CITY OF NOVI CITY COUNCIL
SEPTEMBER 22, 2025

SUBJECT: Consideration of a Preliminary Site Plan request for Twelve Mile Townes with a PD-2 option, a Special Land Use permit, Wetland Permit, and Storm Water Management plan.

SUBMITTING DEPARTMENT: Community Development Department - Planning

KEY HIGHLIGHTS:

- Involves three parcels totaling 16.37 acres northeast of Twelve Oaks Mall.
- Development of 125 townhome units on the vacant parcels.
- The units would be for-sale, and each would have a two-car garage.
- The building design is similar to those being constructed on Main Street.
- The City Council previously approved *The Griffin* in 2022, a multi-family project on the eastern parcel, which contained 174 units.

BACKGROUND INFORMATION:

The applicant is proposing to develop vacant parcels located south of Twelve Mile Road, northeast of the Twelve Oaks Mall in the RC Regional Center District utilizing the PD-2 Development Option. Twenty townhouse-style buildings are proposed with a total of 125 units. Parking would be provided in two-car direct-entry garages, with additional space on the garage aprons. Ten additional visitor spaces are provided in a few locations within the community. A private street network is proposed to connect the development to Twelve Mile Road on the east side and the Twelve Oaks Mall Access Drive, which bisects the project.

The intent of the Planned Development Options as listed in Section 3.31 of the Zoning Ordinance is to provide for alternative means of land use development within designated zoning districts, such as the Regional Center Zoning District, and to insure that alternative land development permitted under these options will allow site designs that create a desirable environment providing for the harmonious relationship between land use types with respect to: uses of land, the location of uses on the land and the architectural and functional compatibility between uses. The development options are only to be considered within those areas of the City which are specifically designated for their application on the City's Master Plan for Land Use Map.

The applicant has submitted a site plan with building elevations and a Traffic Impact Study. All reviews are recommending approval of Preliminary Site Plan with additional

comments to be addressed with the Final Site Plan. The proposed development is largely in conformance with ordinance requirements, with requested deviations noted in the suggested motion. About one-third of the property contains natural features, which has caused the remaining area to be more densely developed, leading to the need for these deviations.

Special Land Use Conditions

When the PD-2 Option is utilized, all uses fall under the Special Land Use requirements. Section 6.1.2.C of the Zoning Ordinance outlines specific factors the Planning Commission shall consider in the review and recommendation to City Council of the Special Land Use Permit request. The Planning Commission reviewed and recommended approval of the Special Land Use request with the findings provided in the Recommended Action section of this document.

Planned Development Option Conditions

Section 3.31.4 outlines specific factors the Planning Commission and City Council shall consider in the review:

1. The plan meets all the requirements of Section 6.1 of this Ordinance for Preliminary Site Plans and the requirements set forth in the City's Site Plan and Development Manual. **All required information has been provided.**
2. The plan satisfies the intent of the Special Land Use provisions as stated in Section 6.1.2.c. **See the Special Land Use Considerations noted in the suggested motion, and further discussion in the Plan Review Letter, page 5.**
3. The Community Impact Statement and Traffic Study are provided, regardless of site size, in accordance with the requirements set forth in the City's Site Plan and Development Manual. **The applicant has provided Community Impact Statement and Traffic Study as required.**
4. *The plan satisfies the intent of this Section with respect to use of the land and principal and accessory use relationships within the site as well as with uses on adjacent sites*. **The proposed residential use is compatible with multi-family and commercial uses in the surrounding area, consistent with the intent of this section.**
5. That all existing or proposed streets, road, utilities, and marginal access service drives, as are required, are correctly located on the site plan in accordance with the approved plans for these improvements. **Engineering and Traffic reviews are recommending approval at this time.**
6. The plan meets all the applicable standards of this Ordinance relative to height, bulk and area requirements, building setbacks, off-street parking and preliminary site engineering requirements. **The plan is in general conformance with the code requirements, although the applicant requests several deviations from the standards to avoid natural features, and to create a more urban-style development given the location and their findings from market trends. See the attached Plan Review Letter and Chart for additional information.**
7. That there exists a reasonable harmonious relationship between the location of buildings on the site relative to buildings on lands in the surrounding area; that there is a reasonable architectural and functional compatibility between all structures on the site and structures within the surrounding area to assure proper relationships between:

a. The topography of the adjoining lands as well as that of the site itself including any significant natural or manmade features. **The site is located at a higher grade than the adjacent residential use to the south, with the highest grade at the north end along Twelve Mile Road approximately 30 feet higher than the southern property boundary. The proposed buildings closest to the Waltonwood property will be screened by existing evergreen trees as well as new tree plantings, for a total of three rows of trees in most places.**
b. The relationship of one building to another whether on-site or on adjacent land, i.e., entrances, service areas and mechanical appurtenances. **The buildings are oriented to the existing and planned street frontages, with parking areas kept internal to the site. This will improve the appearance of the development from adjacent sites and roadways.**
c. The rooftops of buildings that may lie below street levels or from windows of higher adjacent buildings. **The site is located at a higher grade than the adjacent residential use to the south, with the highest grade at the north end along Twelve Mile Road approximately 30 feet higher than the southern property boundary. There are no higher adjacent buildings.**
d. Landscape plantings, off-street parking areas and service drives on adjacent lands. **Landscape generally conforms to the requirements. There are a number of waivers required but they are all supported by staff for the reasons stated in the detailed reviews for each requirement. See the Landscape Review Letter for detailed comments.**
e. Compliance with street, road and public utility layouts approved for the area. **Traffic and Engineering reviews are recommending approval of streets and public utilities, subject to Council approval of noted deviations.**
f. The architecture of the proposed building including overall design and façade materials used. Architectural design and façade material are to be complimentary to existing or proposed buildings within the site and the surrounding area. It is not intended that contrasts in architectural design and use of façade materials is to be discouraged, but care shall be taken so that any such contrasts will not be so out of character with existing building designs and façade materials so as to create an adverse effect on the stability and value of the surrounding area. **Façade review is recommending approval of elevations and supports the waiver requested.**

Section 3.31.4.B indicates the City Council shall review the proposed plan considering the Planning Commission's recommendation and the requirements above. As part of its approval of the Preliminary Site Plan, the Council is permitted to impose conditions that are reasonably related to the purposes of this section and that will:

1. Ensure that public services and facilities affected by a proposed land use or activity will be capable of accommodating increased services and facility loads caused by the land use or activity;
2. Protect the natural environment and conserving natural resources and energy;
3. Insure compatibility with adjacent use of land; and
4. Promote the use of land in a socially and economically desirable manner.

Finally, Section 3.31.7.B.viii.d states that an applicant for mixed-use or residential developments must demonstrate the following:

1. *The development will result in a recognizable and substantial benefit to the ultimate users of the project and to the community, where such benefit would otherwise be unfeasible or unlikely to be achieved.* **In addition to the indirect economic benefits noted elsewhere, the applicant has proposed an off-site sidewalk to connect the project with the Twelve Oaks Mall parking area. This improvement is contingent upon securing the required off-site easements; however the property is owned by the applicant.**
2. *Based on the proposed uses, layout, and design of the overall project, the proposed building façade treatment, the proposed landscaping treatment, and the proposed signage, the development will result in a material enhancement to the area of the City in which it is situated.* **The overall design and appearance of the façade treatments, landscaping and layout are expected to enhance the area.**
3. *In relation to the underlying zoning, the proposed development will not result in an unreasonable negative economic impact upon surrounding properties.* **The proposed residential use would have a positive economic impact on the surrounding properties by providing additional customers and employees in close proximity. Customers and employees for nearby businesses; Taxable value of property increase; job creation.**
4. *Each particular proposed use in the development, as well as the quantity and location of such use, shall result in and contribute to a reasonable and mutually supportive mix of uses on the site, and/or a compatibility of uses in harmony with the surrounding area and other downtown areas of the City, and shall reflect innovative planning and design excellence.* **The residential uses proposed would be supportive of the regional shopping area and harmonious with other residential uses nearby. Residential use will contribute to mall activity, increase vibrancy of the area, other residential uses in the areas.**
5. *The proposed development shall be under single ownership and/or control such that there is a single person or entity having responsibility for completing the project in conformity with this Ordinance. This provision shall not prohibit a transfer of ownership and/or control, upon due notice to the City Clerk, provided that the transfer is to a single person or entity, as required in the first instance.* ***Singh*** **is a single entity and appears to own all three parcels. However, the units are proposed to be sold to individual unit owners. The applicant is asked to provide an explanation of the timing of the transfer and whether there will be a condominium form of ownership.**
6. *Development amenities shall be included as part of a mixed-use or residential development. The use of decorative, pedestrian-scale parking lot lighting, public pathways, and other similar features shall be an integral part of any site plan. Amenities shall include lighting, landscape plantings, sidewalk furniture, parks and other amenities that reflect a consistent residential theme. All such amenities shall be privately owned and maintained.* **The plans show a sidewalk network connecting the buildings to each other and the surrounding area. Pocket parks are provided in all phases with minimal amenities such as benches and shades. Lighting fixtures are shown on the photometric plan sheet. The applicant has extended the sidewalk southward along the finger road to the Twelve Oaks loop road to foster better**

connections in the RC District. A crosswalk connection into the mall parking lot is still to be determined. The applicant should continue to work with mall ownership to complete that connection – at minimum to the mall parking lot.

7. Buildings that are not located on a publicly dedicated roadway may be permitted to have parking on the ground level of the building. Such parking level shall not count against the maximum height/story requirement. The parking inside the building must be aesthetically and effectively screened from view through architectural design, landscaping, or other means, from adjacent drives, walkways and buildings, and particularly from the street level view. **Parking areas are not visible from the public street side of buildings.**
8. In all cases, the maximum height shall include all rooftop appurtenances, architectural features, skylights or other such roof mounted building amenities. **All proposed buildings are below the maximum height limit.**

Planning Commission Action

On July 9, 2025, Planning Commission held a public hearing and made a favorable recommendation to City Council for approval of the Special Land Use permit, Preliminary Site Plan with PD-2 Option, Wetland Permit and Storm Water Management Plan based on the motion shown in the action summary attached. Draft meeting minutes are also attached.

The Ordinance requires the Preliminary Site Plan to receive a recommendation for approval or denial from the Planning Commission with City Council ultimately approving or denying the proposed plan. Following the City Council's approval, the Final Site Plan approval may be granted administratively.

RECOMMENDED ACTION:

(Please note the following **two-part motion**):

Part 1

Approval at the request of Singh Development LLC for JSP 25-03 Twelve Mile Townes, for Special Land Use permit based on and subject to the following:

1. The proposed use will not cause detrimental impact on existing thoroughfares *(based on Traffic review);*
2. The proposed use will not cause a detrimental impact on the capabilities of public services and facilities *(based on Engineering review);*
3. The proposed use is compatible with the natural features and characteristics of the land *(because there are no regulated woodlands on site, and minimal impacts to wetland areas are proposed);*
4. The proposed use is compatible with adjacent uses of land *(because the proposed use is similar to the residential community to the south and complements other nearby uses);*
5. The proposed use is consistent with the goals, objectives, and recommendations of the City's Master Plan for Land Use *(as it fulfills the Master Plan objectives to provide a wide range of housing options and to provide residential developments that support healthy lifestyles);*

6. The proposed use will promote the use of land in a socially and economically desirable manner *(as it fulfills one of the Master Plan objectives to ensure compatibility between residential and non-residential developments);*
7. The proposed use is (1) listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and (2) is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located;
8. This motion and these findings are further subject to the City Council also approving the Preliminary Site Plan, and in the event a plan is not approved, the special land use granted herein shall be null and void.

This motion is made because the plan is otherwise in compliance with Article 3, Article 4, Article 5, and Article 6 of the Zoning Ordinance and all other applicable provisions of the Ordinance, subject to Preliminary Site Plan approval as required by ordinance.

Part 2:

Approval at the request of Singh Development LLC for JSP 25-03 Twelve Mile Townes for Preliminary Site Plan with a PD-2 Option, Wetland Permit and Stormwater Management Plan, based on and subject to the following:

1. Findings that the standards of Section 3.31.4 of the Zoning Ordinance are adequately addressed, as identified in the Planning Review Letter;
2. Findings that the standards of Section 3.31.7.B.viii.d of the Zoning Ordinance are adequately addressed, as identified in the Planning Review Letter.
3. City Council approval of the following ordinance deviations:
    i. Deviation from Section 3.31.7.D for not meeting the minimum building setback requirements for front yard (Twelve Mile frontage). A minimum of 50 feet is required; 20 feet is provided. *The standard setbacks of the district are for a more suburban style of development, and the deviations would be consistent with a more urban development as they propose.*
    ii. Deviation from Section 3.31.7.D for not meeting the minimum building setback requirements for the exterior side yard (Twelve Oaks Mall Road frontage). A minimum of 50 feet is required; 30 feet is provided. *The setbacks of the district are for a more suburban style of development, and the deviations would be consistent with a more urban development as they propose.*
    iii. Deviation from Section 3.31.7.D for not meeting the minimum building setback requirements for the eastern side yard. A minimum of 35 feet is required, 20 feet is provided. *The setbacks of the district are for a more suburban style of development and the deviations would be consistent with a more urban development as they propose.*
    iv. Deviation from Section 3.6.2.H for not meeting the requirement for additional setback from a residential district to the south. A minimum of 111 feet is required for a building 37 feet in height, 40 feet is provided. *This deviation is supported as the uses are both multi-family residential and the additional protection afforded by the larger setback is not warranted. However, the ZBA granted conditional approval for a setback variance for the Waltonwood Phase 2 in 2003 that stated any building on the subject*

property would be a minimum of 150 feet from those buildings. The applicant will need to seek ZBA's amendment of the previous conditions of approval and amend the deed restriction that was placed on the property prior to Final Site Plan approval.

v. Deviation from Section 3.8.2.H to allow a reduction in the minimum distance between buildings (20 feet proposed, at least 30 feet required), as *the layout seeks to optimize the space to maintain adequate open space and circulation.*

vi. Deviation from Section 3.31.7.B.viii.b.xi for the lack of sidewalk on the west side of Twelve Oaks Mall Road south of the entrance, and on the south side of Bishop Drive as shown on the plan.

vii. Deviation from Sec. 5.10.1.B to allow perpendicular parking along a Major Drive. There are 4 spaces proposed on the west side of the project along Bishop Road, which is anticipated to have low traffic volume.

viii. Landscape deviation from Section 5.5.3.B.ii and iii for lack of 4.5-6 foot landscaped berm along eastern property line. *Supported by staff as alternative screening is provided with six-foot fencing.*

ix. Landscape deviation from Section 5.5.3.B.ii and iii for lack of berm or wall in the greenbelt of Twelve Mile Road for the western 616 feet, *to preserve the existing vegetation in the area that is not being developed.*

x. Landscape deviation from Section 5.5.3.B.ii and iii for deficiency in street trees on Twelve Oaks Drive north of the entry drives on the west side, *due to utility conflicts and lack of space between curb and sidewalk.*

xi. Landscape deviation from Section 5.5.3.B.ii and iii for deficiency in street trees on Twelve Mile Road for the western part of the site, *due to utility conflicts.*

xii. Façade deviations from Section 5.15 for an underage of brick on the rear facades of the high-visibility buildings (25% proposed, 30% required), and an underage of brick on all facades of the standard visibility buildings (23-28% proposed, 30% required), *as the deviation is minor in nature and not detrimental to the aesthetic quality. No vinyl siding is permitted.*

xiii. The findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan.

The City Council's approval of the deviations listed above includes the following findings:

A. *That each zoning ordinance provision from which a deviation is sought would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest;*

B. *That approving the proposed deviation would be compatible with the existing and planned uses in the surrounding area;*

C. *That the proposed deviation would not be detrimental to the natural features and resources of the affected property and surrounding area, or would enhance or preserve such natural features and resources;*

D. *That the proposed deviation would not be injurious to the safety or convenience of vehicular or pedestrian traffic; and*

E. *That the proposed deviation would not cause an adverse fiscal or financial impact on the City's ability to provide services and facilities to the property or to the public as a whole.*

This motion is made because the plan is otherwise in compliance with Article 3, Article 4, and Article 5 of the Zoning Ordinance, and with Chapters 11 and 12 of the Code of Ordinances, and all other applicable provisions of the Ordinance.

MAPS

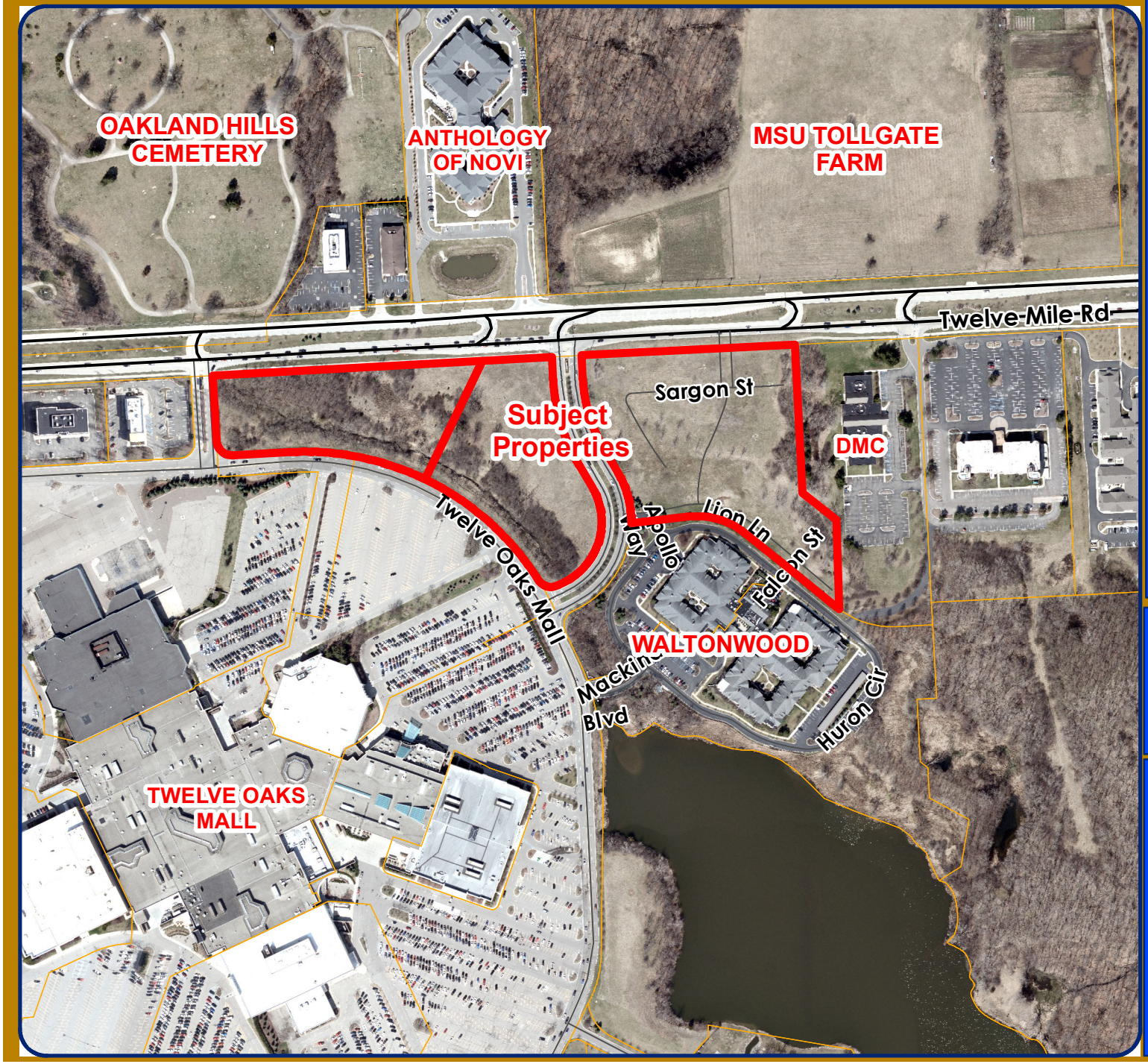
Location

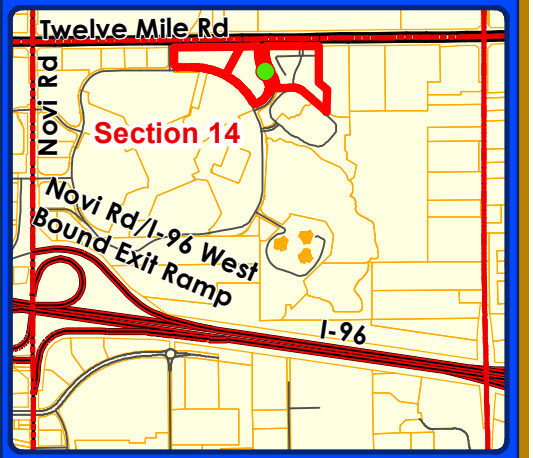
Zoning

Future Land Use

Natural Features

TWELVE MILE TOWNES
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: Lindsay Bell
Date: 7/2/25
Project: 12 MILE TOWNES
Version #: 1

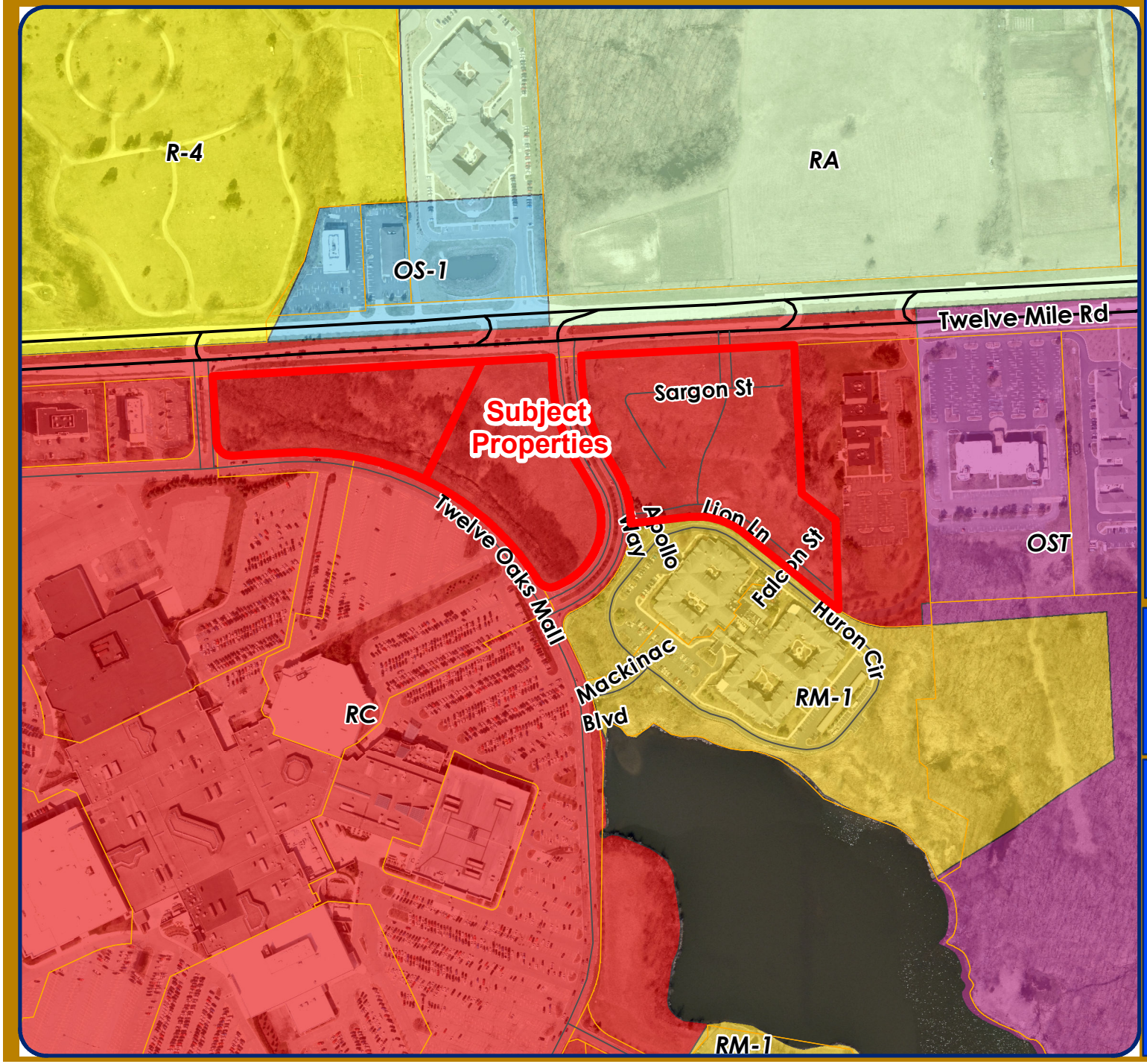
Feet
0 90 180 360 540

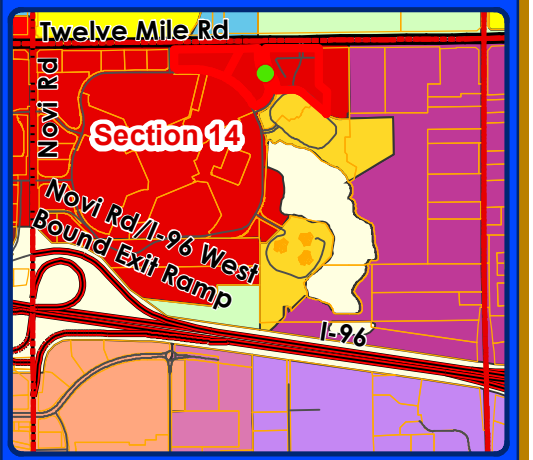
1 inch = 417 feet

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.

TWELVE MILE TOWNES
ZONING





LEGEND

- R-A: Residential Acreage
- R-4: One-Family Residential District
- RM-1: Low-Density Multiple Family
- B-3: General Business District
- C: Conference District
- I-1: Light Industrial District
- OS-1: Office Service District
- OSC: Office Service Commercial
- OST: Office Service Technology
- RC: Regional Center District
- TC: Town Center District
- Subject Property

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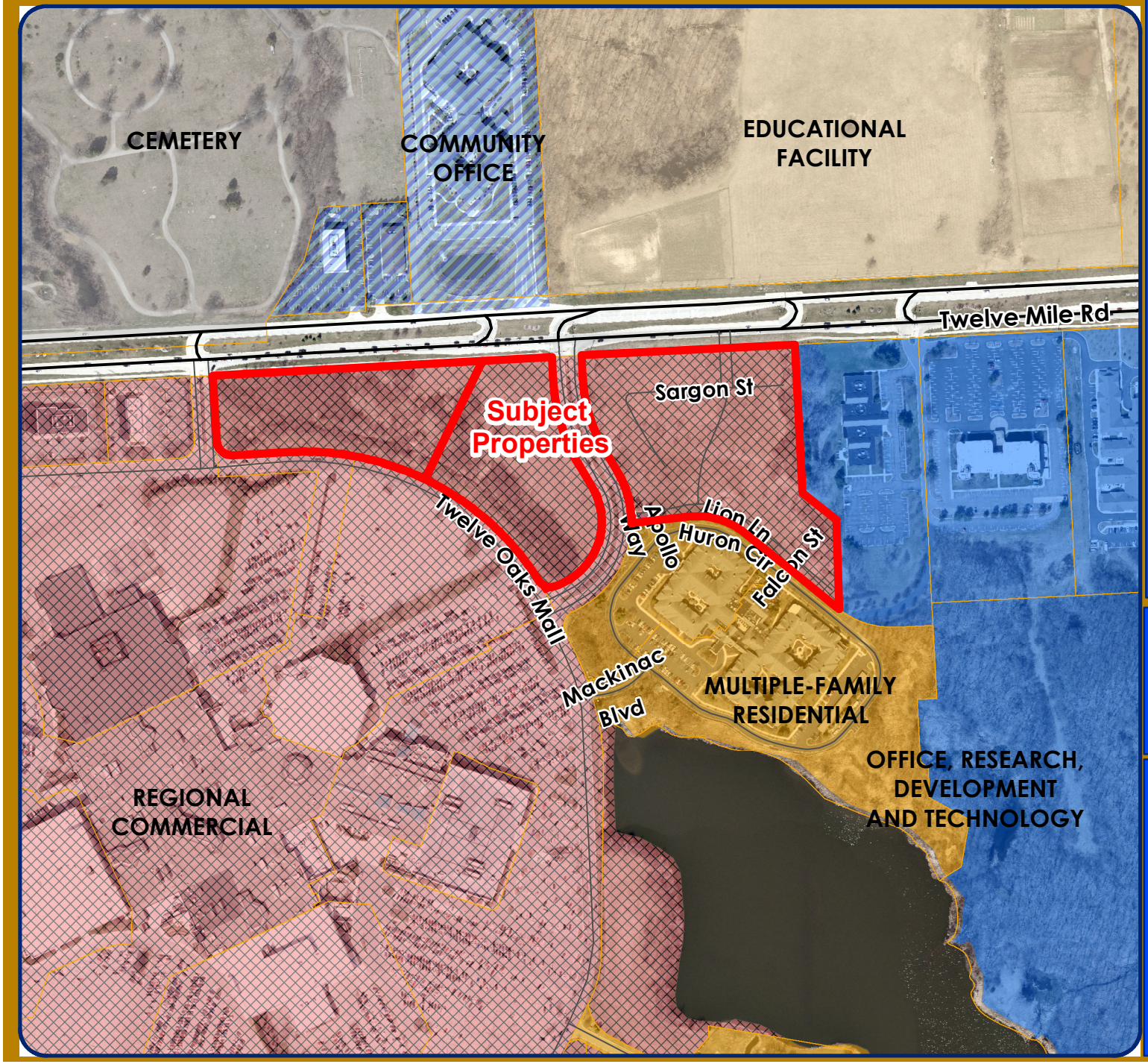
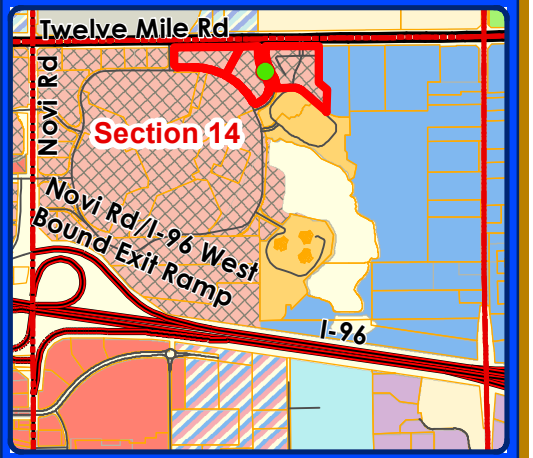
TWELVE MILE TOWNES
FUTURE LAND USE





LEGEND

- Multiple-Family Residential
- Community Office
- Office, Research, Development and Technology
- Office Commercial
- Industrial, Research, Development and Technology
- Regional Commercial
- Town Center Commercial
- Town Center Gateway
- Educational Facility
- Public
- Public Park
- Cemetery
- Subject Property

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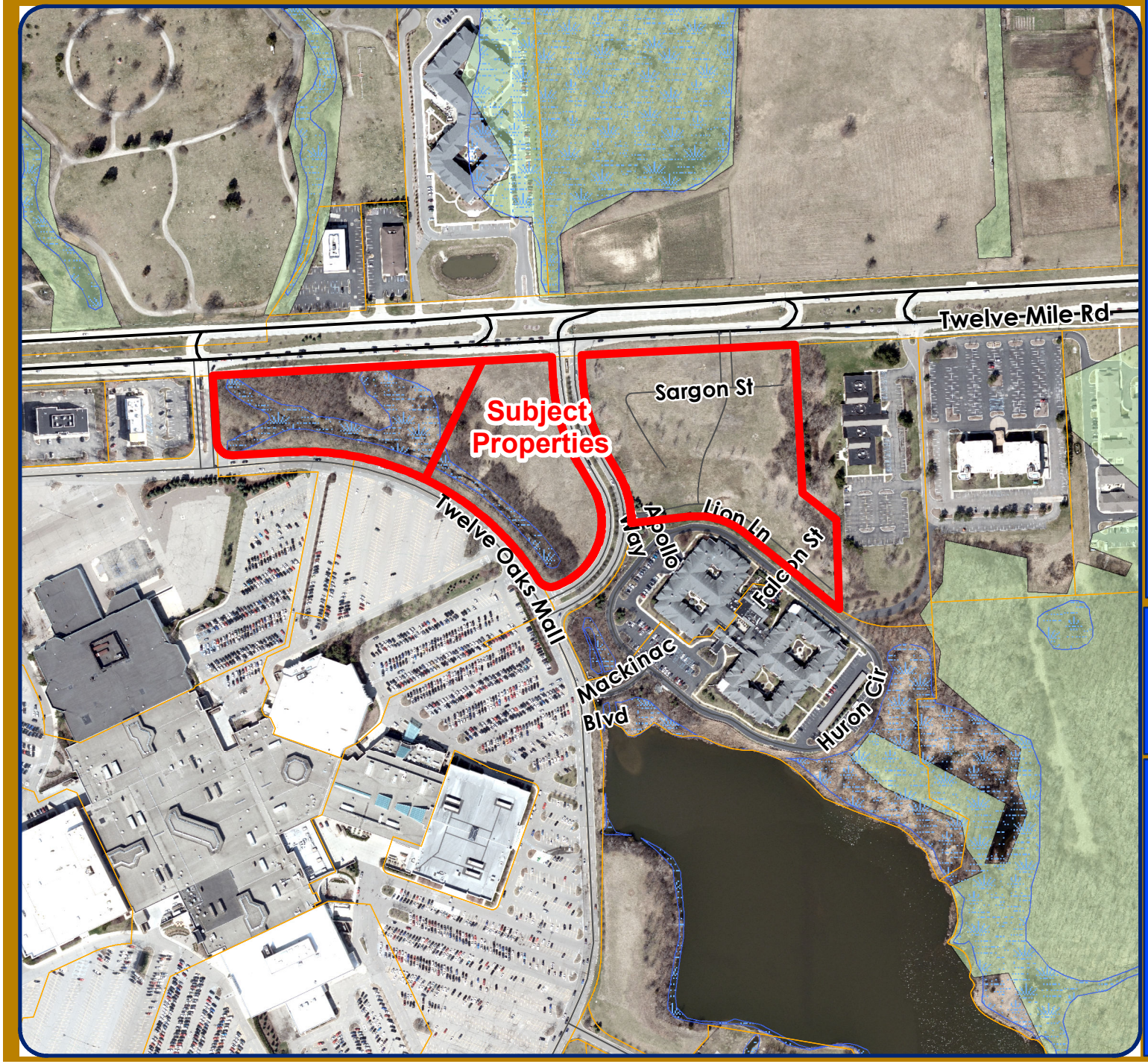
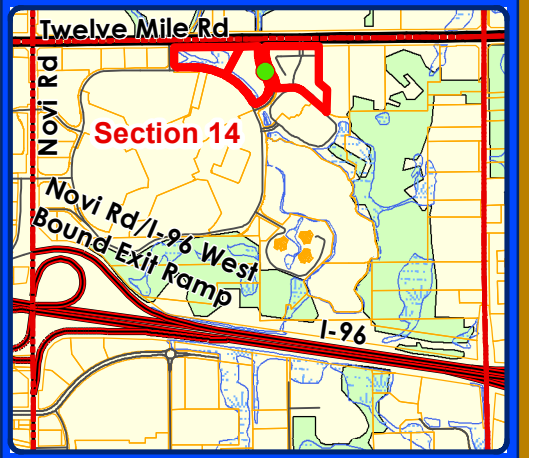
TWELVE MILE TOWNES

NATURAL FEATURES





LEGEND

- WETLANDS
- WOODLANDS
- Subject Property

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SITE PLAN

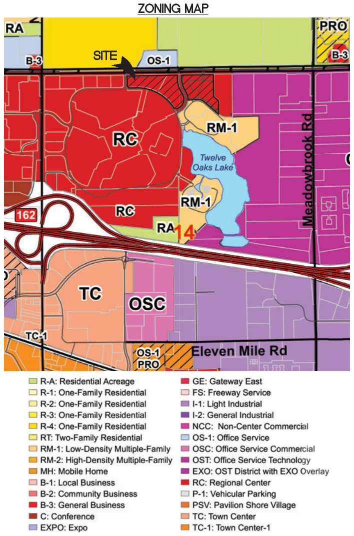
SITE PLAN FOR:

12 MILE ROAD TOWNES

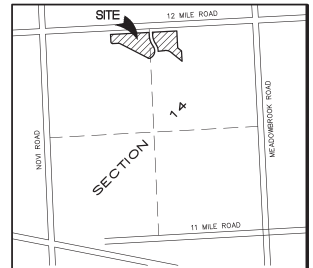
PART OF THE NORTH 1/2 OF SECTION 14, T.1N., R.8E., CITY OF NOVI, OAKLAND COUNTY, MI

PREPARED FOR:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP, MI 48322

ZONING MAP



GRAPHIC SCALE
150 0 75 150 300
(IN FEET)
1" = 150'

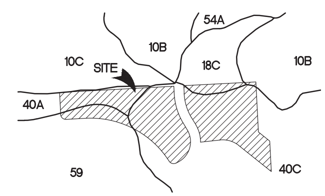


LOCATION MAP
SCALE: 1" = 1500'

SHEET INDEX

No.	Sheet Description
C1	COVER SHEET
C2	OVERALL ALTA-NSPS LAND TITLE SURVEY
C3	SURVEY NOTES
C4	OVERALL ALTA-NSPS LAND TITLE SURVEY
C5	EXISTING CONDITIONS – WEST
C6	EXISTING CONDITIONS – EAST
C7	OVERALL SITE PLAN
C8	SITE PLAN – WEST
C9	SITE PLAN – EAST
C10	COMPOSITE UTILITY PLAN – WEST
C11	COMPOSITE UTILITY PLAN – EAST
C12	GRADING PLAN
C13	STORM WATER MANAGEMENT PLAN
C14	STORM WATER OUTLET
C15	OPEN SPACE PLAN
C16	FIRE TRUCK ROUTING PLAN
C17	NOTES AND DETAILS
1-6	LANDSCAPE PLANS
1-12	PHOTOMETRIC PLANS
1-9	ARCHITECTURAL PLANS

SOILS MAP



SOIL CLASSIFICATIONS

SCALE: 1" = 500'

(PER "SOILS SURVEY OF OAKLAND COUNTY MICHIGAN", UNITED STATES DEPT. OF AGRICULTURE, SOIL CONSERVATION SERVICE IN COOPERATION WITH MICHIGAN AGRICULTURAL EXPEREMENT STATION, ISSUED MARCH 1982)

10B – MARLETTE SANDY LOAM, 1 TO 6 PERCENT SLOPES
10C – MARLETTE SANDY LOAM, 6 TO 12 PERCENT SLOPES
12 – BROOKSTON AND COLWOOD LOAMS
18C – FOX SANDY LOAM, HURON LOBE, 6 TO 12 PERCENT SLOPES
27 – HOUGHTON AND ADRIAN MUCKS
40A – UDORTHENTS, LOAMY, NEARLY LEVEL
40C – UDORTHENTS, LOAMY, ROLLING
54A – MATHERTON SANDY LOAM, 0 TO 3 PERCENT SLOPES
W – WATER

FIRE DEPARTMENT NOTES

1. All fire hydrants & water mains shall be installed & in service prior to above foundation building construction.
2. All roads shall be paved and capable of supporting 35 tons prior to construction above foundation.
3. Building addresses shall be posted facing the street. Addresses shall be a minimum of three inches in height on a contrasting background.
4. Provide 4-6" diameter concrete filled steel posts 48" above finish grade at each hydrant as required.
5. Fire lanes shall be posted with "Fire Lane – No Parking" signs in accordance with Ordinance #85.99.02.

NOTES

1. ALL WORK SHALL CONFORM TO THE CITY OF NOVI'S CURRENT STANDARDS AND SPECIFICATIONS.
2. ALL PAVEMENT MARKINGS, TRAFFIC CONTROL SIGNS, AND PARKING SIGNS SHALL COMPLY WITH THE DESIGN AND PLACEMENT REQUIREMENTS OF THE 2011 MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

LANDSCAPE PLANS PROVIDED BY:
ALLEN DESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 CARPENTER
NORTHVILLE, MICHIGAN 48167
PHONE: 248.467.4668

TOPOGRAPHIC SURVEY PREPARED BY:
NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MICHIGAN, 48342
PHONE: 248.332.7931

CITY PROJECT NUMBER
JSP25-0003

STATE OF MICHIGAN
JASON A. RICKARD
License No. 6201046145
LICENSED PROFESSIONAL ENGINEER

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

SUBMITTAL DATE: 02-19-2025

NO.	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171
811

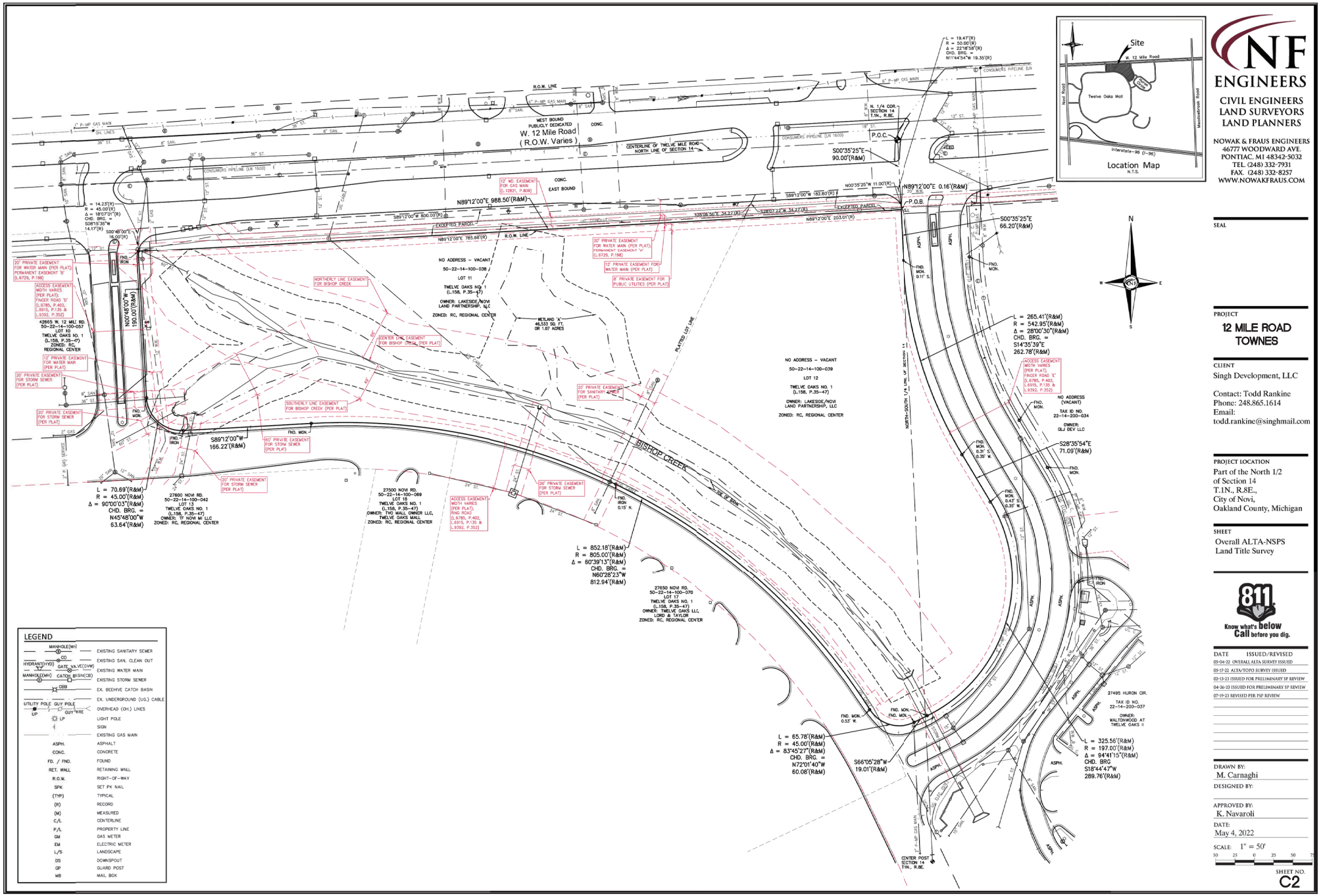
CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP, MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
COVER SHEET

PROJECT NO: 24-197

PAGE No.:
C1



LEGEND

MANHOLE(MH)	EXISTING SANITARY SEWER
CO	EXISTING SAN. CLEAN OUT
HYDRANT(HYD) GATE VALVE(GVW)	EXISTING WATER MAIN
MANHOLE(MH) CATCH BASIN(CB)	EXISTING STORM SEWER
CBB	EX. BEEHIVE CATCH BASIN
UTILITY POLE GUY POLE GUY WIRE	EX. UNDERGROUND (U.G.) CABLE
UP	OVERHEAD (OH.) LINES
LP	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
ASPH.	ASPHALT
CONC.	CONCRETE
FD. / FND.	FOUND
RET. WALL	RETAINING WALL
R.O.W.	RIGHT-OF-WAY
SPK	SET PK NAIL
(TYP)	TYPICAL
(R)	RECORD
(M)	MEASURED
C/L	CENTERLINE
P/L	PROPERTY LINE
GM	GAS METER
EM	ELECTRIC METER
L/S	LANDSCAPE
DS	DOWNSPOUT
GP	GUARD POST
MB	MAIL BOX

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS
NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEAL

PROJECT
12 MILE ROAD TOWNES

CLIENT
Singh Development, LLC

Contact: Todd Rankine
Phone: 248.865.1614
Email:
todd.rankine@singhmail.com

PROJECT LOCATION
Part of the North 1/2 of Section 14 T.1N., R.8E., City of Novi, Oakland County, Michigan

SHEET
Overall ALTA-NSPS Land Title Survey

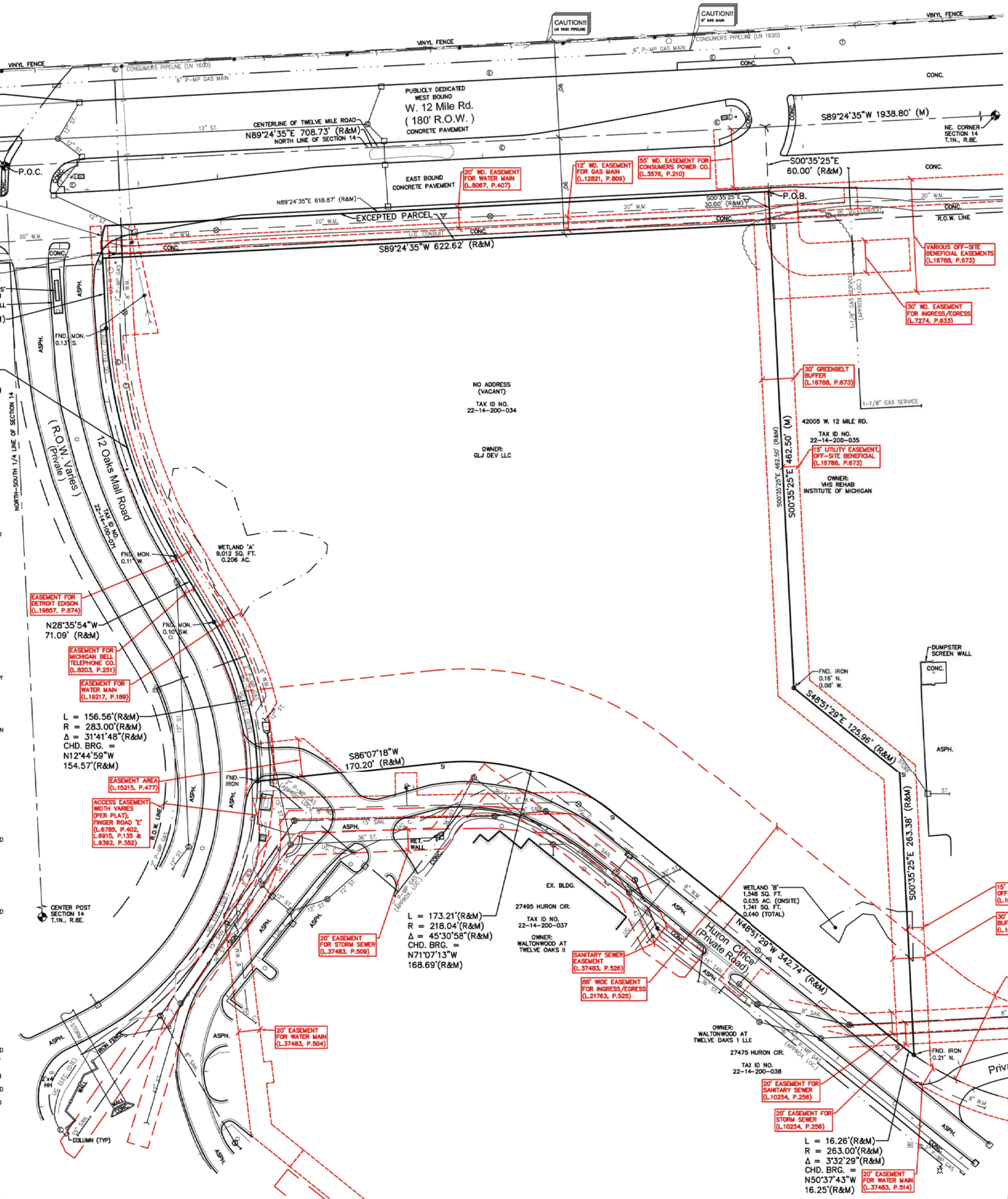
Know what's below Call before you dig.

DATE	ISSUED/REVISED
05-04-22	OVERALL ALTA SURVEY ISSUED
05-17-22	ALTA/TOPO SURVEY ISSUED
02-13-23	ISSUED FOR PRELIMINARY SP REVIEW
04-26-23	ISSUED FOR PRELIMINARY SP REVIEW
07-19-23	REVISED PER FSP REVIEW

DRAWN BY: M. Carnaghi
DESIGNED BY:
APPROVED BY: K. Navaroli
DATE: May 4, 2022
SCALE: 1" = 50'

50 25 0 25 50 75

SHEET NO.
C2



TITLE REPORT NOTES

REFERENCE FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NUMBER: 970575, DATED: MAY 12, 2022.

SCHEDULE B, PART II – EXCEPTIONS:

EXCEPTIONS: 1, 4, 5, 6 AND 25 REFER TO THE OWNERSHIP OF THE PROPERTY AND/OR ARE NOT PLOTTABLE.

2. ANY FACTS, RIGHTS, INTERESTS, OR CLAIMS THAT ARE NOT SHOWN BY THE PUBLIC RECORDS BUT THAT COULD BE ASCERTAINED BY MAKING INQUIRY OF PERSONS IN POSSESSION OF THE LAND.

3. EASEMENTS, ENCUMBRANCES, OR CLAIMS THEREOF, NOT SHOWN BY THE PUBLIC RECORDS.

7. RIGHT OF FIRST REFUSAL IN FAVOR OF LAKESIDE/NOVI LAND PARTNERSHIP, A MICHIGAN CO-PARTNERSHIP AS DISCLOSED IN INSTRUMENT RECORDED IN LIBER 21763, PAGE 525. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

8. RIGHT OF WAY IN FAVOR OF CONSUMERS POWER COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 3576, PAGE 210. [EASEMENT IS ADJACENT TO THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

9. TERMS AND CONDITIONS CONTAINED IN GRANT OF EASEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 7274, PAGE 633. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

10. TERMS AND CONDITIONS CONTAINED IN AGREEMENT WITH RESPECT TO USE AND MAINTENANCE OF ROADWAY AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 7748, PAGE 599. [EASEMENT IS NOT WITHIN AND DOES NOT TOUCH THE SURVEYED LAND AND ITS LOCATION IS NOT SHOWN]

11. GRANT OF EASEMENT IN FAVOR OF MICHIGAN BELL TELEPHONE COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 8203, PAGE 251. [EASEMENT IS ADJACENT TO THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

12. UNDERGROUND EASEMENT FOR GAS PIPELINE IN FAVOR OF CONSUMERS POWER COMPANY AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 12821, PAGE 809. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

13. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF RESTRICTIONS AND EASEMENTS AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 15215, PAGE 477. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

14. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF RESTRICTIONS AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 15215, PAGE 509. [DOCUMENT DOES NOT DESCRIBE ANY PLOTTABLE EASEMENTS OR PLOTTABLE RESTRICTIONS; THE SURVEYED LAND IS WITHIN THE PROPERTY DESCRIBED IN SAID DOCUMENT]

15. TERMS AND CONDITIONS CONTAINED IN EASEMENT AGREEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 16788, PAGE 673. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

16. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF RESTRICTIONS AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 16788, PAGE 698. [DOCUMENT DOES NOT DESCRIBE ANY PLOTTABLE EASEMENTS OR PLOTTABLE RESTRICTIONS; THE SURVEYED LAND IS WITHIN THE PROPERTY DESCRIBED IN SAID DOCUMENT]

17. EASEMENT IN FAVOR OF THE CITY OF NOVI AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 19217, PAGE 189. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

18. DETROIT EDISON OVERHEAD AND UNDERGROUND EASEMENT (RIGHT OF WAY) IN FAVOR OF THE DETROIT EDISON COMPANY AND AMERITECH AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 19857, PAGE 874. [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]

19. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF RESTRICTIONS AND EASEMENTS AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 21763, PAGE 525 [EASEMENT IS WITHIN THE SURVEYED LAND AND ITS LOCATION IS SHOWN]. FIRST AMENDMENT TO DECLARATION OF RESTRICTIONS AND EASEMENTS RECORDED IN LIBER 28126, PAGE 838 [DOCUMENT DOES NOT DESCRIBE ANY PLOTTABLE EASEMENTS OR PLOTTABLE RESTRICTIONS; THE SURVEYED LAND IS NOT WITHIN THE PROPERTY DESCRIBED IN SAID DOCUMENT].

20. TERMS AND CONDITIONS CONTAINED IN DECLARATION OF BUILDING RESTRICTIONS AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 31997, PAGE 401. [DOCUMENT DOES NOT DESCRIBE ANY PLOTTABLE EASEMENTS OR PLOTTABLE RESTRICTIONS; THE SURVEYED LAND IS WITHIN THE PROPERTY DESCRIBED IN SAID DOCUMENT; DOCUMENT STATES: "A DISTANCE OF NOT LESS THAN ONE HUNDRED FIFTY (150) FEET SHALL BE MAINTAINED BETWEEN ANY BUILDINGS NOW OR HEREAFTER CONSTRUCTED ON THE WALTONWOOD PARCEL AND THE UPTOWN PARCEL."]

21. ANY RIGHTS, TITLE INTEREST OR CLAIM THEREOF TO THAT PORTION OF THE LAND TAKEN, USED OR GRANTED FOR STREETS, ROADS OR HIGHWAYS.

22. INTEREST, IF ANY, OF THE UNITED STATES, STATE OF MICHIGAN, OR ANY POLITICAL SUBDIVISION THEREOF, IN THE OIL, GAS AND MINERALS IN AND UNDER AND THAT MAY BE PRODUCED FROM THE CAPTIONED LAND.

