take advantage of the surrounding commercial activity, albeit in a limited fashion.

**Viability of Subject Site for Commercial Use.** The ability to develop this site for commercial use has been in place for 22 years yet it has remained vacant. Conditions have certainly changed since the Consent Agreement was filed and the property is even less viable for commercial development now than it has been during that period. One of the primary reasons is the lack of visibility from primary roads, which include Grand River Ave. and, to a lesser extent, Wixom Road. The subject site is tucked behind the Sam’s Club building and is not visible until driving past that building toward Target. Due to the setback from Wixom Road, the site is only visible from the Target parking lot.

Any of the potential big box uses for the site are already located in the area and they chose locations over this one, likely due to the above-mentioned lack of road visibility and access. The only real option would be development of a strip shopping center with numerous, small retail spaces. Shopping center uses are highly dependent upon visibility from major roads, which is why the Grande Promenade project was developed along Grand River Ave. instead of this site. The lack of visibility has always made this a poor commercial site.

From a planner’s perspective, I am seeing an increase in retail vacancies in shopping centers across the region, including communities that I work in. This is due, in part, to the advent of on-line shopping from virtual companies, like Amazon, as well as traditional retailers like Kohl’s and Wal Mart. It is difficult for small retailers to compete with the price and selection offered by the larger companies. Those specialty retailers that are able to compete locate in either traditional downtowns or in high

visibility, high traffic shopping centers. The subject site meets neither of these conditions and is an extreme disadvantage to other competing sites.

Developers are also telling me that increased construction costs are limiting the types of development that are feasible. These two factors indicate that in-store retailing has contracted and also become more price-competitive. It is far more likely that the above-mentioned specialty retailers looking for space will gravitate toward existing buildings and the lower rent structures than space in a new shopping center. This is further supported by the increase in construction costs, making new commercial development even more expensive and challenging.

**Housing Options.** All of the renter options are now supported by the change in the tax laws, which have increased the standard deduction and with many have eliminated the need for mortgage interest and property tax deductions. This is especially true for many empty nesters that have either paid off their mortgages or have small balances. They can take the equity in their existing houses by selling and use it for other purposes, while maintaining the same standard of living in the community. This is not currently happening due to the housing shortage and inability of empty nesters to find replacement housing within the community, either owner- or renter-occupied. First-time and move-up buyers are having difficulty finding available housing because empty nesters are staying in place, due primarily to lack of replacement units.

The proposed project would provide empty-nester homeowners with an option that allows them to sell their existing homes without having to buy another one immediately, or at all, while remaining in the City of Novi. This in turn will help free up for-sale houses, thereby adding supply to new and move-up home buyers. Once the existing homes are sold, this will also remove the cap on property taxes and provide an increase in revenue for the City. This project will also provide additional short-term corporate housing for companies bringing executives into the area for temporary assignment. There is a shortage of high-quality rental housing in the region and many companies have resorted to buying houses for their temporary transfers to live in.

**Walkability.** Given the location of the site along Grand River Ave., the proposed apartment complex would be in close proximity to a wide range of retail, restaurant, office and medical services. There are sidewalk connections to big box uses like Target, Sam's Club, Meijer and Kroger; a wide range of restaurants like Applebee's, Shaker's, Outback Steakhouse, etc.; and medical services at the Ascension Providence hospital campus. A wide array of retail and service options are within walking distance of the project, thereby limiting the need to drive to these locations. This meets the City's goal of having a walkable community and providing services in close proximity to housing.

## **CONCLUSION**

With the proposed benefits, quality site design, and an understanding of the current and future commercial market for the subject site, the proposed residential development represents an appropriate departure from the current Consent Judgement designation of commercial. It is highly unlikely that this property will ever be developed for commercial purposes due to the lack of visibility from the primary roads. It is hidden behind the Sam's Club and can only be seen from the Target parking lot. The transition to on-line buying has also decreased demand for retail space and only the most outstanding locations will remain viable moving forward. There is a chance that the live-work

Mr. Michael Parks, Managing Member  
**City of Novi Consent Judgement Amendment Letter**  
March 10, 2023  
Page 4

units will benefit from the activity generated by Target and Sam's Club. With more people working from home, the office/conference room area should prove enticing to prospective tenants and add a mix of uses to the project. In addition, upscale rental housing meets the City Master Plan goals and objectives of providing additional housing opportunities in close proximity to services, in a walkable environment.

If you have any further questions, please contact me at 810-335-3800.

Sincerely,

**CIB Planning**



Carmine P. Avantini, AICP  
President

## PLANNING REVIEW

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# PLAN REVIEW CENTER REPORT

June 12, 2023

## Planning Review

Station Flats

JSP23-02 with Amendment to Consent Judgment

### PETITIONER

Cypress Partners, LLC

### REVIEW TYPE

Revised Concept Plan and Request to Amend Consent Judgment

### PROPERTY CHARACTERISTICS

<b>Section</b>	17	
<b>Site Location</b>	22-17-101-032; East of Wixom Road, South of Grand River Avenue	
<b>Site School</b>	Novi Community School District	
<b>Watershed</b>	Huron River Watershed & Rouge River Watershed	
<b>Site Zoning</b>	I-1, Light Industrial, with Consent Judgment (B-2, General Business)	
<b>Adjoining Zoning</b>	North	I-1, Light Industrial, with Consent Judgment (B-2, General Business)
	East	I-1, Light Industrial
	West	R-1, One-Family Residential
	South	I-2, Heavy Industrial with PSLR (Planned Suburban Low Rise)
<b>Current Site</b>	Vacant	
<b>Adjoining Uses</b>	North	Sam's Club
	East	Vacant
	West	Catholic Central High School & Target
	South	Villas at Stonebrook
<b>Site Size</b>	24.77 acres	
<b>Plan Date</b>	May 5, 2023	

### PROJECT SUMMARY

The petitioner is requesting an amendment to a Consent Judgment, which currently limits the site to retail use, and has submitted a Concept Plan for the 24.77 acre site located on the east side of Wixom Road and south of Grand River Avenue (Section 17). The parcel proposed to be developed is currently vacant, and is located immediately to the south of the Sam's Club store, and northeast of the Target store. The property also contains an existing access drive to Wixom Road, a lawn area that is to be used as a parking lot, and existing wetlands and wetland mitigation areas to the east of the proposed development.

The use of this site is limited due to a Consent Judgment on the property that designates this site for retail uses that conform to the Community Business (B-2) District standards. The Consent Judgment lists several binding conditions on the property, which initially envisioned this property being

developed as a traditional “big box” store. If the Consent Judgment were to be amended to allow a multi-family residential development, this would be a significant change to the site. In particular, uses permitted in the Consent Judgment under the Community Business (B-2) district standards significantly differ from those permitted in the High-Density Mid-Rise Multiple-Family Residential (RM-2) district, which is proposed.

Through the review process, the Planning Commission and the City Council would consider the presented plan and determine whether to amend the Consent Judgment to open the site to the standards and uses permitted in the RM-2 district, or another district that is better suited to the proposed use.

The proposed site will consist of 157 multi-family rental units, with 7 live/work units, 24 studio units, 60 one-bedroom units, 64 two-bedroom units, and 2 three-bedroom units. One building consisting of four stories is proposed. The building will include a clubhouse, a two-story co-working/café space on the northwest portion of the building. The site is proposed to have 247 parking spaces. Other site amenities include a pool, clubhouse, and a putting green.

### MASTER PLAN FOR LAND USE & LAND USE NARRATIVE

The Future Land Use Map of the 2016 City of Novi Master Plan for Land Use identifies this property as Community Commercial. As the Master Plan states, “this land use is designated for comparison-shopping needs of a larger population base. They are along major thoroughfares and roadway intersections.” The Community Business (B-2) District and the General Business (B-3) District generally fall within areas planned for Community Commercial. The subject site is zoned Light Industrial (I-1), but is subject to a Consent Judgment that states that the subject site “shall conform to the uses permitted in the B-2 zoning district as described in the City of Novi Zoning Ordinance [...],” which is generally consistent with the Community Commercial land use designation.

The properties to the north are identified in the Master Plan as Community Commercial and Office Research Development Technology, the properties to the east are identified as Office Research Development Technology, the properties to the west are identified as Educational Facility and Community Commercial, and the properties to the south are identified as Planned Suburban Low-Rise.

The applicant provided a Land Use Narrative dated March 10, 2023 that lists several objectives that the project is intended to achieve:

1. Objective (Objective 5, Page 124): Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly.

*Applicant Comment:* “While the City has done a good job of providing a variety of housing types, the provision for additional upscale rental units in a key location will further the above goal and objective.”



Figure 1: 2020 Aerial of Subject Property



**Staff Comment:** While the proposed development increases the amount of rental housing stock within the City, this particular site was envisioned as a site for a big-box retailer, which is supported by the Consent Judgment and Goal A.17.5 of the Master Plan, which states “support retail commercial uses along established transportation corridors that are accessible for the community at large, such as along Grand River Avenue, to preclude future traffic congestion.”

2. Objective (General Goal for the Grand River Corridor, Provide Housing Options, Page 79): The City of Novi is well-known in the region for its thriving single-family neighborhoods, but alternative housing types can serve two segments of the population that may wish to live in a different setting: Millennials and Empty Nesters. Housing in the Grand River Corridor will provide small to medium-sized housing and will fit the low-maintenance needs of both age groups.

*Applicant Comment:* “The proposed [project] will also place additional residents in close proximity to businesses along the Grand River Corridor; further strengthening the viability of those uses.”

**Staff Comment:** While staff agrees that additional rental units within the City would benefit the community, the Consent Judgment envisioned this area to have a mix of retail uses, which is not currently proposed on this site with the exception of 7 live/work units and a co-working space.

The applicant has also noted several other conditions in the provided Land Use Narrative that do not reference the Master Plan, but rather justify the proposal through a land use analysis. These conditions are listed below:

1. Viability of Subject Site for Commercial Use

- a. Lack of Visibility: The applicant has noted that the “ability to develop this site for commercial use has been in place for 22 years yet remained vacant [...] one of the primary reasons is the lack of visibility from primary roads. [...] The only real option would be development of a strip shopping center with numerous, small retail spaces.”

**Staff Comment:** While the site does lack visibility from a major thoroughfare, it is still easily accessible.

- b. Online Shopping & Specialty Retailers: “From a planner’s perspective, I am seeing an increase in retail vacancies in shopping centers across the region [...] this is due, in part, to the advent of on-line shopping from virtual companies [...] it is difficult for small retailers to compete with the price and selection offered by larger companies. Those specialty retailers that are able to compete locate in either traditional downtowns or in high visibility, high traffic shopping centers.”

**Staff Comment:** Staff concurs that online shopping and the pandemic have fueled a decreased interest in retail development, but still feels that the subject site is a viable site for retail use.

- c. Increased Construction Costs: “Developers are also telling me that increased construction costs are limiting the types of development that are feasible. These two factors indicate that in-store retailing has contracted and also become more price-competitive. It is far more likely that the above-mentioned specialty retailers looking for space will gravitate toward existing buildings and the lower rent structures than space in a new shopping center. This is further supported by the increase in

construction costs, making new commercial development even more expensive and challenging.”

**Staff Comment:** Staff agrees that while construction costs are high, it does not affect the long-term viability of the subject property.

2. Housing Options

a. Change in Tax Laws: “All of the renter options are now supported by the change in the tax laws, which have increased the standard deduction and with many have eliminated the need for mortgage interest and property tax deductions. This is especially true for many empty nesters that have either paid off their mortgages or have small balances. They can take the equity in their existing houses by selling and use it for other purposes, while maintaining the same standard of living in the community. This is not currently happening due to the housing shortage and inability of empty nesters to find replacement housing within the community, either owner- or renter-occupied. First-time and move-up buyers are having difficulty finding available housing because empty nesters are staying in place, due primarily to lack of replacement units.”

**Staff Comment:** Staff agrees that the demand for rental units by empty nesters has increased over the last several years.

b. Housing Supply: “The proposed project would provide empty-nester homeowners with an option that allows them to sell their existing homes without having to buy another one immediately, or at all, while remaining in the City of Novi. This in turn will help free up for-sale houses, thereby adding supply to new and move-up home buyers. Once the existing homes are sold, this will also remove the cap on property taxes and provide an increase in revenue for the City. This project will also provide additional short-term corporate housing for companies bringing executives into the area for temporary assignment. There is a shortage of high-quality rental housing in the region and many companies have resorted to buying houses for their temporary transfers to live in.”

**Staff Comment:** Staff agrees that the proposed project will increase the housing supply within the City of Novi. However, staff feels that there are more compatible sites for multi-family residential elsewhere within the City.

3. Walkability: “The proposed apartment complex will be in close proximity to a wide range of retail, restaurant, office, and medical services [...] this meets the City’s goal of having a walkable community and providing services in close proximity to housing.”

**Staff Comment:** Staff agrees that the proposed location has significant walkability potential and the walkability of the site is improved given the site constraints.

**EXISTING ZONING AND LAND USE**

The following table summarizes the zoning and land use status for the subject property and surrounding properties.

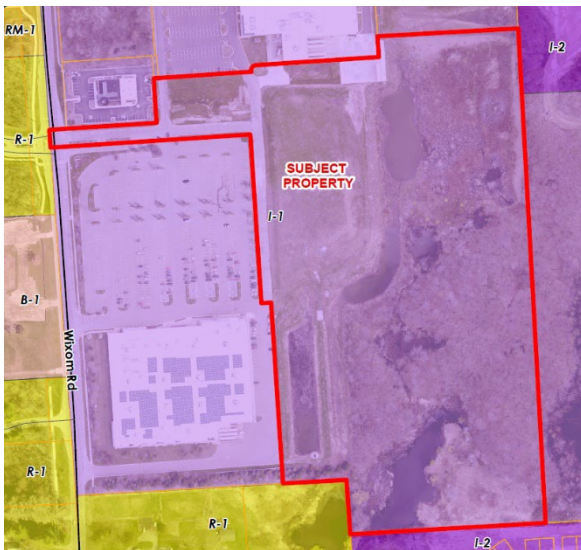
**Land Use and Zoning: For Subject Property and Adjacent Properties**

	<b>Existing Zoning</b>	<b>Existing Land Use</b>	<b>Master Plan Land Use Designation</b>
<b>Subject Property (Project Area)</b>	I-1 Light Industrial District with	Vacant	Community Commercial

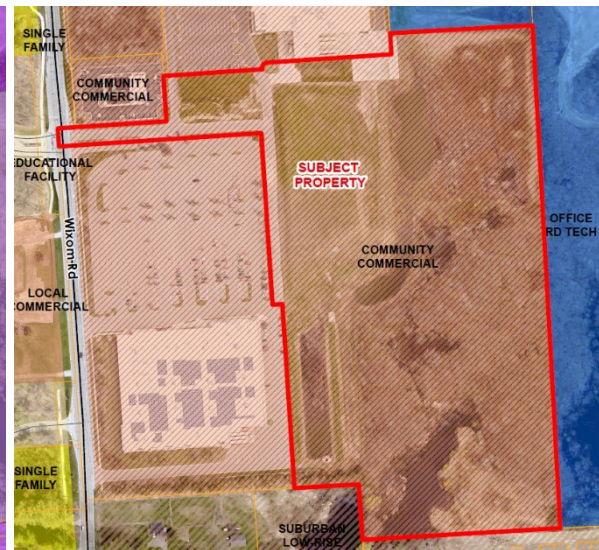
	Consent Judgment B-2 Local Business District		(Uses consistent with B-2 Local Business District)
<b>Northern Parcels</b>	I-1 Light Industrial District with Consent Judgment B-2 Local Business District	Sam's Club & Industrial Building	Community Commercial (Uses consistent with B-2 Local Business District) and Industrial Research Development Technology (Uses consistent with I-1 Light Industrial District)
<b>Southern Parcels</b>	I-2 Heavy Industrial with PRO Agreement	Villas at Stonebrook	Planned Suburban Low Rise
<b>Eastern Parcels</b>	I-1 Light Industrial District	Vacant/Wetland	Industrial Research Development Technology (Uses consistent with I-1 Light Industrial District)
<b>Western Parcels</b>	R-1 One-Family Residential, I-1 Light Industrial District with Consent Judgment B-2 Local Business District	Catholic Central High School, Target	Educational Facility, Community Commercial

**COMPATIBILITY WITH SURROUNDING LAND USE**

The surrounding land uses are shown in the above chart. The compatibility of the proposed development with the zoning and uses on the adjacent properties should be considered by the Planning Commission in making the recommendation to City Council. In particular, the Planning Commission should review the plan carefully to ensure that any negative impacts are minimized and mitigated.



**ZONING**



**FUTURE LAND USE**

**DEVELOPMENT POTENTIAL**

The parcel proposed to be developed is currently vacant. The use of this site is limited due to a Consent Judgment on the property that designates this site for retail uses that conform to the

Community Business (B-2) District standards. The Consent Judgment lists several binding conditions on the property, which initially envisioned this property being developed as a traditional “big box” store. If the Consent Judgment were to be amended to allow a multi-family residential development, this would be a significant change to the site. In particular, uses permitted in the Consent Judgment under the Community Business (B-2) district standards significantly differ from those permitted in the High-Density Mid-Rise Multiple-Family Residential (RM-2) district, which is proposed. Through the process, the applicant and the City would agree to restrict the RM-2 use allowed to 157 multi-family residential units with limited retail/office space located on the first two floors of the building as shown in the proposed concept plan. Any other uses typically permitted in the RM-2 district would not be permitted within the terms of the Amendment to the Consent Judgment.

**COMPARISON OF ZONING DISTRICTS**

The following table provides a comparison of the current and proposed zoning development standards. The applicant is requesting a change of districts from the existing Community Business (B-2) District with a Consent Judgment to High-Density Mid-Rise Multiple-Family Residential (RM-2) with a Consent Judgment. The types of uses allowed in these districts differ significantly as shown below.

	<b>B-2 (Existing)</b>	<b>RM-2 (Proposed)</b>
<b>Principal Permitted Uses &amp; Special Land Uses</b>	<b>Principal Permitted Uses</b> <ol style="list-style-type: none"> <li>1. Retail business use</li> <li>2. Retail business service uses</li> <li>3. Business establishments which perform services on the premises</li> <li>4. Dry cleaning establishments, or pick-up stations, dealing directly with the consumer</li> <li>5. Professional services</li> <li>6. Retail businesses</li> <li>7. Service establishments of an office showroom or workshop nature</li> <li>8. Restaurants (sit-down), banquet facilities or other places serving food or beverage</li> <li>9. Theaters, assembly halls, concert halls, museums or similar places of assembly</li> <li>10. Business schools and colleges or private schools operated for profit</li> <li>11. Day care centers and adult day care centers</li> <li>12. Private clubs, fraternal organizations and lodge halls</li> <li>13. Places of worship</li> <li>14. Hotels, and motels</li> <li>15. Professional and medical offices, including laboratories</li> <li>16. Other uses similar to the above uses</li> <li>17. Accessory structures and uses, customarily incident to the above permitted uses</li> </ol>	<b>Principal Permitted Uses</b> <ol style="list-style-type: none"> <li>1. Multiple-family dwellings</li> <li>2. Accessory buildings and uses customarily incident to any of the above uses</li> </ol> <p>The following uses are regulated according to the standards and regulations in the RM-1, Low-Density, Low Rise Multiple Family (Section 3.1.7):</p> <ol style="list-style-type: none"> <li>1. Independent and congregate elderly living facilities</li> <li>2. Accessory buildings and uses customarily incident to any of the above uses</li> </ol> <p>The following uses are regulated according to the standards and regulations in the RT Two-Family Residential District (Section 3.1.6):</p> <ol style="list-style-type: none"> <li>1. Two-family dwellings (site built)</li> <li>2. Shared elderly housing</li> <li>3. Accessory buildings and uses customarily incident to any of the above uses</li> </ol> <p>The following uses are regulated according to the standards and regulations in the R-4 One Family Residential District (Section 3.1.5):</p> <ol style="list-style-type: none"> <li>1. One-family detached dwellings</li> <li>2. Farms and greenhouses</li> <li>3. Publicly owned and operated parks, parkways and outdoor recreational facilities</li> <li>4. Cemeteries</li> <li>5. Home occupations</li> <li>6. Keeping of horses and ponies</li> <li>7. Family day care homes</li> </ol>
	<b>Special Land Uses</b> <ol style="list-style-type: none"> <li>1. Fueling station</li> <li>2. Sale of produce and seasonal plant materials outdoors</li> <li>3. Veterinary hospitals, or clinics</li> </ol>	

		8. Accessory buildings and uses customarily incident to any of the above uses <b>Special Land Uses</b> 1. Retail commercial services and office uses
<b>Minimum Lot Size</b>	2 acres	See Section 3.8.1
<b>Minimum Lot Width</b>	See Section 3.6.2.D	See Section 3.8.1
<b>Maximum Lot Coverage</b>	See Section 3.6.2.D	45%
<b>Building Height</b>	30 feet or 2 stories, whichever is less	65 feet or 5 stories, whichever is less
<b>Building Setbacks</b>	Front Yard: 40 feet Rear Yard: 30 feet Side Yard: 30 feet	Front Yard: 75 feet Rear Yard: 75 feet Side Yard: 75 feet
<b>Parking Setbacks</b>	Front Yard: 20 feet Rear Yard: 10 feet Side Yard: 10 feet	Front Yard: 75 feet* (Sec. 3.6.2.B) Rear Yard: 20 feet Side Yard: 20 feet

**INFRASTRUCTURE & FAÇADE**

**Engineering**

The Staff Engineer has reviewed the request and indicated that the proposed project meets the general requirements of Chapter 11 Code of Ordinances, the Storm Water Management Ordinance, and the Engineering Design Manual.

**Traffic Engineering Review and Traffic Study**

The proposed site will be accessed from Wixom Road. **Traffic is not recommending approval as several access and traffic flow issues will need to be resolved.** In addition, the Traffic Impact Study has been reviewed by the City's Traffic Consultant. The City's Traffic Consultant **recommends approval of the Traffic Impact Study contingent upon all outstanding conditions being addressed.**

**Façade**

The proposed façade consists of brick, stone, flat metal, cement fiber lap siding, and metal panels. The percentage of cement fiber lap siding exceeds the ordinance maximum on all elevations and exceeds what would qualify for a Section 9 Façade Waiver. **If not adjusted to a percentage that falls within qualification for a Section 9 waiver, a deviation as part of the Consent Judgment would be required.**

**Fire**

The City Fire Marshal has reviewed the site plan and has provided several comments to be addressed with the next submittal. At this time, the Fire Marshal recommends approval with conditions of the concept plan.

**NATURAL FEATURES & EASEMENTS**

The proposed site has several easements and natural features located on its premises as shown in the ALTA survey. The site's wetlands and woodlands shall continue to be protected as indicated in the plans and should remain as part of the existing preservation conservation easements. Please see below for a summary of the Wetland, Landscape, and Woodland reviews.

### Wetland

A minor encroachment into the 25-foot wetland buffer setback area has been identified on the site plan. **Wetlands is recommending conditional approval contingent upon the area of wetland buffer impact and conservation easement impact being quantified on the plans.**

### Landscape and Woodland

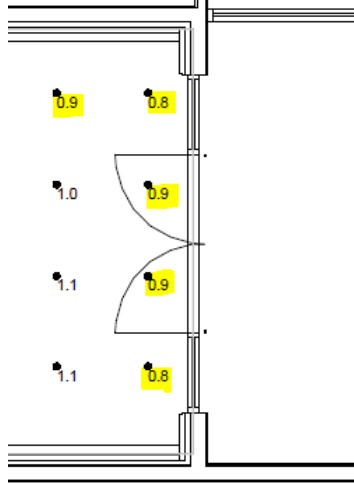
The proposed landscape plan meets several ordinance requirements, but **does not meet screening requirements near the Sam's Club loading docks. Please refer to the Landscape Review for more information. In addition, complete tree survey information has not been provided.** Please refer to the Landscape Review and Woodland Review for more information.

### REVIEW CONCERNS

Staff is requesting additional clarification on the following items. In particular, items in **bold** should be responded to in the next submittal. Please note that any review concerns related to deviations requested as part of the amendment to the Consent Judgment are listed in the following section (Ordinance Deviations).

1. 2016 Master Plan for Land Use (Master Plan): The proposed site is identified as Community Commercial in the 2016 Master Plan for Land Use, which is not consistent with the proposed use of the site. **As the Master Plan did not envision a residential use, the proposal will need to be reviewed by the Master Planning & Zoning Committee prior to going before the Planning Commission or City Council for consideration. This is scheduled for May 24.**
2. Consent Judgment & Zoning: The site is currently bound to a Consent Judgment that requires the site to be developed for retail purposes under the Community Business (B-2) District standards. **An amendment to the Consent Judgment would be required for the current proposed multiple-family use.**
  - a. Uses Permitted (Item 12, B, Consent Judgment): Per the Consent Judgment, retail is only permitted on this site currently (i.e., Big Box store). **Therefore, an amendment to the consent judgment will be required.**
  - b. Buffering & Setback from Dissimilar Uses: The Consent Judgment anticipated that the site would be developed with a big box store, and no buffering between commercial uses was anticipated. Sam's Club's loading zones are immediately adjacent to the subject site, and are actively used. **The applicant is encouraged to provide buffering suitable for the proposed multiple family use adjacent to a loading zone to reduce any adverse effects of the loading/unloading, trash removal, and other aspects of the existing development.**
3. Open Space Area (Sec. 3.1.8.D): An open space calculation of 82,944 square feet has been indicated, which meets the required 32,000 square feet. However, the usable open space is not accurately represented. **Useable open space cannot be placed in a conservation area. Please revise or remove and seek a deviation for lack of meeting the usable open space requirements.**
4. Maximum Dwelling Unit Density/Net Size Area (Sec. 3.1.7.D, Sec. 3.8.1.A.ii): The unit mix breakdown has been provided. However, the percentages for studio, 1-bed, and 2-bed units have been incorrectly listed. **Please revise.**
5. End Islands (Sec. 5.3.12): End islands have been provided in the appropriate locations. However, one end island does not meet minimum square foot requirements. **Please revise.**
6. Entryway Lighting (Sec. 5.7.N): One streetlight is required per entrance from a major throughfare. **Please provide site lighting at the entrance to the site off Wixom Road and show it on the photometric plan.**
7. Economic Impact Information: The requested economic impact information has not been provided at this time. **Please provide a total estimated cost of the project and the number of jobs it is anticipated to create (temporary construction jobs and permanent jobs).**

8. Development/Business Sign: At this time, a business sign has only been shown on the renderings. **Please show the location of any entranceway signs if proposed as deviations from the sign ordinance may be included in the Consent Judgment if approved.**
9. Lighting & Photometric Plan (Sec. 5.7): There are several items that should be addressed on the photometric plan with the next submittal as listed below.
  - a. Lighting Specifications (Sec. 5.7.A.2.ii): **Please provide specification sheets for the proposed light fixtures, fixture mounting detail, fixture design, and fixture hours of operation.**
  - b. Minimum Illumination (Sec. 5.7.3.K): **Please revise the main entrances to buildings to meet the 1 fc minimum (0.8 fc shown).**



### **CONDITIONS OF ANY AMENDMENT TO THE CONSENT JUDGMENT (IF THE CITY COUNCIL AGREES TO THE AMENDMENT)**

The Amendment to a Consent Judgment typically involves a concept plan and specific conditions in conjunction with the request. The applicant and City Council would need to eventually agree on a series of conditions to be included as part of the approval before the judgment goes before court.

The applicant is required to submit a conceptual plan and a list of terms that they are willing to include within the agreement. The applicant has submitted a conceptual plan showing the general layout of the driveways, parking, building, stormwater detention, and a general layout of landscaping throughout the development. The applicant has provided a narrative describing the proposed public benefits. At this time, staff can identify some conditions to be included in the agreement **if** the current design moves forward:

1. Use: The use of the site shall be limited to 160 multi-family units consisting of one building no greater than the building footprint shown on the concept plan.
2. Density: The unit density of the site shall not exceed the density requirements for the RM-2 district.
3. Parking: The proposed development shall provide sufficient parking as required by the Zoning Ordinance or through a shared parking study as part of the site plan submittal that indicates sufficient parking is provided.
4. Open Space: The overall open space of the site shall be a minimum of 40% of the site and any existing preservation easements shall be maintained.

*Development and use of the property shall be subject to the more restrictive requirements shown or specified on the plan, and/or in the conditions imposed, and/or in other conditions and provisions set forth in the Amendment.*

## ORDINANCE DEVIATIONS

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The Amendment to Consent Judgment may permit deviations from the strict interpretation of the Zoning Ordinance if approved by City Council. These deviations must be accompanied by a finding by City Council that "each Zoning Ordinance provision sought to be deviated would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest, and that approving the deviation would be consistent with the Master Plan and compatible with the surrounding areas." Such deviations must be considered by City Council, who will make a finding of whether to include those deviations in the proposed amendment. The proposed amendment would be considered by City Council after tentative approval of the proposed concept plan and amendment.

As noted in this review letter, staff is not comfortable that the proposed multiple family use will be compatible with the existing shopping center, particularly with regard to the buffering of the proposed multiple family from the adjacent Sam's Club loading docks and dumpster area, since multiple family uses had not been contemplated during the development of the overall site for big box stores, and because this review and other review letters identify a number of concerns and deviations that are not currently supported or recommended by staff and/or consultants The proposed use is not compatible with the Master Plan for Land Use or the terms of the Consent Judgment. While not recommending approval, Planning Staff reviewed the Concept Plan in as much detail as possible to determine what deviations from the Zoning Ordinance are currently shown, if the Planning Commission and City Council determine the change in use is acceptable. The applicant may choose to revise the concept plan to better comply with the standards of the Zoning Ordinance or may proceed with the plan as submitted with the understanding that those deviations would have to be approved by City Council in a proposed Amendment to the Consent Judgment.

The applicant has submitted a narrative describing the deviations present in the proposed plans. The deviations identified are as follows (staff comments in **bold** type):

1. Parking Setbacks (Sec. 3.1.7.D, Sec. 3.6.2.B): The proposed parking lot layouts generally comply with the ordinance requirements. However, two proposed out-lots and the main parking lot do not meet the 20 foot side yard setback requirement or the 75 foot front yard setback requirement. The applicant is requesting a deviation of 10 feet (20 feet required, 10 feet proposed) from the north side yard setback in the west out-lot and a deviation of 30 feet (75 feet required, 45 feet proposed) from the front yard setback in the west out-lot. In addition, the applicant is requesting a deviation of 8.29 feet (20 feet required, 11.71 feet proposed) from the north side yard setback in the north out-lot. The applicant is also requesting a deviation of 5 feet (75 feet required, 70 feet proposed) from the front yard setback in the main parking lot.

**Staff Comment: Staff supports the request for this deviation as the proposed parking lots are necessary to provide sufficient parking for the development as long as there are not any conflicts with existing easements or required landscaping. With the next submittal the applicant shall identify the location of all of the noted deviations on the proposed Concept Plan.**

2. Maximum Number of Units (Sec. 3.8.1.B.ii): The proposed unit mix exceeds the maximum percentage allowed for both efficiency units and one bedroom units. The applicant is requesting a deviation of 5.3% (10% required, 15.3% proposed) for efficiency units and a deviation of 9.6% (33% required, 42.6% proposed) for one bedroom units.

**Staff Comment: Staff supports this deviation as the applicant has provided additional 2-bedroom units (64 units, 40.8%) to help provide a good balance of units for the proposed development.**



3. Maximum Length of the Buildings (Sec. 3.8.2.C): A single building cannot exceed 180 feet in length. The applicant is requesting a deviation of 188 feet (180 feet required, 368 feet proposed) for the building length.

**Staff Comment: Staff supports the request for this deviation as the proposed building fits the design of the site more cohesively than previous proposals.**

4. Building Orientation (Sec. 3.8.2.D): The proposed buildings are required to be oriented 45° in relation to the property lines. Currently, the proposed buildings are oriented parallel to the property lines.

**Staff Comment: Staff supports the request for this deviation as the proposed building fits the design of the site more cohesively than previous proposals.**

5. Yard Setback Restrictions (Sec. 3.8.2.E): Within any required yard setback, off-street parking, maneuvering lanes, service drives, or loading areas cannot exceed 30% of the required yard area. The applicant is requesting a deviation of 17.96% (30% required, 47.96% proposed) from this requirement.

**Staff Comment: Staff supports the request for this deviation as long as there are not any conflicts with required landscaping or usable open space.**

6. Off-Street Parking or Related Drives (Sec. 3.8.2.F): Off-street parking shall be no closer than 25 feet to any wall of a dwelling structure that contains openings involving living areas and off-street parking shall be no closer than 20 feet from any property line. Currently, neither of these requirements are met. The applicant is requesting a deviation of 8 feet (25 feet required, 17 feet proposed) from the setback requirements from living areas and a deviation of 10 feet (20 feet required, 10 feet proposed) from the property line setback requirements.

**Staff Comment: Staff supports the request for this deviation as the layout of the parking lot does not negatively impact the site with the proposed setbacks.**

7. Pedestrian Connectivity (Sec. 3.8.2.G): 5 foot wide sidewalks are required on both sides of the proposed private access drive. A 7 foot wide sidewalk connecting to Target on the south side of the property has been provided. However, a sidewalk located on the north side of the property is still required.

**Staff Comment: Staff supports this request as pedestrian connectivity has been maximized given the site constraints.**

8. Number of Parking Spaces (Sec. 5.2.12.A): Based on current calculations, 315 parking spaces are required and only 247 are provided. The applicant is requesting a deviation of 68 parking spaces (315 required, 247 provided).

**Staff Comment: Staff supports this request if a shared parking study and narrative is provided to show that sufficient parking exists.**

9. Maneuvering Lanes (Sec. 5.3.2): A minimum maneuvering lane width of 24 feet is required when adjacent to parking. The applicant is requesting a deviation of 2 feet (24 feet required, 22 feet proposed).

**Staff Comment: Staff supports this request if fire access and traffic access to the parking spaces is not impeded.**

10. Parking on Major and Minor Drives: Off-street parking shall be no closer than 25 feet to any wall of a dwelling structure that contains openings involving living areas. In addition, it is not permitted on a major drive. The applicant is requesting a deviation of 8 feet (25 feet required, 17 feet proposed) from the setback requirements and requests a deviation allowing parking on a major drive.

**Staff Comment: Staff supports the request for this deviation as the layout of the parking lot does not negatively impact the site with the proposed setbacks or traffic flow.**

11. Pedestrian Connectivity (Sec. 3.8.2.G): Five foot wide sidewalks are required on the north and south portion of the site. Currently, the applicant is only proposing a five foot wide sidewalk on the south portion of the site and a five foot sidewalk connecting to the west out-lot. The applicant is requesting a deviation from providing a required five foot sidewalk along the north portion of the site that connects to the Wixom Road sidewalk system.

**Staff Comment: Staff supports this request as pedestrian connectivity has been maximized given the site constraints.**

12. Gross Building Area – Retail (Item 12, A, Consent Judgment): Per the Consent Judgment, Retail "B," which is proposed to be located on this property, shall not exceed 100,000 square feet in total square footage. The proposed development is estimated to be 183,300. The applicant is requesting a deviation of 83,300 gross square feet (100,000 square feet required, 183,300 square feet proposed).

**Staff Comment: Staff supports the request for this deviation so long as the proposed use is considered compatible by the Planning Commission and City Council.**

13. Parking (Item 12, E, Consent Judgment): Per the Consent Judgment, a total of 1,725 parking spaces shall be provided between Retail A, B, and C. 1,470 total spaces are proposed for Retail A,B, and C. The applicant is requesting a deviation of 255 parking spaces (1,725 required, 1,470 proposed).

**Staff Comment: Staff supports the request for this deviation so long as the Traffic Impact Study is approved, and a shared parking study and narrative is provided as part of the site plan submittal.**

14. Entranceway Sign (City Code Section 28.3): A proposed entranceway sign appears on the rendering provided with the site plan. The dimensions of the proposed entranceway sign are unclear and will be provided at a later date. The applicant is requesting a deviation of 91 square feet in size (24 square feet required, 115 square feet proposed).

**Staff Comment: Staff supports the request for this deviation so long as the signage is designed in a manner that complements the design of the site.**

#### **SUMMARY OF OTHER REVIEWS:**

**Planning, Landscape, Wetlands, and Façade are currently not recommending approval.**

- a. Engineering Review (dated 5-26-23): Engineering recommends approval of the Concept Site Plan and Concept Stormwater Management Plan with items to be addressed with the next submittal.

- b. Landscape Review (dated 5-22-23): Landscape **does not** recommend approval of the Concept Site Plan with items to be addressed in a revised submittal.
- c. Wetland Review (dated 5-24-23): Wetland recommends approval of the Concept Site Plan with items to be addressed in a revised submittal.
- d. Woodland Review (dated 5-23-23): Woodlands **does not** recommend approval of the Concept Site Plan with items to be addressed in a revised submittal.
- e. Traffic Review (dated 5-26-23): Traffic **does not** recommend approval of the Concept Site Plan with items to be addressed in a revised submittal.
- f. Facade Review (5-22-23): Façade **does not** recommend approval of the Concept Site Plan with items to be addressed in a revised submittal.
- g. Fire Review (dated 5-17-23): Fire recommends approval with conditions to be addressed with the next submittal.

## RECOMMENDATION

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Approval of the **Consent Judgment Concept Plan is not recommended** until the following items can be further reviewed and addressed:

- It is staff's opinion that the proposed multiple family use is not compatible with the surrounding shopping center, particularly with regard to the buffering of the proposed multiple family from the adjacent Sam's Club loading zone which was previously developed in that manner assuming another retail store would be built adjacent to it, and because this review and other review letters identify a number of concerns and deviations that are not currently supported or recommended by staff and/or consultants; and
- A parking study and narrative justifying that the parking that shown on the plan is sufficient for the uses and density of multiple family uses on the property has not been provided; and
- The proposed multiple family use is not consistent with or compatible with the recommended uses shown on the Master Plan for Land Use or the terms of the Consent Judgment

The Concept Plan was presented to the Planning Commission's Master Plan and Zoning Committee on May 24, during which the Committee members asked questions and provided comment on the proposed plan. A public hearing has now been scheduled with the Planning Commission for the June 21, 2023 Planning Commission meeting.

**The following elaborations on each of the steps in an amendment process depend, of course, on whether the City decides to move the question forward. City Council could, for example, determine at any step in the process outlined here that it does not intend to amend the Consent Judgment.**

## NEXT STEP: PLANNING COMMISSION PUBLIC HEARING

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The Concept Plan has been scheduled for a public hearing before the Planning Commission. Following the hearing, the Planning Commission will either make a recommendation to City Council or postpone pending further information. If a recommendation is made, the Concept Plan will then be scheduled for consideration by the City Council. If the City Council grants tentative approval at that time, they will direct the City Attorney to draft an Amendment to the Consent Judgment describing the terms of the Amendment. If approved, the applicant will still need to seek the required approvals from Planning Commission for the Preliminary Site Plan, Stormwater Management Plan, Woodland Use Permit, Wetland Use Permit, and any other applicable provisions.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.347.0587 or [bmcbeth@cityofnovi.org](mailto:bmcbeth@cityofnovi.org).



## PLANNING REVIEW CHART: B-2, Community Business w/Consent Judgment

**Review Date:** May 26, 2023  
**Review Type:** Revised Consent Judgment Concept Plan  
**Project Name:** **JSP23-02 STATION FLATS**  
 50-22-17-101-032; East of Wixom Rd, South of Grand River Ave  
**Plan Date:** May 5, 2023  
**Prepared by:** Christian Carroll, Planner  
**E-mail:** [ccarroll@cityofnovi.org](mailto:ccarroll@cityofnovi.org) **Phone:** (248) 735-5607

Items in **Bold** need to be addressed by the applicant with next submittal. *Italicized* items should be noted.

Item	Required Code	Proposed	Meets Code	Comments
<b>Zoning and Use Requirements</b>				
<b>Master Plan</b>	Community Commercial	Multiple-Family Residential – Land Use Narrative provided.	<b>No</b>	<i>As the Master Plan did not envision multiple-family use, it will need to be reviewed by Master Plan &amp; Zoning Committee of the Planning Commission.</i>
<b>Zoning</b>	B-2, Community Business (Consent Judgment)	RM-2, High-Density, Mid-Rise Multiple-Family Residential	<b>No</b>	<b>An amendment to the consent judgment would be required.</b>
<b>Uses Permitted</b> (Sec 3.1.11.B & C)	B-2 Uses permitted listed in Section 3.1.11.B & C	Multiple-Family Residential (RM-2)	<b>No</b>	<i>All review comments below pertain to the current Consent Judgment and the proposed change to RM-2 Zoning.</i>
<b>Residential: Height, Bulk, Density, and Area Limitations (Sec. 3.1.8.D)</b>				
<b>Frontage on a Public Street</b> (Sec. 5.12)	Frontage on a Public Street is required	Frontage on Wixom Road	Yes	
<b>Access to a Major Thoroughfare</b> (Sec. 5.13)	Vehicular access shall be provided only to an existing or planned major thoroughfare or freeway service drive OR access driveway on other street type is not across street from existing or planned single-family uses	Complies	Yes	
<b>Minimum Zoning Lot Size</b> for each Unit: in Acres (Sec 3.8.1)	RM-2 Required Conditions <u>See below</u>	Unit mix and height provided	Yes	
<b>Minimum Zoning Lot Size</b> for each Unit: Width in Feet (Sec 3.8.1)		Unit mix and height provided	Yes	
<b>Open Space Area</b> (Sec. 3.1.8.D)	200 sf Minimum usable open space per dwelling unit For a total of 157 dwelling units, <u>required Open Space: 31,400 SF</u>	Courtyards: 16,200 sf Balconies: 11,055 sf Designated open space: 4,000 sf Total: 31,475 sf	<b>TBD</b>	<b>The proposed designated open space is located within a conservation easement and would not be permitted. Please revise the location or seek a deviation for reduced usable open space.</b>
<b>Maximum % of</b>	25%	4.24%	Yes	

Item	Required Code		Proposed	Meets Code	Comments
<b>Lot Area Covered</b> (By All Buildings)					
<b>Building Height</b> (Sec. 3.1.8.D)	65 ft or 5 stories, whichever is less		4 stories, 46 ft tall	Yes	
<b>Minimum Floor Area per Unit</b> (Sec. 3.1.8.D)	Efficiency	400 sf	500 sf	Yes	
	1 bedroom	500 sf	720 sf	Yes	
	2 bedroom	750 sf	860 sf	Yes	
	3 bedroom	900 sf	1,600 sf	Yes	
	4 bedroom	1,000 sf	None	NA	
<b>Maximum Dwelling Unit Density/Net Size Area</b> (Sec. 3.1.8.D)	Efficiency	Max 10%	15.3%, 24 units/8.64 net ac = 2.77 du/ac	No	Please update the percentage in Sheet C-3.0 as it is incorrect. See max number of units
	1 bedroom and Live/Work (1 bedroom)	31.1 du/net ac. Max 33%	38.2% + 4.4% = 42.6%, (60 + 7)/8.64 net ac = 7.75 du/ac	No	Please update the percentage in Sheet C-3.0 as it is incorrect. See max number of units
	2 bedroom	20.7 du/net ac.	40.8%, 64/8.64 net ac = 7.41 du/ac	No	Please update the percentage in Sheet C-3.0 as it is incorrect. See max number of units
	3+ bedroom	15.6 du/net ac.	1.3%, 2/8.64 net ac = 0.23 du/ac	No	See max number of units.
<b>Residential Building Setbacks</b> (Sec. 3.1.8.D, Sec. 3.6.2.B, and Sec. 3.8.2.C - if applicable)					
Front (West)	75 feet		103.21 feet	Yes	
Side (North)	75 feet		163.89 feet	Yes	
Side (South)	75 feet		660.79 feet	Yes	
Rear (East)	75 feet		484.48 feet	Yes	
<b>Parking Setbacks</b> (Sec. 3.1.8.D) Refer to applicable notes in Sec. 3.6.2					
Front (West)	75 feet (Street frontage)		~45 feet (west out lot), ~70 feet (main lot)	No	Deviations requested as part of the Consent Judgment.
Side (North)	20 feet		10 feet (west out lot), 11.71 feet (north out lot)	No	Deviation requested as part of the Consent Judgment.
Side (South)	20 feet		Complies	Yes	
Rear (East)	20 feet		Complies	Yes	
<b>RM-2: Note to District Standards</b> (Sec. 3.6.2)					
<b>Area Requirements</b> (Sec. 3.6.2.A)	Pursuant to the definition contained in Section 2.2, lot width shall be measured between the two points where the front setback line intersects the side lot lines. Within the residential districts, where a main building is		Reduction not proposed at this time	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	<p>placed behind the front setback line, the distance between the side lot lines shall not be reduced below 90% of the required minimum lot width at any point between the front set back line and such main building. The purpose of this amendment is to protect against the creation within the city of irregularly-shaped flag lots.</p>			
<p><b>Structure Setback Requirements</b>                      (Sec. 3.6.2.B)</p>	<p>For all uses permitted other than single-family or two-family residential, the building or structure setback shall at least equal to: (1) the height of the main building; (2) seventy-five (75) feet; or (3) the setback required in the Development Standards of Section 3.1 of this Ordinance, whichever is greater. However, the minimum building setback from access streets may be reduced to fifty (50) feet for fire department structures where quick access to the street network is required. For all off-street parking lots serving any use other than single-family residential, the setback from any interior side or rear lot line shall be not less than twenty (20) feet, and the setback from the front and any exterior side lot line shall comply with the building setback required for such uses specified above. Further, for churches there shall be no parking in the front yard. (See also Section 4.10.)</p>	<p>75 foot building setback from all property lines is met.</p> <p>Off-street parking lot in the two out lots do not meet 20 foot minimums.</p>		<p><i>The minimum building setback from access streets may be reduced to 50 feet for fire department structures where quick access to the street network is required.</i></p> <p><b>Off-street parking lots shall not be setback less than 20 feet from any interior side or rear lot line. Deviation requested as part of the Consent Judgment.</b></p>
<p><b>Exterior Side Yard Abutting a Street</b>                      (Sec 3.6.2.C)</p>	<p>All exterior side yards abutting a street shall be provided with a setback equal to front yard.</p>	<p>Complies</p>	<p>Yes</p>	
<p><b>Wetland/Watercourse Setback</b> (Sec 3.6.2.M)</p>	<p>A setback of 25ft from wetlands and from high watermark course shall be maintained</p>	<p>Shown</p>	<p>Yes</p>	<p><b>Authorization to Encroach into Wetland Buffer Area will be required.</b></p>
<p><b>RM-2 District Required Conditions</b> (Sec. 3.8 &amp; 3.10)</p>				

Item	Required Code	Proposed	Meets Code	Comments
<b>Total number of rooms</b> (Sec. 3.8.1.B)	Total No. of rooms < Net site area in SF/700 $376,534 \text{ SF} / 700 = 538$	358 rooms	Yes	
<b>Public Utilities</b> (Sec. 3.8.1)	All public utilities should be available	Shown	Yes	
<b>Maximum Number of Units</b> (Sec. 3.8.1.B.ii)	Efficiency < 10 percent of the units	15%	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
	1 bedroom units < 33 percent of the units	42.6%	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
	Balance should be at least 2 bedroom units	42.1% - percentages are closer than previous submittal	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Room Count per Dwelling Unit Size</b> (Sec. 3.8.1.C)  <i>An extra room such as den, library or other extra room count as an additional bedroom</i>	<b>Dwelling Unit Size</b>	<b>Room Count *</b>		
	Efficiency	1	24 units – 24 rooms	Yes
	1 bed* (live/work included)	2	67 units – 134 rooms	Yes
	2 bedroom	3	64 units – 192 rooms	Yes
	3 or more bedrooms	4	2 units – 8 rooms	Yes
For the purpose of determining lot area requirements and density in a multiple-family district, a room is a living room, dining room or bedroom, equal to at least eighty (80) square feet in area. A room shall not include the area in kitchen, sanitary facilities, utility provisions, corridors, hallways, and storage. Plans presented showing one (1), two (2), or three (3) bedroom units and including a "den," "library," or other extra room shall count such extra room as a bedroom for the purpose of computing density.				
<b>Setback along natural shoreline</b> (Sec. 3.8.2.A)	A minimum of 150 feet along natural shoreline is required.	No shoreline	NA	
<b>Structure frontage</b> (Sec. 3.8.2.B)	Each structure in the dwelling group shall front either on a dedicated public street or approved private drive.	Drives will be private	Yes	
<b>Maximum length of the buildings</b> (Sec. 3.8.2.C)	A single building or a group of attached buildings cannot exceed 180 ft.	368 feet	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Modification of maximum length</b> (Sec. 3.8.2.C)	Planning Commission may modify the extra length up to 360 ft if common areas with a minimum capacity of 50 persons for recreation or social purposes. Additional setback of 1 ft. for every 3 ft. in excess of 180 ft. from all		NA	<i>Applicant is not seeking a modification at this time.</i>

Item	Required Code	Proposed	Meets Code	Comments
	property lines.			
<b>Building Orientation</b> (Sec. 3.8.2.D)	Where any multiple dwelling structure and/ or accessory structure is located along an outer perimeter property line adjacent to another residential or nonresidential district, said structure shall be oriented at a minimum angle of 45 degrees to property line.	Building is not currently angled, required to be angled 45°	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Yard setback restrictions</b> (Sec. 3.8.2.E)	Within any front, side or rear yard, off-street parking, maneuvering lanes, service drives or loading areas cannot exceed 30% of yard area	47.96%	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Off-Street Parking or related drives</b> (Sec. 3.8.2.F)  <i>Off-street parking and related drives shall be...</i>	No closer than 25 ft. to any wall of a dwelling structure that contains openings involving living areas	17 ft	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
	No closer than 8 ft for other walls	17 ft	Yes	
	No closer than 20 ft from ROW and property line	10 ft	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Pedestrian Connectivity</b> (Sec. 3.8.2.G)	5 feet sidewalks on both sides of the Private drive are required to permit safe and convenient pedestrian access.	7 foot wide sidewalk connecting to Target. No sidewalk on the north side.	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
	Where feasible sidewalks shall be connected to other pedestrian features abutting the site.	Connected to main sidewalk system via Target.	Yes	
	All sidewalks shall comply with barrier free design standards	Barrier free markings shown	TBD	<b>See Traffic Review for more information.</b>
<b>Minimum Distance between the buildings</b> (Sec. 3.8.2.H)	(Total length of building A + total length of building B + 2(height of building + height of building B))/6		NA	<i>One building proposed.</i>
<b>Minimum Distance between the buildings</b> (Sec. 3.8.2.H)	In no instance shall this distance be less than thirty (30) feet unless there is a corner-to-corner relationship in which case the minimum		NA	<i>One building proposed.</i>



Item	Required Code	Proposed	Meets Code	Comments
	distance shall be fifteen (15) feet.			
<b>Number of Parking Spaces</b> Residential, Multiple-family (Sec. 5.2.12.A)	Two (2) for each dwelling unit having two (2) or less bedrooms and two and one-half (2 ½) for each dwelling unit having three (3) or more bedrooms  2 x (7 L/W + 24 studio + 60 1-bed + 64 2-bed) = 310   2.5 x 2 3-bed = 5 <b>Spaces Required: 315</b>	247 spaces are provided  ITE Calculation shows 1.1539 spaces per dwelling unit = 238 spaces	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment. See the Traffic Review for more information.</b>
<b>Parking Space Dimensions and Maneuvering Lanes</b> (Sec. 5.3.2)	- 90° Parking: 9 ft. x 19 ft. - 24 ft. two way drives - 9 ft. x 17 ft. parking spaces allowed along 7 ft. wide interior sidewalks as long as detail indicates a 4" curb at these locations and along landscaping	4" curb with 9' x 17' spaces	No	<b>Minimum width of a maneuvering lane is 24 feet when parking is proposed. Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>End Islands</b> (Sec. 5.3.12)	- End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles. - The end islands shall generally be at least 8 ft. wide, have an outside radius of 15 ft., and be constructed 3 ft. shorter than the adjacent parking stall	End Islands provided	Yes	<b>The end island located on the northwest corner of the site does not meet minimum square footage requirements. See Landscape Review for more information.</b>
<b>Parking stall located adjacent to a parking lot entrance</b> (public or private) (Sec. 5.3.13)	Shall not be located closer than twenty-five (25) feet from the street right-of-way (ROW) line, street easement or sidewalk, whichever is closer	25 feet (1 space in out lot)	Yes	
<b>Barrier Free Spaces</b> Barrier Free Code	With 321 spaces required, 6 standard BF and 2 van-accessible BF spaces required	6 van accessible, 2 standard	Yes	
<b>Barrier Free Space Dimensions</b> Barrier Free Code	- 8' wide with an 8' wide access aisle for van accessible spaces - 8' wide with a 5' wide access aisle for regular accessible spaces	8' wide with curb, 8' access	Yes	
<b>Barrier Free Signs</b> Barrier Free Code	One sign for each accessible parking space.	Shown	Yes	
<b>Corner Clearance</b> (Sec. 5.9)	No fence, wall plant material, sign or other obstruction shall	Shall comply	Yes	<b>See Landscape Review.</b>

Item	Required Code	Proposed	Meets Code	Comments
	be permitted within the clear view zone above a height of 2 feet from established street grade			
<b>Minimum number of Bicycle Parking</b> (Sec. 5.16.1) <u>Multiple-family residential</u>	One (1) space for each five (5) dwelling units  <b>Required: 32 Spaces</b>	24 exterior spaces shown, 8 interior spaces	Yes	
<b>Bicycle Parking General requirements</b> (Sec. 5.16)	No farther than 120 ft. from the entrance being served	Complies	Yes	
	When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations	Complies	Yes	
	Spaces to be paved and the bike rack shall be inverted "U" design Shall be accessible via 6 ft. paved sidewalk	Complies	Yes	
<b>Bicycle Parking Lot layout</b> (Sec 5.16.6)	Parking space width: 6 ft. One tier width: 10 ft. Two tier width: 16 ft. Maneuvering lane width: 4 ft. Parking space depth: 2 ft. single, 2 ½ ft. double	Complies	Yes	
<b>Additional Road Design, Building Setback, And Parking Setback Requirements, Multiple-Family Uses (Sec. 5.10)</b>				
<b>Road standards</b> (Sec. 5.10)	A private drive network within a cluster, two-family, multiple-family, or non-residential uses and developments shall be built to City of Novi Design and Construction Standards for local street standards (28 feet back-to-back width)	Minimum 28 feet wide	Yes	
<b>Major Drives</b>	Width: 28 feet, no parking	Minimum 28 feet wide	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Minor Drive</b>	<ul style="list-style-type: none"> <li>- Cannot exceed 600 feet</li> <li>- Width: 24 feet with no on-street parking</li> <li>- Width: 28 feet with parking on one side</li> <li>- Parking on two sides is not allowed</li> <li>- Needs turn-around if longer than 150 feet</li> </ul>	None shown	NA	
<b>Parking on Major and Minor Drives</b>	- Angled and perpendicular parking, permitted on minor	All conditions met, except the	No	<b>Applicant is requesting a deviation from this</b>

Item	Required Code	Proposed	Meets Code	Comments
	drive, but not from a major drive; - minimum centerline radius: 100 feet - Adjacent parking and on-street parking shall be limited near curves with less than two-hundred thirty (230) feet of centerline radius - Minimum building setback from the end of a parking stall shall be 25 feet in residential districts.	minimum building setback appears to be 17 feet		<b>requirement as part of the Consent Judgment.</b>
<b>Accessory and Rooftop Structures (Sec. 4.19)</b>				
<b>Dumpster</b> (Sec 4.19.2.F)	<ul style="list-style-type: none"> <li>- Located in rear yard</li> <li>- Attached to the building or no closer than 10 ft. from building if not attached</li> <li>- Not located in parking setback</li> <li>- If no setback, then it cannot be any closer than 10 ft, from property line.</li> <li>- Away from Barrier free Spaces</li> </ul>	<ul style="list-style-type: none"> <li>- In Rear Yard</li> <li>- Complies</li>   <li>- Complies</li>   <li>- Complies</li>   <li>- Complies</li> </ul>	Yes	
<b>Dumpster Enclosure</b> (Sec. 21-145. (c) Chapter 21 of City Code of Ordinances)	<ul style="list-style-type: none"> <li>- Screened from public view</li> <li>- A wall or fence 1 ft. higher than height of refuse bin</li> <li>- And no less than 5 ft. on three sides</li> <li>- Posts or bumpers to protect the screening</li> <li>- Hard surface pad</li> <li>- Screening Materials: Masonry, wood or evergreen shrubbery</li> </ul>	<ul style="list-style-type: none"> <li>- Screening not sufficient</li> <li>- 6 ft tall</li> <li>- Complies</li>   <li>- Complies</li>   <li>- Complies</li> <li>- Masonry</li> </ul>	Yes	
<b>Roof top equipment and wall mounted utility equipment</b> (Sec. 4.19.2.E.ii)	All roof top equipment must be screened, and all wall mounted utility equipment must be enclosed and integrated into the design and color of the building	Shown – will be required to be screened	TBD	
<b>Roof top appurtenances screening</b>	Roof top appurtenances shall be screened in accordance with applicable facade regulations, and shall not be visible from any street, road or adjacent property.	Shown – will be required to be screened	TBD	
<b>Sidewalks and Other Requirements</b>				
<b>Non-Motorized Plan</b>	No additional pathways shown.	None shown	NA	

Item	Required Code	Proposed	Meets Code	Comments
<b>Sidewalks</b> (Subdivision Ordinance: Sec. 4.05)	Sidewalks are required on both sides of proposed drives	Only shown on one side (Target)	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Public Sidewalks</b> (Chapter 11, Sec.11-276(b), Subdivision Ordinance: Sec. 4.05)	Connection to main sidewalk on Wixom Road required.	Connection provided	Yes	
<b>Entryway lighting</b> (Sec. 5.7.N)	One streetlight is required per entrance.	Photometric plan provided	TBD	<b>Lighting may be required along entry drive.</b>
<b>Consent Judgment Requirements - Attached</b>				
<b>Total Green and Open Space</b> (Item 11, A)	-The total green and open space, including preservation areas and interior landscaping, shall be preserved and maintained by the Developer on the property, and shall be a minimum of 40% of the total (not including 2.34 acres of right-of-way) land area. - The area depicted on Exhibit B as "Preserved Woodlands, Wetland and Storm Water Detention" shall be permanently preserved, and prior to the issuance of any development approval, the Developer shall execute and record the Conservation Easement attached as Exhibit C prior to any site development approvals [...]	80%	Yes	
<b>Landscape Areas</b> (Item 11, B)	The landscape areas [...] shall be constructed and preserved by the Developer, and shall be subject to the maintenance obligations set forth in this judgment.	Shall comply	Yes	<i>See Landscape Review.</i>
<b>Gross Building Area – Retail</b> (Item 12, A)	Retail "B" located on this property, which shall not exceed 100,000 square feet.	183,300 gross square feet	No	<b>The proposed square footage of the site exceeds 100,000 square feet. Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>
<b>Uses Permitted</b> (Item 12, B)	Retail "A," "B" and "C" shall conform to the uses permitted in the B-2 zoning district as described in the City of Novi	RM-2 Proposed.	No	<b>Amendment to the Consent Judgment will be required.</b>

Item	Required Code	Proposed	Meets Code	Comments
	Zoning Ordinance [...]			
<b>Uses Not Permitted</b> (Item 12, D)	Arcades and adult business uses (or any other uses involving sexually explicit activities, all as defined in the City Zoning Ordinance, as amended) shall not be permitted.	Not proposed	Yes	
<b>Parking</b> (Item 12, E)	Plaintiffs shall provide 1,725 parking spaces for Retail "A," "B" and "C."	247 spaces proposed. 1,470 spaces for Retail A-C.	<b>No</b>	<b>Applicant is requesting a deviation of 255 total spaces from this requirement as part of the Consent Judgment.</b>
<b>Building Code and Other Requirements</b>				
<b>Woodlands</b> (City Code Ch. 37)	Replacement of removed trees	No impacts.	NA	Woodland & Wetland Area to be preserved.
<b>Wetlands</b> (City Code Ch. 12, Art. V)	Mitigation of removed wetlands at ratio of 1.5:1 emergent wetland, 2:1 for forested wetlands	Proposed retaining wall impacting wetland area.	<b>TBD</b>	<b>See Wetland Review.</b>
<b>Design and Construction Standards Manual</b>	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Generally provided	Yes	Additional sheets may be requested, as necessary.
<b>General layout and dimension of proposed physical improvements</b>	Location of all existing and proposed buildings, proposed building heights, building layouts, (floor area in square feet), location of proposed parking and parking layout, streets and drives, and indicate square footage of pavement area (indicate public or private).	Generally provided	Yes	
<b>Economic Impact Information</b>	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	None provided	<b>No</b>	<b>Please provide listed information (i.e., estimated cost, jobs) with the next submittal.</b>
<b>Building Exits</b>	Building exits must be connected to sidewalk system or parking lot.	Complies	Yes	
<b>Phasing</b>	All projects must be completed within two years of the issuance of any starting permit or phasing plan should be provided	One phase	NA	
<b>Other Permits and Approvals</b>				

Item	Required Code	Proposed	Meets Code	Comments
<b>Development/ Business Sign</b> (City Code Sec 28.3)	The leading edge of the sign structure shall be a minimum of 10 ft. behind the right-of-way. Entranceway shall be a maximum of 24 square feet, measured by completely enclosing all lettering within a geometric shape. Maximum height of the sign shall be 5 ft.	Appears on rendering, not shown on plan	No	Show the location of any entranceway signs if proposed; deviation from sign ordinance has been requested.
<b>Project &amp; Street Naming Committee</b>	Some projects may need approval from the Street & Project Naming Committee	One street name approved	Yes	Contact Diana Shanahan at 248.347.0475 or via email <a href="mailto:dshanahan@cityofnovi.org">dshanahan@cityofnovi.org</a>
<b>Parcel Split or Combination or Condominium Approval</b>	Any parcel splits or combinations or condominium approvals must be completed before Stamping Set approval.	None proposed	NA	
<b>Other Legal Requirements</b>				
<b>Master Deed/Covenants and Restrictions</b>	Applicant is required to submit this information for review with the Final Site Plan submittal	Not applicable at this moment	TBD	<u>If proposed, Master Deed draft shall be submitted prior to Stamping Set approval.</u>
<b>Conservation easements</b>	Conservation easements may be required for woodland impacts	Additional wetland and woodland easements may be required	TBD	<u>Draft documents would be required prior to stamping set approval.</u>
<b>Lighting and Photometric Plan (Sec. 5.7)</b>				
<b>Intent (Sec. 5.7.1)</b>	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties & reduce unnecessary transmission of light into the night sky	A lighting and photometric plan is provided	Yes	
<b>Lighting Plan (Sec. 5.7.2.A.i)</b>	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures	Provided	Yes	
<b>Building Lighting (Sec. 5.7.2.A.iii)</b>	Relevant building elevation drawings showing all fixtures, the portions of the walls to be illuminated, illuminance levels of walls and the aiming points of any remote fixtures.	Provided	Yes	
<b>Lighting Specifications (Sec. 5.7.A.2.ii)</b>	Specifications for all proposed & existing lighting fixtures	Not provided	No	<b>Provide specification sheets for light fixtures, mounting detail and design, hours of operation.</b>
	Photometric data	Provided	Yes	
	Fixture height	Max 20 feet	No	
	Mounting & design	Not provided	No	

Item	Required Code	Proposed	Meets Code	Comments
	Glare control devices (Also see Sec. 5.7.3.D)	Appears to comply	Yes	
	Type & color rendition of lamps	LED Lamps	Yes	
	Hours of operation	Not provided	No	
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties	Provided	Yes	
<b>Max Height</b> (Sec. 5.7.3.A)	Height not to exceed maximum height of 25 feet	Max 20 feet	Yes	
<b>Standard Notes</b> (Sec. 5.7.3.B)	<ul style="list-style-type: none"> <li>- Electrical service to light fixtures shall be placed underground</li> <li>- Flashing light shall not be permitted</li> <li>- Only necessary lighting for security purposes &amp; limited operations shall be permitted after a site's hours of operation</li> </ul>	Provided	Yes	
<b>Security Lighting</b> (Sec. 5.7.3.H)	<ul style="list-style-type: none"> <li>- All fixtures shall be located, shielded and aimed at the areas to be secured.</li> <li>- Fixtures mounted on the building and designed to illuminate the facade are preferred</li> </ul>	Complies	Yes	
<b>Average Light Level</b> (Sec.5.7.3.E)	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1	Generally complies	Yes	
<b>Lighting Type</b> (Sec. 5.7.3.F)	Use of true color rendering lamps such as metal halide is preferred over high & low pressure sodium lamps	LED Lighting	Yes	
<b>Min. Illumination</b> (Sec. 5.7.3.K)	Parking areas: 0.2 fc min	0.5 fc	Yes	<b>Revise the main entrances to meet 1.0 foot candle minimum.</b>
	Loading & unloading areas: 0.4 fc min	1 fc	Yes	
	Walkways: 0.2 fc min	0.3 fc	Yes	
	Building entrances, frequent use: 1.0 fc min	0.8 fc	No	
	Building entrances, infrequent use: 0.2 min	0.4 fc	Yes	
<b>Max. Illumination adjacent to Non-Residential</b> (Sec. 5.7.3.K)	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle	0.5 fc	Yes	

Item	Required Code	Proposed	Meets Code	Comments
<b>Cut off Angles</b> <i>(Sec. 5.7.3.L)</i>	When adjacent to residential districts: - All cut off angles of fixtures must be 90° - maximum illumination at the property line shall not exceed 0.5 foot candle - No direct light source shall be visible at the property line (adjacent to residential) at ground level	Not applicable	NA	

**NOTES:**

1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.
2. The section of the applicable ordinance or standard is indicated in parenthesis. Please refer to those sections in Article 3, 4 and 5 of the zoning ordinance for further details.
3. Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.