24. RIGHTS OF TENANTS, IF ANY, UNDER ANY UNRECORDED LEASES.

MISS DIG / UTILITY DISCLAIMER NOTE

A MISS DIG TICKET NUMBER B002442133, PURSUANT TO MICHIGAN PUBLIC ACT 174 WAS ENTERED FOR THE SURVEYED PROPERTY. DUE TO THE EXTENDED REPORTING PERIOD FOR UNDERGROUND FACILITY OWNERS TO PROVIDE THEIR RECORDS, THE SURVEY MAY NOT REFLECT ALL THE UTILITIES AT THE TIME THE SURVEY WAS ISSUED ON SEPTEMBER 30, 2020. THE SURVEY ONLY REFLECTS THOSE UTILITIES WHICH COULD BE OBSERVED BY THE SURVEYOR IN THE FIELD OR AS DEPICTED BY THE UTILITY COMPANY RECORDS FURNISH PRIOR TO THE DATE THIS SURVEY WAS ISSUED. THE CLIENT AND/OR THEIR AUTHORIZED AGENT SHALL VERIFY WITH THE FACILITY OWNERS AND/OR THEIR AUTHORIZED AGENTS, THE COMPLETENESS AND EXACTNESS OF THE UTILITIES LOCATION.

UTILITY NOTE

UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES, AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.

DTE DISCLAIMER NOTE

PLEASE NOTE THAT DTE HAS NEW REGULATIONS THAT MAY IMPACT DEVELOPMENT OUTSIDE THEIR EASEMENT OR THE PUBLIC RIGHT OF WAY. CLIENT SHALL CONTACT DTE TO DETERMINE THE "NEW STRUCTURES AND POWER LINE" REQUIREMENTS AS THEY MAY APPLY TO ANY FUTURE BUILDING OR RENOVATION OF A STRUCTURE. DTE ENERGY CAN BE CONTACTED AT 800-477-4747

BASIS OF BEARING NOTE

ALL BEARINGS ARE IN RELATION TO THE PREVIOUSLY ESTABLISHED NORTH LINE OF SECTION 14 OF "TWELVE OAKS NO. 1" AS RECORDED IN LIBER 158 OF PLATS, PAGES 35-47, OAKLAND COUNTY RECORDS. (N.89°24'35"E.)

FLOOD HAZARD NOTE

THE PROPERTY DESCRIBED ON THIS SURVEY DOES NOT LIE WITHIN A SPECIAL FLOOD HAZARD AREA AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY; THE PROPERTY LIES WITHIN ZONE X OF THE FLOOD INSURANCE RATE MAP IDENTIFIED AS MAP NO. 26125C0627F BEARING AN EFFECTIVE DATE OF 09-29-2006.

ALTA SURVEY NOTES

THERE IS NO VISIBLE EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.

THERE IS NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES AND THERE IS NO EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIR.

THERE IS NO VISIBLE EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

LOCATION OF UTILITIES EXISTING ON OR SERVING THE PROPERTY AS DETERMINED BY: OBSERVED EVIDENCE OR EVIDENCE FROM PLANS REQUESTED BY THE SURVEYOR AND OBTAINED FROM UTILITY COMPANIES.

THE SUBJECT PROPERTY HAS ACCESS TO W. 12 MILE ROAD, BEING A PUBLICLY DEDICATED ROAD VIA ACCESS AND INGRESS/EGRESS EASEMENTS FOR 12 OAKS MALL ROAD AND HURON CIRLE.

CERTIFICATE OF SURVEY

CERTIFIED TO:

-GLJ DEVELOPMENT, LLC, A MICHIGAN LIMITED LIABILITY COMPANY
-FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDE ITEMS 1, 2, 3, 4, 6(a), 6(b), 7(a), 7(b)(1), 7(c), 8, 9, 11(a), 13, 14, 16, 17, 18 AND 19 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 8, 2022.

KEVIN NAVAROLI, P.S. NO. 4001053503
DATE OF PLAT OR MAP: 1-20-2023

STATE OF MICHIGAN
KEVIN CHRISTOPHER NAVAROLI
License No. 4001053503
LICENSED PROFESSIONAL SURVEYOR

Location Map
N.T.S.

SURVEY DATA

SITE AREA:
329,772.715 SQUARE FEET OR 7.57 ACRES (NET)

ZONED:
RC, REGIONAL CENTER DISTRICT

PARKING SPACES:
NO PARKING SPACES (VACANT)

A SURVEYOR CANNOT MAKE A CERTIFICATION ON THE BASIS OF AN INTERPRETATION OR OPINION OF ANOTHER PARTY. A ZONING ENDORSEMENT LETTER SHOULD BE OBTAINED FROM THE CITY OF NOVI TO INSURE CONFORMITY AS WELL AS MAKE A FINAL DETERMINATION OF THE REQUIRED BUILDING SETBACK REQUIREMENTS.

LEGAL DESCRIPTION - PER TITLE COMMITMENT

A PARCEL OF LAND BEING A PART OF THE NORTHEAST 1/4 OF SECTION 14, TOWN 1 NORTH, RANGE 8 EAST, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 14; THENCE ALONG THE NORTH LINE OF SAID SECTION 14, NORTH 89 DEGREES 24 MINUTES 35 SECONDS EAST, 708.73 FEET; THENCE SOUTH 00 DEGREES 35 MINUTES 25 SECONDS EAST, 60.00 FEET TO THE POINT OF BEGINNING; THENCE SOUTH 00 DEGREES 35 MINUTES 25 SECONDS EAST, 462.50 FEET; THENCE SOUTH 48 DEGREES 51 MINUTES 29 SECONDS EAST, 125.96 FEET; THENCE SOUTH 00 DEGREES 35 MINUTES 25 SECONDS EAST, 263.38 FEET; THENCE ALONG THE ARC OF A CURVE TO THE RIGHT 16.26 FEET, SAID CURVE HAVING A RADIUS OF 263.00 FEET, A CENTRAL ANGLE OF 03 DEGREES 32 MINUTES 29 SECONDS AND A CHORD BEARING AND DISTANCE OF NORTH 50 DEGREES 37 MINUTES 43 SECONDS WEST, 16.25 FEET; THENCE NORTH 48 DEGREES 51 MINUTES 29 SECONDS WEST, 342.74 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT 173.21 FEET, SAID CURVE HAVING A RADIUS OF 218.04 FEET, A CENTRAL ANGLE OF 45 DEGREES 30 MINUTES 58 SECONDS AND A CHORD BEARING AND DISTANCE OF NORTH 71 DEGREES 07 MINUTES 13 SECONDS WEST, 168.69 FEET; THENCE SOUTH 86 DEGREES 07 MINUTES 18 SECONDS WEST, 170.20 FEET TO A POINT ON THE EASTERLY LINE OF TWELVE OAKS NO. 1, AS RECORDED IN LIBER 158 OF PLATS, PAGES 35 THROUGH 47 INCLUSIVE, OAKLAND COUNTY RECORDS; THENCE ALONG SAID EASTERLY LINE OF TWELVE OAKS NO. 1 THE FOLLOWING 5 BEARINGS AND DISTANCES; THENCE ALONG THE ARC OF A CURVE TO THE LEFT 156.59 FEET, SAID CURVE HAVING A RADIUS OF 283.00 FEET, A CENTRAL ANGLE OF 31 DEGREES 41 MINUTES 48 SECONDS AND A CHORD BEARING AND DISTANCE OF NORTH 12 DEGREES 44 MINUTES 59 SECONDS WEST, 154.57 FEET; THENCE NORTH 28 DEGREES 35 MINUTES 54 SECONDS WEST, 71.09 FEET; THENCE ALONG THE ARC OF A CURVE TO THE RIGHT 223.37 FEET, SAID CURVE HAVING A RADIUS OF 456.95 FEET, A CENTRAL ANGLE OF 28 DEGREES 00 MINUTES 29 SECONDS AND A CHORD BEARING AND DISTANCE OF NORTH 14 DEGREES 35 MINUTES 39 SECONDS WEST, 221.16 FEET; THENCE NORTH 00 DEGREES 35 MINUTES 25 SECONDS WEST, 77.20 FEET; THENCE ALONG THE ARC OF A CURVE TO THE RIGHT 19.49 FEET, SAID CURVE HAVING A RADIUS OF 50.00 FEET, A CENTRAL ANGLE OF 22 DEGREES 20 MINUTES 01 SECOND AND A CHORD BEARING AND DISTANCE OF NORTH 10 DEGREES 34 MINUTES 36 SECONDS EAST, 19.37 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF TWELVE MILE ROAD; THENCE NORTH 89 DEGREES 24 MINUTES 35 SECONDS EAST, 618.87 FEET TO THE POINT OF BEGINNING.

EXCEPT THE FOLLOWING DESCRIBED PARCEL: PART OF THE NORTHEAST 1/4 OF SECTION 14, TOWN 1 NORTH, RANGE 8 EAST FURTHER DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 14; THENCE NORTH 89 DEGREES 24 MINUTES 35 SECONDS EAST, ON THE NORTH LINE OF SAID SECTION 14, ALSO THE CENTERLINE OF TWELVE MILE ROAD, A DISTANCE OF 708.73 FEET, AND SOUTH 00 DEGREES 35 MINUTES 25 SECONDS EAST, A DISTANCE OF 60.00 FEET, TO A POINT IN THE EXISTING SOUTHERLY RIGHT-OF-WAY LINE OF TWELVE MILE ROAD, THE POINT OF BEGINNING; THENCE SOUTH 00 DEGREES 35 MINUTES 25 SECONDS EAST, A DISTANCE OF 30.00 FEET; THENCE SOUTH 89 DEGREES 24 MINUTES 35 SECONDS WEST, A DISTANCE OF 622.62 FEET, TO THE GRANTOR'S WEST PROPERTY LINE; THENCE NORTH 00 DEGREES 35 MINUTES 25 SECONDS WEST, ON SAID WEST PROPERTY LINE, A DISTANCE OF 11.00 FEET, TO A POINT OF CURVE; THENCE 19.49 FEET, (RECORD PLAT) 19.47 FEET (TITLE COMMITMENT) ON THE ARC OF A CURVE TO THE RIGHT, WITH A RADIUS OF 50.00 FEET AND A CHORD BEARING NORTH 10 DEGREES 34 MINUTES 36 SECONDS EAST, 19.37 FEET; THENCE NORTH 89 DEGREES 24 MINUTES 35 SECONDS EAST, A DISTANCE OF 618.87 FEET, TO THE POINT OF BEGINNING, AS DISCLOSED BY WARRANTY DEED RECORDED IN LIBER 24651, PAGE 269, OAKLAND COUNTY RECORDS.

TAX ID NUMBER: 22-14-200-034

ADDRESS: VACANT W. 12 MILE ROAD, NOVI, MI 48377

LEGEND

Symbol	Description
MANHOLE(MH)	EXISTING SANITARY SEWER
CO	EXISTING SAN. CLEAN OUT
HYDRANT(HYD), GATE VALVE(GVW)	EXISTING WATER MAIN
MANHOLE(MH), CATCH BASIN(CB)	EXISTING STORM SEWER
CBB	EX. BEEHIVE CATCH BASIN
	EX. UNDERGROUND (UG.) CABLE
UTILITY POLE (UP), GUY POLE, GUY WIRE	OVERHEAD (OH.) LINES
LP	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
ASPH.	ASPHALT
CONC.	CONCRETE
FD. / FND.	FOUND
RET. WALL	RETAINING WALL
R.O.W.	RIGHT-OF-WAY
SPK	SET PK NAIL
(TYP)	TYPICAL
(R)	RECORD
(M)	MEASURED
C/L	CENTERLINE
P/L	PROPERTY LINE
GM	GAS METER
EM	ELECTRIC METER
L/S	LANDSCAPE
DS	DOWNSPOUT
MB	MAIL BOX

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NFE-ENGR.COM

SEAL

PROJECT
12 MILE ROAD TOWNES

CLIENT
Singh Development
7125 Orchard Lake Rd.
Suite 200
West Bloomfield, MI 48322

Contact:
Mr. Todd Rankine
Phone: (248) 865-1614

PROJECT LOCATION
Part of the NE 1/4
of Section 14
T. 1 North, R. 8 East,
City of Novi,
Oakland County, Michigan

SHEET
ALTA / NSPS
Land Title Survey

811
Know what's below
Call before you dig.

DATE	ISSUED/REVISED
01-20-23	ALTA SURVEY ISSUED

DRAWN BY:
M. Carnaghi

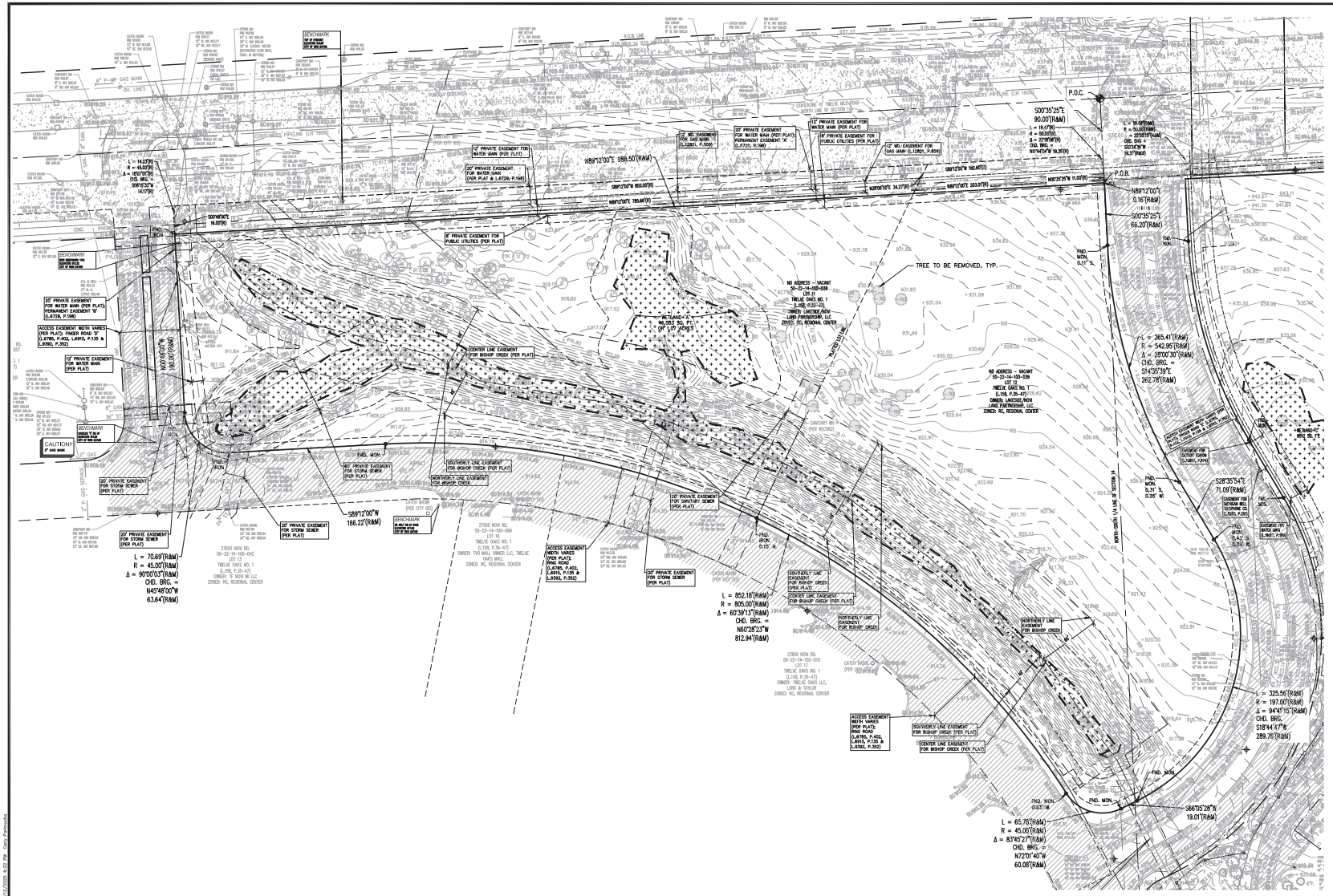
DESIGNED BY:

APPROVED BY:
K. Navaroli

DATE:
January 20, 2023

SCALE: 1" = 50'
50 25 0 25 50 75

SHEET NO.
C4



SURVEY PROVIDED BY:

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

NO	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

SUBMITTAL DATE: 02-19-2025

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 811 FOR MEMBERS OF UNDERGROUND FACILITIES

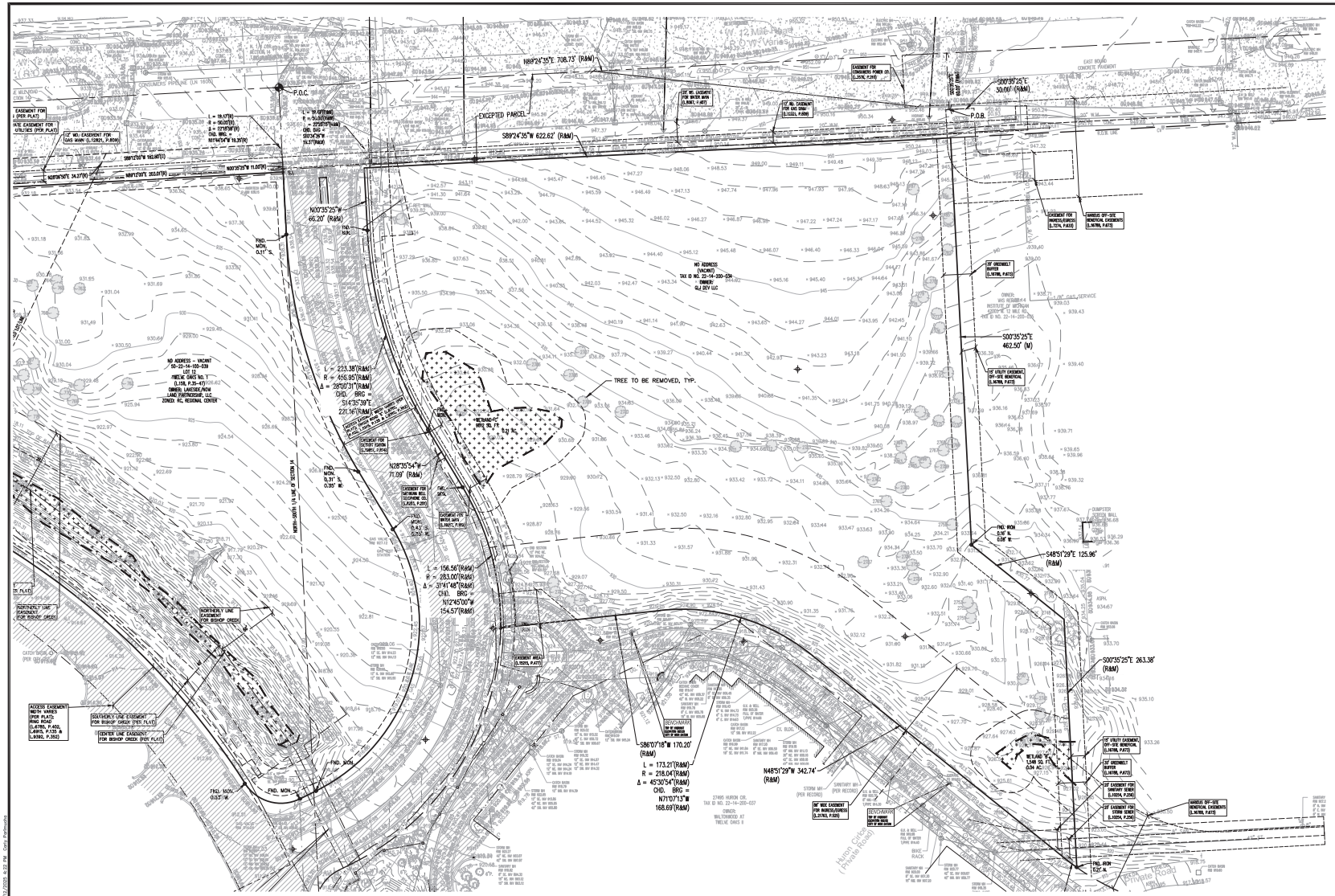
CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
EXISTING CONDITIONS - WEST

PROJECT NO: 24-197

PAGE No.:
C5



SURVEY PROVIDED BY:

NF ENGINEERS
CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257
WWW.NOWAKFRAUS.COM

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

NO	DESCRIPTION	DATE
SUBMITTAL DATE: 02-19-2025		
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
811
IT'S THE LAW
OF UNDERGROUND FACILITIES

CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
EXISTING CONDITIONS - EAST

PROJECT NO: 24-197

PAGE No.:
C6

GRAPHIC SCALE
60 0 30 60 120
(IN FEET)
1" = 60'

FACADE
HIGH VISIBILITY BUILDINGS
1, 8, 9, 10, 14, 15, 16, 17 & 18
STANDARD BUILDINGS
2, 3, 4, 5, 6, 7, 11, 12, 13, 19 & 20

SIGN QUANTITIES

SYMBOL	DESCRIPTION	QUANITITY PANEL	QUANITITY POST
	R1-1 30"x30" "STOP" SIGN	11	11
	R1-2 30" "YIELD" SIGN	5	5
	12" D3-1 STREET NAME ATOP SIGN	12	0
	R2-1(25) "25 MPH SPEED LIMIT" SIGN	3	3
	12"x 18" V.A. BARRIER SIGN (R7-8)	2	2
	6"x 12" VAN ACCESSIBLE SIGN (R7-8P)	2	0
	"NO PARKING FIRE LANE" (R8-3) IN ACCORDANCE WITH SEC. 15-99 (a)(1).	11	11
	"NO OUTLET" (W14-2) 30"x30"	1	1

PHASING LEGEND
PHASE 1
PHASE 2
PHASE 3

PROPOSED LEGEND
SANITARY SEWER
WATER MAIN
STORM SEWER
SILT FENCE
WETLANDS
1000 CONTOUR
CURB AND GUTTER
SANITARY MANHOLE
STORM MANHOLE
CATCH BASIN
END SECTION
FIRE HYDRANT
GATE VALVE AND WELL
PAVEMENT (ASPHALT)
PAVEMENT (CONCRETE SIDEWALK)
DIRECTION SURFACE WATER FLOW
900.0 GRADE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

SUBMITTAL DATE: 02-19-2025

NO	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
811
IT'S FREE AND IT'S THE LAW
OF UNDERGROUND FACILITIES

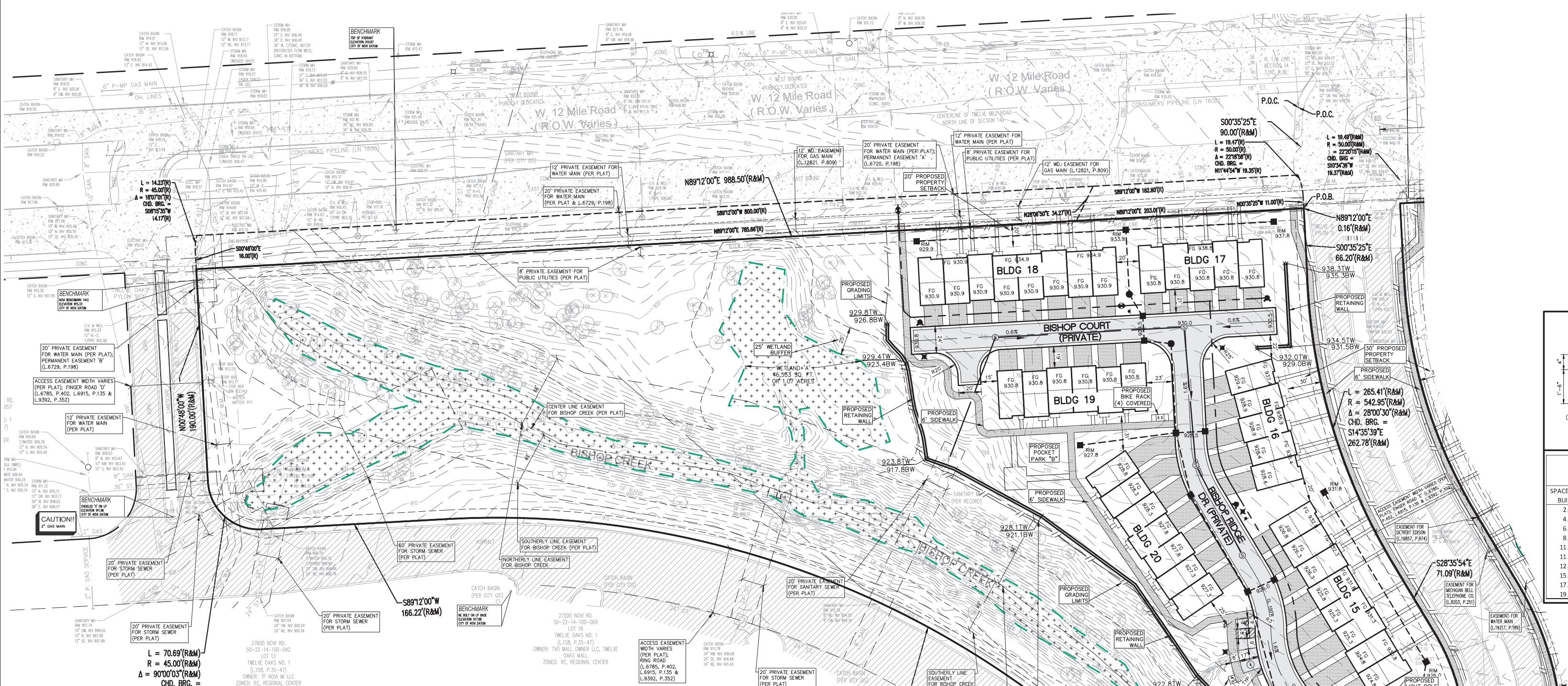
CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

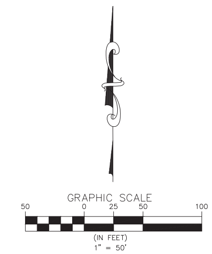
PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

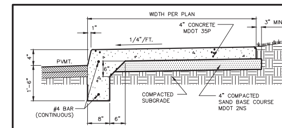
SHEET TITLE:
OVERALL SITE PLAN

PROJECT NO: 24-197

PAGE No.:
C7



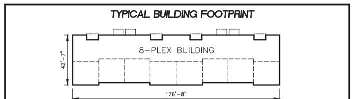




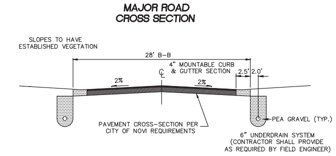
THICKENED EDGE SIDEWALK DETAIL

MINIMUM DISTANCE BETWEEN BUILDINGS $\frac{L_A + L_B + 2(H_A + H_B)}{6}$							
SPACE BETWEEN BUILDINGS:	La	Lb	Ha	Hb	REQUIRED SPACING	PROPOSED SPACING	PRO DEVIATION
2 AND 3	38.58	38.58	37.00	37.00	37.53	20.00	YES
4 AND 5	38.50	37.29	37.00	37.00	37.30	20.26	YES
6 AND 7	38.58	38.58	37.00	37.00	37.53	20.00	YES
8 AND 9	42.58	42.58	37.00	37.00	38.86	20.00	YES
11 AND 12	38.81	42.58	37.00	37.00	38.23	37.26	YES
11 AND 13	1.11	12.24	37.00	37.00	26.89	21.23	YES
12 AND 13	77.78	77.58	37.00	37.00	50.56	99.97	NO
15 AND 16	35.74	40.42	37.00	37.00	37.36	20.49	YES
17 AND 18	38.58	38.58	37.00	37.00	37.53	20.00	YES
19 AND 20	36.39	42.58	37.00	37.00	37.83	34.62	YES

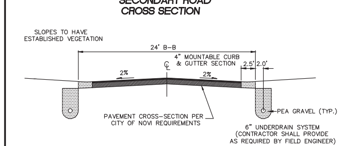
TYPICAL BUILDING FOOTPRINT



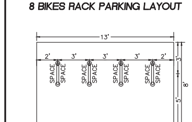
MAJOR ROAD CROSS SECTION



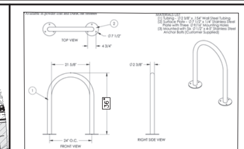
SECONDARY ROAD CROSS SECTION



8 BIKES RACK PARKING LAYOUT



INVERTED "U" BIKE RACK



NOT TO SCALE

SITE DATA

EXISTING ZONING	PDZ
GROSS ACRES - WEST	8.80 AC
WETLAND - WEST	1.07 AC
NET ACRES - WEST	7.73 AC
GROSS ACRES - EAST	7.57 AC
WETLAND - EAST	0.25 AC
NET ACRES - EAST	7.32 AC
GROSS ACRES - TOTAL	16.37 AC
WETLAND - TOTAL	1.32 AC
NET ACRES - TOTAL	15.05 AC
NUMBER OF BUILDING	20 EA
NUMBER OF UNITS	125 EA
ALL UNITS HAVE 3 BEDROOMS (4 ROOMS)	
NUMBER OF ROOMS	500 ROOMS
NET AREA REQUIRED	
2000 SF PER ROOM	1,000,000 SF
	22.96 AC
PROPOSED DENSITY	8.3 UNITS/AC

WETLAND IMPACT

WETLAND NAME	TYPE	AREA (AC.)	WETLAND IMPACT AREA (AC.)	WETLAND FILL VOLUME (CF)	BUFFER DISTURBANCE (AC.)	BUFFER FILL VOLUME (CF)
A	PEM	1.07	0.00	0	0.00	0
B	PEM	0.04	0.02	1307	0.06	7,841
C	PEM	0.21	0.21	27,443	0.29	37,897
TOTAL:		1.32	0.23	28,750	0.35	45,738

NOTES AND PROPOSED IMPROVEMENTS

1. MUNICIPAL SEWER TO BE PROVIDED BY CONNECTING TO AN EXISTING 8" SANITARY SEWER FROM EXISTING PHASES TO THE SOUTH.
2. MUNICIPAL WATER TO BE PROVIDED BY CONNECTING TO AN EXISTING 20" WATER MAIN LOCATED ON THE SOUTH SIDE OF TWELVE MILE ROAD, ALSO CONNECTING TO AN EXISTING 8" WATER MAIN LOCATED ON 12 OAKS DRIVE.
3. STORM WATER DETENTION SHALL BE PROVIDED IN THE REGIONAL 12 OAKS BASIN.
4. 6' WIDE CONCRETE SIDEWALKS SHALL BE CONSTRUCTED AS SHOWN.
5. ALL ROADWAYS TO BE PRIVATE.
6. A CITY OF NOVI RIGHT-OF-WAY PERMIT IS REQUIRED FOR WORK WITHIN ANY PUBLIC ROAD RIGHT-OF-WAY.
7. ALL SIDEWALKS AND SIDEWALK RAMPS SHALL A.D.A. COMPLIANT.
8. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF NOVI STANDARDS AND SPECIFICATIONS.
9. PROP. WATER MAIN AND PROP. SANITARY SEWER TO BE CENTERLINE OF 20' WIDE PUBLIC EASEMENT.
10. TRASH TO BE PICKED UP BY CURBSIDE PICK UP.
11. NO ACCESSORY STRUCTURES ARE PROPOSED.

RESIDENTIAL PARKING CALCULATIONS

PARKING REQUIRED PER SEC. 5.2.12.A
(2.5 SPACES REQUIRED FOR EACH UNIT HAVING 3 OR MORE BEDROOMS)
NO. OF UNITS PROPOSED = 125
PARKING REQUIRED = 125 x 2.5 = 313 SPACES

PARKING PROVIDED =
ATTACHED GARAGE PARKING = 250
APRON GARAGE PARKING = 250
GUEST SURFACE PARKING INCLUDING V.A. SPACE = 10

PARKING PROVIDED = 510 SPACES

ACCESSIBLE PARKING SPACES

TOTAL SURFACE SPACES = 10
ACCESSIBLE SPACES PER 2010 ADA (208.2.3 RESIDENTIAL FACILITIES)
TOTAL REQUIRED: MINIMUM 2% OF THE TOTAL SURFACE SPACES
TOTAL REQUIRED: 10 x 2% = 1 SPACE
TOTAL PROVIDED: 2 VAN ACCESSIBLE SPACE

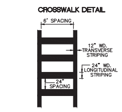
BIKE RACK REQUIREMENTS

BICYCLE PARKING REQUIRED PER SECTION 5.16.1
(ONE SPACE FOR EACH 5 UNITS REQUIRED)
TOTAL REQUIRED = 125 / 5 = 25 SPACES
TOTAL PROVIDED = 26 SPACES
PROVIDED COVERED = 12 SPACES

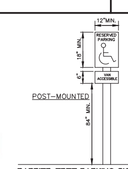
BUILDINGS COVERAGE

MAXIMUM PERMITTED LOT COVERAGE = 25%
PROVIDED LOT COVERAGE = 17.5%

CROSSWALK DETAIL



NOTES:
1. TRANSVERSE LINES SHALL BE 12" WIDE.
2. LONGITUDINAL LINES SHALL BE 24" APART.
3. ALL STRIPING TO BE WHITE PAINT OR APPROVED EQUAL.



BARRIER-FREE PARKING SIGN

Figure 3B-22. International Symbol of Accessibility Parking Space Marking

SIGNAGE NOTES

1. STREET NAME SIGNS SHOULD BE PLACED A TOP THE INTERIOR STOP SIGN.
2. STREET-NAME SIGN SHALL COMPLY WITH THE CITY OF NOVI DESIGN STANDARDS.
3. ALL TRAFFIC SIGNAGE SHALL COMPLY WIYH THE CURRENT MMUTCD STANDARDS.
4. SIGNS 12"X18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 2 LB. U-CHANNEL POST.
5. SIGNS GREATER THAN 12"X18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST.
6. SIGNS BOTTOM HEIGHT OF 7' FROM FINAL GRADE .
7. SIGNING SHALL BE PLACED 2' FROM THE FACE OF THE CURB OR EDGE OF THE NEAREST SIDEWALK TO THE NEAR EDGE OF THE SIGN.
8. FHWA STANDARD ALPHABET SERIES USED FOR ALL SIGN LANGUAGE.
9. HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETRO-REFLECTIVITY.

BARRIER-FREE RESERVED PARKING SIGNS

NOTE: ACCESSIBLE PARKING SPACE SIGNS SHALL HAVE A MIN. HEIGHT AND SIZE TO PERMIT THE SPACE TO BE EASILY IDENTIFIED AND ARE ELEVATED SUCH THAT THEY SHALL NOT PRESENT A HAZARD TO PERSONS WALKING NEAR THE SIGN.

SIGNING NOTES

1. ALL SIGNS SHALL HAVE A MINIMUM BOTTOM MOUNTING HEIGHT OF 7' FROM FINAL GRADE FOR GROUND MOUNTED SIGNS. WALL MOUNTED SIGNS MAY HAVE A BOTTOM MOUNTING HEIGHT OF 5'.
2. ALL ROADSIDE SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF THE CURB TO THE NEAR EDGE OF THE SIGN.
3. SINGLE SIGNS WITH NOMINAL DIMENSIONS OF 12"x18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 2 LB. U-CHANNEL POST. MULTIPLE SIGNS AND/OR SIGNS WITH NOMINAL DIMENSIONS GREATER THAN 12"x18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST AS DICTATED BY THE WEIGHT OF THE PROPOSED SIGNS.
4. TRAFFIC CONTROL SIGNS SHALL USE THE FHWA STANDARD ALPHABET SERIES.
5. TRAFFIC CONTROL SIGNS SHALL HAVE A HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETROREFLECTIVITY REQUIREMENTS.

STRIPING NOTES:

1. PARKING LOTS SHALL HAVE PARKING AREAS AND RAMP PAVEMENT MARKINGS MARKED BY PAINTED 4-INCH WIDE LINES ACCURATELY AND NEATLY ARRANGED AS INDICATED ON THE PLAN. LINES SHALL BE PAINTED WITH AN APPROVED WHITE TRAFFIC PAINT COMPATIBLE WITH BITUMINOUS/CONCRETE SURFACES SUCH AS SHERWIN WILLIAMS NO. B2 9W1; PPG TYPE 11-3 OR 11-4, OR AS APPROVED BY THE OWNER. PROTECT ALL PAINTED AREAS UNTIL PAINT IS COMPLETELY DRY.PARKING AREAS FOR THE PHYSICALLY HANDICAPPED SHALL BE PAINTED WITH BLUE PAINT FOR STRIPING. WHEEL CHAIR SYMBOL SHALL BE PAINTED WHITE. ALL PAINTED MARKINGS AND STRIPING SHALL BE PROVIDED IN TWO COATS.
2. THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY SHALL BE WHITE OR WHITE WITH BLUE BACKGROUND
3. WHEN A BARRIER FREE PARKING SPACE IS ADJACENT TO A STANDARD PARKING SPACE, BLUE AND WHITE LINES ABUTTING EACH OTHER SHALL BE PROVIDED.

REQUESTED DEVIATIONS

1. Building Orientation (Sec. 3.8.2.D) Requested deviation for buildings not to be configured at 45 degrees.
2. Setbacks (Sec. 3.31.7.D) Requested deviation to reduce the setback from 50 feet to 20 feet along 12 Mile Road.
3. Setbacks (Sec. 3.31.7.D) Requested deviation to reduce the setback from 50 feet to 30 feet along 12 Oaks Road & Huron Circle.
4. Setbacks (Sec. 3.31.7.D) Requested deviation to reduce the setback from 35 feet to 20 feet along the easterly boundary of the east parcel.
5. Parking along Major Drives (Sec. 5.10) Requested deviation is to have perpendicular parking on a major drive.
6. Distance between Buildings (Sec. 3.8.2.H) Requested deviation is to provide 20 feet between buildings.
7. Density Allowed (Sec. 3.8.1.A) Requested deviation for density to be 8.3 units/ac from 5.4 units/ac.

BIKE RACK CANOPY DETAIL

PROPOSED LEGEND

	SANITARY SEWER
	WATER MAIN
	STORM SEWER
	SILT FENCE
	WETLANDS
1000	CONTOUR
	CURB AND GUTTER
	SANITARY MANHOLE
	STORM MANHOLE
	CATCH BASIN
	END SECTION
	FIRE HYDRANT
	GATE VALVE AND WELL
	PAVEMENT (ASPHALT)
	PAVEMENT (CONCRETE SIDEWALK)
	DIRECTION SURFACE WATER FLOW
900.0	GRADE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050

FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

SUBMITTAL DATE: 02-19-2025

NO	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

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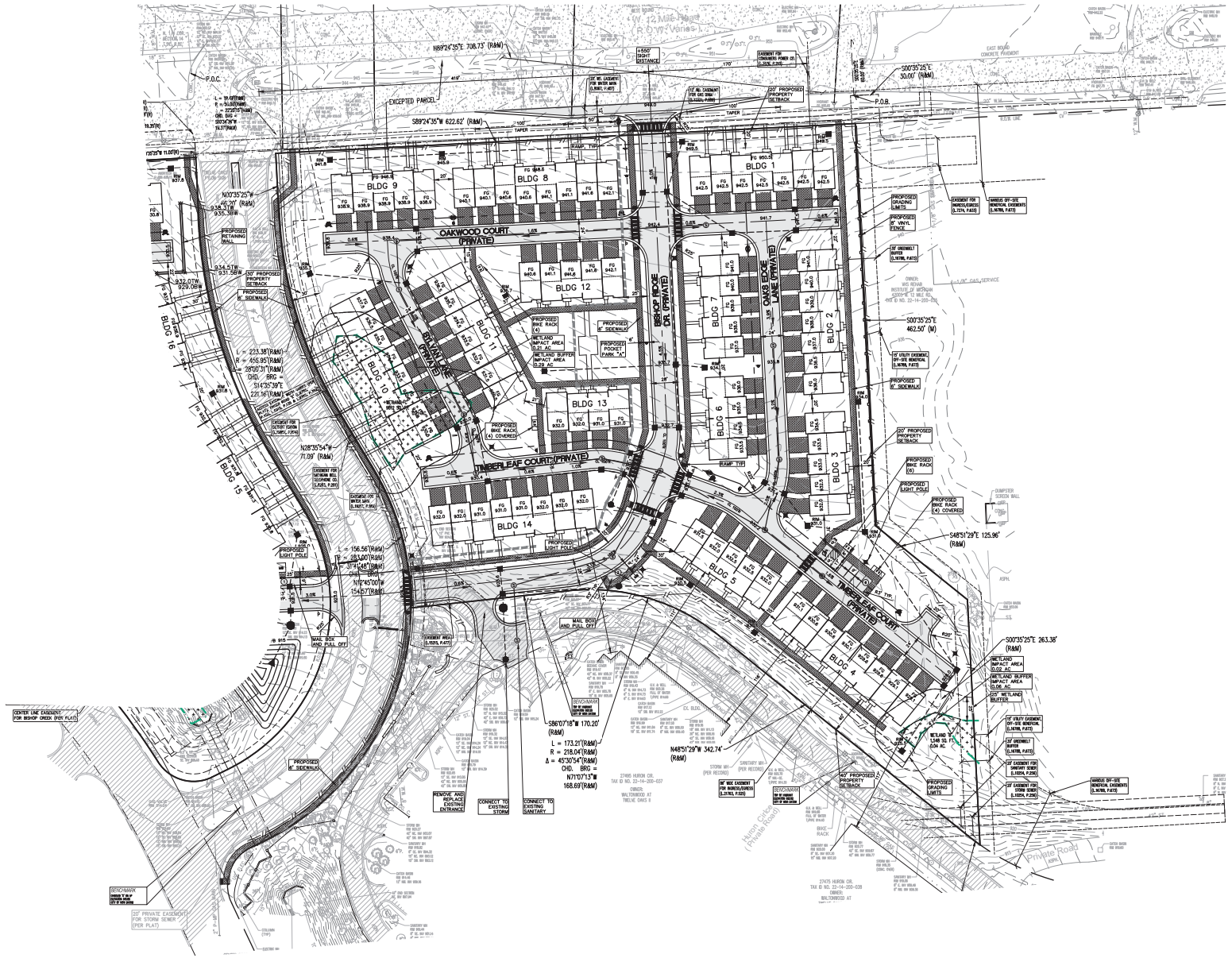
MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
SITE PLAN - WEST

PROJECT NO: 24-197

PAGE No.:
C8



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SHEET TITLE:
SITE PLAN - EAST

PROJECT NO: 24-197

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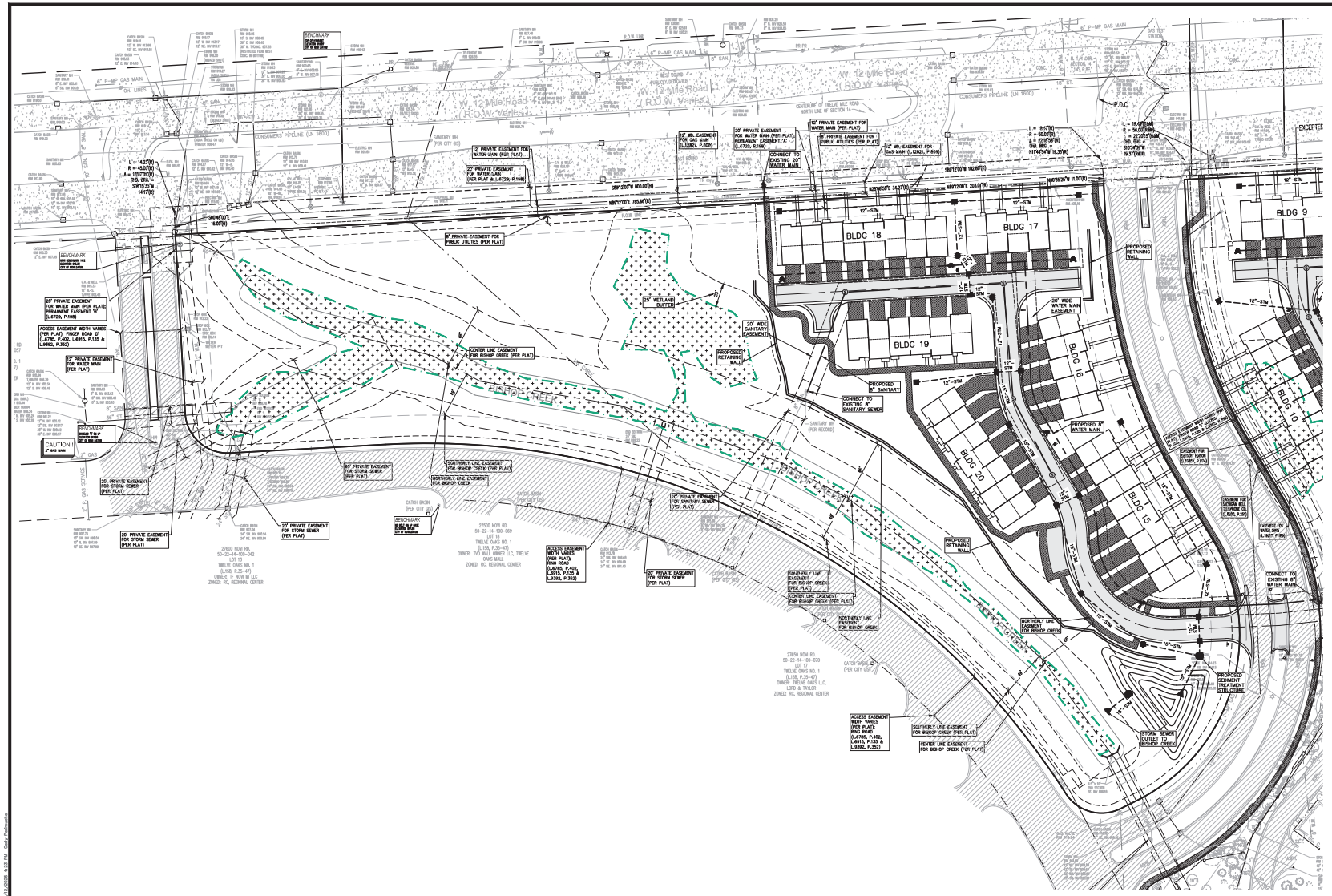

SANITARY BASIS OF DESIGN

NUMBER OF UNITS	127	UNITS
POPULATION		
3.2 PEOPLE/UNIT	406.4	PEOPLE
AVERAGE FLOW		
PEOPLE X 100GAL/CAP/DAY	40640	GAL/DAY
	0.063	CFS
PEAK FLOW		
PEAK FACTOR (< 500 PEOPLE)	4	
PEAK FACTOR X AVERAGE FLOW	0.252	CFS
	112.88	GPM
Q PROVIDED (8" sanitary)	0.764	CFS
	342.88	GPM

PROPOSED LEGEND

- SANITARY SEWER
- WATER MAIN
- STORM SEWER
- SILT FENCE
- WETLANDS
- 1000 CONTOUR
- CURB AND GUTTER
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- END SECTION
- FIRE HYDRANT
- GATE VALVE AND WELL
- PAVEMENT (ASPHALT)
- PAVEMENT (CONCRETE SIDEWALK)
- DIRECTION SURFACE WATER FLOW
- 900.0 GRADE

NO	DESCRIPTION	DATE
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SHEET TITLE:
COMPOSITE UTILITY PLAN - WEST

PROJECT NO: 24-197

PAGE No.:
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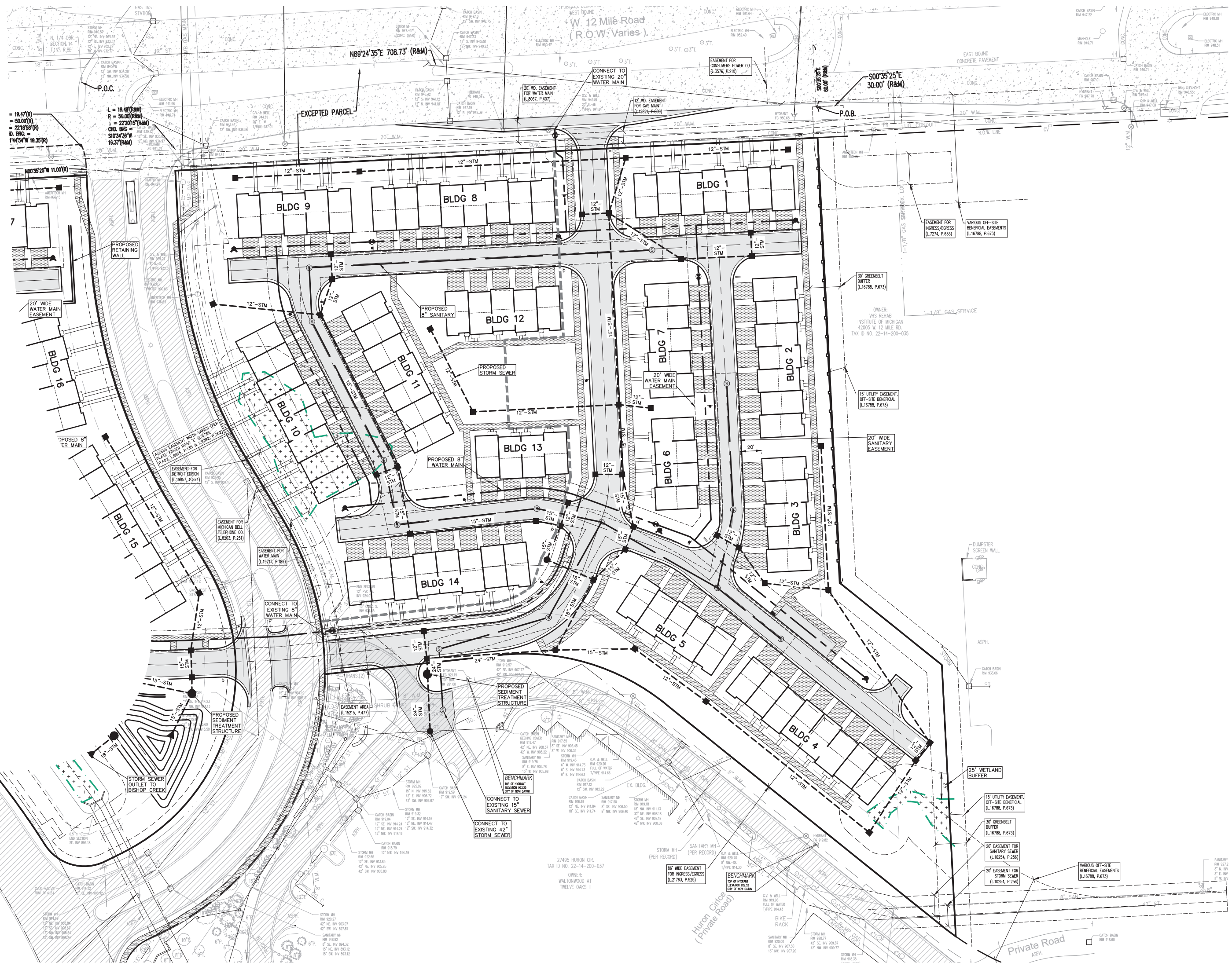

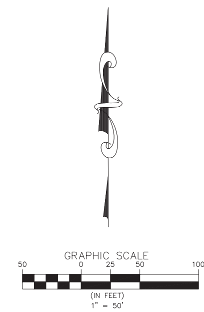

PROPOSED LEGEND

	SANITARY SEWER
	WATER MAIN
	STORM SEWER
	SILT FENCE
	WETLANDS
1000	CONTOUR
	CURB AND GUTTER
(S)	SANITARY MANHOLE
●	STORM MANHOLE
■	CATCH BASIN
▶	END SECTION
	FIRE HYDRANT
	GATE VALVE AND WELL
	PAVEMENT (ASPHALT)
	PAVEMENT (CONCRETE SIDEWALK)
→	DIRECTION SURFACE WATER FLOW
900.0	GRADE

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PROJECT NAME:
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SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
COMPOSITE UTILITY PLAN - EAST

PROJECT NO: 24-197

PAGE No.:
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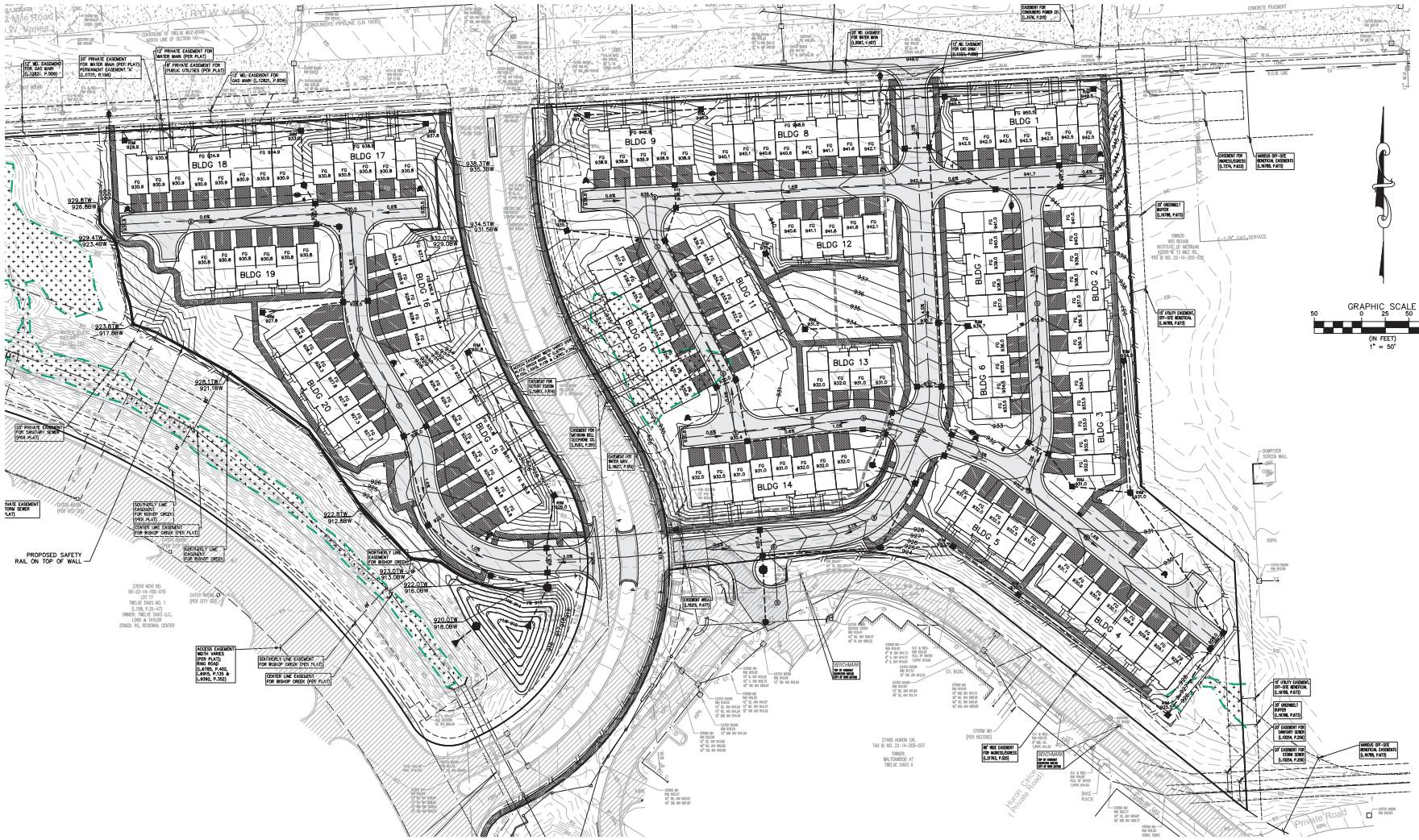