## ENGINEERING REVIEW

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# PLAN REVIEW CENTER REPORT

5/25/2023

## Engineering Review

Station Flats

JSP23-02

### Applicant

MF Novi, LLC

### Review Type

Revised Preliminary Site Plan

### Property Characteristics

- Site Location: Wixom Rd between Grand River Ave & 11 Mile Rd.
- Site Size: 24.77 acres
- Plan Date: 5/4/2023
- Design Engineer: PEA Group.

### Project Summary

- Construction of a four-story building and associated parking. Site access would be provided via Public or Private roadways.
- Water service would be provided by an extension from the existing 12-inch water main along the northern side of the development. A domestic lead and a fire lead would be provided to serve the building, along with four additional hydrants.
- Sanitary sewer service would be provided by an extension from the existing 8-inch sanitary sewer along the western side of the development.
- Storm water would be collected by a single storm sewer collection system and conveyed to an existing detention basin in the southern region of the development.

### Recommendation

**Approval of the revised Preliminary Site Plan and Preliminary Storm Water Management Plan is recommended. with items to be addressed at the final site plans submittal.**

### Comments:

The Revised Preliminary Site Plan meets the general requirements of Chapter 11 of the Code of Ordinances, the Storm Water Management Ordinance, and the Engineering Design Manual with the following exceptions, which can be addressed at the Final Set Plans submittal:

**General**

1. **Only at the time of the printed Stamping Set submittal**, provide the City's standard detail sheets for water main (5 sheets), sanitary sewer (3 sheets), storm sewer (2 sheets), paving (2 sheets) and Boardwalks/Pathways (1 sheet). The most updated details can be found on the City's website at this location: <https://cityofnovi.org/services/public-works/engineering-division/engineering-standards-and-construction-details>
2. The Non-Domestic User Survey form for sanitary sewer flow shall be submitted to the City so it can be forwarded to Oakland County. The form was included in the original site plan package.
3. Provide a traffic control sign table listing the quantities of each **permanent** sign type proposed for the development. Provide a note along with the table stating all traffic signage will comply with the current MMUTCD standards.
4. Provide a note that compacted sand backfill (MDOT sand Class II) shall be provided for all utilities within the influence of paved areas and illustrate and label on the profiles.
5. Provide a construction materials table on the utility plan listing the quantity and material type for each utility (water, sanitary and storm) being proposed.
6. Provide a utility crossing table indicating that at least 18-inch vertical clearance will be provided, or that additional bedding measures will be utilized at points of conflict where adequate clearance cannot be maintained.
7. Where the minimum 18-inch clearance at utility crossings cannot be achieved, provide a prominent note stating the substandard clearance and that proper bedding/encasement will be determined by the inspecting engineer.
8. Provide a note stating if dewatering is anticipated or encountered during construction, then a dewatering plan must be submitted to the Engineering Division for review.
9. Generally, all proposed trees shall remain outside utility easements. Where proposed trees are required within a utility easement, the trees shall maintain a minimum 5-foot horizontal separation distance from any existing or proposed utility. All utilities shall be shown on the landscape plan, or other appropriate sheet, to confirm the separation distance.
10. Show the locations of all light poles on the utility plan and indicate the typical foundation depth for the pole to verify that no conflicts with utilities will occur. Light poles in a utility easement will require a License Agreement.
11. For common area irrigation systems connected to public water supplies: Install a backflow prevention Reduced Pressure Zone Assembly (RPZ) with an ASSE 1013 listing approval at each tap to the public water supply. A minimum clearance of 12-inches measured from the bottom of pressure relief valve to the finished landscaped grade shall be required. Provide a detail showing the RPZ installation setup and height above grade. If backflow preventer is to be

- enclosed, provide a detail of the enclosure with required drainage outlets. Show all locations on a site plan. A plumbing permit is required for the installation of the backflow preventer. Installation of the backflow preventer shall be in such a manner as to not require blowing out the system through the backflow preventer. Drain ports and blow out ports shall be included. Any deviations from these requirements must be approved through the Novi Water & Sewer Division Cross Connection Control Specialist (248-735-5661).
12. The grading and SESC sheets shall show the tree fence at least as far from the trunk as the critical root zone, defined as a circular area around a tree with a radius measured to the tree's longest dripline radius plus one (1) foot. No grading shall occur within the dripline. If the critical root zone is not fully protected, then replacements for that tree may be required.

### **Water Main**

13. Our records show that there is an existing 12-inch water main on the west side of the building that can be extended to serve the proposed development.
14. Per current EGLE requirement, provide a profile for all proposed water main 8-inch and larger.
15. All gate valves 6" or larger shall be placed in a well with the exception of a hydrant shut off valve. A valve shall be placed in a box for water main smaller than 6".
16. **In the general notes and on the profile, add the following note: "Per the Ten States Standards Article 8.8.3, one full 20-foot pipe length of water main shall be used whenever storm sewer or sanitary sewer is crossed, and the pipe shall be centered on the crossing, in order to ensure 10-foot separation between water main and sewers." Additionally, show the 20-foot pipe lengths on the profile.**
17. An electronic and one sealed set of utility plans along with the Michigan Department of Environment, Great Lakes & Energy (EGLE) permit application for water main construction, the Streamlined Water Main Permit Checklist, and electronic utility plan should be submitted to the Engineering Division for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets, and the standard detail sheets.

### **Sanitary Sewer**

18. Revise the basis of design calculation for the water main and sanitary sewer - Number of users per REU is 3.2, and the peaking factor is 4.0. assuming the population is 500 or less. Use City of Novi unit factors. (0.6 for one bedroom, 0.75 for two bedrooms, etc.).
19. Section 11-164 (g)-4 states the maximum length of a sanitary sewer lead shall exceed 100-feet unless otherwise approved. Extend Sanitary Sewer so that leads are not more than 100-feet long **or** provide clean-outs every 100-feet.
20. Provide a note on the Utility Plan and sanitary profile stating the sanitary leads will be buried at least 5 feet deep where under the influence of pavement.

21. For 8-inch and larger extensions - Provide a testing bulkhead immediately upstream of the sanitary connection point. *(If more than one run of 8-inch proposed)* Additionally, provide a temporary 1-foot-deep sump in the first sanitary structure proposed upstream of the connection point, and provide a secondary watertight bulkhead in the downstream side of this structure.
22. Illustrate all pipes intersecting with manholes on the sanitary profiles.
23. Three (3) sealed sets of revised utility plans along with the Michigan Department of Environment, Great Lakes & Energy (EGLE) permit application, electronic utility plan for sanitary sewer construction, and the Streamlined Sanitary Sewer Permit Certification Checklist should be submitted to the Engineering Division for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets, and the standard detail sheets. It should be indicated with the application if an expedited EGLE review is requested. EGLE will charge a fee that can be paid directly to the State.

### **Storm Sewer**

1. Provide profiles for all storm sewer 12-inch and larger. All storm pipes accepting surface drainage shall be 12-inch or larger.
2. A minimum cover depth of 3 feet shall be maintained over all proposed storm sewer. In situations where the minimum cover cannot be achieved, Class V pipe must be used with an absolute minimum cover depth of 2 feet. An explanation shall be provided where the cover depth cannot be provided.
3. Provide a 0.1-foot drop in the downstream invert of all storm structures where a change in direction of 30 degrees or greater occurs.
4. Match the 0.80 diameter depth above invert for pipe size increases.
5. Storm manholes with differences in invert elevations exceeding two feet shall contain a 2-foot-deep plunge pool.
6. Label all inlet storm structures on the profiles. Inlets are only permitted in paved areas and when followed by a catch basin within 50-feet.
7. Label the 10-year HGL on the storm sewer profiles and ensure the HGL remains at least 1-foot below the rim of each structure.
8. Illustrate all pipes intersecting storm structures on the storm profiles.
9. Indicate if any off-site drainage to the site, if so an easement is required over the storm sewer accepting and conveying off-site drainage.
10. Provide a schedule listing the casting type, rim elevation, diameter, and invert sizes/elevations for each proposed, adjusted, or modified storm structure on the utility plan. Round castings shall be provided on all catch basins except curb inlet structures.
11. Show and label all roof conductors and show where they tie into the storm sewer.

**Storm Water Management Plan**

12. The Storm Water Management Plan (SWMP) for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the Engineering Design Manual.
13. Provide calculations verifying the post-development runoff rate directed to the proposed receiving drainage course does not exceed the pre-development runoff rate for the site.
14. Provide manufacturer's details and sizing calculations for the pretreatment structure(s) on the plans.
15. Provide drainage area and runoff coefficient calculations specific to the area tributary to each treatment structure. The treated flow rate should be based on the 1-year storm event intensity (~1.6 In/Hr.), resulting in a flow rate of approximately TBD CFS. Higher flows shall be bypassed.
16. Provide release rate calculations for the three design storm events (first flush, bank full, 100-year).
17. Provide supporting calculations for the runoff coefficient determination.
18. A runoff coefficient of 0.35 shall be used for all turf grass lawns (mowed lawns) and 0.95 shall be used for all impervious surfaces.

**Paving & Grading**

19. Provide a construction materials table on the Paving Plan listing the quantity and material type for each pavement cross-section being proposed.
20. Detectable warning plates are required at all barrier free ramps, hazardous vehicular crossings and other areas where the sidewalk is flush with the adjacent drive or parking pavement. The barrier-free ramps shall comply with current MDOT specifications for ADA Sidewalk Ramps. Provide the latest version of the MDOT standard detail for detectable surfaces.
21. Label specific ramp locations on the plans where the detectable warning surface is to be installed.
22. Specify the product proposed and provide a detail for the detectable warning surface for barrier free ramps. The product shall be the concrete-embedded detectable warning plates, or equal, and shall be approved by the Engineering Division. Stamped concrete will not be acceptable.
23. Verify the slopes along the ingress/egress routing to the building from the barrier-free stalls. All barrier-free stalls shall comply with Michigan Barrier-Free regulations.
24. Provide the on-site cross-section, 1.5 inches of MDOT 5E1 on 2.5 inches of MDOT 3C on 8 inches of 21AA [limestone only if within 100 feet of a watercourse] aggregate base. Revise the cross-section and provide the city of Novi standards for parking lots paving.
25. The end islands shall conform to the City standard island design, or variations of the standard design, while still conforming to the standards as outlined in Section 2506 of Appendix A of the Zoning ordinance (i.e. 2' minor radius, 15' major radius, minimum 8' wide, 3' shorter than adjacent 19' stall).

26. Provide a line designation representing the effective 19-foot stall length for 17-foot perimeter stalls. (Show 2-foot overhang on paving sheets). Provide additional details as necessary.
27. A License Agreement will be required for the proposed retaining wall within any utility easements. A plan view and cross-section shall be included with the agreement showing the relationship between the wall foundation and the existing/proposed utility.
28. Retaining walls that are 48-inches or larger shall need a permit from the Building Department.
29. Retaining wall sheets shall be signed and sealed by the design engineer responsible for the proposed retaining wall design and all associated calculations.

### **Flood Plain**

30. Flood plain does not appear to be impacted by this development.

### **Soil Erosion and Sediment Control**

31. A SESC permit is required. A full review has not been completed at this time. The review checklist detailing all SESC requirements is attached to this letter. Please address the comments below and submit a SESC permit application under separate cover. The application can be found on the City's website at <http://cityofnovi.org/Reference/Forms-and-Permits.aspx>.

### **Agreements**

32. A license Agreement will be required for the retaining wall proposed within the existing sanitary sewer/water main easement. The agreement shall state that the wall and all site facilities within the influence of the wall that may be removed or damaged in the event the utility requires maintenance will be **the responsibility of the property owner** to repair or replace. Additionally, a cross-section shall be included with the agreement showing the distance between the wall foundation and the utility. A template agreement is available from the Engineering Division.

### **The following must be submitted with the Final Site Plan:**

33. A letter from either the applicant or the applicant's engineer must be submitted with the Stamping Set highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved. **Additionally, a statement must be provided stating that all changes to the plan have been discussed in the applicant's response letter.**
34. An itemized construction cost estimate must be submitted to the Community Development Department for the determination of plan review and construction inspection fees. This estimate should only include the civil site work and not any costs associated with construction of the building or any demolition work. **The estimate must be itemized** for each utility (water, sanitary, storm sewer), on-site paving (square yardage, should include number do detectable warning plates), right-of-way paving (including proposed

right-of-way), grading, and the storm water basin (basin construction, control structure, pre-treatment structure and restoration).

**The following must be submitted with the Stamping Set:**

*(Please note that all documents must be submitted together as a package with the Stamping Set submittal with a legal review transmittal form that can be found on the City's website. Partial submittals will not be accepted.)*

35. A draft copy of the 20-foot-wide easement for the water main to be constructed onsite must be submitted to the Community Development Department. This document is available on our website.
36. A draft copy of the 20-foot-wide easement for the sanitary sewer to be constructed onsite must be submitted to the Community Development Department. This document is available on our website.
37. A draft copy of the 20-foot-wide easement for the sanitary sewer monitoring manhole access to be constructed onsite must be submitted to the Community Development Department. This document is available on our website.
38. A draft copy of the warranty deed for the additional proposed 60-foot wide right-of-way along Wixom Road must be submitted for review and acceptance by the City.

**The following must be addressed prior to construction:**

39. A pre-construction meeting shall be required prior to any site work being started. Please contact Sarah Marchioni in the Community Development Department to setup a meeting (248-347-0430). **Be advised that scheduling the pre-construction meeting can take 2-4 weeks.**
40. A City of Novi Grading Permit will be required prior to any grading on the site. This permit will be issued at the pre-construction meeting (no application required). No fee is required for this permit.
41. Material certifications must be submitted to Spalding DeDecker for review prior to the construction of any onsite utilities. Contact Heather Gendron at 248-844-5400 for more information.
42. Construction inspection fees in the amount of **\$TBD** must be paid to the Community Development Department.
43. Legal exhibit review fees in the amount of **\$TBD** must be paid to the Community Development Department.
44. Legal escrow fees in the amount of **\$TBD** must be deposited with the Community Development Department. **All unused escrow will be returned to the payee at the end of the project** (except for escrows that are \$50 or less).



This amount includes engineering legal fees only. There may be additional legal fees for planning legal documents.

45. A storm water performance guarantee in the amount of **\$\$TBD** (Equal to 120% of the cost required to complete the storm water management facilities) as specified in the Storm Water Management Ordinance must be posted at the Community Development Department.
46. Water and Sanitary Sewer Fees must be paid prior to the pre-construction meeting. Contact the Treasury Department at 248-347-0498 to determine the amount of these fees.
47. A street sign financial guarantee in the amount of **\$\$TBD** (\$400 per traffic control sign proposed) must be posted at the Community Development Department. Signs must be installed in accordance with MMUTCD standards.
48. A traffic control inspection fee of **\$\$TBD** must be paid to Community Development. This fee is the inspection of traffic control items such as signs, striping, curbs, parking stalls, sidewalk, detectable warning surfaces, and temporary pavement markings.
49. A Soil Erosion Control Permit must be obtained from the City of Novi. Contact Sarah Marchioni in the Community Development Department, Building Division (248-347-0430) for forms and information. The financial guarantee and inspection fees will be determined during the SESC review.
50. A permit for water main construction must be obtained from EGLE. This permit application must be submitted through the Engineering Division after the water main plans have been approved. Please submit the cover sheet, overall utility sheet, standard details, and plan/profile sheets applicable to the permit.
51. A permit for sanitary sewer construction must be obtained from EGLE. This permit application must be submitted through the Engineering Division after the sanitary sewer plans have been approved. Please submit the cover sheet, overall utility sheet, standard details, and plan/profile sheets applicable to the permit. **Be aware that approval by both (1) Oakland County Water Resources Commissioner (OCWRC) and (2) Wayne County Department of Public Services (WCDPS) are required prior to submittal to EGLE.**
52. An NPDES permit must be obtained from EGLE since the site is over 5 acres in size. EGLE may require an approved SESC plan to be submitted with the Notice of Coverage.
53. An inspection permit for the sanitary sewer tap must be obtained from the Oakland County Water Resources Commissioner (OCWRC).

54. Permits for the construction of each retaining wall exceeding 48 inches in height (measured from bottom of the footing to top of the wall) must be obtained from the Community Development Department (248-347-0415).
55. The amount of the incomplete site work performance guarantee for this development at this time is \$TBD (Equal to 1.2 times the amount required to complete the site improvements, excluding the storm water facilities) as specified in the Performance Guarantee Ordinance. This guarantee will be reduced prior to the Temporary Certificate of Occupancy (TCO), at which time it will be based on the percentage of construction completed.

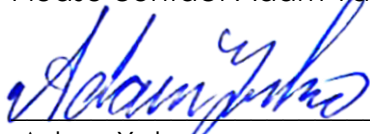
**The following must be addressed prior to issuance of building permits.**

56. A Bill of Sale for the utilities conveying the improvements to the City of Novi must be submitted to the Community Development Department. This document is available on our website.
57. The City's consultant Engineer Spalding DeDecker will prepare the record drawings for this development. The record drawings will be prepared in accordance with Article XII, Design and Construction Standards, Chapter 11 of the Novi Code of Ordinances.
58. Submit to the Community Development Department, Waivers of Lien from any parties involved with the installation of each utility as well as a Sworn Statement listing those parties and stating that all labor and material expenses incurred in connection with the subject construction improvements have been paid.
59. Submit a Maintenance Bond to the Community Development Department in the amount of \$TBD (Equal to 25 percent of the cost of the construction of the utilities to be accepted). This bond must be for a period of two years from the date that the Utility Acceptance Permit is issued by the City of Novi Engineering Division. This document is available on our website.
60. Submit an up-to-date Title Policy (dated within 90 days of City Council consideration of acceptance) for the purpose of verifying that the parties signing the Easement and Bill of Sale documents have the legal authority to do so. Please be sure that all parties of interest shown on the title policy (including mortgage holders) either sign the easement documents themselves or provide a Subordination Agreement. Please be aware that the title policy may indicate that additional documentation is necessary to complete the acceptance process.
61. Provide a warranty deed for the additional proposed road right-of-way along Wixom Road for acceptance by the City.

**Prior to preparing stamping sets**, the applicant should submit the electronic stamping set to planning for review; if any changes are proposed after electronic stamping set approval, send revised sheets directly to engineering for an informal review and approval.

To the extent this review letter addresses items and requirements that require the approval of or a permit from an agency or entity other than the City, this review shall not be considered an indication or statement that such approvals or permits will be issued.

Please contact Adam Yako at (248)735-5695 with any questions.



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Adam Yako,  
Project Engineer

cc: Christian Carroll, Community Development  
Humna Anjum, Engineering  
Ben Croy, City Engineer

**LANDSCAPE REVIEW**

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**PLAN REVIEW CENTER REPORT**  
**May 22, 2023**  
**Station Flats**  
**Revised Preliminary Site Plan - Landscaping**

**Review Type**

Revised Preliminary Site Plan Landscape Review

**Job #**

JSP23-0002

**Property Characteristics**

- Site Location: Wixom Road, south of Sam's Club
- Site Acreage: 24.78 ac.
- Site Zoning: I-1 Proposed RM-1 with PRO
- Adjacent Zoning: North, East, South, West: I-1 (Commercial Use)
- Plan Date: 5/4/2023

**Ordinance Considerations**

This project was reviewed for conformance with Chapter 37: Woodland Protection, Zoning Article 5.5 Landscape Standards, the Landscape Design Manual and any other applicable provisions of the Zoning Ordinance. Items in **bold** below must be addressed and incorporated as part of the revised Preliminary Site Plan submittal and underlined items must be addressed on the Final Site Plans. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review and the accompanying landscape chart are summaries and are not intended to substitute for any Ordinance.

**Recommendation:**

This project **is not recommended for approval for Preliminary Site Plan**. They still have a number of landscape waivers required that are not supported and could be corrected. The issue with the screening from Sam's is more difficult but should be addressed.

**LANDSCAPE WAIVERS REQUIRED FOR PROPOSED LAYOUT:**

- Lack of screening berm between I-1 and RM-1 on north side – *supported by staff as the proposed screening is not complete and may not provide sufficient audible buffering*
- Removal of woodland replacement trees from east side of site without replacements – *not supported by staff*
- Two bays of parking greater than 15 spaces without a landscaped island – *not supported by staff.*
- Insufficient area provided for a tree – *not supported by staff.*

**Please revise the landscaping to correct the conditions requiring the unsupported waivers.**

**Please add the city project number, JSP23-0002, to the bottom right corner of the Krieger/Klatt cover sheet.**

**Ordinance Considerations**

Existing Trees (Sec 37 Woodland Protection, Preliminary Site Plan checklist #17 and LDM 2.3 (2))

1. A tree chart must be provided to match the tree chart.
2. A woodland use permit is required for the removal of those trees, which would either need to be replaced on the site, or a contribution to the tree fund would be required for

- any replacements not planted on the site.
- 3. No woodland replacements are proposed.
- 4. **A landscape waiver is required for the lack of the tree replacements.** *It is not supported by staff.*
- 5. **Only plants native to Michigan may be planted in the conservation easement.**

Adjacent to Residential - Buffer (Zoning Sec. 5.5.3.B.ii and iii)

- 1. The residential project is adjacent to I-1 zoned property with a commercial use. At a minimum, a 6-8 foot tall, landscaped berm is required between the uses. No such berm is proposed. A 10-foot-tall evergreen hedge is proposed along the north and eastern edge of Parking Lot 2.
- 2. No screening is provided on the west edge of Parking Lot 2 or the north end of the western parking area.
- 3. **The evergreen hedge should be extended to wrap around the parking lot and along the north edge of the 7 space bay west of the parking lot to completely screen the loading areas.**
- 4. **The current configuration requires a landscape waiver that would not be supported by staff.**

Adjacent to Public Rights-of-Way – Berm/Wall, Buffer and Street Trees (Zoning Sec. 5.5.3.B.ii, iii)

- 1. The project does not require any additional right-of-way berms or landscaping.
- 2. The landscaping in the boulevard island at Wixom Road is in poor condition and an acceptable replacement landscape plan for it is proposed. **The applicant may reduce the number of lindens used in that island if desired to provide more room for them to grow to their full size.**

Multi-family Landscaping:

- 1. **Unit landscaping:**
  - a) Based on the number of ground-floor units (36), 108 unit trees are required for the site. 116 trees are provided, including parking lot trees and subcanopy trees.
  - b) If desired, the excess trees may be removed from the plan.
- 2. **Interior drive trees** - All required interior drive trees are provided.
- 3. **Building foundation Landscaping**
  - a) 35% of the building frontage facing drives are required to be landscaped
  - b) 71% of the west side of the building are proposed to be landscaped.
  - c) Detailed foundation landscaping plans are required on the Final Site Plans.

Parking Lot Landscaping (Zoning Sec. 5.5.3.C.)

- 1. In general, the required parking lot landscaping interior area and trees and perimeter trees are proposed, but there are issues with the bays at the north and south ends of the building that require landscape waivers which *are not supported by staff.*
- 2. **Please see the landscape chart for a detailed discussion of those issues and correct the site plan to address them.**

Plant List (LDM 4, 10)

- 1. 14 of 22 species used (64%) are native to Michigan.
- 2. The tree mix meets the diversity requirements of LDM Section 4.
- 3. Please keep the percentage of native plants close to or greater than 64% when foundation plantings are added.

Planting Notations and Details (LDM 10)

Provided

Storm Basin Landscape (Zoning Sec 5.5.3.E.iv and LDM 3)

No new detention basin is proposed so no new landscaping is required for this project.

Irrigation (LDM 10)

Either a plan for an automated irrigation system, or an alternative method of providing sufficient water for the landscaping's establishment and long-term survival must be provided in the Final Site Plans.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.735.5621 or at [rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org).



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Rick Meader – Landscape Architect

## LANDSCAPE REVIEW SUMMARY CHART – Revised Preliminary Site Plan

**Review Date:** May 22, 2023  
**Project Name:** JSP23 – 0002: Station Flats  
**Plan Date:** May 4, 2023  
**Prepared by:** Rick Meader, Landscape Architect E-mail: [rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org);  
 Phone: (248) 735-5621

Items in **Bold** need to be addressed by the applicant before approval of the Preliminary Site Plan.  
Underlined items need to be addressed on the Final Site Plan.

### LANDSCAPE WAIVERS REQUIRED FOR PROPOSED LAYOUT:

- Lack of screening berm between I-1 and RM-1 on north side – *not supported by staff as the proposed screening is not complete and may not provide sufficient audible buffering.*
- Removal of woodland replacement trees from east side of site without replacements – *not supported by staff*
- Two bays of parking are greater than 15 spaces without a landscaped island – *not supported by staff.*
- Insufficient area provided for a tree – *not supported by staff.*

Item	Required	Proposed	Meets Code	Comments
<b>Landscape Plan Requirements – Basic Information (LDM (2))</b>				
<b>Landscape Plan</b> <i>(Zoning Sec 5.5.2, LDM 10)</i>	<ul style="list-style-type: none"> <li>• New commercial or residential developments</li> <li>• Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less.</li> <li>• 1"-20' minimum with proper North. Variations from this scale can be approved by LA</li> </ul>	<ul style="list-style-type: none"> <li>• Overall Scale 1" = 40'</li> <li>• Detail Scale 1" = 20'</li> </ul>	Yes	
<b>Owner/Developer Contact Information</b> <i>(LDM 10)</i>	Name, address and telephone number of the owner and developer or association	Yes	Yes	<b>Please add phone number or email address to title block</b>
<b>Project Information</b> <i>(LDM 10)</i>	Name and Address	Location map on L-1.0 shows site location	Yes	
<b>Survey information</b> <i>(LDM 10)</i>	Legal description or boundary line survey	<ul style="list-style-type: none"> <li>• Sheets C-1.1 and C1.2 have survey and description</li> <li>• Southern property line shown on C-1.3</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Yes</li> </ul>	
<b>Landscape Architect contact information</b> <i>(LDM 10)</i>	Name, Address and telephone number of RLA/PLA/LLA who created the plan	PEA Group – Lynn Whipple	Yes	



Item	Required	Proposed	Meets Code	Comments
<b>Sealed by LA.</b> (LDM 10)	Requires original signature	Yes		<u>Final stamping sets must be sealed by LA and have live LA signature</u>
<b>Miss Dig Note</b> (800) 482-7171 (LDM 10)	Show on all plan sheets	On Site Plans' and Landscape Plans' title block	Yes	
<b>EXISTING CONDITIONS</b>				
<b>Existing plant material</b> <b>Existing woodlands or wetlands</b> (LDM 10.h)	<ul style="list-style-type: none"> <li>• Show location type and size.</li> <li>• Label to be saved or removed.</li> <li>• Plan shall state if none exists.</li> </ul>	<ul style="list-style-type: none"> <li>• Tree survey is provided but no corresponding tree chart is</li> <li>• Current wetland delineation by PEA is provided</li> </ul>	<ul style="list-style-type: none"> <li>• Yes/No</li> <li>• Yes</li> </ul>	<ol style="list-style-type: none"> <li>1. <b>Please add a tree chart for the survey to T-1.0</b></li> <li>2. <b>The plan for Novi Promenade (included with this review) shows approximately 38 woodland replacement trees along the eastern and southern sides of the site. The tree survey shows 23 of those, of which 15 or 16 are being removed (it is unclear what is happening with #798).</b></li> <li>3. <b>Indicate all trees to be removed on the tree chart.</b></li> <li>4. <u>Please show the tree fence at the actual dripline on the plans, not just at the outside of the tree symbol, which may or may not accurately represent the dripline.</u></li> </ol>
<b>Natural Features protection &amp; Woodland Replacements</b>		<ul style="list-style-type: none"> <li>• Existing Conservation Easement is shown</li> <li>• No woodland replacements are indicated.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	<ol style="list-style-type: none"> <li>1. <u>Please be sure that proper buffers and protection for adjacent ponds are provided</u></li> <li>2. <u>Add the replacements for the removed and missing woodland replacements from the original plan.</u></li> <li>3. <u>Per the original plan showing 38</u></li> </ol>

Item	Required	Proposed	Meets Code	Comments
				<u>replacements and the proposed plan which shows 5 being preserved, 33 replacements must be added to the plan. They can be planted in the existing conservation easement if desired.</u>
<b>Soil type (LDM 10)</b>	As determined by Soils survey of Oakland county	Sheet L-1.0	Yes	
<b>Zoning (LDM 10)</b>	<ul style="list-style-type: none"> <li>• Site: I-1</li> <li>• Proposed: RM-1 with PRO</li> <li>• North, East, South, West: I-1 (Commercial use)</li> </ul>	Sheet L-1.0	Yes	
<b>PROPOSED IMPROVEMENTS (LDM 10)</b>				
<b>Existing and proposed improvements</b>	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Dimensions provided on Sheets C-3.0-C3.2</li> </ul>	Yes	
<b>Existing and proposed utilities</b>	<ul style="list-style-type: none"> <li>• Overhead and underground utilities, including hydrants</li> <li>• Proposed light posts</li> </ul>	<ul style="list-style-type: none"> <li>• Proposed utilities are shown on the Utility Plan and Landscape Plans</li> <li>• No light posts are shown on the landscape plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	<b>Please add all proposed light fixtures to the landscape plan and resolve light/tree conflicts.</b>
<b>Proposed topography - 2' contour minimum</b>	Provide proposed contours at 2' interval	Spot elevations and TW/BW elevations are on Sheets C-4.1 and C-4.2	Yes	
<b>Clear Zones</b>	25 ft. corner clearance required. Refer to Zoning Sec 5.5.9	Yes	Yes	
<b>LANDSCAPING REQUIREMENTS</b>				
<b>Berms and ROW Planting</b>				
<ul style="list-style-type: none"> <li>• All berms shall have a maximum slope of 33%. Gradual slopes are encouraged. Show 1ft. contours</li> <li>• Berm should be located on lot line except in conflict with utilities.</li> <li>• Berms should be constructed with 6" of topsoil.</li> </ul>				
<b>Residential Adjacent to Non-residential (Sec 5.5.3.A) &amp; (LDM 1.a)</b>				
<b>Berm requirements (Zoning Sec 5.5.3.A)</b>	<u>Residential adjacent to I-1 requires:</u> <ul style="list-style-type: none"> <li>• 10-15 foot tall landscape berm with 6 foot wide crest.</li> <li>• Opacity 80% winter,</li> </ul>	<ul style="list-style-type: none"> <li>• No berm is proposed</li> <li>• A line of evergreen shrubs is proposed along the north edge of</li> </ul>	<ul style="list-style-type: none"> <li>• No</li> <li>• No</li> </ul>	<ol style="list-style-type: none"> <li><b>1. A landscape waiver for the lack of the berm is required.</b></li> <li><b>2. The evergreen hedge should be extended to wrap</b></li> </ol>

Item	Required	Proposed	Meets Code	Comments
	<p>90% summer.</p> <p><u>Residential adjacent to commercial requires:</u></p> <ul style="list-style-type: none"> <li>• 6-8 foot tall landscape berm with 6 foot wide crest.</li> <li>• Opacity 80% winter, 90% summer.</li> </ul>	<p>the project, except around the sections facing the western Sam's loading area. A note indicates they will be maintained at a 10' ht – no screening beyond the parking lot perimeter trees is proposed there</p>		<p><b>around the northern parking areas on the west side of the parking lot and north edge of the 7-space bay west of that (but it should not block the hydrant).</b></p> <p><b>3. The applicant must provide some sort of demonstration of the visual and audible screening that will be provided by the proposed configuration.</b>  <i>Currently, the landscape waiver would not be supported by staff.</i></p>
<b>Adjacent to Public Rights-of-Way (Sec 5.5.B) and (LDM 1.b) (RM-1)</b>				
<b>Greenbelt width</b>	<ul style="list-style-type: none"> <li>• Adj to parking: 20 ft</li> <li>• Not adj to parking: 34 ft</li> </ul>	Site is over 567 feet from Wixom Road	Yes	
<b>Min. berm crest width</b>	2 ft	0 ft	Yes	
<b>Min. berm height</b>	3 ft	0 ft	Yes	
3' wall	(4)(7)	No wall is proposed		
<b>Canopy deciduous or large evergreen trees</b> (7)(10)(11)	<p>NA – not adjacent to ROW</p> <p>The flowering pear trees and other landscaping in the boulevard island at Wixom Road are in poor condition.</p>	<p>None</p> <p>A plan for replacing the failing entry island landscaping is provided</p>	Yes	<b>As lindens get larger than the existing flowering pears, fewer lindens should be planted in the boulevard island to provide better space for the trees' root systems.</b>
<b>Sub-canopy deciduous trees</b> Notes (5)(6)(10)(11)	NA – not adjacent to ROW	None	Yes	
<b>Canopy deciduous trees in area between sidewalk and curb</b> (10)	NA – not adjacent to ROW	None	Yes	
<b>Multi-Family Residential (Sec 5.5.3.F.iii)</b>				
<b>Multi-family Unit Landscaping</b> (Zoning Sec 5.5.3.F.iii.b)	<ul style="list-style-type: none"> <li>• 3 deciduous canopy trees or large evergreen trees per dwelling unit on the first floor.</li> <li>• 36 units * 3 = 108 trees</li> </ul>	116 proposed, including 66 deciduous canopy trees, 32 large evergreen trees, 18 subcanopy trees	Yes	<p><b>1. See the discussion regarding parking lot trees below.</b></p> <p><b>2. If desired, excess multifamily trees may be removed from the</b></p>

Item	Required	Proposed	Meets Code	Comments
	<ul style="list-style-type: none"> <li>Up to 25% of requirement can be subcanopy trees</li> </ul>			<b>plan.</b>
<b>Interior Street Landscaping</b> (Zoning Sec 5.5.3.F.iii.b)	<ul style="list-style-type: none"> <li>1 deciduous canopy tree along interior roads for every 35 lf (both sides), excluding driveways, interior roads adjacent to public rights-of-way and parking entry drives.</li> <li>1125/35 = 32 trees</li> </ul>	32 trees	Yes	
<b>Foundation Landscaping</b> (Zoning Sec 5.5.3.F.iii.b)	35% of building façades facing road must be landscaped	71% of building facing interior drive is landscaped	Yes	<u>Include details at scale of 1"=10' or 1"=20' on Final Site Plans (not Construction Plans)</u>
<b>Parking Area Landscape Requirements</b> (Zoning Sec 5.5.3.C & LDM 5)				
<b>General requirements</b>	<ul style="list-style-type: none"> <li>Clear sight distance within parking islands</li> <li>No evergreen trees</li> </ul>	No trees are located in the clear vision zones.	Yes	
<b>Name, type and number of ground cover</b>	As proposed on planting islands	Seed lawn	Yes	
<b>General</b> (Zoning Sec 5.5.3.C)				
<b>Parking lot Islands</b> (Zoning Sec 5.5.3.c.ii, iii)	<ul style="list-style-type: none"> <li>A minimum of 200 SF to qualify</li> <li>200sf landscape space per tree planted in island.</li> <li>6" curbs</li> <li>Islands minimum width 10' BOC to BOC</li> </ul>	<ul style="list-style-type: none"> <li>The endcap island at the northwest corner of the building has been reduced to just 53sf which is not enough to support the required tree planted in it.</li> <li>The greenspace east of the walk leading from Lot 3 to the building is now large enough to support a required tree.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> <li>Yes</li> </ul>	<b>Please restore the greenspace in the endcap island at the northwest corner of the building and add the required tree. It can be a multi-family unit tree.</b>
<b>Curbs and Parking stall reduction</b> (Zoning Sec 5.5.3.c.ii)	Parking stall can be reduced to 17' with 4" curb adjacent to a sidewalk of minimum 7 ft.	17 ft spaces except in interior of western parking lot	Yes	
<b>Contiguous space limit</b> (Zoning Sec	Maximum of 15 contiguous spaces	<ul style="list-style-type: none"> <li>The northern bay on the east side</li> </ul>	No	<b>1. Please add a tree adjacent to the</b>

Item	Required	Proposed	Meets Code	Comments
5.5.3.c.ii.o))		of the building has 22 spaces without a tree. <ul style="list-style-type: none"> <li>The bay at the southern end of the building has 18 spaces without a tree.</li> <li>There is no endcap island with a tree at the northwest corner of the building.</li> </ul>		enlarged island east of the southern building entry walk. <ol style="list-style-type: none"> <li>Please add a tree in the island in the eastern 22 space bay</li> <li>Please add a tree to the island shown as a snow deposit area. The snow should be deposited elsewhere.</li> <li>As noted above, there needs to be a tree in the endcap island at the northwest corner of the building.</li> <li>Multi-family unit trees can be used for all of those islands.</li> </ol>
<b>Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, NCC, EXPO, FS, TC, TC-1, RC, Special Land Use or non-residential use in any R district (Zoning Sec 5.5.3.C.iii)</b>				
<b>A = Total square footage of vehicular use areas x 7.5%</b>	<ul style="list-style-type: none"> <li><math>A = x \text{ SF} \times 7.5\% = A \text{ sf}</math></li> <li>Lot #1  <math>A = 21,676 \times 7.5\% = 1,626 \text{ sf}</math></li> <li>Lot #2  <math>A = 18,454 \times 7.5\% = 1,384 \text{ sf}</math></li> <li>Parking Lot #3  <math>A = 11,512 \times 7.5\% = 862 \text{ sf}</math></li> </ul>			
<b>B = Total square footage of additional paved vehicular use areas over 50,000 SF x 1 %</b>	<ul style="list-style-type: none"> <li><math>B = x \text{ SF} \times 1\% = B \text{ sf}</math></li> </ul>	NA		
<b>All Categories</b>				
<b>C = A+B</b> Total square footage of landscaped islands	$A + B = C \text{ SF}$ <ul style="list-style-type: none"> <li>Lot #1: 1626 sf</li> <li>Lot #2: 1384 sf</li> <li>Lot #3: 862 sf</li> </ul>	<ul style="list-style-type: none"> <li>Lot #1: 2013 sf</li> <li>Lot #2: 1719 sf</li> <li>Lot #3: 793 sf</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>No</li> </ul>	The area provided in an island cannot be counted toward the requirement unless a canopy tree is planted in it.
<b>D = C/200</b> Number of canopy trees required	<ul style="list-style-type: none"> <li><math>D = C/200</math></li> <li>Minimum 200sf/tree</li> <li>Lot #1: <math>1626/200 = 8</math> trees</li> <li>Lot #2: <math>1384/200 = 7</math> trees</li> <li>Lot #3: <math>862/200 = 4</math> trees</li> </ul>	<ul style="list-style-type: none"> <li>Lot #1: 8 trees</li> <li>Lot #2: 7 trees</li> <li>Lot #3: 5 trees</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>	1. Lot 2 – the 53sf island at the northwest corner of the building is not large enough to support a tree or count toward the total. That island must be restored to 200sf as the tree is

Item	Required	Proposed	Meets Code	Comments
				<p>required as an endcap tree.</p> <p>2. Lot 3 – there must be a canopy tree in the expanded island east of the walk leading to the building and the area.</p> <p>3. There must also be a tree in the island marked as snow deposit area.</p> <p>4. Multifamily unit trees may be used to meet the above requirements.</p>
<p><b>Parking Lot Perimeter Trees</b> (Zoning Sec 5.5.3.c.ii)</p>	<ul style="list-style-type: none"> <li>• 1 Canopy tree per 35 lf</li> <li>• Perimeter trees are not required when the building is within 20 feet of the parking lot.</li> <li>• Lot #1: 606/35 = 17 trees</li> <li>• Lot #2: 439/35 = 13 trees</li> <li>• Lot #3: 200/35 = 6 trees</li> </ul>	<ul style="list-style-type: none"> <li>• Lot #1: 17 trees</li> <li>• Lot #2: 11 trees</li> <li>• Lot #3: 6 trees</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• Yes</li> </ul>	<p>1. At least 2 of the perimeter trees are required on the west side Lot 2.</p> <p>2. Please remove enough of that pavement or the loading zone pavement, or shift the parking lot so a 10 foot green strip along the edges of the paving is provided.</p> <p>3. Please shift the perimeter tree at the northeast corner of the building to the west so it is within 15 feet of the Lot 2 parking lot.</p> <p>4. Please switch the two crabapples used as perimeter trees to canopy trees.</p>
<p><b>Accessway Perimeter</b> (Zoning Sec 5.5.3.C.iv.j)</p>	<p>1 Canopy tree per 35 lf</p>	<p>NA</p>		
<p><b>Parking land banked</b></p>	<p>NA</p>	<p>None</p>		
<p><b>Miscellaneous Landscaping Requirements</b></p>				
<p><b>Plantings around Fire Hydrant</b> (Zoning Sec 5.5.3.c.ii.j)</p>	<ul style="list-style-type: none"> <li>• No plantings with matured height greater than 12' within 10 ft. of fire hydrants, manholes, catch</li> </ul>	<p>No hydrants have trees too close to them.</p>	<p>Yes</p>	<p>1. If the building has <u>Fire Department Connector(s) (FDCs)</u>, please show them on the <u>Landscape Plans</u></p>

Item	Required	Proposed	Meets Code	Comments
	basins or other utility structures. • Trees should not be planted within 5 feet of underground lines.			<u>and keep all plants in front of or immediately next to shorter than the FDC.</u> 2. A note regarding spacing is on Sheet L-1.1. <u>Please copy it to Sheet L-1.2.</u>
<b>Landscaped area (g)</b>	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	Yes		
<b>Name, type and number of ground cover (LDM 5)</b>	As proposed on planting islands	Seed or other landscaping is proposed and indicated with hatching	Yes	
<b>Snow deposit (LDM 10)</b>	Show leave snow deposit areas on plan in locations where landscaping won't be damaged	Yes	Yes/No	<b>Please do not use the island in the southwest corner of the parking lot for snow deposit. It should have a canopy tree planted in it to shade the lot.</b>
<b>Transformers/Utility boxes (LDM 6)</b>	<ul style="list-style-type: none"> <li>• A minimum of 2 ft. separation between box and the plants</li> <li>• Ground cover below 4" is allowed up to pad.</li> <li>• No plant materials within 8 ft. from the doors</li> </ul>	None are shown	TBD	1. <u>Please show transformers and other utility boxes when their locations are determined.</u> 2. <u>If box locations are not determined by final site plans, add a note to plan stating that all utility boxes are to be landscaped per the detail.</u> 3. <u>Please add the city Utility Box planting detail (attached with this review)</u> 4. <u>Please add an allowance of 10 shrubs per box on the plant list and label as such</u>
<b>Detention/Retention Basin Planting requirements (Sec. 5.5.3.e, LDM 3)</b>	<ul style="list-style-type: none"> <li>• Clusters of large native shrubs shall cover 70-75% of the basin rim area at 10 ft away from the permanent water line.</li> <li>• Canopy trees must be</li> </ul>	There is no indication of storm calculations	TBD	If the existing detention pond needs to be enlarged or modified, the modified areas must be landscaped per the current ordinance.

Item	Required	Proposed	Meets Code	Comments
	located at 1 per 35lf of the pond rim 10 feet away from the permanent water level <ul style="list-style-type: none"> <li>• 10" to 14" tall grass along sides of basin</li> <li>• Refer to wetland for basin mix</li> <li>• Include seed mix details on landscape plan</li> </ul>			
<b>Phragmites australis and Japanese Knotweed control</b> <i>(Zoning Sec 5.5.6.3.i.)</i>	<ul style="list-style-type: none"> <li>• Show on plans all populations of Phragmites australis and/or Japanese knotweed on the site.</li> <li>• If none are found, add a note to that effect.</li> <li>• If any are found, add notes stating that the weed shall be completely removed from the site. This may take several years of consistent treatments to achieve.</li> </ul>	None are noted	TBD	1. There is a very large, dense population of Phragmites in the wetland east of the proposed building. 2. <u>Please show it on T-1 and add plans for its removal. Chemical treatments by a licensed ANC applicator will be required, generally in September and early October.</u>
<b>Landscape Notes and Details– Utilize City of Novi Standard Notes</b>				
<b>Plant List (LDM 4,11) – Include all cost estimates</b>				
Quantities and sizes		On plant list	Yes	
Root type		On plant list	Yes	
Botanical and common names	<ul style="list-style-type: none"> <li>• At least 50% of plant species used, not including seed mixes or woodland replacement trees, must be species native to Michigan.</li> <li>• The non-woodland replacement tree diversity must meet the standards of the Landscape Design Manual section 4.</li> </ul>	<ul style="list-style-type: none"> <li>• 14 of 22 species used (64%) are native to Michigan</li> <li>• The tree mix meets the tree diversity requirement of LDM 4</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Yes</li> </ul>	1. <u>When the foundation plantings are designed, the 50% threshold must still be met. Hopefully the 65% currently shown can be maintained.</u> 2. <u>Bald cypress are not native to Michigan, so they should not be used in the conservation easement.</u>
<b>General Landscape Requirements (LDM)</b>				
Type and amount of lawn		Seed lawn or economy prairie mix are proposed	Yes	<u>Need for final site plan</u>
Cost estimate (LDM 10.h.(11))	For all new plantings, mulch and sod as listed on the plan	No	No	1. <u>Need for final site plan</u> 2. <u>Please include the</u>



Item	Required	Proposed	Meets Code	Comments
				<u>costs for all seeding to be done on the plant cost estimate</u>
<b>Planting Details/Info (LDM Part III) – Utilize City of Novi Standard Details</b>				
Canopy Deciduous Tree	Refer to LDM for detail drawings	Yes	Yes	
Evergreen Tree		Yes	Yes	
Shrub		Yes	Yes	
Multi-stem tree		Yes	Yes	
Perennial/ Ground Cover		No	TBD	<u>Please add if perennials or ornamental grasses are added on the Final Site Plans.</u>
Tree stakes and guys	Wood stakes, fabric guys.	Yes	Yes	
<b>Cross-Section of Berms (LDM 1.a.(1))</b>				
Slope, height and width	<ul style="list-style-type: none"> <li>• Label contour lines</li> <li>• Maximum 33% slope</li> <li>• Constructed of loam</li> <li>• 6" top layer of topsoil</li> </ul>	No berms are proposed so no detail is provided		
Type of Ground Cover		NA		
Setbacks from Utilities	Overhead utility lines and 15 ft. setback from edge of utility or 20 ft. setback from closest pole, 10 feet from structures, hydrants	<ul style="list-style-type: none"> <li>• Utilities are shown</li> <li>• No overhead utilities are shown</li> </ul>	Yes	
<b>Walls (LDM 10 &amp; Zoning Sec 5.5.3.vi)</b>				
<b>Material, height and type of construction footing</b>	Freestanding walls should have brick or stone exterior with masonry or concrete interior	A long retaining wall on the east side is proposed.	TBD	<u>Provide dimensioned wall details</u>
<b>Walls greater than 3 ½ ft. should be designed and sealed by an Engineer</b>		TW/BW elevations indicate it will be approximately 5 feet tall	TBD	<u>That wall will need to be designed by an engineer and reviewed with the building plans.</u>
<b>Notes (LDM 10) – Utilize City of Novi Standard Details</b>				
<b>Installation date (LDM 2.i. &amp; Zoning Sec 5.5.5.B)</b>	<ul style="list-style-type: none"> <li>• Provide intended date</li> <li>• Between Mar 15 – Nov 15</li> </ul>	Yes	Yes	
<b>Maintenance &amp; Statement of intent (LDM 2.m &amp; Zoning Sec 5.5.6)</b>	<ul style="list-style-type: none"> <li>• Include statement of intent to install and guarantee all materials for 2 years.</li> <li>• Include a minimum one cultivation in June, July and August</li> </ul>	Yes	Yes	

Item	Required	Proposed	Meets Code	Comments
	for the 2-year warranty period.			
<b>Plant source</b> (LDM 2.n & LDM 3.a.(2))	Shall be northern nursery grown, No.1 grade.	No	No	<u>Please add this note.</u>
<b>Establishment period</b> (Zoning Sec 5.5.6.B)	<b>2 yr. Guarantee</b>	Yes	Yes	
<b>General Conditions</b> (LDM 11)	Plant materials shall not be planted within 4 ft. of property line	Yes	Yes	
<b>Other information</b> (LDM 10.n)	Required by Planning Commission	NA		<u>Please add a note near the native seed mix stating that the contractor shall provide proof of the seed mix to be used (invoice or photo of seed bag) to <a href="mailto:rmeader@cityofnovi.org">rmeader@cityofnovi.org</a> for approval prior to installation.</u>
<b>Irrigation</b> (LDM 10.I.)	<ul style="list-style-type: none"> <li>• A plan detailing how all plants will be provided with sufficient water for establishment and long-term survival must be provided.</li> <li>• If an irrigation system will be provided, the plan for it must be included in the Final Site Plans.</li> <li>• If alternative methods of providing the required water will be used, details concerning them must be provided on Final Site Plans.</li> </ul>	None		<ol style="list-style-type: none"> <li>1. <u>Please add irrigation plan or information as to how plants will be watered sufficiently for establishment and long- term survival.</u></li> <li>2. <u>The plan should meet the requirements listed at the end of this chart.</u></li> <li>3. <u>If xeriscaping is used, please provide information about plantings included.</u></li> </ol>
<b>Landscape tree credit</b> (LDM11.b.(d))	<ul style="list-style-type: none"> <li>• Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA.</li> <li>• Refer to Landscape tree Credit Chart in LDM</li> </ul>	No credits are taken		
<b>Plant Sizes for ROW, Woodland replacement and others</b>	<ul style="list-style-type: none"> <li>• Canopy Deciduous shall be 3" and sub-canopy deciduous shall be 2.5" caliper.</li> </ul>	On plant list	Yes	

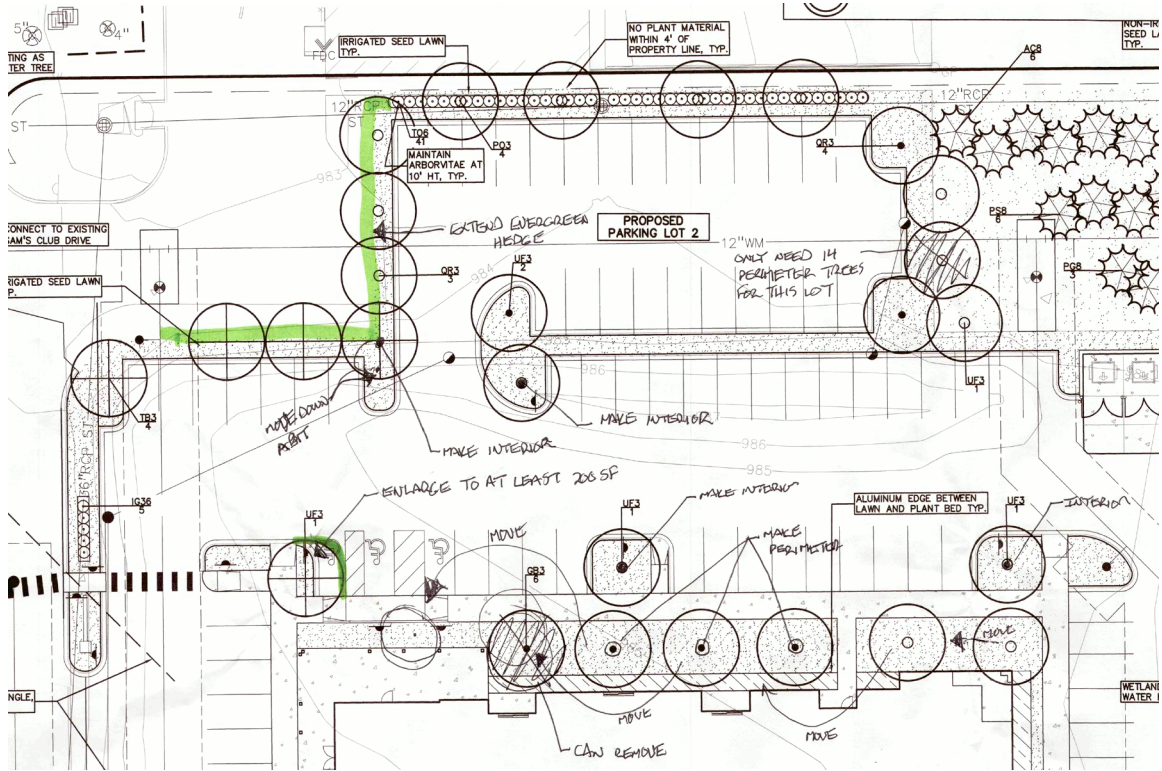
Item	Required	Proposed	Meets Code	Comments
(LDM 11.b)	<ul style="list-style-type: none"> <li>Refer to LDM section 11.b for more details</li> </ul>			
<b>Plant size credit</b> (LDM 11.b)	NA	No credits are taken		
<b>Prohibited Plants</b> (LDM 11.b)	Do not use any plants on the Prohibited Species List	No prohibited species are proposed	Yes	
<b>Recommended trees for planting under overhead utilities</b> (LDM 3.e)	Label the distance from the overhead utilities	No overhead lines are indicated		
<b>Collected or Transplanted trees</b> (LDM 11.b.(2)(c))		None		
<b>Nonliving Durable Material: Mulch</b> (LDM 12)	<ul style="list-style-type: none"> <li>Trees shall be mulched to 3" depth and shrubs, groundcovers to 2" depth</li> <li>Specify natural color, finely shredded hardwood bark mulch.</li> <li>Include in cost estimate.</li> </ul>	Information shown on planting details		

**NOTES:**

1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.
2. The section of the applicable ordinance or standard is indicated in parenthesis. For the landscape requirements, please see the Zoning Ordinance landscape section 5.5 and the Landscape Design Manual for the appropriate items under the applicable zoning classification.
3. Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.

Irrigation System Requirements

1. Any booster pump installed to connect the project's irrigation system to an existing irrigation system must be downstream of the RPZ.
2. The RPZ must be installed in accordance with the 2015 Michigan Plumbing Code.
3. The RPZ must be installed in accordance with the manufacture installation instructions for winterization that includes drain ports and blowout ports.
4. The RPZ must be installed a minimum of 12-inches above FINISHED grade.
5. Attached is a handout that addresses winterization installation requirements to assist with this.
6. A plumbing permit is required.
7. The assembly must be tested after installation with results recorded on the City of Novi test report form.



## WOODLAND REVIEW

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Corporate Headquarters  
 295 South Water Street, Suite 300  
 Kent, OH 44240  
 800-828-8312

Local Office  
 3381 Lapeer Rd. West  
 Auburn Hills, MI 48326

**To:** Christian Carroll, City of Novi Planner  
 Community Development Department, City of Novi

**From:** Kerry Gray, Principal Consultant  
 Davey Resource Group

**CC:** Barbara McBeth City Planner  
 Lindsay Bell, City of Novi Senior Planner  
 Rick Meader, City of Novi Landscape Architect  
 Ben Peacock, City of Novi Planner  
 Diana Shanahan, City of Novi Planning Assistant  
 Douglas Repen, Mannik and Smith Group

**Date:** May 23, 2023

**RE:** Station Flats  
 Woodland Review #2 – JSP23-02

Davey Resource Group, Inc. (DRG) has conducted a review of the revised preliminary site plan submittal for the proposed Station Flats multi-family residential development located on Wixom Road between 11 Mile Road and Grand River Ave. (Parcel No. 22-17-101-032). The plan set prepared by Krieger Klatt Architects/ PEA Groups (revision date: 05/04/2023), proposes a single four story building with 160 units.

DRG reviewed the preliminary site plan set for conformance with the City of Novi’s Woodland Protection Ordinance, Chapter 37. Based on our review of the site plan, and the City of Novi Official Regulated Woodlands Map (see Figure 1) - City regulated woodlands are present on the site. The woodlands will not be impacted by development because they are located within an existing wetland/watercourse easement on the east side of the property that will be protected. However, **regulated woodland replacement trees planted as part of the Novi Promenade will be impacted and require replacement.**

**Recommendation:** DRG **does not recommend approval** of the Station Flats preliminary site plan. Comments from Woodland Review #1 have not been addressed.

The following Woodland Regulations apply to this site:

Woodland Regulation	Required
Woodland Permit (Chapter 37, Section 37-26)	YES
Tree Replacement (Chapter 37, Section 37-8) & Financial Guarantee (Chapter 26.5-5)	NO
Tree Protection (Fence) (Chapter 37, Section 37-9) & Financial Guarantee (Chapter 26.5-5)	YES
Woodland Conservation Easement (Chapter 37-30 (e))	Already In Place

## Woodland Impacts and Replacement Requirements

The Station Flats preliminary site plan does not propose disturbance or removal of any City of Novi Regulated Woodlands or trees for construction of the residential building, associated utilities, and stormwater infrastructure. A permanent conservation easement on the site, per the 2001 Consent Judgement, protects the regulated woodlands and wetlands on the southern portion of the site.

### Woodland Review #1 Comments that have not been addressed.

1. **Woodland Replacements.** While regulated woodland trees are protected – the plan proposes the removal of trees that were planted as woodland replacements for the Novi Promenade development (Figure 2). These trees are regulated, and their removal requires replacement.
2. **Tree Inventory.** As stated in the Landscape Review memo prepared by Rick Meader, City of Novi Landscape Architect, the **woodland replacement trees are required to be inventoried and shown on the plan and in the regulated tree table.** The plans and tree table should also indicate if a tree will be removed or preserved and include associated tree protection fencing if preserved.

**WOODLAND REVIEW #2 COMMENT: Sheet T-1.0** The location of the woodland replacement trees planted for the Novi Promenade development are shown on the plans but there is not a tree table listing the trees and tree replacements have not been calculated and provided. Sheet T-1.0 states that no woodland replacements are required because “no woodland trees greater than 8” DBH are being removed.” This is incorrect per comment #1 – the woodland replacement trees are considered regulated. Revise plans to address comments.

3. **Woodland Replacements.** Woodland replacement credits can be provided by:
  - a. Planting the woodland tree replacement credits on-site.
  - b. Payment to the City of Novi Tree Fund at a rate of \$400/woodland replacement credit.
  - c. Combination of on-site tree planting and payment into the City of Novi Tree Fund (\$400/woodland replacement credit).

**Revise plans** to provide the number of woodland replacements that are required for the removal of the previously planted woodland replacement trees and how the woodland replacement requirements will be met.

4. **Financial Guarantees & Maintenance Bonds.** The following financial guarantees and maintenance bonds may be required for this project – they will be determined after information outlined in comments 2 and 3 have been provided.
  - a. **A woodland fence guarantee of \$6,000 (\$5,000 x 120%) is required** per Chapter 26.5-37. The financial guarantee shall be paid prior to issuance of the City of Novi Woodland Use Permit.
  - b. **Woodland Replacement Financial Guarantee of \$400 per woodland replacement credit** is required as part of the Woodland Use Permit fees to ensure planting of the on-site Woodland Replacement tree credits.

Based on inspection of the installed on-site Woodland Replacement trees, the Woodland Replacement Financial Guarantee shall be returned to the Applicant. The Applicant is responsible for requesting this inspection. Following acceptance of the planted woodland replacement trees, a 2-year performance bond must be paid to ensure the continued health and survival of the replacement trees (comment 6).

- c. **Tree Fund Payment.** Payment into the City of Novi Tree Fund at \$400 per woodland replacement for any woodland replacements not planted on site. This payment is not refundable.
- d. **The applicant shall guarantee trees for two (2) growing seasons after installation and the City's acceptance,** per The City's Performance Guarantees Ordinance. **A two-year maintenance bond in the amount twenty-five (25) percent of the value of the trees but in no case less than one thousand dollars (\$1,000.00),** shall be required to ensure the continued health of the trees following acceptance (Chapter 26.5, Section 26.5-37).

Based on a successful inspection 2 years after installation of the on-site Woodland Replacement trees, the Woodland Replacement Performance Guarantee shall be returned to the Applicant. The Applicant is responsible for requesting this inspection.