PROPOSED LEGEND

- SANITARY SEWER
- WATER MAIN
- STORM SEWER
- SILT FENCE
- WETLANDS
- CONTOUR
- CURB AND GUTTER
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- END SECTION
- FIRE HYDRANT
- GATE VALVE AND WELL
- PAVEMENT (ASPHALT)
- PAVEMENT (CONCRETE SIDEWALK)
- DIRECTION SURFACE WATER FLOW
- GRADE

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NO	DESCRIPTION	DATE
SUBMITTAL DATE: 02-19-2025		
1.	PER CITY REVIEW	04/07/25
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SHEET TITLE:
GRADING PLAN

PROJECT NO: 24-197

PAGE No.:
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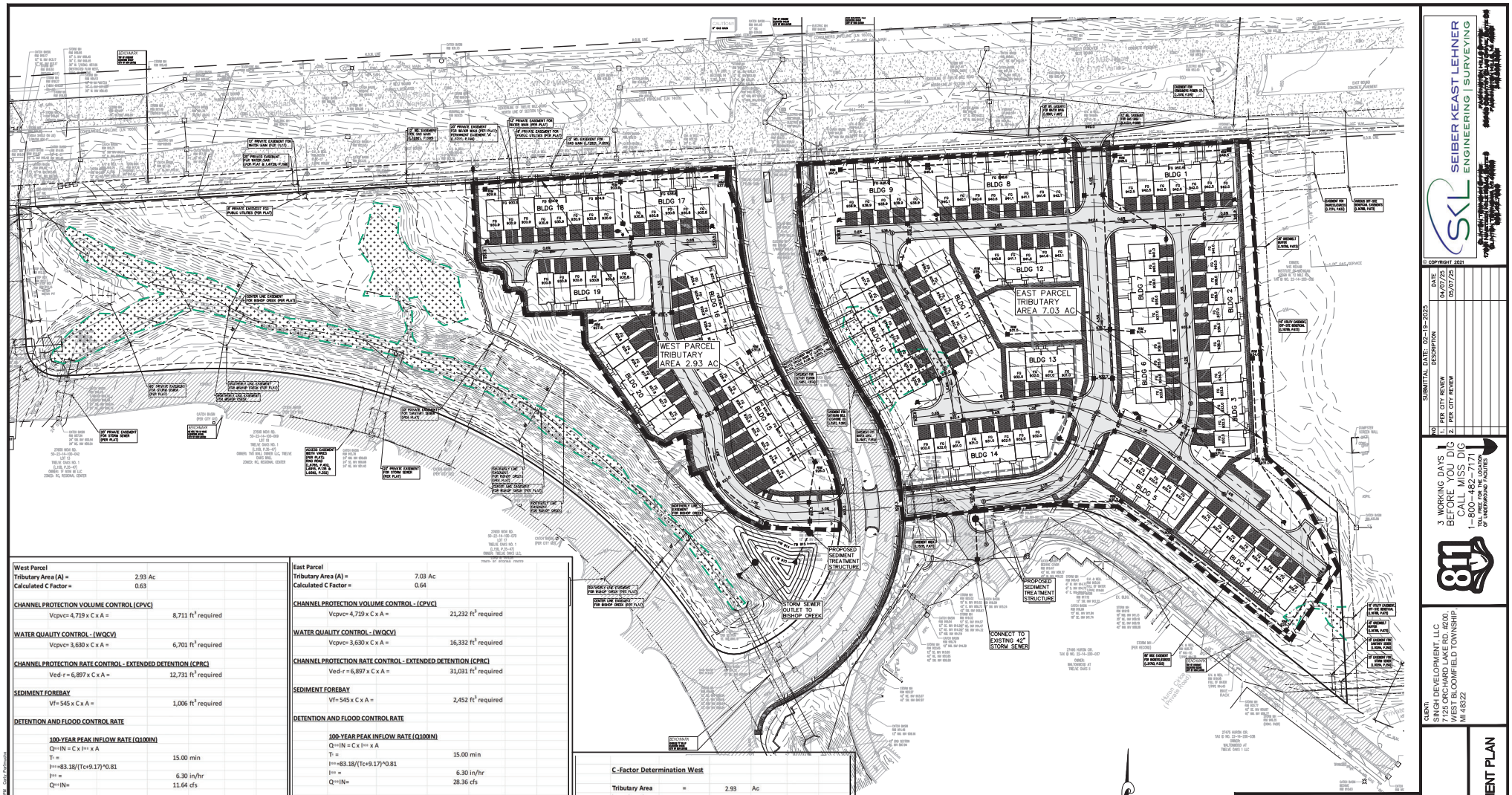


West Parcel

Tributary Area (A) =	2.93	Ac
Calculated C Factor =	0.63	

CHANNEL PROTECTION VOLUME CONTROL (CPVC)

Vcpvc= 4,719 x C x A = 8,711 ft³ required

WATER QUALITY CONTROL - (WQCV)

Vcpvc= 3,630 x C x A = 6,701 ft³ required

CHANNEL PROTECTION RATE CONTROL - EXTENDED DETENTION (CPRC)

Ved-r = 6,897 x C x A = 12,731 ft³ required

SEDIMENT FOREBAY

Vf= 545 x C x A = 1,006 ft³ required

DETENTION AND FLOOD CONTROL RATE

100-YEAR PEAK INFLOW RATE (Q100IN)

Q**IN = C x I** x A

T- = 15.00 min

I**=83.18/(Tc+9.17)^0.81

I** = 6.30 in/hr

Q**IN= 11.64 cfs

VARIABLE RELEASE RATE

Qvrr = 1.1055-0.206 ln(A) 0.88 cfs/acre

PEAK ALLOWABLE 100-YEAR DISCHARGE

Q**P = 2.59 cfs

STORAGE CURVE FACTOR FOR THE 100-YEAR DETENTION VOLUME (R)

R= [0.206-0.15IN (Q100P/Q100IN)] 0.431

100-YEAR DETENTION VOLUME (V100R)

V100r=18985 x C x A = 35,044 ft³

100-YEAR DETENTION VOLUME (V100D)

V100D= (V100R x R) = 15,116 ft³

Vf=	1,006	cubic feet
Vcpvc=	8,711	cubic feet
Ved=	12,731	cubic feet
V100D=	15,116	cubic feet

East Parcel

Tributary Area (A) =	7.03	Ac
Calculated C Factor =	0.64	

CHANNEL PROTECTION VOLUME CONTROL - (CPVC)

Vcpvc= 4,719 x C x A = 21,232 ft³ required

WATER QUALITY CONTROL - (WQCV)

Vcpvc= 3,630 x C x A = 16,332 ft³ required

CHANNEL PROTECTION RATE CONTROL - EXTENDED DETENTION (CPRC)

Ved-r = 6,897 x C x A = 31,031 ft³ required

SEDIMENT FOREBAY

Vf= 545 x C x A = 2,452 ft³ required

DETENTION AND FLOOD CONTROL RATE

100-YEAR PEAK INFLOW RATE (Q100IN)

Q**IN = C x I** x A

T- = 15.00 min

I**=83.18/(Tc+9.17)^0.81

I** = 6.30 in/hr

Q**IN= 28.36 cfs

VARIABLE RELEASE RATE

Qvrr = 1.1055-0.206 ln(A) 0.70 cfs/acre

PEAK ALLOWABLE 100-YEAR DISCHARGE

Q**P = 4.95 cfs

STORAGE CURVE FACTOR FOR THE 100-YEAR DETENTION VOLUME (R)

R= [0.206-0.15IN (Q100P/Q100IN)] 0.468

100-YEAR DETENTION VOLUME (V100R)

V100r=18985 x C x A = 85,417 ft³

100-YEAR DETENTION VOLUME (V100D)

V100D= (V100R x R) = 39,968 ft³

Vf=	2,452	cubic feet
Vcpvc=	21,232	cubic feet
Ved=	31,031	cubic feet
V100D=	39,968	cubic feet

C-Factor Determination West

Tributary Area	=	2.93	Ac	
Impervious Areas				
Bldg, Drives	=	1.06	Ac	at C = 0.95
Roads, Walks		0.63	Ac	at C = 0.95
Pervious Areas				
Lawn Areas	=	1.24	Ac	at C = 0.20
C-Factor Avgerage		0.63		

C-Factor Determination - East

Tributary Area	=	7.03	Ac	
Impervious Areas				
Bldg, Drives	=	2.37	Ac	at C = 0.95
Roads, Walks		1.80	Ac	at C = 0.95
Pervious Areas				
Lawn Areas	=	2.86	Ac	at C = 0.20
C-Factor Avgerage		0.64		

BASIN VOLUME

	ELEVATION	AREA (SF)	VOLUME (CF)
HW	914	4,951.0	
	913	3,434.9	4,192.9
	912	2,196.0	2,815.5
	911	1,217.5	1,706.7
LW	910	505.5	861.5
TOTAL VOLUME PROVIDED			8,715

PROPOSED LEGEND

- SANITARY SEWER
- WATER MAIN
- STORM SEWER
- SILT FENCE
- WETLANDS
- 1000 CONTOUR
- CURB AND GUTTER
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- END SECTION
- FIRE HYDRANT
- GATE VALVE AND WELL
- PAVEMENT (ASPHALT)
- PAVEMENT (CONCRETE SIDEWALK)
- DIRECTION SURFACE WATER FLOW
- 900.0 GRADE

SEIBER KEAST LEHNER ENGINEERING | SURVEYING

NO	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

SUBMITTAL DATE: 02-19-2025

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 811 OF UNDERGROUND FACILITIES

CLIENT: SINGH DEVELOPMENT, LLC 7125 ORCHARD LAKE RD. #200, WEST BLOOMFIELD TOWNSHIP, MI 48322

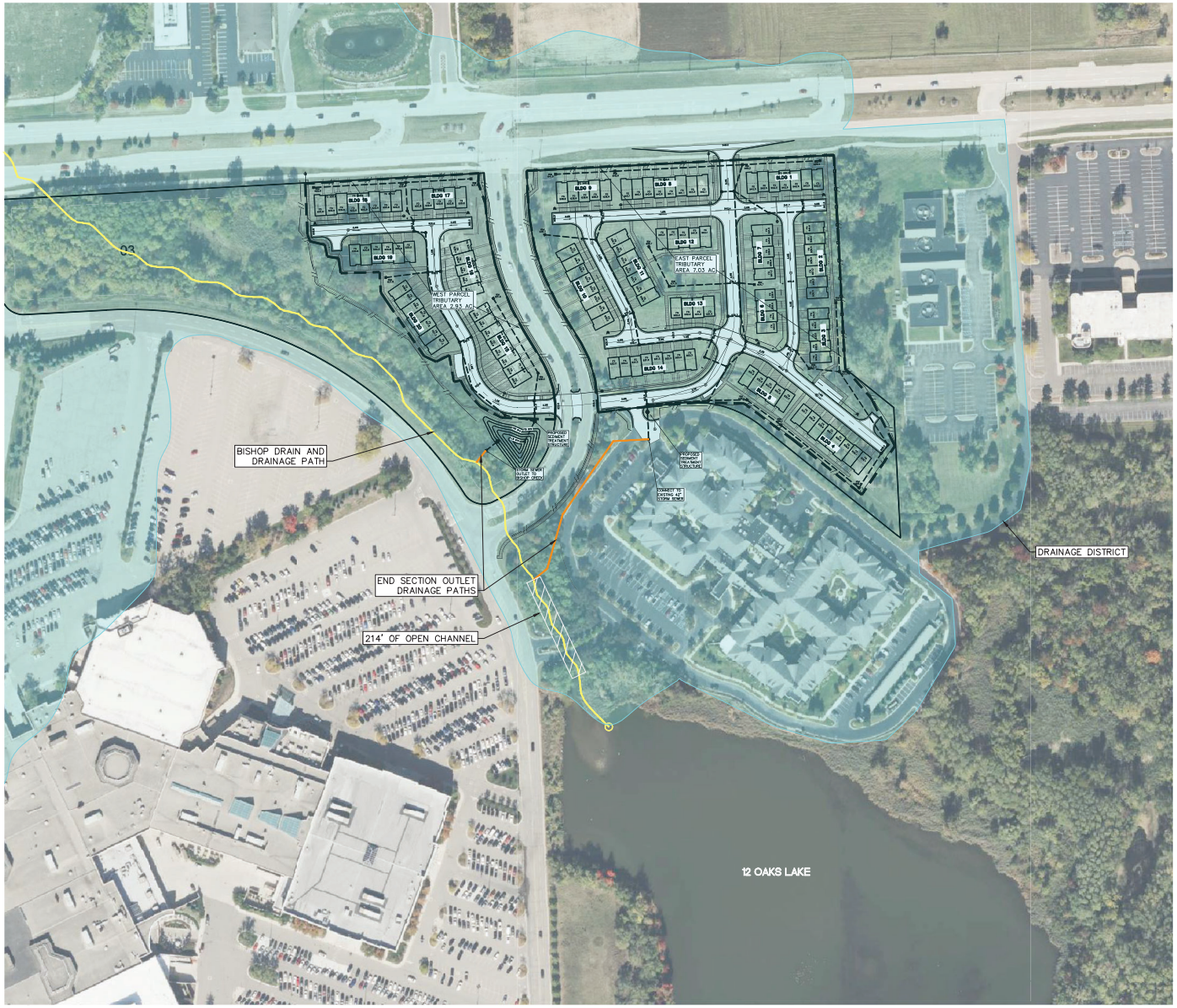
PROJECT NAME: 12 MILE ROAD TOWNES

SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE: STORM WATER MANAGEMENT PLAN

PROJECT NO: 24-197

PAGE No.: C13



GRAPHIC SCALE
100 0 50 100 200
(IN FEET)
1" = 100'

PROPOSED LEGEND

- SANITARY SEWER
- WATER MAIN
- STORM SEWER
- SILT FENCE
- WETLANDS
- CONTOUR
- CURB AND GUTTER
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- END SECTION
- FIRE HYDRANT
- GATE VALVE AND WELL
- PAVEMENT (ASPHALT)
- PAVEMENT (CONCRETE SIDEWALK)
- DIRECTION SURFACE WATER FLOW
- 900.0 GRADE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

SUBMITTAL DATE: 02-19-2025

NO	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
IT'S THE LAW - MICHIGAN LAW REQUIRES NOTIFICATION OF UNDERGROUND FACILITIES

CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
STORM WATER OUTLET

PROJECT NO: 24-197

PAGE No.:
C14

OVERALL SITE

Usable Open Space Calculations SEC. 3.1.7.D

TOTAL No. OF RESIDENTIAL UNITS = 125
USABLE OPEN SPACE REQUIRED = 200 S.F. PER UNIT
= 25,000 S.F. = 0.57 AC.

UNIT DECKS (80 S.F. EACH DECK) x 125
UNITS DECKS = 10,000 S.F. = 0.23 AC.
POCKET PARKS = 17,761 S.F. = 0.41 AC.

USABLE OPEN SPACE PROVIDED = 27,761 S.F. = 0.64 AC.

PHASE 1

Usable Open Space Calculations SEC. 3.1.7.D

TOTAL No. OF RESIDENTIAL UNITS = 41
USABLE OPEN SPACE REQUIRED = 200 S.F. PER UNIT
= 8,200 S.F.

UNIT DECKS (80 S.F. EACH DECK) x 41
UNITS DECKS = 3,280 S.F.
POCKET PARK (HALF OF EAST PARK) = 5,876 S.F.

USABLE OPEN SPACE PROVIDED = 9,156 S.F.

PHASE 2

Usable Open Space Calculations SEC. 3.1.7.D

TOTAL No. OF RESIDENTIAL UNITS = 45
USABLE OPEN SPACE REQUIRED = 200 S.F. PER UNIT
= 9,000 S.F.

UNIT DECKS (80 S.F. EACH DECK) x 45
UNITS DECKS = 3,600 S.F.
POCKET PARK (HALF OF EAST PARK) = 5,446 S.F.

USABLE OPEN SPACE PROVIDED = 9,046 S.F.

PHASE 3

Usable Open Space Calculations SEC. 3.1.7.D

TOTAL No. OF RESIDENTIAL UNITS = 39
USABLE OPEN SPACE REQUIRED = 200 S.F. PER UNIT
= 7,800 S.F.

UNIT DECKS (80 S.F. EACH DECK) x 39
UNITS DECKS = 3,120 S.F.
POCKET PARK (WEST PARK) = 6,439 S.F.

USABLE OPEN SPACE PROVIDED = 9,559 S.F.

PROPOSED LEGEND

- SANITARY SEWER
- WATER MAIN
- STORM SEWER
- SILT FENCE
- WETLANDS
- 1000 CONTOUR
- CURB AND GUTTER
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- END SECTION
- FIRE HYDRANT
- GATE VALVE AND WELL
- PAVEMENT (ASPHALT)
- PAVEMENT (CONCRETE SIDEWALK)
- DIRECTION SURFACE WATER FLOW
- 900.0 GRADE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

SUBMITTAL DATE: 02-19-2025

NO.	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG
1-800-482-7171

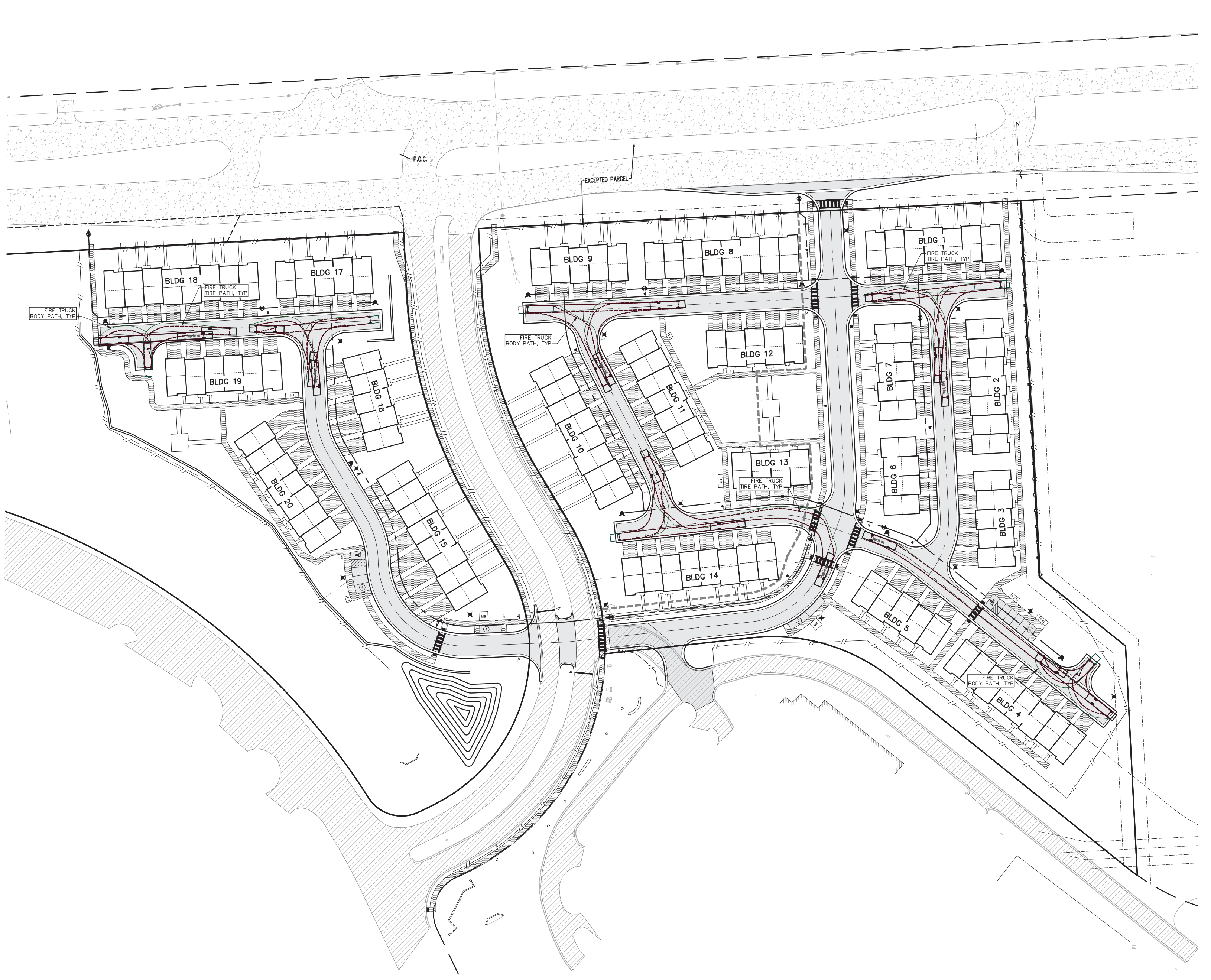
CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

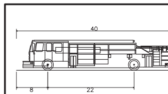
SHEET TITLE:
OPEN SPACE PLAN

PROJECT NO: 24-197

PAGE No.:
C15



NOTE:
BUILDING MUST
"COMPLY WITH THE INTERNATIONAL
FIRE CODE SECTION 510 FOR
EMERGENCY RADIO COVERAGE"



Pumper Fire Truck	
Overall Length	40.000ft
Overall Width	8.167ft
Overall Body Height	7.745ft
Min Body Ground Clearance	0.656ft
Track Width	8.167ft
Lock-to-lock time	5.00s
Max Wheel Angle	45.00°

PROPOSED LEGEND

- SANITARY SEWER
- WATER MAIN
- STORM SEWER
- SILT FENCE
- WETLANDS
- 1000 — CONTOUR
- CURB AND GUTTER
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN
- END SECTION
- FIRE HYDRANT
- GATE VALVE AND WELL
- PAVEMENT (ASPHALT)
- PAVEMENT (CONCRETE SIDEWALK)
- DIRECTION SURFACE WATER FLOW
- 900.0 GRADE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

CLINTON TOWNSHIP OFFICE
17001 NINETEEN MILE ROAD, SUITE 3
CLINTON TOWNSHIP, MI 48038
586.412.7050

FARMINGTON HILLS OFFICE
39205 COUNTRY CLUB DRIVE, SUITE C8
FARMINGTON HILLS, MI 48331
248.308.3331

SUBMITTAL DATE: 02-19-2025

NO.	DESCRIPTION	DATE
1.	PER CITY REVIEW	04/07/25
2.	PER CITY REVIEW	05/07/25

811
3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
TOLL FREE FOR THE LOCATION OF UNDERGROUND FACILITIES

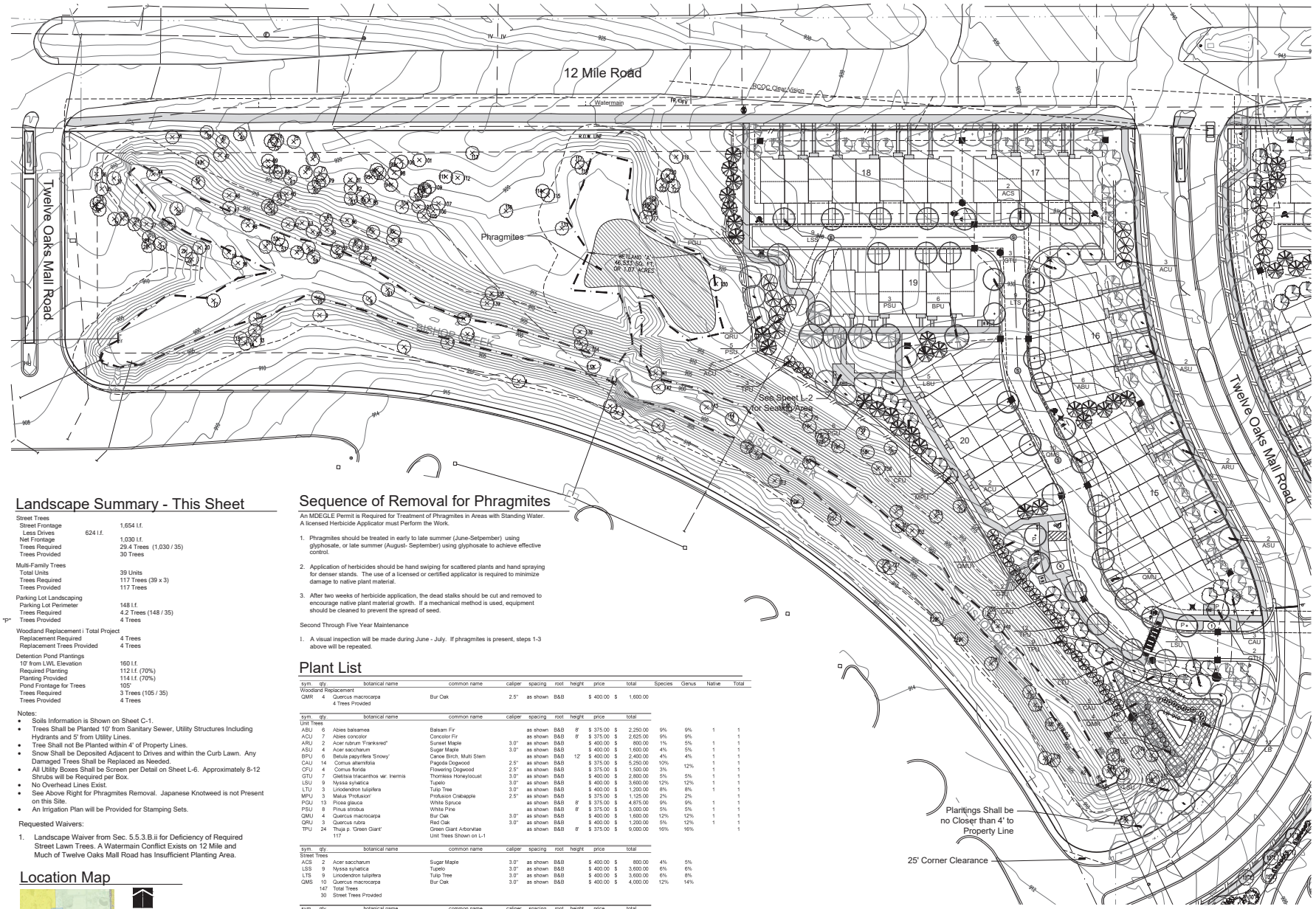
CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
FIRE TRUCK ROUTING PLAN

PROJECT NO: 24-197

PAGE No.:
C16



Landscape Summary - This Sheet

Street Trees		
Street Frontage		1,654 l.f.
Less Drives	624 l.f.	
Net Frontage		1,030 l.f.
Trees Required		29.4 Trees (1,030 / 35)
Trees Provided		30 Trees
Multi-Family Trees		
Total Units		39 Units
Trees Required		117 Trees (39 x 3)
Trees Provided		117 Trees
Parking Lot Landscaping		
Parking Lot Perimeter		148 l.f.
Trees Required		4.2 Trees (148 / 35)
"P" Trees Provided		4 Trees
Woodland Replacement i Total Project		
Replacement Required		4 Trees
Replacement Trees Provided		4 Trees
Detention Pond Plantings		
10' from LWL Elevation		160 l.f.
Required Planting		112 l.f. (70%)
Planting Provided		114 l.f. (70%)
Pond Frontage for Trees		105'
Trees Required		3 Trees (105 / 35)
Trees Provided		4 Trees

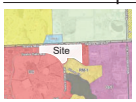
Notes:

- Soils Information is Shown on Sheet C-1.
- Trees Shall be Planted 10' from Sanitary Sewer, Utility Structures Including Hydrants and 5' from Utility Lines.
- Tree Shall not Be Planted within 4' of Property Lines.
- Snow Shall be Deposited Adjacent to Drives and within the Curb Lawn. Any Damaged Trees Shall be Replaced as Needed.
- All Utility Boxes Shall be Screen per Detail on Sheet L-6. Approximately 8-12 Shrubs will be Required per Box.
- No Overhead Lines Exist.
- See Above Right for Phragmites Removal. Japanese Knotweed is not Present on this Site.
- An Irrigation Plan will be Provided for Stamping Sets.

Requested Waivers:

1. Landscape Waiver from Sec. 5.5.3.B.ii for Deficiency of Required Street Lawn Trees. A Watermain Conflict Exists on 12 Mile and Much of Twelve Oaks Mall Road has Insufficient Planting Area.

Location Map



North
No Scale

Sequence of Removal for Phragmites

An MDEGLE Permit is Required for Treatment of Phragmites in Areas with Standing Water. A licensed Herbicide Applicator must Perform the Work.

1. Phragmites should be treated in early to late summer (June-Setpember) using glyphosate, or late summer (August- September) using glyphosate to achieve effective control.
2. Application of herbicides should be hand swiping for scattered plants and hand spraying for denser stands. The use of a licensed or certified applicator is required to minimize damage to native plant material.
3. After two weeks of herbicide application, the dead stalks should be cut and removed to encourage native plant material growth. If a mechanical method is used, equipment should be cleaned to prevent the spread of seed.

Second Through Five Year Maintenance

1. A visual inspection will be made during June - July. If phragmites is present, steps 1-3 above will be repeated.

Plant List

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
Woodland Replacement													
QMR	4	Quercus macrocarpa	Bur Oak	2.5"	as shown	B&B		$ 400.00	$ 1,600.00				
		4 Trees Provided											

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total				
Unit Trees													
ABU	6	Abies balsamea	Balsam Fir		as shown	B&B	8'	$ 375.00	$ 2,250.00	9%	9%	1	1
ACU	7	Abies concolor	Concolor Fir		as shown	B&B	8'	$ 375.00	$ 2,625.00	9%	9%		1
ARU	2	Acer rubrum 'Franksred'	Sunset Maple	3.0"	as shown	B&B		$ 400.00	$ 800.00	1%	5%	1	1
ASU	4	Acer saccharum	Sugar Maple	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	4%	5%	1	1
BPU	6	Betula papyrifera 'Snowy'	Canoe Birch, Multi Stem		as shown	B&B	12'	$ 400.00	$ 2,400.00	4%	4%	1	1
CAU	14	Cornus alternifolia	Pagoda Dogwood	2.5"	as shown	B&B		$ 375.00	$ 5,250.00	10%		1	1
CFU	4	Cornus florida	Flowering Dogwood	2.5"	as shown	B&B		$ 375.00	$ 1,500.00	3%	12%	1	1
GTU	7	Gleditsia triacanthos var. inermis	Thornless Honeylocust	3.0"	as shown	B&B		$ 400.00	$ 2,800.00	5%	5%	1	1
LSU	9	Nyssa sylvatica	Tupelo	3.0"	as shown	B&B		$ 400.00	$ 3,600.00	12%	12%	1	1
LTU	3	Liriodendron tulipifera	Tulip Tree	3.0"	as shown	B&B		$ 400.00	$ 1,200.00	8%	8%	1	1
MPU	3	Malus 'Profusion'	Profusion Crabapple	2.5"	as shown	B&B		$ 375.00	$ 1,125.00	2%	2%	1	1
PGU	13	Picea glauca	White Spruce		as shown	B&B	8'	$ 375.00	$ 4,875.00	9%	9%	1	1
PSU	8	Pinus strobus	White Pine		as shown	B&B	8'	$ 375.00	$ 3,000.00	5%	5%	1	1
QMU	4	Quercus macrocarpa	Bur Oak	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	12%	12%	1	1
QRU	3	Quercus rubra	Red Oak	3.0"	as shown	B&B		$ 400.00	$ 1,200.00	5%	12%	1	1
TPU	24	Thuja p. 'Green Giant'	Green Giant Arborvitae		as shown	B&B	8'	$ 375.00	$ 9,000.00	16%	16%		1
		117	Unit Trees Shown on L-1										

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total				
Street Trees													
ACS	2	Acer saccharum	Sugar Maple	3.0"	as shown	B&B		$ 400.00	$ 800.00	4%	5%		
LSS	9	Nyssa sylvatica	Tupelo	3.0"	as shown	B&B		$ 400.00	$ 3,600.00	6%	6%		
LTS	9	Liriodendron tulipifera	Tulip Tree	3.0"	as shown	B&B		$ 400.00	$ 3,600.00	6%	8%		
QMS	10	Quercus macrocarpa	Bur Oak	3.0"	as shown	B&B		$ 400.00	$ 4,000.00	12%	14%		
	147	Total Trees											
	30	Street Trees Provided											

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total				
Detention Shrubs													
CS	11	Cornus stolonifera	Red-osier Dogwood		as shown	cont	36"	$ 50.00	$ 550.00			1	1
LB	11	Lindera benzoin	Spicebush		as shown	cont	36"	$ 50.00	$ 550.00			1	1
	115	4" Deep Shredded Hardwood Bark Mulch, s.y.						$35/s.y.	$ 4,025.00		Total	15	18
	3,250	Sod, s.y.						$6/ s.y.	$ 19,500.00		% Native	83%	
		Irrigation							$ 30,000.00				
								L-1 Total	$ 113,050.00				

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

ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:

Title:

Landscape Plan

Project:

12 Mile Townes - West
Novi, Michigan

Prepared for:

Singh Homes, LLC
7125 Orchard Lake Road, Suite 200
West Bloomfield, Michigan 48322
248-865-1027

Revision:	Issued:
Submission	February 12, 2025
Revised	April 3, 2025
Revised	May 13, 2025

Job Number:

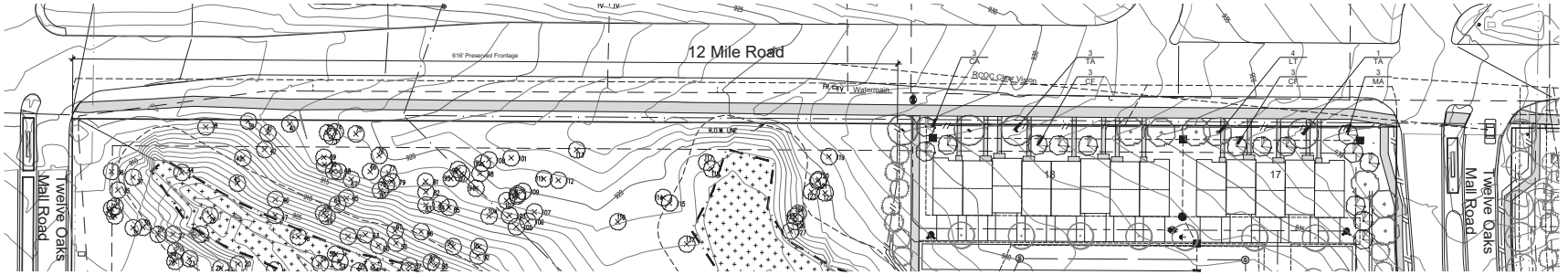
25-009

Drawn By:	Checked By:
jca	jca

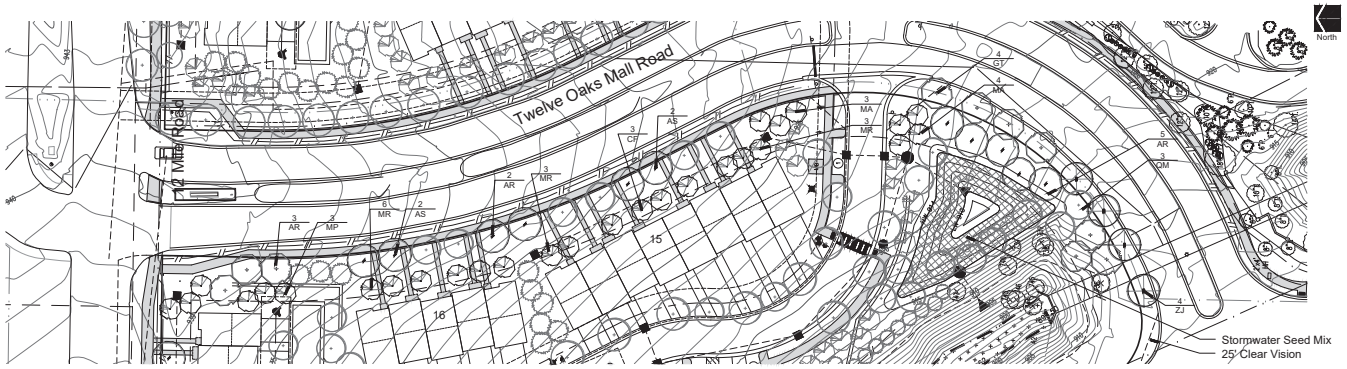
Sheet No.

L-1

12 Mile Greenbelt

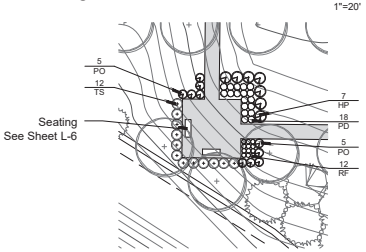


Twelve Oaks Mall Road Greenbelt



Seating Area

1"=20'



Landscape Summary

12 Mile Road	
Street Lawn	
Total Street Frontage	988 l.f.
Less Preserved Frontage	616 l.f.
Net Street Frontage	372 l.f.
Trees Required	8.3 Trees (372 / 45)
Trees Provided	0 Trees
Greenbelt Plantings	
Total Street Frontage	988 l.f.
Less Preserved Frontage	616 l.f.
Net Street Frontage	372 l.f.
Canopy Trees Required	8.3 Trees (372 / 45)
Canopy Trees Provided	8 Trees
Sub-Canopy Trees Required	12.4 Trees (372 / 30)
Sub-Canopy Trees Provided	12 Trees
Twelve Oaks Mall Road	
Street Lawn	
Total Street Frontage	771 l.f.
Less Drive Opening	28 l.f.
Net Street Frontage	743 l.f.
Trees Required	16.5 Trees (743 / 45)
Trees Provided	8 Trees
Greenbelt Plantings	
Total Street Frontage	771 l.f.
Less Drive Opening	28 l.f.
Net Street Frontage	743 l.f.
Canopy Trees Required	16.5 Trees (743 / 45)
Canopy Trees Provided	17 Trees
Sub-Canopy Trees Required	24.8 Trees (743 / 30)
Sub-Canopy Trees Provided	25 Trees

Plant List

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
Greenbelt													
AR	10	Acer rubrum 'Franksred'	Sunset Maple	3.0"	as shown	B&B		$ 400.00	$ 4,000.00	14%	20%	1	1
AS	4	Acer saccharum	Sugar Maple	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	6%	20%	1	1
CA	3	Cornus alternifolia	Pagoda Dogwood	2.5"	as shown	B&B		$ 375.00	$ 1,125.00	4%		1	1
CF	9	Cornus florida	Flowering Dogwood	2.5"	as shown	B&B		$ 375.00	$ 3,375.00	13%	17%	1	1
GT	4	Gleditsia triacanthos var. inermis	Thornless Honeylocust	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	6%	6%	1	1
LT	4	Liriodendron tulipifera	Tulip Tree	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	40%	40%	1	1
MA	10	Malus 'Adirondack'	Adirondack Crabapple	2.5"	as shown	B&B		$ 375.00	$ 3,750.00	14%			1
MP	3	Malus 'Profusion'	Profusion Crabapple	2.5"	as shown	B&B		$ 375.00	$ 1,125.00	4%	36%		1
MR	12	Malus 'Radiant'	Radiant Crabapple	2.5"	as shown	B&B		$ 375.00	$ 4,500.00	17%			1
QM	3	Quercus macrocarpa	Bur Oak	3.0"	as shown	B&B		$ 400.00	$ 1,200.00	4%	4%	1	1
TA	4	Tilia americana 'Redmond'	Basswood	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	6%	6%	1	1
ZJ	4	Zelkova japonica 'Green Vase'	Green Vase Zelkova	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	6%	6%		1
	70	Total Trees											
	33	Total Greenbelt and Street Lawn Trees											
	37	Total Ornamental Trees											

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
Seating Area													
HP	7	Hydrangea p. 'Little Quick Fire'	Little Quick Fire Hydrangea		as shown	cont.	36"	$ 50.00	$ 350.00				1
PD	18	Penstemon 'Dark Towers'	Dark Towers Beard Tongue		24" o.c.	cont.	#1	$ 15.00	$ 270.00			1	1
PO	10	Physocarpus opulifolius 'Diabolo'	Diabolo Ninebark		as shown	cont.	36"	$ 50.00	$ 500.00			1	1
RF	12	Rudbeckia f. 'Goldstrum'	Black-eyed Susan		18" o.c.	cont	#1	$ 15.00	$ 180.00			1	1
TS	12	Thuja standishii x plicata 'Steeplechase'	Steeplechase Arborvitae		as shown	B&B	6'	$ 375.00	$ 4,500.00				1
	23	4" Deep Shredded Hardwood Bark Mulch, s.y.						$35/s.y.	$ 805.00		Total	11	17
	2,740	Sod, s.y.						$6/ s.y.	$ 16,440.00		% Native	65%	
		Irrigation							$ 5,000.00				
								L-2 Total	$ 55,120.00				

Stormwater Seed Mix

4,445 s.f. Total Area

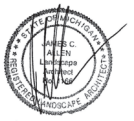
34.2 lbs. per Acre Application Rate
3.5 lbs. of Detention Seed Mix Required
3"-6" of Topsoil with 20%-30% Compost Shall be Placed in this Area.

Note:
Contractor Shall Provide Proof of Seed to be Used in the Form of an Invoice or Photo of the Seed Bag to rmeader@cityofnovi.org for Approval Prior to Installation. If an Unacceptable Seed Mix is Used, the City Reserves the Right to Destroy the Plants and Re-seed with and Acceptable Mix at the Developer's Expense.

Know what's below. Call before you dig.

ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:



Title:

Landscape Plan

Project:

12 Mile Townes - West
Novi, Michigan

Prepared for:

Singh Homes, LLC
7125 Orchard Lake Road, Suite 200
West Bloomfield, Michigan 48322
248-865-1027

Revision:	Issued:
Submission	February 12, 2025
Revised	April 3, 2025
Revised	May 13, 2025

Job Number:

25-009

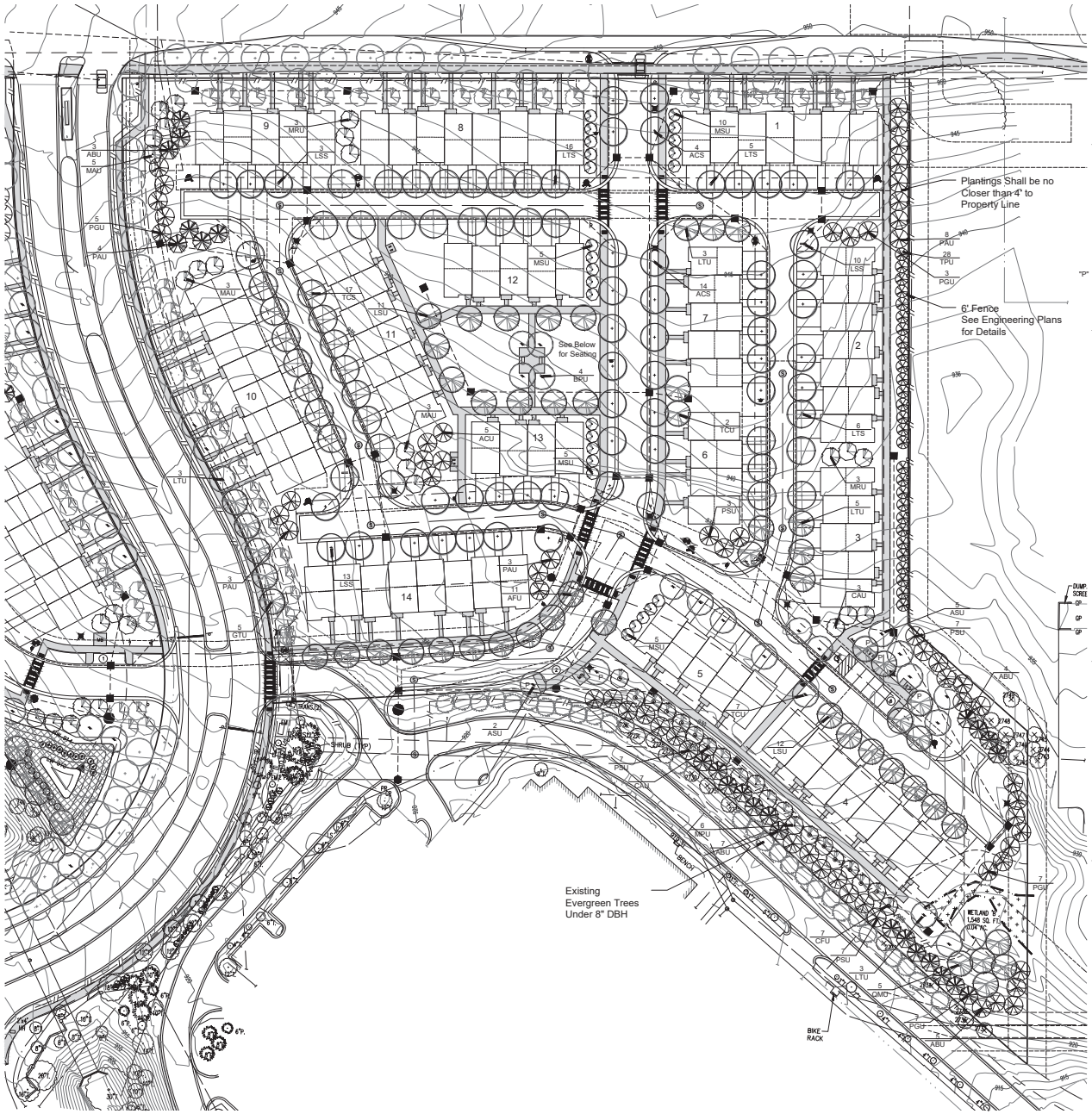
Drawn By:	Checked By:
jca	jca

0' 10' 20' 40'

NORTH
1"=40'

Sheet No.

L-2



Landscape Summary

Street Trees

Street Frontage		4,454 l.f.
Less Drives	1,376 l.f.	
Net Frontage		3,078 l.f.
Trees Required		87.9 Trees (3,078 / 35)
Trees Provided		88 Trees

Multi-Family Trees

Total Units	86 Units
Trees Required	258 Trees (86 x 3)
Trees Provided	258 Trees

Parking Lot Landscaping

Parking Lot Perimeter		164 l.f.
"P" Trees Required		4.7 Trees (164 / 35)
Trees Provided		5 Trees

Plant List

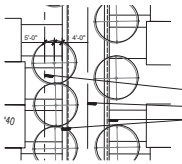
sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
UNIT Trees													
ABU	18	Abies balsamea	Balsam Fir		as shown	B&B	8'	$ 375.00	$ 6,750.00	9%	7%	1	1
ACS	14	Abies concolor	Concolor Fir		as shown	B&B	8'	$ 375.00	$ 1,875.00	1%	7%		1
AFU	11	Acer x freemanii	Freemani Maple	3.0"	as shown	B&B		$ 400.00	$ 4,400.00	3%	10%		1
ASU	7	Acer saccharum	Sugar Maple	3.0"	as shown	B&B		$ 400.00	$ 2,800.00	2%	10%	1	1
BPU	4	Betula papyrifera 'Snowy'	Canoe Birch, Multi Stem		as shown	B&B	12'	$ 800.00	$ 1,600.00	1%	1%	1	1
CAU	10	Cornus alternifolia	Pagoda Dogwood	2.5"	as shown	B&B		$ 375.00	$ 3,750.00	3%	5%	1	1
CFU	7	Cornus florida	Flowering Dogwood	2.5"	as shown	B&B		$ 375.00	$ 2,625.00	2%		1	1
GTU	5	Gleditsia triacanthos var. inermis	Thornless Honeylocust	3.0"	as shown	B&B		$ 400.00	$ 2,000.00	1%	1%	1	1
LSU	16	Nyssa sylvatica	Tupelo	3.0"	as shown	B&B		$ 400.00	$ 6,400.00	12%	12%	1	1
LTU	21	Liriodendron tulipifera	Tulip Tree	3.0"	as shown	B&B		$ 400.00	$ 8,400.00	14%	14%	1	1
MAU	11	Malus 'Adirondack'	Adirondack Crabapple	2.5"	as shown	B&B		$ 400.00	$ 4,400.00	3%			1
MFU	6	Malus 'Profusion'	Profusion Crabapple	2.5"	as shown	B&B		$ 375.00	$ 2,250.00	2%	14%		1
MRU	6	Malus 'Radiant'	Radiant Crabapple	2.5"	as shown	B&B		$ 375.00	$ 2,250.00	2%			1
MSU	25	Malus sargenti 'Tina'	Tina Sargent Crab	2.5"	as shown	B&B		$ 375.00	$ 9,375.00	7%			1
PAU	18	Picea abies	Norway Spruce		as shown	B&B	8'	$ 375.00	$ 6,750.00	5%	12%		1
PGU	22	Picea glauca	White Spruce		as shown	B&B	8'	$ 375.00	$ 8,250.00	6%	12%	1	1
PSU	24	Pinus strobus	White Pine		as shown	B&B	8'	$ 375.00	$ 9,000.00	7%	7%	1	1
QMU	5	Quercus macrocarpa	Bur Oak	3.0"	as shown	B&B		$ 400.00	$ 2,000.00	1%	1%	1	1
TCU	9	Tilia cordata 'Greenspire'	Greenspire Linden	3.0"	as shown	B&B		$ 400.00	$ 3,600.00	8%	8%		1
TPU	28	Thuja p. 'Green Giant'	Green Giant Arborvitae		as shown	B&B	8'	$ 375.00	$ 10,500.00	8%	8%		1
	259		Unit Trees Shown on L-3										

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
Street Trees													
AFS	18	Acer x freemanii	Freemani Maple	3.0"	as shown	B&B		$ 400.00	$ 7,200.00	11%	10%		
LSS	26	Nyssa sylvatica	Tupelo	3.0"	as shown	B&B		$ 400.00	$ 10,400.00	12%	12%		
LTS	27	Liriodendron tulipifera	Tulip Tree	3.0"	as shown	B&B		$ 400.00	$ 10,800.00	14%	14%		
TCS	17	Tilia cordata 'Greenspire'	Greenspire Linden	3.0"	as shown	B&B		$ 400.00	$ 6,800.00	8%	8%		
	348	Total Trees											
	88	Street Trees Provided											

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
Seating Area													
EP	30	Echinacea p 'Pow Wow White'	White Cone Flower		18" o.c.	cont.	#1	$ 15.00	$ 450.00			1	1
HP	10	Hydrangea p. 'Little Quick Fire'	Little Quick Fire Hydrangea		as shown	cont.	36"	$ 50.00	$ 500.00				1
PO	25	Physocarpus opulifolius 'Diabolo'	Diabolo Ninebark		as shown	cont.	36"	$ 50.00	$ 1,250.00			1	1
RF	30	Rudbeckia f. 'Goldstrum'	Black-eyed Susan		18" o.c.	cont.	#1	$ 15.00	$ 450.00			1	1
	110	4" Deep Shredded Hardwood Bark Mulch (e.y.)						$30/e.y.	$ 3,850.00		Total	14	24
	6,550	Sod (s.y.)						$3/s.y.	$ 25,650.00		% Native	58%	
		Irrigation							$ 30,000.00				
								L-3 Total	$ 160,325.00				

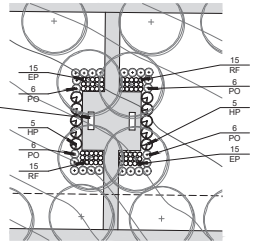
Typical Street Tree Detail

1"=30'



Seating Area

1"=20'



ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:

Title:

Landscape Plan

Project:

12 Mile Townes - East
Novi, Michigan

Prepared for:

Singh Homes, LLC
7125 Orchard Lake Road, Suite 200
West Bloomfield, Michigan 48322
248-865-1027

Revision:	Issued:
Submission	February 12, 2025
Revised	April 3, 2025
Revised	May 13, 2025

Job Number:

25-009

Drawn By:	Checked By:
jca	jca

0' 10' 20' 40'

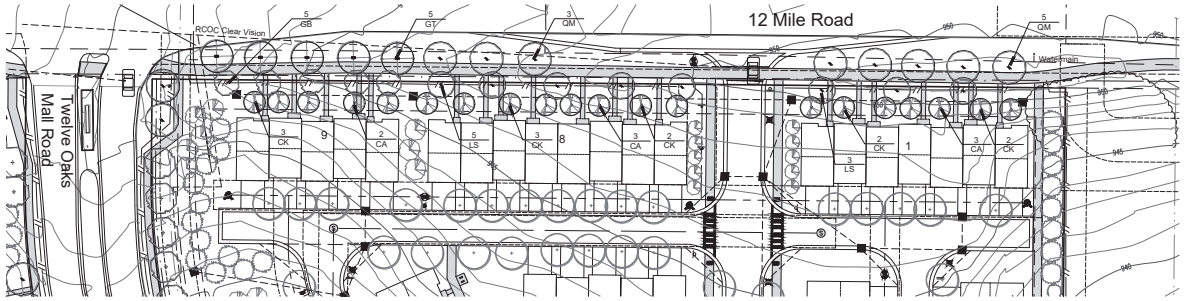
NORTH
1"=40'

Sheet No.

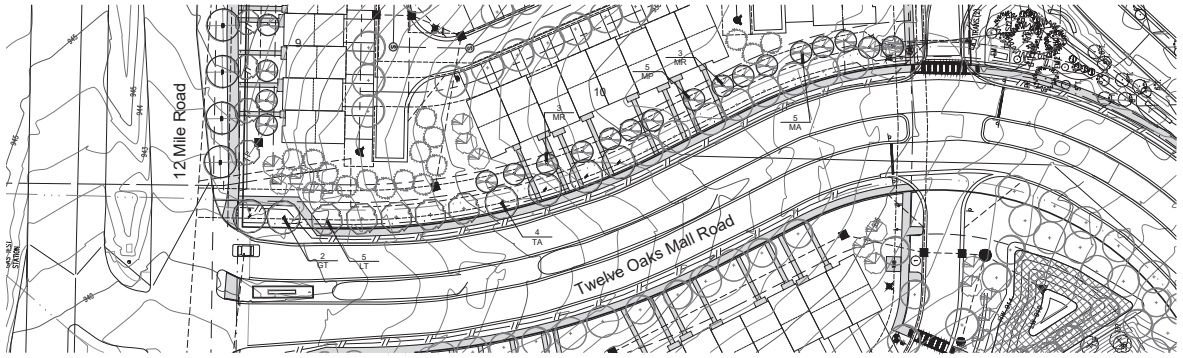
L-3

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

12 Mile Greenbelt



Twelve Oaks Mall Road Greenbelt



Landscape Summary

12 Mile Road	
Street Lawn	
Total Street Frontage	622 l.f.
Less Drive	28 l.f.
Net Street Frontage	594 l.f.
Trees Required	13.2 Trees (594 / 45)
Trees Provided	13 Trees
Greenbelt Plantings	
Total Street Frontage	622 l.f.
Less Drive	28 l.f.
Net Street Frontage	594 l.f.
Canopy Trees Required	13.2 Trees (594 / 45)
Canopy Trees Provided	13 Trees
Sub-Canopy Trees Required	19.8 Trees (594 / 30)
Sub-Canopy Trees Provided	20 Trees
Twelve Oaks Mall Road	
Street Lawn	
Total Street Frontage	517 l.f.
Less Drive Opening	28 l.f.
Net Street Frontage	489 l.f.
Trees Required	10.8 Trees (489 / 45)
Trees Provided	0 Trees
Greenbelt Plantings	
Total Street Frontage	517 l.f.
Less Drive Opening	28 l.f.
Net Street Frontage	489 l.f.
Canopy Trees Required	10.8 Trees (489 / 45)
Canopy Trees Provided	11 Trees
Sub-Canopy Trees Required	16.3 Trees (489 / 30)
Sub-Canopy Trees Provided	16 Trees

Plant List

sym.	qty.	botanical name	common name	caliper	spacing	root	height	price	total	Species	Genus	Native	Total
Greenbelt													
CA	8	Cornus alternifolia	Pagoda Dogwood	2.5"	as shown	B&B		$ 375.00	$ 3,000.00	11%	27%	1	1
CF	12	Cornus florida	Flowering Dogwood	2.5"	as shown	B&B		$ 375.00	$ 4,500.00	16%		1	1
GB	5	Ginko biloba 'Autumn Gold'	Autumn Gold Ginko	3.0"	as shown	B&B		$ 400.00	$ 2,000.00	7%	7%		1
GT	7	Gleditsia triacanthos var. inermis	Thornless Honeylocust	3.0"	as shown	B&B		$ 400.00	$ 2,800.00	10%	10%	1	1
LS	8	Liquidambar styraciflua 'Moraine'	Moraine Sweetgum	3.0"	as shown	B&B		$ 400.00	$ 3,200.00	11%	11%		1
LT	5	Liriodendron tulipifera	Tulip Tree	3.0"	as shown	B&B		$ 400.00	$ 2,000.00	7%	7%	1	1
MA	5	Malus 'Adirondack'	Adirondack Crabapple	2.5"	as shown	B&B		$ 375.00	$ 1,875.00	7%			1
MP	5	Malus 'Profusion'	Profusion Crabapple	2.5"	as shown	B&B		$ 375.00	$ 1,875.00	7%	22%		1
MR	6	Malus 'Radiant'	Radiant Crabapple	2.5"	as shown	B&B		$ 375.00	$ 2,250.00	8%			1
QM	8	Quercus macrocarpa	Bur Oak	3.0"	as shown	B&B		$ 400.00	$ 3,200.00	11%	11%	1	1
TA	4	Tilia americana 'Redmond'	Basswood	3.0"	as shown	B&B		$ 400.00	$ 1,600.00	5%	5%	1	1
	73	Total Trees											
	37	Total Greenbelt and Street Lawn Trees											
	36	Total Ornamental Trees											
	19	4" Deep Shredded Hardwood Bark Mulch, s.y.						$35/s.y.	$ 665.00		Total	6	11
	3,610	Sod, s.y.						99/ s.y.	$ 21,660.00		% Native	55%	
		Irrigation							$ 5,000.00				
								L-2 Total	$ 55,625.00				

Know what's below. Call before you dig.

ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
e. jca@wideopenwest.com
t. 248.467.4668

Seal:

JAMES C. ALLEN Landscape Architect No. 1301 REGISTERED LANDSCAPE ARCHITECT STATE OF MICHIGAN

Title:

Greenbelt Plan

Project:

12 Mile Townes - East
Novi, Michigan

Prepared for:

Singh Homes, LLC
7125 Orchard Lake Road, Suite 200
West Bloomfield, Michigan 48322
248-865-1027

Revision:	Issued:
Submission	February 12, 2025
Revised	April 3, 2025
Revised	May 13, 2025

Job Number:

25-009

Drawn By:	Checked By:
jca	jca

0' 10' 20' 40'

NORTH
1"=40'

Sheet No.

L-4

ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE
557 Carpenter
Northville, Michigan 48167
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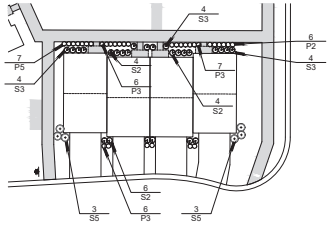
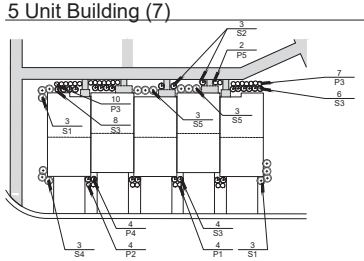
t. 248.467.4668

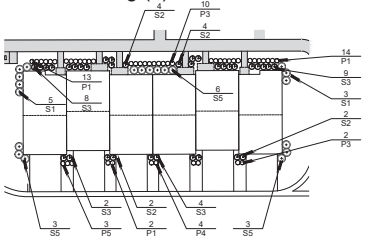
4 Unit Building (2)



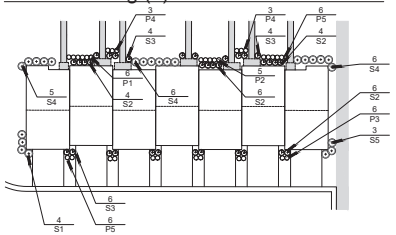
5 Unit Building (7)



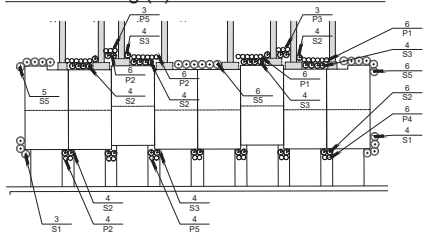
6 Unit Building (1)



7 Unit Building (4)



8 Unit Building (6)



Unit Frontage Summary

Unit Type	Unit Length	Required Landscape (35%)	Landscape Provided
4 Unit	88.3'	30.9'	32.4'
5 Unit	110.7'	38.7'	42.4'
6 Unit	133.5'	46.7'	48.4'
7 Unit	154'	53.9'	54.4'
8 Unit	176.6'	61.8'	64.4

Note:
Plantings Along the Building Sides that will be Visible from the Street are Included in the Provided Frontage Landscaping

Plant List

North & East Exposure

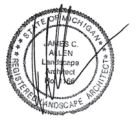
sym.	botanical name	common name	caliper	spacing	root	height	Native	Total
S1	Physocarpus opulifolius 'Diabolo'	Diabolo Ninebark		as shown	cont.	36"	1	1
S2	Itea virginica 'Little Henery'	Dwarf Virginia Sweetspire		as shown	cont.	36"		1
S3	Ilex verticillata 'Red Sprite'	Red Sprite Dwarf Inkberry		as shown	cont.	36"	1	1
S4	Hydrangea p. 'Little Quickfire'	Little Quickfire Hydrangea		as shown	cont.	36"		1
S5	Hydrangea Q. 'Alice'	Alice Oakleaf Hydrangea		as shown	cont.	36"		1
P1	Hosta 'First Frost'	First Frost Hosta		30" o.c.	cont.	#1		1
P2	Hemerocallis 'Little Business'	Little Buisness Daylily		18" o.c.	cont.	#1		1
P3	Sedum s. Red Carpet	Red Carpet Sedum		18" o.c.	cont.	#1		1
P4	Heuchera 'Palace Purple'	Palace Purple Coralbells		18" o.c.	flat	#1		1
P5	Liriope muscari 'Big Blue'	Big Blue Lirope		18" o.c.	cont.	#1		1

South & West Exposure

sym.	botanical name	common name	caliper	spacing	root	height	Native	Total
S1	Physocarpus opulifolius 'Diabolo'	Diabolo Ninebark		as shown	cont.	36"		
S2	Itea virginica 'Little Henery'	Dwarf Virginia Sweetspire		as shown	cont.	36"		
S3	Ilex glabra 'Nordic'	Nordic Inkberry		as shown	cont.	36"		
S4	Aronia melanocarpa	Black Chokeberry		as shown	cont.	36"	1	1
S5	Itea virginica 'Little Henery'	Dwarf Virginia Sweetspire		as shown	cont.	36"		
P1	Cimicifuga r. 'Brunette'	Brunette Snakeroot		18" o.c.	cont.	#1		1
P2	Sporobolus heterolepis	Prairie Dropseed		18" o.c.	cont.	#1	1	1
P3	Penstemon 'Dark Towers'	Dark Towers Penstemon		18" o.c.	cont.	#1	1	1
P4	Echinacea p 'Pow Wow White''	White Cone Flower		18" o.c.	cont.	#1	1	1
P5	Rudbeckia fulgida speciosa 'Goldsturm'	Black Eyed Susan		18" o.c.	cont.	#1	1	1
						Total	7	16
						% Native	44%	

sym.	Total	name	price	total
S1	108	Shrub 1	$ 50.00	$ 5,400.00
S2	273	Shrub 2	$ 50.00	$ 13,650.00
S3	325	Shrub 3	$ 50.00	$ 16,250.00
S4	89	Shrub 4	$ 50.00	$ 4,450.00
S5	180	Shrub 5	$ 50.00	$ 9,000.00
P1	152	Perennial 1	$ 15.00	$ 2,280.00
P2	150	Perennial 2	$ 15.00	$ 2,250.00
P3	205	Perennial 3	$ 15.00	$ 3,075.00
P4	92	Perennial 4	$ 15.00	$ 1,380.00
P5	121	Perennial 5	$ 15.00	$ 1,815.00
320	4" Deep Shredded Hardwood Bark Mulch		$ 35.00	$ 11,200.00
3,850	Sod, s.y.		$ 6.00	$ 23,100.00
	Irrigation			$ 45,000.00
			Total	$ 138,850.00

Seal:



Title:

Units Typicals

Project:

12 Mile Townes
Novi, Michigan

Prepared for:

Singh Homes, LLC
7125 Orchard Lake Road, Suite 200
West Bloomfield, Michigan 48322
248-865-1027

Revision:	Issued:
Submission	February 12, 2025
Revised	April 3, 2025
Revised	May 13, 2025

Job Number:

25-009

Drawn By: jca

Checked By: jca

0' 15' 30'

1"=30'

Sheet No.

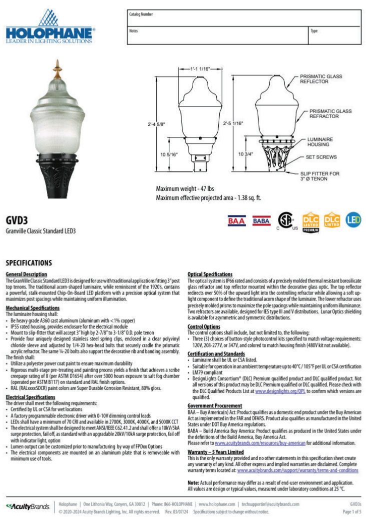
L-5

Schedule

Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power	Mounting Height
	P1	11	Holophane	GVD3 P30 30K XXXX GL3LU RB FC	GranVille Gen3, P30 Performance Package, 3000K CCT, 70CRI, Type 3 lunar optic distribution with Ribs and Bands and Full Cover	6229	0.9	61	14'-0"
	C1	172	Visual Comfort & Co.	8592-12	One Light Outdoor Wall Lantern 3000K	616	0.9	5.7	6'-6"

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Overall/Grade	+	0.3 fc	3.3 fc	0.0 fc	N/A	N/A
Property Line	+	0.1 fc	1.8 fc	0.0 fc	N/A	N/A



General Note

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: GRADE
4. ELECTRIC SERVICE TO LIGHT FIXTURES WILL BE PLACED UNDERGROUND
5. NO FLASHING OR STROBBING LIGHTS HAVE BEEN USED WITHIN THIS PHOTOMETRIC
6. LIGHTING PROVIDED IS NECESSARY FOR SECURITY PURPOSES & LIMITED OPERATIONS FOR THE SITE'S AFTER HOUR OPERATIONS
7. INDOOR LIGHTING SHALL NOT BE THE SOURCE OF EXTERIOR GLARE OR SPILL OVER

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT CONTROLS@GASSERBUSH.COM OR 734-266-6705.

Alternates Note

THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

Ordering Note

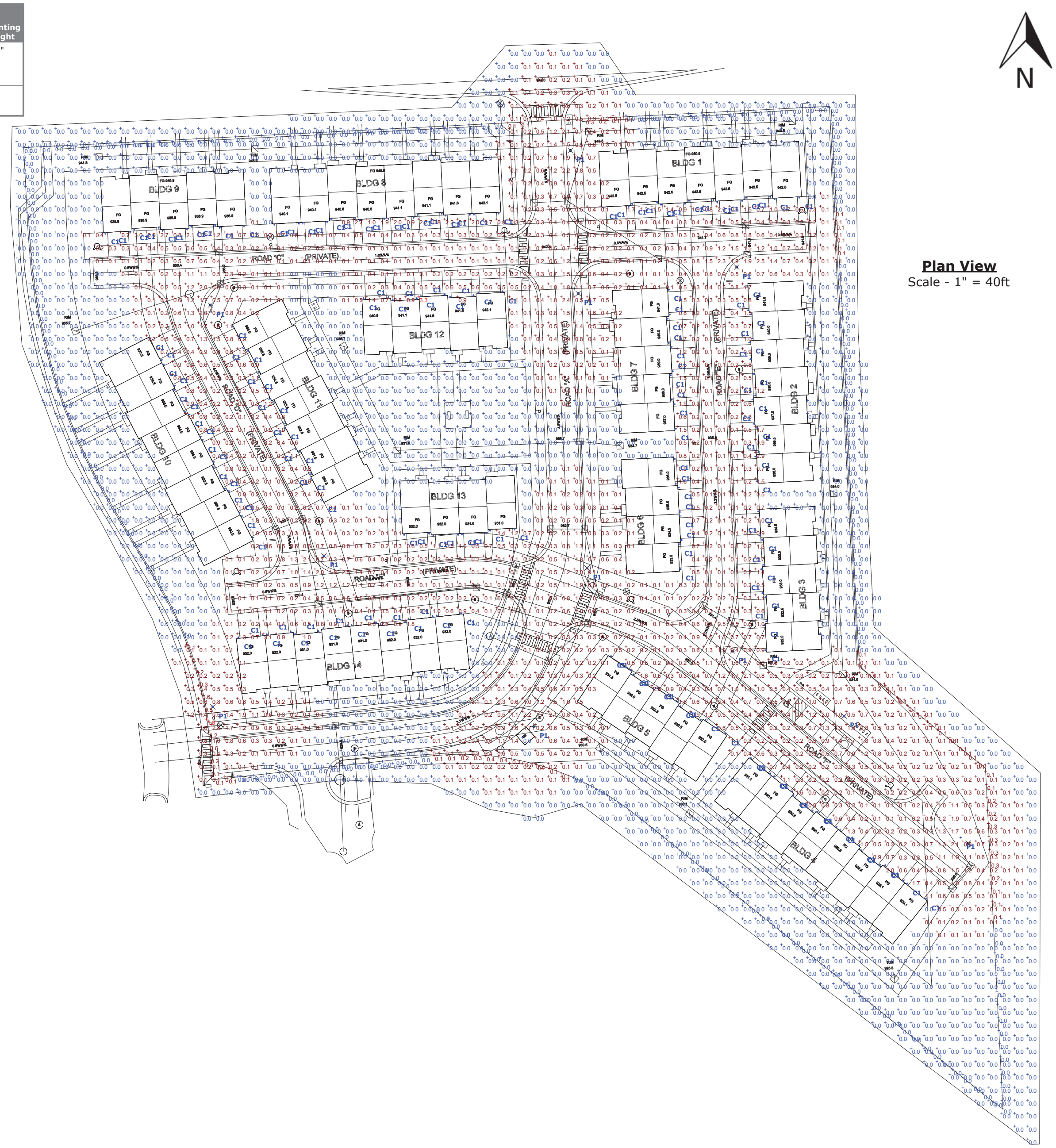
FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

Drawing Note

THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

Mounting Height Note

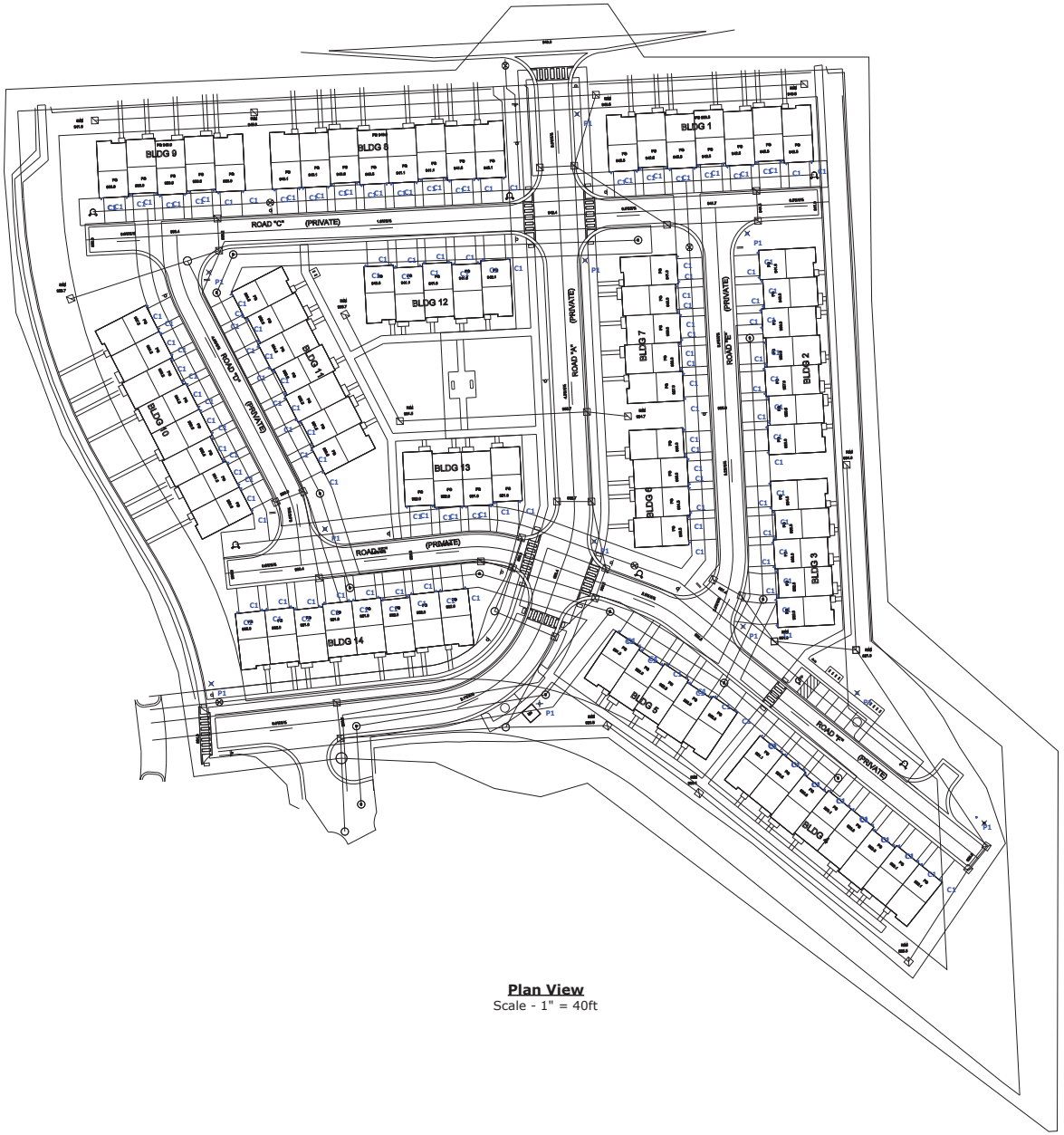
MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.



Plan View
Scale - 1" = 40ft

GRIFFIN NOVI II (EAST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
BK
Date
03/31/2025
Scale
Not to Scale
Drawing No.
#25-39282 V2

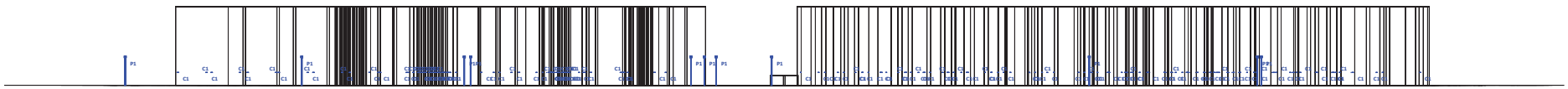


Plan View
Scale - 1" = 40ft

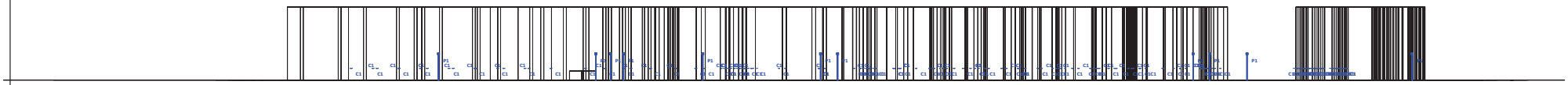
N

GRIFFIN NOVI II (EAST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

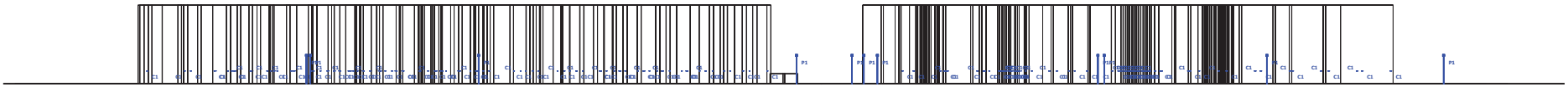
Designer
BK
Date
03/31/2025
Scale
Not to Scale
Drawing No.
#25-39282 V2



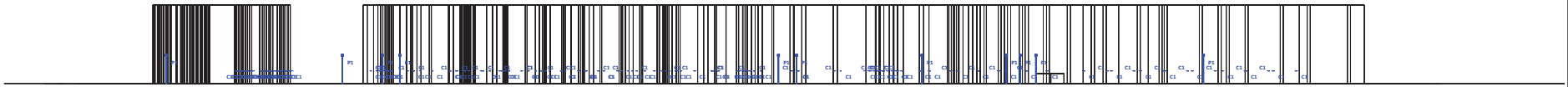
North View
Scale - 1" = 25ft



East View
Scale - 1" = 25ft



South View
Scale - 1" = 25ft



West View
Scale - 1" = 25ft

GRIFFIN NOVI II (EAST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
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Scale
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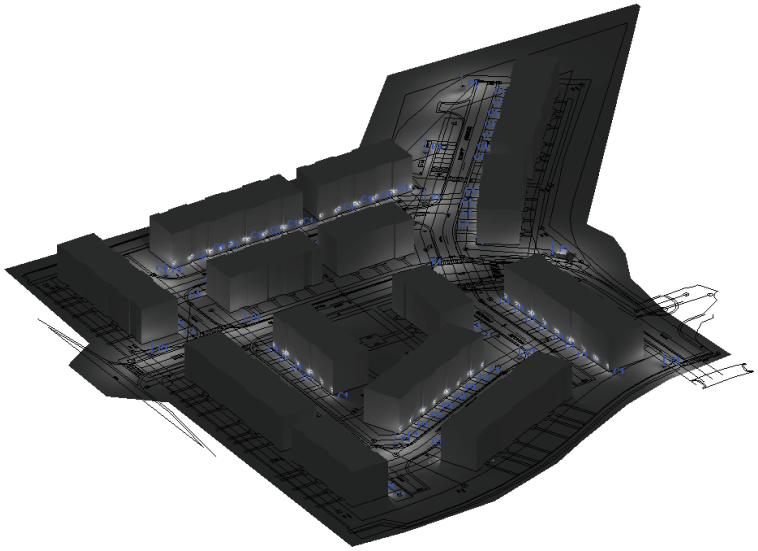
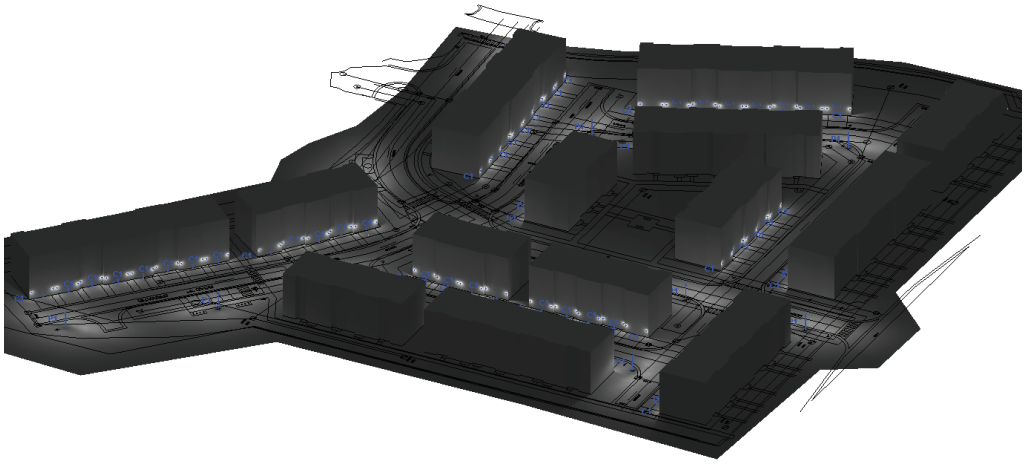
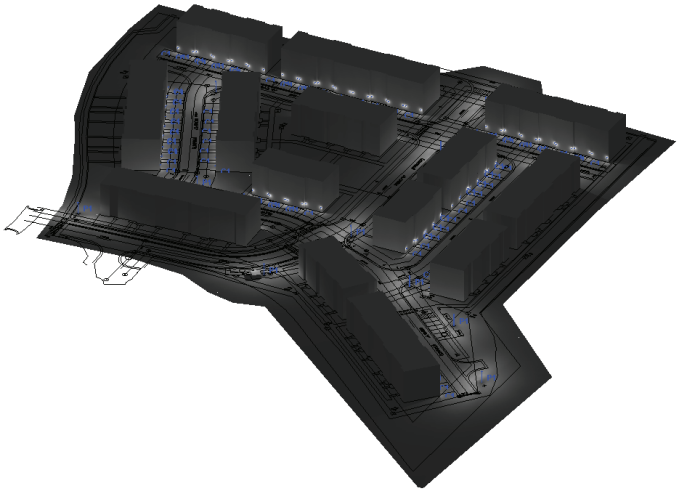
Drawing No.
#25-39282 V2



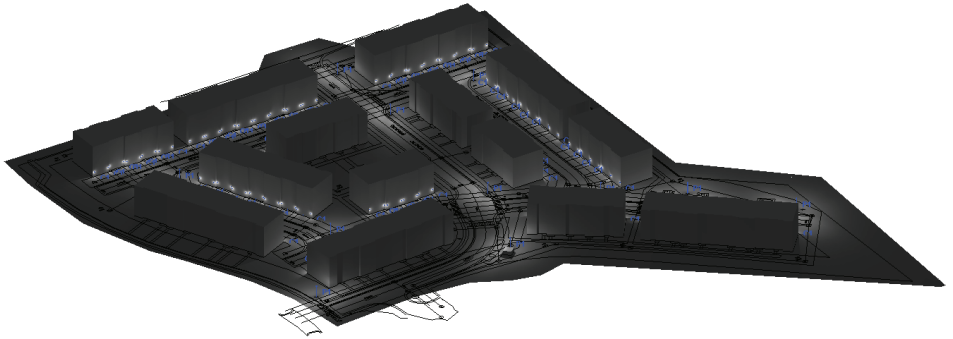
NW Rendered



NE Rendered



SE Rendered



SW Rendered

GRIFFIN NOVI II (EAST)
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Scale
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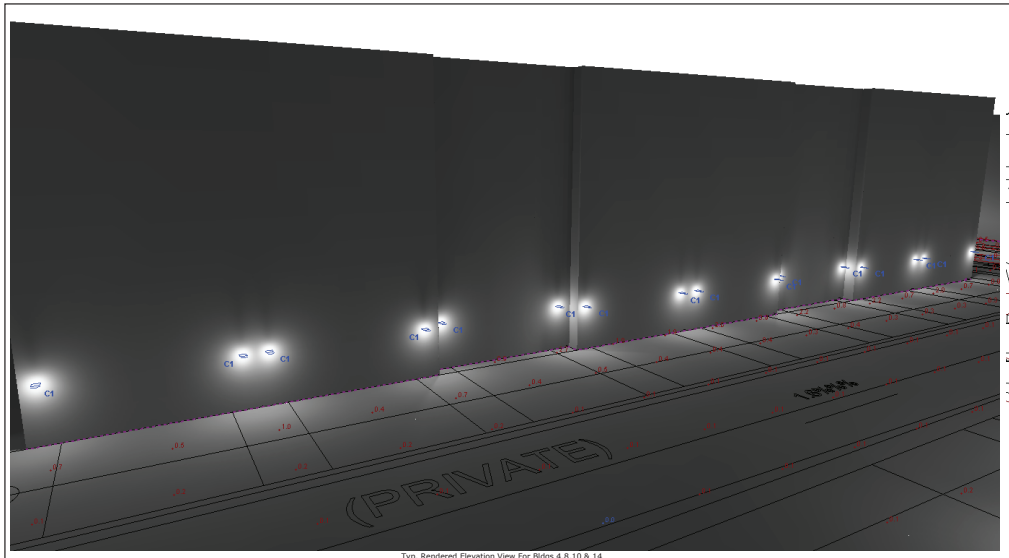
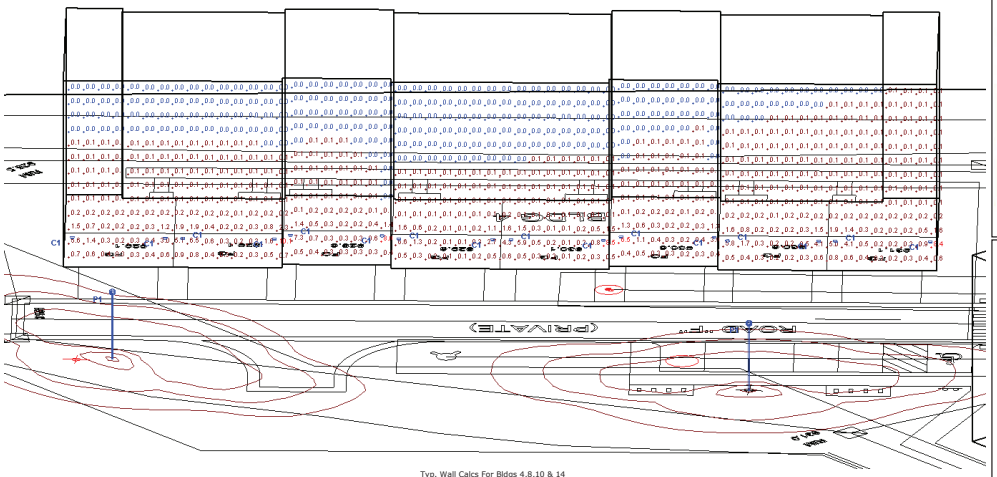
Drawing No.
#25-39282 V2

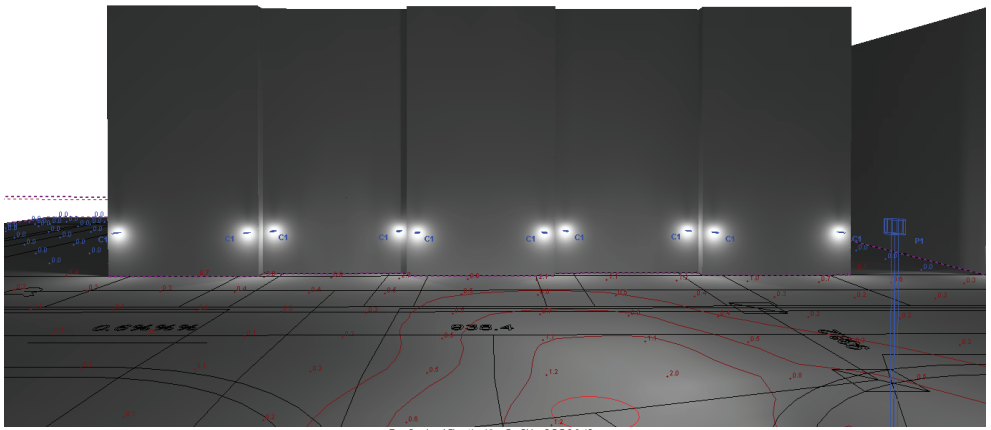


Typ. Rendered Elevation View For Bldgs 4,8,10 & 14

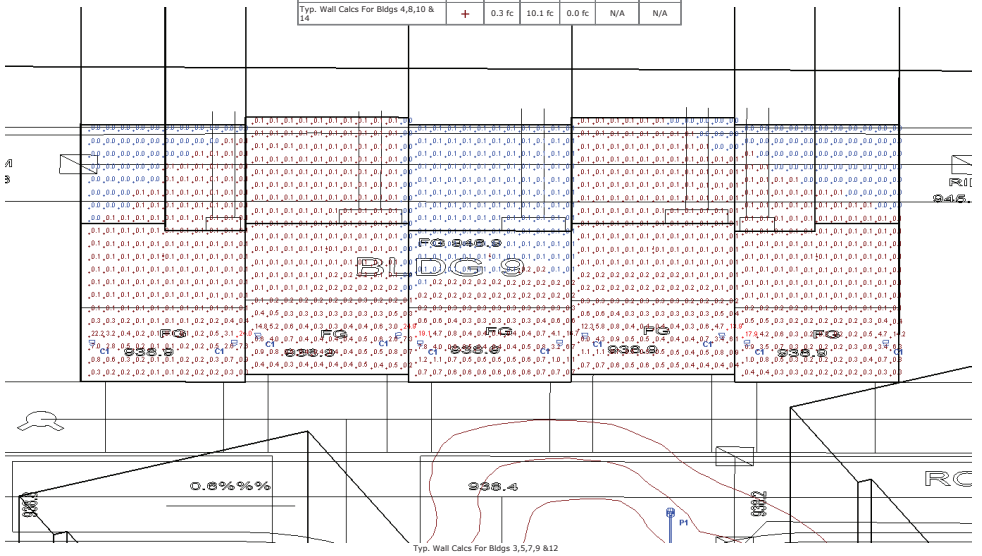


Typ. Wall Calcs For Bldgs 4,8,10 & 14

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Typ. Wall Calcs For Bldgs 4,8,10 & 14	+	0.3 fc	8.5 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 4,8,10 & 14	+	0.3 fc	8.0 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 4,8,10 & 14	+	0.3 fc	6.5 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 4,8,10 & 14	+	0.3 fc	8.4 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 4,8,10 & 14	+	0.3 fc	10.1 fc	0.0 fc	N/A	N/A



Typ. Rendered Elevation View For Bldgs 3,5,7,9 & 12



Typ. Wall Calcs For Bldgs 3,5,7,9 &12

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Typ. Wall Calcs For 3,5,7,9 & 12	+	0.4 fc	24.0 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For 3,5,7,9 & 12	+	0.5 fc	24.9 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For 3,5,7,9 & 12	+	0.5 fc	19.1 fc	0.1 fc	191.0:1	5.0:1
Typ. Wall Calcs For 3,5,7,9 & 12	+	0.5 fc	13.9 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For 3,5,7,9 & 12	+	0.4 fc	17.9 fc	0.0 fc	N/A	N/A

GRIFFIN NOVI II (EAST)
EXTERIOR PHOTOMETRIC PLAN
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Scale
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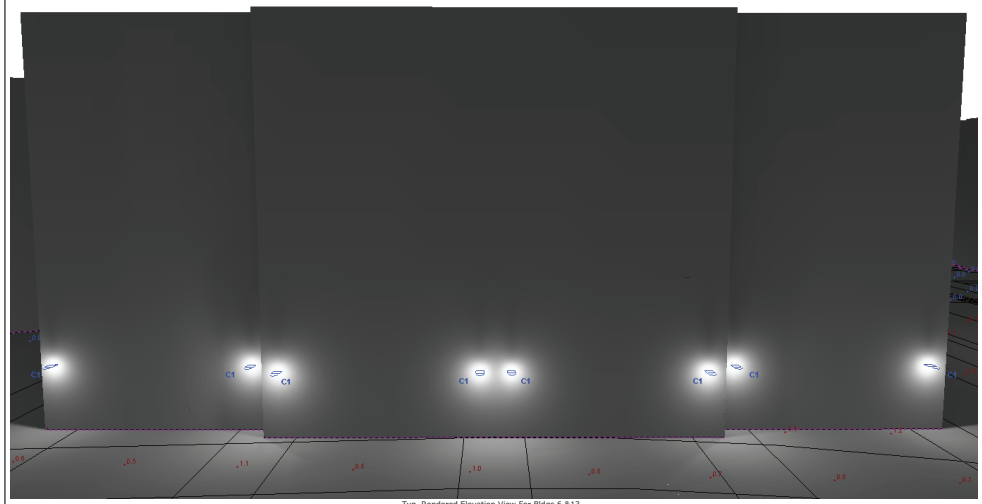
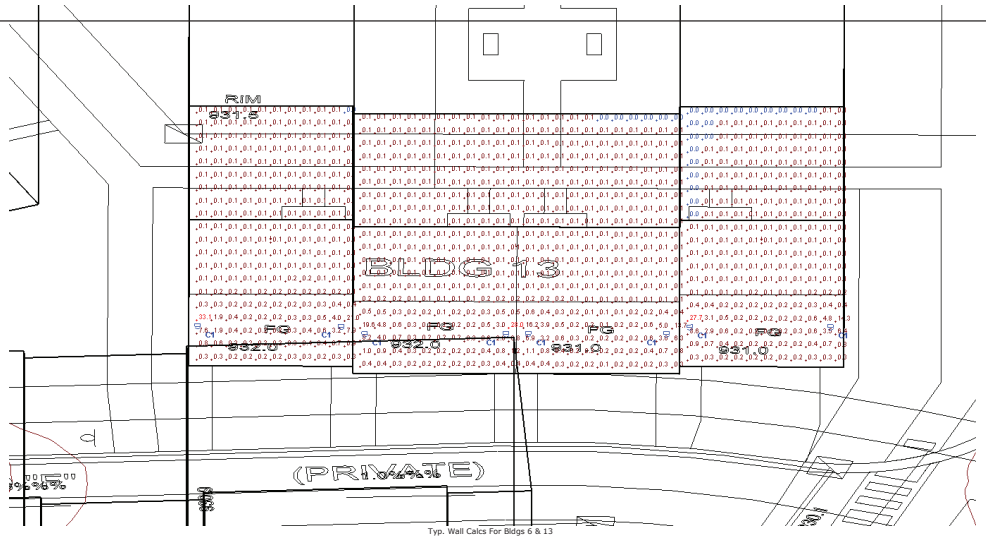
#25-39282 V2

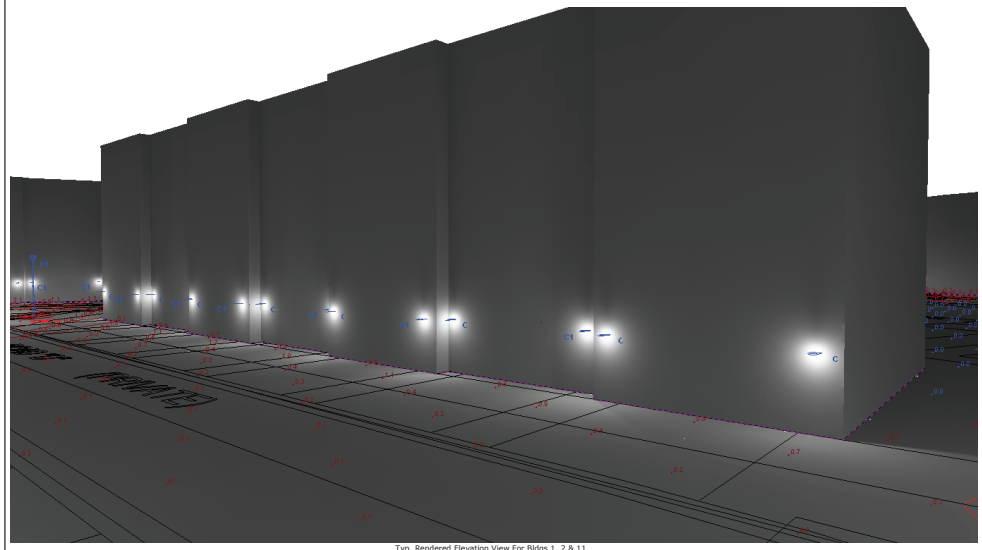


Typ. Rendered Elevation View For Bldgs 6 &13

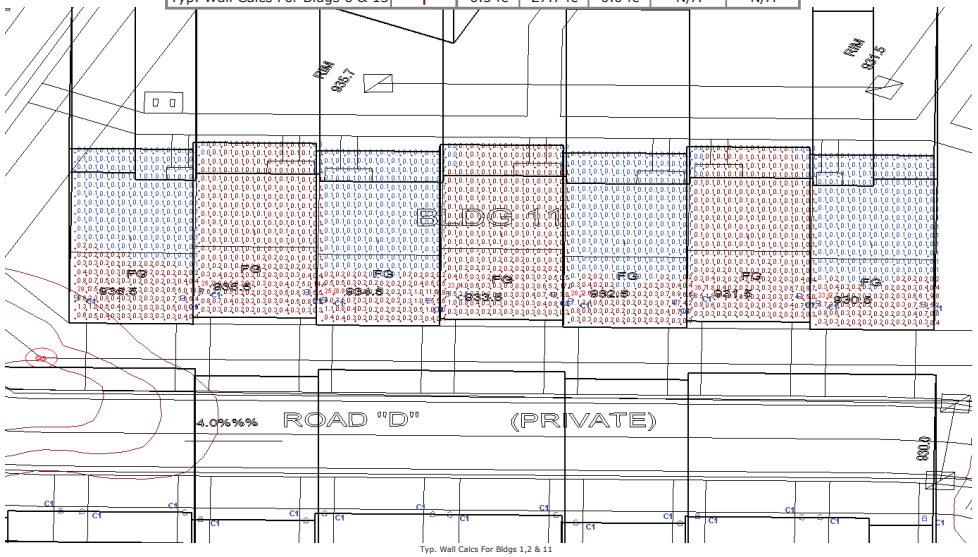


Typ. Wall Calcs For Bldgs 6 & 13

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Typ. Wall Calcs For Bldgs 6 & 13	+	0.5 fc	33.1 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 6 & 13	+	0.5 fc	28.0 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 6 & 13	+	0.5 fc	27.7 fc	0.0 fc	N/A	N/A



Typ. Rendered Elevation View For Bldgs 1, 2 & 11



Typ. Wall Calcs For Bldgs 1,2 & 11

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Typ. Wall Calcs For 1, 2 & 11	+	0.5 fc	25.2 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For 1, 2 & 11	+	0.4 fc	26.3 fc	0.1 fc	263.0:1	4.0:1
Typ. Wall Calcs For 1, 2 & 11	+	0.5 fc	23.0 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For 1, 2 & 11	+	0.5 fc	25.0 fc	0.1 fc	250.0:1	5.0:1
Typ. Wall Calcs For 1, 2 & 11	+	0.5 fc	36.7 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For 1, 2 & 11	+	0.4 fc	23.8 fc	0.1 fc	238.0:1	4.0:1
Typ. Wall Calcs For 1, 2 & 11	+	0.5 fc	29.1 fc	0.1 fc	291.0:1	5.0:1

GRIFFIN NOVI II (EAST)
EXTERIOR PHOTOMETRIC PLAN
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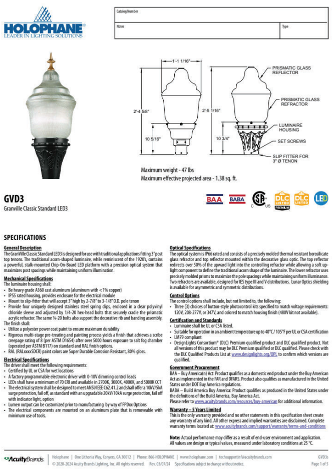
Scale
Not to Scale
Drawing No.
#25-39282 V2

Schedule

Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power	Mounting Height
	P1	5	Holophane	GVD3 P30 40K XXXX GL3LU RB FC	GranVille Gen3, P30 Performance Package, 4000K CCT, 70CRI, Type 3 lunar optic distribution with Ribs and Bands and Full Cover	6229	0.9	61	14'-0"
	C1	78	Visual Comfort & Co.	8592-12	One Light Outdoor Wall Lantern	616	0.9	5.7	6'-6"

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Overall/Grade	+	0.1 fc	3.7 fc	0.0 fc	N/A	N/A
Property Line	+	0.0 fc	0.2 fc	0.0 fc	N/A	N/A



Plan View
Scale - 1" = 30ft

General Note

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: GRADE
4. ELECTRIC SERVICE TO LIGHT FIXTURES WILL BE PLACED UNDERGROUND
5. NO FLASHING OR STROBBING LIGHTS HAVE BEEN USED WITHIN THIS PHOTOMETRIC
6. LIGHTING PROVIDED IS NECESSARY FOR SECURITY PURPOSES & LIMITED OPERATIONS FOR THE SITE'S AFTER HOUR OPERATIONS
7. INDOOR LIGHTING SHALL NOT BE THE SOURCE OF EXTERIOR GLARE OR SPILL OVER

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT CONTROLS@GASSERBUSH.COM OR 734-266-6705.

Alternates Note

THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

Ordering Note

FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

Drawing Note

THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

Mounting Height Note

MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

GRIFFIN NOVI II (WEST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
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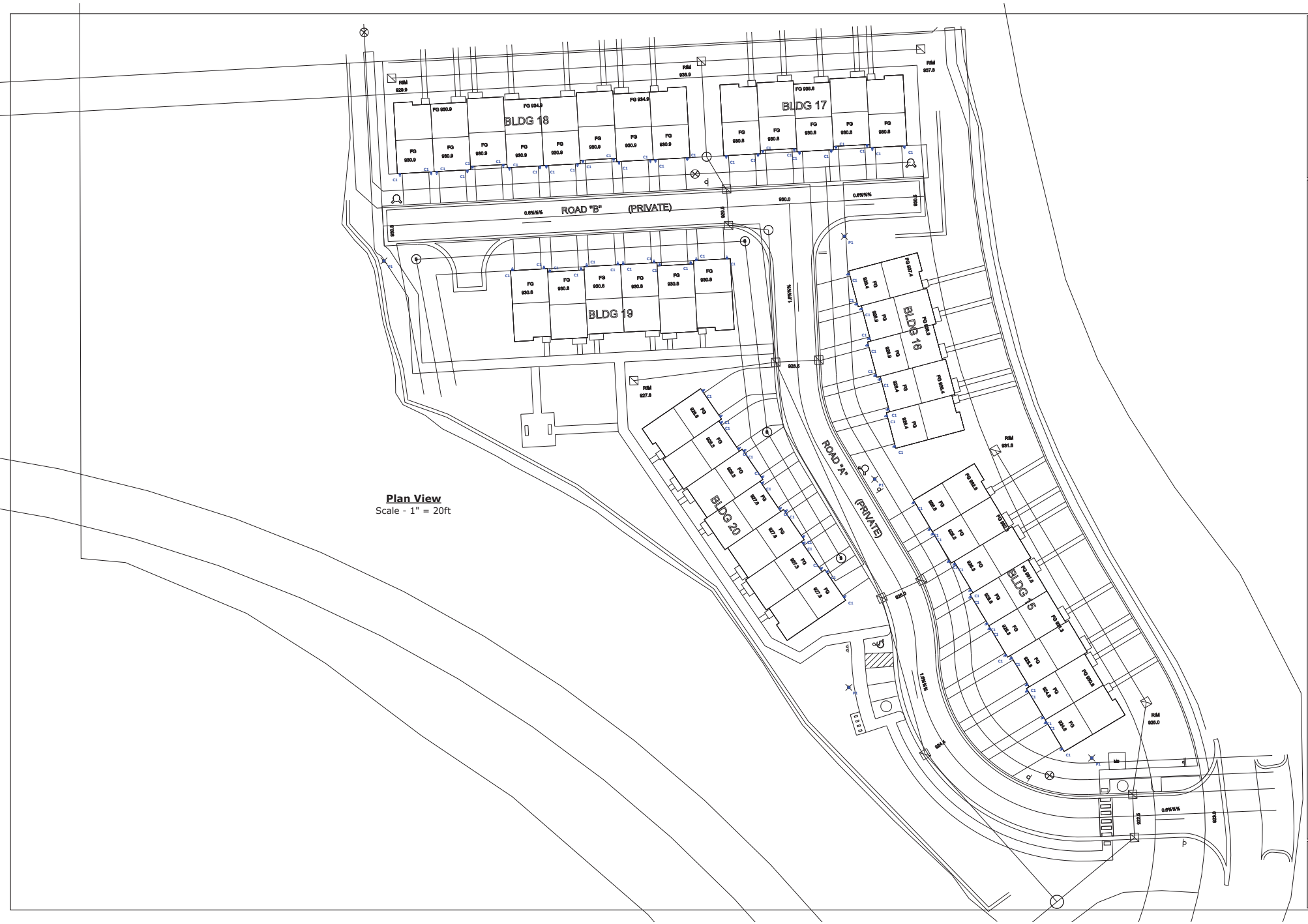
Designer	BK
Date	03/31/2025
Scale	Not to Scale
Drawing No.	#25-39282 V2



Plan View
Scale - 1" = 20ft

GRIFFIN NOVI II (WEST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
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Designer
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Scale
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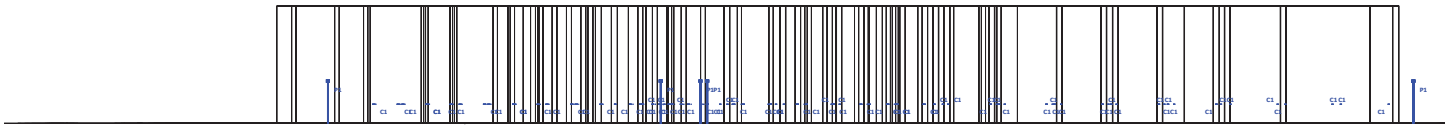
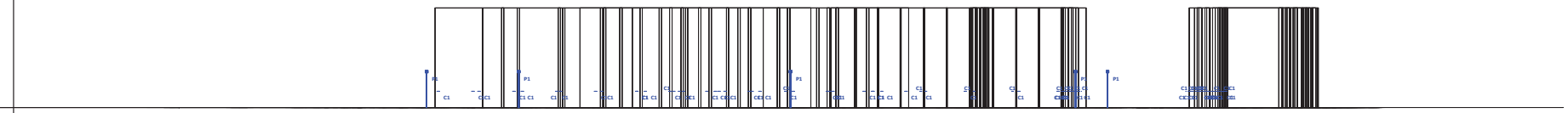
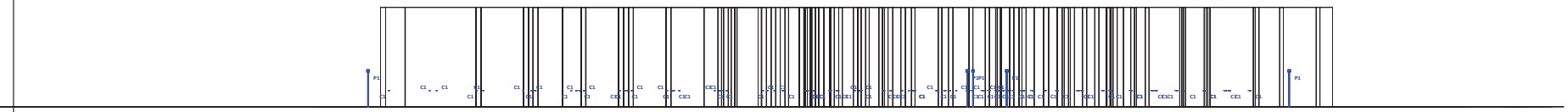


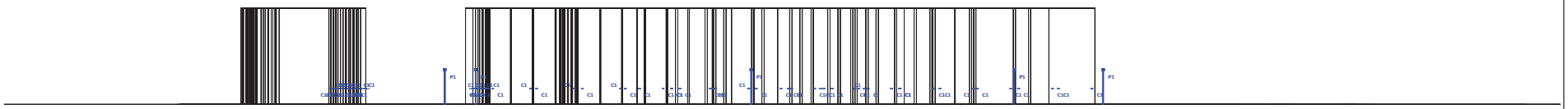
North View
Scale - 1" = 20ft



East View
Scale - 1" = 20ft



South View
Scale - 1" = 20ft



West View
Scale - 1" = 20ft

GRIFFIN NOVI II (WEST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
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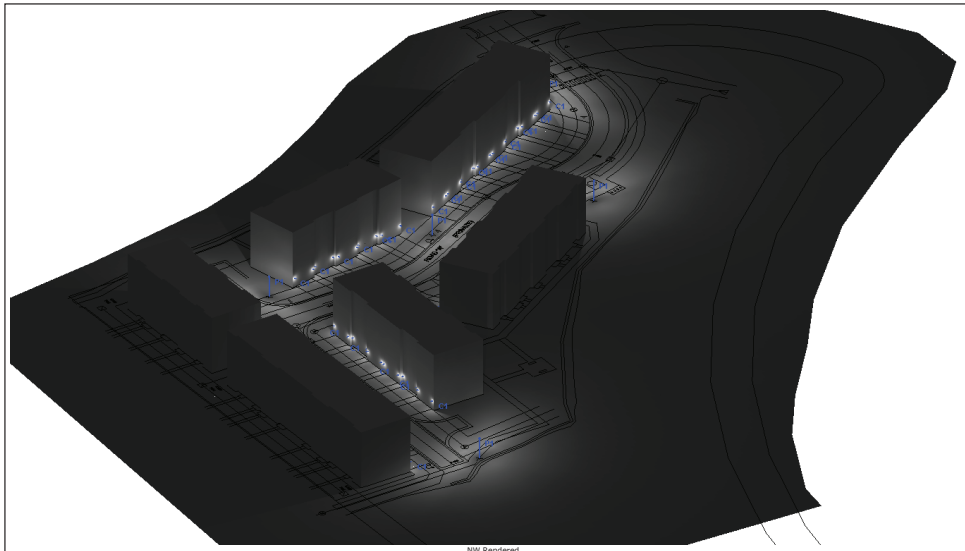
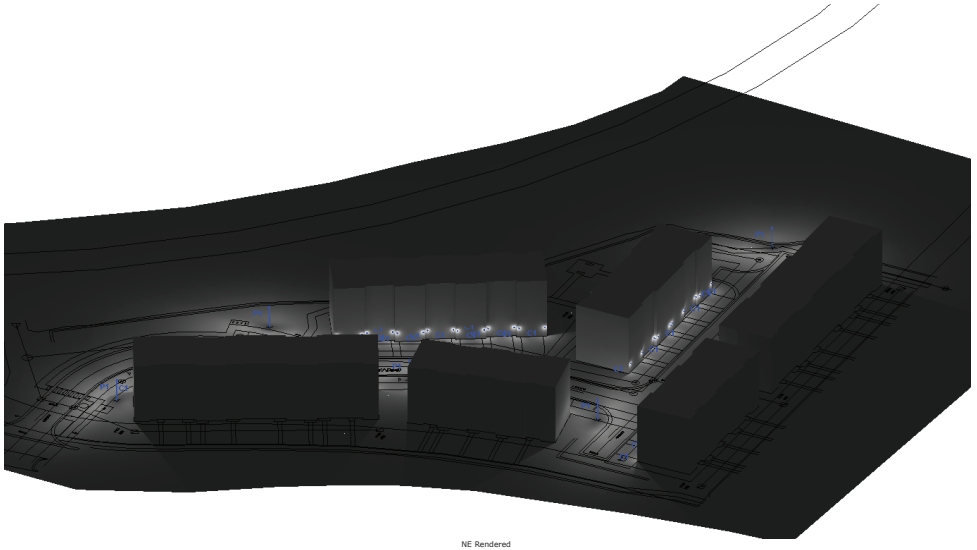
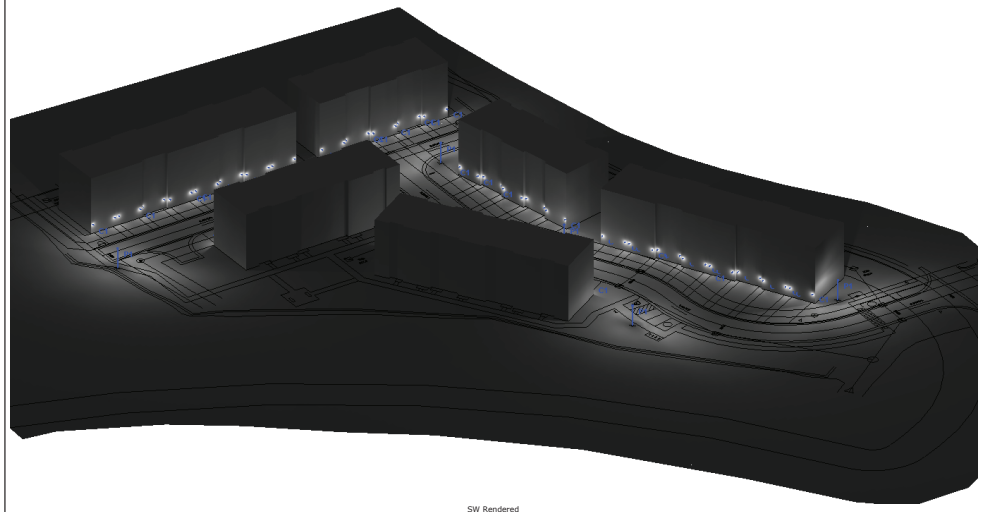
03/31/2025
Scale
Not to Scale
Drawing No.
#25-39282 V2