5. **Woodland Guarantee Inspection.** If the woodland replacements, street trees or landscaping guarantee period is scheduled to end during the period of time when inspections are not conducted (November 15th – April 15th) the Applicant is responsible for contacting the Bond Coordinator and Woodland/Landscape Inspector in late summer/early fall prior to the 2 year expiration to schedule an inspection. **The Applicant is responsible for walking the entire site to confirm that all of the material has survived and is healthy. If any material is missing, dead or dying, replacements should be made prior to requesting the inspection.** Once this occurs the Applicant should contact the Bond Coordinator to schedule the inspection (Angie Sosnowski at [asosnowski@cityofnovi.org](mailto:asosnowski@cityofnovi.org) / 248-347-0441) and complete the inspection request form. If additional inspections are needed, then additional inspection fees will be required to be paid by the applicant. Based upon a successful inspection for the 2 year warranty the Landscape/Woodland/Street trees financial guarantee will be returned to the Applicant



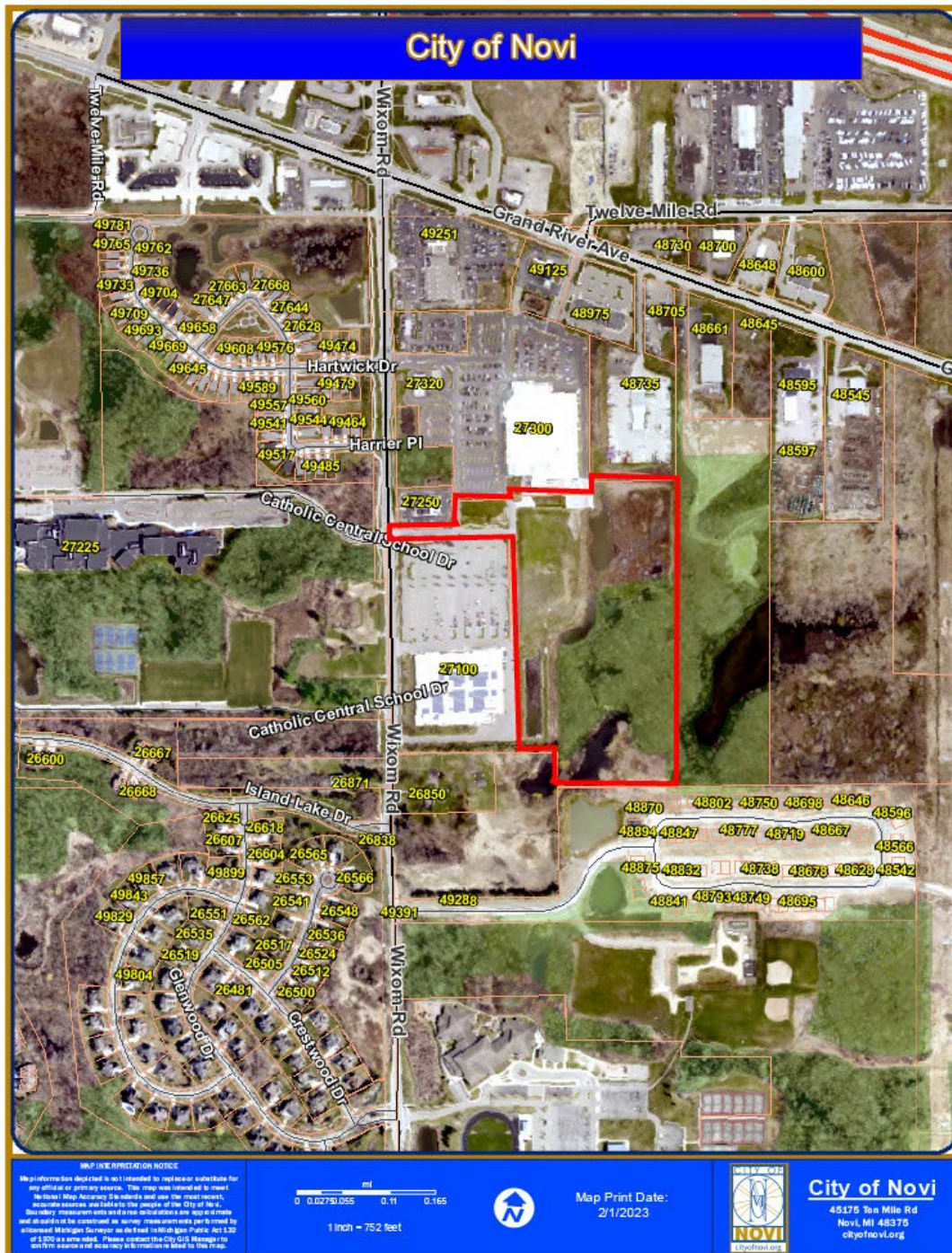


Figure 1. Station Flats Development Site  
 City of Novi Regulated Woodland Map  
 Bold red line = property boundary;  
 Green areas = City-regulated woodlands

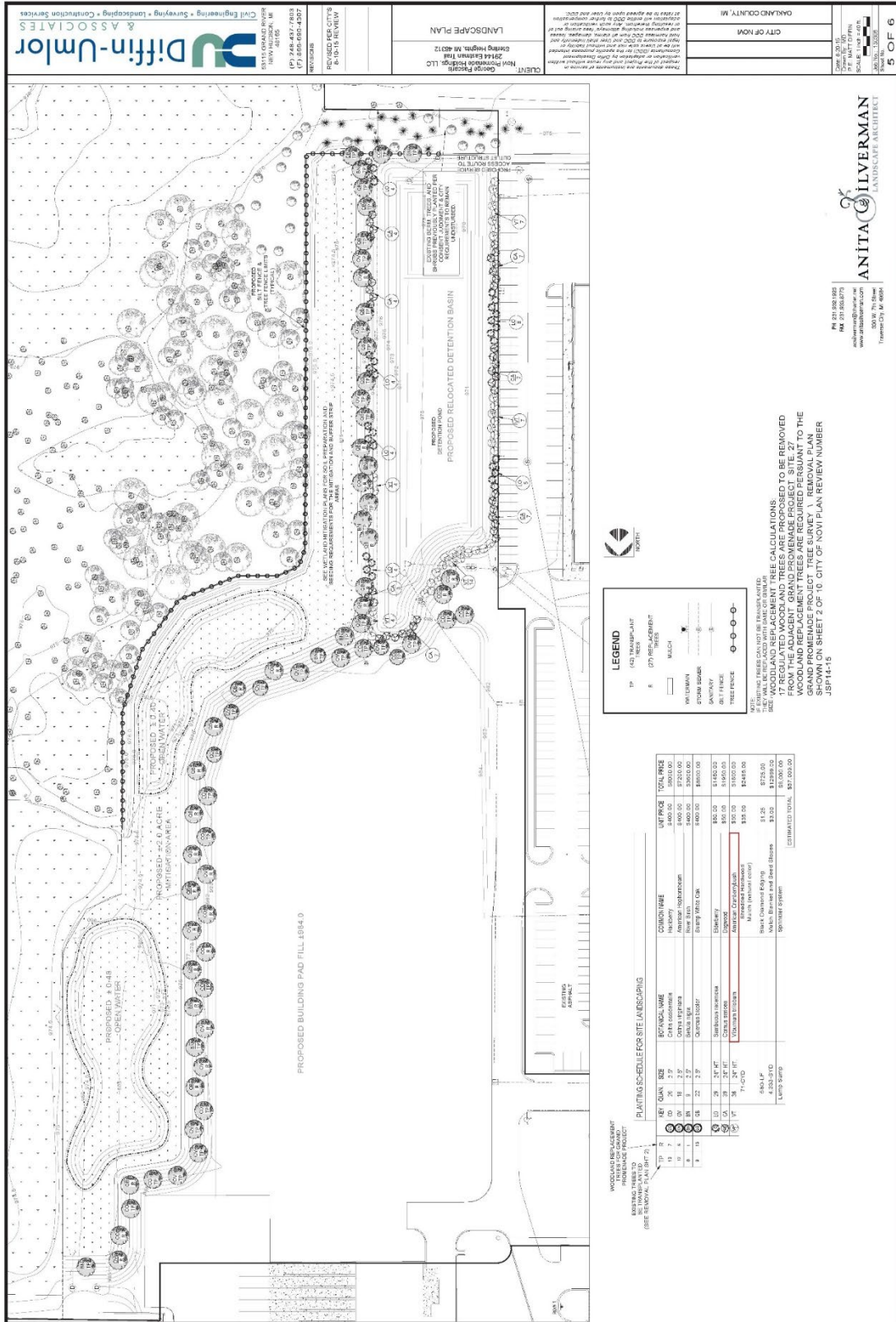


Figure 2. Novi Promenade Approved Woodland Mitigation Landscape Plan

## WETLAND REVIEW

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May 24, 2023

Christian Carroll  
City Planner  
Department of Community Development  
City of Novi  
45175 W. Ten Mile Road  
Novi, Michigan 48375

RE: Station Flats; JSP23-02  
Wetland Review of Revised Preliminary Site Plan  
MSG Project No. N1030143

Dear Mr. Carroll:

The Mannik & Smith Group, Inc. (MSG) completed a project site inspection on June 10, 2022 relative to the revised preliminary site plan set titled *The Station Flats* prepared by Kreiger Klatt Architects dated May 4, 2023 (rPSP). The project site is located east of Wixom Road and south of Grand River Avenue, parcel 50-22-17-101-032, in Section 17 (Site). The rPSP depicts construction of one multi-story multi-family building with associated paved parking, landscaping, utilities, and other improvements.

#### **Published Data**

Upon review of published resources, the Site appears to contain or immediately borders:

- City-regulated wetlands, as identified on the City of Novi Wetlands interactive map website (Figure 1).
- Wetlands that are regulated by the Michigan Department of Environment, Great Lakes, and Energy (EGLE).
- Wetlands as identified on National Wetland Inventory (NWI) and Michigan Resource Inventory System (MIRIS) maps, as identified on the EGLE Wetlands Viewer interactive map website (Figure 2). NWI and MIRIS wetlands are identified through interpretation of topographic data and aerial photographs by the associated governmental bodies.
- Hydric (wetland) soil as mapped by the U.S. Department of Agriculture, Natural Resource Conservation Service, as identified on the EGLE Wetlands Viewer interactive map website (Figure 2).

The Site also contains a conservation easement along the eastern edge of the proposed development area. The conservation easement was established by agreement between the City of Novi and Novi Promenade Holdings, LLC in November 2016. The 2.25-acre Novi conservation easement is bordered on its east side by a previously established conservation area that extends beyond the Site boundaries. The conservation area may be regulated by EGLE based on its size and its apparent interconnectedness with surface water bodies in the area.

#### **MSG Wetland Boundary Verification**

The rPSP depicts one wetland on the Site, within the Novi conservation easement. On May 24, 2023, MSG evaluated the conditions at the Site. MSG observed the Site is predominantly vacant, level land with an approximately 20 percent downward slope along the conservation easement boundary. The ground cover observed

consisted of herbaceous vegetation with young trees (generally 2- to 4-inch diameter) along the conservation easement boundary. Wetland delineation markers, consisting of labeled pink ribbon, were observed at the Site. Most of the markers were attached to herbaceous vegetation, and markers A14 through A16 were not evident. MSG concurs with the general location of the wetland as depicted in the rPSP. Select inspection photographs are provided at the end of this letter.

**Proposed Impacts**

The rPSP does not depict proposed impacts to the regulated wetland area or the conservation easement, except for 705 "SY" (assumed to mean square yards) of buffer impact as noted on Sheet C-1.4 of the rPSP. Although not indicated as such, it is inferred the buffer impact will be permanent because it is proposed to be covered with pavement. It is unclear if the calculated buffer impact area includes the area to be occupied by the retaining wall adjacent to the proposed pavement, or if temporary impact associated with construction of the retaining wall is anticipated. MSG notes the 1-inch to 80-foot scale noted for Sheet C-1.4 appears to be inaccurate.

**Permits and Regulatory Status**

The majority of the proposed work does not appear to depict encroachment into wetlands but does appear to depict encroachment into the natural resources setback buffer. **The area of encroachment into the natural resources setback buffer and/or conservation easement must be clearly and accurately depicted and quantified on Site plans.**

Based on available information, the following wetland-related items appear to be required for this project:

Item	Required/Not Required/Not Applicable
Wetland Permit (specify Non-Minor or Minor)	Not required
Wetland Buffer Authorization	Required
Wetland Mitigation	Not required
EGLE Wetland Permit	Not required
Wetland Conservation Easement	Not required

Chapter 4, Section 2 of the City of Novi Site Plan and Development Manual states, "The boundary lines of any watercourses or wetlands on property should be clearly flagged or staked and such flagging or staking shall remain in place throughout the conduct of permit activity." At least nine of the 16 wetland delineation markers were attached to herbaceous vegetation, which annually dies back and is replaced with new growth (Photo 4). For compliance with the Novi Site Plan and Development Manual, MSG strongly recommends the applicant replace the wetland delineation markers that were not attached to woody plants with more durable markers (e.g. pin flags, stakes).

EGLE typically regulates wetlands within 500 feet of an inland lake, pond, stream, or river, and/or greater than 5 acres in size. As noted above, the Site wetlands appear to meet one or both of these criteria so they are likely regulated by EGLE. It is the applicant's responsibility to confirm the need for a State permit for proposed wetland or watercourse impact, if any. Of note, a Consent Judgement was established in 2001 that appears to indicate wetlands associated with the Site are subject to EGLE regulation.

**The Preliminary Site Plan is conditionally approved for wetlands.** The following items must be revised on Site plans:

- The units of area for wetland buffer impact must be clearly stated;
- Areas of permanent and/or temporary wetland buffer impact must be identified as such; and
- The means of restoration of temporarily impacted areas must be specified.

Please contact the undersigned if you have any questions regarding the matters addressed in this letter.

Sincerely,

**The Mannik & Smith Group, Inc.**



Keegan Mackin  
*Environmental Scientist*



Douglas Repen, CDT  
*Project Manager*  
*Certified Storm Water Management Operator*

CC: Barbara McBeth, City of Novi Planner  
Lindsay Bell, City of Novi Planner  
Ben Peacock, City of Novi Planner  
Diana Shanahan, City of Novi Planning Assistant  
Sarah Marchioni, City of Novi Project Coordinator  
Rick Meader, City of Novi Landscape Architect

## FIGURES



Figure 1

City of Novi Regulated Wetland Map. Approximate tax parcel boundaries are shown in red. Regulated Wetland areas are shown in blue.





**Figure 2** EGLE Wetlands Viewer Map. Approximate Site boundary is shown in red.

### Wetlands Map Viewer



June 15, 2022

Part 303 Final Wetlands Inventory

- Wetlands as identified on NMI and MIRIS maps
- Soil areas which include wetland soils

Wetlands as identified on NMI and MIRIS maps and soil areas which include wetland soils

1:4,185  
0 0.04 0.07 0.14 mi

0 0.05 0.1 0.2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community; Source: Esri, Metair, Earthstar Geographics, and the GIS User Community

Disclaimer: This map is not intended to be used to determine the specific



2365 Haggerty Road South, Canton, Michigan 48188  
Tel: 734.397.3100 Fax: 734.397.3131

**Station Flats; JSP23-02**  
**Wetland Review of Revised Preliminary Site Plan**  
MSG Project No. N1030143

## SITE PHOTOGRAPHS





Photo 1: General view of the Site with conservation easement area in background, facing northeast (5/24/2023)



Photo 2: View of the transition between wetland and upland, facing south (5/24/2023)



Photo 3: View of transition between wetland and upland, facing north (5/24/2023)



Photo 4: Close view of wetland delineation marker attached to herbaceous vegetation (5/24/2023)

## TRAFFIC REVIEW

---



AECOM  
 39575 Lewis Drd  
 Novi  
 MI, 48377  
 USA  
 aecom.com

**Project name:**  
 JSP23-02 – Station Flats Revised Preliminary  
 Site Plan Traffic Review

**To:**  
 Barbara McBeth, AICP  
 City of Novi  
 45175 10 Mile Road  
 Novi, Michigan 48375

**From:**  
 AECOM

**Date:**  
 May 26, 2023

**CC:**  
 Lindsay Bell, Christian Carroll, Humna Anjum, Ben  
 Peacock, Diana Shanahan

# Memo

**Subject:** JSP23-02 – Station Flats Revised Preliminary Site Plan Traffic Review

The revised preliminary site plan was reviewed to the level of detail provided and AECOM recommends **denial** for the applicant to move forward until the following comments are addressed to the satisfaction of the City.

## GENERAL COMMENTS

1. The applicant, Novi Promenade Holdings, LLC, is proposing a 1-building, 157 unit apartment complex.
2. The development is located on the east side of Wixom Road, between Grand River Avenue and 11 Mile Road. Wixom Road is under the jurisdiction of the City of Novi.
3. The site is zoned I-1 (Light Industrial). The applicant is requesting a rezoning to RM-2 (Low Density Multiple-Family).
4. The following traffic related deviations have been requested by the applicant:
  - a. Minimum distance for off-street parking.
  - b. Pedestrian sidewalk on only one side of the drive.
  - c. Parking located closer than 25' from dwelling structure that contains openings.
  - d. Reduced number of parking spaces for property (321 to 249).
  - e. Reduced number of parking spaces for retail area (1,725 to 1,472).
  - f. Reduced maneuvering aisle (22').
  - g. Perpendicular parking on a major drive.

## TRAFFIC IMPACTS

1. AECOM performed an initial trip generation based on the ITE Trip Generation Manual, 11<sup>th</sup> Edition, as follows.

ITE Code: 221 – Multifamily Housing (Mid-Rise)  
 Development-specific Quantity: 157 Dwelling Units  
 Zoning Change: I-1 to RM-2

Trip Generation Summary	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
<b>AM Peak-Hour Trips</b>	59	45	100	No
<b>PM Peak-Hour Trips</b>	63	38	100	No
<b>Daily (One-Directional) Trips</b>	717	N/A	750	No

- The City of Novi generally requires a traffic impact study/statement if the number of trips generated by the proposed development exceeds the City’s threshold of more than 750 trips per day or 100 trips per either the AM or PM peak hour, or if the project meets other specified criteria.

Trip Impact Study Recommendation	
Type of Study:	Justification
TIA	Previous land use exceeded threshold. Current land use is within 10% of threshold, indicating a TIA. A full TIS was submitted and is reviewed in a separate letter.
RTS	Applicant is proposing rezoning the parcel.

## PARKING REVIEW

- AECOM performed an initial parking generation based on the ITE Parking Generation Manual, 5<sup>th</sup> Edition, as follows.

ITE Code: 221 – Multifamily Housing (Mid-Rise)  
 Development-specific Quantity: 160 Dwelling Units

For a weekday, the calculated demand is 210 spaces. Values for weekends are not available by dwelling unit, with too small of a sample size. The ITE demand values would suggest the number of parking spaces the applicant is proposing to be sufficient for the proposed development.

**The applicant is proposing a deviation of 251 parking spaces from the existing retail establishment. As a result, a parking study should be completed and submitted prior to approval being made for the deviation for the reduction in parking spaces for retail establishments.**

## TRAFFIC REVIEW

The following table identifies the aspects of the plan that were reviewed. Items marked O are listed in the City’s Code of Ordinances. Items marked with ZO are listed in the City’s Zoning Ordinance. Items marked with ADA are listed in the Americans with Disabilities Act. Items marked with MMUTCD are listed in the Michigan Manual on Uniform Traffic Control Devices.

The values in the ‘Compliance’ column read as ‘met’ for plan provision meeting the standard it refers to, ‘not met’ stands for provision not meeting the standard and ‘inconclusive’ indicates applicant to provide data or information for review and ‘NA’ stands for not applicable for subject Project. The ‘remarks’ column covers any comments reviewer has and/or ‘requested/required variance’ and ‘potential variance’. A potential variance indicates a variance that will be required if modifications are not made or further information provided to show compliance with the standards and ordinances. The applicant should put effort into complying with the standards; the variances should be the last resort after all avenues for complying have been exhausted. Indication of a potential variance does not imply support unless explicitly stated.

EXTERNAL SITE ACCESS AND OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
1	Driveway Radii   O <a href="#">Figure IX.3</a>	-	N/A	No changes proposed.
2	Driveway Width   O <a href="#">Figure IX.3</a>	-	N/A	No changes proposed.
3	Driveway Taper   O <a href="#">Figure IX.11</a>	-	N/A	
3a	Taper length	-	N/A	

EXTERNAL SITE ACCESS AND OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
3b	Tangent	-	N/A	No changes proposed.
4	Emergency Access   O <a href="#">11-194.a.19</a>	-	N/A	No changes proposed.
5	Driveway sight distance   O <a href="#">Figure VIII-E</a>	-	N/A	Does not directly access City road.
6	Driveway spacing			
6a	Same-side   O <a href="#">11.216.d.1.d</a>	-	N/A	Does not directly access City road.
6b	Opposite side   O <a href="#">11.216.d.1.e</a>	-	N/A	Does not directly access City road.
7	External coordination (Road agency)	-	N/A	
8	External Sidewalk   <a href="#">Master Plan &amp; EDM</a>	5'	Met	
9	Sidewalk Ramps   <a href="#">EDM 7.4 &amp; R-28-J</a>	Indicated	Met	<b>Provide detail in future submittals.</b>
10	Any Other Comments:			

INTERNAL SITE OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
11	Loading zone   <a href="#">ZO 5.4</a>	-	N/A	
12	Trash receptacle   <a href="#">ZO 5.4.4</a>	Indicated in NE corner	Met	
13	Emergency Vehicle Access	Turning movements provided, not accurate for north end of main section.	Met	
14	Maneuvering Lane   <a href="#">ZO 5.3.2</a>	22'	<b>Not Met</b>	<b>22' aisles are not permitted, aisle should be increased to 24'. Applicant is requesting deviation. AECOM would not support this deviation.</b>
15	End islands   <a href="#">ZO 5.3.12</a>			
15a	Adjacent to a travel way	Not dimensioned, appear to be same length as space.	<b>Inconclusive</b>	<b>Provide dimensions for end islands relative to adjacent parking space.</b>
15b	Internal to parking bays	3' shorter	Met	Applicant can increase length of internal islands to match adjacent spaces.
16	Parking spaces   <a href="#">ZO 5.2.12</a>			
17	Adjacent parking spaces   <a href="#">ZO 5.5.3.C.ii.i</a>	<=15 spaces	Met	
18	Parking space length   <a href="#">ZO 5.3.2</a>	17' with 2' clear overhang and 19'	Met	



INTERNAL SITE OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
19	Parking space Width   <a href="#">ZO 5.3.2</a>	9'	Met	
20	Parking space front curb height   <a href="#">ZO 5.3.2</a>	4"	Met	
21	Accessible parking – number   <a href="#">ADA</a>	8	Met	Spaces are not evenly distributed amongst the assumed entrances of the building. As elevators are provided at the north and south ends of the building, accessible spaces could be provided at both ends.
22	Accessible parking – size   <a href="#">ADA</a>	8' spaces with 5' aisles and 8' aisles (for van accessible)	Met	
23	Number of Van-accessible space   <a href="#">ADA</a>	3	Met	
24	Bicycle parking			
24a	Requirement   <a href="#">ZO 5.16.1</a>	5 locations indicated with 4 spaces at 4 locations and 8 at the last. 8 spaces indicated in indoor storage room.	Met	
24b	Location   <a href="#">ZO 5.16.1</a>	3 exterior locations	<b>Inconclusive</b>	Indicate building entrances to confirm compliance. Courtyard spaces appear to be greater than 150' from the nearest building entrance.
24c	Clear path from Street   <a href="#">ZO 5.16.1</a>	5' clear path	<b>Not Met</b>	<b>8' sidewalk required with 2' clear overhang for a 6' clear path, 7' provided.</b>
24d	Height of rack   <a href="#">ZO 5.16.5.B</a>	3'	Met	
24e	Other (Covered / Layout)   <a href="#">ZO 5.16.1</a>	Included	Met	
25	Sidewalk – min 5' wide   <a href="#">Master Plan</a>	5', 7' with 2' overhang at parking	Met	
26	Sidewalk ramps   <a href="#">EDM 7.4</a> & <a href="#">R-28-J</a>	Indicated at entrance	Met	<b>Provide detail in future submittals.</b>
27	Sidewalk – distance back of curb   <a href="#">EDM 7.4</a>	No Offset	Met	Sidewalk abuts parking.
28	Cul-De-Sac   O <a href="#">Figure VIII-F</a>	N/A	-	-
29	EyeBrow   O <a href="#">Figure VIII-G</a>	N/A	-	-

INTERNAL SITE OPERATIONS				
No.	Item	Proposed	Compliance	Remarks
30	Major Drive   <a href="#">ZO 5.10</a>	Perpendicular parking on major drive	<b>Not Met</b>	Perpendicular parking is currently proposed on the major drive encircling the building. <b>Applicant is requesting a deviation for parking on a major drive.</b>
31	Any Other Comments:			

SIGNING AND STRIPING				
No.	Item	Proposed	Compliance	Remarks
32	Signing: Sizes   <a href="#">MMUTCD</a>	Not included	<b>Not Met</b>	<b>Include for any proposed signs.</b>
33	Signing table: quantities and sizes	Not included	<b>Not Met</b>	<b>Include for any proposed signs.</b>
34	Signs 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U-channel post   <a href="#">MMUTCD</a>	Not included	<b>Not Met</b>	
35	Signs greater than 12" x 18" shall be mounted on a galvanized 3 lb. or greater U-channel post   <a href="#">MMUTCD</a>	Not included	<b>Not Met</b>	
36	Sign bottom height of 7' from final grade   <a href="#">MMUTCD</a>	Included	Met	Shown on sign details.
37	Signing shall be placed 2' from the face of the curb or edge of the nearest sidewalk to the near edge of the sign   <a href="#">MMUTCD</a>	Detail included from face of curb	<b>Partially Met</b>	
38	FHWA Standard Alphabet series used for all sign language   <a href="#">MMUTCD</a>	Not included	<b>Not Met</b>	
39	High-Intensity Prismatic (HIP) sheeting to meet FHWA retro-reflectivity   <a href="#">MMUTCD</a>	Not included	<b>Not Met</b>	
40	Parking space striping notes	Included	Met	
41	The international symbol for accessibility pavement markings   ADA	Not included	<b>Not Met</b>	<b>Provide detail in future submittals.</b>
42	Crosswalk pavement marking detail	Included	Met	
43	Any Other Comments:	<b>Ensure all proposed signs are labeled on the site plan, there is no "Do Not Enter" sign labeled but is shown in the sign legend. The applicant could add a "Stop" sign at the northwest parking lot exit.</b>		

Note: Hyperlinks to the standards and Ordinances are for reference purposes only, the applicant and City of Novi to ensure referring to the latest standards and Ordinances in its entirety.

Should the City or applicant have questions regarding this review, they should contact AECOM for further clarification.

Sincerely,

**AECOM**



Patricia Thompson, PE  
Traffic Engineer



Paula K. Johnson, PE  
Senior Transportation Engineer



Saumil Shah, PMP  
Project Manager

# REVIEW OF TRAFFIC IMPACT STATEMENT

---

**Project name:**

JSP23-02 – Station Flats Traffic Impact Study  
Review

**From:**

AECOM

**Date:**

February 8, 2023

**To:**

Barbara McBeth, AICP  
City of Novi  
45175 10 Mile Road  
Novi, Michigan 48375

**CC:**

Lindsay Bell, Christian Carroll, Humna Anjum, Ben  
Peacock, Diana Shanahan

# Memo

**Subject:** JSP23-02 – Station Flats Traffic Impact Study Review

The traffic impact study was reviewed to the level of detail provided and AECOM recommends **approval** for the applicant to move forward until they have addressed the comments provided below.

## GENERAL COMMENTS

1. The following sections will go section through section of the report.

## INTRODUCTION

1. The intersections identified as in the study area are as follows:
  - a. Wixom Road and Grand River Avenue (signalized).
  - b. Wixom Road and Catholic Central High School (CCHS)/Novi Promenade (signalized).
  - c. Wixom Road and North Driveway (existing unsignalized driveway along north face of Target).
  - d. Wixom Road and South Driveway (existing unsignalized driveway along south face of Target).
2. Volumes and turning movement counts were collected on Thursday, May 5, 2022 at the intersections listed above for a total of 4 hours, 7 am to 9 am and 4 pm to 6 pm.
3. The preparer reviewed pre-pandemic volume counts and determined that there was no compelling evidence to apply a correction factor.

## EXISTING CONDITIONS ANALYSIS

1. The preparer conducted a HCM Synchro analysis for AM and PM peaks for the 4 intersections.
2. The following approaches operate at LOS E during the AM and/or PM peak periods:
  - a. NB Wixom Road at Wixom and Grand River (AM)
  - b. SB Wixom Road at Wixom and Grand River (PM)
  - c. EB Catholic Central High School at Wixom and CCHS/Novi Promenade (AM and PM)
  - d. WB Novi Promenade at Wixom and CCHS/Novi Promenade (AM and PM)
3. The preparer proposed timing optimization at Wixom and Grand River and both timing optimization and lane realignment at the Wixom and CCHS/Novi Promenade intersection to allow for right turns to overlap with the corresponding left turns.
  - a. A type confusing northbound-lane and northbound-left is present in this section of the report.

- b. This proposal would increase delay on northbound Wixom Road in both the AM and PM peaks, however total intersection delay would decrease by approximately 4 seconds in both instances. However, NB Wixom Road would change from LOS D to LOS E for the PM peak.
- c. The preparer notes that both these intersections are part of the County's adaptive traffic system, SCATS.

## BACKGROUND CONDITIONS ANALYSIS

1. The following projects were included in background conditions for this project:
  - a. Walbridge Industrial Park Development (Built and Unoccupied)
  - b. Township Warehouse (Under Construction)
  - c. Township Manufacturing Facility (Not Built)
  - d. South Hill Business Park West Phase 1
2. The preparer indicated the trips for these would be distributed according to the existing traffic patterns of the area, as the study area was outside the study areas for the respective developments.
3. A growth rate of 0.5% per year was applied to grow volumes to 2024.
  - a. A growth rate of 4 to 7% per year was indicated from SEMCOG data for 2016 to 2019.
  - b. The preparer indicated the SEMCOG community profile for the city indicated growth of 0.05-0.1% per year from 2020 to 2045.
  - c. The preparer indicates a growth rate of 0.5% was assumed based on anticipated population growth in the City and historical data.
4. When the background conditions volumes are applied to the Synchro model, 50% or more of the approaches operate at LOS E or F for the signalized intersections.
  - a. The preparer notes that at 3 of the LOS E approaches and 1 LOS F approach, actuated signals would decrease delay in practice.

## SITE TRAFFIC CHARACTERISTICS

1. The preparer has accurately indicated the proposed development's trip generation counts.
2. The trip distribution was based on the existing volumes on Wixom and Grand River.
  - a. Trip distribution shows both driveways for the site being utilized equally, which is unlikely to occur. Vehicles heading north would utilize the north driveway and vehicles heading south would utilize the south driveway. If other revisions are required, this could be corrected.

## FUTURE CONDITIONS ANALYSIS

1. Turn lane warrants were done for the three possible site driveways.
  - a. According to Figure IX.10, neither a right turn taper nor a turn lane is warranted.
2. Future conditions with the site traffic were examined in Synchro.
  - a. At Wixom and Grand River, 50% of approaches during AM peak and PM peak operate at LOS E or F.
  - b. At Wixom and CCHS/Novi Promenade, the two sidestreets operate at LOS E during both AM and PM peak.
3. The preparer modeled timing optimization at Wixom and Grand River, which would reduce total delays to 1 approach with LOS E during AM peak and 2 approaches with LOS E during PM peak.

## FINDINGS AND RECOMMENDATIONS

1. The preparer concludes that the development should not result in any significant impact on the road network with SCATS is in effect.
2. Driveway storage length is expected to be able to absorb the increased traffic without incident.

## CONCLUSIONS

1. The preparer could correct the minor typos, however, all Synchro values are accurate in the report text, in that they agree with the appendix reports.
2. The preparer indicates that the improvement scenarios were to demonstrate capacity exists at the intersections for SCATS to make use of with adaptive controls.

Should the City or applicant have questions regarding this review, they should contact AECOM for further clarification.  
Sincerely,

**AECOM**



Patricia Thompson, PE  
Traffic Engineer



Saumil Shah, PMP  
Project Manager

## FAÇADE REVIEW

---



May 22, 2023

City of Novi Planning Department  
 45175 W. 10 Mile Rd.  
 Novi, MI 48375-3024

*Façade Review Status Summary:*  
**Not Approved - Wood Siding Exceeds Ordinance Maximum.**

Re: **FACADE ORDINANCE – Station Flats, JSP23-02**  
 Façade Region: 1, Zoning District: I-1

Dear Ms. McBeth;

This review is based on the drawings prepared by Krieger Klatt Architects, dated 5/4/23. Material percentages that are in non-compliance with the Façade Ordinance, if any, are **highlighted** in the chart below. The sample board required by Section 5.15.4.D was provided in photographic format on sheet A.202.

	<b>West (Front)</b>	<b>North (Left)</b>	<b>South (Right)</b>	<b>East (Rear)</b>	<b>Ordinance Maximum (Minimum)</b>
Brick (Glen Gery, Ebonite, Smooth)	31%	34%	37%	42%	100% (30% Min.)
Stone (Shouldice Cast Stone)	22%	21%	17%	0%	50%
Flat Metal Panels (Knotwood, Faux Wood)	8%	10%	12%	19%	50%
Wood Siding (Cement Fiber Lap Siding)	<b>32%</b>	<b>29%</b>	<b>25%</b>	<b>34%</b>	0%
Metal Panels (Pac-Clad)	7%	6%	9%	5%	50%

Cement Fiber Lap Siding is considered Wood Siding with respect to the Façade Ordinance (Footnote 13). As shown above, the percentage of this material exceeds the maximum amount allowed by the Ordinance by a significant amount. The Ordinance allows the percentage of Wood Siding to be increased from 0% to 50% when its use is consistent with residential style architecture (Footnote 10). The proposed building does not meet these criteria because it lacks features normally associated with residential style architecture such as sloped roof, gables, eaves and attached garages. A Section 9 Waiver would therefore be required for this deviation.

In this case the extent of deviation (34% vs 0%) exceeds what would qualify for a Section 9 Waiver. It should be noted that the percentage of Wood Siding has been increased since the prior submittal dated 1/13/23, with said material now being used generally on the upper 2 stories as compared to only the upper story in the prior submittal.



It is recommended that the applicant reduce the percentage of Wood Siding to more closely conform to the Ordinance, or consider changing the Wood Siding to another material that complies with the Façade Ordinance. For example, Cement Fiber Panels consistent with Footnote 15 are allowed up to 25% and would reduce the deviation to the extent needed to qualify for a Section 9 Waiver. Alternately, the Knotwood Faux Wood Panels used elsewhere on the project are considered Flat Metal Panels with respect to the Façade Ordinance and are allowed up to 50%. The use of this material in lieu of Wood Siding would essentially bring the building into full compliance.

The entrance sign indicated on sheet A.300 is constructed of 100% brick and stone and is in full compliance with the Façade Ordinance. The dumpster enclosure indicated on sheet C-9.2 is constructed of “architectural masonry to match finish of the building”. Assuming that this means identical brick or stone, the dumpster enclosure is in full compliance with the Façade Ordinance.

**General Notes:**

1. RTU Screening - It should be noted that all roof top units must be screened from view from all vantage points both on-site and off-site using materials in compliance with the Façade Ordinance.

2. Inspections – The Façade Ordinance requires inspection(s) for all façade materials. It is the applicant’s responsibility to request the inspection at the appropriate time, prior to installation. Inspections may be requested using the Novi Building Department’s Online Inspection Portal with the following link. Please click on “Click here to Request an Inspection” under “Contractors”, then click “Façade”. <http://www.cityofnovi.org/Services/CommDev/OnlineInspectionPortal.asp>.

Sincerely,  
DRN & Architects PC



Douglas R. Necci, AIA

## FIRE REVIEW

---



May 17, 2023

TO: Barbara McBeth - City Planner  
Lindsay Bell - Plan Review Center  
Christian Carroll - Plan Review Center  
Ben Peacock – Plan Review Center  
Diana Shanahan – Planning Assistant

**CITY COUNCIL**

**Mayor**  
Bob Gatt

**Mayor Pro Tem**  
Dave Staudt

Laura Marie Casey

Hugh Crawford

Justin Fischer

Brian Smith

Ericka Thomas

**Interim City Manager**  
Victor Cardenas

**Director of Public Safety  
Chief of Police**  
Erick W. Zinser

**Fire Chief**  
Jeffery R. Johnson

**Assistant Chief of Police**  
Scott R. Baetens

**Assistant Fire Chief**  
John B. Martin

**Novi Public Safety Administration**  
45125 Ten Mile Road  
Novi, Michigan 48375  
248.348.7100  
248.347.0590 fax

cityofnovi.org

RE: Station Flats

**PSP# 23-0004**

PreApp# 23-0002

**Project Description:**

Build a 45,825 Sq. Ft. Multi-tenant Structure off Wixom Rd south of Grand River

**Comments:**

- **All** fire hydrants **MUST** be installed and operational prior to any combustible material is brought on site. **IFC 2015 3312.1**
- For new buildings and existing buildings, you **MUST** comply with the International Fire Code Section 510 for Emergency Radio Coverage. This shall be completed by the time the final inspection of the fire alarm and fire suppression permits.
- **Corrected 3/27/23 KSP-** Fire lanes will be designated by the Fire Chief or his designee when it is deemed necessary and shall comply with the Fire Prevention Ordinances adopted by the City of Novi. The location of all "fire lane – no parking" signs are to be shown on the site plans. **(Fire Prevention Ord.)**
- **Corrected 3/27/23 KSP-** An unobstructed outside turning radius of 50 feet minimum and an inside turning radius of 30 feet maximum are to be provided at intersections of private or public roadways and cul-de-sacs. **(International Fire Code 503.2.4) (South entrance from Target).**
- The ability to serve at least two thousand (2,000) gallons per minute in single-family detached residential; three thousand (3,000) gallons per school areas; and at least four thousand (4,000) gallons per minute in office, industrial and shopping centers is essential. **(D.C.S. Sec.11-68(a))**
- Hydrants shall be spaced approximately three hundred (300) feet apart online in commercial, industrial, and multiple-residential areas. In cases where the buildings within developments are fully fire suppressed, hydrants shall be no more than five hundred (500) feet apart. The spacing of hydrants around commercial and/or industrial developments shall be considered as individual cases where special circumstances exist upon consultation with the fire chief. **(D.C.S. Sec. 11-68 (f)(1)c)**

- Fire hydrant spacing shall be measured as “hose laying distance” from fire apparatus. Hose laying distance is the distance the fire apparatus travels along improved access routes between hydrants or from a hydrant to a structure.
- Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the code official. **(International Fire Code 912.2.1)**
- Proximity to hydrant: In any building or structure required to be equipped with a fire department connection, the connection shall be located within one hundred (100) feet of a fire hydrant. **(Fire Prevention Ord. Sec. 15-17 912.2.3)**
- **Corrected 3/27/23 KSP-** A hazardous chemical survey is required to be submitted to the Planning & Community Development Department for distribution to the Fire Department at the time any Preliminary Site Plan is submitted for review and approval. Definitions of chemical types can be obtained from the Fire Department at (248) 735-5674.
- Water main sizes shall be put on the plans for review.
- Water mains greater than 25', shall be at least 8" in diameter. Shall not on plans for review. **(D.S.C. 11-68(C)(1)(c))**

**Recommendation:**

Approved with Conditions

Sincerely,

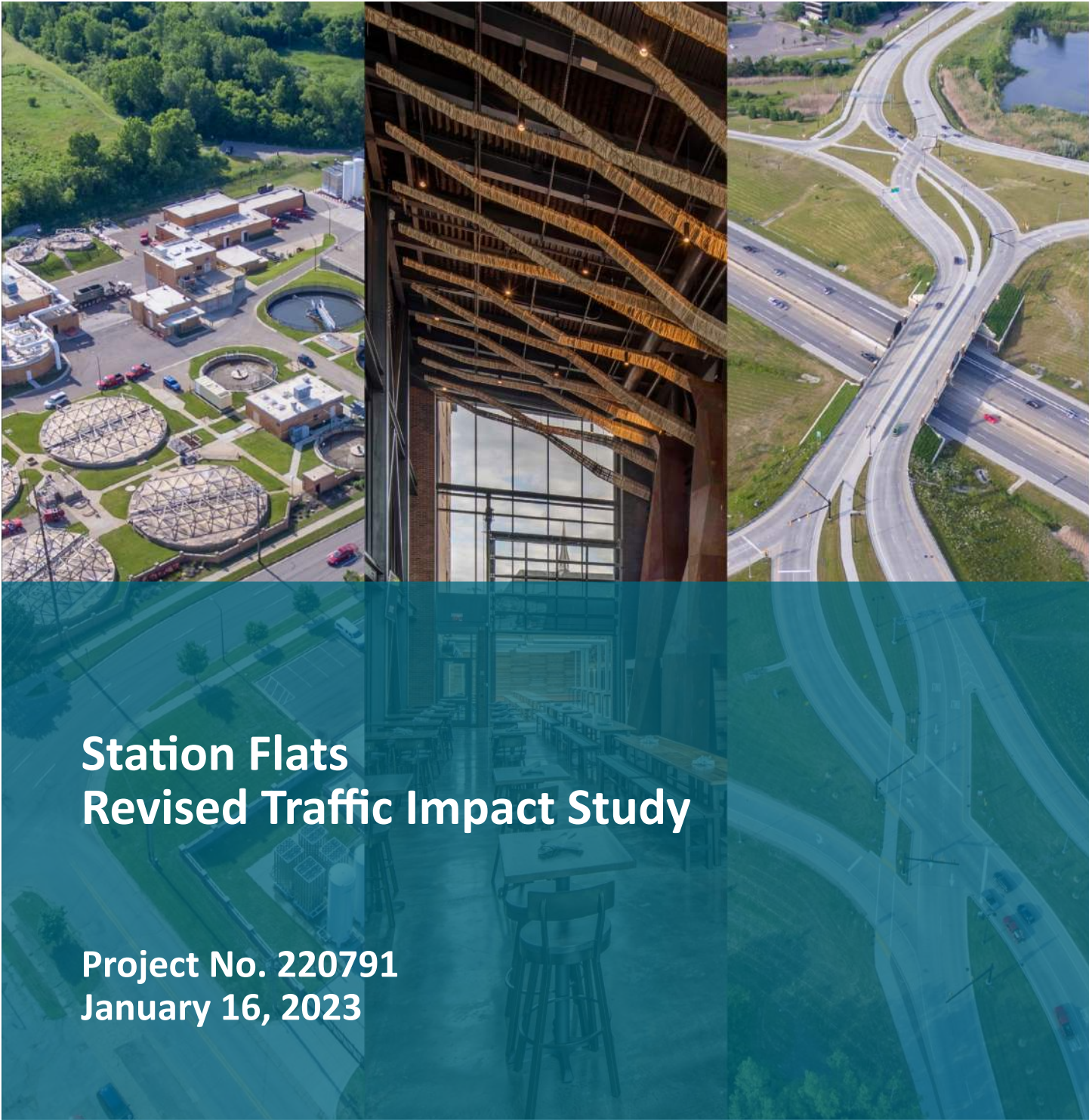
A handwritten signature in black ink, appearing to read 'KSP', with a long horizontal flourish extending to the right.

Kevin S. Pierce-Fire Marshal  
City of Novi – Fire Dept.

cc: file

# TRAFFIC IMPACT STATEMENT

---



# Station Flats Revised Traffic Impact Study

Project No. 220791  
January 16, 2023

# **Station Flats**

## **Revised Traffic Impact Study**

**Prepared For:**  
**Cypress Partners**  
**Birmingham, MI**

**Original Study: May 27, 2022**  
**Revised Study: January 16, 2023**  
**Project No. 220791**

Executive Summary .....1

1.0 Introduction.....2

    1.1 Project Overview.....2

    1.2 Study Methodology.....3

    1.3 Intersection Characteristics .....3

    1.4 Roadway Characteristics.....5

    1.5 Existing Traffic Volumes.....5

    1.6 Multimodal Characteristics.....7

2.0 Existing Conditions Analysis .....7

    2.1 Traffic Operations Analysis Methodology .....7

    2.3 Existing Conditions Traffic Analysis .....7

    2.4 Existing Improvement Conditions Traffic Analysis .....9

3.0 Background Conditions Analysis .....10

    3.1 Background Conditions Traffic Analysis .....13

    3.2 Background Improvement Conditions Traffic Analysis .....14

4.0 Site Traffic Characteristics.....15

    4.1 Trip Generation.....15

    4.2 Trip Distribution .....15

5.0 Future Conditions Analysis.....18

    5.1 Turn Lane Warrants .....18

    5.2 Future Conditions Traffic Analysis.....18

    5.3 Future Improvement Conditions Traffic Analysis.....19

6.0 Findings and Recommendations.....20

**List of Figures**

Figure 1 – Project Location and Study Network .....2

Figure 2 – Existing Lane Configurations .....4

Figure 3 – Existing Traffic Volumes .....6

Figure 4 – Background Traffic Volumes .....12

Figure 5 – Conceptual Site Plan.....15

Figure 6 – Trip Generation Volumes .....16

Figure 7 – Future Conditions Volumes.....17

**List of Tables**

Table 1 – Roadway Characteristics.....5

Table 2 – Signal Characteristics .....5

Table 3 – LOS Criteria .....7

Table 4 – LOS Analysis for Existing Conditions.....8

Table 5 – LOS Analysis for Existing Improvement Conditions.....9

Table 6 – Trip Generation for Background Developments.....10

Table 7 – Trip Distribution for Background Developments A-C (Traffic Impacting Study Area Only) .....11

Table 8 – LOS Analysis for Background Conditions.....13

Table 9 – LOS Analysis for Background Improvement Conditions .....14

Table 10 – Trip Generation for Proposed Development .....15

Table 11 – Trip Distribution.....15

Table 12 – Turn Lane Warrants .....18

Table 13 – LOS Analysis for Future Conditions .....18

Table 14 – LOS Analysis for Future Improvement Conditions.....19



**List of Appendices**

- Appendix 1 – Traffic Volume Data
- Appendix 2 – Existing LOS Output Reports
- Appendix 3 – Existing Improvement LOS Output Reports
- Appendix 4 – Background Development Data
- Appendix 5 – Background LOS Output Reports
- Appendix 6 – Background Improvement LOS Output Reports
- Appendix 7 – Turn Lane Warrants
- Appendix 8 – Future LOS Output Reports
- Appendix 9 – Future Improvement LOS Output Reports

**List of Abbreviations/Acronyms**

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
City	City of Novi
DU	Dwelling Units
EB	Eastbound
FAST-TRAC	Faster and Safer Travel Through Routing and Advanced Controls
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
LUC	Land Use Code
MDOT	Michigan Department of Transportation
mph	Miles Per Hour
NB	Northbound
RCOC	Road Commission for Oakland County
SB	Southbound
SCATS	Sydney Coordinated Adaptive Traffic System
SEMCOG	Southeast Michigan Council of Governments
SF	Square Foot
SMART	Suburban Mobility Authority for Regional Transit
TCDS	Traffic Count Database System
TDMS	Transportation Data Management System
TIS	Traffic Impact Study
TMC	Turning Movement Count
TWLTL	Two-Way Left Turn Lane
WB	Westbound
vpd	Vehicles Per Day

**References**

*The Highway Capacity Manual, 6th Edition.* (2016). Washington, DC.  
*Trip Generation Handbook, 3rd Edition.* (2017). Washington DC.  
*Trip Generation Manual, 11th Edition.* (2021). Washington DC.

## Executive Summary

Fishbeck has completed a revised traffic impact study (TIS) related to a proposed 158 dwelling unit (DU) multifamily residential development that would be located in the Novi Promenade development, which is on the east side of Wixom Road, south of Grand River Avenue, in the City of Novi (City), Oakland County, Michigan. The studied parcel is currently vacant and is located between Sam's Club and Target. The development will be completed in one phase, assumed to be open and fully operational in 2024.

The development will have access to Wixom Road via three existing driveways that already serve the Novi Promenade development. These intersections include the signalized driveway (adjacent to Catholic Central High School), the driveway along the north face of Target, and the driveway along the south face of Target.

This revised study addressed comments from the City's engineering consultant's letters dated July 8, 2022, and July 12, 2022. Additionally, this revised study reflects changes in site plan. The original site plan consisted of 144 DU of multifamily residential split between four two-story buildings. The revised site plan shows 158 DU of multifamily residential in a single four-story building. The increase in number of stories from two to four resulted in the land use changing from Land Use Code (LUC) 220 – Multifamily Housing (Low-Rise) to LUC 221 – Multifamily Housing (Mid-Rise).

The number of proposed units has increased; however, with the change in land use, the number of trips generated in the a.m. peak hour, p.m. peak hour, and weekday has decreased. The number of trips has decreased below the City's threshold for a TIS (100 trips in either peak hour or 750 weekday trips). A revised TIS has been completed given that the review process is already in progress.

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Road Commission for Oakland County (RCOC), and the City.

Vehicular, pedestrian, and cyclist Turning Movement Count (TMC)s were collected at the study intersection on Thursday, May 5, 2022, during the weekday a.m. (7 a.m. to 9 a.m.) and p.m. (4 p.m. to 6 p.m.) peak periods of the roadway network.

There are four known projects on the site vicinity that would add additional traffic volumes or alter traffic patterns within the study network. The following developments were included:

- A: Walbridge Industrial Park Development (Built and Unoccupied).
- B: Lyon Township Warehouse (Under Construction).
- C: Lyon Township Distribution Center (Not Built).
- D: South Hill Business Park West Phase 1.

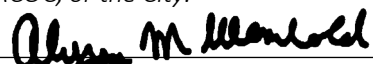
Site-generated traffic was forecast using the information and methodologies specified in the latest version of Trip Generation, Trip Generation Manual, 11th Edition, 2021. The existing traffic volumes, site layout, and engineering judgement were used to develop a trip distribution model for the a.m. and p.m. peak hours for the new traffic that will be generated by the proposed development. Additionally, directions of origin, surrounding residential densities, and commuting patterns were considered.

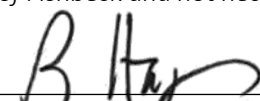
Capacity analyses were conducted for existing, background, and total future conditions based on Highway Capacity Manual (HCM) 6th Edition (Highway Capacity Manual, 6th Edition, 2016) methodologies using Synchro traffic analysis software. Synchro network models were also simulated using SimTraffic to evaluate network operations including intersection queueing.

Based on the findings of the HCM operational analyses and site traffic generation, no improvements are proposed to mitigate any traffic impacts of the proposed development. Improvement scenarios were completed to highlight that additional capacity is available at the intersection of Wixom Road and Grand River Avenue with the existing signal technology.

*The opinions, findings, and conclusions expressed in this TIS are those of Fishbeck and not necessarily those of the Owner/Applicant, RCOC, or the City.*

Prepared By:

  
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Project Manager – Fishbeck

## 1.0 Introduction

### 1.1 Project Overview

On behalf of Cypress Partners, Fishbeck has completed a revised traffic impact study (TIS) related to a proposed 158 dwelling unit (DU) multifamily residential development that would be located in the Novi Promenade development, which is on the east side of Wixom Road, south of Grand River Avenue, in the City of Novi (City), Oakland County, Michigan. The studied parcel is currently vacant and is located between Sam’s Club and Target. The development will be completed in one phase, assumed to be open and fully operational in 2024.

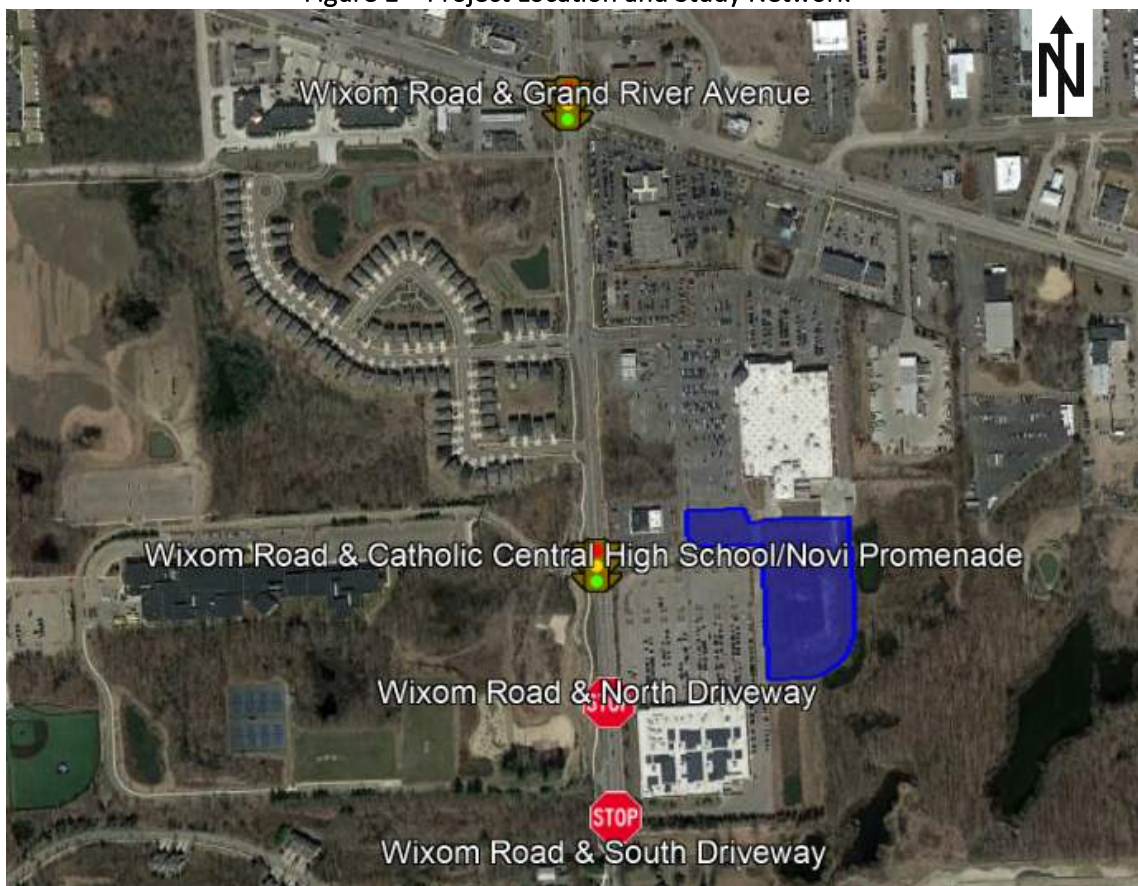
The development will have access to Wixom Road via three existing driveways that already serve the Novi Promenade development. These intersections include the signalized driveway (adjacent to Catholic Central High School), the driveway along the north face of Target, and the driveway along the south face of Target.

This revised study addressed comments from the City’s engineering consultant’s letters dated July 8, 2022, and July 12, 2022. Additionally, this revised study reflects changes in the site plan. The original site plan consisted of 144 DU of multifamily residential split between four two-story buildings. The revised site plan shows 158 DU of multifamily residential in a single four-story building. The increase in number of stories from two to four resulted in the land use changing from Land Use Code (LUC) 220 – Multifamily Housing (Low-Rise) to LUC 221 – Multifamily Housing (Mid-Rise).

The number of proposed units has increased; however, with the change in land use, the number of trips generated in the a.m. peak hour, p.m. peak hour, and weekday has decreased. The number of trips has decreased below the City’s threshold for a TIS (100 trips in either peak hour or 750 weekday trips). A revised TIS has been completed given that the review process is already in progress.

The project location and study intersections are indicated in Figure 1 – Project Location and Study Network.

Figure 1 – Project Location and Study Network



## 1.2 Study Methodology

The objectives of this TIS were to determine what impacts, if any, the proposed project will have on adjacent roadway traffic operations, and to develop recommendations for any improvements necessary to mitigate the project impacts on the studied intersections. Study analyses were completed relative to typical weekday a.m. and p.m. peak periods.

This study was conducted according to the methodologies and guidance published by Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), Road Commission for Oakland County (RCOC), and the City. Key study assumptions including trip generation calculations, trip distribution, COVID-19 adjustments, background growth, and the general study methodology was presented to RCOC and the City's consultant in a scoping document via email dated April 4, 2022. RCOC and the City's consultant provided comments on the scoping document for this TIS via email dated April 22, 2022. Additional comments were received from the City's consultant via review letters dated July 8, 2022, and July 12, 2022.

## 1.3 Intersection Characteristics

Based on the type and size of the proposed development and the likely area of influence for the site trips, traffic operations were analyzed for the following intersections:

1. Wixom Road and Grand River Avenue (signalized).
2. Wixom Road and Catholic Central High School/Novi Promenade (signalized).
3. Wixom Road and North Driveway (existing unsignalized driveway along north face of Target).
4. Wixom Road and South Driveway (existing unsignalized driveway along south face of Target).

The existing intersection lane configurations, traffic controls, and posted speed limits are indicated in Figure 2 – Existing Lane Configurations.



NORTH




SPEED LIMIT 45

WIXOM ROAD

# EXISTING LANE CONFIGURATIONS

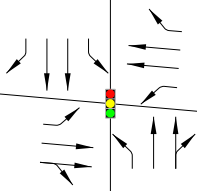
NO SCALE

## LEGEND

-  LANE ASSIGNMENT
-  SIGNALIZED INTERSECTION
-  STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR

SPEED LIMIT 50

GRAND RIVER AVENUE

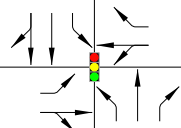


GRAND RIVER AVENUE

SPEED LIMIT 50

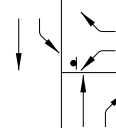
SPEED LIMIT 25

CATHOLIC CENTRAL HIGH SCHOOL



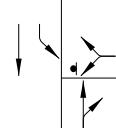
NOVI PROMENADE

SPEED LIMIT 25



NORTH DRIVEWAY

SPEED LIMIT 25



SOUTH DRIVEWAY

SPEED LIMIT 25

WIXOM ROAD

SPEED LIMIT 35



Engineers | Architects | Scientists | Constructors

Hard copy Is Intended to be 8.5"x11" when plotted, Scale(s) Indicated and graphic quality may not be accurate for any other size.

## STATION FLATS

Novi, MI 48374

### Traffic Impact Study

PROJECT NO.

220791

FIGURE NO.

2

### 1.4 Roadway Characteristics

The characteristics of the study area roadways and signalized intersections are described in Table 1 – Roadway Characteristics and Table 2 – Signal Characteristics below. The data points referenced were from the Michigan Department of Transportation (MDOT) Transportation Data Management System (TDMS) and the Southeast Michigan Council of Governments (SEMCOG) Traffic Count Database System (TCDS) online maps.

**Table 1 – Roadway Characteristics**

Roadway	Jurisdiction	Speed Limit (mph)	No. of Lanes	Roadway Classification	Direction	AADT (vpd)
Grand River Avenue	RCOC	50	5	Minor Arterial	EB	9,520
					WB	11,162
Wixom Road (North of Grand River Avenue)	RCOC	45	6	Minor Arterial	NB/SB	32,293
Wixom Road (South of Grand River Avenue)	City	35	3-4	Minor Arterial	NB/SB	8,598

Average Annual Daily Traffic (AADT)  
 Miles Per Hour (mph)  
 Northbound (NB)  
 Southbound (SB)  
 Westbound (WB)  
 Vehicles Per Day (vpd)

**Table 2 – Signal Characteristics**

Intersection	Jurisdiction	Left Turn Phasing			
		NB	SB	EB	WB
Wixom Road and Grand River Avenue	RCOC	Permitted and Protected			
Wixom Road and Catholic Central High School/Novi Promenade	Novi	Permitted and Protected			Split

### 1.5 Existing Traffic Volumes

Vehicular, pedestrian, and cyclist TMCs were collected at the following study intersections during the weekday a.m. (7 to 9 a.m.) and p.m. (4 to 6 p.m.) peak periods of the road network on Thursday, May 5, 2022:

- Wixom Road and Grand River Avenue (signalized).
- Wixom Road and Catholic Central High School/Novi Promenade (signalized).
- Wixom Road and North Driveway (existing unsignalized driveway along north face of Target).
- Wixom Road and South Driveway (existing unsignalized driveway along south face of Target).

Due to the impact of COVID-19, current traffic volume data may not be representative of typical operations. Historical traffic data from the SEMCOG TCDS website was reviewed. Based on this review and information provided by RCOC on other projects indicating that traffic volumes have generally returned to pre-pandemic levels, there was no compelling evidence to apply an adjustment factor to the collected TMCs.

Traffic volume information can be found in Appendix 1 – Traffic Volume Data, which include heavy vehicle and pedestrian crossing data. The adjusted existing traffic volumes used in this study are indicated in Figure 3– Existing Traffic Volumes.



NORTH

### EXISTING TRAFFIC VOLUMES

NO SCALE

#### LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 8.5"x11" when plotted. Scale(s) Indicated and graphic quality may not be accurate for any other size.

## STATION FLATS

Novi, MI 48374

### Traffic Impact Study

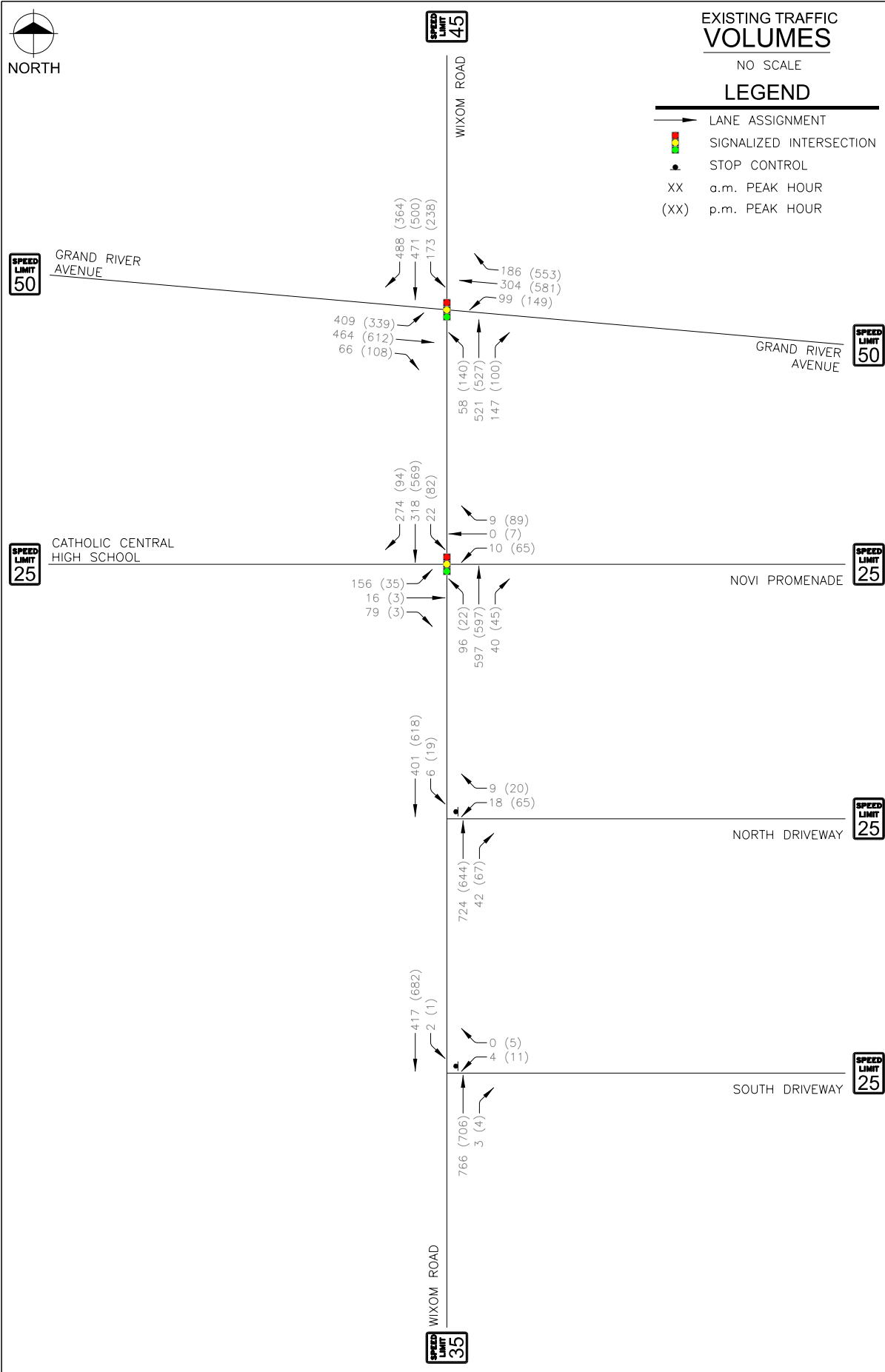
PROJECT NO.

220791

FIGURE NO.

3

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: — TIME: — USER: DMEADE



## 1.6 Multimodal Characteristics

The primary transportation system user in the study area is vehicular traffic. Accordingly, this study focuses on the potential impacts to the vehicle transportation network. Conservatively in this respect, all users of the site are assumed to travel to/from the site by passenger vehicle; however, there are limited multimodal facilities in the vicinity of the project.

South Michigan Area Regional Transit (SMART) is the area transit agency with bus routes existing throughout Metro Detroit and the surrounding area. There are no fixed route transit services that extend west into the City. The proposed project is not expected to have any impact on the existing or planned transit or non-motorized facilities in the site vicinity.

There is currently sidewalk along both sides of Grand River Avenue and Wixom Road within the study area. There is no existing sidewalk within the Novi Promenade development.

At the intersection of Wixom Road and Grand River Avenue, there are pedestrian signals with push buttons and sidewalk ramps in all four quadrants.

At the intersection of Wixom Road and Catholica Central High School/Novi Promenade, there are pedestrian signals on the east, west, and south sides of the intersection, with push buttons on the south side of the intersection only (for crossing Wixom Road adjacent to EB traffic). There are sidewalk ramps in all four quadrants; however, there is no marked crosswalk on the north side of the intersection (adjacent to WB traffic).

## 2.0 Existing Conditions Analysis

### 2.1 Traffic Operations Analysis Methodology

Synchro was used to perform Highway Capacity Manual (HCM) operational analyses during the a.m. and p.m. peak hours for all the intersections within this study. According to the most recent editions of the HCM, level of service (LOS) is a qualitative measure describing operational conditions of a traffic stream or intersection. LOS ranges from A to F, with LOS A representing desirable traffic operations characterized by low delay and LOS F representing extremely poor traffic operations characterized by excessive delays and long vehicle queues. LOS D is generally considered acceptable for most areas. Table 3 – LOS Criteria presents the HCM criteria for various LOS for unsignalized and signalized intersections. The color coding in the table is used in the capacity analysis summary tables later in this report.

**Table 3 – LOS Criteria**

LOS	Average Stopped Vehicle Delay (seconds)	
	Unsignalized	Signalized
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

### 2.3 Existing Conditions Traffic Analysis

Synchro models for the existing network were created based on the existing roadway configurations and traffic controls. Where applicable, data concerning the existing intersection and roadway lane configurations, geometry, and traffic control that were observed in the field were entered in the models. The traffic signal timing permits for the signalized intersections were provided by RCOC for use in the models.



The signal at Wixom Road and Catholic Central High School/Novi Promenade operates special timing scenarios associated with the start and end times of Catholic Central High School. During the calculated a.m. peak hour for this study, the school timing runs for the first 30 minutes and the normal a.m. peak hour timing runs for the second 30 minutes. The school timing was used in the a.m. peak hour models because this timing favors the minor approaches to accommodate the school traffic. Once the school peak starts to ease, the signal can assign any extra time not used by the minor approaches back to the NB and SB phases.

The resulting LOS and delay for the existing conditions are indicated in Table 4 – LOS Analysis for Existing Conditions.

**Table 4 – LOS Analysis for Existing Conditions**

Approach/Lane Group	LOS/Delay (s)			
	a.m. Peak Hour		p.m. Peak Hour	
<b>Wixom Road and Grand River Avenue (Signalized)</b>				
EB Grand River Avenue	D	50.7	D	51.5
WB Grand River Avenue	C	24.7	C	24.2
NB Wixom Road	E	59.9	D	54.9
SB Wixom Road	D	35.3	E	58.4
Overall	D	44.1	D	45.9
<b>Wixom Road and Catholic Central High School/Novi Promenade (signalized)</b>				
EB Catholic Central High School	E	70.8	E	68.4
WB Novi Promenade	E	66.8	E	61.2
NB Wixom Road	B	15.7	B	14.2
SB Wixom Road	C	27.2	A	2.3
Overall	C	30.3	B	13.2
<b>Wixom Road and North Driveway</b>				
WB North Driveway	C	16.6	C	21.0
NB Wixom Road	A	0.0	A	0.0
SB Wixom Road	A	0.1	A	0.3
Overall	A	0.6	A	1.6
<b>Wixom Road and South Driveway</b>				
WB South Driveway	C	17.0	C	17.9
NB Wixom Road	A	0.0	A	0.0
SB Wixom Road	A	0.0	A	0.0
Overall	A	0.1	A	0.3

Further analysis of the LOS results for existing conditions revealed that while several movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, the following movements, approaches, and intersections would operate at a LOS E or F:

- Wixom Road and Grand River Avenue:
  - The NBT movement, NBT/R movement, and NB approach operate at LOS E in the a.m. peak hour.
  - The EBL movement operates at LOS F in the a.m. peak hour.
  - The NBT movement, NBT/R movement, and SB approach operate at LOS E in the p.m. peak hour.
  - The EBL movement and SBL movement operate at LOS F in the p.m. peak hour.
- Wixom Road and Catholic Central High School/Novi Promenade:
  - The EBL movement, WBL/T movement, WBR movement, EB approach, and WB approach operate at LOS E in the a.m. peak hour.
  - The EBL movement, EBT/R movement, WBL/T movement, WBR movement, EB approach, and WB approach operate at LOS E in the p.m. peak hour.

SimTraffic simulations were reviewed to observe network operations and vehicle queues. Long queue lengths were observed at the intersection of Wixom Road and Grand River Avenue on the eastbound (EB) approach in the a.m. and p.m. peak hours and on the SB approach in the p.m. peak hour. The results of the SimTraffic simulation are similar to the queueing observed in the traffic count videos.

The intersection of Wixom Road and Grand River Avenue currently operates near capacity. Several turning movements currently exceed the available storage length, with these turning vehicles typically waiting 1-2 cycle lengths to clear the intersection. This intersection is part of RCOC’s Sydney Coordinated Adaptive Traffic System (SCATS) system, which allows the signal to adjust signal phases in real time in response to the traffic demand experienced within the corridor. This intersection is also part of the RCOC Faster and Safer Travel Through Routing and Advanced Controls (FAST-TRAC) program, which allows for network wide traffic flow monitoring and the balancing of traffic flow along major corridors. Synchro and SimTraffic do not have the capability to model these adaptive changes. The LOS, delays, and 95th percentile queue lengths calculated by Synchro and the SimTraffic simulations may not be representative of field conditions, as the signal can change the phase lengths throughout the peak hour to help manage traffic congestion.

Typically, a LOS E is considered unacceptable in urban areas. However, a LOS E may be acceptable in locations where the LOS E is experienced on the minor approach(es) at a signal with the long cycle length or a signal serving a facility with strong peaking characteristics where traffic volumes are concentrated into a small-time frame, like a school or factory. At the intersection of Wixom Road and Catholic Central High School/Novi Promenade, the minor approaches will experience a LOS E due to the peaking of traffic generated by Catholic Central High School and the long cycle length that prioritizes Wixom Road. The 95th percentile queue lengths clear each cycle, and the longer delays experienced by motorists are the result of waiting for their respective traffic signal heads to activate and display a green indication.

See Appendix 2 – Existing LOS Output Reports for the existing conditions LOS reports and queueing analysis reports.

## 2.4 Existing Improvement Conditions Traffic Analysis

Potential improvements were reviewed for the intersection of Wixom Road and Grand River Avenue. As described above, this intersection is part of RCOC’s SCATS and FAST-TRAC systems. Given that Synchro and SimTraffic cannot accurately model the real-time adjustment of signal phases, signal timing optimization was completed to show that additional capacity can be created at this intersection by the existing signal infrastructure. The LOS and delays indicated below are not intended as a recommendation to change the programmed signal timings but are intended to indicate that additional capacity is available at this intersection with the existing signal technology.

Potential improvements were reviewed for the intersection of Wixom Road and Catholic Central High School/Novi Promenade. These improvements included signal timing split optimization and/or the realignment of laneage on the EB approach to allow the installation of EBR and WBR overlap phasing (the EBR and WBR movements would receive a green arrow during the NBL and SBL protected phases). Neither of these options significantly improved the operations of the intersection and are not included in the existing improvement analysis.

The resulting LOS and delay for the existing improvement conditions are indicated in Table 5 – LOS Analysis for Existing Improvement Conditions.

**Table 5 – LOS Analysis for Existing Improvement Conditions**

Approach/Lane Group	LOS/Delay (s)			
	a.m. Peak Hour		p.m. Peak Hour	
<b>Wixom Road and Grand River Avenue (Signalized)</b>				
EB Grand River Avenue	D	37.5	D	36.9
WB Grand River Avenue	C	28.5	C	32.0
NB Wixom Road	E	59.0	E	61.3
SB Wixom Road	D	36.2	D	39.0
Overall	D	40.7	D	40.9

Further analysis of the LOS results for existing improvement conditions revealed that while several movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, the following movements, approaches, and intersections would operate at a LOS E or F:

- Wixom Road and Grand River Avenue:
  - The NBT movement, NBT/R movement, and NB approach would operate at LOS E in the a.m. and p.m. peak hours.

SimTraffic simulations were also reviewed to observe network operations and vehicle queues. Long queue lengths were observed at the intersection of Wixom Road and Grand River Avenue on the EB approach in the a.m. and p.m. peak hours, however these queue lengths are shorter than the queue lengths observed under existing conditions. See Appendix 3 – Existing Improvement LOS Output Reports.

### 3.0 Background Conditions Analysis

Historical traffic data on the SEMCOG TCDS website was referenced in order to determine the applicable growth rate to project the existing traffic volumes to the project build-out year of 2024. Review of the continuous count data available at the intersection of Wixom Road and Grand River Avenue and at the intersection of Wixom Road and Catholic Central High School/Novi Promenade revealed that the AADT has increased between 4% and 7% per year between 2016 and 2019. Given that it is unlikely that the surrounding community will continue to grow at this rate, the SEMCOG community profile for the City was reviewed. Between 2010 and 2020, the population of Novi grew by 11,019, or an increase of 20.0% (approximately 1.8% per year over the 10-year period). Looking forward, the population of Novi is anticipated to increase by 1,174, or an increase of 1.8% between 2020 and 2045 (approximately 0.07% per year over the 25-year period). Based on this review, a background growth rate of 0.5% was utilized.

Four additional background developments were identified for inclusion in the background traffic conditions as these developments will generate additional traffic to the projected 0.5% annual growth rate. Fishbeck included the traffic generation from the following studies:

- A: Walbridge Industrial Park Development (Built and Unoccupied):
  - Study completed by Tetra Tech dated May 18, 2018
- B: Lyon Township Warehouse (Under Construction):
  - Study completed by ROWE Professional Services Company dated April 16, 2020
- C: Lyon Township Distribution Center (Not Built):
  - Study completed by ROWE Professional Services Company dated March 8, 2021
- D: South Hill Business Park West Phase 1:
  - Study in progress by Fishbeck

One additional development was identified by the City that is located within the vicinity of the proposed project. The Villas of Stonebrook are located just south of the proposed site. However, this development is completely built out, with 77 of the 80 DUs currently occupied. No additional trips associated with this development were included in this TIS.

A breakdown of trips generated by all of the background developments and the portion of traffic that will impact the study area of the residential development is summarized below in Table 6 – Trip Generation from Background Developments.

**Table 6 – Trip Generation for Background Developments**

Development	ITE Land Use	LUC	Units	Description	a.m. Peak Hour			p.m. Peak Hour		
					In	Out	Total	In	Out	Total
A: Walbridge Industrial Park	Industrial Park	130	565,000 SF	Total	183	43	226	47	179	226
				Impacts Study	29	30	59	28	40	68
B: Lyon Township Warehouse	Warehousing Office	150 710	266,000 SF 14,000 SF	Total	77	19	96	19	49	68
				Impacts Study	18	14	32	13	14	27
C: Lyon Township Distribution Center	Warehousing	150	151,593 SF	Total	34	10	44	12	34	46
				Impacts Study	11	7	18	8	11	19
D: South Hill Business Park West Phase 1	Industrial Park	130	1,164,000 SF	Total	321	75	396	87	309	396
				Impacts Study	149	42	191	44	161	205

Square Foot/Feet (SF)

Developments A-C listed above are all located west of Wixom Road and their traffic studies did not include the intersection of Wixom Road and Grand River Avenue. The traffic generated by these developments that will extend into this residential study area was determined from the trip generation figures provided in the previous studies. This traffic was then distributed through the intersection of Wixom Road and Grand River Avenue (to/from the north, south, and east) based on existing traffic patterns. The distribution of traffic at the intersection of Wixom Road and Grand River Avenue is shown in Table 7 – Trip Distribution for Background Developments A-C (Traffic Impacting Study Area Only).

**Table 7 – Trip Distribution for Background Developments A-C (Traffic Impacting Study Area Only)**

Direction	Via	a.m. Peak Hour		p.m. Peak Hour	
		To	From	To	From
North	Wixom Road	48%	44%	46%	36%
South	Wixom Road	18%	32%	23%	23%
East	Grand River Avenue	34%	24%	31%	41%

The study for the South Hill Business Park West was in progress upon the publishing of this report. All draft trip generation figure for the intersection of Wixom Road and Grand River Avenue from the South Hill Business Park West study was used in this study. These volumes are in draft form and may differ from the final trip generation of the South Hill Business Park West final study. The volumes represent the worst-case vehicle trip generation scenario associated with South Hill Business Park West per preliminary RCOC request. Refer to Appendix 4 – Background Development Data for additional details related to the trip generation. The total background traffic volumes are indicated in Figure 4 – Background Traffic Volumes.



NORTH

### BACKGROUND TRAFFIC VOLUMES

NO SCALE

#### LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 8.5"x11" when plotted. Scale(s) Indicated and graphic quality may not be accurate for any other size.

## STATION FLATS

Novi, MI 48374

### Traffic Impact Study

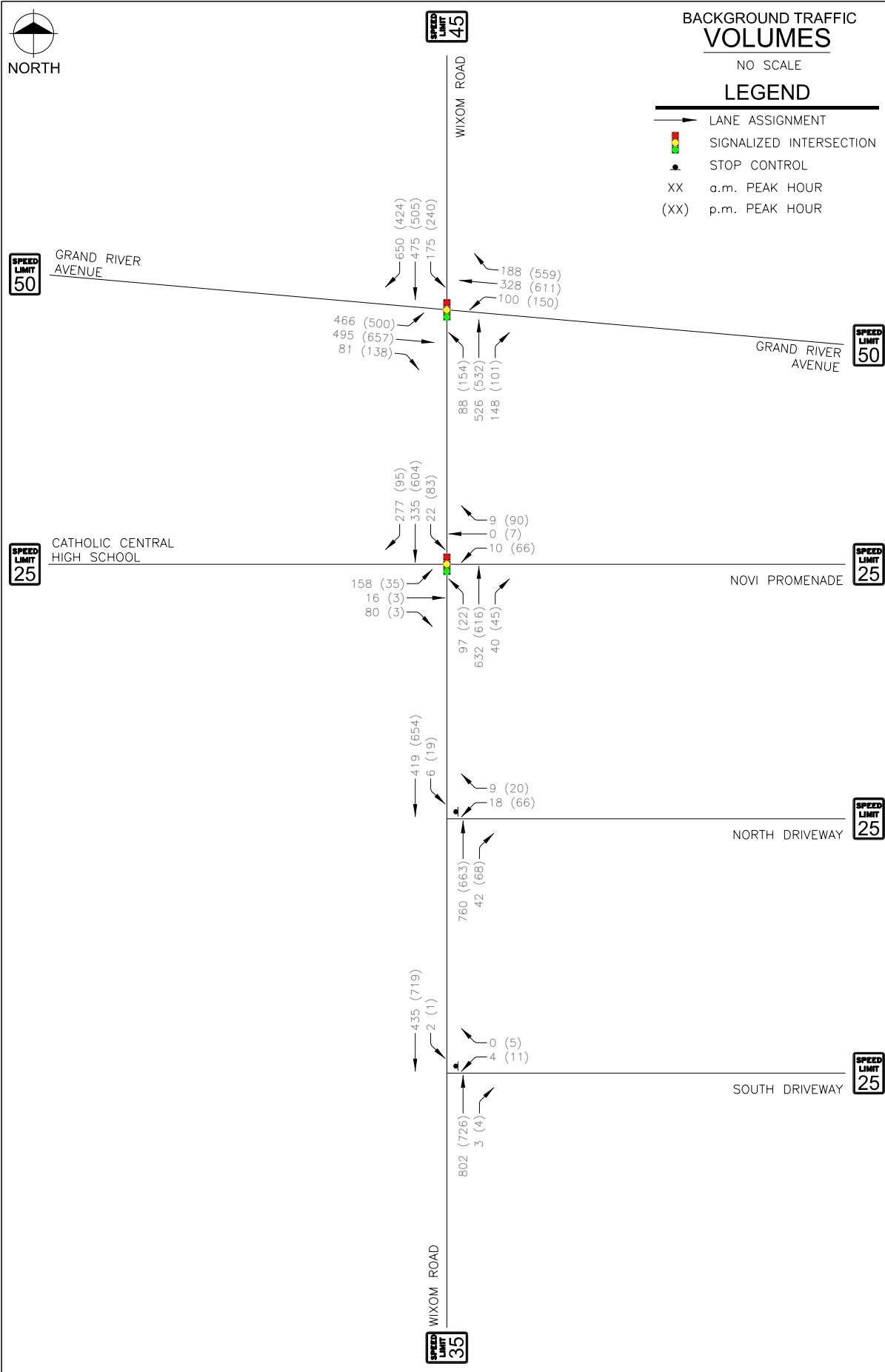
PROJECT NO.

220791

FIGURE NO.

4

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: — TIME: — USER: DMEADE



### 3.1 Background Conditions Traffic Analysis

The resulting LOS and delay for the background conditions are shown in Table 8 – LOS Analysis for Background Conditions.

**Table 8 – LOS Analysis for Background Conditions**

Approach/Lane Group	LOS/Delay (s)	
	a.m. Peak Hour	p.m. Peak Hour
<b>Wixom Road and Grand River Avenue (Signalized)</b>		
EB Grand River Avenue	E 79.1	F 145.6
WB Grand River Avenue	C 25.2	C 24.7
NB Wixom Road	E 59.0 <sup>1</sup>	D 55.2
SB Wixom Road	D 37.6	E 58.3 <sup>1</sup>
Overall	D 53.2	E 73.9
<b>Wixom Road and Catholic Central High School/Novi Promenade (signalized)</b>		
EB Catholic Central High School	E 71.1	E 68.4
WB Novi Promenade	E 66.8	E 61.0 <sup>1</sup>
NB Wixom Road	B 16.6	B 14.9
SB Wixom Road	C 27.7	A 2.5
Overall	C 30.7	B 13.5
<b>Wixom Road and North Driveway</b>		
WB North Driveway	C 17.2	C 22.2
NB Wixom Road	A 0.0	A 0.0
SB Wixom Road	A 0.1	A 0.3
Overall	A 0.6	A 1.6
<b>Wixom Road and South Driveway</b>		
WB South Driveway	C 17.6	C 18.5
NB Wixom Road	A 0.0	A 0.0
SB Wixom Road	A 0.0	A 0.0
Overall	A 0.1	A 0.3

<sup>1</sup>Delay decreases because the actuated phase is called more frequently and/or does not gap out (end early) as frequently

Further analysis of the LOS results for background revealed that while several movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, the following movements, approaches, and intersections would operate at a LOS E or F:

- Wixom Road and Grand River Avenue:
  - The NBT movement, NBT/R movement, and NB approach would continue to operate at LOS E in the a.m. peak hour.
  - The EB approach would degrade from a LOS D to LOS E in the a.m. peak hour.
  - The EBL movement would continue to operate at LOS F in the a.m. peak hour.
  - The NBT movement, NBT/R movement, and SB approach would continue to operate at LOS E in the p.m. peak hour.
  - The NB approach would degrade from a LOS D to LOS E in the p.m. peak hour.
  - The EBL movement and SBL movement would continue to operate at LOS F in the p.m. peak hour.
  - The EB approach would degrade from a LOS D to LOS F in the p.m. peak hour.
  - The overall intersection would degrade from a LOS D to LOS E in the p.m. peak hour.
- Wixom Road and Catholic Central High School/Novi Promenade:
  - The EBL movement, WBL/T movement, WBR movement, EB approach, and WB approach would continue to operate at LOS E in the a.m. peak hour.
  - The EBL movement, EBT/R movement, WBL/T movement, WBR movement, EB approach, and WB approach would continue to operate at LOS E in the p.m. peak hour.

SimTraffic simulations were reviewed to observe network operations and vehicle queues. Long queue lengths were continued to be observed at the intersection of Wixom Road and Grand River Avenue on the EB approach in the a.m. and p.m. peak hours and on the SB approach in the p.m. peak hour.

The operations at Wixom Road and Grand River Avenue would continue to degrade. Several turning movements will continue to exceed the available storage lanes, with these turning vehicles typically waiting 1-2 cycle lengths to clear the intersection. As described in the existing conditions section above, this intersection is part of the RCOC SCATS and FAST-TRAC systems, which allows the signal to adjust signal phases in real time in response to the traffic volumes experienced within the corridor. The LOS, delays, and 95th percentile queue lengths calculated by Synchro and the SimTraffic simulations may not be representative of field conditions, as the signal can change the phases throughout the peak hour to help manage traffic congestion. See Appendix 5 – Background LOS Output Reports.

### 3.2 Background Improvement Conditions Traffic Analysis

As described in the existing improvement conditions section above, signal timing adjustments were reviewed for the intersection of Wixom Road and Grand River Avenue. The LOS and delays shown below are not intended as a recommendation to change the programmed signal timings but are intended to show that additional capacity is available at this intersection with the existing signal technology.

As described in the existing improvement conditions section above, potential improvements were reviewed for the intersection of Wixom Road and Catholic Central High School/Novi Promenade. No improvements at this intersection were included in the background improvement analysis.

The resulting LOS and delay for the background improvement conditions are shown below in Table 9 – LOS Analysis for Background Improvement Conditions.

**Table 9 – LOS Analysis for Background Improvement Conditions**

Approach/Lane Group	LOS/Delay (s)			
	a.m. Peak Hour		p.m. Peak Hour	
Wixom Road and Grand River Avenue (Signalized)				
EB Grand River Avenue	D	40.9	E	56.3
WB Grand River Avenue	D	36.6	D	38.1
NB Wixom Road	E	60.0	E	59.3
SB Wixom Road	D	33.3	D	52.5
Overall	D	42.3	D	50.9

Further analysis of the LOS results for background improvement conditions revealed that while several movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, the following movements, approaches, and intersections would operate at a LOS E or F:

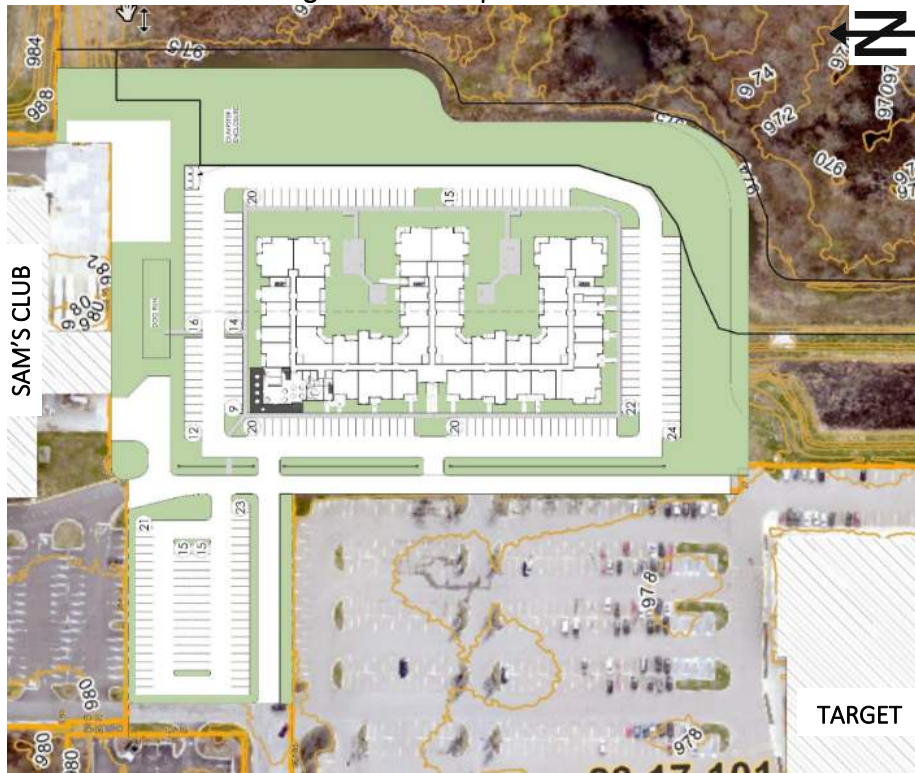
- Wixom Road and Grand River Avenue:
  - The NBT movement, NBT/R movement, and NB approach would continue to operate at LOS E in the a.m. peak hour.
  - The NBT movement, NBT/R movement, and NB and EB approaches would continue to operate at LOS E in the p.m. peak hour.
  - The EBL movement and SBL movement would continue to operate at LOS F in the p.m. peak hour.

Long queue lengths were observed at the intersection of Wixom Road and Grand River Avenue on the EB approach in the a.m. and p.m. peak hours and on the SB approach in the p.m. peak hour, however these queue lengths are similar to the queue lengths observed under existing conditions. See Appendix 6 – Background Improvement LOS Output Reports.

## 4.0 Site Traffic Characteristics

A representation of the current conceptual site plan is provided in Figure 5 – Conceptual Site Plan below.

Figure 5 – Conceptual Site Plan



### 4.1 Trip Generation

Using the information and methodologies specified in the latest version of Trip Generation, Fishbeck forecast the weekday a.m. and p.m. peak hour trips associated with the proposed development. Table 10 – Trip Generation for Proposed Development presents the resulting trip generation for the development.

Table 10 – Trip Generation for Proposed Development

ITE Land Use	LUC	Units	a.m. Peak Hour			p.m. Peak Hour			Weekday
			In	Out	Total	In	Out	Total	
Multifamily Housing (Mid-Rise)	221	158 DU	13	45	58	38	24	62	707
Total			13	45	58	38	24	62	707

### 4.2 Trip Distribution

The directions that site traffic will travel to and from were based upon existing traffic patterns during the a.m. and p.m. peak hours. The existing traffic patterns reflect the gravity between origins and destinations in the study area, and therefore an accurate indication of where the proposed trips would be coming from and going to. **Error! Reference source not found.** 11 – Trip Distribution provides the probable distribution based on the existing traffic patterns.

Table 11 – Trip Distribution

Direction	Via	a.m. Peak Hour		p.m. Peak Hour	
		To	From	To	From
North	Wixom Road	35%	32%	34%	27%
South	Wixom Road	13%	23%	17%	17%
East	Grand River Avenue	25%	17%	23%	31%
West	Grand River Avenue	27%	28%	26%	25%

The trip distribution for the site is indicated below in Figure 6 – Trip Generation Volumes. These trips were added to the background volumes (Figure 4) to result in the future conditions volumes in Figure 7 – Future Conditions Volumes.





SPEED LIMIT 45

### TRIP GENERATION VOLUMES

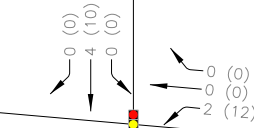
NO SCALE

### LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- ▲ STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR

SPEED LIMIT 50

GRAND RIVER AVENUE

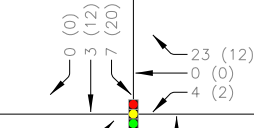


SPEED LIMIT 50

GRAND RIVER AVENUE

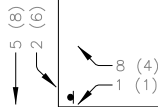
SPEED LIMIT 25

CATHOLIC CENTRAL HIGH SCHOOL



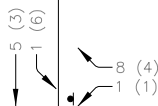
SPEED LIMIT 25

NOVI PROMENADE



SPEED LIMIT 25

NORTH DRIVEWAY



SPEED LIMIT 25

SOUTH DRIVEWAY

SPEED LIMIT 35

WIXOM ROAD



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## STATION FLATS

Novi, MI 48374

### Traffic Impact Study

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: — TIME: — USER: DMEADE

PROJECT NO.

220791

FIGURE NO.

6



NORTH

### FUTURE TRAFFIC VOLUMES

NO SCALE

#### LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 8.5"x11" when plotted. Scale(s) Indicated and graphic quality may not be accurate for any other size.

## STATION FLATS

Novi, MI 48374

### Traffic Impact Study

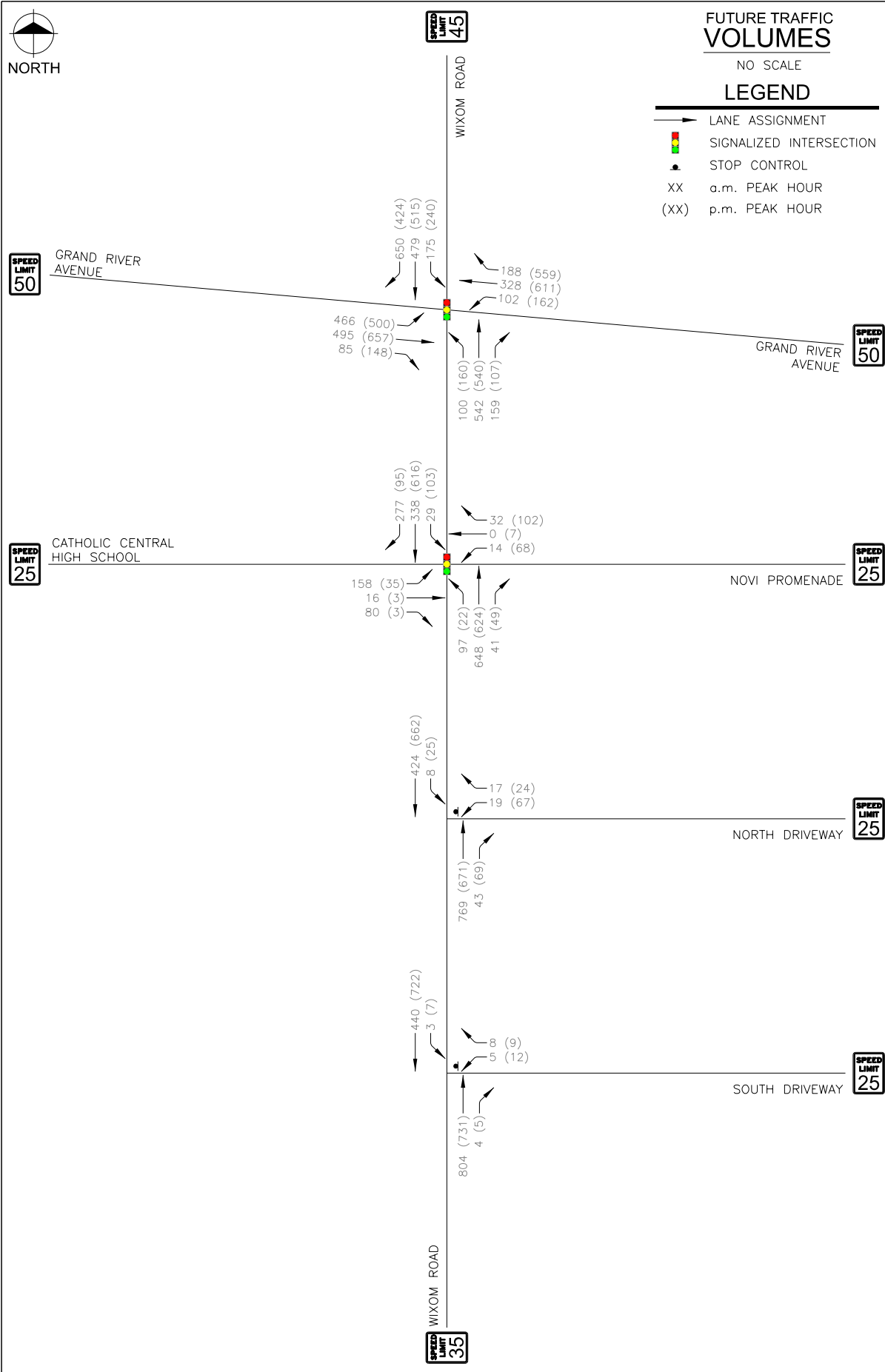
PROJECT NO.

220791

FIGURE NO.

7

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: — TIME: — USER: DMEADE



## 5.0 Future Conditions Analysis

### 5.1 Turn Lane Warrants

An evaluation was performed in accordance with City requirements to determine if right turn deceleration lanes are required at the site driveways. The results of the analysis indicated that no additional turn lane treatments are warranted at the site driveways. All turn lane warrant charts are in Appendix 7 – Turn Lane Warrants. The results of the analysis are presented in Table 12 – Turn Lane Warrants.

**Table 12 – Turn Lane Warrants**

Intersection	Movement	Existing Treatment	Result
Wixom Road and Catholic Central High School/Novi Promenade	NB Right Turn	Turn Lane	-
	SB Left Turn	TWLTL	-
Wixom Road and North Driveway	NB Right Turn	Turn Lane	-
	SB Left Turn	TWLTL	-
Wixom Road and South Driveway	NB Right Turn	None	Not Warranted
	SB Left Turn	TWLTL	-

Two-Way Left Turn Lane (TWLTL)

### 5.2 Future Conditions Traffic Analysis

The resulting LOS and delay for the future conditions are shown in Table 13 – LOS Analysis for Future Conditions.

**Table 13 – LOS Analysis for Future Conditions**

Approach/Lane Group	LOS/Delay (s)			
		a.m. Peak Hour		p.m. Peak Hour
<b>Wixom Road and Grand River Avenue (Signalized)</b>				
EB Grand River Avenue	F	83.2	F	147.6
WB Grand River Avenue	C	25.8	C	25.2
NB Wixom Road	E	59.5	D	55.5
SB Wixom Road	D	37.4 <sup>1</sup>	E	57.9 <sup>1</sup>
Overall	D	54.7	E	74.5
<b>Wixom Road and Catholic Central High School/Novi Promenade (signalized)</b>				
EB Catholic Central High School	E	71.1	E	68.4
WB Novi Promenade	E	65.7 <sup>1</sup>	E	60.4 <sup>1</sup>
NB Wixom Road	B	19.1	B	15.9
SB Wixom Road	C	28.9	A	2.9
Overall	C	32.9	B	14.2
<b>Wixom Road and North Driveway</b>				
WB North Driveway	C	16.3	C	22.5
NB Wixom Road	A	0.0	A	0.0
SB Wixom Road	A	0.2	A	0.3
Overall	A	0.7	A	1.7
<b>Wixom Road and South Driveway</b>				
WB South Driveway	C	16.8	C	18.4
NB Wixom Road	A	0.0	A	0.0
SB Wixom Road	A	0.1	A	0.1
Overall	A	0.3	A	0.4

<sup>1</sup>Delay decreases because the actuated phase is called more frequently and/or does not gap out (end early) as frequently.

Further analysis of the LOS results for future conditions revealed that while several movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, the following movements, approaches, and intersections would operate at a LOS E or F:

- Wixom Road and Grand River Avenue:
  - The NBT movement, NBT/R movement, and NB approach would continue to operate at LOS E in the a.m. peak hour.
  - The EBL movement would continue to operate at LOS F in the a.m. peak hour.
  - The EB approach would degrade from a LOS E to LOS F in the a.m. peak hour.
  - The NBT movement, NBT/R movement, NB approach, SB approach, and overall intersection would continue to operate at LOS E in the p.m. peak hour.
  - The EBL movement, SBL movement, and EB approach would continue to operate at LOS F in the p.m. peak hour.
- Wixom Road and Catholic Central High School/Novi Promenade:
  - The EBL movement, WBL/T movement, WBR movement, EB approach, and WB approach would continue to operate at LOS E in the a.m. peak hour.
  - The EBL movement, EBT/R movement, WBL/T movement, WBR movement, EB approach, and WB approach would continue to operate at LOS E in the p.m. peak hour.

Comparison of the LOS and delay results between background conditions and future conditions revealed that no movement experienced an increase in delay of greater than 4.0 seconds. No intersection delay increased by more than 2.2 seconds in the a.m. peak hour and 0.7 seconds in the p.m. peak hour.

SimTraffic simulations were reviewed to observe network operations and vehicle queues. Long queue lengths were continued to be observed at the intersection of Wixom Road and Grand River Avenue on the EB approach in the a.m. and p.m. peak hours and on the SB approach in the p.m. peak hour.

The operations at Wixom Road and Grand River Avenue would continue to degrade. Several turning movements will continue to exceed the available storage lanes, with these turning vehicles typically waiting 1-2 cycle lengths to clear the intersection. As described in the existing conditions section above, this intersection is part of the RCOC SCATS and FAST-TRAC systems, which allows the signal to adjust signal phases in real time in response to the traffic volumes experienced within the corridor. The LOS, delays, and 95th percentile queue lengths calculated by Synchro and the SimTraffic simulations may not be representative of field conditions, as the signal can change the phases throughout the peak hour to help manage traffic congestion. See Appendix 8 – Future LOS Output Reports.

### 5.3 Future Improvement Conditions Traffic Analysis

As described in the existing improvement conditions section above, signal timing adjustments were reviewed for the intersection of Wixom Road and Grand River Avenue. The LOS and delays shown below are not intended as a recommendation to change the programmed signal timings but are intended to show that additional capacity is available at this intersection with the existing signal technology.

As described in the existing improvement conditions section above, potential improvements were reviewed for the intersection of Wixom Road and Catholic Central High School/Novi Promenade. No improvements at this intersection were included in the background improvement analysis.

The resulting LOS and delay for the future improvement conditions are indicated in Table 14 – LOS Analysis for Future Improvement Conditions.

**Table 14 – LOS Analysis for Future Improvement Conditions**

Approach/Lane Group	LOS/Delay (s)			
		a.m. Peak Hour		p.m. Peak Hour
Wixom Road and Grand River Avenue (Signalized)				
EB Grand River Avenue	D	42.9	E	57.7
WB Grand River Avenue	D	37.4	D	38.6
NB Wixom Road	E	60.7	E	59.9
SB Wixom Road	D	33.3	D	52.3
Overall	D	43.4	D	51.5

Further analysis of the LOS results for future improvement conditions revealed that while several movements, approaches, and intersections are expected to operate at an acceptable LOS D or better during both the a.m. and p.m. peak hours, the following movements, approaches, and intersections would operate at a LOS E or F:

- Wixom Road and Grand River Avenue:
  - The EBL movement, NBT movement, NBT/R movement, and NB approach would operate at LOS E in the a.m. peak hour.
  - The NBT movement, NBT/R movement, and NB and EB approaches would continue to operate at LOS E in the p.m. peak hour.
  - The EBL movement and SBL movement would continue to operate at LOS F in the p.m. peak hour.

Comparison of the LOS and delay results between background improvement conditions and future improvements conditions revealed that no movement experienced an increase in delay of greater than 2.0 seconds. The overall intersection delay increased by 1.1 seconds in the a.m. peak hour and 0.6 seconds in the p.m. peak hour.

Long queue lengths were observed at the intersection of Wixom Road and Grand River Avenue on the EB approach in the a.m. and p.m. peak hours and on the SB approach in the p.m. peak hour, however these queue lengths are similar to the queue lengths observed under existing conditions. See Appendix 9 – Future Improvement LOS Output Reports.

## 6.0 Findings and Recommendations

The analyses conducted for this TIS indicate the proposed development will not result in any significant impact to the adjacent road network. The proposed site access configuration is appropriate and will acceptably facilitate site ingress and egress. These conclusions are supported by the following key findings:

1. Existing storage lengths for the driveways serving the site are adequate for all movements in existing and future conditions.
2. Lane configurations and physical capacity for the driveways are appropriate within the study area.
3. Neither existing nor planned transit or non-motorized facilities in the site vicinity would not be impacted by the project.

Based on the findings of the HCM operational analyses and site traffic generation, no improvements are proposed to mitigate any traffic impacts of the proposed development. Improvement scenarios were completed to highlight that additional capacity is available at the intersection of Wixom Road and Grand River Avenue with the existing signal technology.

# Appendix 1

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Traffic Volume Data

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR			
#1 - Wixom Road & Grand River Avenue	AM Peak 05/05/22		PHF	0.87			0.88			0.86			0.87									
			% Heavy	6%			3%			2%			5%									
			Existing	409	464	66	99	304	186	58	521	147	173	471	488				11	57	18	312
		Existing Adj.	409	464	66	99	304	186	58	521	147	173	471	488								
		Background	413	469	67	100	307	188	59	526	148	175	475	493								
		Bckgrd. Dev. A - D	53	26	14		21		29					157								
		Total Background	466	495	81	100	328	188	88	526	148	175	475	650								
		Site Generated				4	2		12	16	11			4								
		Pass By																				
		Total Site Gen	0	0	4	2	0	0	12	16	11	0	4	0								
		Total Future	466	495	85	102	328	188	100	542	159	175	479	650								

Count Date:	5/5/2022
Count Year:	2022
Existing Adj. Year:	2022
Existing Adjustment Rate:	1.00
Growth Rate:	0.5%
Buildout Year:	2024
Scenario:	AM Peak

Bckgrd. Dev. A: Walbridge Industrial Park Development  
 Bckgrd. Dev. B: Lyon Township Warehouse  
 Bckgrd. Dev. C: Lyon Township Manufacturing Facility  
 Bckgrd. Dev. D: South Hill Business Park West Phase 1

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR		
#2 - Wixom Road & Catholic Central High School/Novi Promenade	AM Peak 05/05/22		PHF	0.60			0.60			0.83			0.88								
			% Heavy	4%			12%			1%			3%								
			Existing	156	16	64	8	0	9	86	536	36	22	259	274	43	7	4	77		
		Existing Adj.	156	16	79	10	0	9	96	597	40	22	318	274							
		Background	158	16	80	10	0	9	97	603	40	22	321	277							
		Bckgrd. Dev. A - D						29					14								
		Total Background	158	16	80	10	0	9	97	632	40	22	335	277							
		Site Generated				4		23		16	1	7	3								
		Pass By																			
		Total Site Gen	0	0	0	4	0	23	0	16	1	7	3	0							
		Total Future	158	16	80	14	0	32	97	648	41	29	338	277							

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#3 - Wixom Road & North Driveway	AM Peak 05/05/22		PHF				0.60			0.90			0.89							
			% Heavy				4%			0%			4%							
			Existing				18		9	674	39	6	401							
		Existing Adj.				18		9	724	42	6	401								
		Background				18		9	731	42	6	405								
		Bckgrd. Dev. A - D						29				14								
		Total Background				18		9	760	42	6	419								
		Site Generated				1		8		9	1	2	5							
		Pass By																		
		Total Site Gen				1		8		9	1	2	5							
		Total Future				19		17		769	43	8	424							

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR
#4 - Wixom Road & South Driveway	AM Peak 05/05/22		PHF				0.60			0.93			0.83						
			% Heavy				0%			0%			3%						
			Existing				4		0	766	3	2	388						
		Existing Adj.				4		0	766	3	2	417							
		Background				4		0	773	3	2	421							
		Bckgrd. Dev. A - D						29				14							
		Total Background				4		0	802	3	2	435							
		Site Generated				1		8		2	1	1	5						
		Pass By																	
		Total Site Gen				1		8		2	1	1	5						
		Total Future				5		8		804	4	3	440						

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR			
#1 - Wixom Road & Grand River Avenue	PM Peak 05/05/22		PHF	0.95			0.93			0.88			0.95									
			% Heavy	2%			1%			0%			2%									
			Existing	339	612	108	149	581	553	140	527	100	238	500	364				21	135	16	127
		2022	Existing Adj.	339	612	108	149	581	553	140	527	100	238	500	364							
		2024	Background	342	618	109	150	587	559	141	532	101	240	505	368							
		Bckgrd. Dev. A - D	158	39	29		24		13					56								
		Total Background	500	657	138	150	611	559	154	532	101	240	505	424								
		Site Generated				10	12		6	8	6		10									
		Pass By																				
		Total Site Gen	0	0	10	12	0	0	6	8	6	0	10	0								
		Total Future	500	657	148	162	611	559	160	540	107	240	515	424								

Count Date:	5/5/2022
Count Year:	2022
Existing Adj. Year:	2022
Existing Adjustment Rate:	1.00
Growth Rate:	0.5%
Buildout Year:	2024
Scenario:	PM Peak

Bckgrd. Dev. A: Walbridge Industrial Park Development  
 Bckgrd. Dev. B: Lyon Township Warehouse  
 Bckgrd. Dev. C: Lyon Township Manufacturing Facility  
 Bckgrd. Dev. D: South Hill Business Park West Phase 1

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR			
#2 - Wixom Road & Catholic Central High School/Novi Promenade	PM Peak 05/05/22		PHF	0.68			0.92			0.95			0.86									
			% Heavy	0%			1%			1%			1%									
			Existing	35	3	3	63	7	89	22	584	44	82	555	94				1	64	9	15
		2022	Existing Adj.	35	3	3	65	7	89	22	597	45	82	569	94							
		2024	Background	35	3	3	66	7	90	22	603	45	83	575	95							
		Bckgrd. Dev. A - D							13				29									
		Total Background	35	3	3	66	7	90	22	616	45	83	604	95								
		Site Generated				2	12		8	4	20	12										
		Pass By																				
		Total Site Gen	0	0	0	2	0	12	0	8	4	20	12	0								
		Total Future	35	3	3	68	7	102	22	624	49	103	616	95								

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#3 - Wixom Road & North Driveway	PM Peak 05/05/22		PHF	0.80			0.95			0.89										
			% Heavy	0%			1%			0%										
			Existing				63		20		626	65	19	601						
		2022	Existing Adj.				65		20		644	67	19	618						
		2024	Background				66		20		650	68	19	625						
		Bckgrd. Dev. A - D							13				29							
		Total Background				66		20		663	68	19	654							
		Site Generated				1	4		8	1	6	8								
		Pass By																		
		Total Site Gen				1	4		8	1	6	8								
		Total Future				67		24		671	69	25	662							

Intersection	Time period	Year	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBRR	WBRR	NBRR	SBRR	
#4 - Wixom Road & South Driveway	PM Peak 05/05/22		PHF	0.67			0.95			0.91										
			% Heavy	6%			1%			1%										
			Existing				11		5		706	4	1	682						
		2022	Existing Adj.				11		5		706	4	1	682						
		2024	Background				11		5		713	4	1	690						
		Bckgrd. Dev. A - D							13				29							
		Total Background				11		5		726	4	1	719							
		Site Generated				1	4		5	1	6	3								
		Pass By																		
		Total Site Gen				1	4		5	1	6	3								
		Total Future				12		9		731	5	7	722							



**Grand River Avenue & Wixom Road - 4 RTOR - TMC**

Tue May 3, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Grand River Eastbound								Grand River Westbound							
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*		
2022-05-03 7:00AM	59	64	14	0	3	140	0	11	54	25	0	15	105	0		
7:15AM	105	79	13	0	1	198	1	19	65	24	0	21	129	0		
7:30AM	117	129	23	0	2	271	0	28	82	34	0	11	155	0		
7:45AM	95	122	20	0	3	240	0	31	90	24	0	23	168	0		
Hourly Total	376	394	70	0	9	849	1	89	291	107	0	70	557	0		
8:00AM	98	106	6	0	1	211	0	17	69	24	0	12	122	0		
8:15AM	99	107	6	0	5	217	0	23	63	47	0	11	144	0		
8:30AM	103	119	10	0	2	234	0	16	73	49	0	14	152	0		
8:45AM	103	130	12	0	4	249	0	23	77	35	0	19	154	0		
Hourly Total	403	462	34	0	12	911	0	79	282	155	0	56	572	0		
4:00PM	55	133	25	0	9	222	0	36	135	99	0	30	300	0		
4:15PM	90	139	18	0	4	251	0	43	150	100	0	35	328	0		
4:30PM	90	156	25	0	5	276	0	36	138	109	0	33	316	0		
4:45PM	80	161	15	0	4	260	0	37	136	98	0	24	295	0		
Hourly Total	315	589	83	0	22	1009	0	152	559	406	0	122	1239	0		
5:00PM	79	156	29	0	8	272	0	33	157	111	0	43	344	0		
5:15PM	84	123	19	0	2	228	0	42	143	75	0	39	299	0		
5:30PM	79	103	19	0	2	203	0	37	141	72	0	31	281	0		
5:45PM	79	92	10	0	3	184	1	29	143	78	0	29	279	0		
Hourly Total	321	474	77	0	15	887	1	141	584	336	0	142	1203	0		
<b>Total</b>	1415	1919	264	0	58	3656	2	461	1716	1004	0	390	3571	0		
<b>% Approach</b>	38.7%	52.5%	7.2%	0%	1.6%	-	-	12.9%	48.1%	28.1%	0%	10.9%	-	-		
<b>% Total</b>	9.8%	13.3%	1.8%	0%	0.4%	25.3%	-	3.2%	11.9%	7.0%	0%	2.7%	24.7%	-		
<b>Lights</b>	1312	1872	263	0	56	3503	-	456	1675	974	0	381	3486	-		
<b>% Lights</b>	92.7%	97.6%	99.6%	0%	96.6%	95.8%	-	98.9%	97.6%	97.0%	0%	97.7%	97.6%	-		
<b>Articulated Trucks</b>	57	13	0	0	1	71	-	1	9	8	0	3	21	-		
<b>% Articulated Trucks</b>	4.0%	0.7%	0%	0%	1.7%	1.9%	-	0.2%	0.5%	0.8%	0%	0.8%	0.6%	-		
<b>Buses and Single-Unit Trucks</b>	46	34	1	0	1	82	-	4	32	22	0	6	64	-		
<b>% Buses and Single-Unit Trucks</b>	3.3%	1.8%	0.4%	0%	1.7%	2.2%	-	0.9%	1.9%	2.2%	0%	1.5%	1.8%	-		
<b>Pedestrians</b>	-	-	-	-	-	-	2	-	-	-	-	-	-	0		
<b>% Pedestrians</b>	-	-	-	-	-	-	100%	-	-	-	-	-	-	-		
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	-	0	-	-	-	-	-	-	0		
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	0%	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Grand River Avenue & Wixom Road - 4 RTOR - TMC**

Tue May 3, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Wixom Northbound								Wixom Southbound								Int
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*			
Time																	
2022-05-03 7:00AM	10	84	6	0	2	102	0	45	79	27	0	42	193	0	540		
7:15AM	13	120	17	0	5	155	0	38	149	37	0	72	296	0	778		
7:30AM	11	132	18	0	2	163	0	41	151	47	0	85	324	0	913		
7:45AM	12	164	34	0	2	212	0	39	143	53	0	77	312	0	932		
Hourly Total	46	500	75	0	11	632	0	163	522	164	0	276	1125	0	3163		
8:00AM	16	107	36	0	10	169	0	46	80	31	0	82	239	0	741		
8:15AM	19	118	41	0	4	182	0	47	97	45	0	68	257	0	800		
8:30AM	18	124	38	0	6	186	0	39	100	27	0	80	246	0	818		
8:45AM	21	107	34	0	0	162	0	50	103	34	0	51	238	0	803		
Hourly Total	74	456	149	0	20	699	0	182	380	137	0	281	980	0	3162		
4:00PM	38	132	27	0	6	203	0	60	99	64	0	25	248	0	973		
4:15PM	42	149	21	0	5	217	0	62	122	57	0	27	268	0	1064		
4:30PM	33	128	18	0	4	183	0	48	123	45	0	44	260	0	1035		
4:45PM	26	123	21	0	3	173	0	66	127	69	0	28	290	0	1018		
Hourly Total	139	532	87	0	18	776	0	236	471	235	0	124	1066	0	4090		
5:00PM	39	127	24	0	4	194	0	62	128	66	0	28	284	0	1094		
5:15PM	29	129	14	0	5	177	0	69	162	73	0	33	337	0	1041		
5:30PM	35	130	10	0	7	182	0	62	139	74	0	24	299	0	965		
5:45PM	32	105	21	0	4	162	0	67	139	55	0	39	300	0	925		
Hourly Total	135	491	69	0	20	715	0	260	568	268	0	124	1220	0	4025		
<b>Total</b>	394	1979	380	0	69	2822	0	841	1941	804	0	805	4391	0	14440		
<b>% Approach</b>	14.0%	70.1%	13.5%	0%	2.4%	-	-	19.2%	44.2%	18.3%	0%	18.3%	-	-	-		
<b>% Total</b>	2.7%	13.7%	2.6%	0%	0.5%	19.5%	-	5.8%	13.4%	5.6%	0%	5.6%	30.4%	-	-		
<b>Lights</b>	391	1950	377	0	69	2787	-	813	1912	763	0	754	4242	-	14018		
<b>% Lights</b>	99.2%	98.5%	99.2%	0%	100%	98.8%	-	96.7%	98.5%	94.9%	0%	93.7%	96.6%	-	97.1%		
<b>Articulated Trucks</b>	1	8	2	0	0	11	-	6	4	21	0	29	60	-	163		
<b>% Articulated Trucks</b>	0.3%	0.4%	0.5%	0%	0%	0.4%	-	0.7%	0.2%	2.6%	0%	3.6%	1.4%	-	1.1%		
<b>Buses and Single-Unit Trucks</b>	2	21	1	0	0	24	-	22	25	20	0	22	89	-	259		
<b>% Buses and Single-Unit Trucks</b>	0.5%	1.1%	0.3%	0%	0%	0.9%	-	2.6%	1.3%	2.5%	0%	2.7%	2.0%	-	1.8%		
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Grand River Avenue & Wixom Road - 4 RTOR - TMC

Tue May 3, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

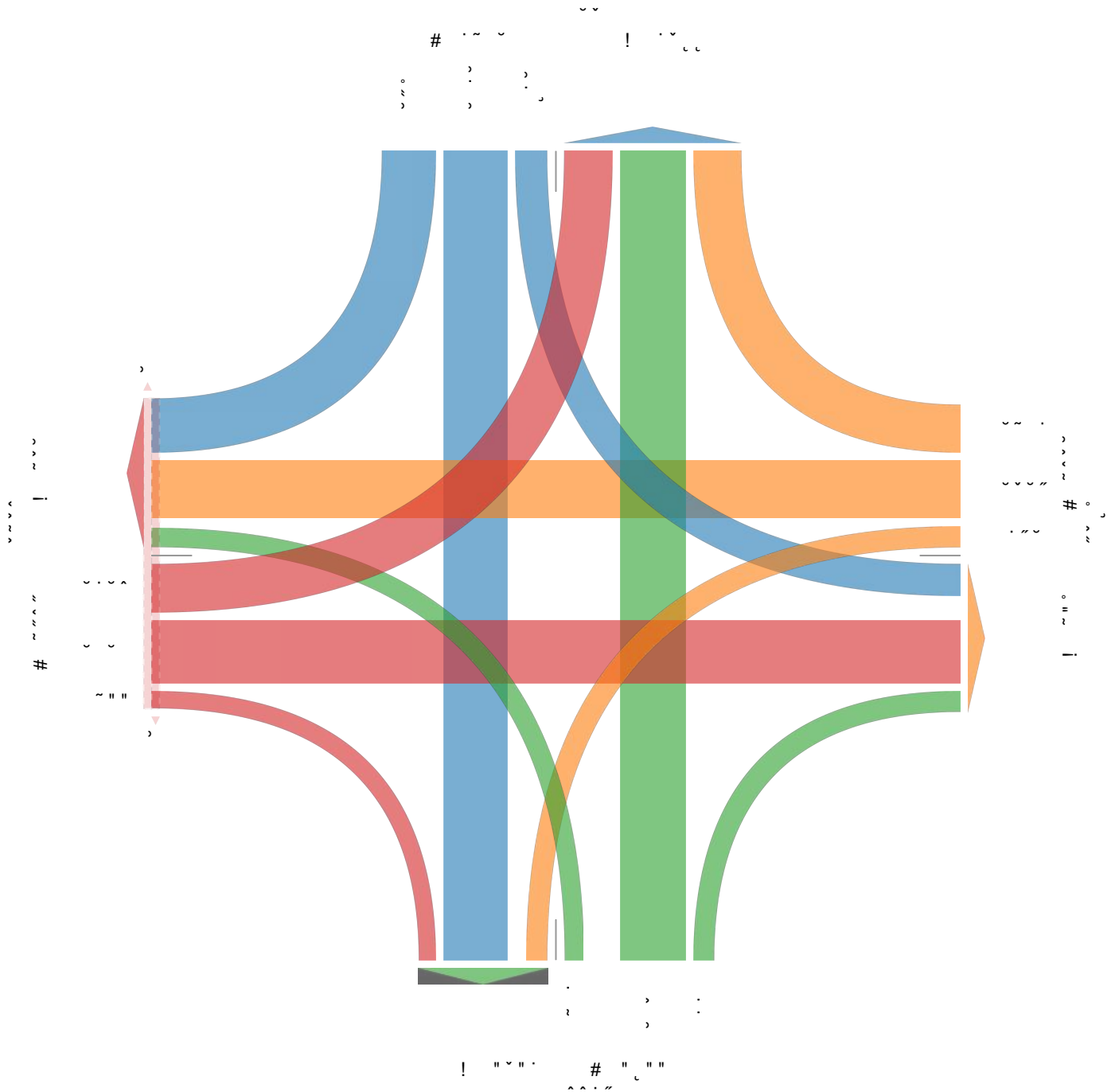
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



# Grand River Avenue & Wixom Road - 4 RTOR - TMC

Tue May 3, 2022

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Grand River Eastbound							Grand River Westbound						
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
Time														
2022-05-03 7:30AM	117	129	23	0	2	<b>271</b>	0	28	82	34	0	11	<b>155</b>	0
7:45AM	95	122	20	0	3	<b>240</b>	0	31	90	24	0	23	<b>168</b>	0
8:00AM	98	106	6	0	1	<b>211</b>	0	17	69	24	0	12	<b>122</b>	0
8:15AM	99	107	6	0	5	<b>217</b>	0	23	63	47	0	11	<b>144</b>	0
<b>Total</b>	409	464	55	0	11	<b>939</b>	0	99	304	129	0	57	<b>589</b>	0
<b>% Approach</b>	43.6%	49.4%	5.9%	0%	1.2%	-	-	16.8%	51.6%	21.9%	0%	9.7%	-	-
<b>% Total</b>	12.1%	13.7%	1.6%	0%	0.3%	<b>27.7%</b>	-	2.9%	9.0%	3.8%	0%	1.7%	<b>17.4%</b>	-
<b>PHF</b>	0.874	0.899	0.598	-	0.550	<b>0.866</b>	-	0.798	0.844	0.686	-	0.620	<b>0.876</b>	-
<b>Lights</b>	368	445	55	0	10	<b>878</b>	-	98	297	122	0	55	<b>572</b>	-
<b>% Lights</b>	90.0%	95.9%	100%	0%	90.9%	<b>93.5%</b>	-	99.0%	97.7%	94.6%	0%	96.5%	<b>97.1%</b>	-
<b>Articulated Trucks</b>	23	6	0	0	1	<b>30</b>	-	0	1	4	0	0	<b>5</b>	-
<b>% Articulated Trucks</b>	5.6%	1.3%	0%	0%	9.1%	<b>3.2%</b>	-	0%	0.3%	3.1%	0%	0%	<b>0.8%</b>	-
<b>Buses and Single-Unit Trucks</b>	18	13	0	0	0	<b>31</b>	-	1	6	3	0	2	<b>12</b>	-
<b>% Buses and Single-Unit Trucks</b>	4.4%	2.8%	0%	0%	0%	<b>3.3%</b>	-	1.0%	2.0%	2.3%	0%	3.5%	<b>2.0%</b>	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

# Grand River Avenue & Wixom Road - 4 RTOR - TMC

Tue May 3, 2022

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Wixom Northbound								Wixom Southbound								Int
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*			
Time																	
2022-05-03 7:30AM	11	132	18	0	2	163	0	41	151	47	0	85	324	0	913		
7:45AM	12	164	34	0	2	212	0	39	143	53	0	77	312	0	932		
8:00AM	16	107	36	0	10	169	0	46	80	31	0	82	239	0	741		
8:15AM	19	118	41	0	4	182	0	47	97	45	0	68	257	0	800		
<b>Total</b>	58	521	129	0	18	726	0	173	471	176	0	312	1132	0	3386		
<b>% Approach</b>	8.0%	71.8%	17.8%	0%	2.5%	-	-	15.3%	41.6%	15.5%	0%	27.6%	-	-	-		
<b>% Total</b>	1.7%	15.4%	3.8%	0%	0.5%	21.4%	-	5.1%	13.9%	5.2%	0%	9.2%	33.4%	-	-		
<b>PHF</b>	0.763	0.794	0.787	-	0.450	0.856	-	0.920	0.780	0.830	-	0.918	0.873	-	0.908		
<b>Lights</b>	58	510	127	0	18	713	-	165	457	170	0	287	1079	-	3242		
<b>% Lights</b>	100%	97.9%	98.4%	0%	100%	98.2%	-	95.4%	97.0%	96.6%	0%	92.0%	95.3%	-	95.7%		
<b>Articulated Trucks</b>	0	3	1	0	0	4	-	3	1	3	0	16	23	-	62		
<b>% Articulated Trucks</b>	0%	0.6%	0.8%	0%	0%	0.6%	-	1.7%	0.2%	1.7%	0%	5.1%	2.0%	-	1.8%		
<b>Buses and Single-Unit Trucks</b>	0	8	1	0	0	9	-	5	13	3	0	9	30	-	82		
<b>% Buses and Single-Unit Trucks</b>	0%	1.5%	0.8%	0%	0%	1.2%	-	2.9%	2.8%	1.7%	0%	2.9%	2.7%	-	2.4%		
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Grand River Avenue & Wixom Road - 4 RTOR - TMC**

Tue May 3, 2022

AM Peak (7:30 AM - 8:30 AM)

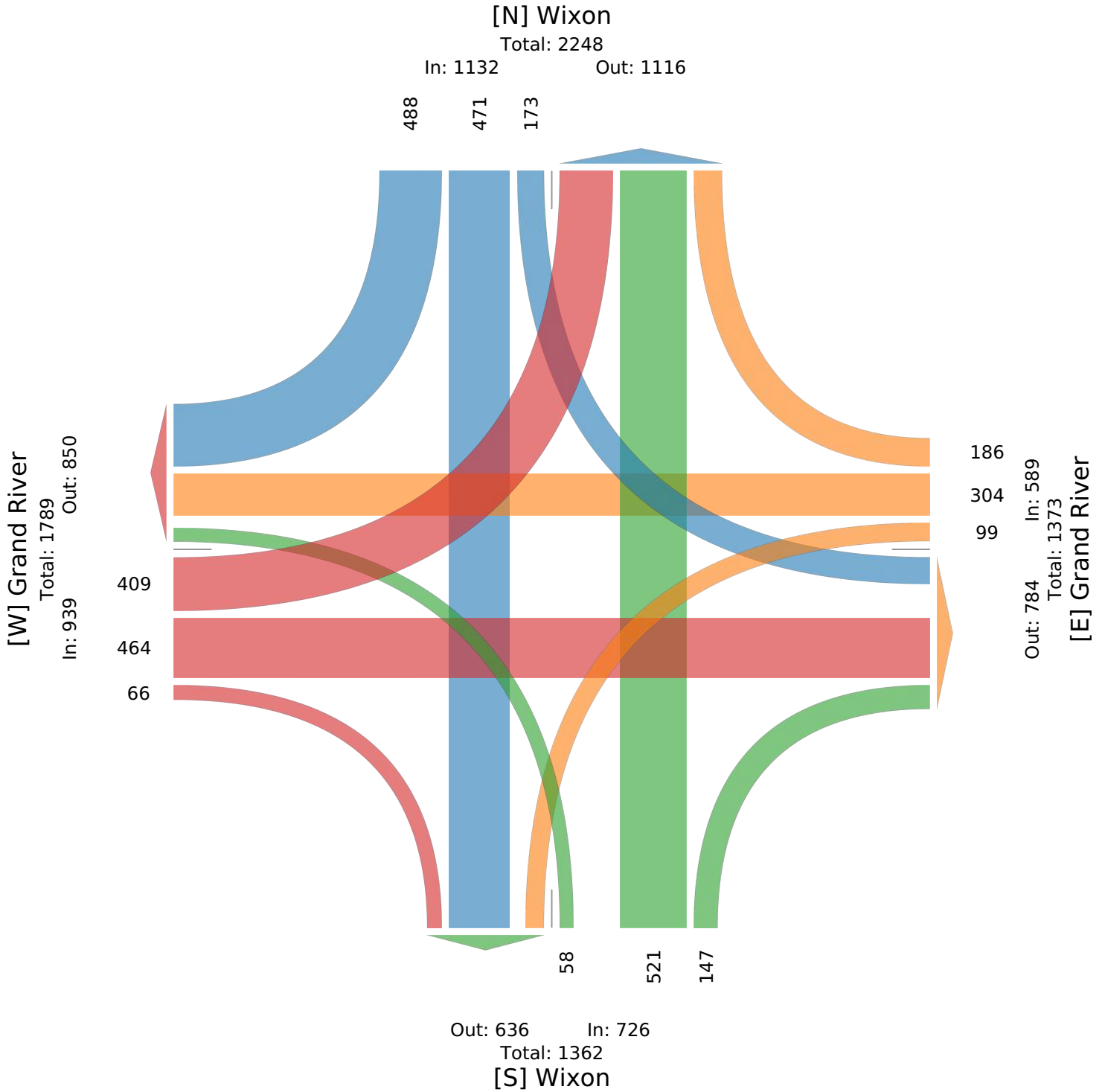
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