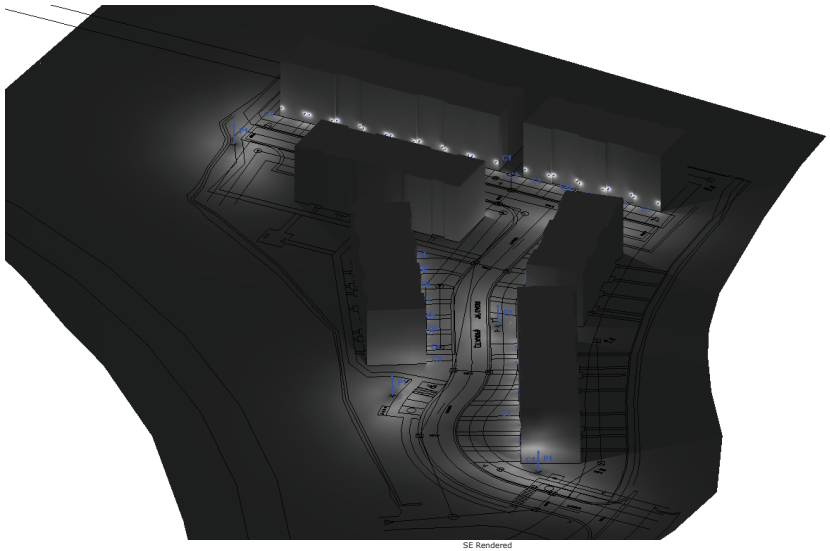
NW Rendered



NE Rendered



SW Rendered



SE Rendered

GRIFFIN NOVI II (WEST)
EXTERIOR PHOTOMETRIC PLAN
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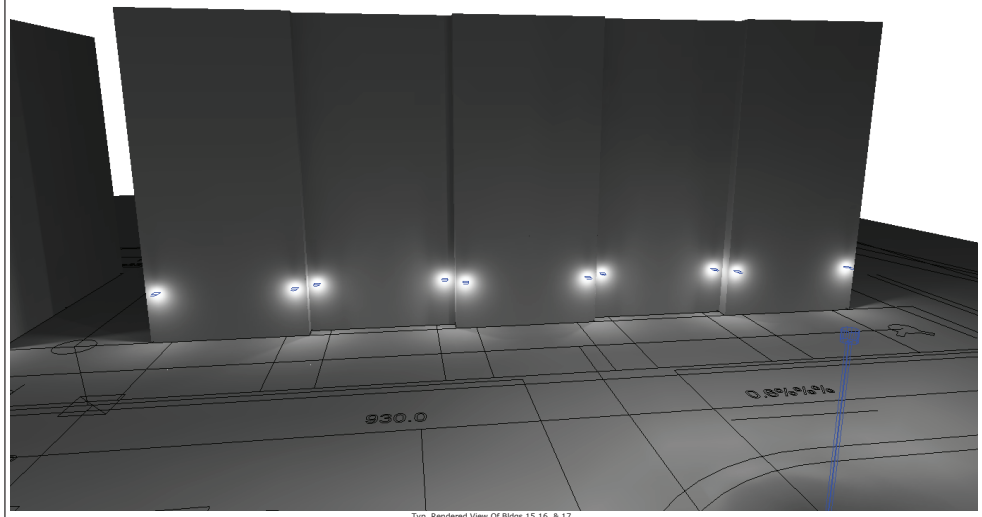
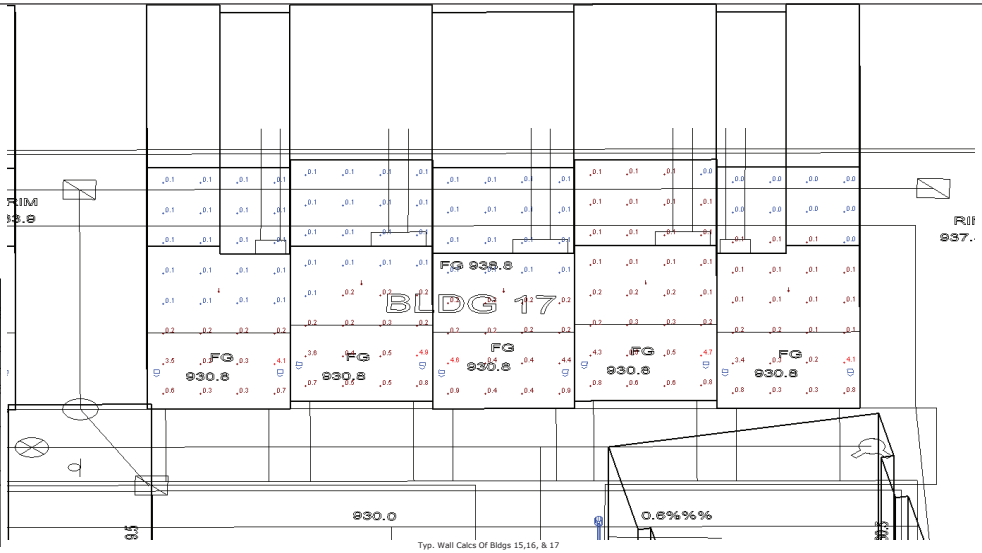


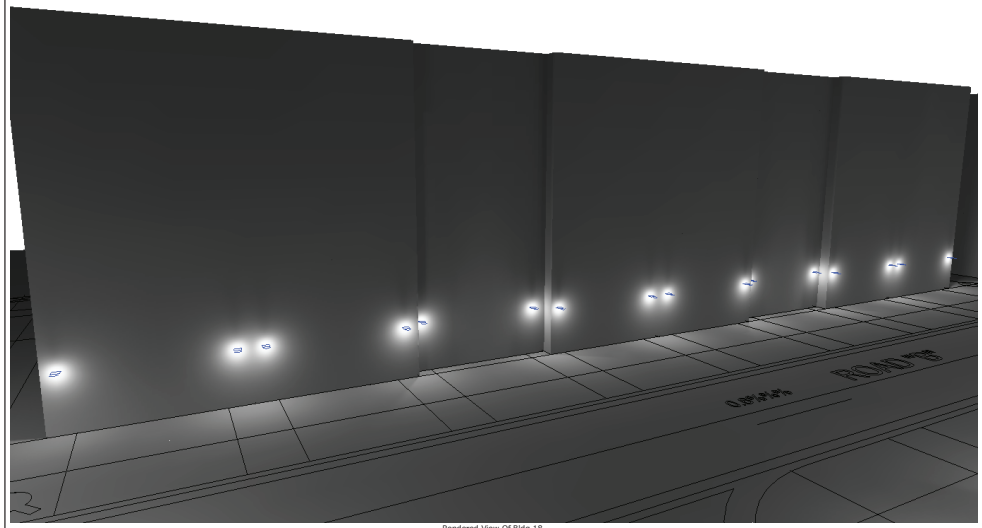
Typ. Rendered View Of Bldgs 15,16, & 17



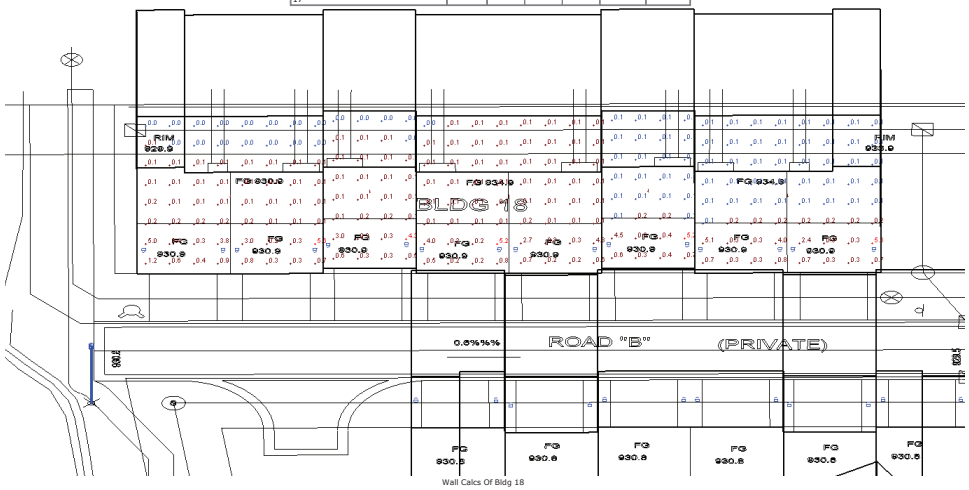
Typ. Wall Calcs Of Bldgs 15,16, & 17

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Typ. Wall Calcs For Bldgs 15,16, & 17	+	0.4 fc	4.1 fc	0.1 fc	41.0:1	4.0:1
Typ. Wall Calcs For Bldgs 15,16, & 17	+	0.5 fc	4.9 fc	0.1 fc	49.0:1	5.0:1
Typ. Wall Calcs For Bldgs 15,16, & 17	+	0.5 fc	4.6 fc	0.1 fc	46.0:1	5.0:1
Typ. Wall Calcs For Bldgs 15,16, & 17	+	0.5 fc	4.7 fc	0.0 fc	N/A	N/A
Typ. Wall Calcs For Bldgs 15,16, & 17	+	0.4 fc	4.1 fc	0.0 fc	N/A	N/A



Rendered View Of Bldg 18



Wall Calcs Of Bldg 18

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Bldg 18 Wall Calcs	+	0.4 fc	5.6 fc	0.1 fc	56.0:1	4.0:1
Bldg 18 Wall Calcs	+	0.4 fc	5.2 fc	0.0 fc	N/A	N/A
Bldg 18 Wall Calcs	+	0.5 fc	5.2 fc	0.1 fc	52.0:1	5.0:1
Bldg 18 Wall Calcs	+	0.4 fc	5.6 fc	0.0 fc	N/A	N/A
Bldg 18 Wall Calcs	+	0.4 fc	4.3 fc	0.0 fc	N/A	N/A

GRIFFIN NOVI II (WEST)
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Scale
Not to Scale
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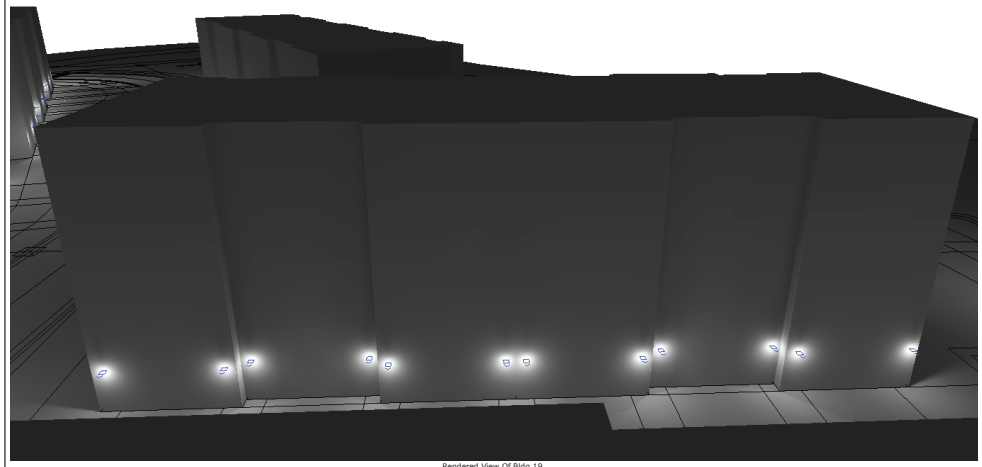
#25-39282 V2

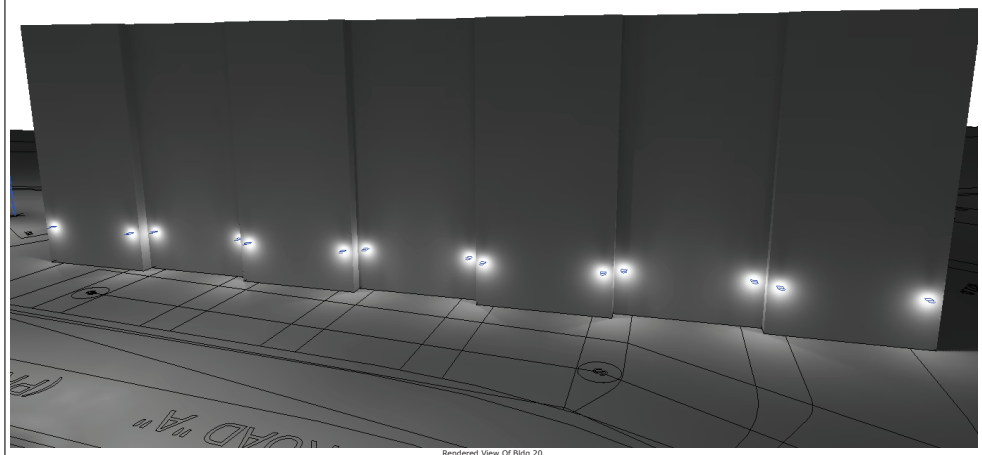


Rendered View Of Bldg 19

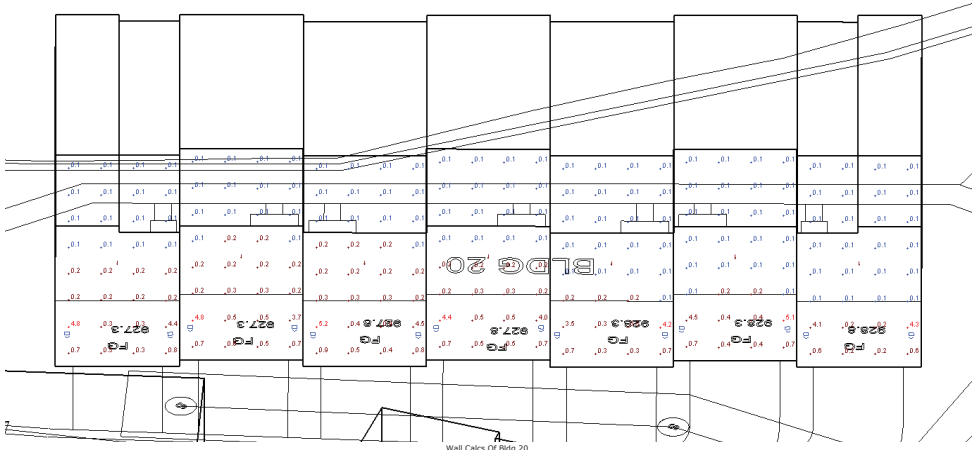
Wall Calcs Of Bldg 19

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Bldg 19 Wall Calcs	+	0.4 fc	5.8 fc	0.1 fc	58.0:1	4.0:1
Bldg 19 Wall Calcs	+	0.4 fc	4.6 fc	0.1 fc	46.0:1	4.0:1
Bldg 19 Wall Calcs	+	0.4 fc	4.8 fc	0.1 fc	48.0:1	4.0:1
Bldg 19 Wall Calcs	+	0.4 fc	5.2 fc	0.1 fc	52.0:1	4.0:1
Bldg 19 Wall Calcs	+	0.5 fc	4.9 fc	0.1 fc	49.0:1	5.0:1



Rendered View Of Bldg 20



Wall Calcs Of Bldg 20

Statistics

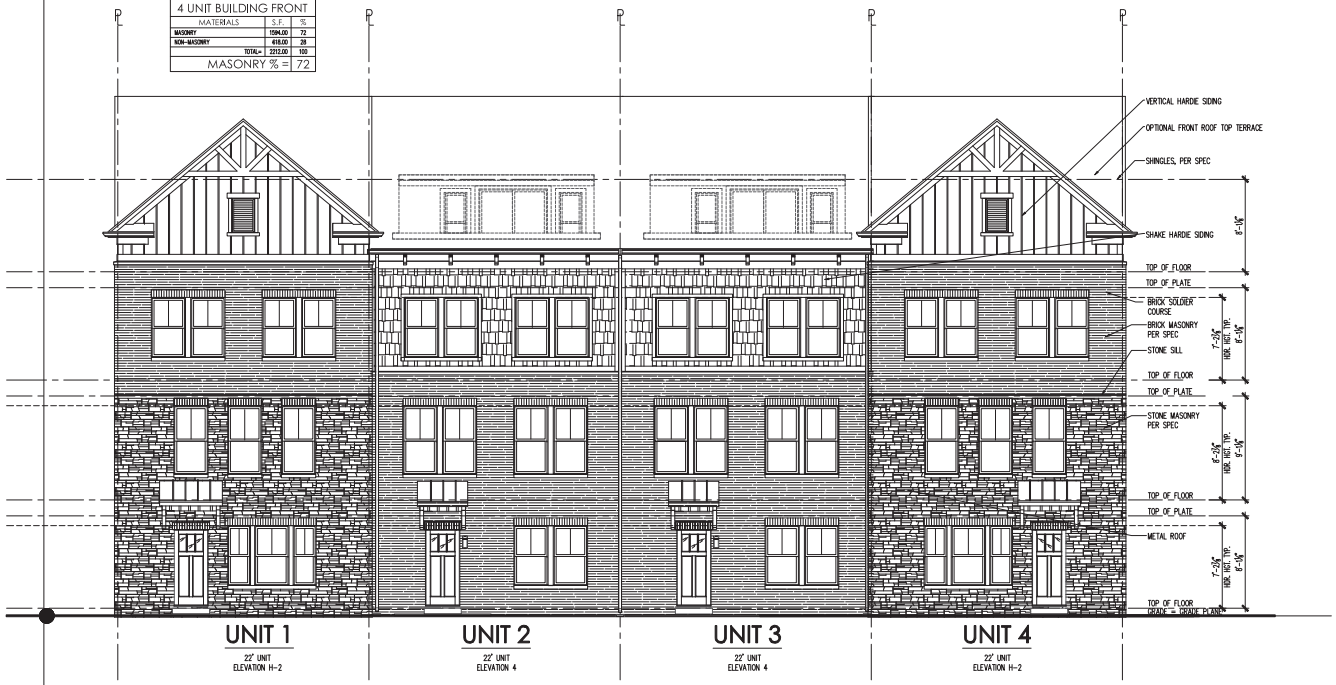
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Bldg 20 Wall Calcs	+	0.5 fc	4.8 fc	0.1 fc	48.0:1	5.0:1
Bldg 20 Wall Calcs	+	0.5 fc	5.2 fc	0.1 fc	52.0:1	5.0:1
Bldg 20 Wall Calcs	+	0.4 fc	4.2 fc	0.1 fc	42.0:1	4.0:1
Bldg 20 Wall Calcs	+	0.4 fc	4.3 fc	0.1 fc	43.0:1	4.0:1
Bldg 20 Wall Calcs	+	0.5 fc	5.1 fc	0.1 fc	51.0:1	5.0:1
Bldg 20 Wall Calcs	+	0.5 fc	4.4 fc	0.1 fc	44.0:1	5.0:1
Bldg 20 Wall Calcs	+	0.5 fc	4.8 fc	0.1 fc	48.0:1	5.0:1

GRIFFIN NOVI II (WEST)
EXTERIOR PHOTOMETRIC PLAN
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
BK
Date
03/31/2025
Scale
Not to Scale
Drawing No.
#25-39282 V2

BUILDING ELEVATIONS &
FAÇADE MATERIAL BOARD

MASONRY PERCENTAGE		
4 UNIT BUILDING FRONT		
MATERIALS	S.F.	%
MASONRY	1594.00	72
NON-MASONRY	618.00	28
TOTAL=	2212.00	100
MASONRY % =		72



4-UNIT BUILDING CONTROL - FRONT ELEVATION - HIGH-VIZ

SCALE: 3/16" = 1'-0"

Michigan Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Diamond

Building Control Plan
4 Unit Building - Front
"High-Viz"

PRODUCTION MANAGER
EM/KR
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
01/25/2019

REV #	DATE / DESCRIPTION

GARAGE HANDING
RL-GB-KR / KC

PLAN NAME

NPC PLAN NUMBER

LAWSON PLAN ID

SHEET
HIGH-VIZ
A4.01

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS -- 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: September 22, 2022 / Kevin Roessler / REV4-MAIN STREET PAGES HIGH VIZ.DWG

MASONRY PERCENTAGE

4 UNIT BUILDING REAR

MATERIALS	S.F.	%
MASONRY	312.00	16
NON-MASONRY	1596.00	84
TOTAL=	1908.00	100

MASONRY % = 16

4-UNIT BUILDING CONTROL - REAR ELEVATION - HIGH-VIZ

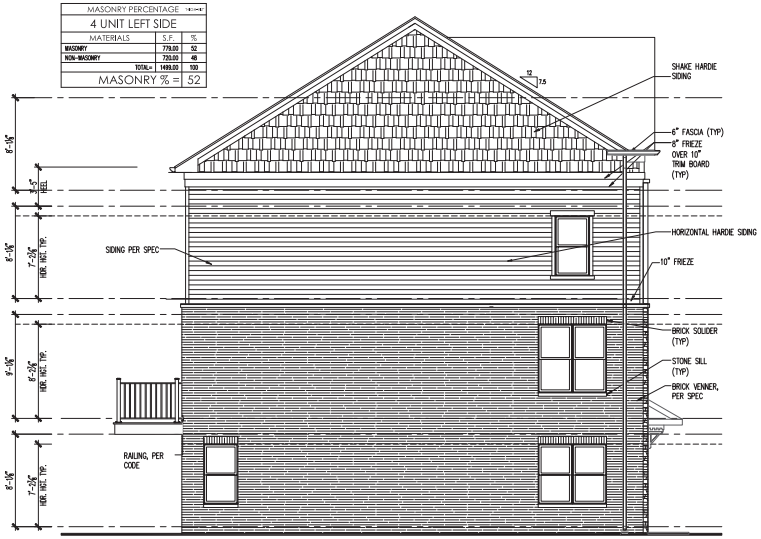
SCALE: 3/16" = 1'-0"

MASONRY PERCENTAGE

4 UNIT LEFT SIDE

MATERIALS	S.F.	%
MASONRY	779.00	52
NON-MASONRY	720.00	48
TOTAL=	1499.00	100

MASONRY % = 52



4-UNIT BUILDING CONTROL - LEFT SIDE ELEVATION - HIGH-VIZ

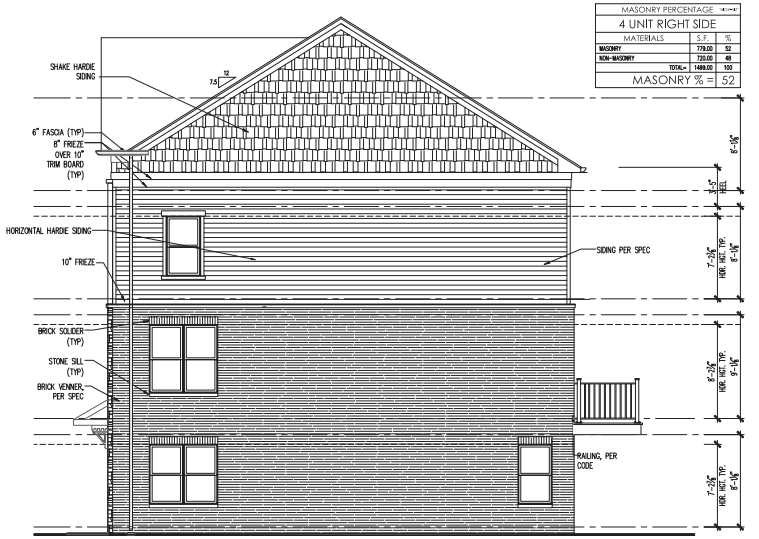
SCALE: 3/16" = 1'-0"

MASONRY PERCENTAGE

4 UNIT RIGHT SIDE

MATERIALS	S.F.	%
MASONRY	779.00	52
NON-MASONRY	720.00	48
TOTAL=	1499.00	100

MASONRY % = 52



4-UNIT BUILDING CONTROL - RIGHT SIDE ELEVATION - HIGH-VIZ

SCALE: 3/16" = 1'-0"

Michigan Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Diamond

Building Control Plan
4 Unit Building - Left and Right Side Elevations
"High-Viz"

PRODUCTION MANAGER
EM/ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
01/25/2019

REV #	DATE / DESCRIPTION
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-

GARAGE HANDING
RL-GB-KR / KC

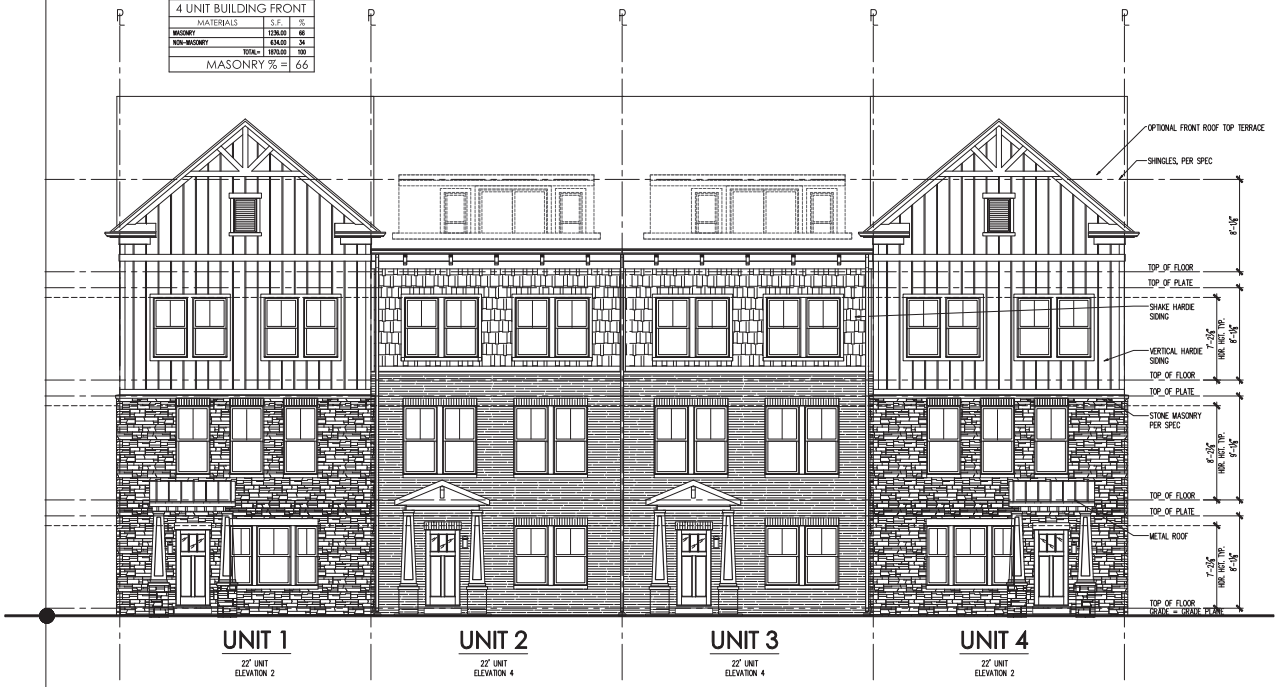
PLAN NAME
NPC PLAN NUMBER
LAWSON PLAN ID

SHEET
HIGH-VIZ
A4.02

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: September 22, 2022 / Kevin Roessler / REV4-MAIN STREET PAGES HIGH VIZ.IMG

MASONRY PERCENTAGE		
4 UNIT BUILDING FRONT		
MATERIALS	S.F.	%
MASONRY	1236.00	66
NON-MASONRY	634.00	34
TOTAL=	1870.00	100
MASONRY % =		66



4-UNIT BUILDING CONTROL - FRONT ELEVATION

SCALE: 3/16" = 1'-0"

Michigan Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Building Control Plan
4 Unit Building - Front
"Standard"

PRODUCTION MANAGER
EM/ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
01/25/2019

REV #	DATE / DESCRIPTION

GARAGE HANDING
RL-GB-KR / KC

PLAN NAME

NPC PLAN NUMBER

LAWSON PLAN ID

SHEET
STANDARD
A4.01

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: September 22, 2022 / Kevin Roessler / REV4-MAIN STREET PAGES - STANDARD.DWG

MASONRY PERCENTAGE

4 UNIT BUILDING REAR

MATERIALS	S.F.	%
MASONRY	312.00	16
NON-MASONRY	1596.00	84
TOTAL=	1908.00	100

MASONRY % = 16

4-UNIT BUILDING CONTROL - REAR ELEVATION

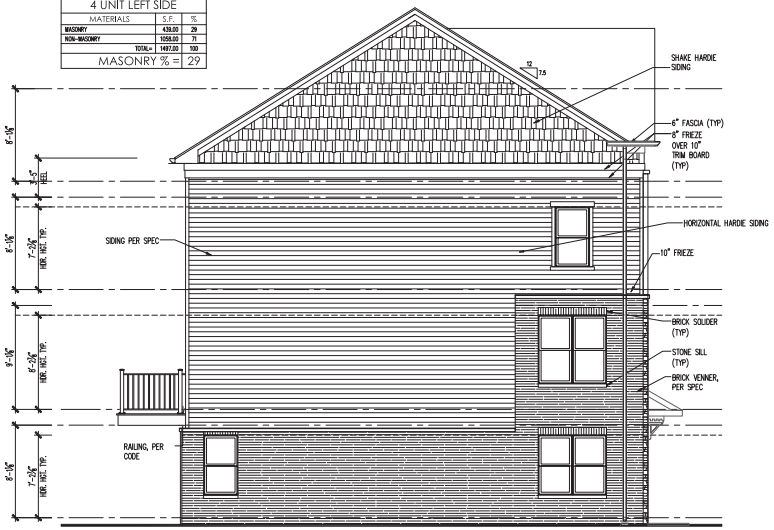
SCALE: 3/16" = 1'-0"

MASONRY PERCENTAGE

4 UNIT LEFT SIDE

MATERIALS	S.F.	%
MASONRY	439.00	29
NON-MASONRY	1058.00	71
TOTAL=	1497.00	100

MASONRY % = 29



4-UNIT BUILDING CONTROL - LEFT SIDE ELEVATION

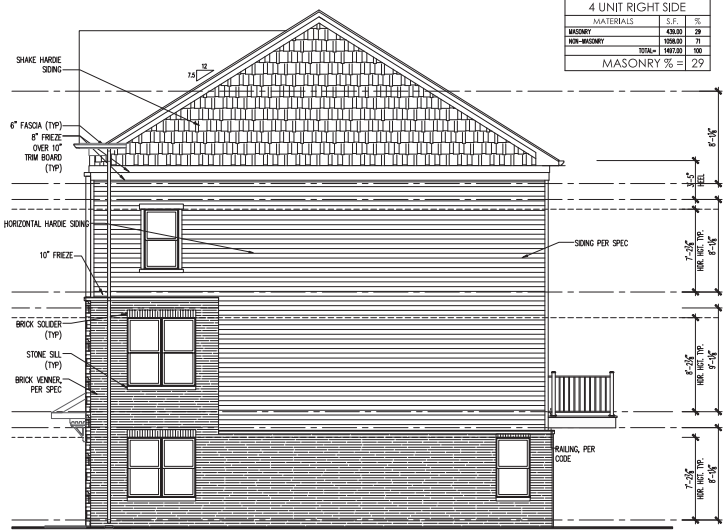
SCALE: 3/16" = 1'-0"

MASONRY PERCENTAGE

4 UNIT RIGHT SIDE

MATERIALS	S.F.	%
MASONRY	439.00	29
NON-MASONRY	1058.00	71
TOTAL=	1497.00	100

MASONRY % = 29



4-UNIT BUILDING CONTROL - RIGHT SIDE ELEVATION

SCALE: 3/16" = 1'-0"

PLOTTED: September 22, 2022 / Kevin Roessler / REV4-MAIN STREET PALOS - STANDARD.DWG

Michigan Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Building Control Plan
4 Unit Building - Left and Right Side Elevations
"Standard"

PRODUCTION MANAGER
EM/ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
01/25/2019

REV #	DATE / DESCRIPTION
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-
△	-

GARAGE HANDING
RL-GB-KR / KC

PLAN NAME
NPC PLAN NUMBER
LAWSON PLAN ID

SHEET
STANDARD
A4.02

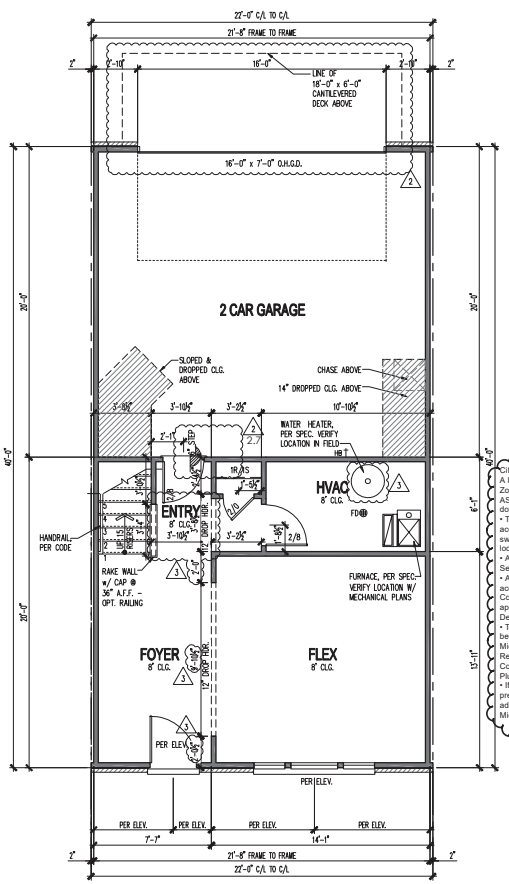
NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

GENERAL FLOOR PLAN NOTES

GENERAL SPECIFICATIONS

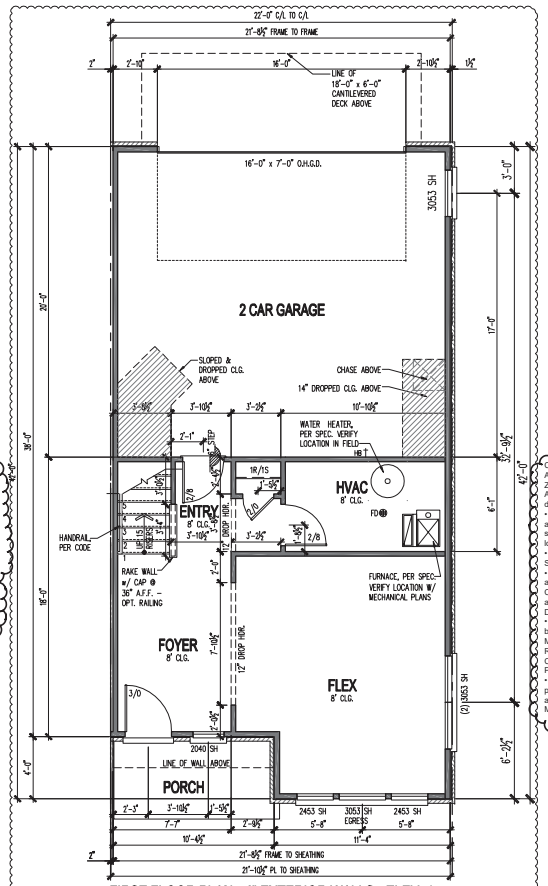
1. ALL ANGLED WALLS (OTHER THAN THOSE AT 90°) SHALL BE CONSIDERED TO BE AT 45° UNLESS NOTED OTHERWISE
2. ALL STUDS AT EXTERIOR AND INTERIOR WALLS SHALL BE 2x4 UNLESS OTHERWISE NOTED
3. ALL STUDS AT EXTERIOR WALLS AND INTERIOR BEARING WALLS TO BE FRAMED AT 16" O.C. UNLESS NOTED OTHERWISE
4. ALL NON-BEARING WALLS, OTHER THAN IN THE KITCHEN AND PLANNING CENTERS, TO BE 2x4 STUDS AT 24" O.C. UNLESS OTHERWISE NOTED OR RESTRICTED BY LOCAL CODES OR ORDINANCES. KITCHEN AND PLANNING CENTER WALLS WHERE WALL CABINETS ARE TO BE HUNG SHALL BE FRAMED AT 16" O.C.
5. PROVIDE DOUBLE 2x TOP PLATES AT ALL LOAD BEARING WALLS.
6. PROVIDE SINGLE TOP PLATE AT ALL INTERIOR NON-LOADING BEARING WALLS.
7. PROVIDE 5/8" DRYWALL AT WALLS, CEILING AND UNDERSIDE OR STAIR ASSEMBLY ACCESSIBLE SPACE UNDER STAIRS IN ACCORDANCE WITH THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE. ALL FLOORS CONSTRUCTED WITH ENGINEERED TRUSSES SHALL HAVE THE UNDERSIDE FULLY SHEATHED WITH A MINIMUM 5/8"**TYPE 'X' GYPSUM BOARD.
8. ALL GLAZING INSTALLED IN HAZARDOUS LOCATIONS AS DEFINED BY THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE SHALL HAVE A PERMANENT DESIGNATION OR LABEL AFFIXED TO EACH PANE OF GLAZING BEARING THE MANUFACTURER'S LABEL SHOWING THE TYPE AND THICKNESS OF GLASS. FOR OTHER THAN TEMPERED GLASS, LABELS MAY BE OMITTED PROVIDED THE BUILDING OFFICIAL APPROVES THE USE OF A CERTIFICATE, AFFIDAVIT OR OTHER EVIDENCE CONFIRMING COMPLIANCE WITH THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE.
9. ALL BATHTUB AND SHOWER FLOORS AND WALLS ABOVE BATHTUBS WITH INSTALLED SHOWER HEADS AND IN SHOWER COMPARTMENTS SHALL BE FINISHED WITH A NON-ABSORBENT SURFACE. SUCH WALL SURFACES SHALL EXTEND TO A HEIGHT NOT LESS THAN 72" ABOVE THE FLOOR PER THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE.
10. PROVIDE THERMO-PLY SHEATHING AND BATT INSULATION FILLING ALL CAVITIES AT EXTERIOR WALLS SURROUNDING TUBS AND SHOWERS.
11. SECTION R309.7 SEPARATION REQUIRED. THE GARAGE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY MEANS OF A MINIMUM 1-HOUR RATED FIRE BARRIER CONSTRUCTED OF FIVE-EIGHTHS INCH (5/8") TYPE X GYPSUM BOARD OR EQUIVALENT APPLIED TO ALL WALLS, CEILINGS AND SUPPORT STRUCTURES, INCLUDING BEAMS AND COLUMNS, OF THE GARAGE. SAID GYPSUM BOARD ASSEMBLY SHALL BE FULLY FIRE TAPED, AND ALL PENETRATIONS THROUGH SAID ASSEMBLY SHALL BE FIRESTOPPED WITH A FIRESTOP SYSTEM LISTED AND APPROVED FOR THE APPLICATION. DUCTS IN A PRIVATE GARAGE AND DUCTS PENETRATING THE WALLS OR CEILINGS SEPARATING THE DWELLING UNIT FROM THE GARAGE SHALL BE ENCAPSULATED IN CONSTRUCTION EQUAL TO THAT OF THOSE WALLS AND CEILINGS, AND SHALL HAVE NO OPENINGS INTO THE GARAGE.
12. FOR ADDITIONAL INFORMATION SEE STRUCTURAL DRAWINGS AND NOTES.
13. ALL CONCEALED FLOOR/CEILING SPACES WHICH ARE GREATER THAN 500 SQFT SHALL BE DRAFTSTOPPED INTO APPROXIMATELY EQUAL AREAS OF LESS THAN 500 SQFT. (SECTION R302.12 AS AMENDED)
14. ALL DOORS FROM THE GARAGE TO THE RESIDENCE SHALL BE A MINIMUM 3/4 HOUR FIRE RATED DOOR AND BE SELF-CLOSING AND LATCHING. (SECTION R309.6 AS AMENDED)
15. FLEXIBLE METALLIC AIR DUCTS MAY BE USED ONLY WHERE PRACTICAL DIFFICULTIES ARE ENCOUNTERED AND IS SUBJECT TO REVIEW AND APPROVAL BY THE BUILDING OFFICIAL PRIOR TO INSTALLATION. (SECTION M1601.1.1 AS AMENDED)
16. PROVIDE COMBUSTION AIR FOR ALL FUEL GAS APPLIANCES INCLUDING THE CLOTHES DRYER, IN COMPLIANCE WITH SECTION G2407. THE INSTALLATION OF A FULL-LOUVERED DOOR OR TWO AIR TRANSFER GRILLS (MINIMUM 100 SQ. IN. EACH AND LOCATED WITHIN 12" OF THE FLOOR AND CEILING) IS CODE COMPLIANT.
17. PROVIDE COMBUSTION AIR FOR ALL FUEL GAS APPLIANCES IN THE MECHANICAL ROOM INCLUDING THE FURNACE (UNLESS OBTAINING ALL COMBUSTION AIR FROM THE OUTDOORS AND THE WATER HEATERS IN COMPLIANCE WITH SECTION G2407. THE INSTALLATION OF A FULL-LOUVERED DOOR OR TWO AIR TRANSFER GRILLS (MINIMUM 100 SQ. IN. EACH AND LOCATED WITHIN 12" OF THE FLOOR AND CEILING) IS CODE COMPLIANT. IF COMBUSTION AIR DUCTS FROM THE EXTERIOR ARE PROVIDED TO THE ROOM, THEN NOTE SECTION R402.4.4 OF THE INTERNATIONAL ENERGY CONSERVATION CODE

2.1, 2.3, 2.13



City of Novi:
A listed and approved Reduced Pressure Zone Assembly (RPZ) conforming to ASSE 1103 is to be installed immediately downstream of the water main.
• The assembly shall be provided in an accessible location with access through a swing door if installed in an enclosed location.
• Access shall be approved by the Water & Sewer Division.
• A floor drain shall be provided in accordance with the Michigan Plumbing Code or Michigan Residential Code and approved by the Community Development Department Plumbing Division.
• Thermal Expansion requirements must be considered in accordance with the Michigan Plumbing Code or Michigan Residential Code and approved by the Community Development Department Plumbing Division.
• If a booster pump is necessary, low pressure cutoff requirements must be addressed in accordance with the Michigan Plumbing Code.

FIRST FLOOR PLAN - 4" EXTERIOR WALLS - ELEV. 2 & 3
SCALE: 1/4" = 1'-0"
"NOT TO SCALE"



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• Thermal Expansion requirements must be considered in accordance with the Michigan Plumbing Code or Michigan Residential Code and approved by the Community Development Department Plumbing Division.
• If a booster pump is necessary, low pressure cutoff requirements must be addressed in accordance with the Michigan Plumbing Code.

FIRST FLOOR PLAN - 4" EXTERIOR WALLS - ELEV. 1
SCALE: 1/4" = 1'-0"
"NOT TO SCALE"

Illinois/Missouri Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Homes

First Floor Plan
4" Exterior Walls

PRODUCTION MANAGER
EM / ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
12/09/2016

REV #	DATE / DESCRIPTION
1	10/04/2016 PERMIT COMMENTS
2	10/14/2016 PERMIT COMMENTS
3	12/22/2016 PLAN REVISIONS

GARAGE HANDING
RL-GB-KR

PLAN NAME
22' Unit
WPC PLAN NUMBER
2466.913
LAWSON PLAN ID
-

SHEET
A1
4-1.1

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: December 22, 2016 / Eric Rutledge / 2466.913-(RL-GE-KR)-4-1-SMB-PLAN-FLLONG

GENERAL FLOOR PLAN NOTES

GENERAL SPECIFICATIONS

1. ALL ANGLED WALLS (OTHER THAN THOSE AT 90°) SHALL BE CONSIDERED TO BE AT 45° UNLESS NOTED OTHERWISE
2. ALL STUDS AT EXTERIOR AND INTERIOR WALLS SHALL BE 2x4 UNLESS OTHERWISE NOTED
3. ALL STUDS AT EXTERIOR WALLS AND INTERIOR BEARING WALLS TO BE FRAMED AT 16" O.C. UNLESS NOTED OTHERWISE
4. ALL NON-BEARING WALLS, OTHER THAN IN THE KITCHEN AND PLANNING CENTERS, TO BE 2x4 STUDS AT 24" O.C. UNLESS OTHERWISE NOTED OR RESTRICTED BY LOCAL CODES OR ORDINANCES. KITCHEN AND PLANNING CENTER WALLS WHERE WALL CABINETS ARE TO BE HUNG SHALL BE FRAMED AT 16" O.C.
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8. ALL GLAZING INSTALLED IN HAZARDOUS LOCATIONS AS DEFINED BY THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE SHALL HAVE A PERMANENT DESIGNATION OR LABEL AFFIXED TO EACH PANE OF GLAZING BEARING THE MANUFACTURER'S LABEL SHOWING THE TYPE AND THICKNESS OF GLASS. FOR OTHER THAN TEMPERED GLASS, LABELS MAY BE OMITTED PROVIDED THE BUILDING OFFICIAL APPROVES THE USE OF A CERTIFICATE, AFFIDAVIT OR OTHER EVIDENCE CONFIRMING COMPLIANCE WITH THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE.
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10. PROVIDE THERMO-PLY SHEATHING AND BATT INSULATION FILLING ALL CAVITIES AT EXTERIOR WALLS SURROUNDING TUBS AND SHOWERS.
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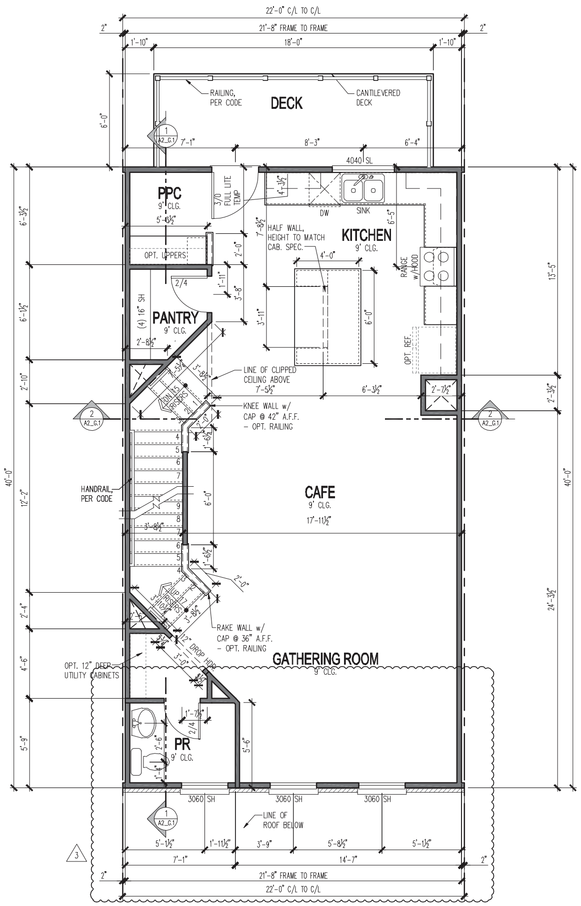
16. PROVIDE COMBUSTION AIR FOR ALL FUEL GAS APPLIANCES INCLUDING THE CLOTHES DRYER. IN COMPLIANCE WITH SECTION G2407. THE INSTALLATION OF A FULL-LOUVERED DOOR OR TWO AIR TRANSFER GRILLS (MINIMUM 100 SQ. IN. EACH AND LOCATED WITHIN 12" OF THE FLOOR AND CEILING) IS CODE COMPLIANT.
17. PROVIDE COMBUSTION AIR FOR ALL FUEL GAS APPLIANCES IN THE MECHANICAL ROOM INCLUDING THE FURNACE (UNLESS OBTAINING ALL COMBUSTION AIR FROM THE OUTDOORS AND THE WATER HEATERS IN COMPLIANCE WITH SECTION G2407. THE INSTALLATION OF A FULL-LOUVERED DOOR OR TWO AIR TRANSFER GRILLS (MINIMUM 100 SQ. IN. EACH AND LOCATED WITHIN 12" OF THE FLOOR AND CEILING) IS CODE COMPLIANT. IF COMBUSTION AIR DUCTS FROM THE EXTERIOR ARE PROVIDED TO THE ROOM, THEN NOTE SECTION R402.4.4 OF THE INTERNATIONAL ENERGY CONSERVATION CODE

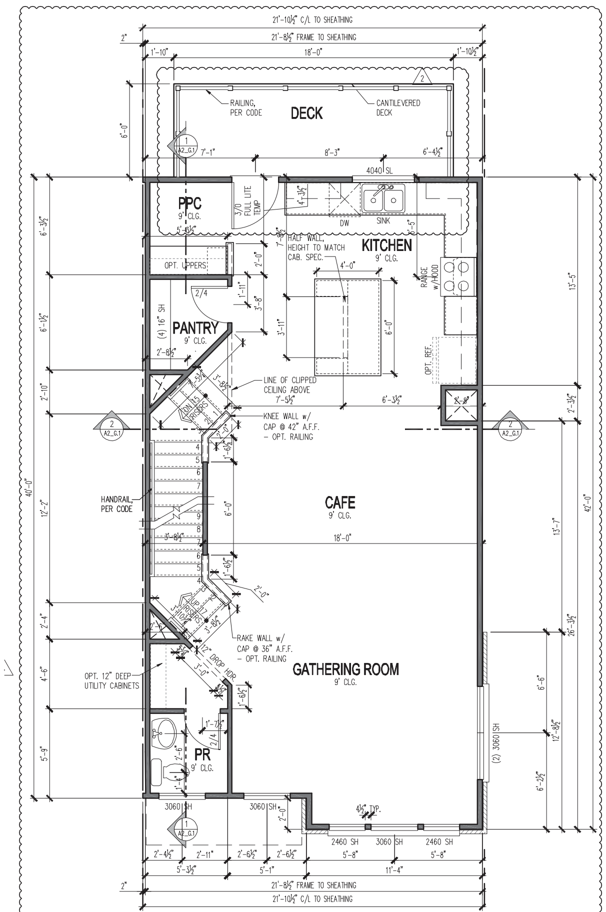
2 1

2.1, 2.3, 2.13



SECOND FLOOR PLAN - 4" WALLS - ELEV. 2

"NOT TO SCALE"



SECOND FLOOR PLAN - 4" WALLS - ELEV. 1

"NOT TO SCALE"

Illinois/Missouri Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Homes

Second Floor Plan
.
4" Exterior Walls

PRODUCTION MANAGER
EM / ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
12/09/2016

REV #	DATE / DESCRIPTION
1	10/04/2016 PERMIT COMMENTS
2	10/14/2016 PERMIT COMMENTS
3	12/22/2016 PLAN REVISIONS
	. .
	. .
	. .
	. .
	. .
	. .