# Grand River Avenue & Wixom Road - 4 RTOR - TMC

Tue May 3, 2022

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Grand River Eastbound							Grand River Westbound						
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
Time														
2022-05-03 4:15PM	90	139	18	0	4	251	0	43	150	100	0	35	328	0
4:30PM	90	156	25	0	5	276	0	36	138	109	0	33	316	0
4:45PM	80	161	15	0	4	260	0	37	136	98	0	24	295	0
5:00PM	79	156	29	0	8	272	0	33	157	111	0	43	344	0
<b>Total</b>	339	612	87	0	21	1059	0	149	581	418	0	135	1283	0
<b>% Approach</b>	32.0%	57.8%	8.2%	0%	2.0%	-	-	11.6%	45.3%	32.6%	0%	10.5%	-	-
<b>% Total</b>	8.1%	14.5%	2.1%	0%	0.5%	25.1%	-	3.5%	13.8%	9.9%	0%	3.2%	30.5%	-
<b>PHF</b>	0.942	0.950	0.750	-	0.656	0.959	-	0.866	0.925	0.941	-	0.785	0.932	-
<b>Lights</b>	325	605	87	0	21	1038	-	148	574	411	0	134	1267	-
<b>% Lights</b>	95.9%	98.9%	100%	0%	100%	98.0%	-	99.3%	98.8%	98.3%	0%	99.3%	98.8%	-
<b>Articulated Trucks</b>	11	3	0	0	0	14	-	0	1	1	0	0	2	-
<b>% Articulated Trucks</b>	3.2%	0.5%	0%	0%	0%	1.3%	-	0%	0.2%	0.2%	0%	0%	0.2%	-
<b>Buses and Single-Unit Trucks</b>	3	4	0	0	0	7	-	1	6	6	0	1	14	-
<b>% Buses and Single-Unit Trucks</b>	0.9%	0.7%	0%	0%	0%	0.7%	-	0.7%	1.0%	1.4%	0%	0.7%	1.1%	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Grand River Avenue & Wixom Road - 4 RTOR - TMC**

Tue May 3, 2022

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Wixom Northbound								Wixom Southbound								Int
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*			
Time																	
2022-05-03 4:15PM	42	149	21	0	5	217	0	62	122	57	0	27	268	0	1064		
4:30PM	33	128	18	0	4	183	0	48	123	45	0	44	260	0	1035		
4:45PM	26	123	21	0	3	173	0	66	127	69	0	28	290	0	1018		
5:00PM	39	127	24	0	4	194	0	62	128	66	0	28	284	0	1094		
<b>Total</b>	140	527	84	0	16	767	0	238	500	237	0	127	1102	0	4211		
<b>% Approach</b>	18.3%	68.7%	11.0%	0%	2.1%	-	-	21.6%	45.4%	21.5%	0%	11.5%	-	-	-		
<b>% Total</b>	3.3%	12.5%	2.0%	0%	0.4%	18.2%	-	5.7%	11.9%	5.6%	0%	3.0%	26.2%	-	-		
<b>PHF</b>	0.833	0.884	0.875	-	0.800	0.884	-	0.902	0.977	0.859	-	0.722	0.950	-	0.962		
<b>Lights</b>	140	524	84	0	16	764	-	231	498	221	0	125	1075	-	4144		
<b>% Lights</b>	100%	99.4%	100%	0%	100%	99.6%	-	97.1%	99.6%	93.2%	0%	98.4%	97.5%	-	98.4%		
<b>Articulated Trucks</b>	0	1	0	0	0	1	-	1	0	9	0	0	10	-	27		
<b>% Articulated Trucks</b>	0%	0.2%	0%	0%	0%	0.1%	-	0.4%	0%	3.8%	0%	0%	0.9%	-	0.6%		
<b>Buses and Single-Unit Trucks</b>	0	2	0	0	0	2	-	6	2	7	0	2	17	-	40		
<b>% Buses and Single-Unit Trucks</b>	0%	0.4%	0%	0%	0%	0.3%	-	2.5%	0.4%	3.0%	0%	1.6%	1.5%	-	0.9%		
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn



**Grand River Avenue & Wixom Road - 4 RTOR - TMC**

Tue May 3, 2022

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

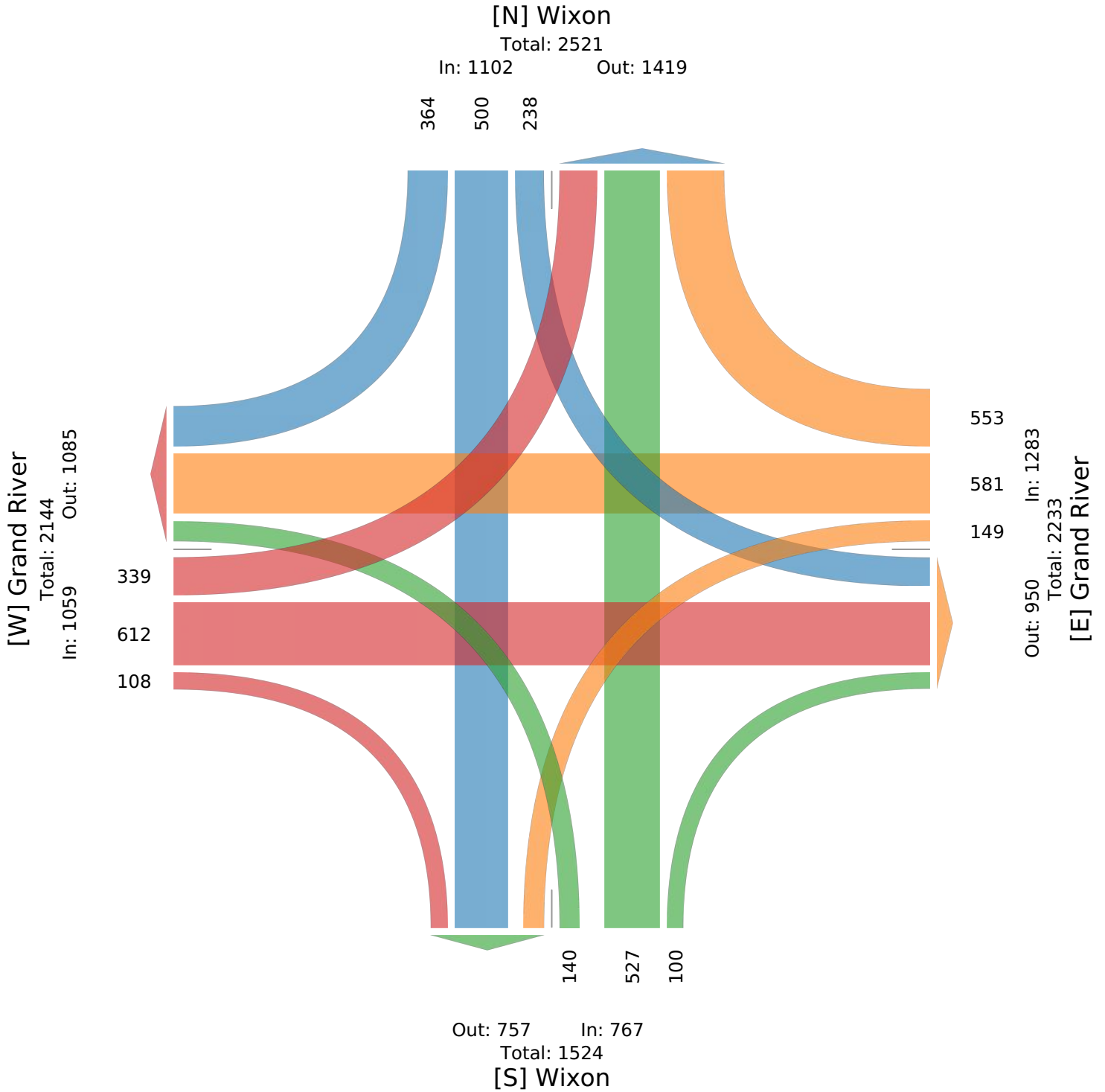
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944266, Location: 42.494222, -83.535852



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	School Eastbound							Target Westbound						
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
2022-05-05 7:00AM	8	1	0	0	5	14	0	4	0	0	1	0	5	0
7:15AM	22	2	1	0	13	38	0	1	0	2	0	0	3	0
7:30AM	68	3	3	0	17	91	0	0	0	0	0	2	2	0
7:45AM	60	10	16	0	13	99	0	2	0	0	0	2	4	0
Hourly Total	158	16	20	0	48	242	0	7	0	2	1	4	14	0
8:00AM	6	1	1	0	0	8	0	5	0	0	0	3	8	0
8:15AM	1	0	1	0	0	2	0	7	0	3	0	3	13	0
8:30AM	3	0	0	0	2	5	0	2	0	5	0	8	15	0
8:45AM	2	0	2	0	2	6	0	5	0	4	0	7	16	0
Hourly Total	12	1	4	0	4	21	0	19	0	12	0	21	52	0
4:00PM	13	3	4	0	2	22	0	16	0	6	0	18	40	0
4:15PM	7	2	0	0	0	9	1	17	1	3	0	4	25	0
4:30PM	6	2	0	0	2	10	0	16	0	6	0	13	35	0
4:45PM	9	1	0	0	2	12	2	16	3	4	0	15	38	0
Hourly Total	35	8	4	0	6	53	3	65	4	19	0	50	138	0
5:00PM	12	1	2	0	0	15	3	18	1	8	1	15	43	0
5:15PM	5	0	0	0	0	5	3	16	1	4	0	11	32	0
5:30PM	5	1	0	0	1	7	0	15	3	5	0	20	43	0
5:45PM	13	1	0	0	0	14	0	14	2	7	0	18	41	0
Hourly Total	35	3	2	0	1	41	6	63	7	24	1	64	159	0
<b>Total</b>	240	28	30	0	59	357	9	154	11	57	2	139	363	0
<b>% Approach</b>	67.2%	7.8%	8.4%	0%	16.5%	-	-	42.4%	3.0%	15.7%	0.6%	38.3%	-	-
<b>% Total</b>	4.3%	0.5%	0.5%	0%	1.0%	6.3%	-	2.7%	0.2%	1.0%	0%	2.5%	6.5%	-
<b>Lights</b>	230	27	30	0	59	346	-	153	10	54	2	136	355	-
<b>% Lights</b>	95.8%	96.4%	100%	0%	100%	96.9%	-	99.4%	90.9%	94.7%	100%	97.8%	97.8%	-
<b>Articulated Trucks</b>	1	0	0	0	0	1	-	0	0	1	0	0	1	-
<b>% Articulated Trucks</b>	0.4%	0%	0%	0%	0%	0.3%	-	0%	0%	1.8%	0%	0%	0.3%	-
<b>Buses and Single-Unit Trucks</b>	9	1	0	0	0	10	-	1	1	2	0	3	7	-
<b>% Buses and Single-Unit Trucks</b>	3.8%	3.6%	0%	0%	0%	2.8%	-	0.6%	9.1%	3.5%	0%	2.2%	1.9%	-
Pedestrians	-	-	-	-	-	-	7	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	77.8%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	2	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	22.2%	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Wixom Northbound								Wixom Southbound								Int
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*			
Time																	
2022-05-05 7:00AM	18	106	6	0	0	130	0	2	52	32	0	4	90	0	239		
7:15AM	25	127	5	0	2	159	0	4	61	58	0	24	147	0	347		
7:30AM	26	101	6	0	1	134	0	3	50	79	0	20	152	0	379		
7:45AM	34	150	13	0	1	198	0	9	61	56	0	32	158	0	459		
Hourly Total	103	484	30	0	4	621	0	18	224	225	0	80	547	0	1424		
8:00AM	1	158	8	0	0	167	0	6	87	4	0	1	98	0	281		
8:15AM	0	166	12	0	2	180	0	8	109	3	0	2	122	0	317		
8:30AM	0	144	8	0	2	154	0	4	94	3	0	0	101	0	275		
8:45AM	3	161	15	0	0	179	0	10	92	5	0	0	107	0	308		
Hourly Total	4	629	43	0	4	680	0	28	382	15	0	3	428	0	1181		
4:00PM	2	134	8	0	1	145	0	14	108	16	0	5	143	0	350		
4:15PM	2	131	6	0	0	139	0	12	138	10	0	3	163	0	336		
4:30PM	3	153	9	0	2	167	0	17	142	13	0	7	179	0	391		
4:45PM	3	133	12	0	1	149	0	20	123	15	0	4	162	0	361		
Hourly Total	10	551	35	0	4	600	0	63	511	54	0	19	647	0	1438		
5:00PM	4	155	12	0	0	171	0	17	121	18	0	0	156	0	385		
5:15PM	3	135	3	0	1	142	0	27	159	21	0	5	212	0	391		
5:30PM	4	152	10	0	4	170	0	17	134	22	0	5	178	0	398		
5:45PM	11	142	10	0	4	167	0	21	141	18	0	5	185	0	407		
Hourly Total	22	584	35	0	9	650	0	82	555	79	0	15	731	0	1581		
<b>Total</b>	139	2248	143	0	21	2551	0	191	1672	373	0	117	2353	0	5624		
<b>% Approach</b>	5.4%	88.1%	5.6%	0%	0.8%	-	-	8.1%	71.1%	15.9%	0%	5.0%	-	-	-		
<b>% Total</b>	2.5%	40.0%	2.5%	0%	0.4%	45.4%	-	3.4%	29.7%	6.6%	0%	2.1%	41.8%	-	-		
<b>Lights</b>	139	2234	141	0	21	2535	-	188	1643	361	0	114	2306	-	5542		
<b>% Lights</b>	100%	99.4%	98.6%	0%	100%	99.4%	-	98.4%	98.3%	96.8%	0%	97.4%	98.0%	-	98.5%		
<b>Articulated Trucks</b>	0	3	0	0	0	3	-	1	5	0	0	1	7	-	12		
<b>% Articulated Trucks</b>	0%	0.1%	0%	0%	0%	0.1%	-	0.5%	0.3%	0%	0%	0.9%	0.3%	-	0.2%		
<b>Buses and Single-Unit Trucks</b>	0	11	2	0	0	13	-	2	24	12	0	2	40	-	70		
<b>% Buses and Single-Unit Trucks</b>	0%	0.5%	1.4%	0%	0%	0.5%	-	1.0%	1.4%	3.2%	0%	1.7%	1.7%	-	1.2%		
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

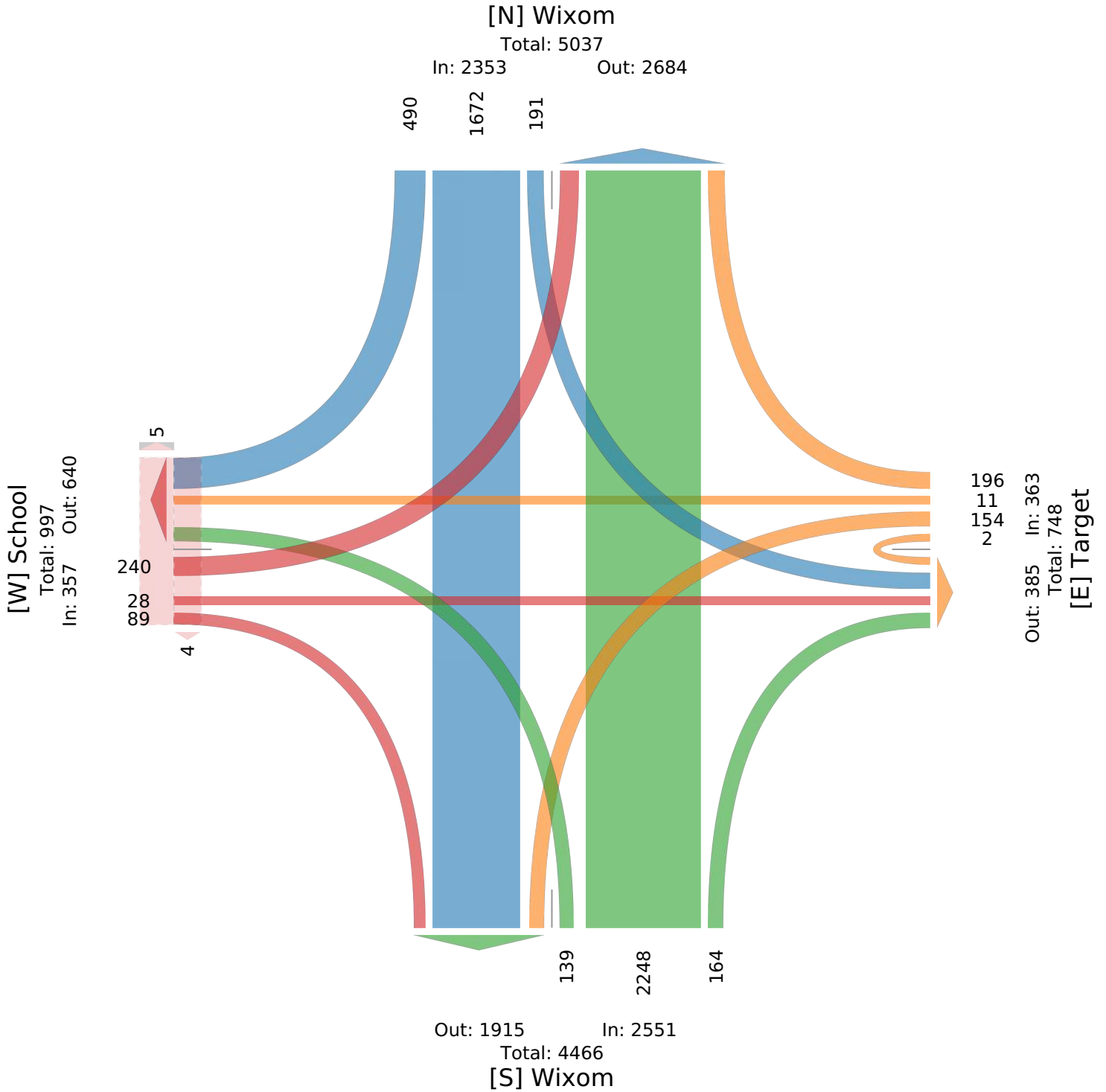
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	School Eastbound							Target Westbound						
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*
Time														
2022-05-05 7:15AM	22	2	1	0	13	<b>38</b>	0	1	0	2	0	0	<b>3</b>	0
7:30AM	68	3	3	0	17	<b>91</b>	0	0	0	0	0	2	<b>2</b>	0
7:45AM	60	10	16	0	13	<b>99</b>	0	2	0	0	0	2	<b>4</b>	0
8:00AM	6	1	1	0	0	<b>8</b>	0	5	0	0	0	3	<b>8</b>	0
<b>Total</b>	156	16	21	0	43	<b>236</b>	0	8	0	2	0	7	<b>17</b>	0
<b>% Approach</b>	66.1%	6.8%	8.9%	0%	18.2%	-	-	47.1%	0%	11.8%	0%	41.2%	-	-
<b>% Total</b>	10.6%	1.1%	1.4%	0%	2.9%	<b>16.1%</b>	-	0.5%	0%	0.1%	0%	0.5%	<b>1.2%</b>	-
<b>PHF</b>	0.574	0.400	0.328	-	0.632	<b>0.596</b>	-	0.400	-	0.250	-	0.583	<b>0.531</b>	-
<b>Lights</b>	148	15	21	0	43	<b>227</b>	-	8	0	1	0	6	<b>15</b>	-
<b>% Lights</b>	94.9%	93.8%	100%	0%	100%	<b>96.2%</b>	-	100%	0%	50.0%	0%	85.7%	<b>88.2%</b>	-
<b>Articulated Trucks</b>	0	0	0	0	0	<b>0</b>	-	0	0	0	0	0	<b>0</b>	-
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	0%	0%	<b>0%</b>	-
<b>Buses and Single-Unit Trucks</b>	8	1	0	0	0	<b>9</b>	-	0	0	1	0	1	<b>2</b>	-
<b>% Buses and Single-Unit Trucks</b>	5.1%	6.3%	0%	0%	0%	<b>3.8%</b>	-	0%	0%	50.0%	0%	14.3%	<b>11.8%</b>	-
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Wixom Northbound								Wixom Southbound								Int
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*			
Time																	
2022-05-05 7:15AM	25	127	5	0	2	159	0	4	61	58	0	24	147	0	347		
7:30AM	26	101	6	0	1	134	0	3	50	79	0	20	152	0	379		
7:45AM	34	150	13	0	1	198	0	9	61	56	0	32	158	0	459		
8:00AM	1	158	8	0	0	167	0	6	87	4	0	1	98	0	281		
<b>Total</b>	86	536	32	0	4	658	0	22	259	197	0	77	555	0	1466		
<b>% Approach</b>	13.1%	81.5%	4.9%	0%	0.6%	-	-	4.0%	46.7%	35.5%	0%	13.9%	-	-	-		
<b>% Total</b>	5.9%	36.6%	2.2%	0%	0.3%	44.9%	-	1.5%	17.7%	13.4%	0%	5.3%	37.9%	-	-		
<b>PHF</b>	0.632	0.848	0.615	-	0.500	0.831	-	0.611	0.744	0.623	-	0.602	0.878	-	0.798		
<b>Lights</b>	86	535	30	0	4	655	-	21	251	192	0	74	538	-	1435		
<b>% Lights</b>	100%	99.8%	93.8%	0%	100%	99.5%	-	95.5%	96.9%	97.5%	0%	96.1%	96.9%	-	97.9%		
<b>Articulated Trucks</b>	0	0	0	0	0	0	-	1	1	0	0	1	3	-	3		
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	-	4.5%	0.4%	0%	0%	1.3%	0.5%	-	0.2%		
<b>Buses and Single-Unit Trucks</b>	0	1	2	0	0	3	-	0	7	5	0	2	14	-	28		
<b>% Buses and Single-Unit Trucks</b>	0%	0.2%	6.3%	0%	0%	0.5%	-	0%	2.7%	2.5%	0%	2.6%	2.5%	-	1.9%		
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

AM Peak (7:15 AM - 8:15 AM)

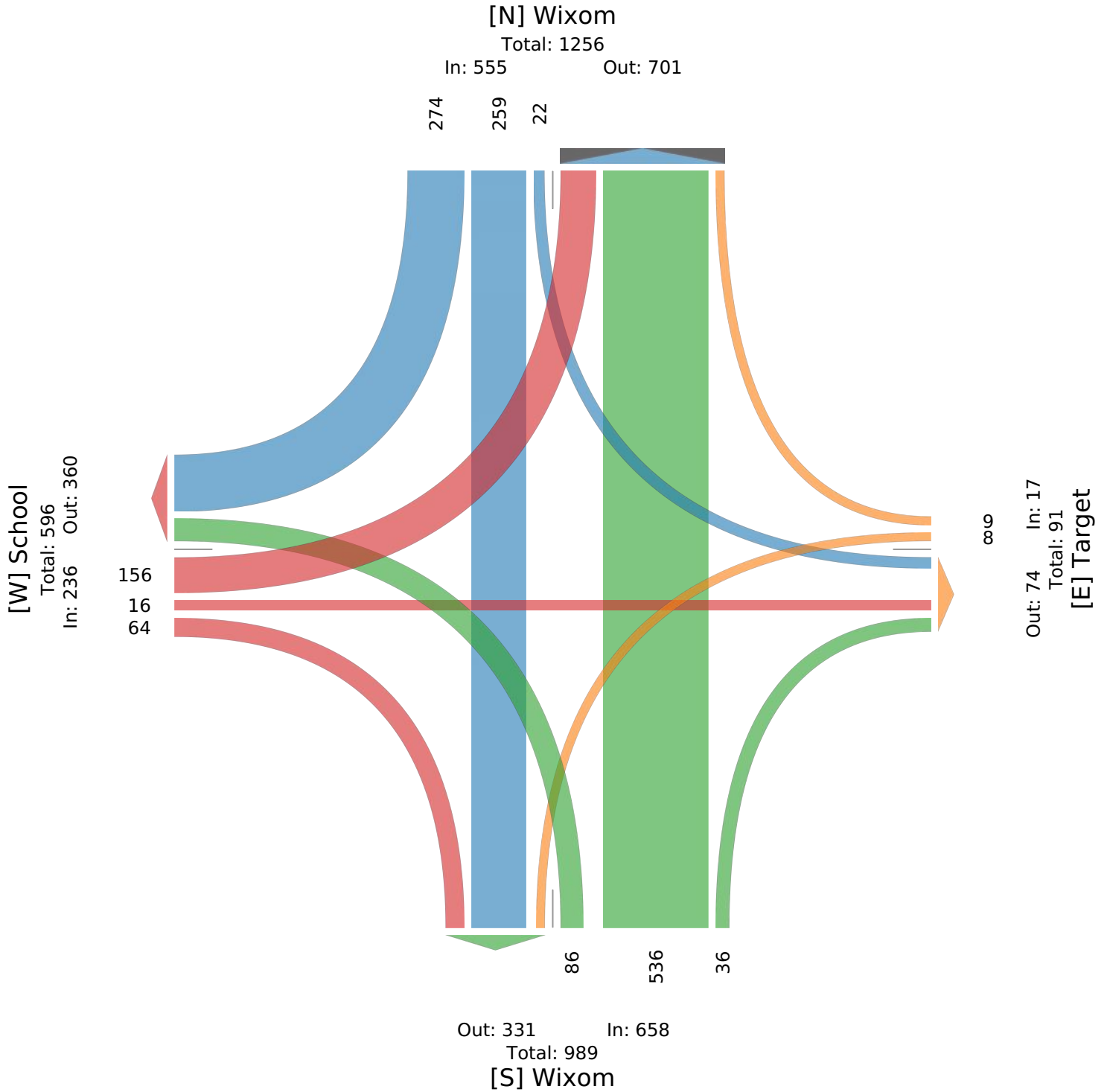
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	School Eastbound								Target Westbound							
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*		
Time																
2022-05-05 5:00PM	12	1	2	0	0	15	3	18	1	8	1	15	43	0		
5:15PM	5	0	0	0	0	5	3	16	1	4	0	11	32	0		
5:30PM	5	1	0	0	1	7	0	15	3	5	0	20	43	0		
5:45PM	13	1	0	0	0	14	0	14	2	7	0	18	41	0		
<b>Total</b>	35	3	2	0	1	41	6	63	7	24	1	64	159	0		
<b>% Approach</b>	85.4%	7.3%	4.9%	0%	2.4%	-	-	39.6%	4.4%	15.1%	0.6%	40.3%	-	-		
<b>% Total</b>	2.2%	0.2%	0.1%	0%	0.1%	2.6%	-	4.0%	0.4%	1.5%	0.1%	4.0%	10.1%	-		
<b>PHF</b>	0.673	0.750	0.250	-	0.250	0.683	-	0.875	0.583	0.750	0.250	0.800	0.924	-		
<b>Lights</b>	35	3	2	0	1	41	-	63	6	24	1	64	158	-		
<b>% Lights</b>	100%	100%	100%	0%	100%	100%	-	100%	85.7%	100%	100%	100%	99.4%	-		
<b>Articulated Trucks</b>	0	0	0	0	0	0	-	0	0	0	0	0	0	-		
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-		
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	-	0	1	0	0	0	1	-		
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	-	0%	14.3%	0%	0%	0%	0.6%	-		
Pedestrians	-	-	-	-	-	-	4	-	-	-	-	-	-	0		
% Pedestrians	-	-	-	-	-	-	66.7%	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	2	-	-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	-	33.3%	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn



**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Wixom Northbound								Wixom Southbound								Int
	L	T	R	U	RR	App	Ped*	L	T	R	U	RR	App	Ped*			
2022-05-05 5:00PM	4	155	12	0	0	171	0	17	121	18	0	0	156	0	385		
5:15PM	3	135	3	0	1	142	0	27	159	21	0	5	212	0	391		
5:30PM	4	152	10	0	4	170	0	17	134	22	0	5	178	0	398		
5:45PM	11	142	10	0	4	167	0	21	141	18	0	5	185	0	407		
<b>Total</b>	22	584	35	0	9	650	0	82	555	79	0	15	731	0	1581		
<b>% Approach</b>	3.4%	89.8%	5.4%	0%	1.4%	-	-	11.2%	75.9%	10.8%	0%	2.1%	-	-	-		
<b>% Total</b>	1.4%	36.9%	2.2%	0%	0.6%	41.1%	-	5.2%	35.1%	5.0%	0%	0.9%	46.2%	-	-		
<b>PHF</b>	0.500	0.942	0.729	-	0.563	0.950	-	0.759	0.873	0.898	-	0.750	0.862	-	0.971		
<b>Lights</b>	22	578	35	0	9	644	-	82	551	74	0	15	722	-	1565		
<b>% Lights</b>	100%	99.0%	100%	0%	100%	99.1%	-	100%	99.3%	93.7%	0%	100%	98.8%	-	99.0%		
<b>Articulated Trucks</b>	0	3	0	0	0	3	-	0	1	0	0	0	1	-	4		
<b>% Articulated Trucks</b>	0%	0.5%	0%	0%	0%	0.5%	-	0%	0.2%	0%	0%	0%	0.1%	-	0.3%		
<b>Buses and Single-Unit Trucks</b>	0	3	0	0	0	3	-	0	3	5	0	0	8	-	12		
<b>% Buses and Single-Unit Trucks</b>	0%	0.5%	0%	0%	0%	0.5%	-	0%	0.5%	6.3%	0%	0%	1.1%	-	0.8%		
Pedestrians	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-		
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

**Wixom Road & Catholic Central High School Dr... - TMC**

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

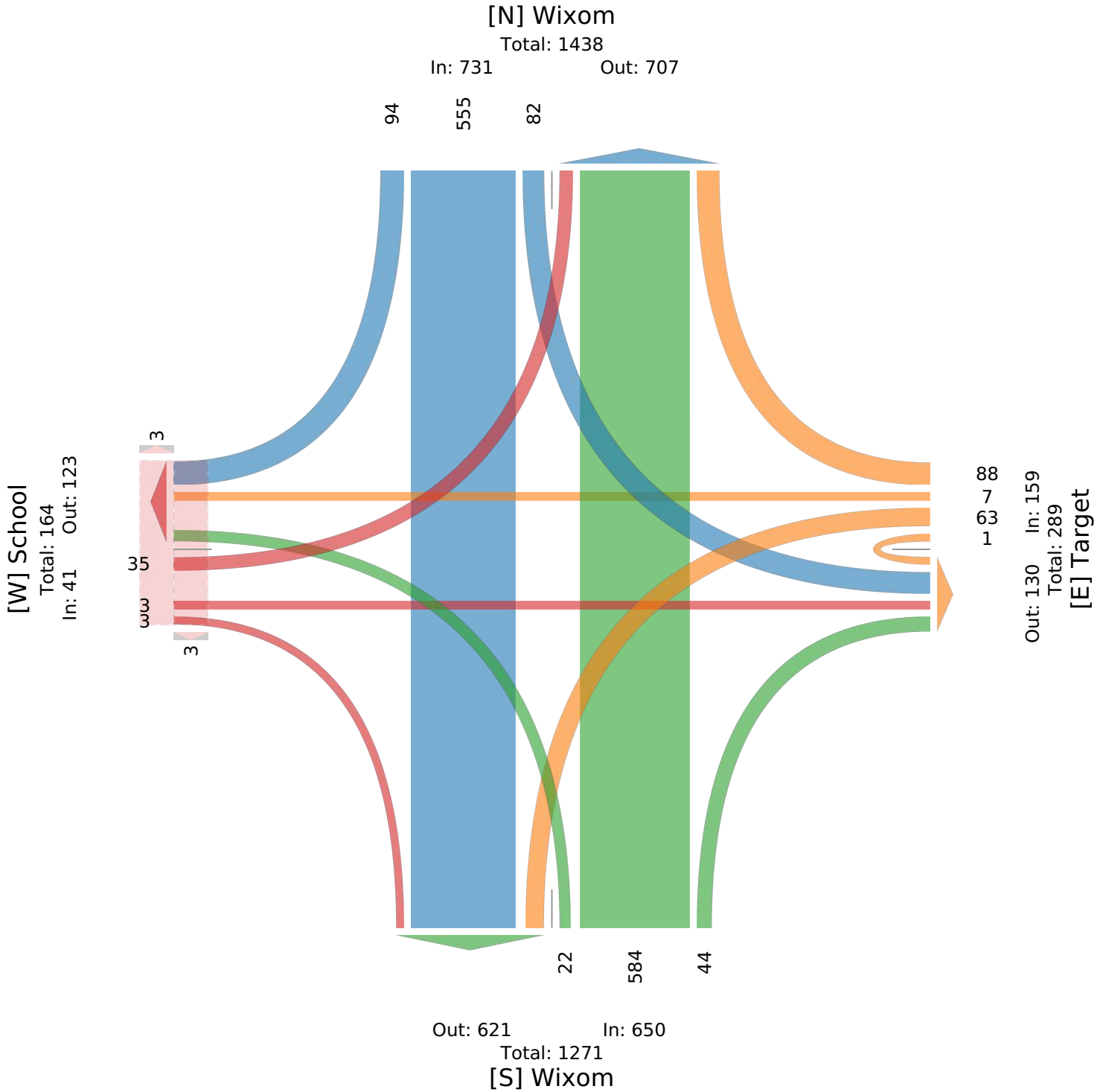
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944263, Location: 42.489605, -83.535472



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Target North Drive on north fac... - TMC**

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944265, Location: 42.488189, -83.535279



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Westbound					Wixom Northbound					Wixom Southbound					Int
	L	R	U	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	
Time																
2022-05-05 7:00AM	2	0	0	2	0	132	1	0	133	0	1	59	0	60	0	195
7:15AM	3	1	0	4	0	156	1	0	157	0	1	75	0	76	0	237
7:30AM	2	1	0	3	0	147	3	0	150	0	0	69	0	69	0	222
7:45AM	1	0	0	1	0	188	1	0	189	0	1	94	0	95	0	285
Hourly Total	8	2	0	10	0	623	6	0	629	0	3	297	0	300	0	939
8:00AM	2	1	0	3	0	166	7	0	173	0	0	92	0	92	0	268
8:15AM	3	1	0	4	0	188	10	0	198	0	2	112	0	114	0	316
8:30AM	4	4	0	8	0	142	9	0	151	0	0	100	0	100	0	259
8:45AM	9	3	0	12	0	178	13	0	191	0	4	97	0	101	0	304
Hourly Total	18	9	0	27	0	674	39	0	713	0	6	401	0	407	0	1147
4:00PM	13	5	1	19	0	141	21	1	163	0	5	127	0	132	0	314
4:15PM	13	6	0	19	0	131	13	0	144	0	7	148	0	155	0	318
4:30PM	15	3	0	18	0	169	7	0	176	0	3	155	0	158	0	352
4:45PM	15	8	1	24	0	145	11	0	156	0	5	133	0	138	0	318
Hourly Total	56	22	2	80	0	586	52	1	639	0	20	563	0	583	0	1302
5:00PM	13	2	0	15	0	160	17	0	177	0	7	137	0	144	0	336
5:15PM	19	6	1	26	0	136	19	0	155	0	2	172	0	174	0	355
5:30PM	14	3	1	18	0	168	14	0	182	0	4	142	0	146	0	346
5:45PM	17	7	0	24	0	162	15	0	177	0	6	150	0	156	0	357
Hourly Total	63	18	2	83	0	626	65	0	691	0	19	601	0	620	0	1394
<b>Total</b>	145	51	4	200	0	2509	162	1	2672	0	48	1862	0	1910	0	4782
<b>% Approach</b>	72.5%	25.5%	2.0%	-	-	93.9%	6.1%	0%	-	-	2.5%	97.5%	0%	-	-	-
<b>% Total</b>	3.0%	1.1%	0.1%	4.2%	-	52.5%	3.4%	0%	55.9%	-	1.0%	38.9%	0%	39.9%	-	-
<b>Lights</b>	145	50	4	199	-	2495	162	1	2658	-	48	1830	0	1878	-	4735
<b>% Lights</b>	100%	98.0%	100%	99.5%	-	99.4%	100%	100%	99.5%	-	100%	98.3%	0%	98.3%	-	99.0%
<b>Articulated Trucks</b>	0	0	0	0	-	3	0	0	3	-	0	5	0	5	-	8
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0.1%	0%	0%	0.1%	-	0%	0.3%	0%	0.3%	-	0.2%
<b>Buses and Single-Unit Trucks</b>	0	1	0	1	-	11	0	0	11	-	0	27	0	27	-	39
<b>% Buses and Single-Unit Trucks</b>	0%	2.0%	0%	0.5%	-	0.4%	0%	0%	0.4%	-	0%	1.5%	0%	1.4%	-	0.8%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Wixom Road & Target North Drive on north fac... - TMC**

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

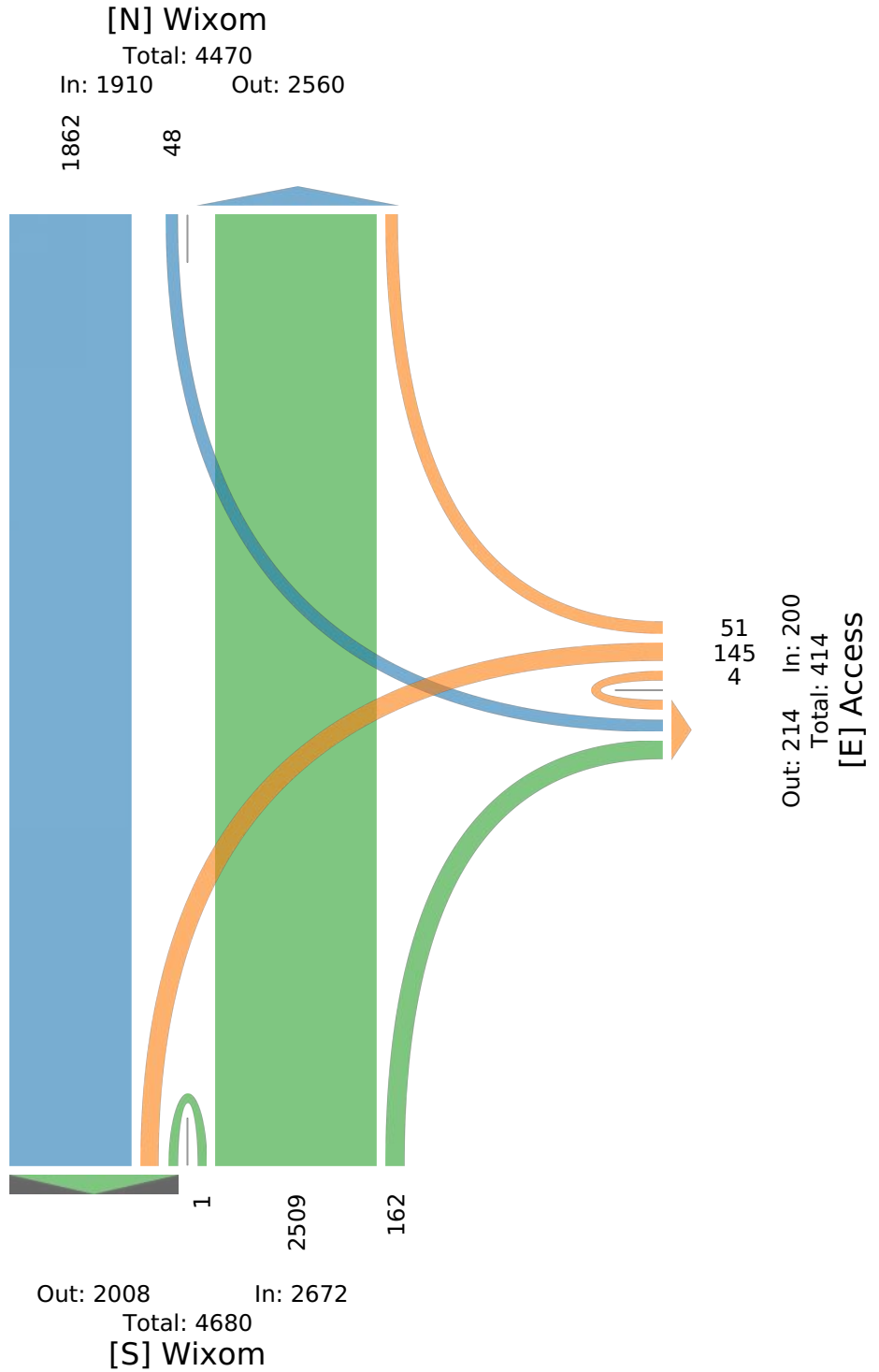
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944265, Location: 42.488189, -83.535279



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Target North Drive on north fac... - TMC**

Thu May 5, 2022

AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944265, Location: 42.488189, -83.535279



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Westbound					Wixom Northbound					Wixom Southbound					Int
	L	R	U	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	
Time																
2022-05-05 8:00AM	2	1	0	3	0	166	7	0	173	0	0	92	0	92	0	268
8:15AM	3	1	0	4	0	188	10	0	198	0	2	112	0	114	0	316
8:30AM	4	4	0	8	0	142	9	0	151	0	0	100	0	100	0	259
8:45AM	9	3	0	12	0	178	13	0	191	0	4	97	0	101	0	304
<b>Total</b>	18	9	0	27	0	674	39	0	713	0	6	401	0	407	0	1147
<b>% Approach</b>	66.7%	33.3%	0%	-	-	94.5%	5.5%	0%	-	-	1.5%	98.5%	0%	-	-	-
<b>% Total</b>	1.6%	0.8%	0%	2.4%	-	58.8%	3.4%	0%	62.2%	-	0.5%	35.0%	0%	35.5%	-	-
<b>PHF</b>	0.500	0.563	-	0.563	-	0.896	0.750	-	0.900	-	0.375	0.895	-	0.893	-	0.907
<b>Lights</b>	18	8	0	26	-	671	39	0	710	-	6	383	0	389	-	1125
<b>% Lights</b>	100%	88.9%	0%	96.3%	-	99.6%	100%	0%	99.6%	-	100%	95.5%	0%	95.6%	-	98.1%
<b>Articulated Trucks</b>	0	0	0	0	-	0	0	0	0	-	0	1	0	1	-	1
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.2%	0%	0.2%	-	0.1%
<b>Buses and Single-Unit Trucks</b>	0	1	0	1	-	3	0	0	3	-	0	17	0	17	-	21
<b>% Buses and Single-Unit Trucks</b>	0%	11.1%	0%	3.7%	-	0.4%	0%	0%	0.4%	-	0%	4.2%	0%	4.2%	-	1.8%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Wixom Road & Target North Drive on north fac... - TMC

Thu May 5, 2022

AM Peak (8 AM - 9 AM)

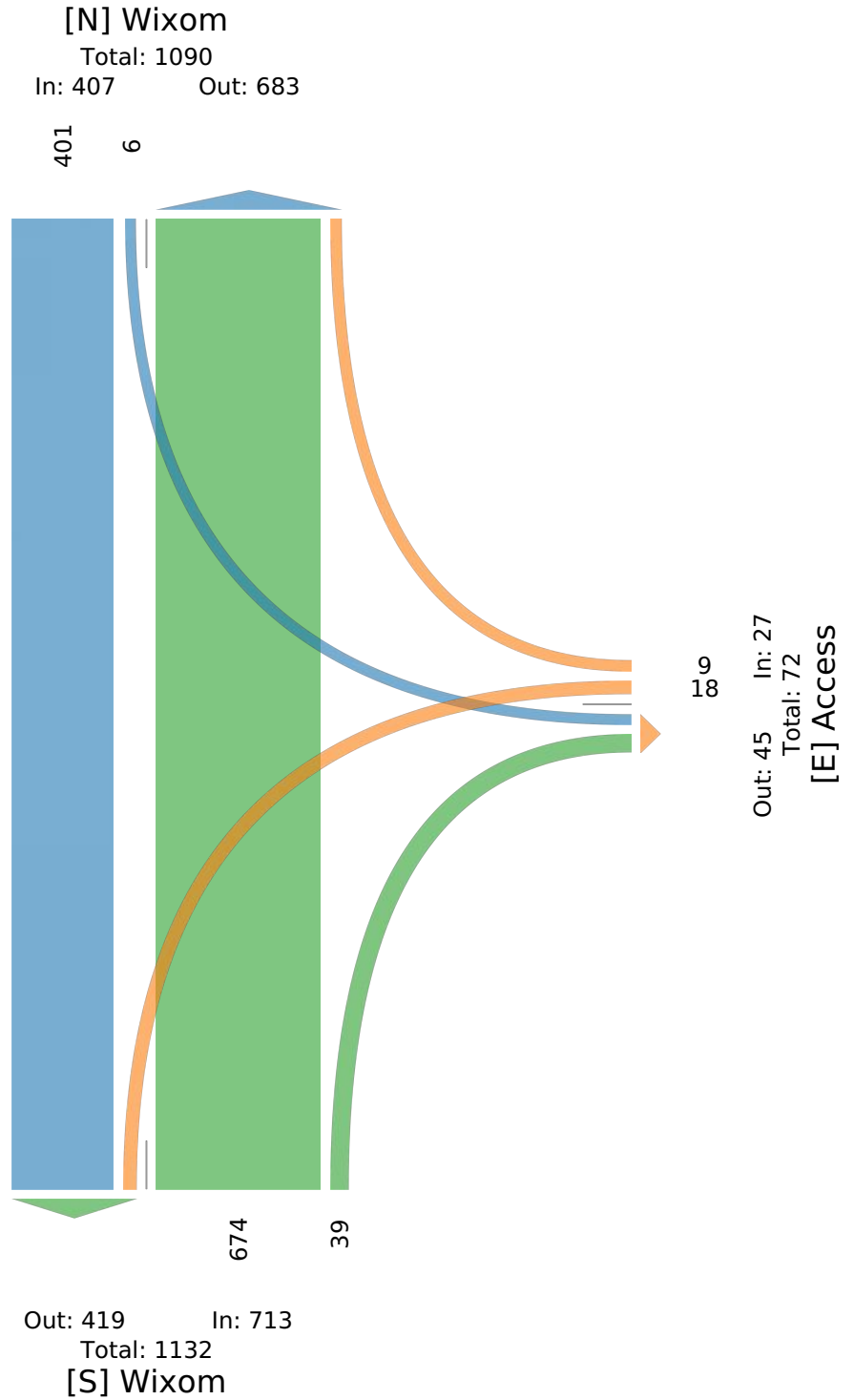
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944265, Location: 42.488189, -83.535279



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Target North Drive on north fac... - TMC**

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944265, Location: 42.488189, -83.535279



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Westbound					Wixom Northbound					Wixom Southbound					Int
	L	R	U	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	
Time																
2022-05-05 5:00PM	13	2	0	15	0	160	17	0	177	0	7	137	0	144	0	336
5:15PM	19	6	1	26	0	136	19	0	155	0	2	172	0	174	0	355
5:30PM	14	3	1	18	0	168	14	0	182	0	4	142	0	146	0	346
5:45PM	17	7	0	24	0	162	15	0	177	0	6	150	0	156	0	357
<b>Total</b>	63	18	2	83	0	626	65	0	691	0	19	601	0	620	0	1394
<b>% Approach</b>	75.9%	21.7%	2.4%	-	-	90.6%	9.4%	0%	-	-	3.1%	96.9%	0%	-	-	-
<b>% Total</b>	4.5%	1.3%	0.1%	6.0%	-	44.9%	4.7%	0%	49.6%	-	1.4%	43.1%	0%	44.5%	-	-
<b>PHF</b>	0.829	0.643	0.500	0.798	-	0.932	0.855	-	0.949	-	0.679	0.874	-	0.891	-	0.976
<b>Lights</b>	63	18	2	83	-	621	65	0	686	-	19	599	0	618	-	1387
<b>% Lights</b>	100%	100%	100%	100%	-	99.2%	100%	0%	99.3%	-	100%	99.7%	0%	99.7%	-	99.5%
<b>Articulated Trucks</b>	0	0	0	0	-	3	0	0	3	-	0	2	0	2	-	5
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0.5%	0%	0%	0.4%	-	0%	0.3%	0%	0.3%	-	0.4%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	-	2	0	0	2	-	0	0	0	0	-	2
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	-	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	-	0.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Wixom Road & Target North Drive on north fac... - TMC**

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

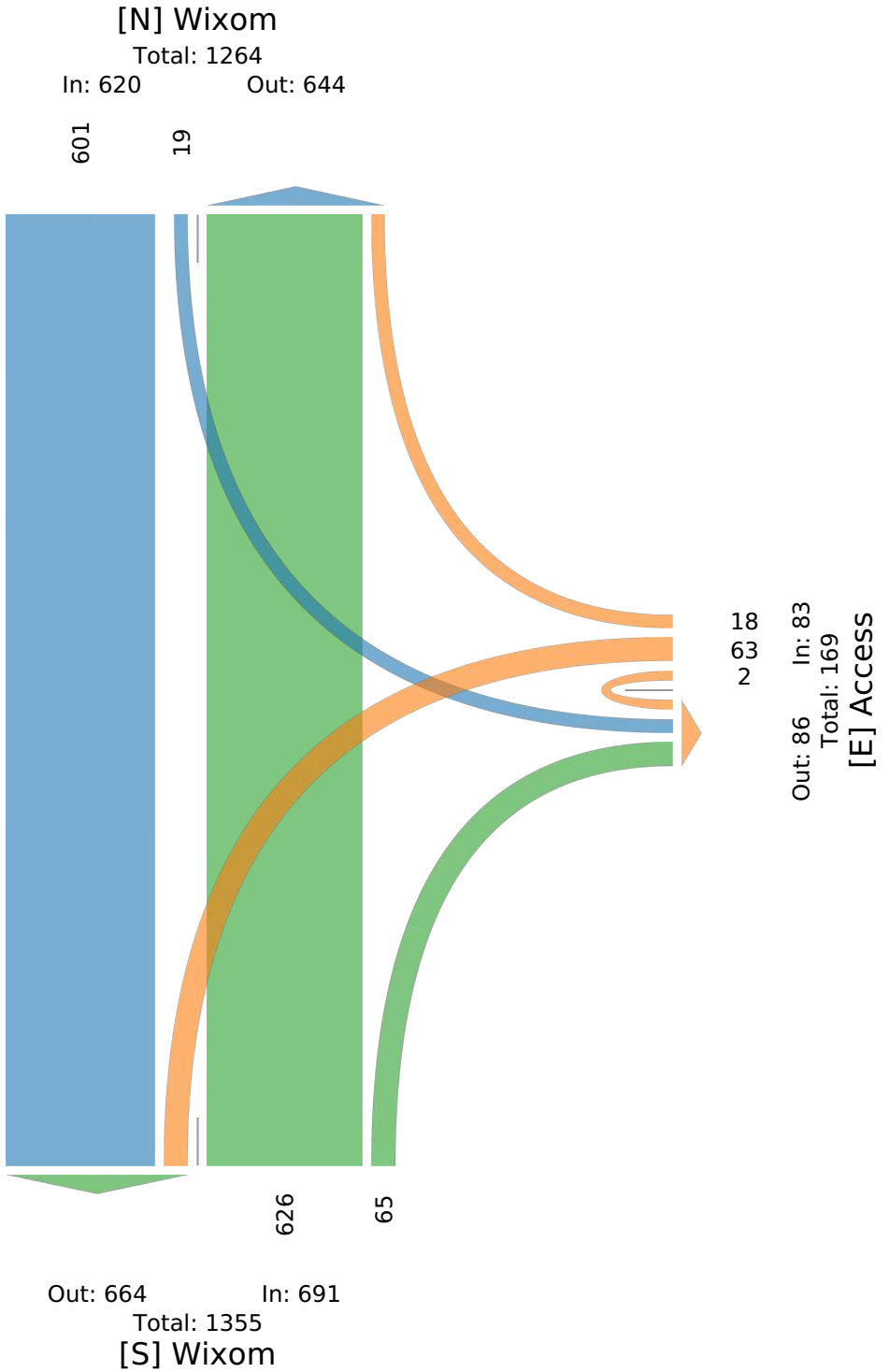
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944265, Location: 42.488189, -83.535279



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US





**Wixom Road & Target South Drive on south fac... - TMC**

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944267, Location: 42.487042, -83.535236



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Westbound					Wixom Northbound					Wixom Southbound					Int
	L	R	U	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	
Time																
2022-05-05 7:00AM	1	0	0	1	0	140	0	0	140	0	0	62	0	62	0	203
7:15AM	0	0	0	0	0	180	0	0	180	0	0	80	0	80	0	260
7:30AM	1	0	0	1	0	191	0	0	191	0	0	75	0	75	0	267
7:45AM	1	0	0	1	0	206	1	0	207	0	0	103	0	103	0	311
Hourly Total	3	0	0	3	0	717	1	0	718	0	0	320	0	320	0	1041
8:00AM	0	0	0	0	0	174	2	0	176	0	0	95	0	95	0	271
8:15AM	2	0	0	2	0	195	0	0	195	0	2	115	0	117	0	314
8:30AM	1	0	0	1	0	152	1	0	153	0	0	106	0	106	0	260
8:45AM	4	1	0	5	0	187	2	0	189	0	1	102	0	103	0	297
Hourly Total	7	1	0	8	0	708	5	0	713	0	3	418	0	421	0	1142
4:00PM	7	1	1	9	0	169	3	0	172	0	1	140	0	141	0	322
4:15PM	5	2	0	7	0	147	3	0	150	0	1	160	0	161	0	318
4:30PM	4	0	0	4	0	175	2	0	177	0	0	164	0	164	0	345
4:45PM	1	0	0	1	0	160	1	0	161	0	0	159	0	159	0	321
Hourly Total	17	3	1	21	0	651	9	0	660	0	2	623	0	625	0	1306
5:00PM	4	1	0	5	0	177	0	0	177	0	0	156	0	156	0	338
5:15PM	2	1	0	3	0	165	2	0	167	0	1	187	0	188	0	358
5:30PM	2	0	0	2	0	186	0	0	186	0	0	170	0	170	0	358
5:45PM	3	3	0	6	0	178	2	0	180	0	0	169	0	169	0	355
Hourly Total	11	5	0	16	0	706	4	0	710	0	1	682	0	683	0	1409
<b>Total</b>	38	9	1	48	0	2782	19	0	2801	0	6	2043	0	2049	0	4898
<b>% Approach</b>	79.2%	18.8%	2.1%	-	-	99.3%	0.7%	0%	-	-	0.3%	99.7%	0%	-	-	-
<b>% Total</b>	0.8%	0.2%	0%	1.0%	-	56.8%	0.4%	0%	57.2%	-	0.1%	41.7%	0%	41.8%	-	-
<b>Lights</b>	38	6	1	45	-	2767	19	0	2786	-	3	2017	0	2020	-	4851
<b>% Lights</b>	100%	66.7%	100%	93.8%	-	99.5%	100%	0%	99.5%	-	50.0%	98.7%	0%	98.6%	-	99.0%
<b>Articulated Trucks</b>	0	1	0	1	-	2	0	0	2	-	2	5	0	7	-	10
<b>% Articulated Trucks</b>	0%	11.1%	0%	2.1%	-	0.1%	0%	0%	0.1%	-	33.3%	0.2%	0%	0.3%	-	0.2%
<b>Buses and Single-Unit Trucks</b>	0	2	0	2	-	13	0	0	13	-	1	21	0	22	-	37
<b>% Buses and Single-Unit Trucks</b>	0%	22.2%	0%	4.2%	-	0.5%	0%	0%	0.5%	-	16.7%	1.0%	0%	1.1%	-	0.8%
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Wixom Road & Target South Drive on south fac... - TMC

Thu May 5, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

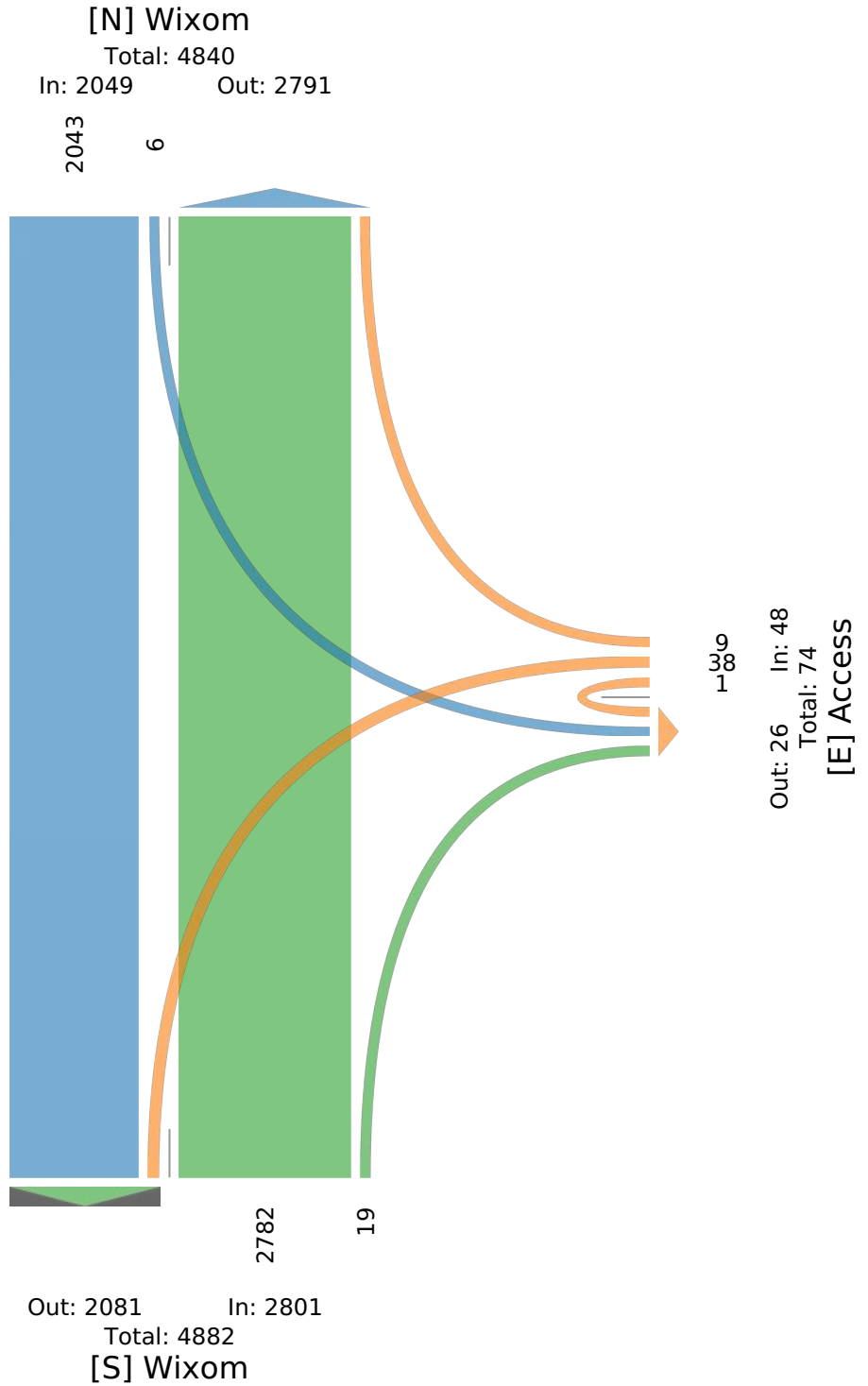
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944267, Location: 42.487042, -83.535236



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Target South Drive on south fac... - TMC**

Thu May 5, 2022

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944267, Location: 42.487042, -83.535236



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Westbound					Wixom Northbound					Wixom Southbound					Int
	L	R	U	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	
2022-05-05 7:30AM	1	0	0	1	0	191	0	0	191	0	0	75	0	75	0	267
7:45AM	1	0	0	1	0	206	1	0	207	0	0	103	0	103	0	311
8:00AM	0	0	0	0	0	174	2	0	176	0	0	95	0	95	0	271
8:15AM	2	0	0	2	0	195	0	0	195	0	2	115	0	117	0	314
<b>Total</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>766</b>	<b>3</b>	<b>0</b>	<b>769</b>	<b>0</b>	<b>2</b>	<b>388</b>	<b>0</b>	<b>390</b>	<b>0</b>	<b>1163</b>
<b>% Approach</b>	100%	0%	0%	-	-	99.6%	0.4%	0%	-	-	0.5%	99.5%	0%	-	-	-
<b>% Total</b>	0.3%	0%	0%	<b>0.3%</b>	-	65.9%	0.3%	0%	<b>66.1%</b>	-	0.2%	33.4%	0%	<b>33.5%</b>	-	-
<b>PHF</b>	0.500	-	-	<b>0.500</b>	-	0.930	0.375	-	<b>0.929</b>	-	0.250	0.843	-	<b>0.833</b>	-	0.926
<b>Lights</b>	4	0	0	4	-	763	3	0	766	-	2	377	0	379	-	1149
<b>% Lights</b>	100%	0%	0%	<b>100%</b>	-	99.6%	100%	0%	<b>99.6%</b>	-	100%	97.2%	0%	<b>97.2%</b>	-	98.8%
<b>Articulated Trucks</b>	0	0	0	0	-	0	0	0	0	-	0	1	0	1	-	1
<b>% Articulated Trucks</b>	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	<b>0%</b>	-	0%	0.3%	0%	<b>0.3%</b>	-	0.1%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	-	3	0	0	3	-	0	10	0	10	-	13
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	<b>0%</b>	-	0.4%	0%	0%	<b>0.4%</b>	-	0%	2.6%	0%	<b>2.6%</b>	-	1.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Wixom Road & Target South Drive on south fac... - TMC

Thu May 5, 2022

AM Peak (7:30 AM - 8:30 AM)

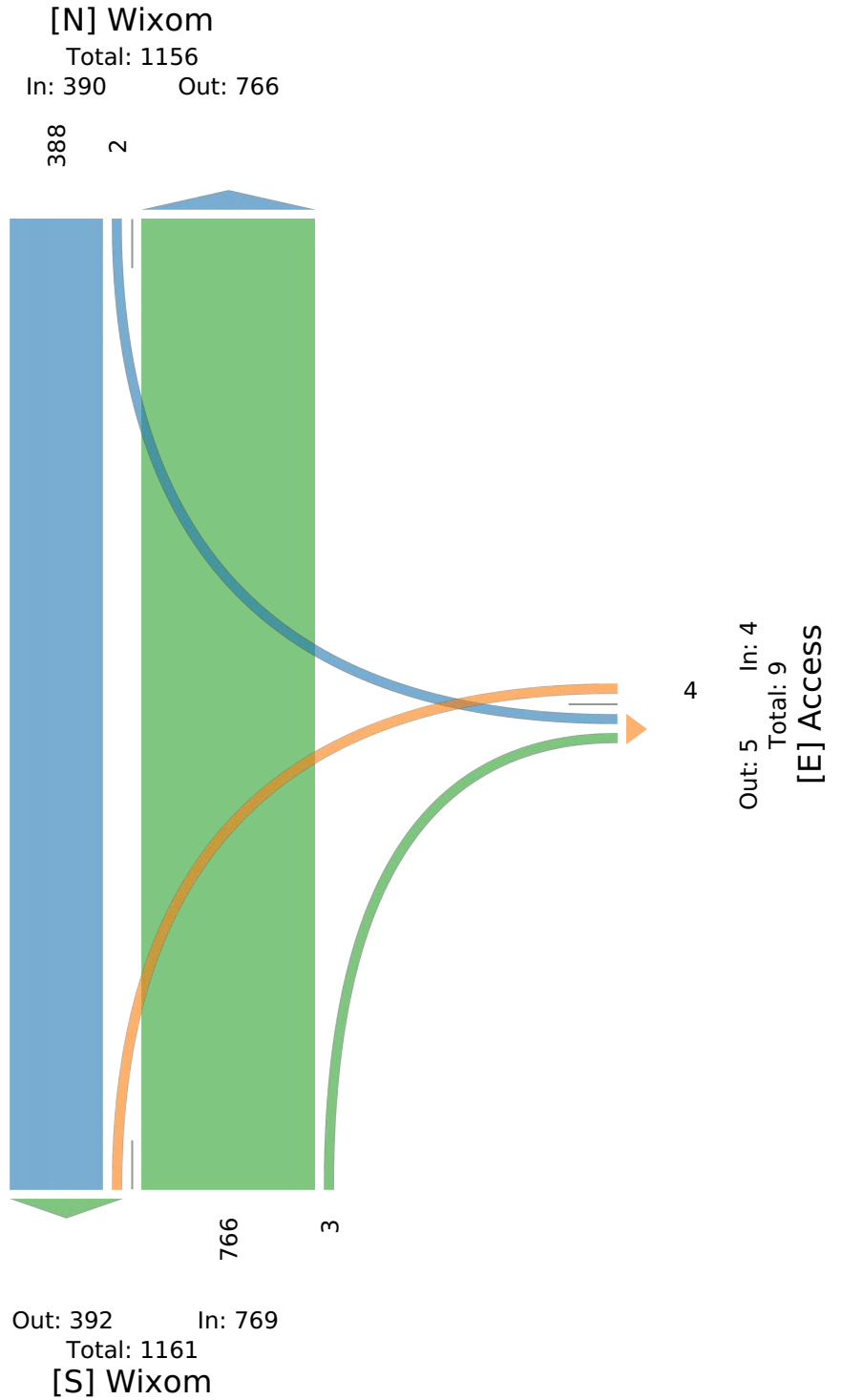
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944267, Location: 42.487042, -83.535236