GARAGE HANDING
RL-GE-KR

PLAN NAME
22' Unit
NPC PLAN NUMBER
2466.913
LAWSON PLAN ID
--

SHEET
A1
4-2.1

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: December 22, 2016 / Eric Rutledge / 2466.913-(RL-GE-KR)-IL-SMB-PLAN-FL2.DWG

GENERAL FLOOR PLAN NOTES

GENERAL SPECIFICATIONS

1. ALL ANGLED WALLS (OTHER THAN THOSE AT 90°) SHALL BE CONSIDERED TO BE AT 45° UNLESS NOTED OTHERWISE
2. ALL STUDS AT EXTERIOR AND INTERIOR WALLS SHALL BE 2x4 UNLESS OTHERWISE NOTED
3. ALL STUDS AT EXTERIOR WALLS AND INTERIOR BEARING WALLS TO BE FRAMED AT 16" O.C. UNLESS NOTED OTHERWISE
4. ALL NON-BEARING WALLS, OTHER THAN IN THE KITCHEN AND PLANNING CENTERS, TO BE 2x4 STUDS AT 24" O.C. UNLESS OTHERWISE NOTED OR RESTRICTED BY LOCAL CODES OR ORDINANCES. KITCHEN AND PLANNING CENTER WALLS WHERE WALL CABINETS ARE TO BE HUNG SHALL BE FRAMED AT 16" O.C.
5. PROVIDE DOUBLE 2x TOP PLATES AT ALL LOAD BEARING WALLS.
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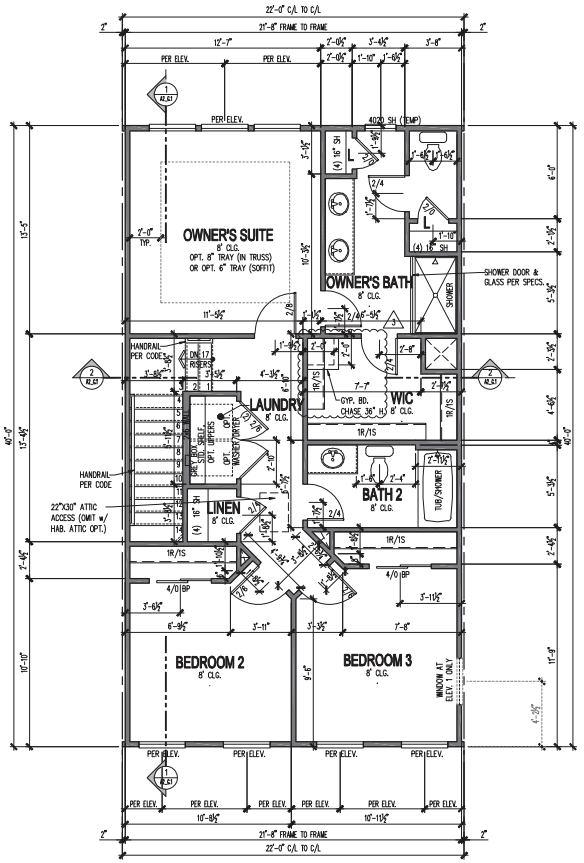
7. PROVIDE 5/8" DRYWALL AT WALLS, CEILING AND UNDERSIDE OR STAIR ASSEMBLY ACCESSIBLE SPACE UNDER STAIRS IN ACCORDANCE WITH THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE. ALL FLOORS CONSTRUCTED WITH ENGINEERED TRUSSES SHALL HAVE THE UNDERSIDE FULLY SHEATHED WITH A MINIMUM 5/8"**TYPE 'X' GYPSUM BOARD.
8. ALL GLAZING INSTALLED IN HAZARDOUS LOCATIONS AS DEFINED BY THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE SHALL HAVE A PERMANENT DESIGNATION OR LABEL AFFIXED TO EACH PANE OF GLAZING BEARING THE MANUFACTURER'S LABEL SHOWING THE TYPE AND THICKNESS OF GLASS. FOR OTHER THAN TEMPERED GLASS, LABELS MAY BE OMITTED PROVIDED THE BUILDING OFFICIAL APPROVES THE USE OF A CERTIFICATE, AFFIDAVIT OR OTHER EVIDENCE CONFIRMING COMPLIANCE WITH THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE.
9. ALL BATHTUB AND SHOWER FLOORS AND WALLS ABOVE BATHTUBS WITH INSTALLED SHOWER HEADS AND IN SHOWER COMPARTMENTS SHALL BE FINISHED WITH A NON-ABSORBENT SURFACE. SUCH WALL SURFACES SHALL EXTEND TO A HEIGHT NOT LESS THAN 72" ABOVE THE FLOOR PER THE CURRENTLY ADOPTED EDITION OF THE IRC OR APPLICABLE LOCAL CODE.
10. PROVIDE THERMO-PLY SHEATHING AND BATT INSULATION FILLING ALL CAVITIES AT EXTERIOR WALLS SURROUNDING TUBS AND SHOWERS.
11. SECTION R309.7 SEPARATION REQUIRED. THE GARAGE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY MEANS OF A MINIMUM 1-HOUR RATED FIRE BARRIER CONSTRUCTED OF FIVE-EIGHTHS INCH (5/8") TYPE X GYPSUM BOARD OR EQUIVALENT APPLIED TO ALL WALLS, CEILINGS AND SUPPORT STRUCTURES, INCLUDING BEAMS AND COLUMNS, OF THE GARAGE. SAID GYPSUM BOARD ASSEMBLY SHALL BE FULLY FIRE TAPED, AND ALL PENETRATIONS THROUGH SAID ASSEMBLY SHALL BE FIRESTOPPED WITH A FIRESTOP SYSTEM LISTED AND APPROVED FOR THE APPLICATION. DUCTS IN A PRIVATE GARAGE AND DUCTS PENETRATING THE WALLS OR CEILINGS SEPARATING THE DWELLING UNIT FROM THE GARAGE SHALL BE ENCAPSULATED IN CONSTRUCTION EQUAL TO THAT OF THOSE WALLS AND CEILINGS, AND SHALL HAVE NO OPENINGS INTO THE GARAGE.
12. FOR ADDITIONAL INFORMATION SEE STRUCTURAL DRAWINGS AND NOTES.
13. ALL CONCEALED FLOOR/CEILING SPACES WHICH ARE GREATER THAN 500 SQFT SHALL BE DRAFTSTOPPED INTO APPROXIMATELY EQUAL AREAS OF LESS THAN 500 SQFT. (SECTION R302.12 AS AMENDED)
14. ALL DOORS FROM THE GARAGE TO THE RESIDENCE SHALL BE A MINIMUM 3/4 HOUR FIRE RATED DOOR AND BE SELF-CLOSING AND LATCHING. (SECTION R309.6 AS AMENDED)
15. FLEXIBLE METALLIC AIR DUCTS MAY BE USED ONLY WHERE PRACTICAL DIFFICULTIES ARE ENCOUNTERED AND IS SUBJECT TO REVIEW AND APPROVAL BY THE BUILDING OFFICIAL PRIOR TO INSTALLATION. (SECTION M1601.1.1 AS AMENDED)
16. PROVIDE COMBUSTION AIR FOR ALL FUEL GAS APPLIANCES INCLUDING THE CLOTHES DRYER, IN COMPLIANCE WITH SECTION G2407. THE INSTALLATION OF A FULL-LOUVERED DOOR OR TWO AIR TRANSFER GRILLS (MINIMUM 100 SQ. IN. EACH AND LOCATED WITHIN 12" OF THE FLOOR AND CEILING) IS CODE COMPLIANT.
17. PROVIDE COMBUSTION AIR FOR ALL FUEL GAS APPLIANCES IN THE MECHANICAL ROOM INCLUDING THE FURNACE (UNLESS OBTAINING ALL COMBUSTION AIR FROM THE OUTDOORS AND THE WATER HEATERS IN COMPLIANCE WITH SECTION G2407. THE INSTALLATION OF A FULL-LOUVERED DOOR OR TWO AIR TRANSFER GRILLS (MINIMUM 100 SQ. IN. EACH AND LOCATED WITHIN 12" OF THE FLOOR AND CEILING) IS CODE COMPLIANT. IF COMBUSTION AIR DUCTS FROM THE EXTERIOR ARE PROVIDED TO THE ROOM, THEN NOTE SECTION R402.4.4 OF THE INTERNATIONAL ENERGY CONSERVATION CODE

2.1, 2.3, 2.13



THIRD FLOOR PLAN - 4" WALLS

~~SCALE: 1/4" = 1'-0"~~
"NOT TO SCALE"

Illinois/Missouri Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Homes

Third Floor Plan
4" Exterior Walls

PRODUCTION MANAGER
EM / CR
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
12/09/2016

REV #	DATE / DESCRIPTION
1	10/04/2016 PERMIT COMMENTS
2	10/14/2016 PERMIT COMMENTS
3	12/22/2016 PLAN REVISIONS

GARAGE HANDING
RL-GB-KR

PLAN NAME
22' Unit
WFC PLAN NUMBER
2466.913
LAWSON PLAN ID
-

SHEET
A1
4-3.1

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: December 22, 2016 / Eric Rutledge / 2466.913-(RL-GE-KR)-4-SMB-PLAN-FLSTNG

2 BLDG SECTION - 8'/9'/8'/8' - FRONT LOAD - GRADE-LEVEL - HABITABLE ATTIC

~~SCALE: 1/4" = 1'-0"~~ "NOT TO SCALE"

1 BUILDING SECTION - 8'/9'/8'/8' - REAR LOAD - GRADE-LEVEL - HABITABLE ATTIC

~~SCALE: 1/4" = 1'-0"~~ "NOT TO SCALE"

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

Illinois/Missouri Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Homes

Building Sections 1 and 2
Habitable Attic- Grade-Level Entry - Rear Load
Slab Foundation

PRODUCTION MANAGER
EM / ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
12/09/2016

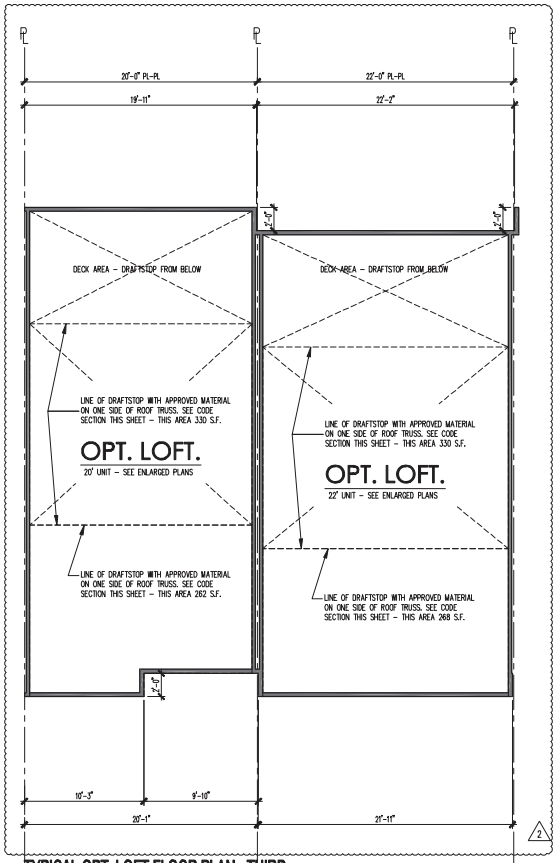
REV #	DATE / DESCRIPTION
1	10/04/2016 PERMIT COMMENTS
2	10/14/2016 PERMIT COMMENTS
3	12/22/2016 PLAN REVISIONS
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-

GARAGE HANDING
RL-GE-KR

PLAN NAME
22' Unit
MPC PLAN NUMBER
2466.913
LAWSON PLAN ID
1

SHEET
A2
8-HA-G.1

PLOTTED: April 20, 2017 / Vanessa Benger / 2466.913-[RL-GE-KR]-A-SHAB-SECTIONS



TYPICAL OPT. LOFT FLOOR PLAN - THIRD FLOOR PLAN

~~SCALE: 3/16" = 1'-0"~~
"NOT TO SCALE"

CONTROL PLAN NOTE

2
2.6

REFER TO THE ENLARGED FLOOR PLANS AS ELEVATIONS FOR MORE DETAILED INFORMATION OF EACH UNIT(S).

R302.12.1 MATERIALS. DRAFTSTOPPING MATERIALS SHALL NOT BE LESS THAN 1/2-INCH (12.7 MM) GYPSUM BOARD, 3/8-INCH (9.5 MM) WOOD STRUCTURAL PANELS OR OTHER APPROVED MATERIALS ADEQUATELY SUPPORTED. DRAFTSTOPPING SHALL BE INSTALLED PARALLEL TO THE FLOOR FRAMING MEMBERS UNLESS OTHERWISE APPROVED BY THE BUILDING OFFICIAL. THE INTEGRITY OF THE DRAFTSTOPS SHALL BE MAINTAINED.

Illinois/Missouri Division
1900 Golf Road, - Suite 300
Schaumburg, Illinois 60173

Pulte Homes

Building Control Plan
Third Floor Plan - Typical Opt. Loft Floor Pla
Units 1-5

PRODUCTION MANAGER
EM/ER
INITIAL RELEASE DATE:
05/31/2016
CURRENT RELEASE DATE:
12/09/2016

REV #	DATE / DESCRIPTION
1	10/04/2016 PERMIT COMMENTS
2	10/14/2016 PERMIT COMMENTS
3	12/22/2016 PLAN REVISIONS

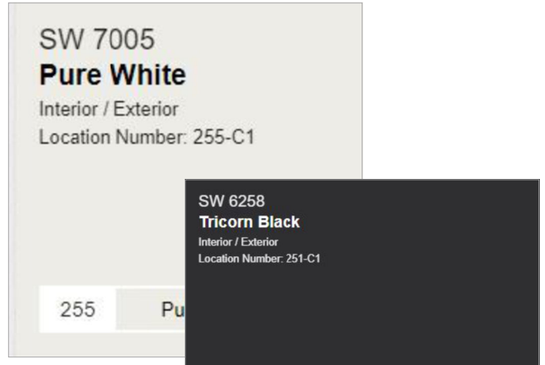
GARAGE HANDING
RL-GB-KR / KC

PLAN NAME
NPC PLAN NUMBER
LAWSON PLAN ID
—

SHEET
CP-5B
3.2

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: December 22, 2016 / Eric Rutledge /IL-SWB-SUNTRUDC-BLDNG



Exterior Package - Twelve Mile Townes								
	Stone	Brick	Siding - Horizontal & Vertical	Siding - Shingle	Cornice, Trim & Accents	Roof - Shingles	Metal Awning	Garage Door
Package	Brampton Brick - "Grenada Ashland" or Equal	Michigan Brick - "Meadow Brook" or Equal	Hardieplank Siding (Horizontal) & Hardie Panel (Vertical) - "Evening Blue"	Hardieshingle - "Kahki Brown"	Sherwin-Williams - SW7005 "Pure White"	Certainteed Landmark - "Weathered Wood" or Equal	Sherwin-Williams - SW6258 "Tricorn Black"	Wayne Dalton - "White"

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7125 Orchard Lake Road
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West Bloomfield, MI 48325

248.865.1600 Phone
248.865.1630 Fax
www.SinghWeb.com

Project Name:

Twelve Mile Townes

Sheet Title:

Exterior Material Sample

Date:

7.3.2025 (JSP 25-0003 Preliminary Site Plan Review)

PLANNING REVIEW

Planning Review

JSP 25-03 TWEVE MILE TOWNES		
Preliminary Site Plan, Special Land Use with Planned Development-2 (2nd Revision)		
Date of Review	June 09, 2025	
Plan Date	May 07, 2025	
Applicant	Singh Development LLC	
Parcel ID's	Section 14: 22-14-200-034, 22-14-100-038 & -039	
Site Size	16.37 acres gross, 15.05-acre net	
Site Location	South of Twelve Mile Road and east of Novi Road, located on both the east and west sides of the Twelve Oaks Mall access drive	
Site School District	Novi Community School District	
Current Site Zoning	RC Regional Center with Planned Development (PD-2) Option	
Adjoining Zoning	North	OS-1 Office Service & RA Residential Acreage
	East	RC Regional Center
	West	RC Regional Center
	South	RM-1 Low Density Multifamily Residential
Current Site Use	Vacant	
Adjoining Uses	North	Medical Offices, Story Point Assisted Living & MSU Tollgate Farn
	East	Medical Office
	West	Fast-food Restaurant (McDonalds)
	South	Twelve Oaks Mall & Assisted Living Facility (Walton Wood)
Current FLU designation	Regional Commercial With PD-2	
Future Land Use (FLU)	North	Community Office, Educational Facility
	East	Office, Research, Development and Technology
	West	Regional Commercial With PD-2
	South	PD-1 & Regional Commercial

PROJECT SUMMARY

The subject property consists of three parcels that are approximately 16.37 acres in total and is located south of Twelve Mile Road, northeast of the Twelve Oaks Mall in the RC Regional Center District (Section 14). The subject properties qualify to seek development under Planned Development (PD-2) Option 20230 city's future land use plan. The applicant is proposing to develop the vacant parcels with 20 buildings containing 125 townhome units (6 buildings & 39 units to west of Twelve Oaks Mall Access Drive and the remaining to the east). Each unit would have a two-car garage, with additional parking on the driveways. Additionally, 10 surface spaces are also provided. A private street network is proposed to connect the development to Twelve Mile Road on the east side and the Twelve Oaks Mall Access Drive, which bisects the project.

PLANNER RECOMMENDATION

Approval of the revised Preliminary Site Plan is recommended at this time, with the following conditions: City Council must approve the plan and its requested deviations, and the Zoning Board of Appeals must approve the proposed change to the previous condition. While the plan mostly meets the requirements of the Zoning Ordinance, several deviations are requested. About one-third of the property contains natural features, which has caused the remaining area to be more densely developed, leading to the need for these deviations.

PLANNING COMMISSION RECOMMENDATION

Per Section 3.31, the Planning Commission will be asked to make a recommendation to the City Council for approval, approval subject to conditions, or denial of the Planned Development Option, Preliminary Site Plan with a Special Land Use permit, Wetland permit, Woodland permit and Storm Water Management Plan.

Section 3.31.4 of the ordinance outlines the review procedures for Preliminary Site Plans using the PD-2 Option. This requires the Preliminary Site Plan to receive a recommendation for approval or denial from the Planning Commission with City Council ultimately approving or denying the proposed plan. **In its recommendation to City Council, the Planning Commission will need to consider the standards for Special Land Use consideration as well as the standards of the site plan review section of the Planned Development option discussed below.**

PLANNED DEVELOPMENT OPTION: PC STANDARDS FOR RECOMMENDATION (Section 3.31.4.A.)

The Planning Commission, in making its review of the Preliminary Site Plan, shall find that at least the following conditions are met:

1. *The plan meets all the requirements of Section 6.1 of this Ordinance for Preliminary Site Plans and the requirements set forth in the City's Site Plan and Development Manual.* **All required information has been provided.**
2. *The plan satisfies the intent of the Special Land Use provisions as stated in Section 6.1.2.c.* **Page 5 of this review lists the provisions and planner's comments.**
3. *The Community Impact Statement and Traffic Study are provided, regardless of site size, in accordance with the requirements set forth in the City's Site Plan and Development Manual.* **Both studies as noted are provided.**
4. *The plan satisfies the intent of this Section with respect to use of the land and principal and accessory use relationships within the site as well as with uses on adjacent sites*. **The proposed residential use is compatible with multi-family and commercial uses in the surrounding area, consistent with the intent of this section. Refer to page 1 for adjacent uses and zoning.**
5. *That all existing or proposed streets, road, utilities, and marginal access service drives, as are required, are correctly located on the site plan in accordance with the approved plans for these improvements.* **Engineering and Traffic reviews are recommending approval at this time.**
6. *The plan meets all the applicable standards of this Ordinance relative to height, bulk and area requirements, building setbacks, off-street parking and preliminary site engineering requirements.* **The plan is in general conformance with the code requirements, although the applicant requests several deviations from the standards to create a more urban-style development given the location and their findings from market trends. The PC may refer to plan review chart, applicant's narrative for information about list of deviations.**

7. *That there exists a reasonable harmonious relationship between the location of buildings on the site relative to buildings on lands in the surrounding area; that there is a reasonable architectural and functional compatibility between all structures on the site and structures within the surrounding area to assure proper relationships between:*

    a. *The topography of the adjoining lands as well as that of the site itself including any significant natural or manmade features.* **The site is located at a higher grade than the adjacent residential use to the south, with the highest grade at the north end along Twelve Mile Road approximately 30 feet higher than the southern property boundary. The proposed buildings are mostly oriented away from the community to the south, which should help to minimize their massing.**

    b. *The relationship of one building to another whether on-site or on adjacent land, i.e., entrances, service areas and mechanical appurtenances.* **The buildings are oriented to the existing and planned street frontages, with parking areas kept internal to the site. This will improve the appearance of the development from adjacent sites and roadways.**

    c. *The rooftops of buildings that may lie below street levels or from windows of higher adjacent buildings.* **As noted in item a, the site is located at a higher grade than the adjacent residential use to the south. There are no higher adjacent buildings.**

    d. *Landscape plantings, off-street parking areas and service drives on adjacent lands.* **Landscape generally conforms to the requirements. There are a number of waivers required but they are all supported by staff for the reasons stated in the detailed reviews for each requirement. See the Landscape Review Letter for detailed comments.**

    e. *Compliance with street, road and public utility layouts approved for the area.* **Traffic and Engineering reviews are recommending approval of streets and public utilities, subject to Council approval of noted deviations.**

    f. *The architecture of the proposed building including overall design and façade materials used. Architectural design and façade material are to be complimentary to existing or proposed buildings within the site and the surrounding area. It is not intended that contrasts in architectural design and use of façade materials is to be discouraged, but care shall be taken so that any such contrasts will not be so out of character with existing building designs and façade materials so as to create an adverse effect on the stability and value of the surrounding area.* **Façade review is recommending approval of elevations and supports the waiver requested.**

PLANNED DEVELOPMENT OPTION: CONDITIONS OF APPROVAL (Section 3.31.4.B.)

Section 3.31.4.B indicates the City Council shall review the proposed plan considering the Planning Commission's recommendation and the requirements of Section 3.31.4.A. As part of its approval of the Preliminary Site Plan, the Council is permitted to impose conditions that are reasonably related to the purposes of this section and that will:

1. *Ensure that public services and facilities affected by a proposed land use or activity will be capable of accommodating increased services and facility loads caused by the land use or activity;*
2. *Protect the natural environment and conserving natural resources and energy;*
3. *Insure compatibility with adjacent use of land; and*
4. *Promote the use of land in a socially and economically desirable manner.*

The Planning Commission may refer to the applicant's narrative, including any requests for deviations and the rationale provided, before identifying reasonable conditions to mitigate potential impacts. For example, this may include establishing conservation easements to permanently preserve on-site natural features or providing additional amenities to support residents' active and passive recreational needs.

PLANNED DEVELOPMENT PD-2 OPTION: ADDITIONAL STANDARDS (Section 3.31.7.)

Section 3.31.7.B.viii.d states that an applicant for mixed-use or residential developments must demonstrate the following:

1. *The development will result in a recognizable and substantial benefit to the ultimate users of the project and to the community, where such benefit would otherwise be unfeasible or unlikely to be achieved.* **In addition to the indirect economic benefits noted elsewhere, the applicant has proposed an off-site sidewalk to connect the project with the Twelve Oaks Mall parking area. This improvement is contingent upon securing the required off-site easements.**
2. *Based on the proposed uses, layout, and design of the overall project, the proposed building façade treatment, the proposed landscaping treatment, and the proposed signage, the development will result in a material enhancement to the area of the City in which it is situated.* **The overall design and appearance of the façade treatments, landscaping and layout are expected to enhance the area.**
3. *In relation to the underlying zoning, the proposed development will not result in an unreasonable negative economic impact upon surrounding properties.* **The residential use proposed would have a positive economic impact on the surrounding properties by providing additional customers and employees in close proximity. Customers and employees for nearby businesses; Taxable value of property increase; job creation.**
4. *Each particular proposed use in the development, as well as the quantity and location of such use, shall result in and contribute to a reasonable and mutually supportive mix of uses on the site, and/or a compatibility of uses in harmony with the surrounding area and other downtown areas of the City, and shall reflect innovative planning and design excellence.* **The residential uses proposed would be supportive of the regional shopping area and harmonious with other residential uses nearby. Residential use will contribute to mall activity, increase vibrancy of the area, other residential uses in the areas.**
5. *The proposed development shall be under single ownership and/or control such that there is a single person or entity having responsibility for completing the project in conformity with this Ordinance. This provision shall not prohibit a transfer of ownership and/or control, upon due notice to the City Clerk, provided that the transfer is to a single person or entity, as required in the first instance.* ***Singh*** **is a single entity and appears to own all three parcels. However, the units are proposed to be sold to individual unit owners. The applicant is asked to provide an explanation of the timing of the transfer and whether there will be a condominium form of ownership.**
6. *Development amenities shall be included as part of a mixed-use or residential development. The use of decorative, pedestrian-scale parking lot lighting, public pathways, and other similar features shall be an integral part of any site plan. Amenities shall include lighting, landscape plantings, sidewalk furniture, parks and other amenities that reflect a consistent residential theme. All such amenities shall be privately owned and maintained.* **The plans show a sidewalk network connecting the buildings to each other and the surrounding area. Pocket parks are provided in all phases with minimal amenities such as benches and shades. Lighting fixtures are shown on the photometric plan sheet. The applicant has extended the sidewalk southward along the finger road to the Twelve Oaks loop road to foster better connections in the RC District. A crosswalk connection into the mall parking lot is still to be determined. The applicant should continue to work with mall ownership to complete that connection – at minimum to the mall parking lot.**

Section. 3.31.7.B. *Buildings that are not located on a publicly dedicated roadway may be permitted to have parking on the ground level of the building. Such parking level shall not count against the maximum height/story requirement. The parking inside the building must be aesthetically and effectively screened from view through architectural design, landscaping, or other means, from adjacent drives, walkways and buildings, and particularly from the street level view.* **Parking areas are not visible from the public street side of buildings.**

Section 3.31.7.A. ix. *In all cases, the maximum height shall include all rooftop appurtenances, architectural features, skylights or other such roof mounted building amenities.* **Proposed buildings are below the maximum height limit.**

SPECIAL LAND USE CONSIDERATIONS (Section 6.1.2.C)

When the PD-2 Option is utilized, all uses fall under the Special Land Use requirements. Section 6.1.2.C of the Zoning Ordinance outlines specific factors the Planning Commission shall consider in the review and recommendation to City Council of the Special Land Use Permit request:

i. *Whether, relative to other feasible uses of the site, the proposed use will cause any detrimental impact on existing thoroughfares in terms of overall volumes, capacity, safety, vehicular turning patterns, intersections, view obstructions, line of sight, ingress and egress, acceleration/ deceleration lanes, off-street parking, off-street loading/unloading, travel times and thoroughfare level of service.* **Traffic review is recommending approval of the plan and the traffic impact study.**

ii. *Whether, relative to other feasible uses of the site, the proposed use will cause any detrimental impact on the capabilities of public services and facilities, including water service, sanitary sewer service, storm water disposal and police and fire protection to service existing and planned uses in the area.* **Fire and Engineering reviews are recommending approval.**

iii. *Whether, relative to other feasible uses of the site, the proposed use is compatible with the natural features and characteristics of the land, including existing woodlands, wetlands, watercourses and wildlife habitats.* **The proposed development requires a minor wetland permit. No regulated woodlands are present.**

iv. *Whether, relative to other feasible uses of the site, the proposed use is compatible with adjacent uses of land in terms of location, size, character, and impact on adjacent property or the surrounding neighborhood.* **The proposed residential units will support surrounding retail and are compatible with office and multi-residential uses on adjacent properties.**

v. *Whether, relative to other feasible uses of the site, the proposed use is consistent with the goals, objectives and recommendations of the City's Master Plan for Land Use.* **The proposed development utilizes the PD-2 option recommended in the Master Plan.**

vi. *Whether, relative to other feasible uses of the site, the proposed use will promote the use of land in a socially and economically desirable manner.* **There is no current need for more retail or regional commercial uses in this area. The proposed residential use fits well with nearby development, supports the existing mix of uses, and provides needed housing.**

vii. *Whether, relative to other feasible uses of the site, the proposed use is*
   a. *Listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and*
   b. *Is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located.* **The plan is in general conformance with site design regulations, except for the deviations requested.**

STUDY FINDINGS

1. Traffic Impact Study: The applicant has submitted a Traffic Impact Study. See comments in the TIS Review letter. Per the study, overall operations at the intersections are not expected to change significantly, however, the LOS of the intersection at Twelve Mile Road and Novi Road is anticipated to change from B to C for the AM and PM peak period

2. Community Impact Statement: Below is an excerpt from the community impact study. **The PC may refer to the statement to make their recommendation.**
   a. Employment and Economic Impact: The applicant estimates the project will create approximately 2 jobs per unit, or 250 jobs. No on-site permanent employees are anticipated.
   b. Novi Police Department: According to data, in 2020 the per capita Police Response was 1 per 2.63 persons. Based on occupancy data from a similar project, the estimated residential population of Twelve Mile Townes is 1.59 persons per household, or 199 people. The applicant states 77 annual police calls, or 0.2 calls per day, could be expected. The NPD handles approximately 189 calls per day.

c. Novi Fire Department: Based on the Novi Fire Department's Strategic Plan 2022-2027, the total number of Fire Department calls in 2021 were 8,038, of which 115 were Fires. That total also includes 5,129 EMS/Rescue/Extrication calls.

d. Utility Connections: The development proposes no increased impacts on municipal utilities above the master planned levels.

e. Storm Water Disposal: On-site stormwater will be collected by storm sewer piping system and delivered to the Twelve Oaks Mall storm water management pond, which was designed to accommodate future development that included this property (which was formerly owned by Taubman). **Engineering review is recommending approval of the stormwater management plan.**

f. Environmental Factors: The applicant concludes that impacts to air quality, temperature, noise, lighting and habitat are typical of developments of similar nature, and not uncommon when developing a vacant parcel. There are no known above or underground storage tanks. No hazardous or toxic chemicals will be stored on site, and no tanks, wells or septic tanks will be permitted.

ORDINANCE REQUIREMENTS

This project was reviewed for conformance with the Zoning Ordinance with respect to Article 3 (Zoning Districts), Article 4 (Use Standards), Article 5 (Site Standards), and any other applicable provisions of the Zoning Ordinance**. Please see the attached chart for information pertaining to ordinance requirements.** Items in **bold** below must be addressed and incorporated as part of the Final Site Plan submittal:

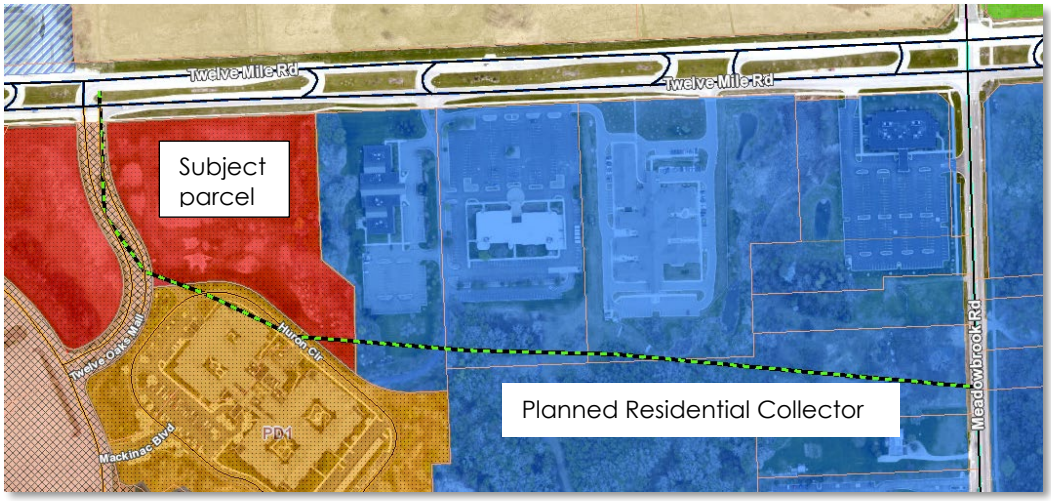
1. Project and Street Names: It is important for consistency that the project name and street names are approved at the earlier stages of the project. **This project requires approval from the Street and Project Naming Committee. Please submit an application for approval at your earliest convenience. Provide several options in case names are considered too similar to existing names within the City.**

2. Usable Open Space (Sec. 3.31.7.B.vii.v.iii.): The parks in Phases 1 and 2 are centrally located within their respective phases. The park in Phase 3 is positioned to overlook Bishop Creek. The open space is proposed to be completed in conjunction with each corresponding phase of development. These requirements are met through private deck areas for each unit and a series of pocket parks. Each pocket park includes landscaped areas and a designated seating area with two benches.

Additional amenities such as shaded seating, play features, or active use amenities should be considered to improve the function and value of these spaces as community assets.

3. Pedestrian Connectivity (Sec. 3.31.7.B.viii.b.(11)): Six-foot concrete sidewalks are required along internal roads and to connect to neighboring buildings. **While sidewalks are proposed along most areas of the site, a pedestrian crossing should be indicated at the intersection of Bishop Drive and Twelve Oaks Mall Road to connect the two sides of the project. In addition, sidewalks are missing along certain parts of Bishop Drive and along the west side of Twelve Oaks Mall Drive south of the entrance, which will require a deviation.**

4. Planned Residential Collector Road: The Future Land Use map indicates a planned Residential Collector to be located in the approximate location of the site extending south from Twelve Mile Road and bending to the east to connect to Meadowbrook Road (see dashed green/black line below). This roadway has been planned for many years, even as far back as the 1980s, prior to the widening of Twelve Mile Road into its current boulevard configuration. The area surrounding the planned road has not been zoned or planned for residential uses, except for the Waltonwood development. The City's public works department does not see a need for a public roadway currently at this location given the capacity available on Twelve Mile Road. **Therefore, the applicant's proposed private drive alignment along the southern portion of their site, with a stub left for possible future secondary access or emergency access connection with development to the east, appears to be a reasonable alternative to the planned public road.**



5. Building Lighting (Sec. 5.7.2.A.iii.). **The ordinance requires that illuminance levels be shown on building façades. However, the submitted photometric plans are misleading, as the light levels appear to be presented in plan view rather than on the vertical building surfaces. Please revise as needed.**

6. Private Easements: The site plan indicates various private easements with adjacent landowners. There is an 86-foot wide easement for ingress/egress spanning the southern boundary of the property. The applicant is asked to verify that the parties of that easement are seeking to terminate the easement in order to construct proposed buildings and other improvements within that area. **Letters of approval, or concurrence with, the planned improvements shall be provided to demonstrate the project will not be contrary to those private agreements or subject to change in the future**.

DEVIATIONS FROM AREA, BULK, YARD, AND DIMENSIONAL REQUIREMENTS (SEC. 3.31.5.):

As part of approval of a Preliminary Site Plan, the City Council shall be authorized to grant deviations from the strict terms of the zoning ordinance governing area, bulk, yard, and dimensional requirements applicable to the property; provided, however, that such authorization to grant deviations shall be conditioned upon the Council finding:

A. *That each zoning ordinance provision from which a deviation is sought would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest;*
B. *That approving the proposed deviation would be compatible with the existing and planned uses in the surrounding area;*
C. *That the proposed deviation would not be detrimental to the natural features and resources of the affected property and surrounding area, or would enhance or preserve such natural features and resources;*
D. *That the proposed deviation would not be injurious to the safety or convenience of vehicular or pedestrian traffic; and*
E. *That the proposed deviation would not cause an adverse fiscal or financial impact on the City's ability to provide services and facilities to the property or to the public as a whole.*

The current site plan requires the following deviations from Ordinance requirements. **The applicant included justification for each deviation in the community impact statement.** Staff comments are in **bold.**

PLANNING DEVIATIONS

i. Deviation from section 3.8.2.D. for not orienting buildings at 45 degrees to the property line that abuts another non-residential district.
ii. Deviation from Section 3.31.7.D for not meeting the minimum front yard building setback requirements

(Twelve Mile frontage). A minimum of 50 feet is required, 20 feet is proposed.

iii. Deviation from Section 3.31.7.D for not meeting the minimum exterior side yard building setback (Twelve Oaks Mall Road frontage). A minimum of 50 feet is required, 30 feet is proposed.

iv. Deviation from Section 3.31.7.D for not meeting the minimum side yard building setback (eastern side). A minimum of 35 feet is required, 20 feet is provided.

v. Deviation from Section 3.6.2.H for not meeting the requirement for additional setback from a residential district to the south. A minimum of 111 feet is required for a building 37-feet in height, 40 feet is provided.

Where the RC District abuts a residential district, a minimum setback of 3 feet for every foot of building height is required. For Buildings 4 and 5, which are approximately 37 feet tall, this results in a required setback of 111 feet along the southern property line adjacent to the RM-1 District. The applicant is proposing a 40-foot setback, which is supported by staff as the proposed use is similar to adjacent RM-1 use.

Typically, such deviation would require City Council approval. However, in 2003, as part of the approval for the Waltonwood Phase II project located directly south of the subject property, the Zoning Board of Appeals (ZBA) imposed a condition requiring a minimum 150-foot separation between any building constructed on the subject property and the approved building to the south. This condition was formalized through a deed restriction recorded at that time.

Any current approval by City Council should therefore be contingent upon the applicant obtaining ZBA approval to amend the 2003 condition and the associated deed restriction. The applicant shall seek approval from the ZBA prior to submitting a final site plan. If ZBA approval is not granted, the applicant may be required to revise the plans to comply with the required setback standards.

vi. Deviation from Section 3.8.2.H to allow a reduction in the minimum distance between buildings in nearly all locations as indicated on the site plan. A minimum of 30 feet is required, a minimum of 20 feet proposed. **The applicant has provided a table of required and proposed distances in order to determine whether deviations are required and where those are located.**

vii. Deviation from Section 3.31.7.B.viii.b.xi for the lack of sidewalk on the west side of Twelve Oaks Mall Road south of the entrance, and on the south side of Bishop Drive as shown on the plan.

viii. Deviation from Sec. 5.10.1.B to allow perpendicular parking along a Major Drive. There are 4 spaces proposed on the west side of the project along Bishop Road.

The Ordinance states a private drive network within a multiple-family development shall be built to the City's Design and Construction Standards for local streets (28-feet back-to-back width). Major drives are defined as a principal internal loop drive or cul-de-sac drive that has direct access to an exterior public road. Minor drives must be less than 600 feet in length. Road A appears to be proposed according to major drive standards as required. On-street parallel parking is proposed along the major drive, and on the west side of the site there are 4 perpendicular spaces proposed, which will require a deviation.

LANDSCAPE DEVIATIONS

ix. Landscape deviation from Section 5.5.3.B.ii and iii for lack of 4.5-6 foot landscaped berm along eastern property line. **Supported by staff because an opaque fence is provided to supplement the plantings.**

x. Landscape deviation from Section 5.5.3.B.ii and iii for lack of 4.5-6 foot landscaped berm along western property line. **Supported by staff because there is significant distance to the commercial buildings, existing vegetation is preserved, and new trees are proposed near the buildings.**

xi. Landscape deviation from Section 5.5.3.B.ii and iii for lack of berm or wall in the greenbelt of Twelve Mile Road for the western 616 feet. **Supported by staff to preserve the existing vegetation in the area that is not being developed.**

xii. Landscape deviation from Section 5.5.3.B.ii and iii for deficiency in street trees on Twelve Oaks Drive north of the entry drives. **Supported by staff due to utility conflicts.**

xiii. Landscape deviation from Section 5.5.3.B.ii and iii for deficiency in street trees on Twelve Mile Road for

the western part of the site. **Supported by staff due to utility conflicts.**

xiv. Landscape deviation from *Section 5.5.3.F.iii* for deficiency in building foundation landscaping. **Supported by staff since additional foundation landscaping has been added to the sides of the buildings facing roads to make up for the deficiencies along the interior drives.**

FAÇADE DEVIATIONS

xv. Façade deviations from Section 5.15 for an underage of brick on the rear facades of the high-visibility buildings (25% proposed, 30% required), and an underage of brick on all facades of the standard visibility buildings (23-28% proposed, 30% required). **As these deviations are relatively minor and are not detrimental to the aesthetic quality of the buildings, these are supported.**

OTHER REVIEWS

a. Engineering Review: Engineering is **recommending approval at this time**.

b. Landscape Review: Landscape review has identified several waivers that may be required. Refer to review letter for detailed comments. Landscape is **recommending approval** with the requested waivers.

c. Wetlands Review: A Nonresidential Non-Minor Use Wetlands Permit is required for the proposed impacts to regulated wetlands. **The impacts do not appear to exceed the 0.25 acre threshold for mitigation, however an environmental enhancement plan and conservation easements for remaining wetlands are requested.** Additional comments to be addressed with Final Site Plan. **Wetlands recommends approval.**

d. Woodlands Review: The plan has proposed the impact to no regulated trees on-site. A Woodland Use Permit is required to perform construction on any site containing regulated woodlands. Because less than three regulated trees are proposed for removal, Planning Commission Approval is not required.

e. Traffic Review: Traffic is **recommending approval**. Comments to be addressed with Final Site Plan submittal.

f. Traffic Study Review: TIS is **recommended for approval**. Previous comment was addressed in applicant's response letter and on the plans.

g. Facade Review: Section 9 Façade Waiver required for underage of brick on several elevations. Façade **recommends approval**.

h. Fire Review: **Conditional approval** of the Preliminary Site Plan is recommended. Additional comments to be addressed with Final Site Plan.

NEXT STEP: PLANNING COMMISSION MEETING

All reviewing departments are recommending approval, subject to the comments and deviations noted being approved. This project will be scheduled for Preliminary Site Plan with PD-2 Option, Special Land Use review, Wetland Permit and Stormwater Management Plan public hearing and review on **July 9, 2025**. Please provide the following not later than July1st:

1. Site Plan submittal in PDF format (Received)
2. A response letter addressing ALL the comments from ALL the review letters and a request for deviations as you see fit.
3. Façade Sample Board

FUTURE STEPS:

The following steps will be initiated in sequence following the Planning Commission hearing. This list is provided for reference purposes only:

CITY COUNCIL MEETING

The site plan will be placed on City Council's agenda once Planning Commission recommends approval. No additional information is required prior to City Council meeting, unless Planning Commission provides comments that would require a resubmittal.

STREET AND PROJECT NAME

The project and the street names must be reviewed and approved by the Project and Street Naming Committee. Please contact Stacey Choi (248-347-0547) in the Community Development Department for additional information. The application can be found by clicking on this link.

ZONING BOARD OF APPEALS

The applicant shall seek an amendment of the previous conditioned variance from the Zoning Board of Appeals prior to the submittal of the Final Site Plan. Please submit an application to Community Development Account Clerks to go before the Zoning Board of Appeals. The deadline for Zoning Board of Appeals applications is typically the first of the month for the following month's meeting.

FINAL SITE PLAN SUBMITTAL

If City Council grants approval and variance condition amendment approved by ZBA, the applicant should then submit the following for Final Site Plan review and approval:

1. Six copies of Final Site Plan (24"x36", folded) addressing all comments from Preliminary review
2. Response letter **addressing all comments and refer to sheet numbers where the change is reflected. Please refer to the last review letters from other reviewers.**
3. Final Site Plan Application & Final Site Plan Checklist
4. No Revision Façade Affidavit (If façade designs have been modified, please include additional set of plans
5. Engineering Cost Estimate
6. Landscape Cost Estimate
7. Other Agency Checklist
8. Project & Street Naming Application with street layout plan for final Street Name approval
9. Drafts of any legal documents (note that off-site easements need to be executed, and any on-site easements need to be submitted in draft form before stamping sets will be stamped)

ELECTRONIC STAMPING SET SUBMITTAL AND RESPONSE LETTER

After receiving Final Site Plan approval, please submit the following for Electronic Stamping Set approval:

1. Plans addressing the comments in all of the staff and consultant review letters in PDF format.
2. Response letter addressing all comments in ALL letters and ALL charts and **refer to sheet numbers where the change is reflected.**

STAMPING SET APPROVAL

Stamping sets are still required for this project. After having received all of the review letters from City staff the applicant should make the appropriate changes on the plans and submit **9 size 24" x 36" copies with original signature and original seals,** to the Community Development Department for final Stamping Set approval.

SITE AMENITIES

Site amenities will require special inspection. Those items will be added here at the time of Final Site Plan review.

SITE ADDRESSING

New addresses are required for this project. The applicant should contact the Building Division for addresses prior to applying for a building permit. Building permit applications cannot be processed without a correct address. The address application can be found by clicking on this link. Please contact the Ordinance Division 248.735.5678 in the Community Development Department with any specific questions regarding addressing of sites.

PRE-CONSTRUCTION MEETING

A Pre-Construction meeting is required for this project. Prior to the start of any work on the site, Pre-Construction (Pre-Con) meetings must be held with the applicant's contractor and the City's consulting engineer. Pre-Con meetings are generally held after Stamping Sets have been issued and prior to the start of any work on the site. There are a variety of requirements, fees and permits that must be issued before a Pre-Con can be scheduled, so it is recommended that you begin working with Sarah Marchioni [248.347.0430 or smarchioni@cityofnovi.org] in the Community Development Department after Final Site Plan approval. If you have questions regarding the checklist or the Pre-Con itself, please contact Sarah.

CHAPTER 26.5 – PROJECT COMPLETION

Chapter 26.5 of the City of Novi Code of Ordinances generally requires all projects be completed within two years of the issuance of any starting permit. Please contact Sarah Marchioni at 248-347-0430 for additional information on starting permits. The applicant should review and be aware of the requirements of Chapter 26.5 before starting construction.

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 703-474-2625 or sri@sriplanning.com. For immediate assistance, please contact Lindsay Bell at 248.347.0484 or lbell@cityofnovi.org.

Sri Ravali Komaragiri

Sri Ravali Komaragiri, AICP

SRI Planning LLC

Planning Review Summary Chart

JSP 25-03 TWEVE MILE TOWNES	
Preliminary Site Plan, Special Land Use with Planned Development-2 (2nd Revision)	
Date of Review	June 9, 2025
Plan Date	May 7, 2025

- 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. Please refer to those sections in Article 3, 4 and 5 of the zoning ordinance for further details.
- 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.

General Site Standards (Article 3, 4 & 6)

Item	Required Code	Proposed	Meets Code	Comments
A. ZONING AND USE REQUIREMENTS				
Master Plan *(adopted July 27, 2017)*	Regional Commercial with PD-2 Option	PD-2: Planned Development	Yes	**Planning Commission's recommendation to City Council – concurrent with site plan/special land use**
Area Study	None		NA	
Zoning *(Effective January 8, 2015, as amended)*	RC: Regional Commercial	RC District using the PD-2 Option	Yes	
Uses Permitted (Sec 3.1.24.B & C)	Sec 3.1.24.B Principal Uses Permitted. Sec 3.1.24.C Special Land Uses	Multiple Family Residential – 125 units Residential uses permitted as SLU using PD-2	TBD	**Subject to City Council approval upon Planning Commission's recommendation**
Phasing	Provide phases lines and detail description of activities in each phase	3-phase project proposed, Sheet C7 Phase 1 (East): 7 buildings & 41 units Phase 2 (Center): 7 buildings & 45 units Phase 3 (West): 6 buildings & 39 units	TBD	See comments in Planning Review

Item	Required Code	Proposed	Meets Code	Comments
B. HEIGHT, BULK, DENSITY AND AREA LIMITATIONS *(Sec 3.1.23.D)*				
Frontage on a Public Street *(Sec. 5.12)* **Access To Major Thoroughfare** *(Sec. 5.12)*	Frontage on a Public Street is required.	The site has frontage and access to Twelve Mile Road (and access on the East side mall road)	Yes	
Building Height *(Sec 3.31.7.B.viii.b.iv)*	Building height not to exceed 55 feet or 4 stories, whichever is less	3 stories proposed	Yes	
Building Setbacks *(Sec 3.31.7.D) Per Section 5.10.1.B.v. "building and parking lot setbacks shall be measured… a) when abutting a "major drive" measure setbacks from back of curb; b) when abutting a property line, measure from property line; c) when abutting a "minor drive," measure from back of curb…"*				
Front @ Twelve Mile (North)	50 ft.	**20 ft**	**No**	**Buildings 4, 5 & 14 are proposed within the 88' ingress & access road easement. The applicant indicated that this will be vacated prior to stamping set approval by the developer.** **Setback deviations are subject to City Council approval.**
Exterior side yard @ Twelve Oaks Mall Road	50 ft	**30 ft**	**No**	
South Yard	35 ft	40 ft	Yes	
Side Yard (East) Side Yard (West)	35 ft. 50 ft.	**20 ft.** Exceeds 50 ft	**No** Yes	
C. OFF-STREET PARKING SETBACK *(Sec 3.31.7.D)*				
Front @ Twelve Mile (North)	20 ft.	Not proposed	NA	Surface parking primarily on garage aprons, a few visitor spaces internal
Exterior side yard @ Twelve Oaks Mall Road (West)	20 ft.	Not proposed	NA	
Exterior side yard Access Drive (South)	20 ft.	Not proposed	NA	
Interior Side Yard (East)	10 ft.	46 ft.	Yes	
Side Yard (West)	20 ft.	Exceeds	Yes	
D. NOTE TO DISTRICT STANDARDS FOR RC DISTRICT *(Sec 3.6.2)*				
Exterior Side Yard Abutting a Street *(Sec 3.6.2.C)*	All exterior side yards abutting a street shall be provided with a setback equal to front yard.	See setbacks above		

Item	Required Code	Proposed	Meets Code	Comments
Minimum Zoning Lot Size, Width and Lot Coverage *(Sec 3.6.2.D)*	Except where otherwise provided in this Ordinance, the minimum lot area and width, and the maximum percent of lot coverage shall be determined on the basis of off-street parking, loading, greenbelt screening, yard setback, or usable open space.		NA	
Off-Street Parking in Front Yard *(Sec 3.6.2.E)*	Off-street parking is allowed in front yard.	Not proposed	NA	
Min. Building Setback Abutting Residential Districts *(Sec 3.6.2.H)*	Where abutting a Residential District, minimum setback of buildings to the district shall be 3 ft for every foot of building height **Townhouse buildings ~37 ft, require 111-foot setback from RM-1 (Walton wood)**	No building height provided **40 feet setback proposed**	**No**	**The site is also subject to 150 ft. setback as a condition of a prior ZBA variance.** **ZBA approval of revised condition of variance is required in addition to Council approval of the deviation.**
Adjacent to residential zoning *(Sec 3.6.2.L)*	Minimum 20 ft. setback where property abuts residentially zoned property	Residential zoning present to the south; Min 20 feet provided	Yes	
Wetland/Watercourse Setback *(Sec 3.6.2.M)*	A setback of 25ft from wetlands and from high watermark shall be maintained.	Wetland impacts are proposed		A minor wetland permit is required. See wetland review comments
Additional Building height *(Sec 3.6.2.O)*	Additional height up to 65 ft. may be allowed for properties within 1200 ft from a freeway subject to additional conditions	Does not qualify since adjacent to residential district	NA	
Parking setback screening *(Sec 3.6.2.P)*	Required parking setback area shall be landscaped per sec 5.5.3.	No parking lots proposed	Yes	
Modification of parking setback requirements *(Sec 3.6.2.Q)*	The Planning Commission may modify parking setback requirements based on its determination according to Sec 3.6.2.Q.		NA	
E. DRIVEWAYS, PARKING, LOADING AND DUMPSTER REQUIREMENTS				
Number of Parking Spaces *(Sec.5.2.12. A & B)*	For 2 or less bedroom units:2 spaces each For 3 or more-bedroom units: 2 ½ spaces each For 125- 3 bedroom units **TOTAL: 313 spaces**	Garages: 250 Drive aprons: 250 Surface: 16 **516 spaces**	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Landbank Parking *(Sec.5. 2.14)*	Maximum number of Landbank spaces: 25% of required parking	Not proposed	NA	
Parking Space Dimensions and Maneuvering Lanes *(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	- 24 ft. two-way drives - 9 ft. x 17 ft. parking spaces with buffer or sidewalk as required - 8 ft. x 23 ft. parallel spaces	Yes	
Parking stall located adjacent to a parking lot entrance (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	Not applicable	NA	
End Islands *(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 feet wide, have an outside radius of 15 feet, and be constructed 3' shorter than the adjacent parking stall as illustrated in the Zoning Ordinance	Not proposed	NA	Proposed guest parking spaces do not abut circulation aisles. End islands are not required.
Barrier Free Spaces *Barrier Free Code*	To be determined	1 BF space is proposed on east side, 1 on west side	Yes	
Barrier Free Space Dimensions *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	Appears to comply	Yes	
Barrier Free Signs *Barrier Free Code*	One sign for each accessible parking space.	Shown	Yes	
Minimum number of Bicycle Parking *(Sec. 5.16.1)*	One (1) space for each five (5) dwelling units For 125 units, 25 **bike spaces are required** *when 20+ spaces are required, 25% shall be covered spaces	26 spaces proposed including 12 covered spaces	Yes Yes	

Item	Required Code	Proposed	Meets Code	Comments
Bicycle Parking General requirements *(Sec. 5.16)*	- No farther than 120 ft. from the entrance being served - When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations - Spaces to be paved and the bike rack shall be inverted "U" design - Shall be accessible via 6 ft. paved sidewalk	Shown in 4 locations	Yes	
Bicycle Parking Lot layout *(Sec 5.16.6)*	Parking space width: 7 ft. One tier width: 11 ft. Two tier width: 18 ft. Maneuvering lane width: 4 ft. Parking space depth: 32 in	36" shown between racks, 4-foot maneuvering lane appears to be provided	Yes	
Exterior lighting *Sec. 5.7*	- Photometric plan and exterior lighting details needed at time of Preliminary Site Plan submittal.	Provided		*See comments below in chart*
Dumpster *Sec 4.19.2.F*	- Located in rear yard - Attached to the building or - No closer than 10 ft. from building if not attached - Not located in parking setback - If no setback, then it cannot be any closer than 10 ft., from property line. - Away from Barrier free Spaces	Not proposed	NA	Individual trash pick up service
Dumpster Enclosure *Sec. 21-145. (c) Chapter 21 of City Code of Ordinances*	- Screened from public view - A wall or fence 1 ft. higher than height of refuse bin - And no less than 5 ft. on three sides - Posts or bumpers to protect the screening - Hard surface pad. - Screening Materials: Masonry, wood or evergreen shrubbery		NA	
Accessory Structures *Sec. 4.19*		Per applicant response letter, none proposed.		The plan proposes covered structure for bike parking
Roof top equipment and wall mounted utility equipment *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.	None proposed at this time	NA	

Item	Required Code	Proposed	Meets Code	Comments
Roof top appurtenances screening	Roof top appurtenances shall be screened in accordance with applicable facade regulations, and shall not be visible from any street, road, or adjacent property.			
F. 5.10 ADDITIONAL ROAD DESIGN, BUILDING SETBACK, AND PARKING SETBACK REQUIREMENTS, MULTIPLE-FAMILY USES				
Road standards *(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)	Minor and Major Roads proposed	Yes	
Major Drives *(Sec. 5.10.1.B)*	– Width: 28 feet	Bishop Ridge is 28 feet	Yes	
Minor Drive *(Sec. 5.10.1.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	All other roads are 24 feet wide T-turnarounds are added where appropriate	Yes	No parking signs are proposed along Minor drives to prohibit parking on 24' wide minor drives.
Parking on Major and Minor Drives *(Sec. 5.10.1.B.iv-vi)*	– Angled and perpendicular parking, permitted on minor 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.	Perpendicular guest parking on west side of Bishop Ridge in Phase 3. Centerline radius: 100' 25 ft. to 31 ft. setback is maintained from nearest end of the building.		**Deviation required for perpendicular parking on West side, Bishop Ridge (centerline radius is100 ft, but 230 ft. is required for parking)**
G. LIGHTING AND PHOTOMETRIC PLAN *(SEC. 5.7)*				
Intent *(Sec. 5.7.1)*	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties & reduce unnecessary transmission of light into the night sky	*Provided*	Yes	
Lighting Plan *(Sec. 5.7.2.A.i)*	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures	*Provided*	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Building Lighting *(Sec. 5.7.2.A.iii)*	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.	*Light locations on building facades are shown in a perspective.* **Plans are misleading as the light levels appear to be indicated on plan view of buildings rather than façade.**	Yes	
Lighting Specifications *(Sec. 5.7.A.2.ii)*	Specifications for all proposed & existing lighting fixtures	2 fixtures shown	Yes	
	Photometric data	Provided	Yes	
	Fixture height	Provided	Yes	
	Mounting & design	Provided	Yes	
	Glare control devices *(Also see Sec. 5.7.3.D)*	Provided	Yes	
	Type & color rendition of lamps	Provided	Yes	
	Hours of operation	Provided	Yes	
Max Height *(Sec. 5.7.3.A)*	Height not to exceed maximum height of zoning district (or 25 ft. where adjacent to residential districts or uses.	Pole lights: 14 ft max. Wall lights: 6'-6"	Yes	
Required Conditions *(Sec. 5.7.3.B)*	- Electrical service to light fixtures shall be placed underground - Flashing light shall not be permitted - Only necessary lighting for security purposes & limited operations shall be permitted after a site's hours of operation	Provided standard notes on plan	yes	
Indoor Lighting *(Sec. 5.7.3.H)*	- Indoor lighting shall not be the source of exterior glare or spillover	Note added to plan	yes	
Security Lighting *(Sec. 5.7.3.H)*	- All fixtures shall be located, shielded and aimed at the areas to be secured. - Fixtures mounted on the building and designed to illuminate the facade are preferred	*Proposed*	Yes	
Color Spectrum Management *(Sec. 5.7.3.F)*	Non-Res and Multifamily: For all permanent lighting installations - minimum Color Rendering Index of 70 and Correlated Color Temperature of no greater than 3000 Kelvin	3000K proposed 70 CRI proposed	Yes Yes	

Item	Required Code	Proposed	Meets Code	Comments
Parking Lot Lighting *(Sec. 5.7.3.J)*	- Provide the minimum illumination necessary to ensure adequate vision and comfort. - Full cut-off fixtures shall be used to prevent glare and spillover.	Small parking areas are lit	Yes	
Min. Illumination *(Sec. 5.7.3.L)*	Parking areas: 0.2 fc min	0.7 fc	Yes	
	Loading & unloading areas: 0.4 fc min		NA	
	Walkways: 0.2 fc min		NA	
	Building entrances, frequent use: 1.0 fc min		NA	
	Building entrances, infrequent use: 0.2 min		NA	
Average Light Level *(Sec.5.7.3.L)*	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1	3.3:1	Yes	
Max. Illumination adjacent to Residential *(Sec. 5.7.3.M)*	Fixture height not to exceed 25 feet Cut off angle of 90 degrees or less No direct light source shall be visible at the property line adjacent to residential at ground level Maximum illumination at the prop line not to exceed 0.5 fc.	Residential to south – max of 0.4fc at property line	Yes	
Residential Developments *(Sec. 5.7.3.O)*	Provide sufficient illumination (0.2 fc min) at each entrance from major thoroughfare Residential projects may deviate from the min. illumination levels and uniformity requirements of 5.7.3.L so long as site lighting for parking lots, property lines and security lighting is provided	Lighting shown at east entrance off Twelve Oaks Mall Dr Each unit has garage side lighting, parking areas have lighting	Yes	