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Wixom Road & Target South Drive on south fac... - TMC**

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944267, Location: 42.487042, -83.535236



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Westbound					Wixom Northbound					Wixom Southbound					Int
	L	R	U	App	Ped*	T	R	U	App	Ped*	L	T	U	App	Ped*	
2022-05-05 5:00PM	4	1	0	5	0	177	0	0	177	0	0	156	0	156	0	338
5:15PM	2	1	0	3	0	165	2	0	167	0	1	187	0	188	0	358
5:30PM	2	0	0	2	0	186	0	0	186	0	0	170	0	170	0	358
5:45PM	3	3	0	6	0	178	2	0	180	0	0	169	0	169	0	355
<b>Total</b>	11	5	0	16	0	706	4	0	710	0	1	682	0	683	0	1409
<b>% Approach</b>	68.8%	31.3%	0%	-	-	99.4%	0.6%	0%	-	-	0.1%	99.9%	0%	-	-	-
<b>% Total</b>	0.8%	0.4%	0%	1.1%	-	50.1%	0.3%	0%	50.4%	-	0.1%	48.4%	0%	48.5%	-	-
<b>PHF</b>	0.688	0.417	-	0.667	-	0.949	0.500	-	0.954	-	0.250	0.912	-	0.908	-	0.984
<b>Lights</b>	11	4	0	15	-	701	4	0	705	-	0	679	0	679	-	1399
<b>% Lights</b>	100%	80.0%	0%	93.8%	-	99.3%	100%	0%	99.3%	-	0%	99.6%	0%	99.4%	-	99.3%
<b>Articulated Trucks</b>	0	1	0	1	-	2	0	0	2	-	1	1	0	2	-	5
<b>% Articulated Trucks</b>	0%	20.0%	0%	6.3%	-	0.3%	0%	0%	0.3%	-	100%	0.1%	0%	0.3%	-	0.4%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	-	3	0	0	3	-	0	2	0	2	-	5
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	-	0.4%	0%	0%	0.4%	-	0%	0.3%	0%	0.3%	-	0.4%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Wixom Road & Target South Drive on south fac... - TMC

Thu May 5, 2022

PM Peak (5 PM - 6 PM) - Overall Peak Hour

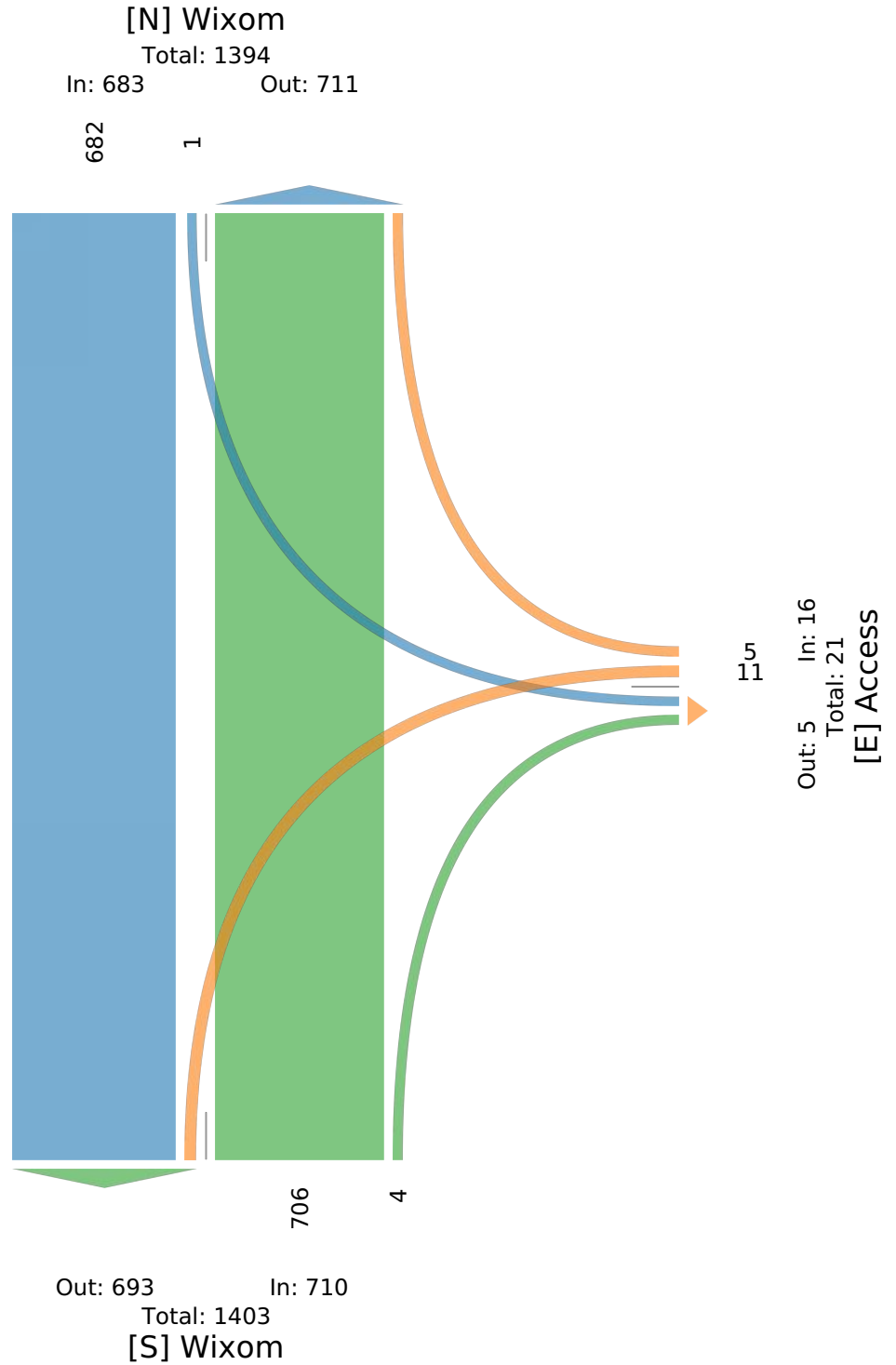
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 944267, Location: 42.487042, -83.535236



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



# Appendix 2

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Existing LOS Output Reports

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2022 Existing Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	409	464	66	99	304	186	58	521	147	173	471	488
Future Volume (veh/h)	409	464	66	99	304	186	58	521	147	173	471	488
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1906	1906	1906	1953	1953	1953	1969	1969	1969	1922	1922	1922
Adj Flow Rate, veh/h	470	533	63	112	345	146	67	606	150	199	541	202
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.87	0.87	0.87
Percent Heavy Veh, %	6	6	6	3	3	3	2	2	2	5	5	5
Cap, veh/h	466	1271	150	379	1346	755	259	725	179	260	1089	616
Arrive On Green	0.08	0.39	0.39	0.05	0.36	0.36	0.01	0.08	0.08	0.09	0.30	0.30
Sat Flow, veh/h	1816	3264	385	1860	3711	1655	1875	2973	734	1830	3652	1629
Grp Volume(v), veh/h	470	295	301	112	345	146	67	381	375	199	541	202
Grp Sat Flow(s),veh/h/ln	1816	1811	1837	1860	1856	1655	1875	1870	1837	1830	1826	1629
Q Serve(g_s), s	9.6	14.3	14.4	4.5	7.8	6.3	3.2	24.1	24.2	9.5	14.6	10.6
Cycle Q Clear(g_c), s	9.6	14.3	14.4	4.5	7.8	6.3	3.2	24.1	24.2	9.5	14.6	10.6
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	466	705	715	379	1346	755	259	456	448	260	1089	616
V/C Ratio(X)	1.01	0.42	0.42	0.30	0.26	0.19	0.26	0.83	0.84	0.76	0.50	0.33
Avail Cap(c_a), veh/h	466	705	715	429	1346	755	361	549	539	260	1089	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	26.7	26.7	22.4	26.9	19.5	33.2	52.8	52.8	31.9	34.7	26.5
Incr Delay (d2), s/veh	43.8	1.8	1.8	0.4	0.5	0.6	0.5	9.2	9.6	12.7	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	6.2	6.3	1.9	3.4	2.5	1.5	13.3	13.1	4.9	6.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.8	28.5	28.6	22.8	27.3	20.0	33.7	62.0	62.4	44.6	35.0	26.8
LnGrp LOS	F	C	C	C	C	C	C	E	E	D	D	C
Approach Vol, veh/h		1066			603			823			942	
Approach Delay, s/veh		50.7			24.7			59.9			35.3	
Approach LOS		D			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	49.9	11.5	42.6	12.8	53.1	18.0	36.1				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 9.6	* 38	11.2	35.2	* 9.6	* 38	11.2	35.2				
Max Q Clear Time (g_c+I1), s	11.6	9.8	5.2	16.6	6.5	16.4	11.5	26.2				
Green Ext Time (p_c), s	0.0	2.5	0.1	3.8	0.1	3.1	0.0	3.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			44.1									
HCM 6th LOS			D									
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												



HCM 6th Signalized Intersection Summary  
 2: Wixom Road & Catholic Central HS/Novi Promenade

2022 Existing Conditions  
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	16	79	10	0	9	96	597	40	22	318	274
Future Volume (veh/h)	156	16	79	10	0	9	96	597	40	22	318	274
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1938	1938	1938	1813	1813	1813	1984	1984	1984	1953	1953	1953
Adj Flow Rate, veh/h	260	27	60	17	0	3	116	719	43	25	361	224
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.88	0.88	0.88
Percent Heavy Veh, %	4	4	4	12	12	12	1	1	1	3	3	3
Cap, veh/h	287	83	185	35	0	31	493	1201	1018	361	1137	964
Arrive On Green	0.16	0.16	0.16	0.02	0.00	0.02	0.04	0.61	0.61	0.01	0.19	0.19
Sat Flow, veh/h	1845	535	1189	1726	0	1536	1890	1984	1682	1860	1953	1655
Grp Volume(v), veh/h	260	0	87	17	0	3	116	719	43	25	361	224
Grp Sat Flow(s),veh/h/ln	1845	0	1724	1726	0	1536	1890	1984	1682	1860	1953	1655
Q Serve(g_s), s	16.6	0.0	5.4	1.2	0.0	0.2	2.9	26.9	1.2	0.7	19.1	13.7
Cycle Q Clear(g_c), s	16.6	0.0	5.4	1.2	0.0	0.2	2.9	26.9	1.2	0.7	19.1	13.7
Prop In Lane	1.00		0.69	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	0	268	35	0	31	493	1201	1018	361	1137	964
V/C Ratio(X)	0.91	0.00	0.32	0.49	0.00	0.10	0.24	0.60	0.04	0.07	0.32	0.23
Avail Cap(c_a), veh/h	292	0	273	388	0	346	635	1201	1018	543	1137	964
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	0.0	45.1	58.2	0.0	57.7	10.8	14.7	9.6	12.4	27.9	25.8
Incr Delay (d2), s/veh	29.3	0.0	0.7	10.1	0.0	1.3	0.2	2.2	0.1	0.1	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	0.0	2.4	0.6	0.0	0.1	1.2	12.1	0.5	0.3	10.2	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.1	0.0	45.7	68.2	0.0	59.0	11.0	16.9	9.7	12.4	28.7	26.4
LnGrp LOS	E	A	D	E	A	E	B	B	A	B	C	C
Approach Vol, veh/h		347			20			878			610	
Approach Delay, s/veh		70.8			66.8			15.7			27.2	
Approach LOS		E			E			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	78.6		8.4	11.0	75.9		24.7				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	14.0	36.0		27.0	14.0	36.0		19.0				
Max Q Clear Time (g_c+I1), s	2.7	28.9		3.2	4.9	21.1		18.6				
Green Ext Time (p_c), s	0.0	2.8		0.0	0.2	2.5		0.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				30.3								
HCM 6th LOS				C								

HCM 6th TWSC  
3: Wixom Road & North Driveway

2022 Existing Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕↔		↙	↗
Traffic Vol, veh/h	18	9	724	42	6	401
Future Vol, veh/h	18	9	724	42	6	401
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	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	90	90	89	89
Heavy Vehicles, %	4	4	0	0	4	4
Mvmt Flow	30	15	804	47	7	451

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1293	426	0	0	851
Stage 1	828	-	-	-	-
Stage 2	465	-	-	-	-
Critical Hdwy	6.66	6.96	-	-	4.16
Critical Hdwy Stg 1	5.86	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.538	3.338	-	-	2.238
Pot Cap-1 Maneuver	164	573	-	-	775
Stage 1	386	-	-	-	-
Stage 2	626	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	163	573	-	-	775
Mov Cap-2 Maneuver	286	-	-	-	-
Stage 1	386	-	-	-	-
Stage 2	620	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	286	573	775
HCM Lane V/C Ratio	-	-	0.105	0.026	0.009
HCM Control Delay (s)	-	-	19.1	11.5	9.7
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	0

HCM 6th TWSC  
4: Wixom Road & South Driveway

2022 Existing Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	4	0	766	3	2	417
Future Vol, veh/h	4	0	766	3	2	417
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	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	93	93	83	83
Heavy Vehicles, %	0	0	0	0	3	3
Mvmt Flow	7	0	824	3	2	502

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1332	826	0	0	827
Stage 1	826	-	-	-	-
Stage 2	506	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227
Pot Cap-1 Maneuver	172	375	-	-	800
Stage 1	433	-	-	-	-
Stage 2	610	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	172	375	-	-	800
Mov Cap-2 Maneuver	306	-	-	-	-
Stage 1	433	-	-	-	-
Stage 2	609	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	306	800
HCM Lane V/C Ratio	-	-	0.022	0.003
HCM Control Delay (s)	-	-	17	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	827	1078	958	112	164	154	90	178	378	436	312	365
Average Queue (ft)	629	592	482	44	78	59	26	34	218	253	142	197
95th Queue (ft)	1024	1452	1284	92	138	125	67	111	369	413	275	298
Link Distance (ft)		1173	1173		2672	2672			724	724		518
Upstream Blk Time (%)		32	1									0
Queuing Penalty (veh)		0	0									0
Storage Bay Dist (ft)	750			500			185	500			350	
Storage Blk Time (%)	42	0				0			1		1	0
Queuing Penalty (veh)	98	1				0			0		3	0

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	271	328
Average Queue (ft)	125	121
95th Queue (ft)	238	233
Link Distance (ft)	518	518
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade**

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	258	157	43	65	174	384	35	39	210	110
Average Queue (ft)	111	47	11	8	54	126	6	9	42	22
95th Queue (ft)	201	104	34	34	127	295	26	30	132	65
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)	1					0				
Queuing Penalty (veh)	0					1				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	5			0	
Queuing Penalty (veh)					0	5			1	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	54	30	80	4	34
Average Queue (ft)	18	7	4	0	4
95th Queue (ft)	47	28	41	3	21
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**
























Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	22	18
Average Queue (ft)	4	1
95th Queue (ft)	19	8
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 110
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HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2022 Existing Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	612	108	149	581	553	140	527	100	238	500	364
Future Volume (veh/h)	339	612	108	149	581	553	140	527	100	238	500	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1984	1984	1984	2000	2000	2000	1969	1969	1969
Adj Flow Rate, veh/h	357	644	92	160	625	450	159	599	96	251	526	249
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.88	0.88	0.88	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	0	0	0	2	2	2
Cap, veh/h	335	1360	194	377	1560	825	276	742	119	238	846	483
Arrive On Green	0.06	0.41	0.41	0.06	0.41	0.41	0.03	0.07	0.07	0.08	0.23	0.23
Sat Flow, veh/h	1875	3286	469	1890	3770	1682	1905	3281	525	1875	3741	1668
Grp Volume(v), veh/h	357	366	370	160	625	450	159	346	349	251	526	249
Grp Sat Flow(s),veh/h/ln	1875	1870	1884	1890	1885	1682	1905	1900	1906	1875	1870	1668
Q Serve(g_s), s	7.6	17.1	17.2	5.8	14.0	22.3	7.6	21.5	21.6	9.2	15.2	15.0
Cycle Q Clear(g_c), s	7.6	17.1	17.2	5.8	14.0	22.3	7.6	21.5	21.6	9.2	15.2	15.0
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	335	774	780	377	1560	825	276	430	431	238	846	483
V/C Ratio(X)	1.07	0.47	0.47	0.42	0.40	0.55	0.58	0.81	0.81	1.05	0.62	0.52
Avail Cap(c_a), veh/h	335	774	780	377	1560	825	276	589	591	238	1160	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	25.6	25.7	19.5	24.7	21.3	34.9	52.9	53.0	40.4	41.8	35.6
Incr Delay (d2), s/veh	67.9	2.1	2.1	0.8	0.8	2.6	2.9	5.8	5.9	73.1	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	7.6	7.7	2.5	6.1	9.1	3.9	11.7	11.8	7.1	6.9	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.6	27.7	27.7	20.3	25.5	23.9	37.8	58.7	58.9	113.6	42.6	36.5
LnGrp LOS	F	C	C	C	C	C	D	E	E	F	D	D
Approach Vol, veh/h		1093			1235			854			1026	
Approach Delay, s/veh		51.5			24.2			54.9			58.4	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	56.1	16.0	33.9	14.0	56.1	16.0	33.9				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 7.6	* 40	9.2	37.2	* 7.6	* 40	9.2	37.2				
Max Q Clear Time (g_c+I1), s	9.6	24.3	9.6	17.2	7.8	19.2	11.2	23.6				
Green Ext Time (p_c), s	0.0	4.8	0.0	3.9	0.0	3.9	0.0	3.5				

Intersection Summary

HCM 6th Ctrl Delay	45.9
HCM 6th LOS	D

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
 2: Wixom Road & Catholic Central HS/Novi Promenade

2022 Existing Conditions  
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	3	3	65	7	89	22	597	45	82	569	94
Future Volume (veh/h)	35	3	3	65	7	89	22	597	45	82	569	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	2000	2000	1984	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	51	4	3	71	8	27	34	918	55	95	662	92
Peak Hour Factor	0.68	0.68	0.68	0.92	0.92	0.92	0.65	0.65	0.65	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	71	39	30	101	11	100	583	1333	1126	347	1351	1129
Arrive On Green	0.04	0.04	0.04	0.06	0.06	0.06	0.02	0.67	0.67	0.06	1.00	1.00
Sat Flow, veh/h	1905	1061	796	1707	192	1682	1890	1984	1677	1890	1984	1658
Grp Volume(v), veh/h	51	0	7	79	0	27	34	918	55	95	662	92
Grp Sat Flow(s),veh/h/ln	1905	0	1857	1899	0	1682	1890	1984	1677	1890	1984	1658
Q Serve(g_s), s	3.2	0.0	0.4	4.9	0.0	1.8	0.7	33.9	1.3	1.9	0.0	0.0
Cycle Q Clear(g_c), s	3.2	0.0	0.4	4.9	0.0	1.8	0.7	33.9	1.3	1.9	0.0	0.0
Prop In Lane	1.00		0.43	0.90		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	0	69	112	0	100	583	1333	1126	347	1351	1129
V/C Ratio(X)	0.72	0.00	0.10	0.70	0.00	0.27	0.06	0.69	0.05	0.27	0.49	0.08
Avail Cap(c_a), veh/h	143	0	139	411	0	364	666	1333	1126	413	1351	1129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	55.8	55.4	0.0	54.0	5.7	12.0	6.7	10.9	0.0	0.0
Incr Delay (d2), s/veh	12.9	0.0	0.6	7.7	0.0	1.4	0.0	2.9	0.1	0.4	1.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.2	2.6	0.0	0.8	0.2	14.4	0.5	0.7	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	0.0	56.5	63.1	0.0	55.4	5.8	15.0	6.8	11.3	1.3	0.1
LnGrp LOS	E	A	E	E	A	E	A	B	A	B	A	A
Approach Vol, veh/h		58			106			1007			849	
Approach Delay, s/veh		68.4			61.2			14.2			2.3	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	86.6		13.1	8.7	87.7		10.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	53.0		26.0	8.0	53.0		9.0				
Max Q Clear Time (g_c+I1), s	3.9	35.9		6.9	2.7	2.0		5.2				
Green Ext Time (p_c), s	0.1	6.7		0.4	0.0	5.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕↔		↙	↗
Traffic Vol, veh/h	65	20	644	67	19	618
Future Vol, veh/h	65	20	644	67	19	618
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	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	95	95	89	89
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	81	25	678	71	21	694

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1450	375	0	0	749
Stage 1	714	-	-	-	-
Stage 2	736	-	-	-	-
Critical Hdwy	6.6	6.9	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	134	628	-	-	869
Stage 1	452	-	-	-	-
Stage 2	477	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	131	628	-	-	869
Mov Cap-2 Maneuver	269	-	-	-	-
Stage 1	452	-	-	-	-
Stage 2	466	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	269	628	869
HCM Lane V/C Ratio	-	-	0.302	0.04	0.025
HCM Control Delay (s)	-	-	24.1	11	9.2
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	0.1



Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T		T	T
Traffic Vol, veh/h	11	5	706	4	1	682
Future Vol, veh/h	11	5	706	4	1	682
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	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	95	95	91	91
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	16	7	743	4	1	749

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1496	745	0	0	747
Stage 1	745	-	-	-	-
Stage 2	751	-	-	-	-
Critical Hdwy	6.46	6.26	-	-	4.11
Critical Hdwy Stg 1	5.46	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.554	3.354	-	-	2.209
Pot Cap-1 Maneuver	132	408	-	-	866
Stage 1	462	-	-	-	-
Stage 2	459	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	132	408	-	-	866
Mov Cap-2 Maneuver	270	-	-	-	-
Stage 1	462	-	-	-	-
Stage 2	459	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	302	866
HCM Lane V/C Ratio	-	-	0.079	0.001
HCM Control Delay (s)	-	-	17.9	9.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.3	0

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1060	1128	1108	242	230	304	263	230	298	336	600	1018
Average Queue (ft)	822	738	578	98	140	136	138	97	180	205	511	609
95th Queue (ft)	1356	1545	1375	208	204	229	252	187	260	294	716	1200
Link Distance (ft)		1174	1174		2672	2672			724	724		1010
Upstream Blk Time (%)		42	3									20
Queuing Penalty (veh)		0	0									0
Storage Bay Dist (ft)	1000			500			185	500			500	
Storage Blk Time (%)	49	3				1	7				56	0
Queuing Penalty (veh)	150	10				8	20				138	1

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	982	695
Average Queue (ft)	450	137
95th Queue (ft)	1066	441
Link Distance (ft)	1010	1010
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade**

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	100	36	146	96	100	375	39	112	148	47
Average Queue (ft)	29	5	57	38	16	126	8	32	43	8
95th Queue (ft)	72	23	119	77	67	288	30	74	108	27
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)						0				
Queuing Penalty (veh)						1				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)						6			0	
Queuing Penalty (veh)						2			0	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	108	39	30	8	35
Average Queue (ft)	43	14	0	0	8
95th Queue (ft)	85	40	0	4	30
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	55	4	6
Average Queue (ft)	14	0	0
95th Queue (ft)	41	3	0
Link Distance (ft)	536	433	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			200
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Zone Summary**

Zone wide Queuing Penalty: 329
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





















# Appendix 3

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Existing Improvement LOS Output Reports

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2022 Existing Conditions Imp  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	409	464	66	99	304	186	58	521	147	173	471	488
Future Volume (veh/h)	409	464	66	99	304	186	58	521	147	173	471	488
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1906	1906	1906	1953	1953	1953	1969	1969	1969	1922	1922	1922
Adj Flow Rate, veh/h	470	533	63	112	345	146	67	606	150	199	541	202
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.87	0.87	0.87
Percent Heavy Veh, %	6	6	6	3	3	3	2	2	2	5	5	5
Cap, veh/h	515	1287	152	387	1185	669	254	730	180	246	1065	687
Arrive On Green	0.13	0.39	0.39	0.05	0.32	0.32	0.01	0.08	0.08	0.09	0.29	0.29
Sat Flow, veh/h	1816	3264	385	1860	3711	1655	1875	2973	734	1830	3652	1629
Grp Volume(v), veh/h	470	295	301	112	345	146	67	381	375	199	541	202
Grp Sat Flow(s),veh/h/ln	1816	1811	1837	1860	1856	1655	1875	1870	1837	1830	1826	1629
Q Serve(g_s), s	15.6	14.1	14.2	4.8	8.4	6.9	3.2	24.1	24.2	9.7	14.8	9.8
Cycle Q Clear(g_c), s	15.6	14.1	14.2	4.8	8.4	6.9	3.2	24.1	24.2	9.7	14.8	9.8
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	515	714	725	387	1185	669	254	459	451	246	1065	687
V/C Ratio(X)	0.91	0.41	0.42	0.29	0.29	0.22	0.26	0.83	0.83	0.81	0.51	0.29
Avail Cap(c_a), veh/h	515	714	725	387	1185	669	340	564	554	246	1102	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	26.3	26.3	25.1	30.6	23.3	33.1	52.7	52.7	33.0	35.3	22.9
Incr Delay (d2), s/veh	20.7	1.8	1.8	0.4	0.6	0.7	0.5	8.4	8.7	17.9	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	6.1	6.3	2.1	3.7	2.8	1.5	13.2	13.0	5.4	6.4	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	28.0	28.1	25.5	31.3	24.1	33.7	61.1	61.4	50.9	35.7	23.1
LnGrp LOS	D	C	C	C	C	C	C	E	E	D	D	C
Approach Vol, veh/h		1066			603			823			942	
Approach Delay, s/veh		37.5			28.5			59.0			36.2	
Approach LOS		D			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.0	44.7	11.5	41.8	13.0	53.7	17.0	36.3				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 16	* 32	10.2	36.2	* 6.6	* 41	10.2	36.2				
Max Q Clear Time (g_c+I1), s	17.6	10.4	5.2	16.8	6.8	16.2	11.7	26.2				
Green Ext Time (p_c), s	0.0	2.3	0.0	3.8	0.0	3.2	0.0	3.3				

Intersection Summary

HCM 6th Ctrl Delay	40.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.  
\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	668	618	596	128	166	151	98	98	340	382	256	330
Average Queue (ft)	431	356	312	48	88	67	30	31	195	227	129	195
95th Queue (ft)	880	1091	974	102	146	133	74	74	291	335	230	291
Link Distance (ft)		1173	1173		2672	2672			724	724		518
Upstream Blk Time (%)		10	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	750			500			185	500			350	
Storage Blk Time (%)	23	0				0						0
Queuing Penalty (veh)	53	1				0						0

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	270	237
Average Queue (ft)	136	105
95th Queue (ft)	253	194
Link Distance (ft)	518	518
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade**

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	248	163	50	57	158	379	36	47	142	124
Average Queue (ft)	117	44	11	7	50	138	7	10	36	21
95th Queue (ft)	205	105	35	30	112	312	28	33	101	68
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)	0	0				0				
Queuing Penalty (veh)	0	0				0				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	6			0	
Queuing Penalty (veh)					1	6			1	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	SB
Directions Served	L	R	T	L
Maximum Queue (ft)	54	42	41	30
Average Queue (ft)	15	7	1	3
95th Queue (ft)	43	30	16	17
Link Distance (ft)	517	517	362	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				150
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 4: Wixom Road & South Driveway**























Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	31	24
Average Queue (ft)	3	1
95th Queue (ft)	19	8
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 62

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2022 Existing Conditions Imp  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	612	108	149	581	553	140	527	100	238	500	364
Future Volume (veh/h)	339	612	108	149	581	553	140	527	100	238	500	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1984	1984	1984	2000	2000	2000	1969	1969	1969
Adj Flow Rate, veh/h	357	644	92	160	625	450	159	599	96	251	526	249
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.88	0.88	0.88	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	0	0	0	2	2	2
Cap, veh/h	399	1228	175	360	1197	733	305	703	112	307	943	637
Arrive On Green	0.13	0.37	0.37	0.07	0.32	0.32	0.03	0.07	0.07	0.12	0.25	0.25
Sat Flow, veh/h	1875	3286	469	1890	3770	1682	1905	3281	525	1875	3741	1668
Grp Volume(v), veh/h	357	366	370	160	625	450	159	346	349	251	526	249
Grp Sat Flow(s),veh/h/ln	1875	1870	1884	1890	1885	1682	1905	1900	1906	1875	1870	1668
Q Serve(g_s), s	15.1	18.3	18.3	6.8	16.3	24.7	7.7	21.6	21.7	12.4	14.7	13.0
Cycle Q Clear(g_c), s	15.1	18.3	18.3	6.8	16.3	24.7	7.7	21.6	21.7	12.4	14.7	13.0
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	399	699	704	360	1197	733	305	407	408	307	943	637
V/C Ratio(X)	0.89	0.52	0.53	0.44	0.52	0.61	0.52	0.85	0.85	0.82	0.56	0.39
Avail Cap(c_a), veh/h	399	699	704	419	1197	733	313	462	464	307	1035	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	29.3	29.3	25.0	33.5	26.1	35.1	53.9	53.9	33.4	39.1	26.9
Incr Delay (d2), s/veh	21.8	2.8	2.8	0.9	1.6	3.8	1.5	12.9	13.2	15.8	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	8.3	8.4	3.0	7.4	10.4	3.9	12.5	12.6	6.8	6.6	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	32.0	32.1	25.9	35.1	29.9	36.5	66.7	67.1	49.2	39.6	27.3
LnGrp LOS	D	C	C	C	D	C	D	E	E	D	D	C
Approach Vol, veh/h		1093			1235			854			1026	
Approach Delay, s/veh		36.9			32.0			61.3			39.0	
Approach LOS		D			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.0	44.5	16.5	37.0	15.2	51.3	21.0	32.5				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 16	* 35	10.2	33.2	* 13	* 38	14.2	29.2				
Max Q Clear Time (g_c+I1), s	17.1	26.7	9.7	16.7	8.8	20.3	14.4	23.7				
Green Ext Time (p_c), s	0.0	3.3	0.0	3.7	0.1	3.7	0.0	2.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			40.9									
HCM 6th LOS			D									
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												



Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	700	524	379	222	306	409	265	254	437	478	295	309
Average Queue (ft)	493	188	188	94	166	170	157	99	271	289	171	198
95th Queue (ft)	784	397	355	189	262	317	271	188	443	463	307	290
Link Distance (ft)		1174	1174		2672	2672			724	724		1010
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			500			185	500			500	
Storage Blk Time (%)							4	11		0		
Queuing Penalty (veh)							21	32		0		

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	260	251
Average Queue (ft)	144	105
95th Queue (ft)	253	186
Link Distance (ft)	1010	1010
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	LT	R	L	T	R	L	T	R	
Maximum Queue (ft)	76	32	134	98	101	372	38	100	130	21	
Average Queue (ft)	30	5	62	39	16	127	9	33	45	5	
95th Queue (ft)	66	22	109	77	62	288	32	71	106	19	
Link Distance (ft)	259	259	270	270		415	415		676		
Upstream Blk Time (%)	0										
Queuing Penalty (veh)	1										
Storage Bay Dist (ft)					150				500	150	
Storage Blk Time (%)	5										
Queuing Penalty (veh)	2										

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	107	30	6	9	43
Average Queue (ft)	42	15	0	0	11
95th Queue (ft)	83	39	5	4	36
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	55	6
Average Queue (ft)	13	0
95th Queue (ft)	40	0
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

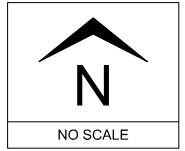
Zone wide Queuing Penalty: 56
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# Appendix 4

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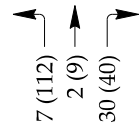
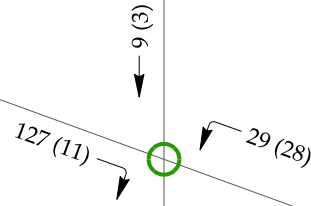
Background Development Data

# WALBRIDGE INDUSTRIAL PARK DEVELOPMENT

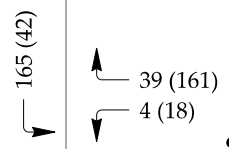


XX = AM PEAK HOUR  
(XX) = PM PEAK HOUR

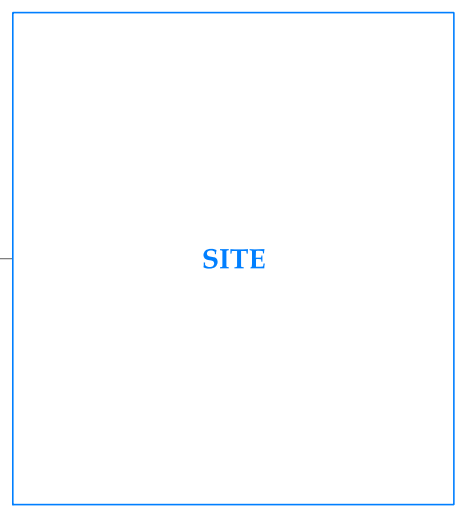
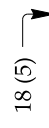
GRAND RIVER AVENUE



SOUTH HILL ROAD



SITE DRIVEWAY





NORTH

# WALBRIDGE INDUSTRIAL PARK DEVELOPMENT TRAFFIC VOLUMES

NO SCALE

## LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



Engineers | Architects | Scientists | Constructors

Hard copy Is  
Intended to be  
8.5"x11" when  
plotted. Scale(s)  
Indicated and  
graphic quality may  
not be accurate for  
any other size.

## STATION FLATS

Novi, MI 48374

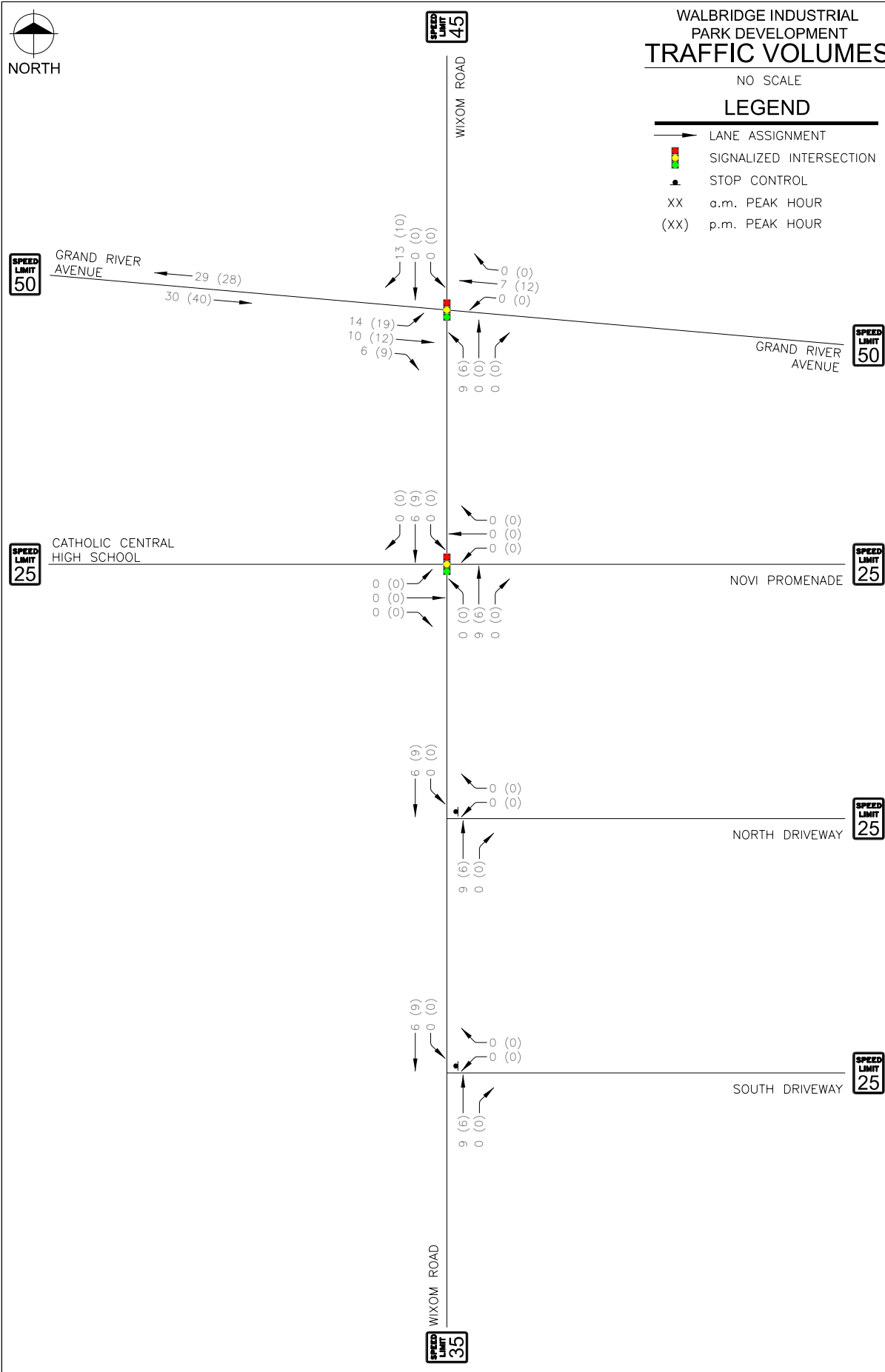
### Traffic Impact Study

PROJECT NO.

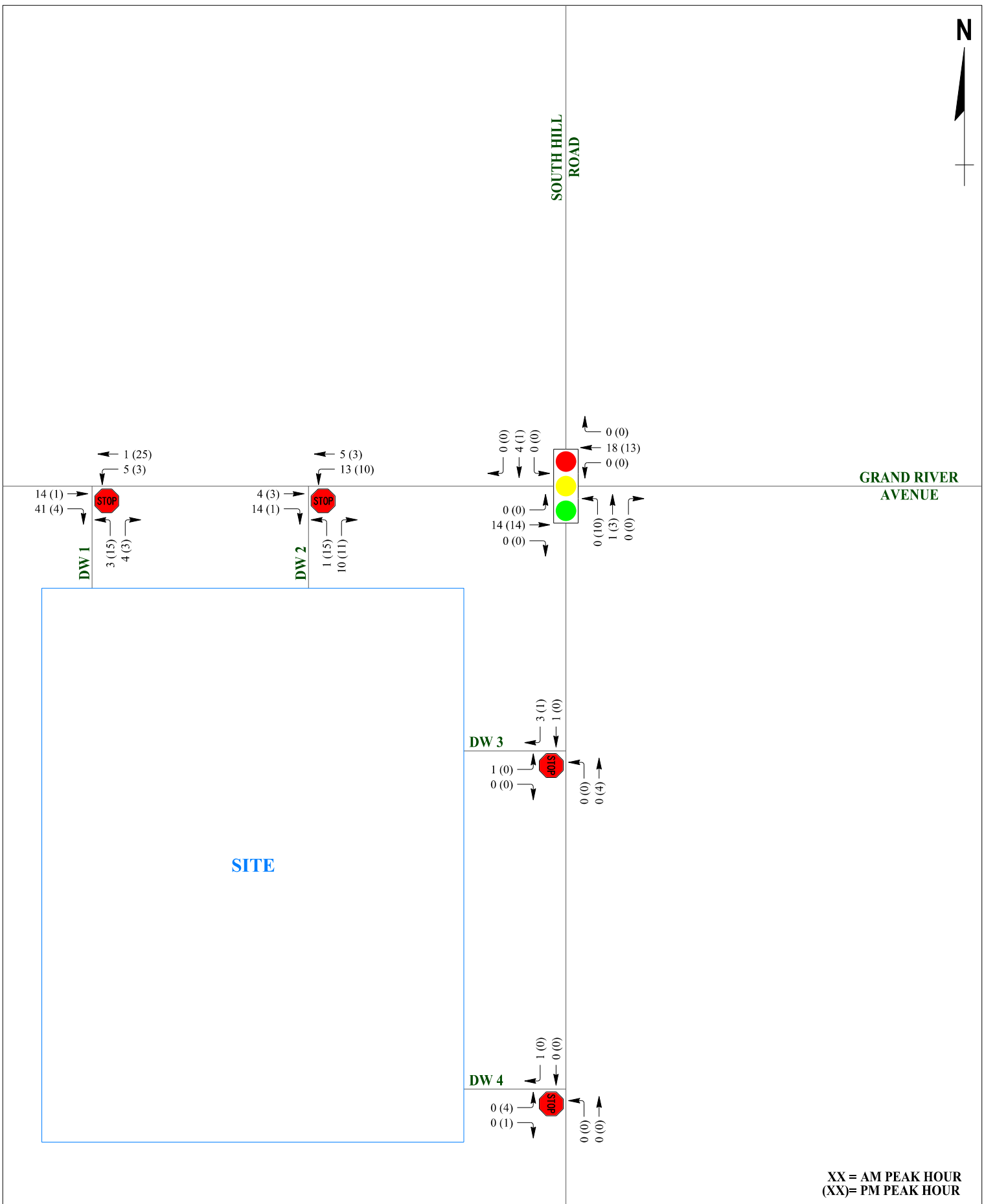
220791

FIGURE NO.

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-85X11.DWG LAYOUT: MODEL DATE: -- TIME: -- USER: DMEADE



# LYON TOWNSHIP WAREHOUSE



**TRIP GENERATION AM (PM) PEAK HOUR TRAFFIC VOLUMES**



NORTH

# LYON TOWNSHIP WAREHOUSE TRAFFIC VOLUMES

NO SCALE

## LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



Engineers | Architects | Scientists | Constructors

Hard copy Is Intended to be 8.5"x11" when plotted. Scale(s) Indicated and graphic quality may not be accurate for any other size.

## STATION FLATS

Novi, MI 48374

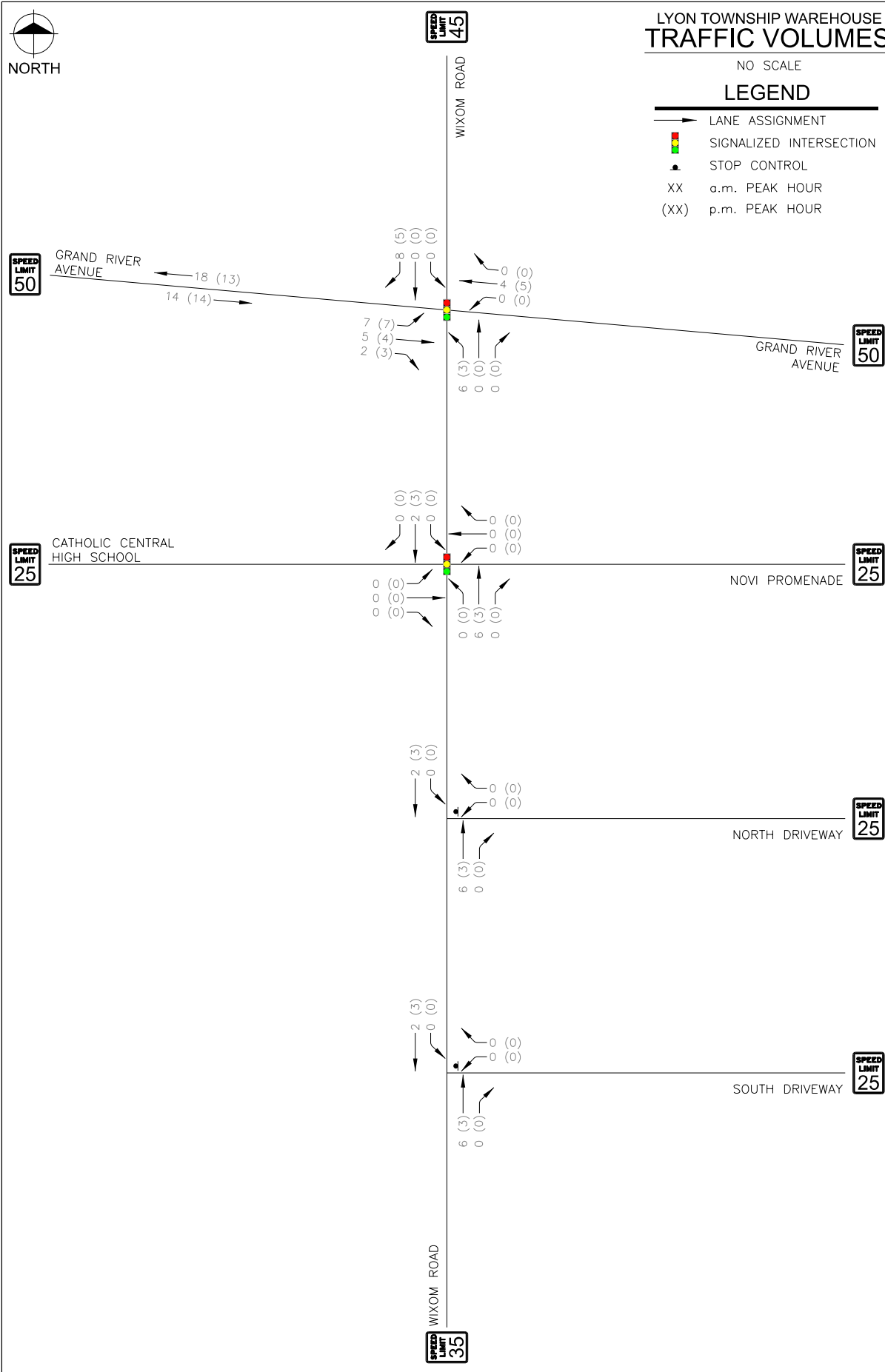
### Traffic Impact Study

PROJECT NO.

220791

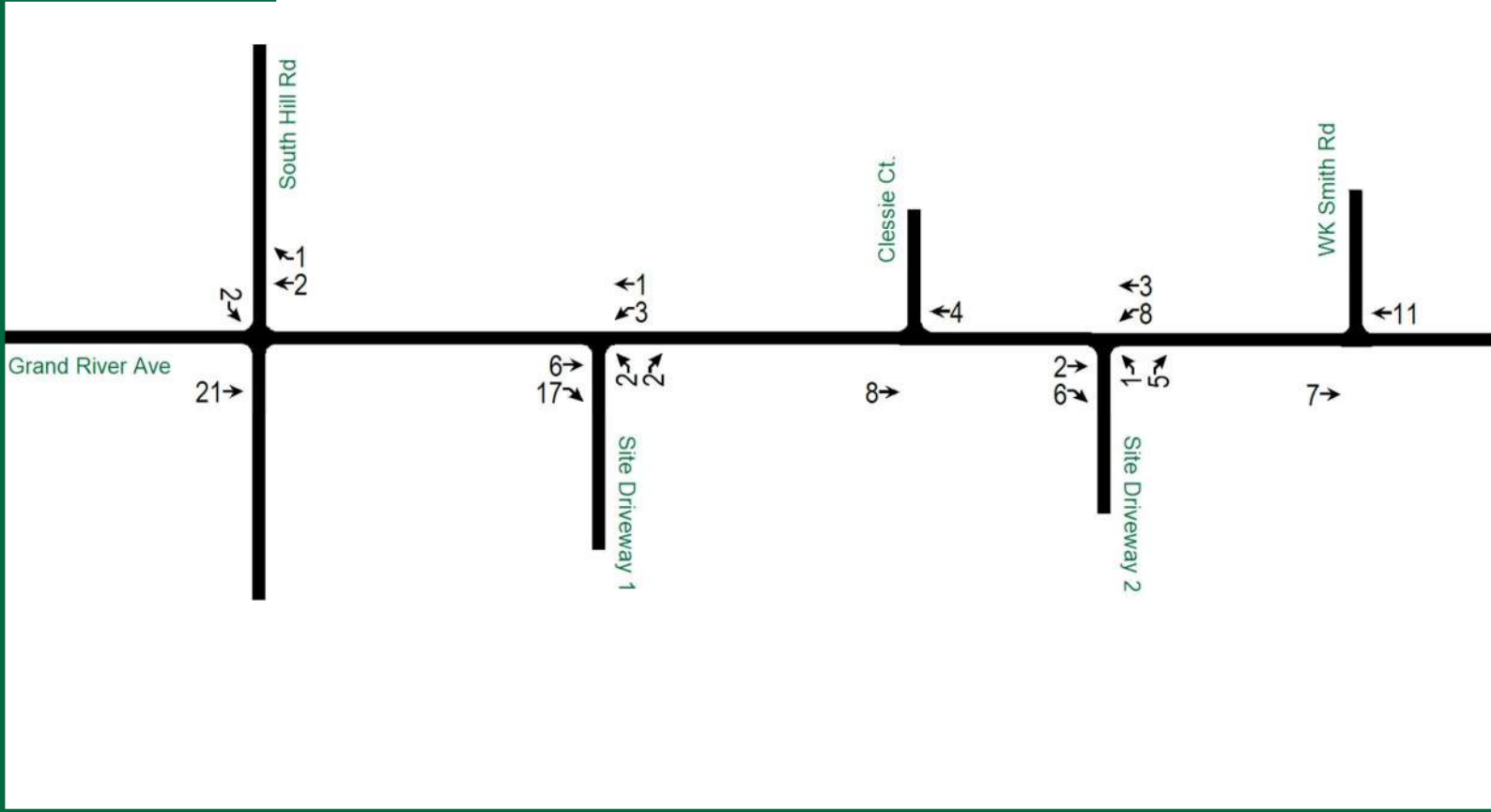
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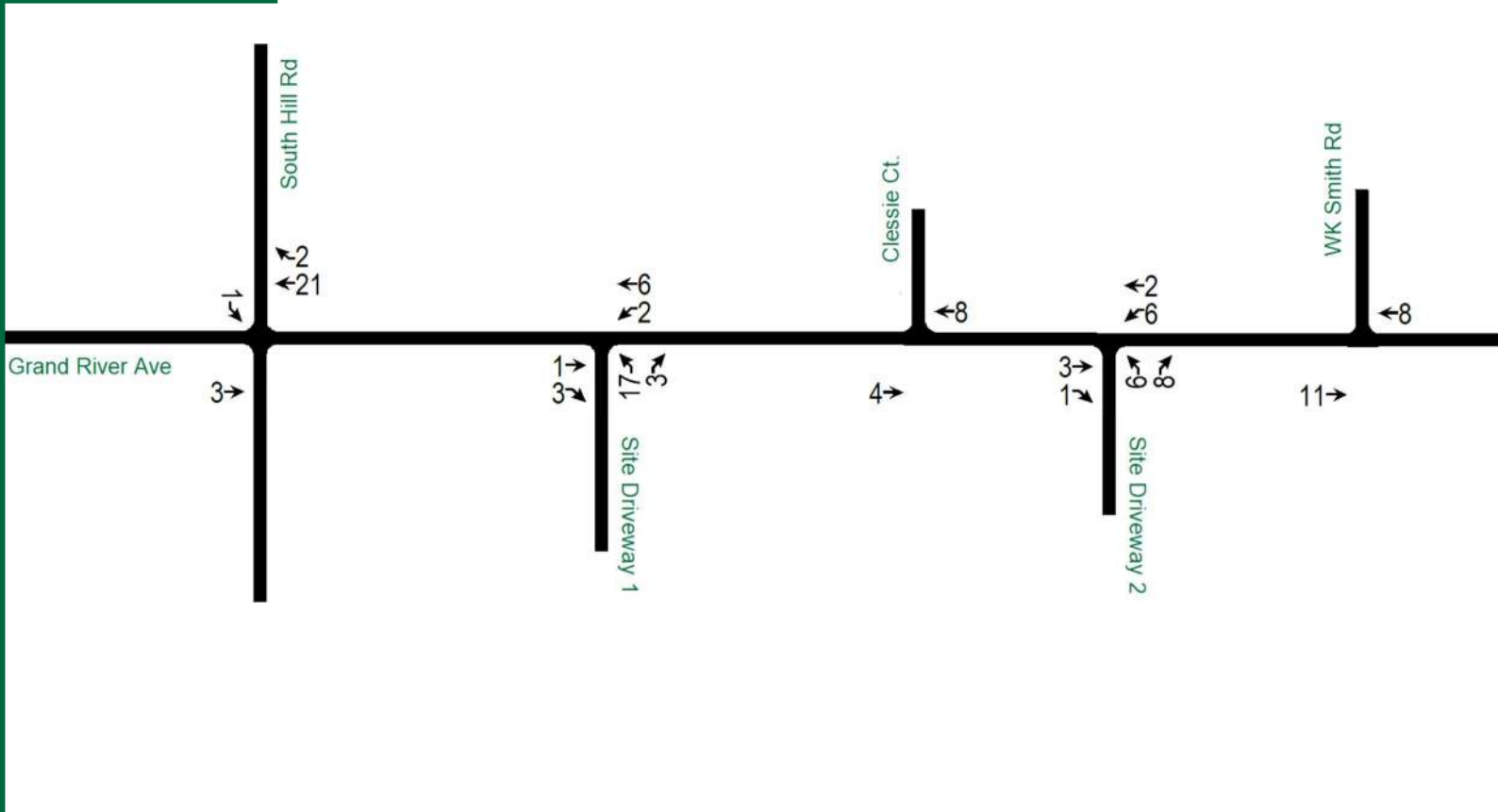


**AM Peak Hour**

**LYON TOWNSHIP DISTRIBUTION CENTER**



**PM Peak Hour**









NORTH

# SOUTH HILL BUSINESS PARK WEST PHASE 1 TRAFFIC VOLUMES

NO SCALE

## LEGEND

- LANE ASSIGNMENT
- SIGNALIZED INTERSECTION
- STOP CONTROL
- XX a.m. PEAK HOUR
- (XX) p.m. PEAK HOUR



Engineers | Architects | Scientists | Constructors

Hard copy is intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

## STATION FLATS

Novi, MI 48374

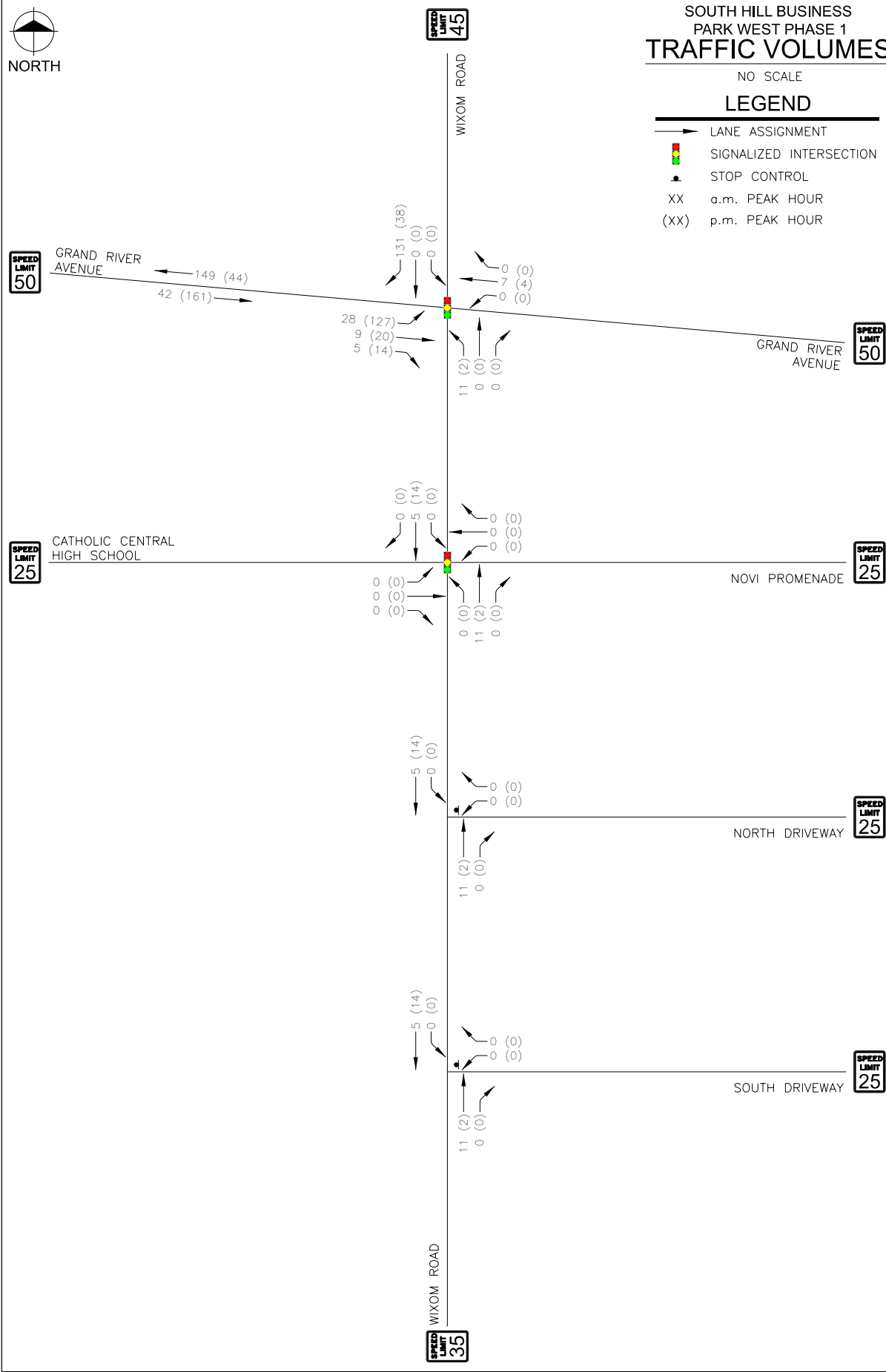
### Traffic Impact Study

PROJECT NO.

220791

FIGURE NO.

PLOT INFO: M:\CUSTOM\AUTODESK PRODUCTS\ACAD\SYMBOLS\B-95X11.DWG LAYOUT: MODEL DATE: --- TIME: --- USER: DMEADE



# Appendix 5

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Background LOS Output Reports

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Background Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	466	495	81	100	328	188	88	526	148	175	475	650
Future Volume (veh/h)	466	495	81	100	328	188	88	526	148	175	475	650
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1906	1906	1906	1953	1953	1953	1969	1969	1969	1922	1922	1922
Adj Flow Rate, veh/h	536	569	80	114	373	149	102	612	151	201	546	388
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.87	0.87	0.87
Percent Heavy Veh, %	6	6	6	3	3	3	2	2	2	5	5	5
Cap, veh/h	452	1234	173	357	1340	752	259	731	180	260	1035	592
Arrive On Green	0.08	0.39	0.39	0.05	0.36	0.36	0.02	0.08	0.08	0.09	0.28	0.28
Sat Flow, veh/h	1816	3190	447	1860	3711	1655	1875	2975	733	1830	3652	1629
Grp Volume(v), veh/h	536	322	327	114	373	149	102	384	379	201	546	388
Grp Sat Flow(s),veh/h/ln	1816	1811	1826	1860	1856	1655	1875	1870	1837	1830	1826	1629
Q Serve(g_s), s	9.6	15.9	16.0	4.6	8.6	6.5	4.8	24.3	24.4	9.8	15.1	23.9
Cycle Q Clear(g_c), s	9.6	15.9	16.0	4.6	8.6	6.5	4.8	24.3	24.4	9.8	15.1	23.9
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	452	701	706	357	1340	752	259	459	451	260	1035	592
V/C Ratio(X)	1.19	0.46	0.46	0.32	0.28	0.20	0.39	0.84	0.84	0.77	0.53	0.66
Avail Cap(c_a), veh/h	452	701	706	405	1340	752	329	549	539	260	1071	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	27.4	27.5	22.7	27.2	19.6	32.8	52.8	52.8	32.7	36.2	31.9
Incr Delay (d2), s/veh	104.0	2.2	2.2	0.5	0.5	0.6	1.0	9.4	9.8	13.4	0.4	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.6	6.9	7.0	2.0	3.7	2.6	2.3	13.4	13.3	5.1	6.6	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	139.0	29.6	29.6	23.2	27.7	20.2	33.8	62.2	62.6	46.2	36.7	34.4
LnGrp LOS	F	C	C	C	C	C	C	E	E	D	D	C
Approach Vol, veh/h		1185			636			865			1135	
Approach Delay, s/veh		79.1			25.2			59.0			37.6	
Approach LOS		E			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	49.7	13.5	40.8	12.9	52.8	18.0	36.3				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 9.6	* 38	11.2	35.2	* 9.6	* 38	11.2	35.2				
Max Q Clear Time (g_c+I1), s	11.6	10.6	6.8	25.9	6.6	18.0	11.8	26.4				
Green Ext Time (p_c), s	0.0	2.6	0.1	3.3	0.1	3.4	0.0	3.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				53.2								
HCM 6th LOS				D								
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary  
 2: Wixom Road & Catholic Central HS/Novi Promenade

2024 Background Conditions  
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	16	80	10	0	9	97	632	40	22	335	277
Future Volume (veh/h)	158	16	80	10	0	9	97	632	40	22	335	277
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1938	1938	1938	1813	1813	1813	1984	1984	1984	1953	1953	1953
Adj Flow Rate, veh/h	263	27	61	17	0	3	117	761	43	25	381	228
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.88	0.88	0.88
Percent Heavy Veh, %	4	4	4	12	12	12	1	1	1	3	3	3
Cap, veh/h	290	83	188	35	0	31	477	1198	1015	335	1134	961
Arrive On Green	0.16	0.16	0.16	0.02	0.00	0.02	0.04	0.60	0.60	0.01	0.19	0.19
Sat Flow, veh/h	1845	529	1194	1726	0	1536	1890	1984	1682	1860	1953	1655
Grp Volume(v), veh/h	263	0	88	17	0	3	117	761	43	25	381	228
Grp Sat Flow(s),veh/h/ln	1845	0	1723	1726	0	1536	1890	1984	1682	1860	1953	1655
Q Serve(g_s), s	16.8	0.0	5.4	1.2	0.0	0.2	3.0	29.6	1.2	0.7	20.2	14.0
Cycle Q Clear(g_c), s	16.8	0.0	5.4	1.2	0.0	0.2	3.0	29.6	1.2	0.7	20.2	14.0
Prop In Lane	1.00		0.69	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	0	271	35	0	31	477	1198	1015	335	1134	961
V/C Ratio(X)	0.91	0.00	0.33	0.49	0.00	0.10	0.25	0.64	0.04	0.07	0.34	0.24
Avail Cap(c_a), veh/h	292	0	273	388	0	346	618	1198	1015	517	1134	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.7	0.0	44.9	58.2	0.0	57.7	11.1	15.3	9.7	13.0	28.5	26.0
Incr Delay (d2), s/veh	29.9	0.0	0.7	10.1	0.0	1.3	0.3	2.6	0.1	0.1	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.4	0.6	0.0	0.1	1.2	13.3	0.5	0.3	10.8	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.7	0.0	45.6	68.2	0.0	59.0	11.4	17.8	9.7	13.1	29.3	26.6
LnGrp LOS	E	A	D	E	A	E	B	B	A	B	C	C
Approach Vol, veh/h		351			20			921			634	
Approach Delay, s/veh		71.1			66.8			16.6			27.7	
Approach LOS		E			E			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	78.5		8.4	11.0	75.7		24.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	4.0	36.0		27.0	14.0	36.0		19.0				
Max Q Clear Time (g_c+1/2), s	12.8	31.6		3.2	5.0	22.2		18.8				
Green Ext Time (p_c), s	0.0	2.1		0.0	0.2	2.6		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay											30.7	
HCM 6th LOS											C	

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↕↔		↖	↗
Traffic Vol, veh/h	18	9	760	42	6	419
Future Vol, veh/h	18	9	760	42	6	419
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	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	90	90	89	89
Heavy Vehicles, %	4	4	0	0	4	4
Mvmt Flow	30	15	844	47	7	471

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1353	446	0	0	891
Stage 1	868	-	-	-	-
Stage 2	485	-	-	-	-
Critical Hdwy	6.66	6.96	-	-	4.16
Critical Hdwy Stg 1	5.86	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.538	3.338	-	-	2.238
Pot Cap-1 Maneuver	151	556	-	-	748
Stage 1	368	-	-	-	-
Stage 2	613	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	150	556	-	-	748
Mov Cap-2 Maneuver	272	-	-	-	-
Stage 1	368	-	-	-	-
Stage 2	607	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	272	556	748
HCM Lane V/C Ratio	-	-	0.11	0.027	0.009
HCM Control Delay (s)	-	-	19.9	11.7	9.9
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	0

HCM 6th TWSC  
4: Wixom Road & South Driveway

2024 Background Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	0	802	3	2	435
Future Vol, veh/h	4	0	802	3	2	435
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	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	93	93	83	83
Heavy Vehicles, %	0	0	0	0	3	3
Mvmt Flow	7	0	862	3	2	524

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1392	864	0	0	865
Stage 1	864	-	-	-	-
Stage 2	528	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227
Pot Cap-1 Maneuver	158	357	-	-	774
Stage 1	416	-	-	-	-
Stage 2	596	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	158	357	-	-	774
Mov Cap-2 Maneuver	292	-	-	-	-
Stage 1	416	-	-	-	-
Stage 2	594	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	292	774
HCM Lane V/C Ratio	-	-	0.023	0.003
HCM Control Delay (s)	-	-	17.6	9.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1226	1224	1185	128	154	156	107	107	314	365	236	374
Average Queue (ft)	1100	950	537	46	86	63	31	50	192	222	115	206
95th Queue (ft)	1454	1666	1319	100	142	133	75	94	290	329	204	309
Link Distance (ft)	1174	1174	1174		2672	2672			724	724		518
Upstream Blk Time (%)	72	64	1									0
Queuing Penalty (veh)	0	0	0									0
Storage Bay Dist (ft)				500			185	500			350	
Storage Blk Time (%)							0					0
Queuing Penalty (veh)							0					0

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	324	439
Average Queue (ft)	145	204
95th Queue (ft)	288	379
Link Distance (ft)	518	518
Upstream Blk Time (%)	1	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	259	133	67	59	174	374	39	44	185	130
Average Queue (ft)	117	38	10	10	58	134	9	9	36	21
95th Queue (ft)	210	86	39	36	138	304	32	32	108	70
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)	0					0				
Queuing Penalty (veh)	0					1				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	6			0	
Queuing Penalty (veh)					0	6			1	



**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	58	54	66	14	31
Average Queue (ft)	15	8	1	0	4
95th Queue (ft)	45	33	25	10	22
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**























Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	32	18
Average Queue (ft)	2	1
95th Queue (ft)	15	10
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	200	
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 9
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HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Background Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	657	138	150	611	559	154	532	101	240	505	424
Future Volume (veh/h)	500	657	138	150	611	559	154	532	101	240	505	424
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1984	1984	1984	2000	2000	2000	1969	1969	1969
Adj Flow Rate, veh/h	526	692	123	161	657	456	175	605	97	253	532	312
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.88	0.88	0.88	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	0	0	0	2	2	2
Cap, veh/h	324	1307	232	347	1553	822	272	748	120	238	853	486
Arrive On Green	0.06	0.41	0.41	0.06	0.41	0.41	0.03	0.08	0.08	0.08	0.23	0.23
Sat Flow, veh/h	1875	3174	564	1890	3770	1682	1905	3281	525	1875	3741	1668
Grp Volume(v), veh/h	526	408	407	161	657	456	175	350	352	253	532	312
Grp Sat Flow(s),veh/h/ln	1875	1870	1867	1890	1885	1682	1905	1900	1906	1875	1870	1668
Q Serve(g_s), s	7.6	19.7	19.7	5.9	14.9	22.8	8.3	21.8	21.8	9.2	15.4	19.6
Cycle Q Clear(g_c), s	7.6	19.7	19.7	5.9	14.9	22.8	8.3	21.8	21.8	9.2	15.4	19.6
Prop In Lane	1.00		0.30	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	324	770	769	347	1553	822	272	433	435	238	853	486
V/C Ratio(X)	1.62	0.53	0.53	0.46	0.42	0.55	0.64	0.81	0.81	1.06	0.62	0.64
Avail Cap(c_a), veh/h	324	770	769	347	1553	822	272	589	591	238	1160	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	26.5	26.5	20.2	25.1	21.5	35.1	52.9	52.9	40.3	41.7	37.1
Incr Delay (d2), s/veh	293.3	2.6	2.6	1.0	0.8	2.7	5.1	5.9	6.1	75.9	0.8	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.1	8.8	8.8	2.5	6.5	9.3	4.5	11.8	11.9	7.3	7.0	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	326.1	29.1	29.1	21.1	26.0	24.2	40.2	58.8	59.0	116.1	42.4	38.5
LnGrp LOS	F	C	C	C	C	C	D	E	E	F	D	D
Approach Vol, veh/h		1341			1274			877			1097	
Approach Delay, s/veh		145.6			24.7			55.2			58.3	
Approach LOS		F			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	55.8	16.0	34.2	14.0	55.8	16.0	34.2				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 7.6	* 40	9.2	37.2	* 7.6	* 40	9.2	37.2				
Max Q Clear Time (g_c+I1), s	9.6	24.8	10.3	21.6	7.9	21.7	11.2	23.8				
Green Ext Time (p_c), s	0.0	4.9	0.0	3.9	0.0	4.3	0.0	3.5				

Intersection Summary

HCM 6th Ctrl Delay	73.9
HCM 6th LOS	E

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary  
 2: Wixom Road & Catholic Central HS/Novi Promenade

2024 Background Conditions  
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	3	3	66	7	90	22	616	45	83	604	95
Future Volume (veh/h)	35	3	3	66	7	90	22	616	45	83	604	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	2000	2000	1984	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	51	4	3	72	8	28	34	948	55	97	702	93
Peak Hour Factor	0.68	0.68	0.68	0.92	0.92	0.92	0.65	0.65	0.65	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	71	39	30	102	11	101	564	1331	1124	330	1350	1128
Arrive On Green	0.04	0.04	0.04	0.06	0.06	0.06	0.02	0.67	0.67	0.06	1.00	1.00
Sat Flow, veh/h	1905	1061	796	1709	190	1682	1890	1984	1677	1890	1984	1658
Grp Volume(v), veh/h	51	0	7	80	0	28	34	948	55	97	702	93
Grp Sat Flow(s),veh/h/ln	1905	0	1857	1899	0	1682	1890	1984	1677	1890	1984	1658
Q Serve(g_s), s	3.2	0.0	0.4	5.0	0.0	1.9	0.7	36.2	1.3	2.0	0.0	0.0
Cycle Q Clear(g_c), s	3.2	0.0	0.4	5.0	0.0	1.9	0.7	36.2	1.3	2.0	0.0	0.0
Prop In Lane	1.00		0.43	0.90		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	0	69	114	0	101	564	1331	1124	330	1350	1128
V/C Ratio(X)	0.72	0.00	0.10	0.70	0.00	0.28	0.06	0.71	0.05	0.29	0.52	0.08
Avail Cap(c_a), veh/h	143	0	139	411	0	364	647	1331	1124	395	1350	1128
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	55.8	55.4	0.0	53.9	5.7	12.5	6.7	11.7	0.0	0.0
Incr Delay (d2), s/veh	12.9	0.0	0.6	7.7	0.0	1.5	0.0	3.3	0.1	0.5	1.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.2	2.6	0.0	0.9	0.3	15.5	0.5	0.8	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	0.0	56.5	63.0	0.0	55.4	5.8	15.7	6.8	12.2	1.4	0.1
LnGrp LOS	E	A	E	E	A	E	A	B	A	B	A	A
Approach Vol, veh/h		58			108			1037			892	
Approach Delay, s/veh		68.4			61.0			14.9			2.5	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	86.5		13.2	8.7	87.6		10.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	60.0	53.0		26.0	8.0	53.0		9.0				
Max Q Clear Time (g_c+14), s	14.0	38.2		7.0	2.7	2.0		5.2				
Green Ext Time (p_c), s	0.1	6.5		0.4	0.0	6.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↕↔		↘	↗
Traffic Vol, veh/h	66	20	663	68	19	654
Future Vol, veh/h	66	20	663	68	19	654
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	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	95	95	89	89
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	83	25	698	72	21	735

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1511	385	0	0	770	0
Stage 1	734	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Critical Hdwy	6.6	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	123	619	-	-	854	-
Stage 1	441	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	120	619	-	-	854	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	441	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.2	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT	
Capacity (veh/h)	-	-	257	619	854	-
HCM Lane V/C Ratio	-	-	0.321	0.04	0.025	-
HCM Control Delay (s)	-	-	25.5	11.1	9.3	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.3	0.1	0.1	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	11	5	726	4	1	719
Future Vol, veh/h	11	5	726	4	1	719
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	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	95	95	91	91
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	16	7	764	4	1	790

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1558	766	0	0	768
Stage 1	766	-	-	-	-
Stage 2	792	-	-	-	-
Critical Hdwy	6.46	6.26	-	-	4.11
Critical Hdwy Stg 1	5.46	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.554	3.354	-	-	2.209
Pot Cap-1 Maneuver	121	396	-	-	850
Stage 1	452	-	-	-	-
Stage 2	439	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	121	396	-	-	850
Mov Cap-2 Maneuver	258	-	-	-	-
Stage 1	452	-	-	-	-
Stage 2	439	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	290	850
HCM Lane V/C Ratio	-	-	0.082	0.001
HCM Control Delay (s)	-	-	18.5	9.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1215	1204	1189	166	275	359	264	260	287	314	600	940
Average Queue (ft)	1177	1126	543	77	148	153	150	123	185	214	472	522
95th Queue (ft)	1288	1529	1362	146	232	289	265	227	266	298	709	1100
Link Distance (ft)	1174	1174	1174		2672	2672			724	724		1010
Upstream Blk Time (%)	92	83	1									19
Queuing Penalty (veh)	0	0	0									0
Storage Bay Dist (ft)				500			185	500			500	
Storage Blk Time (%)						2	9				47	0
Queuing Penalty (veh)						10	27				117	1

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	870	531
Average Queue (ft)	415	166
95th Queue (ft)	1001	513
Link Distance (ft)	1010	1010
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	90	33	128	123	129	378	35	106	170	29
Average Queue (ft)	28	6	63	39	20	149	9	38	51	6
95th Queue (ft)	65	24	116	82	82	337	32	81	127	21
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)						0				
Queuing Penalty (veh)						1				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)						9			1	
Queuing Penalty (veh)						3			2	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	87	30	94	4	35
Average Queue (ft)	40	16	5	0	10
95th Queue (ft)	72	40	56	3	33
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	56	6
Average Queue (ft)	13	0
95th Queue (ft)	41	4
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	200	
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 160
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# Appendix 6























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Background Improvement LOS Output Reports



HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Background Conditions Imp  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	466	495	81	100	328	188	88	526	148	175	475	650
Future Volume (veh/h)	466	495	81	100	328	188	88	526	148	175	475	650
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1906	1906	1906	1953	1953	1953	1969	1969	1969	1922	1922	1922
Adj Flow Rate, veh/h	536	569	80	114	373	149	102	612	151	201	546	388
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.87	0.87	0.87
Percent Heavy Veh, %	6	6	6	3	3	3	2	2	2	5	5	5
Cap, veh/h	562	1237	174	347	883	548	257	725	179	259	1027	792
Arrive On Green	0.20	0.39	0.39	0.05	0.24	0.24	0.02	0.08	0.08	0.09	0.28	0.28
Sat Flow, veh/h	1816	3190	447	1860	3711	1655	1875	2975	733	1830	3652	1629
Grp Volume(v), veh/h	536	322	327	114	373	149	102	384	379	201	546	388
Grp Sat Flow(s),veh/h/ln	1816	1811	1826	1860	1856	1655	1875	1870	1837	1830	1826	1629
Q Serve(g_s), s	24.6	15.9	16.0	5.5	10.2	7.9	4.8	24.3	24.4	9.8	15.2	19.3
Cycle Q Clear(g_c), s	24.6	15.9	16.0	5.5	10.2	7.9	4.8	24.3	24.4	9.8	15.2	19.3
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	562	703	708	347	883	548	257	456	448	259	1027	792
V/C Ratio(X)	0.95	0.46	0.46	0.33	0.42	0.27	0.40	0.84	0.85	0.78	0.53	0.49
Avail Cap(c_a), veh/h	562	703	708	347	883	548	328	533	524	259	1041	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	27.3	27.4	32.0	38.7	29.5	33.0	52.9	52.9	32.9	36.4	20.8
Incr Delay (d2), s/veh	26.6	2.2	2.2	0.5	1.5	1.2	1.0	10.4	10.8	13.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.0	6.9	7.0	2.4	4.7	3.3	2.3	13.5	13.4	5.2	6.6	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	29.5	29.5	32.5	40.2	30.7	34.0	63.3	63.7	46.7	36.9	21.2
LnGrp LOS	D	C	C	C	D	C	C	E	E	D	D	C
Approach Vol, veh/h		1185			636			865			1135	
Approach Delay, s/veh		40.9			36.6			60.0			33.3	
Approach LOS		D			D			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.0	35.0	13.5	40.6	13.0	53.0	18.0	36.0				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 25	* 24	11.2	34.2	* 6.6	* 42	11.2	34.2				
Max Q Clear Time (g_c+I1), s	26.6	12.2	6.8	21.3	7.5	18.0	11.8	26.4				
Green Ext Time (p_c), s	0.0	2.0	0.1	3.9	0.0	3.5	0.0	2.8				

Intersection Summary

HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.  
\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1021	522	494	157	189	190	150	122	401	433	347	366
Average Queue (ft)	600	237	177	57	108	88	37	50	228	262	145	198
95th Queue (ft)	1138	760	602	128	177	166	93	97	361	400	288	299
Link Distance (ft)	1173	1173	1173		2672	2672			724	724	518	518
Upstream Blk Time (%)	7	5	0									0
Queuing Penalty (veh)	0	0	0									0
Storage Bay Dist (ft)				500			185	500				
Storage Blk Time (%)						0	0		0			
Queuing Penalty (veh)						1	0		0			

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	324	497
Average Queue (ft)	149	205
95th Queue (ft)	305	407
Link Distance (ft)	518	518
Upstream Blk Time (%)	1	2
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	258	118	54	52	173	392	48	39	158	98
Average Queue (ft)	116	38	11	8	55	150	9	13	39	17
95th Queue (ft)	200	82	35	35	126	324	33	36	102	57
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)	1					0				
Queuing Penalty (veh)	0					1				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	7			0	
Queuing Penalty (veh)					0	7			1	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	53	35	73	10	31
Average Queue (ft)	15	8	3	0	3
95th Queue (ft)	43	31	38	8	17
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**























Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	28	18
Average Queue (ft)	3	1
95th Queue (ft)	18	8
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	200	
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 11
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HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Background Conditions Imp  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	657	138	150	611	559	154	532	101	240	505	424
Future Volume (veh/h)	500	657	138	150	611	559	154	532	101	240	505	424
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1984	1984	1984	2000	2000	2000	1969	1969	1969
Adj Flow Rate, veh/h	526	692	123	161	657	456	175	605	97	253	532	312
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.88	0.88	0.88	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	0	0	0	2	2	2
Cap, veh/h	482	1265	225	361	1082	625	282	721	115	247	822	681
Arrive On Green	0.19	0.40	0.40	0.08	0.29	0.29	0.03	0.07	0.07	0.09	0.22	0.22
Sat Flow, veh/h	1875	3174	564	1890	3770	1682	1905	3281	525	1875	3741	1668
Grp Volume(v), veh/h	526	408	407	161	657	456	175	350	352	253	532	312
Grp Sat Flow(s),veh/h/ln	1875	1870	1867	1890	1885	1682	1905	1900	1906	1875	1870	1668
Q Serve(g_s), s	22.6	20.1	20.1	7.1	18.1	28.0	8.4	21.8	21.9	10.2	15.5	16.3
Cycle Q Clear(g_c), s	22.6	20.1	20.1	7.1	18.1	28.0	8.4	21.8	21.9	10.2	15.5	16.3
Prop In Lane	1.00		0.30	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	482	746	744	361	1082	625	282	418	419	247	822	681
V/C Ratio(X)	1.09	0.55	0.55	0.45	0.61	0.73	0.62	0.84	0.84	1.02	0.65	0.46
Avail Cap(c_a), veh/h	482	746	744	414	1082	625	282	494	495	247	973	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	27.7	27.7	26.8	36.9	32.5	35.4	53.5	53.6	39.5	42.6	25.9
Incr Delay (d2), s/veh	67.9	2.9	2.9	0.9	2.5	7.3	4.1	10.6	10.8	63.6	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.4	9.1	9.1	3.2	8.3	12.4	4.4	12.4	12.5	6.4	7.1	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.0	30.6	30.6	27.7	39.5	39.8	39.5	64.1	64.4	103.0	43.7	26.3
LnGrp LOS	F	C	C	C	D	D	D	E	E	F	D	C
Approach Vol, veh/h		1341			1274			877			1097	
Approach Delay, s/veh		56.3			38.1			59.3			52.5	
Approach LOS		E			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.0	40.8	17.0	33.2	15.6	54.2	17.0	33.2				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 23	* 30	10.2	31.2	* 13	* 40	10.2	31.2				
Max Q Clear Time (g_c+I1), s	24.6	30.0	10.4	18.3	9.1	22.1	12.2	23.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.6	0.1	4.2	0.0	2.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			50.9									
HCM 6th LOS			D									
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1209	1212	1180	196	432	486	265	272	301	334	1030	1042
Average Queue (ft)	1014	770	536	80	238	274	216	116	192	216	808	636
95th Queue (ft)	1441	1576	1252	165	411	501	324	223	280	314	1280	1298
Link Distance (ft)	1174	1174	1174	2672	2672	2672			724	724	1010	1010
Upstream Blk Time (%)	47	40	1								47	41
Queuing Penalty (veh)	0	0	0								0	0
Storage Bay Dist (ft)							185	500				
Storage Blk Time (%)						20	28					
Queuing Penalty (veh)						115	85					

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1021	538
Average Queue (ft)	344	127
95th Queue (ft)	904	321
Link Distance (ft)	1010	1010
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	81	37	126	84	129	368	35	100	162	30
Average Queue (ft)	32	5	57	37	20	142	8	34	53	8
95th Queue (ft)	65	23	104	71	75	310	30	74	127	25
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)						0				
Queuing Penalty (veh)						1				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)						7			1	
Queuing Penalty (veh)						2			1	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	86	40	14	13	44
Average Queue (ft)	38	15	0	1	7
95th Queue (ft)	68	41	0	6	30
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**

Movement	WB
Directions Served	LR
Maximum Queue (ft)	46
Average Queue (ft)	13
95th Queue (ft)	38
Link Distance (ft)	536
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Zone Summary**

Zone wide Queuing Penalty: 204

# Appendix 7

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Turn Lane Warrants

South Driveway AM Peak Hour  
South Driveway PM Peak Hour

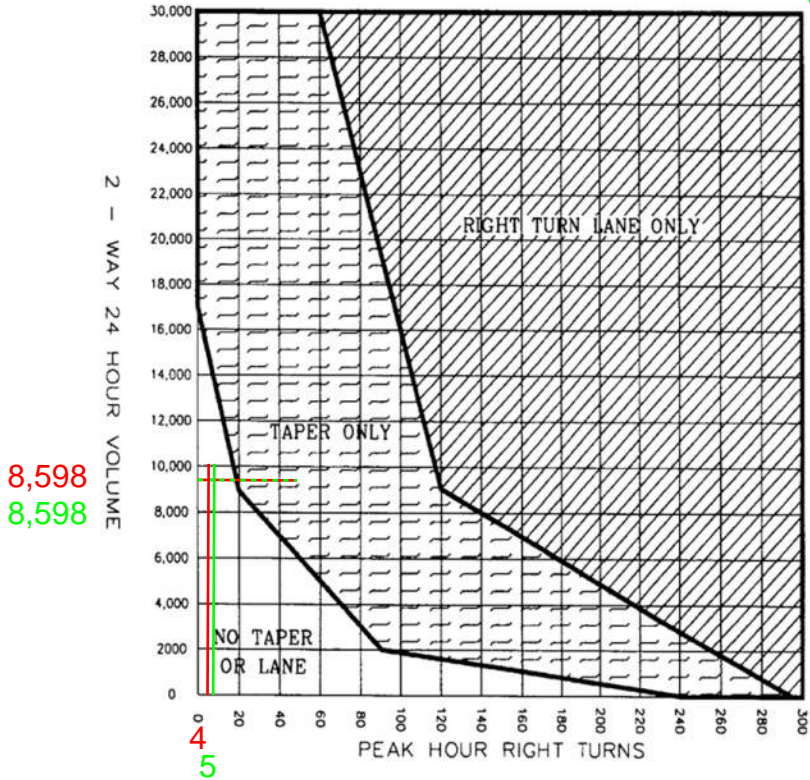


FIGURE IX.10

CITY OF NOVI  
STANDARD WARRANT  
FOR RIGHT TURN  
DECELERATION LANE  
OR TAPER

WARRANT FOR RIGHT TURN DECELERATION LANE OR TAPER

NO SCALE

DATE: 27-Jan-99



# Appendix 8

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Future LOS Output Reports

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Future Conditions  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	466	495	85	102	328	188	100	542	159	175	479	650
Future Volume (veh/h)	466	495	85	102	328	188	100	542	159	175	479	650
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1906	1906	1906	1953	1953	1953	1969	1969	1969	1922	1922	1922
Adj Flow Rate, veh/h	536	569	85	116	373	149	116	630	164	201	551	388
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.87	0.87	0.87
Percent Heavy Veh, %	6	6	6	3	3	3	2	2	2	5	5	5
Cap, veh/h	445	1196	178	349	1312	740	269	744	193	258	1042	595
Arrive On Green	0.08	0.38	0.38	0.06	0.35	0.35	0.02	0.08	0.08	0.09	0.29	0.29
Sat Flow, veh/h	1816	3162	471	1860	3711	1655	1875	2938	764	1830	3652	1629
Grp Volume(v), veh/h	536	325	329	116	373	149	116	401	393	201	551	388
Grp Sat Flow(s),veh/h/ln	1816	1811	1822	1860	1856	1655	1875	1870	1831	1830	1826	1629
Q Serve(g_s), s	9.6	16.3	16.4	4.7	8.7	6.6	5.4	25.4	25.4	9.7	15.2	23.8
Cycle Q Clear(g_c), s	9.6	16.3	16.4	4.7	8.7	6.6	5.4	25.4	25.4	9.7	15.2	23.8
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	445	685	689	349	1312	740	269	474	464	258	1042	595
V/C Ratio(X)	1.20	0.47	0.48	0.33	0.28	0.20	0.43	0.85	0.85	0.78	0.53	0.65
Avail Cap(c_a), veh/h	445	685	689	395	1312	740	329	549	537	258	1071	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.3	28.3	23.3	27.9	20.2	32.1	52.7	52.7	32.3	36.1	31.7
Incr Delay (d2), s/veh	111.8	2.4	2.4	0.6	0.5	0.6	1.1	10.5	10.9	13.9	0.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.1	7.2	7.3	2.0	3.8	2.6	2.6	14.1	13.9	5.1	6.6	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	147.3	30.6	30.7	23.8	28.4	20.8	33.2	63.2	63.6	46.2	36.6	34.1
LnGrp LOS	F	C	C	C	C	C	C	E	E	D	D	C
Approach Vol, veh/h		1190			638			910			1140	
Approach Delay, s/veh		83.2			25.8			59.5			37.4	
Approach LOS		F			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	48.8	14.1	41.0	13.0	51.8	18.0	37.2				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 9.6	* 38	11.2	35.2	* 9.6	* 38	11.2	35.2				
Max Q Clear Time (g_c+I1), s	11.6	10.7	7.4	25.8	6.7	18.4	11.7	27.4				
Green Ext Time (p_c), s	0.0	2.6	0.1	3.3	0.1	3.4	0.0	3.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				54.7								
HCM 6th LOS				D								
<b>Notes</b>												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary  
 2: Wixom Road & Catholic Central HS/Novi Promenade

2024 Future Conditions  
 AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	16	80	14	0	32	97	648	41	29	338	277
Future Volume (veh/h)	158	16	80	14	0	32	97	648	41	29	338	277
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1938	1938	1938	1813	1813	1813	1984	1984	1984	1953	1953	1953
Adj Flow Rate, veh/h	263	27	61	23	0	41	117	781	44	33	384	228
Peak Hour Factor	0.60	0.60	0.60	0.60	0.60	0.60	0.83	0.83	0.83	0.88	0.88	0.88
Percent Heavy Veh, %	4	4	4	12	12	12	1	1	1	3	3	3
Cap, veh/h	290	83	188	68	0	60	459	1154	978	305	1095	928
Arrive On Green	0.16	0.16	0.16	0.04	0.00	0.04	0.04	0.58	0.58	0.01	0.18	0.18
Sat Flow, veh/h	1845	529	1194	1726	0	1536	1890	1984	1682	1860	1953	1655
Grp Volume(v), veh/h	263	0	88	23	0	41	117	781	44	33	384	228
Grp Sat Flow(s),veh/h/ln	1845	0	1723	1726	0	1536	1890	1984	1682	1860	1953	1655
Q Serve(g_s), s	16.8	0.0	5.4	1.6	0.0	3.2	3.1	32.6	1.3	0.9	20.6	14.1
Cycle Q Clear(g_c), s	16.8	0.0	5.4	1.6	0.0	3.2	3.1	32.6	1.3	0.9	20.6	14.1
Prop In Lane	1.00		0.69	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	0	271	68	0	60	459	1154	978	305	1095	928
V/C Ratio(X)	0.91	0.00	0.33	0.34	0.00	0.68	0.25	0.68	0.04	0.11	0.35	0.25
Avail Cap(c_a), veh/h	292	0	273	388	0	346	598	1154	978	481	1095	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.7	0.0	44.9	56.1	0.0	56.9	12.1	17.3	10.8	14.8	29.9	27.3
Incr Delay (d2), s/veh	29.9	0.0	0.7	2.9	0.0	12.6	0.3	3.2	0.1	0.2	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.4	0.7	0.0	1.4	1.3	15.0	0.5	0.4	11.0	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.7	0.0	45.6	59.0	0.0	69.4	12.4	20.5	10.9	15.0	30.8	27.9
LnGrp LOS	E	A	D	E	A	E	B	C	B	B	C	C
Approach Vol, veh/h		351			64			942			645	
Approach Delay, s/veh		71.1			65.7			19.1			28.9	
Approach LOS		E			E			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	75.8		10.7	11.2	73.2		24.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	1.0	36.0		27.0	14.0	36.0		19.0				
Max Q Clear Time (g_c+1/2g), s	1.0	34.6		5.2	5.1	22.6		18.8				
Green Ext Time (p_c), s	0.0	0.8		0.2	0.2	2.6		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay											32.9	
HCM 6th LOS											C	

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕		↙	↗
Traffic Vol, veh/h	19	17	769	43	8	424
Future Vol, veh/h	19	17	769	43	8	424
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	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	90	90	89	89
Heavy Vehicles, %	4	4	0	0	4	4
Mvmt Flow	32	28	854	48	9	476

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1372	451	0	0	902
Stage 1	878	-	-	-	-
Stage 2	494	-	-	-	-
Critical Hdwy	6.66	6.96	-	-	4.16
Critical Hdwy Stg 1	5.86	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.538	3.338	-	-	2.238
Pot Cap-1 Maneuver	146	552	-	-	741
Stage 1	364	-	-	-	-
Stage 2	607	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	144	552	-	-	741
Mov Cap-2 Maneuver	267	-	-	-	-
Stage 1	364	-	-	-	-
Stage 2	600	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	267	552	741
HCM Lane V/C Ratio	-	-	0.119	0.051	0.012
HCM Control Delay (s)	-	-	20.3	11.9	9.9
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	0

HCM 6th TWSC  
4: Wixom Road & South Driveway

2024 Future Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	8	804	4	3	440
Future Vol, veh/h	5	8	804	4	3	440
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	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	93	93	83	83
Heavy Vehicles, %	0	0	0	0	3	3
Mvmt Flow	8	13	865	4	4	530

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1405	867	0	0	869
Stage 1	867	-	-	-	-
Stage 2	538	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.13
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.227
Pot Cap-1 Maneuver	155	355	-	-	771
Stage 1	415	-	-	-	-
Stage 2	589	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	154	355	-	-	771
Mov Cap-2 Maneuver	289	-	-	-	-
Stage 1	415	-	-	-	-
Stage 2	586	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	326	771
HCM Lane V/C Ratio	-	-	0.066	0.005
HCM Control Delay (s)	-	-	16.8	9.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1218	1218	1185	96	155	148	102	147	370	405	300	314
Average Queue (ft)	1071	909	532	41	82	63	28	58	221	255	135	198
95th Queue (ft)	1482	1663	1294	84	139	129	73	116	333	371	259	289
Link Distance (ft)	1173	1173	1173	2672	2672	2672			724	724	518	518
Upstream Blk Time (%)	68	59	0									
Queuing Penalty (veh)	0	0	0									
Storage Bay Dist (ft)							185	500				
Storage Blk Time (%)						0						
Queuing Penalty (veh)						0						

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	341	487
Average Queue (ft)	145	208
95th Queue (ft)	283	395
Link Distance (ft)	518	518
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade**

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	267	144	55	68	174	367	40	61	238	140
Average Queue (ft)	120	43	12	24	55	161	8	15	40	23
95th Queue (ft)	214	98	36	56	136	346	30	42	130	75
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)	1					0				
Queuing Penalty (veh)	0					0				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	8			1	
Queuing Penalty (veh)					1	8			2	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	SB
Directions Served	L	R	T	L
Maximum Queue (ft)	50	56	43	31
Average Queue (ft)	15	15	2	4
95th Queue (ft)	43	44	24	22
Link Distance (ft)	517	517	362	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				150
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 4: Wixom Road & South Driveway**























Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	36	19
Average Queue (ft)	9	1
95th Queue (ft)	31	12
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 12

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Future Conditions  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	657	148	162	611	559	160	540	107	240	515	424
Future Volume (veh/h)	500	657	148	162	611	559	160	540	107	240	515	424
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1984	1984	1984	2000	2000	2000	1969	1969	1969
Adj Flow Rate, veh/h	526	692	134	174	657	456	182	614	104	253	542	312
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.88	0.88	0.88	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	0	0	0	2	2	2
Cap, veh/h	322	1273	246	339	1536	814	273	756	128	238	870	494
Arrive On Green	0.06	0.41	0.41	0.06	0.41	0.41	0.03	0.08	0.08	0.08	0.23	0.23
Sat Flow, veh/h	1875	3126	605	1890	3770	1682	1905	3251	550	1875	3741	1668
Grp Volume(v), veh/h	526	414	412	174	657	456	182	358	360	253	542	312
Grp Sat Flow(s),veh/h/ln	1875	1870	1860	1890	1885	1682	1905	1900	1901	1875	1870	1668
Q Serve(g_s), s	7.6	20.2	20.2	6.4	15.0	23.0	8.6	22.3	22.4	9.2	15.6	19.4
Cycle Q Clear(g_c), s	7.6	20.2	20.2	6.4	15.0	23.0	8.6	22.3	22.4	9.2	15.6	19.4
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	322	762	758	339	1536	814	273	442	442	238	870	494
V/C Ratio(X)	1.64	0.54	0.54	0.51	0.43	0.56	0.67	0.81	0.81	1.06	0.62	0.63
Avail Cap(c_a), veh/h	322	762	758	339	1536	814	273	589	589	238	1160	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	27.1	27.1	20.8	25.5	21.9	34.9	52.8	52.8	39.9	41.3	36.6
Incr Delay (d2), s/veh	299.5	2.8	2.8	1.3	0.9	2.8	6.0	6.3	6.4	76.4	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.3	9.1	9.0	2.8	6.5	9.4	4.7	12.1	12.2	7.3	7.1	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	332.6	29.8	29.9	22.1	26.4	24.7	40.9	59.1	59.2	116.3	42.1	37.9
LnGrp LOS	F	C	C	C	C	C	D	E	E	F	D	D
Approach Vol, veh/h		1352			1287			900			1107	
Approach Delay, s/veh		147.6			25.2			55.5			57.9	
Approach LOS		F			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	55.3	16.0	34.7	14.0	55.3	16.0	34.7				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 7.6	* 40	9.2	37.2	* 7.6	* 40	9.2	37.2				
Max Q Clear Time (g_c+I1), s	9.6	25.0	10.6	21.4	8.4	22.2	11.2	24.4				
Green Ext Time (p_c), s	0.0	4.9	0.0	3.9	0.0	4.3	0.0	3.6				

Intersection Summary												
HCM 6th Ctrl Delay											74.5	
HCM 6th LOS											E	

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



HCM 6th Signalized Intersection Summary  
 2: Wixom Road & Catholic Central HS/Novi Promenade

2024 Future Conditions  
 PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	3	3	68	7	102	22	624	49	103	616	95
Future Volume (veh/h)	35	3	3	68	7	102	22	624	49	103	616	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	2000	2000	1984	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	51	4	3	74	8	41	34	960	61	120	716	93
Peak Hour Factor	0.68	0.68	0.68	0.92	0.92	0.92	0.65	0.65	0.65	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	71	39	30	106	11	104	553	1316	1112	325	1346	1124
Arrive On Green	0.04	0.04	0.04	0.06	0.06	0.06	0.02	0.66	0.66	0.08	1.00	1.00
Sat Flow, veh/h	1905	1061	796	1713	185	1682	1890	1984	1677	1890	1984	1658
Grp Volume(v), veh/h	51	0	7	82	0	41	34	960	61	120	716	93
Grp Sat Flow(s),veh/h/ln	1905	0	1857	1899	0	1682	1890	1984	1677	1890	1984	1658
Q Serve(g_s), s	3.2	0.0	0.4	5.1	0.0	2.8	0.7	37.9	1.5	2.5	0.0	0.0
Cycle Q Clear(g_c), s	3.2	0.0	0.4	5.1	0.0	2.8	0.7	37.9	1.5	2.5	0.0	0.0
Prop In Lane	1.00		0.43	0.90		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	71	0	69	118	0	104	553	1316	1112	325	1346	1124
V/C Ratio(X)	0.72	0.00	0.10	0.70	0.00	0.39	0.06	0.73	0.05	0.37	0.53	0.08
Avail Cap(c_a), veh/h	143	0	139	411	0	364	636	1316	1112	380	1346	1124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	55.8	55.2	0.0	54.1	6.0	13.2	7.1	12.8	0.0	0.0
Incr Delay (d2), s/veh	12.9	0.0	0.6	7.2	0.0	2.4	0.0	3.6	0.1	0.7	1.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.2	2.7	0.0	1.3	0.3	16.4	0.5	1.1	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	0.0	56.5	62.4	0.0	56.5	6.1	16.8	7.2	13.5	1.5	0.1
LnGrp LOS	E	A	E	E	A	E	A	B	A	B	A	A
Approach Vol, veh/h		58			123			1055			929	
Approach Delay, s/veh		68.4			60.4			15.9			2.9	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	85.6			13.4	8.7	87.4		10.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	53.0			26.0	8.0	53.0		9.0				
Max Q Clear Time (g_c+14.5), s	39.9			7.1	2.7	2.0		5.2				
Green Ext Time (p_c), s	0.1	6.1		0.5	0.0	6.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕		↙	↗
Traffic Vol, veh/h	67	24	671	69	25	662
Future Vol, veh/h	67	24	671	69	25	662
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	0	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	95	95	89	89
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	84	30	706	73	28	744

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1543	390	0	0	779
Stage 1	743	-	-	-	-
Stage 2	800	-	-	-	-
Critical Hdwy	6.6	6.9	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	117	614	-	-	847
Stage 1	436	-	-	-	-
Stage 2	446	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	113	614	-	-	847
Mov Cap-2 Maneuver	249	-	-	-	-
Stage 1	436	-	-	-	-
Stage 2	431	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.5	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	249	614	847
HCM Lane V/C Ratio	-	-	0.336	0.049	0.033
HCM Control Delay (s)	-	-	26.6	11.2	9.4
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	1.4	0.2	0.1

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	12	9	731	5	7	722
Future Vol, veh/h	12	9	731	5	7	722
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	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	95	95	91	91
Heavy Vehicles, %	6	6	1	1	1	1
Mvmt Flow	18	13	769	5	8	793

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1581	772	0	0	774	0
Stage 1	772	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Critical Hdwy	6.46	6.26	-	-	4.11	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	-	-	2.209	-
Pot Cap-1 Maneuver	117	393	-	-	846	-
Stage 1	449	-	-	-	-	-
Stage 2	431	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	116	393	-	-	846	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	449	-	-	-	-	-
Stage 2	427	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	846
HCM Lane V/C Ratio	-	-	0.105	0.009
HCM Control Delay (s)	-	-	18.4	9.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1226	1209	1192	224	243	284	262	272	282	319	971	885
Average Queue (ft)	1180	1113	599	91	140	134	142	122	176	203	679	370
95th Queue (ft)	1281	1555	1420	194	208	229	255	234	255	286	1081	912
Link Distance (ft)	1174	1174	1174	2672	2672	2672			724	724	1010	1010
Upstream Blk Time (%)	92	82	3								16	15
Queuing Penalty (veh)	0	0	0								0	0
Storage Bay Dist (ft)							185	500				
Storage Blk Time (%)						2	6					
Queuing Penalty (veh)						9	20					

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	733	403
Average Queue (ft)	223	124
95th Queue (ft)	577	282
Link Distance (ft)	1010	1010
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	83	24	113	109	124	424	35	124	179	71
Average Queue (ft)	28	6	57	42	18	148	10	39	50	8
95th Queue (ft)	65	22	105	83	70	355	33	85	133	41
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)						0				
Queuing Penalty (veh)						2				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	8			1	
Queuing Penalty (veh)					0	2			1	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	99	42	53	4	44
Average Queue (ft)	42	16	2	0	11
95th Queue (ft)	77	42	21	3	36
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	77	8	30
Average Queue (ft)	21	0	3
95th Queue (ft)	57	4	17
Link Distance (ft)	536	433	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			200
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Zone Summary**

Zone wide Queuing Penalty: 34
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





















# Appendix 9

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Future Improvement LOS Output Reports

HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Future Conditions Imp  
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	466	495	85	102	328	188	100	542	159	175	479	650
Future Volume (veh/h)	466	495	85	102	328	188	100	542	159	175	479	650
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1906	1906	1906	1953	1953	1953	1969	1969	1969	1922	1922	1922
Adj Flow Rate, veh/h	536	569	85	116	373	149	116	630	164	201	551	388
Peak Hour Factor	0.87	0.87	0.87	0.88	0.88	0.88	0.86	0.86	0.86	0.87	0.87	0.87
Percent Heavy Veh, %	6	6	6	3	3	3	2	2	2	5	5	5
Cap, veh/h	555	1203	179	340	856	536	268	738	192	257	1033	795
Arrive On Green	0.20	0.38	0.38	0.05	0.23	0.23	0.02	0.08	0.08	0.09	0.28	0.28
Sat Flow, veh/h	1816	3162	471	1860	3711	1655	1875	2938	764	1830	3652	1629
Grp Volume(v), veh/h	536	325	329	116	373	149	116	401	393	201	551	388
Grp Sat Flow(s),veh/h/ln	1816	1811	1822	1860	1856	1655	1875	1870	1831	1830	1826	1629
Q Serve(g_s), s	24.6	16.3	16.4	5.7	10.3	8.0	5.4	25.4	25.4	9.7	15.3	19.2
Cycle Q Clear(g_c), s	24.6	16.3	16.4	5.7	10.3	8.0	5.4	25.4	25.4	9.7	15.3	19.2
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	555	689	693	340	856	536	268	470	460	257	1033	795
V/C Ratio(X)	0.96	0.47	0.47	0.34	0.44	0.28	0.43	0.85	0.86	0.78	0.53	0.49
Avail Cap(c_a), veh/h	555	689	693	340	856	536	328	533	522	257	1041	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	28.1	28.1	32.7	39.5	30.1	32.3	52.9	52.9	32.5	36.3	20.6
Incr Delay (d2), s/veh	29.4	2.3	2.3	0.6	1.6	1.3	1.1	11.6	12.0	14.5	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	7.1	7.2	2.5	4.7	3.4	2.6	14.3	14.0	5.2	6.7	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.3	30.4	30.4	33.2	41.1	31.4	33.4	64.4	64.9	46.9	36.8	21.1
LnGrp LOS	E	C	C	C	D	C	C	E	E	D	D	C
Approach Vol, veh/h		1190			638			910			1140	
Approach Delay, s/veh		42.9			37.4			60.7			33.3	
Approach LOS		D			D			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.0	34.1	14.2	40.8	13.0	52.1	18.0	36.9				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 25	* 24	11.2	34.2	* 6.6	* 42	11.2	34.2				
Max Q Clear Time (g_c+I1), s	26.6	12.3	7.4	21.2	7.7	18.4	11.7	27.4				
Green Ext Time (p_c), s	0.0	2.0	0.1	4.0	0.0	3.5	0.0	2.7				

Intersection Summary

HCM 6th Ctrl Delay	43.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.  
\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Wixom Road & Grand River Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1103	1027	897	186	187	183	112	150	365	418	387	365
Average Queue (ft)	683	283	185	63	101	78	35	58	215	253	189	209
95th Queue (ft)	1233	856	598	160	165	157	83	120	322	370	367	308
Link Distance (ft)	1173	1173	1173	2672	2672	2672			724	724	518	518
Upstream Blk Time (%)	7	4	0									0
Queuing Penalty (veh)	0	0	0									0
Storage Bay Dist (ft)							185	500				
Storage Blk Time (%)							0					
Queuing Penalty (veh)							1					

Intersection: 1: Wixom Road & Grand River Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	302	375
Average Queue (ft)	149	167
95th Queue (ft)	273	299
Link Distance (ft)	518	518
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	266	172	61	73	159	406	52	58	146	94
Average Queue (ft)	125	45	15	20	56	163	10	14	37	22
95th Queue (ft)	217	104	46	53	132	349	35	42	98	65
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)	1	0				0				
Queuing Penalty (veh)	0	0				2				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)					0	8			0	
Queuing Penalty (veh)					1	8			1	



**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	SB
Directions Served	L	R	T	L
Maximum Queue (ft)	56	53	106	40
Average Queue (ft)	15	15	6	6
95th Queue (ft)	46	43	49	28
Link Distance (ft)	517	517	362	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				150
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 4: Wixom Road & South Driveway**























Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	36	12
Average Queue (ft)	9	1
95th Queue (ft)	31	9
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 12
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HCM 6th Signalized Intersection Summary  
1: Wixom Road & Grand River Avenue

2024 Future Conditions Imp  
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	657	148	162	611	559	160	540	107	240	515	424
Future Volume (veh/h)	500	657	148	162	611	559	160	540	107	240	515	424
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1984	1984	1984	2000	2000	2000	1969	1969	1969
Adj Flow Rate, veh/h	526	692	134	174	657	456	182	614	104	253	542	312
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.88	0.88	0.88	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	1	1	1	0	0	0	2	2	2
Cap, veh/h	480	1218	236	359	1067	619	282	727	123	246	836	687
Arrive On Green	0.19	0.39	0.39	0.08	0.28	0.28	0.03	0.07	0.07	0.09	0.22	0.22
Sat Flow, veh/h	1875	3126	605	1890	3770	1682	1905	3251	550	1875	3741	1668
Grp Volume(v), veh/h	526	414	412	174	657	456	182	358	360	253	542	312
Grp Sat Flow(s),veh/h/ln	1875	1870	1860	1890	1885	1682	1905	1900	1901	1875	1870	1668
Q Serve(g_s), s	22.6	20.8	20.8	7.7	18.2	28.2	8.7	22.4	22.4	10.2	15.8	16.2
Cycle Q Clear(g_c), s	22.6	20.8	20.8	7.7	18.2	28.2	8.7	22.4	22.4	10.2	15.8	16.2
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	480	729	725	359	1067	619	282	425	425	246	836	687
V/C Ratio(X)	1.10	0.57	0.57	0.48	0.62	0.74	0.64	0.84	0.85	1.03	0.65	0.45
Avail Cap(c_a), veh/h	480	729	725	403	1067	619	282	494	494	246	973	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	28.7	28.7	27.0	37.3	32.9	35.2	53.5	53.5	39.1	42.3	25.5
Incr Delay (d2), s/veh	69.8	3.2	3.2	1.0	2.7	7.6	5.0	11.2	11.5	64.6	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6	9.5	9.4	3.4	8.4	12.5	4.7	12.7	12.8	6.4	7.2	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.2	31.9	31.9	28.0	40.0	40.5	40.2	64.7	65.0	103.7	43.5	26.0
LnGrp LOS	F	C	C	C	D	D	D	E	E	F	D	C
Approach Vol, veh/h		1352			1287			900			1107	
Approach Delay, s/veh		57.7			38.6			59.9			52.3	
Approach LOS		E			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.0	40.4	17.0	33.6	16.2	53.2	17.0	33.6				
Change Period (Y+Rc), s	* 6.4	* 6.4	6.8	6.8	* 6.4	* 6.4	6.8	6.8				
Max Green Setting (Gmax), s	* 23	* 30	10.2	31.2	* 13	* 40	10.2	31.2				
Max Q Clear Time (g_c+I1), s	24.6	30.2	10.7	18.2	9.7	22.8	12.2	24.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.6	0.1	4.2	0.0	2.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				51.5								
HCM 6th LOS				D								
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	1211	1200	1144	210	506	551	265	231	307	345	1038	1036
Average Queue (ft)	1018	796	570	100	248	288	198	116	196	224	870	757
95th Queue (ft)	1463	1572	1325	183	453	567	320	201	278	311	1296	1394
Link Distance (ft)	1174	1174	1174	2672	2672	2672			724	724	1010	1010
Upstream Blk Time (%)	51	45	1								65	58
Queuing Penalty (veh)	0	0	0								0	0
Storage Bay Dist (ft)							185	500				
Storage Blk Time (%)						21	28					
Queuing Penalty (veh)						119	85					

**Intersection: 1: Wixom Road & Grand River Avenue**

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1033	1021
Average Queue (ft)	413	182
95th Queue (ft)	1039	592
Link Distance (ft)	1010	1010
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 2: Wixom Road & Catholic Central HS/Novi Promenade**

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	LT	R	L	T	R	L	T	R
Maximum Queue (ft)	89	28	129	102	120	426	42	108	195	30
Average Queue (ft)	30	6	57	41	20	169	10	37	65	7
95th Queue (ft)	67	23	107	79	78	369	36	77	150	25
Link Distance (ft)	259	259	270	270		415	415		676	
Upstream Blk Time (%)						1				
Queuing Penalty (veh)						2				
Storage Bay Dist (ft)					150			500		150
Storage Blk Time (%)						11			1	
Queuing Penalty (veh)						3			2	

**Intersection: 3: Wixom Road & North Driveway**

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	L
Maximum Queue (ft)	134	49	117	30	39
Average Queue (ft)	44	15	5	2	12
95th Queue (ft)	96	41	54	15	36
Link Distance (ft)	517	517	362	362	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					150
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 4: Wixom Road & South Driveway**

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	54	31
Average Queue (ft)	14	3
95th Queue (ft)	41	19
Link Distance (ft)	536	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Zone Summary**

Zone wide Queuing Penalty: 211
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**APPLICANT'S RESPONSE LETTER**

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# KRIEGER KLATT

## ARCHITECTS

06/16/2023

Re: Plan Review Center Report (06/12/2023)  
Project Number JSP 23-02 with Amendment to Consent Judgment  
Station Flats

Dear Planning Department:

Thank you for your review of the Station Flats. Below is the list of review concerns from the planning review (6/12/2023) with our responses below each item in **RED**.

### REVIEW CONCERNS

Staff is requesting additional clarification on the following items. In particular, items in **bold** should be responded to in the next submittal. Please note that any review concerns related to deviations requested as part of the amendment to the Consent Judgment are listed in the following section (Ordinance Deviations).

1. 2016 Master Plan for Land Use (Master Plan): The proposed site is identified as Community Commercial in the 2016 Master Plan for Land Use, which is not consistent with the proposed use of the site. **As the Master Plan did not envision a residential use, the proposal will need to be reviewed by the Master Planning & Zoning Committee prior to going before the Planning Commission or City Council for consideration. This is scheduled for May 24.**

**We met with the Committee informally and we thought the meeting was positive.**

2. Consent Judgment & Zoning: The site is currently bound to a Consent Judgment that requires the site to be developed for retail purposes under the Community Business (B-2) District standards. **An amendment to the Consent Judgment would be required for the current proposed multiple-family use.**
  - a. Uses Permitted (Item 12, B, Consent Judgment): Per the Consent Judgment, retail is only permitted on this site currently (i.e., Big Box store). **Therefore, an amendment to the consent judgment will be required.**
  - b. Buffering & Setback from Dissimilar Uses: The Consent Judgment anticipated that the site would be developed with a big box store, and no buffering between commercial uses was anticipated. Sam's Club's loading zones are immediately adjacent to the subject site, and are actively used. **The applicant is encouraged to provide buffering suitable for the proposed multiple family use adjacent to a loading zone to reduce any adverse effects of the loading/unloading, trash removal, and other aspects of the existing development.**

**All screening possible due to site constraints has been provided. 10' arborvitae and carports will screen the neighboring loading zone and retailers. The project's PC presentation will also present other projects in the area with similar conditions that have been successful.**

3. Open Space Area (Sec. 3.1.8.D): An open space calculation of 82,944 square feet has been indicated, which meets the required 32,000 square feet. However, the usable open space is not accurately represented. **Useable open space cannot be placed in a conservation area. Please revise or remove and seek a deviation for lack of meeting the usable open space requirements.**

**Open space calculations to be revised on next submittal, requirement met.**

# KRIEGER KLATT

## ARCHITECTS

4. Maximum Dwelling Unit Density/Net Size Area (Sec. 3.1.7.D, Sec. 3.8.1.A.ii): The unit mix breakdown has been provided. However, the percentages for studio, 1-bed, and 2-bed units have been incorrectly listed. **Please revise.**

**Percentages revised, see C-3.0 in next submission.**

5. End Islands (Sec. 5.3.12): End islands have been provided in the appropriate locations. However, one end island does not meet minimum square foot requirements. **Please revise.**

**Revised, see C-3.0 in next submission.**

6. Entryway Lighting (Sec. 5.7.N): One streetlight is required per entrance from a major throughfare. **Please provide site lighting at the entrance to the site off Wixom Road and show it on the photometric plan.**

**Entrance drive from Wixom Rd contains existing fixtures lighting the approach.**

7. Economic Impact Information: The requested economic impact information has not been provided at this time. **Please provide a total estimated cost of the project and the number of jobs it is anticipated to create (temporary construction jobs and permanent jobs).**

**The construction of the project will employ approximately 250 people working directly on site and roughly another 75-100 people indirectly thru supply chain, adm, banking, consultants, delivery and other associated jobs.**

**When complete it will employ approximately another 20 people thru property management, asset management, maintenance, leasing, bank oversight and development office/services.**

**The estimated construction cost of the project is approximately \$18M not including land.**

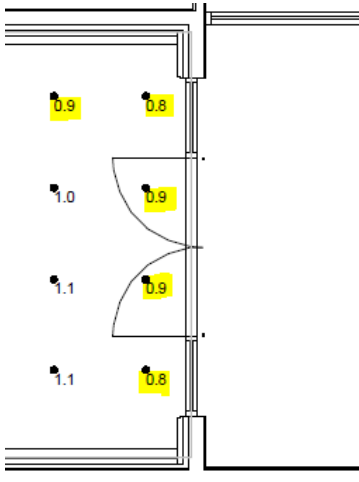
8. Development/Business Sign: At this time, a business sign has only been shown on the renderings. **Please show the location of any entranceway signs if proposed as deviations from the sign ordinance may be included in the Consent Judgment if approved.**

**Entrance sign designated on civil site plan, see C-3.0.**

9. Lighting & Photometric Plan (Sec. 5.7): There are several items that should be addressed on the photometric plan with the next submittal as listed below.
  - a. Lighting Specifications (Sec. 5.7.A.2.ii): **Please provide specification sheets for the proposed light fixtures, fixture mounting detail, fixture design, and fixture hours of operation.**

**Specifications have been provided, please see separate PDF. All exterior lighting will operate on photocells.**

- b. Minimum Illumination (Sec. 5.7.3.K): **Please revise the main entrances to buildings to meet the 1 fc minimum (0.8 fc shown).**



Photometric will be updated with all requirements being met.



Below is the list of deviations from the planning review (6/12/2023) with revisions in **RED**. Please note that a deviation was added, see #15.

## ORDINANCE DEVIATIONS

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The applicant has submitted a narrative describing the deviations present in the proposed plans. The deviations identified are as follows (staff comments in **bold** type):

1. Parking Setbacks (Sec. 3.1.7.D, Sec. 3.6.2.B): The proposed parking lot layouts generally comply with the ordinance requirements. However, two proposed out-lots and the main parking lot do not meet the 20 foot side yard setback requirement or the 75 foot front yard setback requirement. The applicant is requesting a deviation of 10 feet (20 feet required, 10 feet proposed) from the north side yard setback in the west out-lot and a deviation of 30 feet (75 feet required, 45 feet proposed) from the front yard setback in the west out-lot. In addition, the applicant is requesting a deviation of 8.29 feet (20 feet required, 11.71 feet proposed) from the north side yard setback in the north out-lot. The applicant is also requesting a deviation of 5 feet (75 feet required, 70 feet proposed) from the front yard setback in the main parking lot.

**Staff Comment: Staff supports the request for this deviation as the proposed parking lots are necessary to provide sufficient parking for the development as long as there are not any conflicts with existing easements or required landscaping. With the next submittal the applicant shall identify the location of all of the noted deviations on the proposed Concept Plan.**

2. Maximum Number of Units (Sec. 3.8.1.B.ii): The proposed unit mix exceeds the maximum percentage allowed for both efficiency units and one bedroom units. The applicant is requesting a **deviation of 5%** (10% required, **15% proposed**) for efficiency units and a **deviation of 5%** (33% required, **38% proposed**) for one bedroom units.

**Percentages revised to reflect those on architectural plans.**

**Staff Comment: Staff supports this deviation as the applicant has provided additional 2-bedroom units (64 units, 40.8%) to help provide a good balance of units for the proposed development.**

3. Maximum Length of the Buildings (Sec. 3.8.2.C): A single building cannot exceed 180 feet in length. The applicant is requesting a deviation of 188 feet (180 feet required, 368 feet proposed) for the building length.

**Staff Comment: Staff supports the request for this deviation as the proposed building fits the design of the site more cohesively than previous proposals.**

4. Building Orientation (Sec. 3.8.2.D): The proposed buildings are required to be oriented 45° in relation to the property lines. Currently, the proposed buildings are oriented parallel to the property lines.

**Staff Comment: Staff supports the request for this deviation as the proposed building fits the design of the site more cohesively than previous proposals.**

# KRIEGER KLATT

## ARCHITECTS

5. Yard Setback Restrictions (Sec. 3.8.2.E): Within any required yard setback, off-street parking, maneuvering lanes, service drives, or loading areas cannot exceed 30% of the required yard area. The applicant is requesting a deviation of 17.96% (30% required, 47.96% proposed) from this requirement.

**Staff Comment: Staff supports the request for this deviation as long as there are not any conflicts with required landscaping or usable open space.**

6. Off-Street Parking or Related Drives (Sec. 3.8.2.F): Off-street parking shall be no closer than 25 feet to any wall of a dwelling structure that contains openings involving living areas and off-street parking shall be no closer than 20 feet from any property line. Currently, neither of these requirements are met. The applicant is requesting a deviation of 8 feet (25 feet required, 17 feet proposed) from the setback requirements from living areas and a deviation of 10 feet (20 feet required, 10 feet proposed) from the property line setback requirements.

**Staff Comment: Staff supports the request for this deviation as the layout of the parking lot does not negatively impact the site with the proposed setbacks.**

7. Pedestrian Connectivity (Sec. 3.8.2.G): 5 foot wide sidewalks are required on both sides of the proposed private access drive. A 7 foot wide sidewalk connecting to Target on the south side of the property has been provided. However, a sidewalk located on the north side of the property is still required.

**Staff Comment: Staff supports this request as pedestrian connectivity has been maximized given the site constraints.**

8. Number of Parking Spaces (Sec. 5.2.12.A): Based on current calculations, 315 parking spaces are required and only 247 are provided. The applicant is requesting a deviation of 68 parking spaces (315 required, 247 provided).

**Staff Comment: Staff supports this request if a shared parking study and narrative is provided to show that sufficient parking exists.**

9. Maneuvering Lanes (Sec. 5.3.2): A minimum maneuvering lane width of 24 feet is required when adjacent to parking. The applicant is requesting a deviation of 2 feet (24 feet required, 22 feet proposed).

**Staff Comment: Staff supports this request if fire access and traffic access to the parking spaces is not impeded.**

10. Parking on Major and Minor Drives: Off-street parking shall be no closer than 25 feet to any wall of a dwelling structure that contains openings involving living areas. In addition, it is not permitted on a major drive. The applicant is requesting a deviation of 8 feet (25 feet required, 17 feet proposed) from the setback requirements and requests a deviation allowing parking on a major drive.

**Staff Comment: Staff supports the request for this deviation as the layout of the parking lot does not negatively impact the site with the proposed setbacks or traffic flow.**

11. Pedestrian Connectivity (Sec. 3.8.2.G): Five foot wide sidewalks are required on the north and south portion of the site. Currently, the applicant is only proposing a five foot wide sidewalk on the south portion of the site and a five foot sidewalk connecting to the west out-lot. The applicant is requesting a deviation from providing a required five foot sidewalk along the north portion of the site that connects to the Wixom Road sidewalk system.

**Staff Comment: Staff supports this request as pedestrian connectivity has been maximized given the site constraints.**

# KRIEGER KLATT

## ARCHITECTS

12. Gross Building Area – Retail (Item 12, A, Consent Judgment): Per the Consent Judgment, Retail "B," which is proposed to be located on this property, shall not exceed 100,000 square feet in total square footage. The proposed development is estimated to be 183,300. The applicant is requesting a deviation of 83,300 gross square feet (100,000 square feet required, 183,300 square feet proposed).

**Staff Comment: Staff supports the request for this deviation so long as the proposed use is considered compatible by the Planning Commission and City Council.**

13. Parking (Item 12, E, Consent Judgment): Per the Consent Judgment, a total of 1,725 parking spaces shall be provided between Retail A, B, and C. 1,470 total spaces are proposed for Retail A, B, and C. The applicant is requesting a deviation of 255 parking spaces (1,725 required, 1,470 proposed).

**Staff Comment: Staff supports the request for this deviation so long as the Traffic Impact Study is approved, and a shared parking study and narrative is provided as part of the site plan submittal.**

14. Entranceway Sign (City Code Section 28.3): A proposed entranceway sign appears on the rendering provided with the site plan. The dimensions of the proposed entranceway sign are unclear and will be provided at a later date. The applicant is requesting a deviation of 91 square feet in size (24 square feet required, 115 square feet proposed).

**Staff Comment: Staff supports the request for this deviation so long as the signage is designed in a manner that complements the design of the site.**

15. Building Façade Materials: Proposed fiber cement lap siding in lieu of vinyl siding permitted per zoning ordinance.



## PLANNING REVIEW CHART: B-2, Community Business w/Consent Judgment

**Review Date:** May 26, 2023  
**Review Type:** Revised Consent Judgment Concept Plan  
**Project Name:** **JSP23-02 STATION FLATS**  
 50-22-17-101-032; East of Wixom Rd, South of Grand River Ave  
**Plan Date:** May 5, 2023  
**Prepared by:** Christian Carroll, Planner  
**E-mail:** [ccarroll@cityofnovi.org](mailto:ccarroll@cityofnovi.org) **Phone:** (248) 735-5607

Items in **Bold** need to be addressed by the applicant with next submittal. *Italicized* items should be noted.