Planned Development Standards (Section 3.31)

A. PLANNED DEVELOPMENT SITE PLAN SUBMITTAL REQUIREMENTS (Sec. 3.31.4.A)				
Special Land Use *(Sec. 3.31.4.A.ii)*	Special Land use requirements listed in Sec. 6.1.2.C.	Subject to Planning Commission determination	Yes	*Requires a 15-day public hearing notice;* **See Planning Review for detailed comments**
Community Impact Statement *(Sec. 3.31.4.A.iii)*	Required according to site plan manual (SDM link: Site development Manual)	Provided	Yes	
Traffic Study *(Sec. 3.31.4.A.iii)*	Required regardless of site size, with requirements in SPDM	Provided	Yes	**See Traffic TIS review**
Planning Commission Findings for Site plan review *(Sec. 3.31.4.A)*	The proposed site plan meets the intent of other items listed in Section	PD-2 Option, SLU and PSP can proceed simultaneously	**TBD**	**See comments in Planning Review**
B. USE CONDITIONS FOR ALLOWABLE USES UNDER PD-2 OPTION (Sec. 3.31.7.B)				
Use Conditions for Allowable Uses under PD-2 Option (Sec. 3.31.7.B)	**Applicant must demonstrate** *(Sec. 3.31.7.B.viii.d)*		**TBD**	**See standards & comments in Planning Review**
Marginal Access Service Drives *(Sec. 3.31.7.F.)*	Determination of need for marginal access service drives	Traffic study does not indicate need	NA	
C. STANDARDS FOR MIXED/RESIDENTIAL UNDER PD-2 OPTION *(Sec. 3.31.7.B.viii.b.)*				
Mixed-Use buildings or MF Residential Buildings *(Sec. 3.31.7.B.viii.a.)*	All buildings with any use or combination of uses permitted within RM-2 B-1, B-2, or OSC districts; Retail/office components not to exceed 20% of GFA	Multi-family residential use only	Yes	
Density *(Sec. 3.31.7.B.viii.b.i.)*	Net density not to exceed 24 DUA	125 units/15.05 acres = 8.3 du/ac	Yes	
Maximum Lot Coverage *(Sec. 3.31.7.B.viii.b.ii.)*	Same as section 3.6.2.D		NA	
Usable Open Space Area *(Sec 3.31.7.B.viii.b.iii)* (may include private pool and clubhouse amenities, pocket parks, play structures and/or walking trails that connect to the City's Non-Motorized Network)	Minimum of 200 sf of usable open space per dwelling unit For a total of 125 dwelling units, required Open Space: 25,000 sf Phase 1: 8,200 s Phase 2: 9,000 sf Phase 3: 7,800 sf	Calculations indicate 32,445 sf provided Phase 1: 6,421 sf + 3,280 sf in decks Phase 2: 6, 421 sf + 3,600 sf in decks Phase 3: 9,603 sf + 3,210 in decks	Yes	**Refer to plan review letter for more comments.**

Building Height *(Sec 3.31.7.B.viii.b.iv)*	Building height not to exceed 55 feet or 4 stories, whichever is less		Approximately 37 feet & 3 stories proposed	Yes	
Minimum Floor Area per Unit *(Sec 3.31.7.B.viii.b, v-vi)*	Efficiency	400 sq. ft.		NA	
	1 bedroom	500 sq. ft.		NA	
	2 bedroom			NA	
	3 bedroom		2, 584 sf	Yes	
Maximum Dwelling Unit Density/Net Site Area *(Sec 3.31.7.B.viii.b, v-vi)*	Efficiency	Max 15%			
	1 bedroom	Max 50%			
	2 bedroom				
	3+ bedroom		100%	Yes	
Maximum length of the buildings *(Sec 3.31.7.B.viii.b.vii)*	A single building shall not exceed 125 ft. unless pedestrian entranceways are provided every 125 ft		22' units x 8 = 176'-8" Individual entrance per unit	Yes	
Setback along natural shore line *(Sec 3.31.7.B.viii)*	A minimum of 100 feet along natural shore line is required.		No natural shore line exists within the property	NA	
Yard setback restrictions *(Sec 3.31.7.B.viii.b.ix)*	Within any front, side or rear yard, off-street parking, maneuvering lanes, service drives or loading areas cannot exceed 30% of yard area		Appears to comply – paved areas internal to the site	Yes	
Pedestrian Orientation/Design Amenities *(Sec 3.31.7.B.viii.b.x)*	Significant pedestrian orientation with design amenities such as: pedestrian walkways, brick or decorative paving in plazas, lighting, benches, trash receptacles, landscape treatments, focal points		Pedestrian paths proposed, 2 pocket parks	**TBD**	**Details of pocket parks lacking – appears to be green spaces with 2 benches in each.**
Pedestrian Connectivity *(Sec. 3.31.7.B.viii.b.(11))*	6 feet concrete sidewalks along internal roads and to any community center, recreational facility, parking and neighboring buildings to permit safe and convenient pedestrian access.		6-foot sidewalks proposed on both sides of Bishop Dr and Twelve Oaks Mall Road, 6-foot sidewalk proposed along front of units	Yes	**Pedestrian crossing should be indicated at the intersection of Bishop Drive and Twelve Oaks Mall Road to allow non-motorized crossing between the 2 sides of the site** **Deviation required for lack of sidewalk along west side of Twelve Oaks Mall road south of the entrance, and on**

				Bishop Dr (south side between TOM Road and Mailboxes)
	Where feasible sidewalks shall be connected to other pedestrian features abutting the site.	Provides connectivity to Twelve Mile pathway and to 12 Oaks Mall Ring road	Yes	
	All sidewalks shall comply with barrier free design standards		**TBD**	**Provide details in FSP submittal**
Minimum Distance between the buildings *(Sec 3.31.7.B viii.b.xii – same as Sec. 3.8.2.H)*	**(**Total length of building A **+** total length of building B **+** 2(height of building **+** height of building B)**)/**6	Table shows deviations required for nearly all cases	**No**	**Requested deviations are subject to City Council approval.**
	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 distance shall be fifteen (15) feet.	**20 ft minimum proposed**	**No**	**Requested deviations are subject to City Council approval.**
On-Street Parking *(Sec 3.31.7.B.viii.b.xiii)*	Parallel parking along major drives permitted if 26-foot drive aisles maintained	Pull-off parallel spaces proposed next to mailboxes	Yes	
Parking for Amenities *(Sec 3.31.7.B.viii.b.xiv)*	No parking required for swimming pools and similar amenities. Barrier free parking are required.	No clubhouse or community pool proposed	NA	
Off-street Loading *(Sec 3.31.7.B.viii.b.xv)*	Not required for residential uses	None proposed	NA	

Other Standards

A. NON-MOTORIZED FACILITIES				
Article XI. Off-Road Non-Motorized Facilities	A 6-foot sidewalk is required along collector and arterial roads Building exits must be connected to sidewalk system or parking lot.	Sidewalks proposed along Bishop Drive, in some cases on both sides; 8 ft. existing sidewalk on 12 Mile Road. 6-foot sidewalk on Twelve Oaks Mall Access Road		
Pedestrian Connectivity	Assure safety and convenience of both vehicular and pedestrian traffic both within the site and in relation to access streets	A sidewalk network mostly connects buildings within the site		

B. OTHER REQUIREMENTS				
Design and Construction Standards Manual	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Provided	Yes	
General layout and dimension of proposed physical improvements	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).	Provided	Yes	**See review letters for any missing information**
Economic Impact	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	Employment impact of 250 jobs	TBD	
Building Exits	- Building exits must be connected to sidewalk system or parking lot.	Proposed	Yes	
Development/ Business Sign & Street addressing	- Signage if proposed requires a permit. - The applicant should contact the Building Division for an address prior to applying for a building permit.	Signage information not reviewed at this time		For further information contact Ordinance 248-347-0438 if a sign permit is required.
Project and Street naming	This project requires approval from the Street and Project Naming Committee.	Not yet applied	TBD	Strongly recommended to apply for Project and Street name approvals as soon as possible
Property Split	The proposed property split must be submitted to the Assessing Department for approval.		NA	Indicate if property splits/combos are proposed
C. OTHER LEGAL REQUIREMENTS				
Master Deed/Covenants and Restrictions	Applicant is required to submit this information for review with the Final Site Plan submittal		TBD	Required at a later time
Conservation easements	Conservation easements are a condition of Wetland and/or Woodland permits		TBD	May be required

Previous agreements	Provide all pre-existing easements and agreements that pertain to the property	Buildings are proposed in 86' ingress easement	No	Off-site easements likely required Existing easements should be revised or vacated

ENGINEERING REVIEW

PLAN REVIEW CENTER REPORT

06-05-2025

Engineering Review

12 Mile Townes
JSP 25-0003

APPLICANT

Singh Development Co LTD

REVIEW TYPE

2nd Revised Preliminary Site Plan

PROPERTY CHARACTERISTICS

- Site Location: South of 12 Mile Road between Novi Road and Meadowbrook Road
- Site Size: 10.35 acres
- Plan Date: 05-07-2025
- Design Engineer: Seiber Keast Lehner (SKL)

PROJECT SUMMARY

- Construction of 20 residential buildings and associated parking. Site access would be provided via an entrance on 12 Mile and an entrance off the Twelve Oaks Mall entrance drive.
- Water service would be provided by an extension from the existing 20-inch water main along the south side of 12 Mile Road. A domestic lead will need to be provided to serve each building, along with eight additional hydrants.
- Sanitary sewer service would be provided by two extensions, one for the east side and one for the west. The west side will connect to the Twelve Oaks Mall sanitary sewer manhole slightly north of Bishop creek. The east side will connect to the Waltonwood sanitary sewer along Huron Circle. A lead will need to be provided to serve each building.
- Storm water for the west side would be collected and discharged to Bishop Creek. Storm water for the east side would be collected and discharged to the existing storm water collection system along Huron Circle. On-site detention will be required for this development.

RECOMMENDATION

Approval of the 2nd Revised Preliminary Site Plan is recommended at this time, the plan meets the general requirements of the design and construction standards as set forth in Chapter 11 of the City of Novi Code of Ordinances, the Storm Water Management

Ordinance and the Engineering Design Manual with the following items to be addressed at the time of Final Site Plan submittal:

COMMENTS to be addressed at the time of the Final Site Plan

1. Please also provide information related to the discharge rate of the 100-year storm event in the hydrology report along with the 10-year storm event.
2. Provide at least two reference benchmarks at intervals no greater than 1,200 feet. At least one referenced benchmark must be a City-established benchmark, refer to City of Novi Survey Benchmarks Arch Map.
3. **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), and paving (2 sheets) The most updated details can be found on the City's website under Engineering Standards and Construction Details.
4. A Right-of-Way Permit will be required from the City of Novi and Oakland County.
5. Provide sight distance measurements for the 12 Mile Road and 12 Oaks Mall Road entrances in accordance with Figure VIII-E of the Design and Construction Standards, Chapter 11 of the City of Novi Code of Ordinances.
6. 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.
7. Traffic signs in the Road Commission for Oakland County (RCOC) right-of-way may be installed by RCOC.
8. Provide a traffic control plan for the proposed road work activity.
9. Any existing recorded easements shall be revised by changing the parcel name from Griffin Novi to 12 Mile Townes.
10. Show the location of the existing SMART bus stop on the plans.
11. Relocate mailboxes outside all the public utility easements. If it cannot be done, a license agreement will be required.
12. Relocate light poles outside all the public utility easements. If it cannot be done, a license agreement will be required.
13. Provide a construction materials table on the utility plan listing the quantity and material type for each utility (water, sanitary and storm) being proposed.
14. 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.
15. 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.
16. Provide a note that compacted sand backfill (MDOT sand Class II) shall be provided for all utilities within the influence of paved areas; illustrate and label on the profiles.
17. 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 from water main and storm sewer and 10-foot horizontal separation from sanitary sewer. All utilities shall be shown on the landscape plan, or other appropriate sheet, to confirm the separation distance.

18. 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.

WATER MAIN

19. Water Systems must have the ability to serve three thousand (3,000) gallons per minute in apartment, cluster residential and similar complexes.
20. Provide a profile for all proposed public water main 8-inch or larger.
21. 6-inch hydrant leads are allowed for leads less than or equal to 25 feet in length. 8-inch leads are required for leads greater than 25 feet in length.
22. 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".
23. Show all proposed water main leads on the plans.
24. The water main basis of design shall be provided on the plans.
25. Provide a separate domestic lead and, if required by the Fire Marshal, a minimum 6-inch fire lead for each building with a unique shut-off valve for each.
26. 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.
27. A 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, Contaminated Site Evaluation Checklist, Basis of Design, and an electronic version of the 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.

IRRIGATION

28. Indicate if an irrigation system will be proposed on the site. A separate review will be required for any irrigation proposed.

SANITARY SEWER

29. It appears some of the proposed sanitary sewers are incorrectly labeled as STM.
30. Show all the sanitary sewer leads on the plans.

31. Note on the construction materials table that 6-inch sanitary leads shall be a minimum SDR 23.5, and mains shall be SDR 26.
32. 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.
33. Provide a testing bulkhead immediately upstream of the sanitary connection point. 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.
34. The sanitary segment shall have a minimum slope of 0.60-percent since it is the furthest upstream segment without additional contributing flows.
35. Illustrate all pipes intersecting with manholes on the sanitary profiles.
36. 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

37. A minimum cover depth of 3 feet shall be maintained over all proposed storm sewer. Grades shall be elevated, and minimum pipe slopes shall be used to maximize the cover depth.
38. Provide profiles for all storm sewer 12-inch and larger.
39. 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.
40. Illustrate all pipes intersecting storm structures on the storm profiles.
41. An easement is required over the storm sewer accepting and conveying off-site drainage. This is required for the stormwater leaving the site going to Waltonwood.
42. 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.
43. Show and label all roof conductors and show where they tie into the storm sewer.
44. Provide Storm sewer basis of design table.

STORM WATER MANAGEMENT PLAN

45. For the required on-site storage, soil borings shall be provided per ordinance requirements to determine soil conditions and to establish the high-water

elevation of the groundwater table. Note the bottom of the detention facility must be a minimum of three (3) feet above the groundwater elevation.

46. 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 (updated Jan 31, 2024)**
47. An adequate maintenance access route will be required for any pretreatment structures or storage provided on site.
48. As part of the Storm Drainage Facility Maintenance Easement Agreement, provide an access easement for maintenance over the storm water detention system and the pretreatment structure. Also, include an access easement to the detention area from the public road right-of-way.
49. Provide manufacturer's details and sizing calculations for the pretreatment structures on the plans. The treated flow rate should be based on the 1-year storm event intensity (~1.6 In/Hr).

PAVING & GRADING

50. Provide a construction materials table on the Paving Plan listing the quantity and material type for each pavement cross-section being proposed.
51. Sidewalks on private roadways should be located such that the outside edge of the sidewalk is a minimum of 15 feet from back of curb.
52. Sidewalks shall be provided on both sides of every proposed road inside the development.
53. Provide a minimum of 6 spot elevations where the pathway crosses each driveway (one at each corner and two in the center of the driveway on each side of the pathway). Spot elevations shall be provided to demonstrate a level landing adjacent to each side of the pathway crossing.
54. Provide spot elevations at the intersection of the proposed pathway with the existing pathway.
55. The city standards driveways 16-foot wide with 3-foot tapers on each side indicate proposed driveway dimensions. City is revising driveway dimensions; a variance may be supported for this project.
56. Show individual driveway tapers on plans to ensure no conflict with sidewalks, hydrants, street signs etc. Detectable warning surfaces and sidewalk ramps shall not be proposed within a residential driveway.
57. 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.
58. Label specific ramp locations on the plans where the detectable warning surface is to be installed.
59. Provide at least 3-foot buffer distance between the sidewalk and any fixed objects, including hydrants and irrigation backflow devices. Include a note on the plan where the 3-foot separation cannot be provided.

60. Site grading shall be limited to 1V:4H (25-percent), excluding landscaping berms.
61. The grade of the drive approach shall not exceed 2-percent within the first 25 feet of the intersection. Provide spot grades as necessary to establish this grade.
62. Per MDOT Special Provision for Crushed Concrete, the use of crushed concrete is prohibited on the project within 100 feet of any water course (stream, river, county drain, etc.) and lake, regardless of the application of location of the water course or lake relative to the project limits. Add note to use 21AA crushed limestone base for any pavement within 100 feet of a water course.
63. The pavement design shall meet city standards, 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.
64. Provide additional spot grades as necessary to demonstrate that a minimum 5-percent slope away from the building is provided for a minimum distance of ten feet around the perimeter of the building.
65. Provide the standard MDOT detail 'M' approach at all entrances.
66. 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.
67. Retaining walls that are 48-inches or larger shall need a permit from Building Department.
68. A retaining wall that has a grade change of 30" or more within a 3' horizontal distance will require a guardrail.
69. Soil borings along the proposed road will be required at 500-foot intervals per Section 11-195(d) of the Design and Construction Standards.
70. Per Section 26.5-35(H), a statement is required on any plan containing a private street with the following language: "City of Novi has no responsibility to improve or maintain the private streets contained within or private streets providing access to the property described in this plan".

SOIL EROSION & SEDIMENT CONTROL

71. A SESC permit is required (link to Soil Erosion Permit Application). A review will be done when a completed packet is submitted to Sarah Marchioni at Community Development.

OFF-SITE EASEMENTS

72. Any off-site utility easements anticipated must be executed **prior to Stamping Set Approval**. If you have not already done so, drafts of the easements and a recent title search shall be submitted to the Community Development Department as soon as possible for review and shall be approved by the Engineering Division and the City Attorney prior to executing the easements.
    a. Off-Site Title Policy.
    b. Off-Site Cross Access Easement (for the connection to Waltonwood)

c. Off-Site Sanitary Sewer Easement.
d. Off-site Storm Drainage Easement.
e. Off-site Temporary Construction Easement for the sidewalk.

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 Milad Alesmail at (248) 735-5695 or email at malesmail@cityofnovi.org with any questions.

Milad Alesmail

Milad Alesmail,
Project Engineer

cc: Lindsay Bell, Community Development
Humna Anjum, Engineering
Kate Purpura, Engineering
Ben Croy, City Engineer

LANDSCAPE REVIEW

PLAN REVIEW CENTER REPORT

February 26, 2025

12 Mile Towns

Preliminary Site Plan - Landscaping

Review Type	**Job #**
Preliminary Site Plan Landscape Review	JSP25-0003

Property Characteristics

- Site Location: Twelve Mile Road and Twelve Oaks Drive
- Site Acreage: 16.37 ac.
- Site Zoning: RC
- Adjacent Zoning: North: RA, East, West: RC, South: RM-1
- Plan Date: 2/19/2025

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 Final Site Plan submittal. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review is a summary and is not intended to substitute for any Ordinance.

LANDSCAPE WAIVERS REQUIRED FOR THE PROPOSED LAYOUT:

- Lack of screening wall or berm along the east side of the site – *not supported by staff*
- Lack of screening wall or berm along the west side of the site – *supported by staff*
- Lack of street trees and greenbelt trees along western 616lf of 12 Mile Road frontage – *supported by staff to preserve existing conditions*
- Lack of street trees north of western units due to utility conflicts – *supported by staff*
- Lack of street trees along Twelve Oaks Mall Drive north of entries due to lack of space between the sidewalks and curb – *supported by staff*
- Possible deficiency in interior street trees due to insufficient spacing from proposed utility lines – *not supported by staff*

Recommendation

This project is **not recommended for approval for Preliminary Site Plan. There are two significant unsupported waivers that need to be resolved before a recommendation for approval can be made.** There are several other waivers required that are supported and other items that can be addressed on the Final Site Plans.

Please add the City Project Number JSP25-0003 to the bottom right corner of the cover sheet.

Ordinance Considerations

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

1. No tree sizes are shown on the chart. **Please show them**.
2. No tree numbers are shown on C5 and C6 for trees that will be removed. **Please add them.**
3. No offsite trees are included in the tree survey. **Please add all offsite trees 8" dbh or**

larger within 50' of the limits of disturbance.

4. Please show and characterize other offsite vegetation adjacent to the site.

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

1. The adjacent property to the east is zoned RC and is occupied by an office building.
2. Instead of the required 4.5-6 ft tall, landscaped berm, a line of densely planted large evergreen trees is proposed.
3. **This alternative requires a landscape waiver.** *It is **not** supported by staff.* **Please add an opaque fence or wall along the property line to supplement the plantings, except within the preserved wetland at the south end of the site.**
4. *The lack of a screening wall along the west side of the west section of the site is supported as the distance between the commercial to the south and west is significant a line of vegetation is proposed along the west edge of the development and all existing vegetation is being preserved.*

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

1. The project has frontages along three roads – Twelve Mile Road, Twelve Oaks Drive and a new proposed road along the south of the property.
2. A waiver is requested to not provide the required greenbelt landscaping along the 616lf of 12 Mile Road frontage west of the developed portion of the west section. **This requires a waiver** *that is supported by staff to protect the natural vegetation on the site.*
3. No street trees are proposed along Twelve Oaks Drive north of the entries due to a number of utility lines there and lack of room for the trees. **This requires a landscape waiver** *that is supported by staff*.
4. No street trees are proposed in front of the units along 12 Mile Road due to a lack of space and utility conflicts. **This requires a landscape waiver**. *It is supported by staff.*
5. **A waiver is also required for the lack of greenbelt vegetation provided along the Twelve Oaks Mall circle drive and western boulevard entry, as well as the lack of additional street trees along the western boulevard entry**. *This waiver is supported by staff to protect the natural vegetation.*
6. **Please move a proportionate number of the required greenbelt canopy trees for the 12 Mile Road east frontage to in front of Building 1**.

Existing and proposed overhead and underground utilities, including hydrants. (LDM 2.e.(4))

1. All utilities and light posts are included on the landscape plan.
2. The location of a number of underground utility lines does not leave room for the required interior drive trees and the required spacing for them. This could lead to a need for a waiver for insufficient interior drive trees. **That waiver would not be supported.**
3. **Please revise the utility plan to leave the required room for the required trees.**

Multi-family Development Landscaping (Zoning Sec. 5.5.3xx.)

Multi-family unit landscaping

1. All of the required multifamily unit trees are provided
2. Approximately 25% of the required trees are subcanopy trees to increase diversity on the site.

Interior drive landscaping

1. The required number of trees is provided. Excess trees along the interior drives are multi-family unit trees.
2. As noted above, insufficient spacing is provided for most of the required trees between trees and underground utility lines. **This may require that those trees can't be planted, which would require a landscape waiver.** *That waiver would not be supported by staff as it is only proposed utilities that are problematic, not existing utilities.* **Please redesign the utility lines so the required interior street trees can be planted with the required spacing.**

Building foundation landscaping.

1. The required 35% greenspace along drives is not provided for any of the buildings. **This requires a landscape waiver.** *It is **not** supported as proposed.*
2. *If additional landscaping is provided along the ends of buildings that face interior or exterior roads to make up the difference between what is required and what is proposed, the waiver could be supported by staff.*

Parking Lot Landscaping

1. There are no parking lots proposed, only some small bays along one side of a drive.
2. Parking lot perimeter trees are proposed, with the requirement being met with multifamily unit trees. This is acceptable per the ordinance.

Plant List (LDM 4.)

1. Provided
2. 21 of 41 species used (51%) are native to Michigan.
3. Only flowering crabapples exceed the tree diversity requirement. Please reduce the total number of flowering crabapple trees to no more than 92 trees (15% of 615 trees).

Planting Notations and Details (LDM)

Provided

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

1. No new above-ground stormwater detention pond is proposed as the large existing mall pond will be the ultimate source of storage after it passes down the existing stream, so no stormwater landscaping is required.
2. A relatively large stand of Phragmites was found on the western site and instructions were provided for its removal.

Irrigation (LDM 1.a.(1)(e) and 2.s)

1. The proposed landscaping must be provided with sufficient water to become established and survive over the long term.
2. Please provide an irrigation plan or note how this will be accomplished if an irrigation plan is not provided on 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 rmeader@cityofnovi.org.

Rick Meader – Landscape Architect

LANDSCAPE REVIEW SUMMARY CHART – Preliminary Site Plan

Review Date: February 26, 2025
Project Name: JSP25-0003: 12 Mile Towns
Plan Date: February 19, 2025
Prepared by: Rick Meader, Landscape Architect E-mail: 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 DEVIATIONS THAT MAY BE REQUIRED FOR PROPOSED LAYOUT:

- Lack of screening berm or wall along the east side of the site – *not supported by staff*
- Lack of street trees and greenbelt trees along western 616lf of 12 Mile Road frontage – *supported by staff to preserve existing conditions*
- Lack of street trees north of western units due to utility conflicts – *supported by staff*
- Lack of street trees along Twelve Oaks Mall Drive north of entries due to lack of space between the sidewalks and curb – *supported by staff*
- Lack of greenbelt berms and landscaping and street trees along the Twelve Oaks Mall circle drive and additional street trees along the western mall entrance boulevard – *supported by staff to preserve the existing natural vegetation.*
- Possible deficiency in interior street trees due to insufficient spacing from proposed utility lines – *not supported by staff*

Please add the City Project Number, JSP25-0003, to the bottom right corner of the Cover Sheet.

Item	Required	Proposed	Meets Code	Comments
Landscape Plan Requirements – Basic Information (LDM (2))				
Landscape Plan *(Zoning Sec 5.5.2, LDM 2.e)*	• New commercial or residential developments • Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less. • 1"-20' minimum with proper North. Variations from this scale can be approved by LA	• Overall plan: 1"=40' • Building foundation plans: 1"= 30'	Yes	
Owner/Developer Contact Information *(LDM 2.a.)*	Name, address and telephone number of the owner and developer or association	On title block	Yes	
Project Information *(LDM 2.d.)*	Name and Address	Location map is provided	Yes	
Survey information *(LDM 2.c.)*	Legal description or boundary line survey	Sheets C2-C6	Yes	
Landscape Architect contact information	Name, Address and telephone number of	Jim Allen – Allen Design	Yes	

Item	Required	Proposed	Meets Code	Comments
(LDM 2.b.)	RLA/PLA/LLA who created the plan			
Sealed by LA. *(LDM 2.g.)*	Requires original signature	Copy of seal and signature		Final stamping sets must be sealed and signed by LA
Miss Dig Note (800) 482-7171 *(LDM.3.a.(8))*	Show on all plan sheets	On title block	Yes	
EXISTING CONDITIONS				
Existing plant material **Existing woodlands or wetlands** *(LDM 2.e.(2), Sec 12, 37))*	• Show location type and size. • Label to be saved or removed. • Plan shall state if none exists.	• Tree chart on Sheet C3 does not include tree sizes • Tree symbols are shown on topo survey but tree numbers are only shown on trees to remain. • One removal is indicated on the tree chart and 4 replacements are indicated but tree removals are not shown on any plan view. • No offsite trees are shown. • The landscape plan indicates that 4 replacements are required and are shown as being planted on site and a deposit for the tree fund will be made for four trees • Wetland boundaries are indicated on Sheets C5 and C6 • No calculations showing quantities of wetland impacts or wetland buffer are provided – it appears there will be no impacts	• No • No • TBD • Yes • TBD	**1. Please show the tree sizes on the chart** **2. Please show all tree numbers on Sheet C5** **3. Indicate all trees to be removed on demolition plan or C5 plan view** **4. Please add offsite trees 8" dbh or larger within 50' of the limits of disturbance. If there is just brush without any trees, show that with a cloud and a note describing the vegetation.** **5. Please clean up the note on the landscape plan regarding replacements to indicate trees will be planted on site, as the plan shows.** **6. If any wetland impacts are proposed, please show the calculations for them.** **7. See the Merjent letter for a complete review of the woodlands and wetlands.**

Item	Required	Proposed	Meets Code	Comments
Natural Features protection				**Please be sure that proper buffers and protection for stream and wetland are provided.**
Soil type *(LDM.2.r.)*	As determined by Soils survey of Oakland county	• Soils information provided on cover sheet • Areas to be developed are primarily Udorthents	Yes	
Zoning *(LDM 2.f.)*	Show site zoning and adjacent parcels' zoning	Shown on Cover Sheet Site: RC Proposed: RC with PD-2 option North: RA/OS-1/R-4, East, South: RC/RM-1, West: RC	Yes	
PROPOSED IMPROVEMENTS				
Existing and proposed improvements *(LDM 2.e.(4))*	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W.	All proposed site elements are included on the landscape plans.	Yes	
Existing and proposed utilities *(LDM 2.e.(4))*	• Overhead and underground utilities, including hydrants on the landscape plans • Light posts should also be shown on the landscape plans	• Sheet C9 • All utilities are shown on the landscape plan • Proposed light posts are shown on the landscape plans • A note on Sheet L-1 lists the required spacing between trees and utility lines and structures, including 10 feet between sanitary lines and trees	• Yes • Yes • Yes	1. The utility plan layout, particularly the location of the sanitary lines, does not leave room for the required spacing between trees and the utility lines. 2. **Please revise the utility layout so all required trees, particularly street trees, can be planted per the ordinance.** 3. **If the required trees cannot be provided, it would require a landscape waiver.** *That waiver would not be supported by staff.*
Proposed topography - 2' contour minimum *(LDM 2.e.(1))*	Provide proposed contours at 2' interval	• Only building finished grades and spot grades along the interior drives are shown	• No • No	1. **Please provide proposed contours, at least in greenbelts, and tie them to existing contours that**

Item	Required	Proposed	Meets Code	Comments
		on Sheets C8 and C9. • No retaining wall elevations are provided		**won't change.** **2. Show TW/BW elevations for the retaining wall**
Clear Zones *(LDM 2.e.(5))*	25 ft. corner clearance required. Refer to Zoning Sec 5.5.9	• Road Commission for Oakland County clear zones are shown for the 12 Mile Road entry. • The City Clear zones are shown at the Twelve Oaks Mall Drive entries, but they are not drawn correctly	• Yes • No	**1. Please correct the City clear vision zones to show them oriented at the ROW lines, not the curb line (see the image at the bottom of this chart).** **2. While not required, it's advised to show the clear vision zones on interior intersections as well.** **3. Please add the City Clear zone at the intersection of the Twelve Oaks Mall Road and Twelve Oaks Mall circle drive to be sure proposed street tree there is outside of the clear vision zone.**
LANDSCAPING REQUIREMENTS				
Berms and ROW Planting				
• All berms shall have a maximum slope of 33%. Gradual slopes are encouraged. Show 1ft. contours • Berm should be located on lot line except in conflict with utilities. • Berms should be constructed with 6" of topsoil.				
Residential Adjacent to Non-residential (Sec 5.5.3.A) & (LDM 1.a)				
Berm requirements *(Zoning Sec 5.5.A)*	Multi-family Residential adjacent to RC requires a 6-foot-high landscaped berm between the RC zoning east of the site and the residential complex	• Densely planted evergreens are proposed along the east border • No berm or screening wall is indicated	No	**1. A landscape waiver would be required for the proposed layout.** *It would not be supported by staff.* **2. In lieu of the berm, a 6-foot-tall screening wall must be provided along the east boundary of the east section of the project, in addition to the evergreens. Please add it to the site plan and landscape plans.** **3.** *As no development*

Item	Required	Proposed	Meets Code	Comments
				is proposed west of the west portion of the site, and all existing vegetation is proposed to remain, the waiver would be supported for the lack of screening walls to the west.
Adjacent to Public Rights-of-Way (Sec 5.5.B) and (LDM 1.b)				
ROW Landscape Screening Requirements Chart *(Sec 5.5.3.B. ii)* ***(RM-1)***				
Greenbelt width (2)(3) (5)	• Adj to parking: 20 ft • Not adj to parking: 25 ft	25 feet min – never adjacent to parking	Yes	
Min. berm crest width	0 feet (not adj to pkg)	0 ft	Yes	
Min. berm height (9)	0 feet (not adj to pkg)	0 ft	Yes	
3' wall	(4)(7)	No walls are proposed along the rights-of-way	Yes	
Canopy deciduous or large evergreen trees Notes (1) (10)	• Not adjacent to pkg • 1 tree per 45 lf WEST: • 12 Mile Road: (988-616)/45 = 8 trees • **Waiver requested for 616 lf undeveloped along west end of 12 Mile Road** • Twelve Oaks Mall Drive: (771-28)/45 = 17 trees EAST: • 12 Mile Road: (622-28)/45 = 13 trees • Twelve Oaks Mall Drive: (517-28)/45 = 11 trees **Waiver requested for Twelve Oaks Mall Circle Drive and west boulevard undeveloped frontage**	WEST: • 12 Mile Road: 8 trees • Twelve Oaks Mall Drive: 17 trees EAST: • 12 Mile Road: 13 trees • Twelve Oaks Mall Drive: 11 trees	• WEST: No • EAST: Yes	*The waivers are supported by staff to protect the existing natural conditions.*
Sub-canopy deciduous trees Notes (2)(10)	• Not adjacent to pkg • 1 tree per 30 lf WEST: • 12 Mile Road: (988-616)/30 = 12 trees	WEST: • 12 Mile Road: 12 trees • Twelve Oaks Mall Drive: 25 trees	• WEST: No • EAST: Yes	*The waivers are supported by staff to protect the existing natural conditions.*

Item	Required	Proposed	Meets Code	Comments
	• **Waiver requested for 616 lf undeveloped along west end of 12 Mile Road** • Twelve Oaks Mall Drive: (771-28)/30 = 25 trees EAST: • 12 Mile Road: (622-28)/30 = 20 trees • Twelve Oaks Mall Drive: (517-28)/30 = 16 trees **Waiver requested for Twelve Oaks Mall Circle Drive and west mall entry boulevard undeveloped frontage**	EAST: • 12 Mile Road: 20 trees • Twelve Oaks Mall Drive: 16 trees		
Canopy deciduous trees in area between sidewalk and curb	• 1 tree per 45 lf WEST: 12 Mile Road: (988-616)/45 = 8 trees • **Waiver requested to not provide the required trees for 616 lf undeveloped along west end of 12 Mile Road** • **Waiver requested for not providing the required trees along the east 372lf of 12 Mile Road frontage due to utility conflict** • Twelve Oaks Mall Drive: (771-28)/45 = 17 trees • **Waiver requested to not provide the required trees along Twelve Oaks Mall Drive north of entry (465lf) due to lack of space between the proposed sidewalk and curb** EAST: • 12 Mile Road: (622-28)/45 = 13 trees	WEST: • 12 Mile Road: 0 trees • Twelve Oaks Mall Drive: 8 trees EAST: • 12 Mile Road: 20 trees • Twelve Oaks Mall Drive: 0 trees	• WEST: No • EAST: No	1. It appears that only 5 feet exist or will be provided between the proposed sidewalks and curb along most of Twelve Oaks Mall Drive **2.** It also appears the utility easements along the drive may not allow street trees to be planted along most of Twelve Oaks Mall Drive ***3.*** *For the above reasons, the waivers noted are supported by staff.* ***4.*** *The waiver to not provide additional trees along the west boulevard entry to preserve the existing vegetation is supported by staff.* **5. Please shift a proportionate amount of the greenbelt canopy trees for the east section east of the entry to 12 Mile Road in front of Building 1.**

Item	Required	Proposed	Meets Code	Comments
	• Twelve Oaks Mall Drive: (517-28)/45 = 11 trees • **Waiver requested to not provide the required trees along the entire section of Twelve Oaks Mall Drive north of the entry due to a lack of space between the proposed sidewalk and curb and utility easement conflicts.** **Waiver requested to not provide additional street trees along the west entry boulevard frontage**			
Multi-Family Residential (Sec 5.5.3.F.ii)				
Building Landscaping *(Zoning Sec 5.5.3.E.ii.)*	• 3 deciduous canopy trees or large evergreen trees per dwelling unit on the first floor. • TBD units * 3 = TBD trees • Up to 25% of requirement can be subcanopy trees WEST: 39 units x 3 = 117 trees EAST: 86 units x 3 = 258 trees	• WEST: 117 trees (21 subcanopy trees) • EAST: 266 trees (65 subcanopy trees)	• Yes • Yes	
Interior Street Landscaping	• 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. • Trees in boulevard islands do not count toward street tree requirement • WEST: 1030lf/35 = 30 trees	• WEST: 30 trees • EAST: 88 trees	• Yes • Yes	

Item	Required	Proposed	Meets Code	Comments
	• EAST: 3078lf/35 = 88 trees			
Foundation Landscaping	35% of building façades facing road must be landscaped	• Per the foundation planting details provided, none of the buildings meet the requirement • Only 27.2-27.6% of the buildings' facades are landscaped (approximately 79% of the requirement)	No	**1. The deficiency in the percentage of building facades facing the interior drives require a landscape waiver** **2.** *It would not be supported by staff.* **3. If additional landscaping along the ends of buildings visible from internal or external roads to make up the shortage was added, the waiver could be supported by staff.**
Parking Area Landscape Requirements (Zoning Sec 5.5.3.C & LDM 5)				
General requirements *(LDM 1.c)*	• Clear sight distance within parking islands • No evergreen trees	No parking lot islands are proposed in either sections – only small single-sided bays	NA	
Name, type and number of ground cover (LDM 1.c.(5))	As proposed on planting islands	NA	TBD	
General *(Zoning Sec 5.5.3.C)*				
Parking lot Islands *(a, b. i)*	• A minimum of 200 SF to qualify • 200sf landscape space per tree planted in an island. • 6" curbs • Islands minimum width 10' BOC to BOC	There are no islands proposed	NA	
Curbs and Parking stall reduction *(c)*	Parking stall can be reduced to 17' with 4" curb adjacent to a sidewalk of minimum 7 ft.	Spaces are 17 feet long with a 7 foot wide sidewalk facing them	Yes	
Contiguous space limit *(i)*	Maximum of 15 contiguous spaces	No bay is more than 6 spaces	Yes	
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)*				
A = Total square footage of vehicular use areas x 7.5%	A = x SF x 7.5% = A sf	NA		Only single-sided parking areas are provided so only

Item	Required	Proposed	Meets Code	Comments
				parking lot perimeter trees will need to be provided and interior street trees may be used for that purpose.
B = Total square footage of additional paved vehicular use areas over 50,000 SF x 1 %	B = x SF x 1% = B sf	NA		**See above**
All Categories				
C = A+B Total square footage of landscaped islands	A + B = C SF	NA		
D = C/200 Number of canopy trees required	C/200 = D Trees	NA		
Parking Lot Perimeter Trees	• 1 Canopy tree per 35 lf • Sub-canopy trees can be used under overhead utility lines. • Perimeter within 20 feet of a building does not need to be included in the basis	• A total of 9 parking lot perimeter trees are shown • The requirement is met with multifamily unit trees	• Yes • Yes	1. See above 2. The required parking lot perimeter trees are provided.
Parking land banked	NA			
Miscellaneous Landscaping Requirements				
Plantings around Fire Hydrant *(d)*	• No plantings with matured height greater than 12' within 10 ft. of fire hydrants, manholes, catch basins or other utility structures, or underground sanitary lines. • Trees should not be planted within 5 feet of other underground lines.	Most, if not all, interior street trees are shown to be closer than allowed from underground utility lines	No	**1. Please adjust the utility alignment to create space for the required trees.** **2. If all of the required trees can't be planted as required, a landscape waiver would be required.** *It would not be supported by staff.*
Landscaped area *(g)*	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	None indicated	NA	
Name, type and number of ground cover (LDM 1.c.(5))	As proposed on planting islands	Sod is indicated as the ground cover	Yes	
Snow deposit *(LDM.2.q.)*	Show leave snow deposit areas on plan in locations where	A note indicates that snow will be deposited along	No	Please show some deposit areas on both sections (east and west)

Item	Required	Proposed	Meets Code	Comments
	landscaping won't be damaged	the street. No snow deposit areas are indicated		on the landscape plan
Transformers/Utility boxes *(LDM 1.e from 1 through 5)*	• A minimum of 2 ft. separation between box and the plants • Ground cover below 4" is allowed up to pad. • No plant materials within 8 ft. from the doors	No utility boxes or utility box landscaping is shown	TBD	**1.** Please show transformers and other utility boxes when their locations are determined. **2.** 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. **3.** Please add an allowance of 10 shrubs per box on the plant list and label as such
Detention/Retention Basin Planting requirements *(Sec. 5.5.3.E.iv)*	• Clusters of large native shrubs shall cover 70-75% of the basin rim area at 10 ft away from the permanent water line. • Canopy trees must be located at 1 per 35lf of the pond rim 10 feet away from the permanent water level • 10" to 14" tall grass along sides of basin • Refer to wetland for basin mix • Include seed mix details on landscape plan	No above-ground detention is shown as the stormwater will be treated by the regional Twelve Oaks basin	TBD	If any above-ground detention is required on-site, it must be landscaped per the current ordinance.
Landscape Notes and Details– Utilize City of Novi Standard Notes				
Plant List (LDM 4) – Include all cost estimates				
Quantities and sizes		Yes	Yes	
Root type		Yes	Yes	
Botanical and common names	• At least 50% of plant species used, not including seed mixes or woodland replacement trees, must be species native to Michigan. • The non-woodland	• 21 of 41 species used (51%) are native to Michigan • The tree diversity is met for all but flowering crabapples.	• Yes • No	Please reduce the total number of flowering crabapples to no more than 92 (15% of 615 trees).

Item	Required	Proposed	Meets Code	Comments
	replacement tree diversity must meet the standards of the Landscape Design Manual section 4.			
Type and amount of lawn		No	No	Need for final site plan
Cost estimate (LDM 2.t)	For all new plantings, mulch and sod as listed on the plan	No	No	Need for final site plan
Planting Details/Info (LDM 2.i) – Utilize City of Novi Standard Details				
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		Yes	Yes	
Tree stakes and guys	Wood stakes, fabric guys.	Yes	Yes	
Cross-Section of Berms (LDM 2.j)				
Slope, height and width	• Label contour lines • Maximum 33% slope • Constructed of loam • 6" top layer of topsoil	No	No	
Type of Ground Cover		Sod	Yes	
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	No	No	**Space all trees appropriately from utility lines, poles and utility structures**
Walls (LDM 2.k & Zoning Sec 5.5.3.vi)				
Material, height and type of construction footing	Freestanding walls should have brick or stone exterior with masonry or concrete interior	A long retaining wall is proposed for the west section	TBD	Provide dimensioned wall details and TW/BW elevations.
Walls greater than 3 ½ ft. should be designed and sealed by an Engineer		No	No	If walls are taller than 3 ½ feet, please have engineer design, sign and seal.
Notes (LDM 2.i) – Utilize City of Novi Standard Details				
Installation date *(LDM 2.l. & Zoning Sec 5.5.5.B)*	• Provide intended date • Between Mar 15 – Nov 15	Yes	Yes	
Maintenance & Statement of intent	• Include statement of intent to install and	Yes	Yes	

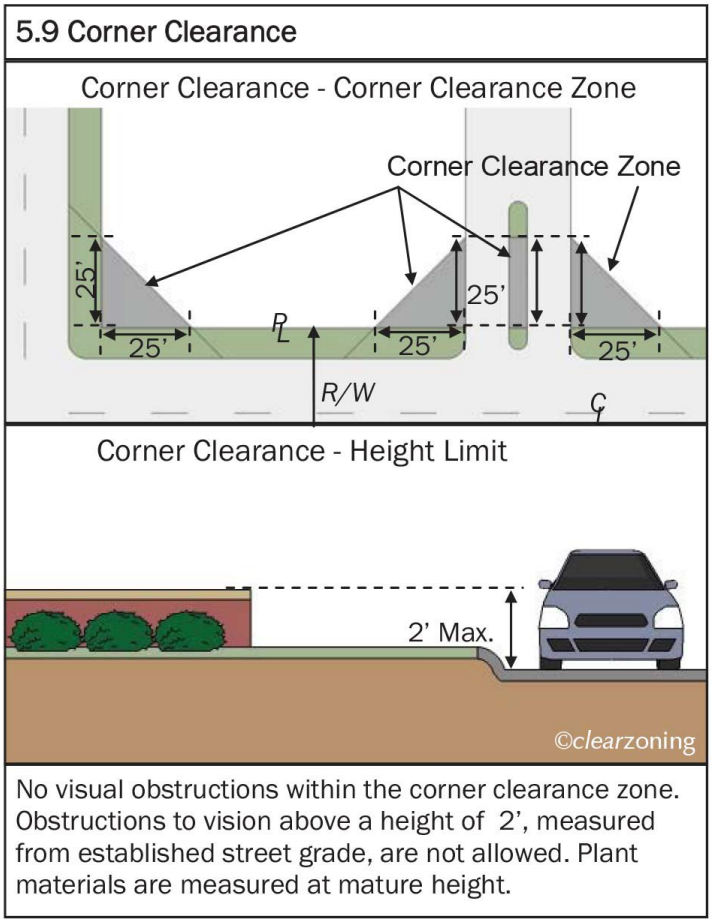
Item	Required	Proposed	Meets Code	Comments
(LDM 2.m & Zoning Sec 5.5.6)	guarantee all materials for 2 years. • Include a minimum one cultivation in June, July and August for the 2-year warranty period.			
Plant source *(LDM 2.n & LDM 3.a.(2))*	Shall be northern nursery grown, No.1 grade.	Yes	Yes	
Establishment period *(Zoning Sec 5.5.6.B)*	**2 yr. Guarantee**	Yes	Yes	
Approval of substitutions. *(Zoning Sec 5.5.5.E)*	City must approve any substitutions in writing prior to installation.	Yes	Yes	
Miscellaneous Landscape Requirements (LDM 3)				
General Conditions *(LDM 3.a)*	Plant materials shall not be planted within 4 ft. of property line	Yes	Yes	
Irrigation plan *(LDM 2.s.)*	A fully automatic irrigation system and a method of draining is required with Final Site Plan	No		1. Please add an irrigation plan or information as to how plants will be watered sufficiently for establishment and long-term survival. 2. The plan should meet the requirements listed at the end of this chart. 3. If xeriscaping is used, please provide information about plantings included.
Other information *(LDM 2.u)*	Required by Planning Commission	NA		
Landscape tree credit *(LDM11.b.(d))*	• Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA. • Refer to Landscape tree Credit Chart in LDM	None shown		
Plant Sizes for ROW, Woodland replacement and others *(LDM 11.b)*	• Canopy Deciduous shall be 3" and sub-canopy deciduous shall be 2.5" caliper. • Refer to LDM section	Correct sizes are shown on the plant list	Yes	

Item	Required	Proposed	Meets Code	Comments
	11.b for more details			
Plant size credit *(LDM11.b)*	NA	None taken		
Prohibited Plants *(LDM 11.b)*	Do not use any plants on the Prohibited Species List	None used		
Recommended trees for planting under overhead utilities *(LDM 3.e)*	Label the distance from the overhead utilities	A note indicates there are no overhead lines on the site	Yes	
Collected or Transplanted trees *(LDM 3.f)*		None indicated		
Nonliving Durable Material: Mulch *(LDM 4)*	• Trees shall be mulched to 3" depth and shrubs, groundcovers to 2" depth • Specify natural color, finely shredded hardwood bark mulch. • Include in cost estimate.	Information is on the 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

- 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.
- A plumbing permit is required.
- The assembly must be tested after installation with results recorded on the City of Novi test report form.


5.9 Corner Clearance
Corner Clearance - Corner Clearance Zone
Corner Clearance Zone
25'
25'
25'
25'
25'
P/L
R/W
℄
Corner Clearance - Height Limit
2' Max.
©clearzoning
No visual obstructions within the corner clearance zone. Obstructions to vision above a height of 2', measured from established street grade, are not allowed. Plant materials are measured at mature height.

WETLAND & WOODLAND REVIEW

merjent

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April 25, 2025

Lindsay Bell
Planner – Community Development
City of Novi
45175 Ten Mile Road
Novi, MI 48375

Submitted electronically to lbell@cityofnovi.org

Re: 12 Mile Road Townes Wetland Review (Preliminary Site Plan; JSP25-03)

Dear Lindsay,

Merjent, Inc. (Merjent) has conducted a site plan review of the revised preliminary site plan (rPSP) for the 12 Mile Road Townes (site). Two sets of plans were provided:

- One plan prepared by Seiber Keast Lehner dated April 7, 2025. This plan contains the primary design/engineering information for the PSP.
- One plan prepared by Allen Design dated April 3, 2025. This plan contains the proposed landscape design and invasive removal information for the PSP.

Merjent reviewed the plans for conformance with the City of Novi's (City) Woodland Protection Ordinance, Chapter 37, and Wetlands and Watercourse Protection Ordinance, Chapter 12 Article V. The site is located on both the west and east side of 12 Oaks Mall Road, south of the intersection of West 12 Mile Road and 12 Oaks Mall Road in Section 14 of the City. Development is proposed within parcels 50-22-14-200-034, 50-22-14-100-039, and 50-22-14-100-038 in the City records. The site does not contain City-regulated woodlands (**Figure 1**) and does contain City-regulated wetlands (**Figure 2**).

An initial Wetland Review was conducted in February 2025 and has been combined with the Woodlands review from April 2025.

Wetlands

Wetland Recommendation: Merjent **recommends approval** of the 12 Mile Road Townes PSP **with requests for minor edits**. Additional comments have been provided to meet the City's Wetlands and Watercourse Protection Ordinance.

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

☒ City-regulated wetlands, as identified on the City of Novi interactive map website. Note that both wetland and property limits depicted on the City's map are considered approximations (**Figure 2**).

☒ 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

(**Attachment A**). NWI and MIRIS wetlands are identified by the associated governmental bodies' interpretation of topographic data and aerial photographs.

☐ Hydric (wetland) soil as mapped by the U.S. Department of Agriculture, Natural Resources Conservation Service, as identified on the EGLE Wetlands Viewer interactive map website.

Permits and Regulatory Status

Merjent visited the Site on February 26, 2025 to observe the conditions on-site relative to the provided PSP. Merjent found conditions on-site consistent with the provided PSP; three wetlands (Wetland A, Wetland B, and Wetland C) are on-site and consist of cover primarily dominated by common reed (*Phragmites australis*). Photos from the site visit are included in **Attachment B**. The City of Novi Code of Ordinances, Chapter 12, Article V defines an essential wetland as meeting one or more of the criteria listed in subsections 12-174(b)(1) through (10). It is Merjent's opinion that all wetlands on-site provide the functional characteristics of stormwater storage capacity and/or wildlife habitat. Accordingly, the wetlands on-site meet the criteria for essential wetlands as noted above.

Due to the comments below, the following wetland-related items will be required for this project:

Item	Required/Not Required
Wetland Permit (specify Non-minor or Minor)	Required, Non-minor
Wetland Mitigation	Not Required, EGLE Mitigation Required
Environmental Enhancement Plan	Required, if feasible
Wetland Buffer Authorization	Required
EGLE Wetland Permit	Required
Wetland Conservation Easement	Required, if feasible

Wetland Review Comments

1. The applicant has proposed the fill of Wetland C and partially filling Wetland B. The proposed impacts are summarized below:

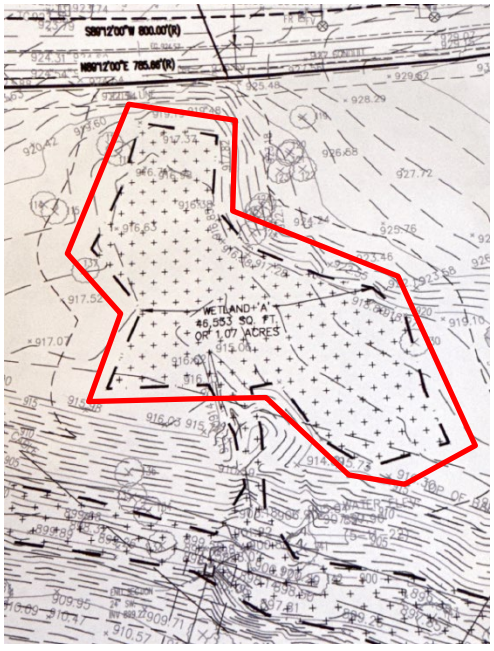
Impact	Amount
Wetland B Permanent	0.02 acre (871 sq. ft.)
Wetland C Permanent	0.21 acre (9,012 sq. ft.)
Total Permanent Impact	0.23 acre

   - **Requested Edit**: The applicant should list the type (Cowardin classification) of wetland on the site plan (Sheet C9). Additionally, the applicant should list the amount of fill to be placed in each wetland. It should be noted that the remaining undisturbed portions of Wetland B and Wetland A may need to be marked with signs noting that no mowing or disturbance will be allowed after the development is established (if approved) to notify future land owners of the protection needed around these areas.

2. An existing culvert/wetland crossing was identified in the northwest portion of Wetland Large. To reduce any unnecessary impacts to the wetland, the applicant should add the existing culvert/crossing to the plan and adjust the size of the wetland, if necessary. Photographs of the area are included in **Attachment B**.

3. When a project permanently impacts 0.25 acres or more of essential wetland, the City of Novi requires mitigation at a ratio of 2:1 for forested wetlands and 1.5:1 for emergent and scrub-shrub wetlands. Merjent recommends the areas of the wetland types be individually quantified on Site development plans for calculation of the mitigation area required (should mitigation be necessary). Otherwise, a conservative mitigation ratio of 2:1 will be utilized for all wetland types at the Site.

    - The total proposed impacts to on-site wetlands consists of approximately 0.23 acre of wetland fill. Because less than 0.25 acre of impacts are proposed, mitigation will not be required for this project. **However**, Section 12-173 (e)(1)(b) states that "*Where an activity results in the impairment or destruction of wetland areas of less than one-quarter-acre that are determined to be essential under subsection 12-174(b), are two acres in size or greater or are contiguous to a lake, pond, river or stream,* ***additional planting or other environmental enhancement shall be required onsite within the wetlands or wetland and watercourse setback where the same can be done within the wetland and without disturbing further areas of the site***."
    - **Requested Edit**: due to the amount of proposed impacts, Merjent is requesting that the applicant provide an environmental enhancement plan for the remaining wetland (Wetland A) not proposed to be impacted on-site. The environmental enhancement is recommended to consist of the following:
        - Management of *Phragmites* within Wetland A increased from three years to five years.
        - Seeding and establishment of a suitable native wetland seed mix throughout Wetland A following successful removal of *Phragmites*. Planting and establishment of the native wetland seed shall be consistent with the requirements set forth in the City of Novi Landscape Design Manual and the City of Novi Zoning Ordinance.
        - Planting individual surviving, established, and free-to-grow shrubs in the remaining wetland (Wetland A) that are classified as native wetland species and consisting of at least four different species (suitable for wetland conditions). These shrubs shall be planted in Wetland A in the portion north of Bishop Creek, as identified in the photograph below. These shrubs should be planted at a rate of 300 shrubs/acre.



- Placement of the entirety of the remaining wetlands on-site (Wetland A and Wetland B) in a conservation easement (see Comment 6).
    - Placement of conservation easements on the remaining wetland areas may require signage or education to future residents to prevent disturbance to the undisturbed wetland areas (see Comments 1 and 4).