Item	Required Code	Proposed	Meets Code	Comments
<b>Zoning and Use Requirements</b>				
<b>Master Plan</b>	Community Commercial	Multiple-Family Residential – Land Use Narrative provided.	<b>No</b>	<i>As the Master Plan did not envision multiple-family use, it will need to be reviewed by Master Plan &amp; Zoning Committee of the Planning Commission.</i>
<b>Zoning</b>	B-2, Community Business (Consent Judgment)	RM-2, High-Density, Mid-Rise Multiple-Family Residential	<b>No</b>	<b>An amendment to the consent judgment would be required.</b> <b>Understood.</b>
<b>Uses Permitted</b> (Sec 3.1.11.B & C)	B-2 Uses permitted listed in Section 3.1.11.B & C	Multiple-Family Residential (RM-2)	<b>No</b>	<i>All review comments below pertain to the current Consent Judgment and the proposed change to RM-2 Zoning.</i>
<b>Residential: Height, Bulk, Density, and Area Limitations (Sec. 3.1.8.D)</b>				
<b>Frontage on a Public Street</b> (Sec. 5.12)	Frontage on a Public Street is required	Frontage on Wixom Road	Yes	
<b>Access to a Major Thoroughfare</b> (Sec. 5.13)	Vehicular access shall be provided only to an existing or planned major thoroughfare or freeway service drive OR access driveway on other street type is not across street from existing or planned single-family uses	Complies	Yes	
<b>Minimum Zoning Lot Size</b> for each Unit: in Acres (Sec 3.8.1)	RM-2 Required Conditions <u>See below</u>	Unit mix and height provided	Yes	
<b>Minimum Zoning Lot Size</b> for each Unit: Width in Feet (Sec 3.8.1)		Unit mix and height provided	Yes	
<b>Open Space Area</b> (Sec. 3.1.8.D)	200 sf Minimum usable open space per dwelling unit For a total of 157 dwelling units, <u>required Open Space: 31,400 SF</u>	Courtyards: 16,200 sf Balconies: 11,055 sf Designated open space: 4,000 sf Total: 31,475 sf	<b>TBD</b>	<b>The proposed designated open space is located within a conservation easement and would not be permitted. Please revise the location or seek a deviation for reduced usable open space.</b> <b>Calculation revised.</b>
<b>Maximum % of</b>	25%	4.24%	Yes	

Item	Required Code		Proposed	Meets Code	Comments
<b>Lot Area Covered</b> (By All Buildings)					
<b>Building Height</b> (Sec. 3.1.8.D)	65 ft or 5 stories, whichever is less		4 stories, 46 ft tall	Yes	
<b>Minimum Floor Area per Unit</b> (Sec. 3.1.8.D)	Efficiency	400 sf	500 sf	Yes	
	1 bedroom	500 sf	720 sf	Yes	
	2 bedroom	750 sf	860 sf	Yes	
	3 bedroom	900 sf	1,600 sf	Yes	
	4 bedroom	1,000 sf	None	NA	
<b>Maximum Dwelling Unit Density/Net Size Area</b> (Sec. 3.1.8.D)	Efficiency	Max 10%	15.3%, 24 units/8.64 net ac = 2.77 du/ac	No	Please update the percentage in Sheet C-3.0 as it is incorrect. See max number of units <b>Deviation requested for unit mix percentage.</b>
	1 bedroom and Live/Work (1 bedroom)	31.1 du/net ac. Max 33%	38.2% + 4.4% = 42.6%, (60 + 7)/8.64 net ac = 7.75 du/ac	No	Please update the percentage in Sheet C-3.0 as it is incorrect. See max number of units <b>Deviation requested for unit mix percentage.</b>
	2 bedroom	20.7 du/net ac.	40.8%, 64/8.64 net ac = 7.41 du/ac	No	Please update the percentage in Sheet C-3.0 as it is incorrect. See max number of units <b>Under max per net acre.</b>
	3+ bedroom	15.6 du/net ac.	1.3%, 2/8.64 net ac = 0.23 du/ac	No	See max number of units. <b>Under max per net acre.</b>
<b>Residential Building Setbacks</b> (Sec. 3.1.8.D, Sec. 3.6.2.B, and Sec. 3.8.2.C - if applicable)					
Front (West)	75 feet		103.21 feet	Yes	
Side (North)	75 feet		163.89 feet	Yes	
Side (South)	75 feet		660.79 feet	Yes	
Rear (East)	75 feet		484.48 feet	Yes	
<b>Parking Setbacks</b> (Sec. 3.1.8.D) Refer to applicable notes in Sec. 3.6.2					
Front (West)	75 feet (Street frontage)		~45 feet (west out lot), ~70 feet (main lot)	No	Deviations requested as part of the Consent Judgment. <b>Deviation Requested.</b>
Side (North)	20 feet		10 feet (west out lot), 11.71 feet (north out lot)	No	Deviation requested as part of the Consent Judgment. <b>Deviation Requested.</b>
Side (South)	20 feet		Complies	Yes	
Rear (East)	20 feet		Complies	Yes	
<b>RM-2: Note to District Standards</b> (Sec. 3.6.2)					

<p><b>Area Requirements</b> (Sec. 3.6.2.A)</p>	<p>Pursuant to the definition contained in Section 2.2, lot width shall be measured between the two points where the front setback line intersects the side lot lines. Within the residential districts, where a main building is</p>	<p>Reduction not proposed at this time</p>	<p>Yes</p>	
	<p>placed behind the front setback line, the distance between the side lot lines shall not be reduced below 90% of the required minimum lot width at any point between the front set back line and such main building. The purpose of this amendment is to protect against the creation within the city of irregularly-shaped flag lots.</p>			
<p><b>Structure Setback Requirements</b> (Sec. 3.6.2.B)</p>	<p>For all uses permitted other than single-family or two-family residential, the building or structure setback shall at least equal to: (1) the height of the main building; (2) seventy-five (75) feet; or (3) the setback required in the Development Standards of Section 3.1 of this Ordinance, whichever is greater. However, the minimum building setback from access streets may be reduced to fifty (50) feet for fire department structures where quick access to the street network is required. For all off-street parking lots serving any use other than single-family residential, the setback from any interior side or rear lot line shall be not less than twenty (20) feet, and the setback from the front and any exterior side lot line shall comply with the building setback required for such uses specified above. Further, for churches there shall be no parking in the front yard. (See also Section 4.10.)</p>	<p>75 foot building setback from all property lines is required and is met.</p> <p>Off-street parking lot in the two out lots do not meet 20 foot minimums.</p>		<p><i>The minimum building setback from access streets may be reduced to 50 feet for fire department structures where quick access to the street network is required.</i></p> <p><b>Off-street parking lots shall not be setback less than 20 feet from any interior side or rear lot line. Deviation requested as part of the Consent Judgment.</b></p> <p><b>Deviation Requested.</b></p>
<p><b>Exterior Side Yard Abutting a Street</b> (Sec 3.6.2.C)</p>	<p>All exterior side yards abutting a street shall be provided with a setback equal to front yard.</p>	<p>Complies</p>	<p>Yes</p>	

<b>Wetland/Watercourse Setback</b> (Sec 3.6.2.M)	A setback of 25ft from wetlands and from high watermark course shall be maintained		Shown	Yes	<b>Authorization to Encroach into Wetland Buffer Area will be required.</b> <b>Understood.</b>
<b>RM-2 District Required Conditions (Sec. 3.8 &amp; 3.10)</b>					
<b>Total number of rooms</b> (Sec. 3.8.1.B)	Total No. of rooms < Net site area in SF/700 376,534 SF/700 = 538		358 rooms	Yes	
<b>Public Utilities</b> (Sec. 3.8.1)	All public utilities should be available		Shown	Yes	
<b>Maximum Number of Units</b> (Sec. 3.8.1.B.ii)	Efficiency < 10 percent of the units		15%	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b> <b>Deviation Requested.</b>
	1 bedroom units < 33 percent of the units		42.6%	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b> <b>Deviation Requested.</b>
	Balance should be at least 2 bedroom units		42.1% - percentages are closer than previous submittal	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b> <b>Deviation Requested .</b>
<b>Room Count per Dwelling Unit Size</b> (Sec. 3.8.1.C)  <i>An extra room such as den, library or other extra room count as an additional bedroom</i>	<b>Dwelling Unit Size</b>	<b>Room Count *</b>			
	Efficiency	1	24 units – 24 rooms	Yes	
	1 bed* (live/work included)	2	67 units – 134 rooms	Yes	
	2 bedroom	3	64 units – 192 rooms	Yes	
	3 or more bedrooms	4	2 units – 8 rooms	Yes	
For the purpose of determining lot area requirements and density in a multiple-family district, a room is a living room, dining room or bedroom, equal to at least eighty (80) square feet in area. A room shall not include the area in kitchen, sanitary facilities, utility provisions, corridors, hallways, and storage. Plans presented showing one (1), two (2), or three (3) bedroom units and including a "den," "library," or other extra room shall count such extra room as a bedroom for the purpose of computing density.					
<b>Setback along natural shoreline</b> (Sec. 3.8.2.A)	A minimum of 150 feet along natural shoreline is required.		No shoreline	NA	
<b>Structure frontage</b> (Sec. 3.8.2.B)	Each structure in the dwelling group shall front either on a dedicated public street or approved private drive.		Drives will be private	Yes	
<b>Maximum length of the buildings</b> (Sec. 3.8.2.C)	A single building or a group of attached buildings cannot exceed 180 ft.		368 feet	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b> <b>Deviation Requested.</b>

Item	Required Code	Proposed	Meets Code	Comments
<p><b>Modification of maximum length</b>                      (Sec. 3.8.2.C)</p>	<p>Planning Commission may modify the extra length up to 360 ft if common areas with a minimum capacity of 50 persons for recreation or social purposes. Additional setback of 1 ft. for every 3 ft. in excess of 180 ft. from all</p>		<p>NA</p>	<p><i>Applicant is not seeking a modification at this time.</i></p>



Item	Required Code	Proposed	Meets Code	Comments
	property lines.			
<b>Building Orientation</b> (Sec. 3.8.2.D)	Where any multiple dwelling structure and/ or accessory structure is located along an outer perimeter property line adjacent to another residential or nonresidential district, said structure shall be oriented at a minimum angle of 45 degrees to property line.	Building is not currently angled, required to be angled 45°	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation Requested.</b>
<b>Yard setback restrictions</b> (Sec. 3.8.2.E)	Within any front, side or rear yard, off-street parking, maneuvering lanes, service drives or loading areas cannot exceed 30% of yard area	47.96%	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation Requested.</b>
<b>Off-Street Parking or related drives</b> (Sec. 3.8.2.F)	No closer than 25 ft. to any wall of a dwelling structure that contains openings involving living areas	17 ft	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation Requested.</b>
<i>Off-street parking and related drives shall be...</i>	No closer than 8 ft for other walls	17 ft	Yes	
	No closer than 20 ft from ROW and property line	10 ft	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation requested.</b>
<b>Pedestrian Connectivity</b> (Sec. 3.8.2.G)	5 feet sidewalks on both sides of the Private drive are required to permit safe and convenient pedestrian access.	7 foot wide sidewalk connecting to Target. No sidewalk on the north side.	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation Requested.</b>
	Where feasible sidewalks shall be connected to other pedestrian features abutting the site.	Connected to main sidewalk system via Target.	Yes	
	All sidewalks shall comply with barrier free design standards	Barrier free markings shown	TBD	<b>See Traffic Review for more information.</b>  <b>All barrier free requirements will be met.</b>
<b>Minimum Distance between the buildings</b> (Sec. 3.8.2.H)	(Total length of building A + total length of building B + 2(height of building + height of building B))/6		NA	<i>One building proposed.</i>

Item	Required Code	Proposed	Meets Code	Comments
	distance shall be fifteen (15) feet.			
<b>Number of Parking Spaces</b> Residential, Multiple-family (Sec. 5.2.12.A)	Two (2) for each dwelling unit having two (2) or less bedrooms and two and one-half (2 ½) for each dwelling unit having three (3) or more bedrooms  2 x (7 L/W + 24 studio + 60 1-bed + 64 2-bed) = 310   2.5 x 2 3-bed = 5 <b>Spaces Required: 315</b>	247 spaces are provided  ITE Calculation shows 1.1539 spaces per dwelling unit = 238 spaces	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment. See the Traffic Review for more information.</b>  <b>Parking study to be provided. Parking is NOT to be shared with neighboring retailers.</b>
<b>Parking Space Dimensions and Maneuvering Lanes</b> (Sec. 5.3.2)	- 90° Parking: 9 ft. x 19 ft. - 24 ft. two way drives - 9 ft. x 17 ft. parking spaces allowed along 7 ft. wide interior sidewalks as long as detail indicates a 4" curb at these locations and along landscaping	4" curb with 9' x 17' spaces	No	<b>Minimum width of a maneuvering lane is 24 feet when parking is proposed. Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation requested.</b>
<b>End Islands</b> (Sec. 5.3.12)	- End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles. - The end islands shall generally be at least 8 ft. wide, have an outside radius of 15 ft., and be constructed 3 ft. shorter than the adjacent parking stall	End Islands provided	Yes	<b>The end island located on the northwest corner of the site does not meet minimum square footage requirements. See Landscape Review for more information.</b>  <b>Island revised.</b>
<b>Parking stall located adjacent to a parking lot entrance</b> (public or private) (Sec. 5.3.13)	Shall not be located closer than twenty-five (25) feet from the street right-of-way (ROW) line, street easement or sidewalk, whichever is closer	25 feet (1 space in out lot)	Yes	
<b>Barrier Free Spaces</b> Barrier Free Code	With 321 spaces required, 6 standard BF and 2 van-accessible BF spaces required	6 van accessible, 2 standard	Yes	
<b>Barrier Free Space Dimensions</b> Barrier Free Code	- 8' wide with an 8' wide access aisle for van accessible spaces - 8' wide with a 5' wide access aisle for regular accessible spaces	8' wide with curb, 8' access	Yes	
<b>Barrier Free Signs</b> Barrier Free Code	One sign for each accessible parking space.	Shown	Yes	

<b>Corner Clearance</b> (Sec. 5.9)	No fence, wall plant material, sign or other obstruction shall	Shall comply	Yes	<b>See Landscape Review.</b>
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Item	Required Code	Proposed	Meets Code	Comments
	be permitted within the clear view zone above a height of 2 feet from established street grade			<b>Corner clearances will be met.</b>
<b>Minimum number of Bicycle Parking</b> (Sec. 5.16.1) <u>Multiple-family residential</u>	One (1) space for each five (5) dwelling units  <b>Required: 32 Spaces</b>	24 exterior spaces shown, 8 interior spaces	Yes	
<b>Bicycle Parking General requirements</b> (Sec. 5.16)	No farther than 120 ft. from the entrance being served	Complies	Yes	
	When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations	Complies	Yes	
	Spaces to be paved and the bike rack shall be inverted "U" design Shall be accessible via 6 ft. paved sidewalk	Complies	Yes	
<b>Bicycle Parking Lot layout</b> (Sec 5.16.6)	Parking space width: 6 ft. One tier width: 10 ft. Two tier width: 16 ft. Maneuvering lane width: 4 ft. Parking space depth: 2 ft. single, 2 ½ ft. double	Complies	Yes	
<b>Additional Road Design, Building Setback, And Parking Setback Requirements, Multiple-Family Uses (Sec. 5.10)</b>				
<b>Road standards</b> (Sec. 5.10)	A private drive network within a cluster, two-family, multiple-family, or non-residential uses and developments shall be built to City of Novi Design and Construction Standards for local street standards (28 feet back-to-back width)	Minimum 28 feet wide	Yes	
<b>Major Drives</b>	Width: 28 feet, no parking	Minimum 28 feet wide	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation Requested.</b>
<b>Minor Drive</b>	- Cannot exceed 600 feet - Width: 24 feet with no on-street parking - Width: 28 feet with parking on one side - Parking on two sides is not allowed - Needs turn-around if longer than 150 feet	None shown	NA	
<b>Parking on Major and Minor Drives</b>	- Angled and perpendicular parking, permitted on minor	All conditions met, except the	No	<b>Applicant is requesting a deviation from this</b>

Item	Required Code	Proposed	Meets Code	Comments
	drive, but not from a major drive; - minimum centerline radius: 100 feet - Adjacent parking and on-street parking shall be limited near curves with less than two-hundred thirty (230) feet of centerline radius - Minimum building setback from the end of a parking stall shall be 25 feet in residential districts.	minimum building setback appears to be 17 feet		<b>requirement as part of the Consent Judgment.</b>  <b>Deviation Requested.</b>
<b>Accessory and Rooftop Structures (Sec. 4.19)</b>				
<b>Dumpster</b> (Sec. 4.19.2.F)	<ul style="list-style-type: none"> <li>- Located in rear yard</li> <li>- Attached to the building or no closer than 10 ft. from building if not attached</li> <li>- Not located in parking setback</li> <li>- If no setback, then it cannot be any closer than 10 ft, from property line.</li> <li>- Away from Barrier free Spaces</li> </ul>	<ul style="list-style-type: none"> <li>- In Rear Yard</li> <li>- Complies</li> <li>- Complies</li> <li>- Complies</li> <li>- Complies</li> </ul>	Yes	
<b>Dumpster Enclosure</b> (Sec. 21-145. (c) Chapter 21 of City Code of Ordinances)	<ul style="list-style-type: none"> <li>- Screened from public view</li> <li>- A wall or fence 1 ft. higher than height of refuse bin</li> <li>- And no less than 5 ft. on three sides</li> <li>- Posts or bumpers to protect the screening</li> <li>- Hard surface pad</li> <li>- Screening Materials: Masonry, wood or evergreen shrubbery</li> </ul>	<ul style="list-style-type: none"> <li>- Screening not sufficient</li> <li>- 6 ft tall</li> <li>- Complies</li> <li>- Complies</li> <li>- Complies</li> <li>- Masonry</li> </ul>	Yes	
<b>Roof top equipment and wall mounted utility equipment</b> (Sec. 4.19.2.E.ii)	All roof top equipment must be screened, and all wall mounted utility equipment must be enclosed and integrated into the design and color of the building	Shown – will be required to be screened	TBD	<b>All rooftop equipment screened adequately via parapets.</b>
<b>Roof top appurtenances screening</b>	Roof top appurtenances shall be screened in accordance with applicable facade regulations, and shall not be visible from any street, road or adjacent property.	Shown – will be required to be screened	TBD	
<b>Sidewalks and Other Requirements</b>				
<b>Non-Motorized Plan</b>	No additional pathways shown.	None shown	NA	

Item	Required Code	Proposed	Meets Code	Comments
<b>Sidewalks</b> (Subdivision Ordinance: Sec. 4.05)	Sidewalks are required on both sides of proposed drives	Only shown on one side (Target)	No	<b>Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>  <b>Deviation requested.</b>
<b>Public Sidewalks</b> (Chapter 11, Sec.11-276(b), Subdivision Ordinance: Sec. 4.05)	Connection to main sidewalk on Wixom Road required.	Connection provided	Yes	
<b>Entryway lighting</b> (Sec. 5.7.N)	One streetlight is required per entrance.	Photometric plan provided	TBD	<b>Lighting may be required along entry drive.</b>  <b>Entry drive lighting exists.</b>
<b>Consent Judgment Requirements - Attached</b>				
<b>Total Green and Open Space</b> (Item 11, A)	-The total green and open space, including preservation areas and interior landscaping, shall be preserved and maintained by the Developer on the property, and shall be a minimum of 40% of the total (not including 2.34 acres of right-of-way) land area. - The area depicted on Exhibit B as "Preserved Woodlands, Wetland and Storm Water Detention" shall be permanently preserved, and prior to the issuance of any development approval, the Developer shall execute and record the Conservation Easement attached as Exhibit C prior to any site development approvals [...]	80%	Yes	
<b>Landscape Areas</b> (Item 11, B)	The landscape areas [...] shall be constructed and preserved by the Developer, and shall be subject to the maintenance obligations set forth in this judgment.	Shall comply	Yes	See Landscape Review.
<b>Gross Building Area – Retail</b> (Item 12, A)	Retail "B" located on this property, which shall not exceed 100,000 square feet.	183,300 gross square feet	No	<b>The proposed square footage of the site exceeds 100,000 square feet. Applicant is requesting a deviation from this requirement as part of the Consent Judgment.</b>

<b>Uses Permitted</b> <i>(Item 12, B)</i>	Retail "A," "B" and "C" shall conform to the uses permitted in the B-2 zoning district as described in the City of Novi	RM-2 Proposed.	<b>No</b>	<b>Amendment to the Consent Judgment will be required.</b>  <b>Deviation requested.</b>
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Item	Required Code	Proposed	Meets Code	Comments
	Zoning Ordinance [...]			
<b>Uses Not Permitted</b> (Item 12, D)	Arcades and adult business uses (or any other uses involving sexually explicit activities, all as defined in the City Zoning Ordinance, as amended) shall not be permitted.	Not proposed	Yes	
<b>Parking</b> (Item 12, E)	Plaintiffs shall provide 1,725 parking spaces for Retail "A," "B" and "C."	247 spaces proposed. 1,470 spaces for Retail A-C.	<b>No</b>	<b>Applicant is requesting a deviation of 255 total spaces from this requirement as part of the Consent Judgment.</b>  <b>Deviation requested.</b>
<b>Building Code and Other Requirements</b>				
<b>Woodlands</b> (City Code Ch. 37)	Replacement of removed trees	No impacts.	NA	Woodland & Wetland Area to be preserved.
<b>Wetlands</b> (City Code Ch. 12, Art. V)	Mitigation of removed wetlands at ratio of 1.5:1 emergent wetland, 2:1 for forested wetlands	Proposed retaining wall impacting wetland area.	<b>TBD</b>	<b>See Wetland Review.</b>  <b>Impact will be proposed to be minimum will be determined during CP phase.</b>
<b>Design and Construction Standards Manual</b>	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Generally provided	Yes	Additional sheets may be requested, as necessary.
<b>General layout and dimension of proposed physical improvements</b>	Location of all existing and proposed buildings, proposed building heights, building layouts, (floor area in square feet), location of proposed parking and parking layout, streets and drives, and indicate square footage of pavement area (indicate public or private).	Generally provided	Yes	
<b>Economic Impact Information</b>	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	None provided	<b>No</b>	<b>Please provide listed information (i.e., estimated cost, jobs) with the next submittal.</b>  <b>See response in review concerns section.</b>
<b>Building Exits</b>	Building exits must be connected to sidewalk system or parking lot.	Complies	Yes	



<b>Phasing</b>	All projects must be completed within two years of the issuance of any starting permit or phasing plan should be provided	One phase	NA	
<b>Other Permits and Approvals</b>				

Item	Required Code	Proposed	Meets Code	Comments
<b>Development/ Business Sign</b> <i>(City Code Sec 28.3)</i>	The leading edge of the sign structure shall be a minimum of 10 ft. behind the right-of-way. Entranceway shall be a maximum of 24 square feet, measured by completely enclosing all lettering within a geometric shape. Maximum height of the sign shall be 5 ft.	Appears on rendering, not shown on plan	No	<b>Show the location of any entranceway signs if proposed; deviation from sign ordinance has been requested.</b>  <b>Note added to civil drawings.</b>
<b>Project &amp; Street Naming Committee</b>	Some projects may need approval from the Street & Project Naming Committee	One street name approved	Yes	Contact Diana Shanahan at 248.347.0475 or via email <a href="mailto:dshanahan@cityofnovi.org">dshanahan@cityofnovi.org</a>
<b>Parcel Split or Combination or Condominium Approval</b>	Any parcel splits or combinations or condominium approvals must be completed before Stamping Set approval.	None proposed	NA	
<b>Other Legal Requirements</b>				
<b>Master Deed/Covenants and Restrictions</b>	Applicant is required to submit this information for review with the Final Site Plan submittal	Not applicable at this moment	TBD	<u>If proposed, Master Deed draft shall be submitted prior to Stamping Set approval.</u>  <b>Noted</b>
<b>Conservation easements</b>	Conservation easements may be required for woodland impacts	Additional wetland and woodland easements may be required	TBD	<u>Draft documents would be required prior to stamping set approval.</u>  <b>Noted</b>
<b>Lighting and Photometric Plan (Sec. 5.7)</b>				
<b>Intent (Sec. 5.7.1)</b>	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties & reduce unnecessary transmission of light into the night sky	A lighting and photometric plan is provided	Yes	
<b>Lighting Plan (Sec. 5.7.2.A.i)</b>	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures	Provided	Yes	
<b>Building Lighting (Sec. 5.7.2.A.iii)</b>	Relevant building elevation drawings showing all fixtures, the portions of the walls to be illuminated, illuminance levels of walls and the aiming points of any remote fixtures.	Provided	Yes	
<b>Lighting</b>	Specifications for all proposed & existing lighting fixtures	Not provided	No	<b>Provide specification sheets for light fixtures,</b>
	Photometric data	Provided	Yes	

<b>Specifications</b> (Sec. 5.7.A.2.ii)	Fixture height	Max 20 feet	<b>No</b>	<b>mounting detail and design, hours of operation.</b>
	Mounting & design	Not provided	<b>No</b>	

Item	Required Code	Proposed	Meets Code	Comments
	Glare control devices (Also see Sec. 5.7.3.D)	Appears to comply	Yes	<b>All spec sheets have been provided. Lights will operate on photocells and not require timers.</b>
	Type & color rendition of lamps	LED Lamps	Yes	
	Hours of operation	Not provided	<b>No</b>	
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties	Provided	Yes	
<b>Max Height</b> (Sec. 5.7.3.A)	Height not to exceed maximum height of 25 feet	Max 20 feet	Yes	
<b>Standard Notes</b> (Sec. 5.7.3.B)	<ul style="list-style-type: none"> <li>- Electrical service to light fixtures shall be placed underground</li> <li>- Flashing light shall not be permitted</li> <li>- Only necessary lighting for security purposes &amp; limited operations shall be permitted after a site's hours of operation</li> </ul>	Provided	Yes	
<b>Security Lighting</b> (Sec. 5.7.3.H)	<ul style="list-style-type: none"> <li>- All fixtures shall be located, shielded and aimed at the areas to be secured.</li> <li>- Fixtures mounted on the building and designed to illuminate the facade are preferred</li> </ul>	Complies	Yes	
<b>Average Light Level</b> (Sec.5.7.3.E)	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1	Generally complies	Yes	
<b>Lighting Type</b> (Sec. 5.7.3.F)	Use of true color rendering lamps such as metal halide is preferred over high & low pressure sodium lamps	LED Lighting	Yes	
<b>Min. Illumination</b> (Sec. 5.7.3.K)	Parking areas: 0.2 fc min	0.5 fc	Yes	<b>Revise the main entrances to meet 1.0 foot candle minimum.</b>  <b>All lighting requirements will be met.</b>
	Loading & unloading areas: 0.4 fc min	1 fc	Yes	
	Walkways: 0.2 fc min	0.3 fc	Yes	
	Building entrances, frequent use: 1.0 fc min	0.8 fc	<b>No</b>	
	Building entrances, infrequent use: 0.2 min	0.4 fc	Yes	
<b>Max. Illumination adjacent to Non-Residential</b> (Sec. 5.7.3.K)	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle	0.5 fc	Yes	

Item	Required Code	Proposed	Meets Code	Comments
<b>Cut off Angles</b> (Sec. 5.7.3.L)	When adjacent to residential districts: - All cut off angles of fixtures must be 90° - maximum illumination at the property line shall not exceed 0.5 foot candle - No direct light source shall be visible at the property line (adjacent to residential) at ground level	Not applicable	NA	

**NOTES:**

1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.
2. The section of the applicable ordinance or standard is indicated in parenthesis. Please refer to those sections in Article 3, 4 and 5 of the zoning ordinance for further details.
3. Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.



# PLAN REVIEW CENTER REPORT

May 22, 2023  
Station Flats  
Revised Preliminary Site Plan - Landscaping

## Review Type

Revised Preliminary Site Plan Landscape Review

## Job #

JSP23-0002

## Property Characteristics

- Site Location: Wixom Road, south of Sam's Club
- Site Acreage: 24.78 ac.
- Site Zoning: I-1 Proposed RM-1 with PRO
- Adjacent Zoning: North, East, South, West: I-1 (Commercial Use)
- Plan Date: 5/4/2023

## Ordinance Considerations

This project was reviewed for conformance with Chapter 37: Woodland Protection, Zoning Article 5.5 Landscape Standards, the Landscape Design Manual and any other applicable provisions of the Zoning Ordinance. Items in **bold** below must be addressed and incorporated as part of the revised Preliminary Site Plan submittal and underlined items must be addressed on the Final Site Plans. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review and the accompanying landscape chart are summaries and are not intended to substitute for any Ordinance.

## Recommendation:

This project **is not recommended for approval for Preliminary Site Plan**. They still have a number of landscape waivers required that are not supported and could be corrected. The issue with the screening from Sam's is more difficult but should be addressed.

## **LANDSCAPE WAIVERS REQUIRED FOR PROPOSED LAYOUT:**

- Lack of screening berm between I-1 and RM-1 on north side – *supported by staff as the proposed screening is not complete and may not provide sufficient audible buffering*
- Removal of woodland replacement trees from east side of site without replacements – *not supported by staff*
- Two bays of parking greater than 15 spaces without a landscaped island – *not supported by staff.*
- Insufficient area provided for a tree – *not supported by staff.*

**Please revise the landscaping to correct the conditions requiring the unsupported waivers.**

**Please add the city project number, JSP23-0002, to the bottom right corner of the Krieger/Klatt cover sheet.**

## Ordinance Considerations

Existing Trees (Sec 37 Woodland Protection, Preliminary Site Plan checklist #17 and LDM 2.3 (2))

1. A tree chart must be provided to match the tree chart.
2. A woodland use permit is required for the removal of those trees, which would either need to be replaced on the site, or a contribution to the tree fund would be required for

- any replacements not planted on the site.
- 3. No woodland replacements are proposed.
- 4. **A landscape waiver is required for the lack of the tree replacements. It is not supported by staff.**
- 5. **Only plants native to Michigan may be planted in the conservation easement.**

**The woodland (tree preservation plans T-1.0 and T-1.1) have been revised.**

Adjacent to Residential - Buffer (Zoning Sec. 5.5.3.B.ii and iii)

- 1. The residential project is adjacent to I-1 zoned property with a commercial use. At a minimum, a 6-8 foot tall, landscaped berm is required between the uses. No such berm is proposed. A 10-foot-tall evergreen hedge is proposed along the north and eastern edge of Parking Lot 2.
- 2. No screening is provided on the west edge of Parking Lot 2 or the north end of the western parking area.
- 3. **The evergreen hedge should be extended to wrap around the parking lot and along the north edge of the 7 space bay west of the parking lot to completely screen the loading areas. The hedge has been extended.**
- 4. **The current configuration requires a landscape waiver that would not be supported by staff.**

Adjacent to Public Rights-of-Way – Berm/Wall, Buffer and Street Trees (Zoning Sec. 5.5.3.B.ii, iii)

- 1. The project does not require any additional right-of-way berms or landscaping.
- 2. The landscaping in the boulevard island at Wixom Road is in poor condition and an acceptable replacement landscape plan for it is proposed. **The applicant may reduce the number of lindens used in that island if desired to provide more room for them to grow to their full size.**

Multi-family Landscaping:

- 1. **Unit landscaping:**
  - a) Based on the number of ground-floor units (36), 108 unit trees are required for the site. 116 trees are provided, including parking lot trees and subcanopy trees.
  - b) If desired, the excess trees may be removed from the plan.
- 2. **Interior drive trees** - All required interior drive trees are provided.
- 3. **Building foundation Landscaping**
  - a) 35% of the building frontage facing drives are required to be landscaped
  - b) 71% of the west side of the building are proposed to be landscaped.
  - c) Detailed foundation landscaping plans are required on the Final Site Plans.

Parking Lot Landscaping (Zoning Sec. 5.5.3.C.)

- 1. In general, the required parking lot landscaping interior area and trees and perimeter trees are proposed, but there are issues with the bays at the north and south ends of the building that require landscape waivers which *are not supported by staff.*
- 2. **Please see the landscape chart for a detailed discussion of those issues and correct the site plan to address them.**

Plant List (LDM 4, 10)

- 1. 14 of 22 species used (64%) are native to Michigan.
- 2. The tree mix meets the diversity requirements of LDM Section 4.
- 3. Please keep the percentage of native plants close to or greater than 64% when foundation plantings are added.

Planting Notations and Details (LDM 10)

Provided

Storm Basin Landscape (Zoning Sec 5.5.3.E.iv and LDM 3)

No new detention basin is proposed so no new landscaping is required for this project.

Irrigation (LDM 10)

Either a plan for an automated irrigation system, or an alternative method of providing sufficient water for the landscaping's establishment and long-term survival must be provided in the Final Site Plans.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.735.5621 or at [rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org).



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Rick Meader – Landscape Architect



## LANDSCAPE REVIEW SUMMARY CHART – Revised Preliminary Site Plan

**Review Date:** May 22, 2023  
**Project Name:** JSP23 – 0002: Station Flats  
**Plan Date:** May 4, 2023  
**Prepared by:** Rick Meader, Landscape Architect E-mail: [rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org);  
 Phone: (248) 735-5621

Items in **Bold** need to be addressed by the applicant before approval of the Preliminary Site Plan.  
Underlined items need to be addressed on the Final Site Plan.

### LANDSCAPE WAIVERS REQUIRED FOR PROPOSED LAYOUT:

- Lack of screening berm between I-1 and RM-1 on north side – *not supported by staff as the proposed screening is not complete and may not provide sufficient audible buffering.*
- Removal of woodland replacement trees from east side of site without replacements – *not supported by staff*
- Two bays of parking are greater than 15 spaces without a landscaped island – *not supported by staff.*
- Insufficient area provided for a tree – *not supported by staff.*

Item	Required	Proposed	Meets Code	Comments
<b>Landscape Plan Requirements – Basic Information (LDM (2))</b>				
<b>Landscape Plan</b> <i>(Zoning Sec 5.5.2, LDM 10)</i>	<ul style="list-style-type: none"> <li>• New commercial or residential developments</li> <li>• Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less.</li> <li>• 1"-20' minimum with proper North. Variations from this scale can be approved by LA</li> </ul>	<ul style="list-style-type: none"> <li>• Overall Scale 1" = 40'</li> <li>• Detail Scale 1" = 20'</li> </ul>	Yes	
<b>Owner/Developer Contact Information</b> <i>(LDM 10)</i>	Name, address and telephone number of the owner and developer or association	Yes	Yes	<b>Please add phone number or email address to title block on the plans</b>
<b>Project Information</b> <i>(LDM 10)</i>	Name and Address	Location map on L-1.0 shows site location	Yes	
<b>Survey information</b> <i>(LDM 10)</i>	Legal description or boundary line survey	<ul style="list-style-type: none"> <li>• Sheets C-1.1 and C1.2 have survey and description</li> <li>• Southern property line shown on C-1.3</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Yes</li> </ul>	
<b>Landscape Architect contact information</b> <i>(LDM 10)</i>	Name, Address and telephone number of RLA/PLA/LLA who created the plan	PEA Group – Lynn Whipple	Yes	

Item	Required	Proposed	Meets Code	Comments
<b>Sealed by LA.</b> (LDM 10)	Requires original signature	Yes		<u>Final stamping sets must be sealed by LA and have live LA signature</u>
<b>Miss Dig Note</b> (800) 482-7171 (LDM 10)	Show on all plan sheets	On Site Plans' and Landscape Plans' title block	Yes	
<b>EXISTING CONDITIONS</b>				
<b>Existing plant material</b> <b>Existing woodlands or wetlands</b> (LDM 10.h)	<ul style="list-style-type: none"> <li>• Show location type and size.</li> <li>• Label to be saved or removed.</li> <li>• Plan shall state if none exists.</li> </ul>	<ul style="list-style-type: none"> <li>• Tree survey is provided but no corresponding tree chart is</li> <li>• Current wetland delineation by PEA is provided</li> </ul>	<ul style="list-style-type: none"> <li>• Yes/No</li> <li>• Yes</li> </ul>	<ol style="list-style-type: none"> <li>1. <b>Please add a tree chart for the survey to T-1.0</b></li> <li>2. <b>The plan for Novi Promenade (included with this review) shows approximately 38 woodland replacement trees along the eastern and southern sides of the site. The tree survey shows 23 of those, of which 15 or 16 are being removed (it is unclear what is happening with #798).</b></li> <li>3. <b>Indicate all trees to be removed on the tree chart.</b></li> <li>4. <u>Please show the tree fence at the actual dripline on the plans, not just at the outside of the tree symbol, which may or may not accurately represent the dripline.</u> Indicated on the revised tree preservation plans.</li> </ol>
<b>Natural Features protection &amp; Woodland Replacements</b>		<ul style="list-style-type: none"> <li>• Existing Conservation Easement is shown</li> <li>• No woodland replacements are indicated.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	<ol style="list-style-type: none"> <li>1. <u>Please be sure that proper buffers and protection for adjacent ponds are provided</u></li> <li>2. <u>Add the replacements for the removed and missing woodland replacements from the original plan.</u></li> <li>3. <u>Per the original plan showing 38</u></li> </ol>

Item	Required	Proposed	Meets Code	Comments
				<p><u>replacements and the proposed plan which shows 5 being preserved, 33 replacements must be added to the plan. They can be planted in the existing conservation easement if desired.</u></p> <p>Indicated on the revised tree preservation plans.</p>
<b>Soil type</b> (LDM 10)	As determined by Soils survey of Oakland county	Sheet L-1.0	Yes	
<b>Zoning</b> (LDM 10)	<ul style="list-style-type: none"> <li>• Site: I-1</li> <li>• Proposed: RM-1 with PRO</li> <li>• North, East, South, West: I-1 (Commercial use)</li> </ul>	Sheet L-1.0	Yes	
<b>PROPOSED IMPROVEMENTS</b> (LDM 10)				
<b>Existing and proposed improvements</b>	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Dimensions provided on Sheets C-3.0-C3.2</li> </ul>	Yes	
<b>Existing and proposed utilities</b>	<ul style="list-style-type: none"> <li>• Overhead and underground utilities, including hydrants</li> <li>• Proposed light posts</li> </ul>	<ul style="list-style-type: none"> <li>• Proposed utilities are shown on the Utility Plan and Landscape Plans</li> <li>• No light posts are shown on the landscape plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	<b>Please add all proposed light fixtures to the landscape plan and resolve light/tree conflicts.</b>
<b>Proposed topography - 2' contour minimum</b>	Provide proposed contours at 2' interval	Spot elevations and TW/BW elevations are on Sheets C-4.1 and C-4.2	Yes	
<b>Clear Zones</b>	25 ft. corner clearance required. Refer to Zoning Sec 5.5.9	Yes	Yes	
<b>LANDSCAPING REQUIREMENTS</b>				
<b>Berms and ROW Planting</b>				
<ul style="list-style-type: none"> <li>• All berms shall have a maximum slope of 33%. Gradual slopes are encouraged. Show 1ft. contours</li> <li>• Berm should be located on lot line except in conflict with utilities.</li> <li>• Berms should be constructed with 6" of topsoil.</li> </ul>				
<b>Residential Adjacent to Non-residential (Sec 5.5.3.A) &amp; (LDM 1.a)</b>				

<b>Berm requirements</b> (Zoning Sec 5.5.3.A)	<u>Residential adjacent to I-1 requires:</u> <ul style="list-style-type: none"><li>• 10-15 foot tall landscape berm with 6 foot wide crest.</li><li>• Opacity 80% winter,</li></ul>	<ul style="list-style-type: none"><li>• No berm is proposed</li><li>• A line of evergreen shrubs is proposed along the north edge of</li></ul>	<ul style="list-style-type: none"><li>• No</li><li>• No</li></ul>	<b>1. A landscape waiver for the lack of the berm is required.</b> <b>2. The evergreen hedge should be extended to wrap</b>
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Item	Required	Proposed	Meets Code	Comments
	90% summer.  <u>Residential adjacent to commercial requires:</u> <ul style="list-style-type: none"> <li>6-8 foot tall landscape berm with 6 foot wide crest.</li> <li>Opacity 80% winter, 90% summer.</li> </ul>	the project, except around the sections facing the western Sam's loading area. A note indicates they will be maintained at a 10' ht – no screening beyond the parking lot perimeter trees is proposed there		around the northern parking areas on the west side of the parking lot and north edge of the 7-space bay west of that (but it should not block the hydrant).  <b>3. The applicant must provide some sort of demonstration of the visual and audible screening that will be provided by the proposed configuration.</b> <i>Currently, the landscape waiver would not be supported by staff.</i>
<b>Adjacent to Public Rights-of-Way (Sec 5.5.B) and (LDM 1.b) (RM-1)</b>				
<b>Greenbelt width</b>	<ul style="list-style-type: none"> <li>Adj to parking: 20 ft</li> <li>Not adj to parking: 34 ft</li> </ul>	Site is over 567 feet from Wixom Road	Yes	
<b>Min. berm crest width</b>	2 ft	0 ft	Yes	
<b>Min. berm height</b>	3 ft	0 ft	Yes	
3' wall	(4)(7)	No wall is proposed		
<b>Canopy deciduous or large evergreen trees (7)(10)(11)</b>	NA – not adjacent to ROW  The flowering pear trees and other landscaping in the boulevard island at Wixom Road are in poor condition.	None  A plan for replacing the failing entry island landscaping is provided	Yes	<b>As lindens get larger than the existing flowering pears, fewer lindens should be planted in the boulevard island to provide better space for the trees' root systems.</b>
<b>Sub-canopy deciduous trees Notes (5)(6)(10)(11)</b>	NA – not adjacent to ROW	None	Yes	
<b>Canopy deciduous trees in area between sidewalk and curb (10)</b>	NA – not adjacent to ROW	None	Yes	
<b>Multi-Family Residential (Sec 5.5.3.F.iii)</b>				
<b>Multi-family Unit Landscaping (Zoning Sec 5.5.3.F.iii.b)</b>	<ul style="list-style-type: none"> <li>3 deciduous canopy trees or large evergreen trees per dwelling unit on the first floor.</li> <li>36 units * 3 = 108 trees</li> </ul>	116 proposed, including 66 deciduous canopy trees, 32 large evergreen trees, 18 subcanopy trees	Yes	<b>1. See the discussion regarding parking lot trees below.</b> <b>2. If desired, excess multifamily trees may be removed from the</b>

Item	Required	Proposed	Meets Code	Comments
	<ul style="list-style-type: none"> <li>Up to 25% of requirement can be subcanopy trees</li> </ul>			<b>plan.</b>
<b>Interior Street Landscaping</b> (Zoning Sec 5.5.3.F.iii.b)	<ul style="list-style-type: none"> <li>1 deciduous canopy tree along interior roads for every 35 lf (both sides), excluding driveways, interior roads adjacent to public rights-of-way and parking entry drives.</li> <li>1125/35 = 32 trees</li> </ul>	32 trees	Yes	
<b>Foundation Landscaping</b> (Zoning Sec 5.5.3.F.iii.b)	35% of building façades facing road must be landscaped	71% of building facing interior drive is landscaped	Yes	<u>Include details at scale of 1"=10' or 1"=20' on Final Site Plans (not Construction Plans).</u>
<b>Parking Area Landscape Requirements</b> (Zoning Sec 5.5.3.C & LDM 5)				
<b>General requirements</b>	<ul style="list-style-type: none"> <li>Clear sight distance within parking islands</li> <li>No evergreen trees</li> </ul>	No trees are located in the clear vision zones.	Yes	
<b>Name, type and number of ground cover</b>	As proposed on planting islands	Seed lawn	Yes	
<b>General</b> (Zoning Sec 5.5.3.C)				
<b>Parking lot Islands</b> (Zoning Sec 5.5.3.c.ii, iii)	<ul style="list-style-type: none"> <li>A minimum of 200 SF to qualify</li> <li>200sf landscape space per tree planted in island.</li> <li>6" curbs</li> <li>Islands minimum width 10' BOC to BOC</li> </ul>	<ul style="list-style-type: none"> <li>The endcap island at the northwest corner of the building has been reduced to just 53sf which is not enough to support the required tree planted in it.</li> <li>The greenspace east of the walk leading from Lot 3 to the building is now large enough to support a required tree.</li> </ul>	<ul style="list-style-type: none"> <li>No</li> <li>Yes</li> </ul>	<p><b>Please restore the greenspace in the endcap island at the northwest corner of the building and add the required tree. It can be a multi-family unit tree.</b></p> <p><b>Noted</b></p>
<b>Curbs and Parking stall reduction</b> (Zoning Sec 5.5.3.c.ii)	Parking stall can be reduced to 17' with 4" curb adjacent to a sidewalk of minimum 7 ft.	17 ft spaces except in interior of western parking lot	Yes	
<b>Contiguous space limit</b> (Zoning Sec	Maximum of 15 contiguous spaces	<ul style="list-style-type: none"> <li>The northern bay on the east side</li> </ul>	No	<b>1. Please add a tree adjacent to the</b>

Item	Required	Proposed	Meets Code	Comments
5.5.3.c.ii.o))		of the building has 22 spaces without a tree. <ul style="list-style-type: none"> <li>The bay at the southern end of the building has 18 spaces without a tree.</li> <li>There is no endcap island with a tree at the northwest corner of the building.</li> </ul>		enlarged island east of the southern building entry walk. <ol style="list-style-type: none"> <li>Please add a tree in the island in the eastern 22 space bay</li> <li>Please add a tree to the island shown as a snow deposit area. The snow should be deposited elsewhere.</li> <li>As noted above, there needs to be a tree in the endcap island at the northwest corner of the building.</li> <li>Multi-family unit trees can be used for all of those islands.</li> </ol> <b>Noted</b>
<b>Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, NCC, EXPO, FS, TC, TC-1, RC, Special Land Use or non-residential use in any R district (Zoning Sec 5.5.3.C.iii)</b>				
<b>A = Total square footage of vehicular use areas x 7.5%</b>	<ul style="list-style-type: none"> <li><math>A = x \text{ SF} \times 7.5\% = A \text{ sf}</math></li> <li>Lot #1 <math>A = 21676 \times 7.5\% = 1626 \text{ sf}</math></li> <li>Lot #2 <math>A = 18,454 \times 7.5\% = 1384 \text{ sf}</math></li> <li>Parking Lot #3 <math>A = 11,512 \times 7.5\% = 862 \text{ sf}</math></li> </ul>			
<b>B = Total square footage of additional paved vehicular use areas over 50,000 SF x 1 %</b>	<ul style="list-style-type: none"> <li><math>B = x \text{ SF} \times 1\% = B \text{ sf}</math></li> </ul>	NA		
<b>All Categories</b>				
C = A+B Total square footage of landscaped islands	$A + B = C \text{ SF}$ <ul style="list-style-type: none"> <li>Lot #1: 1626 sf</li> <li>Lot #2: 1384 sf</li> <li>Lot #3: 862 sf</li> </ul>	<ul style="list-style-type: none"> <li>Lot #1: 2013 sf</li> <li>Lot #2: 1719 sf</li> <li>Lot #3: 793 sf</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>No</li> </ul>	The area provided in an island cannot be counted toward the requirement unless a canopy tree is planted in it. <b>Noted</b>
D = C/200 Number of canopy trees required	<ul style="list-style-type: none"> <li><math>D = C/200</math></li> <li>Minimum 200sf/tree</li> <li>Lot #1: <math>1626/200 = 8</math> trees</li> <li>Lot #2: <math>1384/200 = 7</math> trees</li> <li>Lot #3: <math>862/200 = 4</math> trees</li> </ul>	<ul style="list-style-type: none"> <li>Lot #1: 8 trees</li> <li>Lot #2: 7 trees</li> <li>Lot #3: 5 trees</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>	<ol style="list-style-type: none"> <li>Lot 2 – the 53sf island at the northwest corner of the building is not large enough to support a tree or count toward the total. That island must be restored to 200sf as the tree is</li> </ol>

Item	Required	Proposed	Meets Code	Comments
				<p>required as an endcap tree.</p> <p>2. Lot 3 – there must be a canopy tree in the expanded island east of the walk leading to the building and the area.</p> <p>3. There must also be a tree in the island marked as snow deposit area.</p> <p>4. Multifamily unit trees may be used to meet the above requirements.</p> <p><b>Noted</b></p>
<p><b>Parking Lot Perimeter Trees</b> (Zoning Sec 5.5.3.c.ii)</p>	<ul style="list-style-type: none"> <li>• 1 Canopy tree per 35 lf</li> <li>• Perimeter trees are not required when the building is within 20 feet of the parking lot.</li> <li>• Lot #1: 606/35 = 17 trees</li> <li>• Lot #2: 439/35 = 13 trees</li> <li>• Lot #3: 200/35 = 6 trees</li> </ul>	<ul style="list-style-type: none"> <li>• Lot #1: 17 trees</li> <li>• Lot #2: 11 trees</li> <li>• Lot #3: 6 trees</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• Yes</li> </ul>	<p>1. At least 2 of the perimeter trees are required on the west side Lot 2.</p> <p>2. <b>Please remove enough of that pavement or the loading zone pavement, or shift the parking lot so a 10 foot green strip along the edges of the paving is provided.</b></p> <p>3. <b>Please shift the perimeter tree at the northeast corner of the building to the west so it is within 15 feet of the Lot 2 parking lot.</b></p> <p>4. <b>Please switch the two crabapples used as perimeter trees to canopy trees.</b></p> <p><b>Noted</b></p>
<p><b>Accessway Perimeter</b> (Zoning Sec 5.5.3.C.iv.j)</p>	<p>1 Canopy tree per 35 lf</p>	<p>NA</p>		
<p><b>Parking land banked</b></p>	<p>NA</p>	<p>None</p>		
<p><b>Miscellaneous Landscaping Requirements</b></p>				



<b>Plantings around Fire Hydrant</b> ( <i>Zoning Sec 5.5.3.c.ii,j</i> )	<ul style="list-style-type: none"><li>No plantings with matured height greater than 12' within 10 ft. of fire hydrants, manholes, catch</li></ul>	No hydrants have trees too close to them.	Yes	1. <u>If the building has Fire Department Connector(s) (FDCs), please show them on the Landscape Plans</u>
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Item	Required	Proposed	Meets Code	Comments
	basins or other utility structures. • Trees should not be planted within 5 feet of underground lines.			<u>and keep all plants in front of or immediately next to shorter than the FDC.</u> 2. A note regarding spacing is on Sheet L-1.1. <u>Please copy it to Sheet L-1.2.</u>
<b>Landscaped area (g)</b>	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	Yes		
<b>Name, type and number of ground cover (LDM 5)</b>	As proposed on planting islands	Seed or other landscaping is proposed and indicated with hatching	Yes	
<b>Snow deposit (LDM 10)</b>	Show leave snow deposit areas on plan in locations where landscaping won't be damaged	Yes	Yes/No	<b>Please do not use the island in the southwest corner of the parking lot for snow deposit It should have a canopy tree planted in it to shade the lot.</b> <b>Noted</b>
<b>Transformers/Utility boxes (LDM 6)</b>	<ul style="list-style-type: none"> <li>• A minimum of 2 ft. separation between box and the plants</li> <li>• Ground cover below 4" is allowed up to pad.</li> <li>• No plant materials within 8 ft. from the doors</li> </ul>	None are shown	TBD	1. <u>Please show transformers and other utility boxes when their locations are determined.</u> 2. <u>If box locations are not determined by final site plans, add a note to plan stating that all utility boxes are to be landscaped per the detail.</u> 3. <u>Please add the city Utility Box planting detail (attached with this review)</u> 4. <u>Please add an allowance of 10 shrubs per box on the plant list and label as such</u>
<b>Detention/Retention Basin Planting requirements (Sec. 5.5.3.e, LDM 3)</b>	<ul style="list-style-type: none"> <li>• Clusters of large native shrubs shall cover 70-75% of the basin rim area at 10 ft away from the permanent water line.</li> <li>• Canopy trees must be</li> </ul>	There is no indication of storm calculations	TBD	If the existing detention pond needs to be enlarged or modified, the modified areas must be landscaped per the current ordinance.

Item	Required	Proposed	Meets Code	Comments
	located at 1 per 35lf of the pond rim 10 feet away from the permanent water level <ul style="list-style-type: none"> <li>• 10" to 14" tall grass along sides of basin</li> <li>• Refer to wetland for basin mix</li> <li>• Include seed mix details on landscape plan</li> </ul>			
<b>Phragmites australis and Japanese Knotweed control</b> <i>(Zoning Sec 5.5.6.3.i.)</i>	<ul style="list-style-type: none"> <li>• Show on plans all populations of Phragmites australis and/or Japanese knotweed on the site.</li> <li>• If none are found, add a note to that effect.</li> <li>• If any are found, add notes stating that the weed shall be completely removed from the site. This may take several years of consistent treatments to achieve.</li> </ul>	None are noted	TBD	1. There is a very large, dense population of Phragmites in the wetland east of the proposed building. 2. <u>Please show it on T-1 and add plans for its removal. Chemical treatments by a licensed ANC applicator will be required, generally in September and early October.</u>
<b>Landscape Notes and Details– Utilize City of Novi Standard Notes</b>				
<b>Plant List (LDM 4,11) – Include all cost estimates</b>				
Quantities and sizes		On plant list	Yes	
Root type		On plant list	Yes	
Botanical and common names	<ul style="list-style-type: none"> <li>• At least 50% of plant species used, not including seed mixes or woodland replacement trees, must be species native to Michigan.</li> <li>• The non-woodland replacement tree diversity must meet the standards of the Landscape Design Manual section 4.</li> </ul>	<ul style="list-style-type: none"> <li>• 14 of 22 species used (64%) are native to Michigan</li> <li>• The tree mix meets the tree diversity requirement of LDM 4</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• Yes</li> </ul>	1. <u>When the foundation plantings are designed, the 50% threshold must still be met. Hopefully the 65% currently shown can be maintained.</u> 2. <u>Bald cypress are not native to Michigan, so they should not be used in the conservation easement.</u>
<b>General Landscape Requirements (LDM)</b>				
Type and amount of lawn		Seed lawn or economy prairie mix are proposed	Yes	<u>Need for final site plan</u>
Cost estimate (LDM 10.h.(11))	For all new plantings, mulch and sod as listed on the plan	No	No	1. <u>Need for final site plan</u> 2. <u>Please include the</u>

Item	Required	Proposed	Meets Code	Comments
				<u>costs for all seeding to be done on the plant cost estimate</u>
<b>Planting Details/Info (LDM Part III) – Utilize City of Novi Standard Details</b>				
Canopy Deciduous Tree	Refer to LDM for detail drawings	Yes	Yes	
Evergreen Tree		Yes	Yes	
Shrub		Yes	Yes	
Multi-stem tree		Yes	Yes	
Perennial/ Ground Cover		No	TBD	<u>Please add if perennials or ornamental grasses are added on the Final Site Plans.</u>
Tree stakes and guys	Wood stakes, fabric guys.	Yes	Yes	
<b>Cross-Section of Berms (LDM 1.a.(1))</b>				
Slope, height and width	<ul style="list-style-type: none"> <li>Label contour lines</li> <li>Maximum 33% slope</li> <li>Constructed of loam</li> <li>6" top layer of topsoil</li> </ul>	No berms are proposed so no detail is provided		
Type of Ground Cover		NA		
Setbacks from Utilities	Overhead utility lines and 15 ft. setback from edge of utility or 20 ft. setback from closest pole, 10 feet from structures, hydrants	<ul style="list-style-type: none"> <li>Utilities are shown</li> <li>No overhead utilities are shown</li> </ul>	Yes	
<b>Walls (LDM 10 &amp; Zoning Sec 5.5.3.vi)</b>				
<b>Material, height and type of construction footing</b>	Freestanding walls should have brick or stone exterior with masonry or concrete interior	A long retaining wall on the east side is proposed.	TBD	<u>Provide dimensioned wall details</u>
<b>Walls greater than 3 ½ ft. should be designed and sealed by an Engineer</b>		TW/BW elevations indicate it will be approximately 5 feet tall	TBD	<u>That wall will need to be designed by an engineer and reviewed with the building plans.</u>
<b>Notes (LDM 10) – Utilize City of Novi Standard Details</b>				
<b>Installation date (LDM 2.i. &amp; Zoning Sec 5.5.5.B)</b>	<ul style="list-style-type: none"> <li>Provide intended date</li> <li>Between Mar 15 – Nov 15</li> </ul>	Yes	Yes	
<b>Maintenance &amp; Statement of intent (LDM 2.m &amp; Zoning Sec 5.5.6)</b>	<ul style="list-style-type: none"> <li>Include statement of intent to install and guarantee all materials for 2 years.</li> <li>Include a minimum one cultivation in June, July and August</li> </ul>	Yes	Yes	

Item	Required	Proposed	Meets Code	Comments
	for the 2-year warranty period.			
<b>Plant source</b> (LDM 2.n & LDM 3.a.(2))	Shall be northern nursery grown, No.1 grade.	No	No	<u>Please add this note.</u>
<b>Establishment period</b> (Zoning Sec 5.5.6.B)	<b>2 yr. Guarantee</b>	Yes	Yes	
<b>General Conditions</b> (LDM 11)	Plant materials shall not be planted within 4 ft. of property line	Yes	Yes	
<b>Other information</b> (LDM 10.n)	Required by Planning Commission	NA		<u>Please add a note near the native seed mix stating that the contractor shall provide proof of the seed mix to be used (invoice or photo of seed bag) to <a href="mailto:rmeader@cityofnovi.org">rmeader@cityofnovi.org</a> for approval prior to installation.</u>
<b>Irrigation</b> (LDM 10.I.)	<ul style="list-style-type: none"> <li>• A plan detailing how all plants will be provided with sufficient water for establishment and long-term survival must be provided.</li> <li>• If an irrigation system will be provided, the plan for it must be included in the Final Site Plans.</li> <li>• If alternative methods of providing the required water will be used, details concerning them must be provided on Final Site Plans.</li> </ul>	None		<ol style="list-style-type: none"> <li>1. <u>Please add irrigation plan or information as to how plants will be watered sufficiently for establishment and long- term survival.</u></li> <li>2. <u>The plan should meet the requirements listed at the end of this chart.</u></li> <li>3. <u>If xeriscaping is used, please provide information about plantings included.</u></li> </ol>
<b>Landscape tree credit</b> (LDM11.b.(d))	<ul style="list-style-type: none"> <li>• Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA.</li> <li>• Refer to Landscape tree Credit Chart in LDM</li> </ul>	No credits are taken		
<b>Plant Sizes for ROW, Woodland replacement and others</b>	<ul style="list-style-type: none"> <li>• Canopy Deciduous shall be 3" and sub-canopy deciduous shall be 2.5" caliper.</li> </ul>	On plant list	Yes	

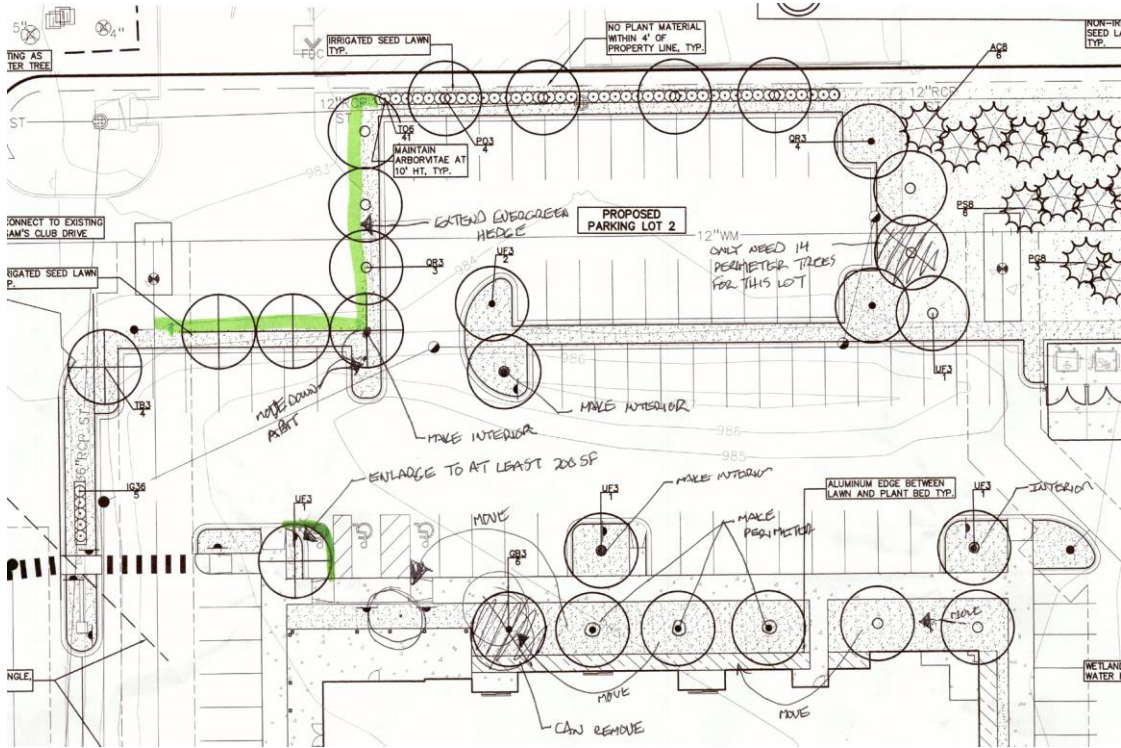
Item	Required	Proposed	Meets Code	Comments
(LDM 11.b)	<ul style="list-style-type: none"> <li>Refer to LDM section 11.b for more details</li> </ul>			
<b>Plant size credit</b> (LDM 11.b)	NA	No credits are taken		
<b>Prohibited Plants</b> (LDM 11.b)	Do not use any plants on the Prohibited Species List	No prohibited species are proposed	Yes	
<b>Recommended trees for planting under overhead utilities</b> (LDM 3.e)	Label the distance from the overhead utilities	No overhead lines are indicated		
<b>Collected or Transplanted trees</b> (LDM 11.b.(2)(c))		None		
<b>Nonliving Durable Material: Mulch</b> (LDM 12)	<ul style="list-style-type: none"> <li>Trees shall be mulched to 3" depth and shrubs, groundcovers to 2" depth</li> <li>Specify natural color, finely shredded hardwood bark mulch.</li> <li>Include in cost estimate.</li> </ul>	Information shown on planting details		

**NOTES:**

- This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.
- The section of the applicable ordinance or standard is indicated in parenthesis. For the landscape requirements, please see the Zoning Ordinance landscape section 5.5 and the Landscape Design Manual for the appropriate items under the applicable zoning classification.
- Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.

Irrigation System Requirements

- Any booster pump installed to connect the project's irrigation system to an existing irrigation system must be downstream of the RPZ.
- The RPZ must be installed in accordance with the 2015 Michigan Plumbing Code.
- The RPZ must be installed in accordance with the manufacture installation instructions for winterization that includes drain ports and blowout ports.
- The RPZ must be installed a minimum of 12-inches above FINISHED grade.
- Attached is a handout that addresses winterization installation requirements to assist with this.
- A plumbing permit is required.
- The assembly must be tested after installation with results recorded on the City of Novi test report form.



## CORRESPONDANCE

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**CITY OF NOVI**  
**RESPONSE FORM**

**RECEIVED**

**JUN 16 2023**

**CITY OF NOVI  
COMMUNITY DEVELOPMENT**

**STATION FLATS JSP23-02 FOR PLANNING COMMISSION'S RECOMMENDATION TO CITY COUNCIL FOR A REQUEST TO AMEND A CONSENT JUDGMENT TO ALLOW FOR A HIGH-DENSITY, MID-RISE, MULTIPLE-FAMILY USE (RM-2 DISTRICT).**

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Return via email: [dshanahan@cityofnovi.org](mailto:dshanahan@cityofnovi.org)

Return via mail or fax: Community Development Department  
45175 Ten Mile Road, Novi, Michigan 48375  
248-347-0475 (Main) 248-735-5633 (Fax)

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I SUPPORT

I OBJECT

**TO THE ABOVE REQUEST FOR THE FOLLOWING REASONS:**

Increased traffic is going to make difficult travel even worse. On Grand River and Wixom Rd. There are 3 schools in very close proximity of the proposed development, which will make unsafe conditions for the children going to school.

SIGNATURE: \_\_\_\_\_

PRINT NAME: Edward Miller

ADDRESS: 48827 Windfall Rd, Novi 48374

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I SUPPORT

I OBJECT

**TO THE ABOVE REQUEST FOR THE FOLLOWING REASONS:**

- I thought Novi was a city of single family homes. Now we have high rise multi family buildings. It is not fair to change policy after so many have large investments in their homes.
- The roads, already in poor condition, cannot support more traffic.

SIGNATURE: Martha Keyse

PRINT NAME: MARTHA KEYSE

ADDRESS: 48640 WINDFALL ROAD

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CITY OF NOVI

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I SUPPORT

I OBJECT

TO THE ABOVE REQUEST FOR THE FOLLOWING REASONS:

MASTER PLAN - FUTURE RESIDENTIAL DEVELOPMENTS  
IN THE SOUTH WEST QUADRANT SHALL BE  
LOW DENSITY RESIDENTIAL THAT REFLECTS A  
SEMI-RURAL ENVIRONMENT

SIGNATURE: Mark L. Campbell  
PRINT NAME: MARK L. CAMPBELL  
ADDRESS: 26050 ISLAND LAKE DRIVE

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I SUPPORT

I OBJECT

**TO THE ABOVE REQUEST FOR THE FOLLOWING REASONS:**

#1. Safety exit/main gate from Wixom road is not enough. Wixom Road (2 lane without enough yellow line) may not support safety of drivers and cause risks of car accident

#2. Environment, all these wild life ind deer, turkey, grouse, squirrel are in danger of disappearing habitats.

#3. Considering all aspects, I recommend low density of single house/ townhouse by securing environment + driving safety

SIGNATURE:

PRINT NAME:

Young Shik Song / Hye Jung Lee (wife) on wixom road

ADDRESS:

48822 Windfall Rd, Novi MI 48374

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I SUPPORT

I OBJECT

**TO THE ABOVE REQUEST FOR THE FOLLOWING REASONS:**

*That this property should be single family homes or condos like those already in the area*

SIGNATURE: *Ronald Simsick*  
PRINT NAME: Ronald Simsick  
ADDRESS: 48772 Windfall Rd., Novi 48374

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I SUPPORT

I OBJECT

**TO THE ABOVE REQUEST FOR THE FOLLOWING REASONS:**

*In the city of Novi aspiring to be a miniature New York City with constant traffic jams, heavy shopping, crowds. Please take care of the roads and services already in place and leave some green space for future generations.*

SIGNATURE: Linda A. Cousino  
PRINT NAME: LINDA A. COUSINO  
ADDRESS: 48848 STONEBROOK

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