4. In addition to wetlands, the City of Novi regulates wetland and watercourse buffers/setbacks. Article 24 of the Zoning Ordinance, Schedule of Regulations, states: "There shall be maintained in all districts a wetland and watercourse setback, as provided herein, unless and to the extent, it is determined to be in the public interest not to maintain such a setback. The intent of this provision is to require a minimum setback from wetlands and watercourses". The established wetland and watercourse buffer/setback limit is 25 horizontal feet, regardless of grade change. The location and area of affected wetland buffers/setbacks must be identified on Site development plans.
    - The applicant has proposed 0.06 acre of permanent impact to the buffer of Wetland B and 0.29 acre to the buffer of Wetland C.
    - **Requested edit**: The applicant should list the amount of fill to be placed in the wetland setback buffer.
        - It should be noted that the remaining buffer of Wetland B and Wetland A may need to be marked with signs noting that no mowing or disturbance will be allowed after the development is established (if approved).

5. Pursuant to Section 12-172(f), “Upon filing of the application, the applicant shall have the boundary lines of any watercourses or wetlands on the property flagged or staked. The flagging or staking shall remain in place throughout the conduct of the permit activity.” Merjent conducted an on-site review on February 26, 2025 and flagging was only present around Wetland A.

    - **Requested edit**: because portions of Wetland B will be left intact and continues off-site, the applicant should flag/mark Wetland B and the markings will need to be kept intact throughout construction to ensure disturbance does not occur within the proposed avoidance areas of Wetland B.

6. The Applicant is encouraged to provide wetland conservation easements for any areas of remaining wetland and 25-foot wetland buffer. The Applicant shall provide wetland conservation easements as directed by the City of Novi Community Development Department for any areas of proposed wetland mitigation areas. This language shall be submitted to the City Attorney for review. The executed easement must be returned to the City Attorney within 60 days of the issuance of the City of Novi Wetland and Watercourse permit.

Woodlands

Woodland Recommendation: Merjent **recommends approval** of the 12 Mile Townes rPSP and subsequent Final Site Plan (upon approval of all other reviewers). A list of comments is provided below to meet the requirements of the Woodland Protection Ordinance. The following Woodland Regulations apply to this site:

Woodland Regulation	Required
Woodland Permit (Chapter 37, Section 37-26)	No
Tree Replacement (Chapter 37, Section 37-8)	No
Tree Protection (Fence; Chapter 37, Section 37-9)	No
Woodland Conservation Easement (Chapter 37-30[e])	Recommended

Woodland Review Comments – 12 Mile Townes Site

1. City-regulated woodlands, as identified on the City of Novi Woodlands interactive map website, are not present onsite. Note that both the woodlands and property limits depicted on the City map are considered approximations (**Figure 1**). Pursuant to Section 37-2 and Section 37-4 of Chapter 37, Woodlands Protection, woodland areas can be identified by additional features such as soil quality, habitat quality, tree species and diversity, health and vigor of tree stand, understory species and quality, presence of wildlife, and other factors such as the value of the woodland area as a scenic asset, wind block, noise buffer, healthy environment, and the value of historic or specimen trees. A site visit was performed on April 11, 2025 to verify and review the potential extent of woodlands on-site. Merjent agrees with the existing conditions listed on the City's Woodland Map.

   Site photographs are included in **Attachment A**. Many of the trees noted in the tree survey (Sheet C3) are noted to be honey locust (*Gleditsia triacanthos*) but are more likely to be black locust (*Robinia pseudoacacia*) trees, which are considered invasive. Throughout much of the shrub covered portion of the site, common buckthorn (*Rhamnus cathartica*) is also present in copious amounts. Additionally, the dominance of more shrub-covered areas and the absence of old forest growth is consistent with the absence of regulated woodlands on City maps.

2. When a proposed site plan is located within a regulated woodland, any tree proposed for removal with a diameter at breast height (DBH) greater than or equal to eight inches will require tree replacement and a Woodland Use Permit per Section 37-8. This also applies to any tree that will be preserved, but where impacts to critical root zones are proposed.

3. Regardless of the presence of regulated woodlands onsite, a Woodland Use Permit is required to perform construction on any site containing the removal of trees larger than 36 inches DBH.
   a. No trees on-site are larger than 36 inches. The applicant has listed the removal of a 30-inch silver maple (*Acer saccharinum*, tree 766). While they are not required to provide four replacement credits, the applicant is encouraged to plant additional tree species on-site.

4. The plan has proposed the impact to no regulated trees on-site. A **Woodland Use Permit** is required to perform construction on any site containing regulated woodlands. Because less than three regulated trees are proposed for removal, Planning Commission Approval is not required.

5. **Woodland Replacement**. Based on a review of the plan and existing conditions on-site, a replacement plan and cost estimate for the tree replacement will not be necessary prior to final site plan approval by the City.

6. **Critical root zone**. Accurate critical root zones must be depicted on the site plan for all regulated trees within 50 feet of the proposed grading or construction activities. Section 37-2 defines a critical root zone

as a circular area around a tree with a radius measured to the tree's longest dripline radius plus one foot. Because regulated trees are not within 50 feet of proposed grading activities – critical root zones are not required to be displayed. **However**, pursuant to Part 1, Item 10(h)(2)(d) of the City of Novi Landscape Design Manual, all trees with a DBH of eight inches or larger within 50 feet of construction shall also be included in the tree survey. For additional information – please review the Landscape Review.

7. A **woodland fence guarantee** will not be required for this project**.**

8. If tree replacements are planted on-site, the Applicant may be required to provide preservation/conservation easements as directed by the City of Novi Community Development Department for any areas of woodland replacement trees. The applicant shall demonstrate that all proposed woodland replacement trees and existing regulated woodland trees to remain will be guaranteed to be preserved as planted with a conservation easement or landscape easement to be granted to the city. This language shall be submitted to the City Attorney for review. The executed easement must be returned to the City Attorney within 60 days of the issuance of the City of Novi Woodland permit. Any associated easement boundaries shall be indicated on the Plan.

- Although no tree replacements are required on-site, it is recommended that remaining shrub and tree covered areas (identified on **Figure 1**) be preserved in a conservation easement for both woodlands and wetlands. If feasible, this will allow for the permanent shade cover of Bishop Creek (reducing water temperature) and continued growth of trees in this area. This may or may not benefit the proposed development in the form of additional future visual and sound screening between the existing 12 Oaks Mall and the proposed development.

Should you have any questions or concerns with this review, please contact me via email at jason.demoss@merjent.com or via phone at (619) 944-3835.

Sincerely,

Merjent, Inc.

Jason DeMoss, PWS
Environmental Consultant

Enclosures:

Figure 1 – City of Novi Woodlands Map
Figure 2 – City of Novi Wetlands Map
Attachment A – Site Photographs

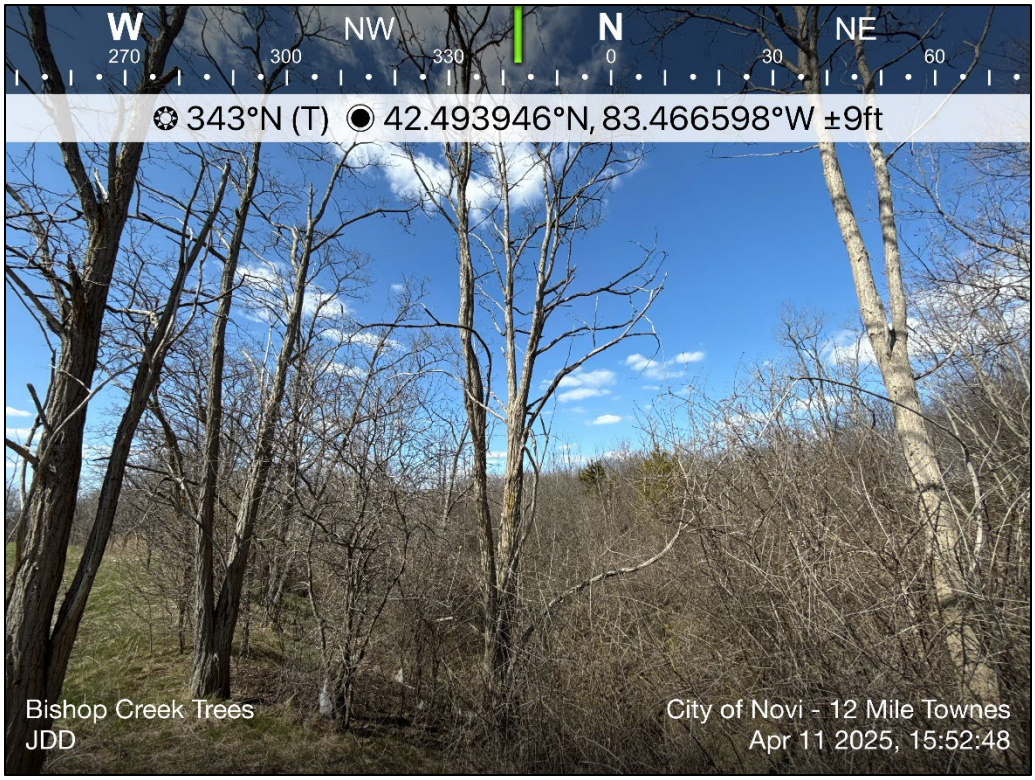
CC:
Stacey Choi, City of Novi, schoi@cityofnovi.org
Rick Meader, City of Novi, rmeader@cityofnovi.org
Barbara McBeth, City of Novi, bmcbeth@cityofnovi.org

Matt Pudlo, Merjent, matt.pudlo@merjent.com

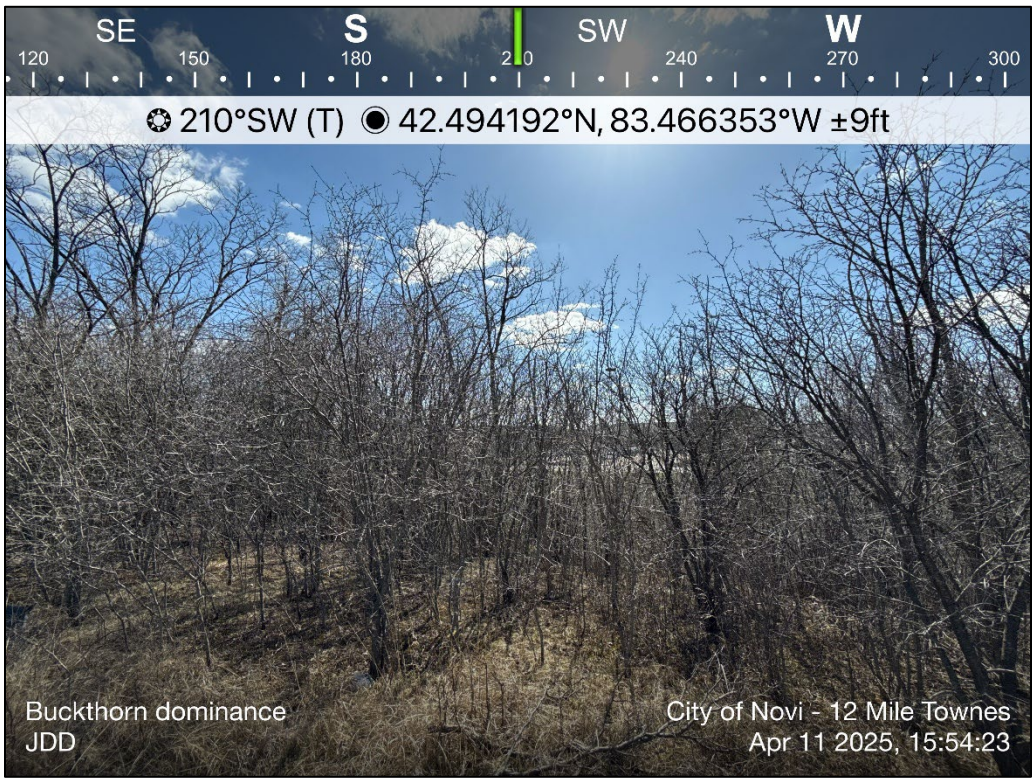
Figure 1. City of Novi Regulated Woodlands Map
Approximate Site boundary is shown in Red.
(Approximate) Regulated Woodland areas are shown in Green.
Proposed approximate Future conservation easement is in yellow (does not include the recommended additional wetland conservation/enhancement area on-site).

Figure 1. City of Novi Regulated Wetlands Map
Approximate Site boundary is shown in red.
(Approximate) Regulated Wetland areas are shown in blue.

Attachment A
Site Photographs

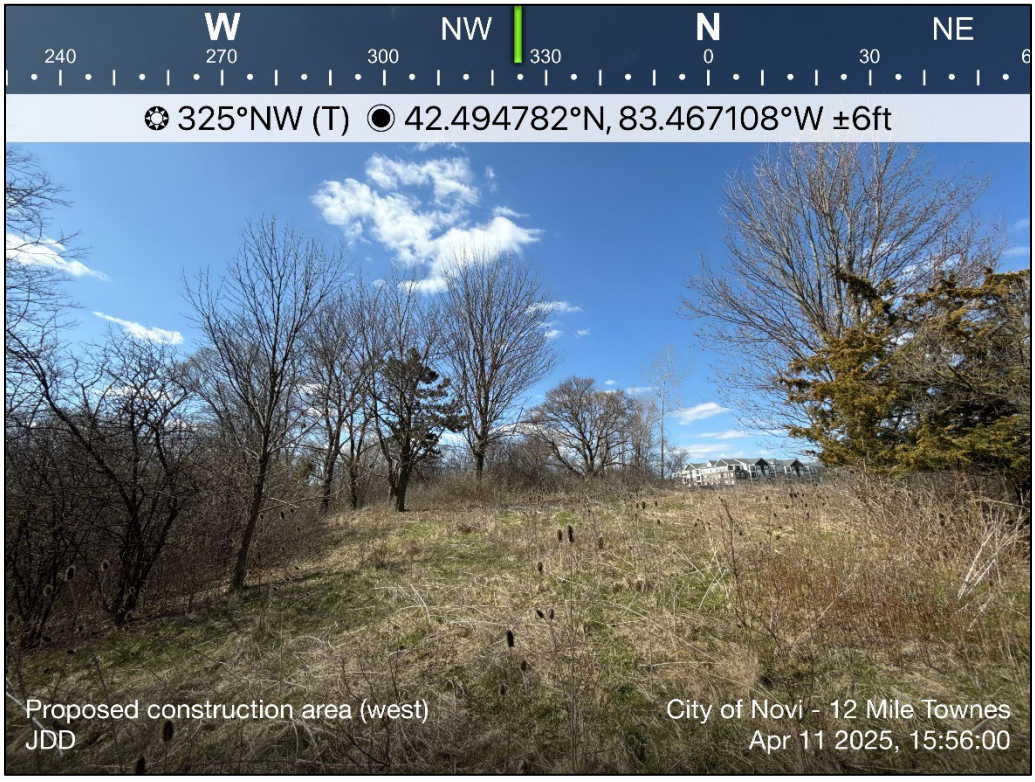


Overview of trees adjacent to Bishop Creek, with cottonwood and black locust trees being present



Overview of a dominance of buckthorn shrubs

Overview of eastern trees (east of site boundary)



Overview of proposed western development area, showing large openings between trees

TRAFFIC REVIEW

AECOM
39575 Lewis Dr, Ste. 400
Novi
MI, 48377
USA
aecom.com

Project name:
JSP23-05 – 12 Mile Road Townes Revised Preliminary Traffic Review

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

From:
AECOM

Date:
April 25, 2025

CC:
Lindsay Bell, Humna Anjum, Diana Shanahan, Dan Commer, Stacey Choi, Milad Alesmail

Memo

Subject: JSP23-05 – 12 Mile Road Townes Revised Preliminary Traffic Review

The revised preliminary site plan was reviewed to the level of detail provided and AECOM recommends **approval** for the applicant to move forward as long as the comments below are addressed to the satisfaction of the City.

GENERAL COMMENTS

1. The applicant, Sieber Keast Lehner, is proposing 20 buildings consisting of 125 units. Traffic Impact study considered 127 units.
2. The development is located on the south side of 12 Mile Road and the east and west sides of 12 Oaks Mall Road. 12 Mile Road is under the jurisdiction of the Road Commission for Oakland County. 12 Oaks Mall Road is a private street.
3. The site is zoned RC (Regional Center).
4. The following traffic related deviation is being requested by the applicant:
    a. Parking along major drives.

TRAFFIC IMPACTS

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

    ITE Code: 215 – Single Family Attached Housing
    Development-specific Quantity: 125 Units / 127 Units per Traffic Impact Study
    Zoning Change: N/A

Trip Generation Summary	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
AM Peak-Hour Trips	60	45	100	No
PM Peak-Hour Trips	72	42	100	No
Daily (One-Directional) Trips	917	N/A	750	Yes

2. 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**
None	The applicant previously submitted a Traffic Impact Study (TIS) dated February 12 that was reviewed under a separate letter. For Median opening comment within TIS, **t**he applicant added a 4-way stop at this location and noted they have coordinated with mall property owner.

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 Figure IX.3	25' and existing	Met	
2	Driveway Width | O Figure IX.3	28' major drive and 24' secondary road	Met	
3	Driveway Taper | O Figure IX.11			
3a	Taper length	100' exit and entrance taper	Met	
3b	Tangent	50'	Met	
4	Emergency Access | O 11-194.a.19	Only 1 access point on west side development, 2 access points on east side development	Met	Secondary access point is not required per Fire review.
5	Driveway sight distance | O Figure VIII-E	550'+	Met	
6	Driveway spacing			
6a	Same-side | O 11.216.d.1.d	419'	Met	
6b	Opposite side | O 11.216.d.1.e	-	N/A	

EXTERNAL SITE ACCESS AND OPERATIONS				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
7	External coordination (Road agency)	RCOC	Met	The applicant indicated RCOC coordination will be completed for entrance along 12 Mile Road.
8	External Sidewalk | Master Plan & EDM	5' proposed sidewalk along 12 Oaks Mall Rd tying into existing sidewalk along 12 Mile Road	Met	
9	Sidewalk Ramps | EDM 7.4 & R-28-K	Not indicated	**Not Met**	**Label proposed ramps at the 12 Mile Road entrance. Update the R-28-I detail in the plans to the latest R-28-K detail.**
10	Any Other Comments:	The applicant added a 4-way stop at this location and noted they have coordinated with mall property owner.		

INTERNAL SITE OPERATIONS				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
11	Loading zone | ZO 5.4	-	N/A	
12	Trash receptacle | ZO 5.4.4	Indicated	Met	The applicant indicated collection will be managed through a waste service with scheduled pick-ups at each unit.
13	Emergency Vehicle Access	Turning movements provided	Met	
14	Maneuvering Lane | ZO 5.3.2	-	N/A	
15	End islands | ZO 5.3.12			
15a	Adjacent to a travel way	Proposed, not dimensioned	**Partially Met**	**Dimension proposed radius at either side of guest parking rows.**
15b	Internal to parking bays	-	N/A	
16	Parking spaces | ZO 5.2.12	10 spaces in addition to parking at each unit		See Planning review letter. **The applicant is requesting a deviation for parking along a major drive.**
17	Adjacent parking spaces | ZO 5.5.3.C.ii.p	<15 spaces without an island	Met	
18	Parking space length | ZO 5.3.2	17' and 25'	Met	17' in front of 7' sidewalk.
19	Parking space Width | ZO 5.3.2	9'	Met	

INTERNAL SITE OPERATIONS				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
20	Parking space front curb height | ZO 5.3.2	Not indicated	**Inconclusive**	**4" required in front of 17' parking spaces, 6" everywhere else. The applicant noted to see detail but no detail is provided.**
21	Accessible parking – number | ADA	2 required, 2 proposed	Met	
22	Accessible parking – size | ADA	9' with 8' aisle or 9' aisle	Met	
23	Number of Van-accessible space | ADA	1 required, 1 proposed at each site	Met	
24	Bicycle parking			
24a	Requirement | ZO 5.16.1	25 required, 26 proposed	Met	6 covered spaces.
24b	Location | ZO 5.16.1	3 locations	Met	
24c	Clear path from Street | ZO 5.16.1	6'	Met	
24d	Height of rack | ZO 5.16.5.B	3'	Met	
24e	Other (Covered / Layout) | ZO 5.16.1, Text Amendment 18.301	Provided	**Partially Met**	**Refer to the latest layout requirements per Text Amendment 18.301 and update detail on sheet C8.**
25	Sidewalk – min 5' wide | Master Plan	6' and 8' in front of parking	Met	**Revise note 4 on sheet C8 from 5' to 6'.**
26	Sidewalk ramps | EDM 7.4 & R-28-K	Indicated	**Partially Met**	**Update the R-28-I detail in the plans to the latest R-28-K detail.**
27	Sidewalk – distance back of curb | EDM 7.4	Dimensioned	Met	
28	Cul-De-Sac | O Figure VIII-F	-	N/A	
29	EyeBrow | O Figure VIII-G	-	N/A	
30	Turnaround | ZO 5.10	Dimensioned	Met	
31	Any Other Comments:			

SIGNING AND STRIPING				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
32	Signing: Sizes | MMUTCD	Partially provided	**Partially Met**	**Include sign sizes for R1-1 and W14-2 signs.**
33	Signing table: quantities and sizes	Table provided	Met	
34	Signs 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U-channel post | MMUTCD	Included	Met	
35	Signs greater than 12" x 18" shall be mounted on a galvanized 3 lb. or greater U-channel post | MMUTCD	Included	Met	
36	Sign bottom height of 7' from final grade | MMUTCD	Included	Met	

SIGNING AND STRIPING				
No.	**Item**	**Proposed**	**Compliance**	**Remarks**
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 | MMUTCD	Included	Met	
38	FHWA Standard Alphabet series used for all sign language | MMUTCD	Included	Met	
39	High-Intensity Prismatic (HIP) sheeting to meet FHWA retro-reflectivity | MMUTCD	Included	Met	
40	Parking space striping notes	Provided	Met	
41	The international symbol for accessibility pavement markings | ADA	Provided	Met	
42	Crosswalk pavement marking detail	Provided	Met	
43	Any Other Comments:	No parking signs along roadways where parking will be prohibited have been added.		

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

Paula K. Johnson, PE
Senior Transportation Engineer

Saumil Shah
Project Manager

AECOM
39575 Lewis Drive Suite 400
Novi, MI 48377
USA
aecom.com

Project name:
12-Mile Townes, Multi-Family Development TIS Traffic Review
From:
AECOM

Date:
March 17, 2025

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

CC:
Lindsay Bell, Diana Shanahan, Dan Commer, Humna Anjum

Memo

Subject: 12 Mile Townes, Multi-Family Development TIS Review

The Traffic Impact Study was reviewed to the level of detail provided and AECOM recommends **approval with conditions, as indicated,** of the Traffic Impact Study; the applicant should review the comments provided below and provide a revised study to the City.

GENERAL COMMENTS

1. The memo will provide comments on a section-by-section basis following the format of the submitted report.
2. The project is located on the south side of Twelve Mile Road, between Novi Road and Meadowbrook Road.
3. The project includes 127 dwelling units of Town Homes.

BACKGROUND

1. The following roadways were included in the study:
    a. Twelve Mile Road: East/West, 45 mph, 4 lanes divided
    b. Novi Road: North/South, 45 mph, 7 lanes with two-way left-turn lane (TWLTL) south of 12 Mile and 5 lanes with TWLTL north of 12 Mile.
    c. 12 Oaks Mall Road: Private Road, North/South, 25 mph, 4 lanes.
    d. The intersections at the crossovers from just west of Novi Road to just east of the site driveway were included in the study.
2. Turning movement counts were taken on Wednesday, January 15, 2025.
    a. AM peak hour was identified as 8:00 AM to 9:00 AM and the PM peak hour was identified as 4:45 PM to 5:45 PM

EXISTING CONDITIONS

1. Overall Level of Service (LOS) at the major road intersections is LOS B or better.
    a. All individual movements are LOS D or better.
2. Minor queues were observed in the SimTraffic for peak 15-minute periods, but the queues quickly dissipated.

BACKGROUND CONDITIONS 2026

1. A conservative 0.5% annual growth rate was used to determine the 2026 build year data, based on the SEMCOG population and employment forecasts.
2. No background developments were identified within the vicinity of the project site.
3. Overall operations at the intersections are not expected to change significantly, however, the LOS of the intersection at Twelve Mile Road and Novi Road is anticipated to change from B to C for the AM and PM peak period
    a. A change of 1.4 seconds per vehicle in overall intersection delay during the AM peak hour
    b. a change of 1.0 seconds per vehicle in overall intersection delay during the PM peak hour

SITE TRIP GENERATION

1. ITE Trip Generation Manual, 11th Edition was utilized to calculate the trip generation. Land Use Code 215 Single-Family Attached Housing fitted curve was used.
    a. 917 trips daily
    b. 60 trips in the AM peak hour (15 In and 45 Out)
    c. 72 trips in the PM peak hour (43 In and 29 Out)

SITE TRAFFIC ASSIGNMENT

1. Adjacent street volumes were used to calculate site trip distribution.
    a. The largest portion of the traffic is assumed to be coming from/going to the east on Twelve Mile Road.

FUTURE CONDITIONS

1. Operations at the signalized intersections are not expected to be impacted greatly.
    a. The overall LOS of the intersections has not changed, SBT at 12 Mile Road and 12 Oaks Mall Road changed from LOS C to D during the AM peak hour.
2. The site driveways are expected to operate at LOS A during the AM peak period and LOS B during the PM peak period.

ACCESS MANAGEMENT

1. Due to the volume of traffic on Twelve Mile Road, a right turn taper is warranted at the North Site Drive.
2. Driveway spacing is about 400 ft to 12 Oaks Mall Road and 190 ft to the EB to WB Crossover.
3. **Table 8 suggests a maximum queue length of 41 feet and available storage of 450 feet and 350 feet for Southbound and Northbound on S. Site Drive at 12 Oaks Mall Road respectively. However, the review could not verify the storage in any of the drawings or the TIS report. Through lanes cannot be considered as storage, moreover, a stopped vehicle on a left/inside through lane is a significant safety concern.**
    a. **Condition: TIS preparer to submit the details of S Site Drive gapped out median, sight distance, and storage lengths.**

CONCLUSIONS

1. The intersections all currently operate at LOS D or higher.
2. The system is expected to operate at LOS D or better in 2026 with background traffic growth
3. The proposed development is not expected to cause any significant congestion, with all intersections operating at LOS D or better.
4. A right turn taper is warranted at the Twelve Mile Road at North Site Drive.
5. **TIS preparer to submit the details of S Site Drive gapped out median, sight distance, and storage lengths.**

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

Sincerely,

AECOM

Carlie delaPaz	Saumil Shah	Sarah Binkowski, PE, PTOE
Traffic Engineer	Project Manager	Michigan Traffic Engineering Manager

FAÇADE REVIEW

DRN & ASSOCIATES, ARCHITECTS, PC
Phone: (248) 880-6523
E-Mail: dnecci@drnarchitects.com
Web: drnarchitects.com
50850 Applebrooke Dr., Northville, MI 48167

March 12, 2025

Façade Review Status:
Approved - Section 9 Waiver Recommended for minor underage of Brick.

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

Attn: Ms. Barb McBeth – Director of Community Development

Re: FACADE ORDINANCE REVIEW – Façade Ordinance, Preliminary Site Plan
12 Mile Townes, JSP25-03
Façade Region: 1, Zoning District: RC/RM-1

Dear Ms. McBeth:
This Facade Review is based on the drawings prepared by Pulte Homes, plot stamp dated 9/22/22. The sample board required by Section 5.15.4.D of the Façade Ordinance has not been provided at the time of this review. The Town Center Ordinance Sections 5.15 and 3.27.G are applicable to this project. The percentages of materials proposed are as shown in the table below. The maximum (and minimum) percentages of materials required by the Ordinances are shown in the right-hand columns. Materials that are in non-compliance are highlighted in bold.

High Visibility Buildings	Front	Rear	Right Side	Left Side	Ordinance 5.15 Maximum (Minimum)
Brick	38%	**25%**	45%	45%	100% (30%)
Stone	22%	0%	0%	0%	50%
Asphalt Shingles	20%	20%	6%	6%	50%
Horizontal Cement Filer Siding	0%	50%	24%	24%	50% (Footnote 10)
Vertical Cement Fiber Siding	5%	0%	0%	0%	25%
Shake Cement Fiber Siding	6%	0%	20%	20%	25%
Standing Seam Metal Roof	1%	0%	0%	0%	25%
Trim	8%	5%	5%	5%	15%

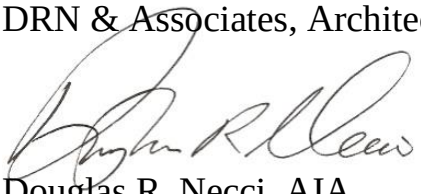
High Visibility Buildings - As shown above, the minimum amount of Brick is not provided on the rear facades (25% vs. 30%). The underage of 5% represents a minor deviation that is not detrimental to the aesthetic quality of the building. A Section 9 Waiver is therefore recommended for the underage of Brick on the rear facades of the High Visibility Buildings.

Standard Visibility Buildings	Front	Rear	Right Side	Left Side	Ordinance 5.15 Maximum (Minimum)
Brick	23%	25%	28%	28%	100% (30%)
Stone	19%	0%	0%	0%	50%
Asphalt Shingles	20%	20%	6%	6%	50%
Horizontal Cement Filer Siding	0%	50%	45%	45%	50% (Footnote 10)
Vertical Cement Fiber Siding	20%	0%	0%	0%	25%
Shake Cement Fiber Siding	9%	0%	20%	20%	25%
Standing Seam Metal Roof	1%	0%	0%	0%	25%
Trim	6%	5%	1%	1%	15%

Standard Visibility Buildings - As shown above, the minimum amount of Brick is not provided on all facades. In this case the deviation is relatively small and is not detrimental to the aesthetic quality of the building. We recommend that a Section 9 Waiver for the underage of Brick is justified based on the reduced level of visibility of the buildings.

The applicant should clarify which building are High and Standard Visibility. We recommend that Buildings 1, 8, 10, 14, 15, 16, 17 & 18 be considered High Visibility, at a minimum.

Sincerely,
DRN & Associates, Architects PC



Douglas R. Necci, AIA

FIRE REVIEW

February 27, 2025

TO: Barbara McBeth - City Planner
Lindsay Bell - Plan Review Center
Dan Commer – Plan Review Center
Diana Shanahan – Plan Review Center
Stacey Choi – Planning Assistant

RE: 12 Mile Road Townes

PreApp24-16
PSP# 25-0005

Project Description:

Build 20 multi-tenant structures off Twelve Mile east of Novi Rd.

Comments:

- **All** fire hydrants **MUST** be installed and operational prior to any combustible material is brought on site. **IFC 2015 3312.1**
- **Corrected 2-27-25 KSP-**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 p All fire apparatus access roads (public and private) with a dead-end drive in excess of one hundred fifty (150) feet shall be designed with a turn-around designed in accordance with Figure VIII-I or a cul-de-sac designed in accordance with Figure VIII-F. ***(D.C.S. Sec 11-194 (a)(20))***
- The minimum width of a posted fire lane is 20 feet. The minimum height of a posted fire lane is 14 feet. ***(D.C.S Sec. 158-99(a).)***
- 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.)***
- 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))
- Water mains greater than 25', shall be at least 8" in diameter. Shall be put on plans for review. ***(D.S.C. Sec.11-68(C)(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.

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

cityofnovi.org

- 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)***
- No part of a commercial, industrial, or multiple residential area shall be more than 300 feet from a hydrant. ***(D.C.S. Sec. 11-68 (f)(1)c.1)***
- For interior fire protection systems a separate fire protection line shall be provided in addition to a domestic service for each building. Individual shutoff valves for interior fire protection shall be by post indicator valve (P.I.V.) or by valve in well and shall be provided within a public water main easement. ***(D.C.S. Sec.11-68(a)(9))***
- 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)***
- 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.

Recommendation:

Approved with Conditions

Sincerely,

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

cc: file

APPLICANT RESPONSE LETTERS

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

JASON M. EMERINE, PE
ROBERT J. EMERINE, PE
ROBERT R. DROUILLARD, PS

June 27, 2025

City of Novi
45175 Ten Mile Road
Novi, Michigan 48375

Attention: **Lindsay Bell, Senior Planner**

Regarding: **JSP25-0003**
12 Mile Road Townes

Please find below a detailed response to the Comprehensive Review packet that was received by Seiber Keast Lehner for the 12 Mile Road Townes Project. The responses have been addressed according to the specific review letters received.

Planning Review - Dated June 9, 2025

ORDINANCE REQUIREMENTS

1. A Street and Project Naming application will be submitted.
3. We will add a pedestrian crossing at the intersection of Bishop Drive and Twelve Oaks Mall road.
5. The Photometric plans will be updated with our next submittal.
6. Singh Development will supply documentation as to the private agreements for the 86-foot wide easement for ingress/egress.

Planning Review Chart:

- The 150-foot setback from the Waltonwood buildings to the south will be addressed through Singh Development and the City.

Deviations

a. Building Orientation *(Sec. 3.8.2.D)*
REQUIREMENT:
i. 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 forty-five (45) degrees to said property line.

We are requesting a deviation because the buildings are not designed to be constructed at a 45-degree angle to the property line, and reorienting them would significantly impact the site layout and building functionality.

DEVIATION REQUEST:
i. Requested deviation for buildings not to be configured at 45 degrees

b. Setbacks *(Sec. 3.31.7.D)*
REQUIREMENT
i. Front Yard Setback – 50 feet

ii. Side Yard Setback(s) - 35 feet (2) (total of two 70 ft.)

We are requesting deviations from the building setback requirements as outlined below. The current setbacks are more aligned with a traditional "suburban" development pattern, whereas this location—along with recent text amendments to the Zoning Ordinance that promote greater density—supports a more urban development approach consistent with the intent of the PD-2 Overlay. We are preserving the existing 30-foot greenbelt along the eastern boundary of the east parcel, and the proposed front yard setback deviations will contribute to a more defined and engaging streetscape.

DEVIATION REQUEST

i. Front Yard Setback – Reduce the setback from 50 feet to 20 feet along 12 Mile Road.
ii. Front Yard Setback – Reduce the setback from 50 feet to 30 feet along 12 Oaks Road & Huron Circle.
iii. Side Yard Setback(s) - Reduce the setback from 35 feet to 20 feet along the easterly boundary of the east parcel.

c. Parking along Major Drives *(Sec. 5.10.1.B)*

REQUIREMENT:

i. Parking lots shall be setback a minimum of ten (10) feet from a major and minor drives and twenty (20) feet from any property line, unless a greater distance is specified for non-residential and multiple-family uses elsewhere in this Ordinance. Angled and perpendicular parking spaces may be accessed directly from a minor drive or parking lot aisle, but not from a major drive

We seek a deviation to allow perpendicular parking on a major drive on the west side of the site. We are requesting a deviation from this ordinance because the only thoroughfare proposed is a major drive.

DEVIATION REQUEST:

i. Requested deviation is to have perpendicular parking on a major drive.

d. Distance between Buildings *(Sec. 3.8.2.H)*

REQUIREMENT:

i. In all RM-1 and RM-2 districts, the minimum distance between any two (2) buildings shall be regulated according to the length and height of such buildings, and 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 distance shall be fifteen (15)feet.

We are seeking a deviation to allow a 20-foot separation between buildings because the proposed layout is designed to optimize site planning while maintaining adequate open space and circulation.

DEVIATION REQUEST:

i. Requested deviation is to provide 20 feet between buildings.

e. Landscape Deviations *(Sec. 5.5.3)*

REQUIREMENT:

i. Screening wall or berm along the west and east sides of the site
ii. Street trees and greenbelt trees along 12 Mile Road frontage

iii. Street trees along Twelve Oaks Mall Drive

We are requesting a deviation from the screening wall or berm requirement on the west side of the property to preserve the natural conditions as no development is proposed in the adjacent area, and the existing vegetation is proposed to remain. We are requesting a deviation from the street trees and greenbelt requirement along the 616 LF of 12 Mile Road frontage for the same reasons. On the eastern property line, we are proposing an opaque fence.

We are requesting a deviation from the street tree requirement on Twelve Oaks Drive north of the western units due to utility conflicts. We are requesting a deviation from street trees along Twelve Oaks Mall Drive north of entries due to lack of space between the sidewalks and curb.

DEVIATION REQUEST:

i. No screening wall or berm along the west side of the site
ii. An opaque fence in lieu of a screening wall or berm along the east side of the site
iii. No street trees or greenbelt trees along the western 616 LF of 12 Mile Road frontage
iv. No street trees along Twelve Oaks Mall Drive north of the western units

f. Façade Deviation *(Sec. 5.15)*

REQUIREMENT:

i. Minimum of 30% brick

We are requesting a deviation from the required brick percentage in order to maintain the intended architectural style of the buildings. The proposed variation is minimal and does not compromise the overall aesthetic quality or visual appeal of the design.

DEVIATION REQUEST:

i. 25% brick on the rear facades of the high-visibility buildings
ii. 23-28% brick on all facades of the standard visibility buildings

Engineering Review - Dated June 5, 2025

Recommends approval

Landscape Review - Dated April 11, 2025

See attached Response Letter from Allen Design

Wetland Review - Dated April 25, 2025

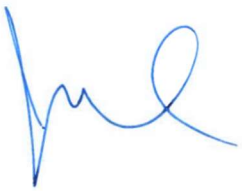
See attached Response Letter from Allen Design

Traffic Review - Dated April 25th 2025

Recommends approval

9. We have labeled the proposed ramps at 12 Mile Road entrance and added R-28-I detail.
15a. 3-foot radius is now provided at guest parking and labeled.
20. All proposed thickened edge walk is 4" at parking spaces see detail.
25. We revised note 4 on sheet C8 from 5' to 6'.
26. We updated the R-28-I details.
32. Sign sizes for R1-1 & W14-2 have been added to the plans.

Sincerely,
Seiber Keast Lehner, Inc.



Jason A. Rickard, PE

ALLENDESIGN
LAND PLANNING / LANDSCAPE ARCHITECTURE

557 Carpenter · Northville, MI 48167
e. jca@wideopenwest.com
t. (248) 467-4668

April 3, 2025

Mr. Rick Meader, Landscape Architect
City of Novi Community Development
45175 West 10 Mile
Novi, MI 48375

RE: Twelve Mile Townes

Dear Mr. Meader:

Below are our responses to your review dated February 26, 2025.

Landscape Comments:

- *Existing plant material.* Tree sizes are shown on the tree chart. Tag numbers and removals as shown on Sheet C5. All off-site trees 8"+ are shown on the tree plan. This is the same plan that was originally approved with the Griffin project. The woodland note showing a tree fund donation has been removed since the required trees are provided on-site. Wetland impacts are provided. The wetland buffers are shown on the plans.
- *Existing and proposed utilities.* The sanitary sewer has been relocated under the street to eliminate the planting conflict. A typical street with utility detail is provided on L-3.
- *Proposed topography.* Proposed grading and top and bottom of walls are provided on the engineering plans.
- *Clear zones.* The clear zones along Twelve Oaks Mall Road have been revised as suggested. Interior clear zones are provided. The clear zone at Twelve Oaks Mall Road and Circle is provided.
- *Berm requirements.* A 6' fence is provided along the east property line. A detail is provided on the engineering plans.
- *Canopy trees between sidewalk and curb.* Greenbelt trees have been shifted to be in front of Building 1.
- *Foundation landscaping.* Additional foundation landscaping has been added to the building sides to make for the shortage.
- *Snow deposit.* Snow deposit will be along the streets within the curb lawn. Any damaged trees will be replaced as needed.
- *Botanical and common names.* The crab apple quantity has been reduced to 92 trees.

Merjent Comment:

- *Wetland A.* The phragmites removal program has been extended from three years to five years.

If you have any questions or comments regarding this response, please contact me at your convenience.

Sincerely,

James C. Allen
Allen Design L.L.C.

COMMUNITY IMPACT STATEMENT

SINGH
A Tradition Of Excellence

Real Estate - Developers - Builders - Investors - Management

SINGH DEVELOPMENT, L.L.C.
7125 ORCHARD LAKE ROAD
SUITE 200
WEST BLOOMFIELD, MICHIGAN 48322

TELEPHONE: (248) 865-1614
CELL PHONE: (248) 866-9799
todd.rankine@singhmail.com
www.singhweb.com

Twelve Mile Townes
Community Impact Statement

April 2025

1. Site Description

The proposed Twelve Mile Townes residential development consists of three vacant parcels of land containing just over 16 acres total.

The property is located on the south side of Twelve Mile Road, roughly mid-way between Novi Road and Meadowbrook Road, in Section 14 of the City of Novi. The subject property is zoned RC, Regional Commercial, and is subject to the PD-2 Overlay District, which provides for residential uses.

This area was envisioned to be a growth area of mixed-use buildings; however, the City of Novi understands the changing commercial real estate climate and the need to be flexible and less restrictive in terms of land uses. In March 2021, the city approved and put in place, text amendments to Article 3 that permitted stand-alone multifamily residential for projects located in the PD-2 Planned Development Option area.

2. Project Description

The proposed Twelve Mile Townes is a multifamily development which consists of 127 townhomes across 20 buildings in a well-planned community setting. Situated on a 16.37-acre site, the project achieves a density of 8.3 units per acre, offering an ideal balance of housing and open space.

Each townhome features a three-bedroom layout, catering to modern living needs with spacious and functional designs. In addition to high-quality residential offerings, Twelve Mile Townes will provide 26,510 square feet (0.61 acres) of usable open space, exceeding the required amount and enhancing the community's livability.

This is a single-use multi-family development, with no commercial or retail uses included in this proposal. The subject property is solely owned by Singh Development with no outside partnerships or third-party interests. The townhome units are intended for condominium ownership.

The proposed development will offer a range of townhome blocks, ranging from 4-unit, 5-unit, 6-unit, 7 unit, and 8-unit buildings. Each townhome will contain ground level garage parking, located under the building.

3. **Surrounding Land Uses**

   a. **North:** Anthology Senior Living and Two Office Buildings, zoned OS-1
   b. **North East:** Vacant property, zoned RA
   c. **North West:** Oakland Hills Memorial Gardens, zoned R-4
   d. **South:** Twelve Oaks Mall, zoned RC
   e. **South East:** Waltonwood Senior Living, zoned RM-1
   f. **East:** Physical rehabilitation center, zoned OST
   g. **West:** McDonald's, zoned RC

4. **Economic and Community Benefit**

   Twelve Mile Townes will not result in unreasonable negative economic impact to the surrounding properties. We fully believe that these townhomes will provide an additional customer base within close proximity to the existing Twelve Oaks Mall and surrounding businesses. The vibrancy of the existing regional commercial district will surely benefit from this new residential community. Twelve Mile Townes will have a positive economic impact and expand the viability of the existing commercial area. In addition, the prosed development is for residential uses only, the removal of the commercial component will surely decrease the average daily trips to and from the property location.

5. **Employment Opportunities**

   Residential construction is known to have a ***positive direct impact on the economy*** as a whole. Work opportunities are created in the construction industry, as well as in industries that provide products or support services to contractors. The National Association of Homebuilders estimates that 1.16 full-time equivalent jobs result from building each multifamily unit having a market value of $116,000. It is estimated that Twelve Mile Townes could create an employment impact of approximately 2 jobs per unit, or 254 jobs. No on-site permanent employees are anticipated for the project.

6. **Impacts on Novi Police Department**

   Based on Police Department records and the SEMCOG population for the year 2020 of 63,966 persons, the per capita response was one Police Department response for every 2.63 persons. Based on occupancy data from a comparable project we estimate a residential population of 202 persons at Twelve Mile Townes (1.59 persons per household). Therefore, we estimate that 77 annual Police Department calls would be made from the project, or 0.2 calls per day. The NPD handles approximately 189 calls per day, so the increase represents a nominal change.

   The Novi Police Department is professionally managed and has approximately 70 dedicated and well-trained full-time officers as well as a professional, proactive, and service oriented civilian staff. They have a long track record of managing the City of Novi's public safety needs for a population of approximately 60,000 residents. The population increase of 202 residents associated with Twelve Mile

Townes represents a nominal increase in overall population and will not impact police services in any significant way.

7. Impacts on Novi Fire Department

The Novi Fire Department has been serving the Novi Community since 1929 and is staffed by a combination of full time and paid-on-call employees who operate from four fire stations located throughout the city. Twelve Mile Townes has been designed pursuant to the City's fire regulations including coverage and access.

Based on the Novi Fire Department's Strategic Plan 2022-2027, the total number of Fire Department calls in 2021 were 8,038, including 115 fires, and 5,129 EMS/Rescue/Extrication calls After deducting a 30-percent factor for commercial, industrial, and office uses, the per capita response for the City of Novi during the year 2021, was 0.08 Fire Department calls per person.

Based on the estimated Twelve Mile Townes population of 202 persons, the total number of projected annual Fire Department responses is 17 calls. The population increase of 202 residents at Townes at Twelve Mile Townes represents a nominal increase in overall population and will not impact fire services in any significant way.

8. City Performance Standards

The proposed Twelve Mile Townes shall comply with all existing City Performance Standards.

9. Utility Connections

The development proposes no increased impacts on municipal utilities above the master planned levels.

10. Traffic Impacts

Attached with this submittal is a Traffic Impact Study, conducted by Fleis & Vandenbrink, traffic engineers. Please refer to this Study for all impacts on surrounding traffic.

11. Storm Water Disposal

Storm water generated on the proposed site will be collected by on site storm sewer piping system and delivered to the existing Twelve Oaks Mall storm water management system. The existing Twelve Oaks detention basin was designed to accommodate the future development of the Twelve Oaks Malls property, once owned by the Taubman Group. Net impervious area on the proposed development is not increased over the original detention basin design assumptions. Therefore, the existing detention basin is adequately sized and no modifications to the basin are required.

12. Refuse and Solid Waste Disposal

Each residential unit within the development is intended to have individual waste and recycling containers to ensure efficient and convenient disposal of solid waste. Collection will be managed through a designated waste service, with scheduled pickups to maintain cleanliness and minimize environmental impact.

13. Environmental Factors

Ecologically, the developed areas will affect the existing vegetation and ground cover to the extent that all existing field grasses and trees will be removed.

The ground water table will be affected slightly due to the extent of paving and building coverage. Soil erosion control will be provided on the site in accordance with the City of Novi requirements.

Air quality will be affected somewhat by automobile emissions and natural gas combustion gases from the apartment heating systems. In addition, the net ambient air temperature of the site will be increased slightly due to the loss of vegetation and the addition of pavement and buildings. Both impacts to air quality and temperature are in line and typical to developments of similar scope, not uncommon with developing a vacant land parcel.

Noise levels will increase due to the additional automobile and truck traffic, and exterior air conditioning units. However, the anticipated noise levels will be less than if this were to be a mixed used development, having commercial deliveries and additional vehicular traffic.

Site lighting will be designed to maintain a low profile and minimize light spill and glare onto the adjacent property. A photometric plan and light fixture catalog cuts will be provided with the Preliminary Site Plan submittal.

The proposed landscaping, a mix of trees, shrubs and groundcover, will soften the overall impact of the development with a significant number of trees are proposed to be planted.

Wildlife commonly found on the site consists of small mammals such as field mice, squirrels, raccoons, and rabbits. A variety of small birds normally populate the area. Most of this wildlife is expected to return after construction is completed.

Finally, there are no known above or underground storage tanks of any kind. No hazardous or toxic chemicals will be stored on-site. No underground storage tanks, wells, or septic tanks are proposed and none will be permitted.

14. Deviations

a. Building Orientation *(Sec. 3.8.2.D)*

REQUIREMENT:

i. 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 forty-five (45) degrees to said property line.

We are requesting a deviation because the buildings are not designed to be constructed at a 45-degree angle to the property line, and reorienting them would significantly impact the site layout and building functionality.

DEVIATION REQUEST:

i. Requested deviation for buildings not to be configured at 45 degrees

b. Setbacks *(Sec. 3.31.7.D)*

REQUIREMENT

i. Front Yard Setback – 50 feet
ii. Side Yard Setback(s) - 35 feet (2) (total of two 70 ft.)

We are requesting deviations from the building setback requirements as outlined below. The current setbacks are more aligned with a traditional "suburban" development pattern, whereas this location—along with recent text amendments to the Zoning Ordinance that promote greater density—supports a more urban development approach consistent with the intent of the PD-2 Overlay. We are preserving the existing 30-foot greenbelt along the eastern boundary of the east parcel, and the proposed front yard setback deviations will contribute to a more defined and engaging streetscape.

DEVIATION REQUEST

i. Front Yard Setback – Reduce the setback from 50 feet to 20 feet along 12 Mile Road.
ii. Front Yard Setback – Reduce the setback from 50 feet to 30 feet along 12 Oaks Road & Huron Circle.
iii. Side Yard Setback(s) - Reduce the setback from 35 feet to 20 feet along the easterly boundary of the east parcel.

c. Parking along Major Drives *(Sec. 5.10.1.B)*

REQUIREMENT:

i. Parking lots shall be setback a minimum of ten (10) feet from a major and minor drives and twenty (20) feet from any property line, unless a greater distance is specified for non-residential and multiple-family uses elsewhere in this Ordinance. Angled and perpendicular parking spaces may be accessed directly from a minor drive or parking lot aisle, but not from a major drive

We seek a deviation to allow perpendicular parking on a major drive on the west side of the site. We are requesting a deviation from this ordinance because the only thoroughfare proposed is a major drive.

DEVIATION REQUEST:

i. Requested deviation is to have perpendicular parking on a major drive.

d. Distance between Buildings *(Sec. 3.8.2.H)*

REQUIREMENT:

i. In all RM-1 and RM-2 districts, the minimum distance between any two (2) buildings shall be regulated according to the length and height of such buildings, and 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 distance shall be fifteen (15)feet.

We are seeking a deviation to allow a 20-foot separation between buildings because the proposed layout is designed to optimize site planning while maintaining adequate open space and circulation.

DEVIATION REQUEST:

i. Requested deviation is to provide 20 feet between buildings.

e. Landscape Deviations *(Sec. 5.5.3)*

REQUIREMENT:

i. Screening wall or berm along the west and east sides of the site
ii. Street trees and greenbelt trees along 12 Mile Road frontage
iii. Street trees along Twelve Oaks Mall Drive

We are requesting a deviation from the screening wall or berm requirement on the west side of the property to preserve the natural conditions as no development is proposed in the adjacent area, and the existing vegetation is proposed to remain. We are requesting a deviation from the street trees and greenbelt requirement along the 616 LF of 12 Mile Road frontage for the same reasons. On the eastern property line, we are proposing an opaque fence.

We are requesting a deviation from the street tree requirement on Twelve Oaks Drive north of the western units due to utility conflicts. We are requesting a deviation from street trees along Twelve Oaks Mall Drive north of entries due to lack of space between the sidewalks and curb.

DEVIATION REQUEST:

i. No screening wall or berm along the west side of the site
ii. An opaque fence in lieu of a screening wall or berm along the east side of the site
iii. No street trees or greenbelt trees along the western 616 LF of 12 Mile Road frontage
iv. No street trees along Twelve Oaks Mall Drive north of the western units

f. Façade Deviation *(Sec. 5.15)*

REQUIREMENT:

i. Minimum of 30% brick

We are requesting a deviation from the required brick percentage in order to maintain the intended architectural style of the buildings. The proposed variation is minimal and does not compromise the overall aesthetic quality or visual appeal of the design.

DEVIATION REQUEST:

i. 25% brick on the rear facades of the high-visibility buildings
ii. 23-28% brick on all facades of the standard visibility buildings

TRAFFIC IMPACT STATEMENT

MEMO

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

VIA EMAIL: Matthew.Delapp@singhmail.com

To:	**Singh Development, LLC**
From:	**Jacob Swanson, PE, PTOE** **Haylee Rubin, EIT** **Fleis & VandenBrink**
Date:	**March 3, 2021** **Revised February 12, 2025**
Re:	**12-Mile Townes, Multi-Family Development** **Novi, Michigan** **Traffic Impact Study**

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed residential development in Novi, Michigan. The project site is located south of 12-Mile Road, adjacent to both sides of 12 Oaks Mall Road, as shown in the attached **Figure 1**. The proposed development includes the construction of a multi-family residential development, located on property that is currently vacant. Site access is proposed via one (1) driveway on 12-Mile Road and one (1) driveway on 12 Oaks Mall Road. A TIS has been required for this project as part of the site plan approval process with the City of Novi and for the permitting of site access on 12-Mile Road with the Road Commission for Oakland County (RCOC).

F&V previously completed a TIS for this project site, dated March 3, 2021. The proposed development plan has since changed; therefore, this study provides an updated evaluation to reflect the current site plan. The scope of work for this study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practices, and information published by Institute of Transportation Engineers (ITE). Additionally, the City of Novi and their traffic engineering consultant (AECOM) provided input regarding the original scope of work. The study analyses were completed using Synchro/SimTraffic (Version 12) traffic analysis software. Sources of data for this study include F&V subconsultant Quality Counts, LLC (QC), RCOC, the City of Novi, the Southeast Michigan Council of Governments (SEMCOG), the Michigan Department of Transportation (MDOT), and ITE.

2 BACKGROUND

2.1 EXISTING ROAD NETWORK

The lane use and traffic control at the study intersections is shown in the attached **Figure 2**. For the purposes of this study, all minor streets, median U-turns (crossovers), and driveways were assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted. Additional information for the study roadways is described below and summarized in **Table 1**.

Table 1: Roadway Information

Roadway Segment	12-Mile Road	Novi Road		12 Oaks Mall Road
		N. of 12-Mile Road	S. of 12-Mile Road	
National Functional Classification	Principal Arterial	Minor Arterial	Principal Arterial	Local Road
Speed Limit	45-mph	45-mph	45-mph	25-mph
Road Jurisdiction	RCOC	City of Novi	RCOC	Private
Average Daily Traffic Volumes (MDOT 2023)	25,911 vpd	6,022 vpd	36,126 vpd	N/A

27725 Stansbury Boulevard, Suite 195
Farmington Hills, MI 48334
P: 248.536.0080
F: 248.536.0079
www.fveng.com

12-Mile Road runs in the east / west directions, adjacent to the north side of the project site. The study section of 12-Mile Road provides a median divided, six-lane cross-section, with two (2) lanes of travel in each direction; left-turn movements are accommodated via median U-turn (crossovers) intersections. 12-Mile Road widens at the signalized study intersection with Novi Road, in order to provide exclusive right-turn lanes in both directions, and widens at the signalized study intersection with 12 Oaks Mall Road, in order to provide an exclusive eastbound right-turn lane and dual (2) exclusive westbound left-turn lanes.

Novi Road runs in the north / south directions, approximately ½-mile west of 12 Oaks Mall Road. The study section of Novi Road, south of 12-Mile Road, provides a seven-lane cross-section, with three (3) lanes of travel in each direction and a center two-way left-turn lane (TWLTL). North of 12-Mile Road, Novi Road provides a five-lane cross-section, with two (2) lanes of travel in each direction and a center TWLTL. At the signalized intersection with 12-Mile Road, Novi Road widens, in order to provide an exclusive northbound right-turn lane.

12 Oaks Mall Road generally runs in the north / south directions, adjacent to both sides of the project parcels. 12 Oaks Mall Road is a four-lane, median divided roadway, with two (2) lanes of travel in each direction. As part of the development plan, a median opening is proposed along 12 Oaks Mall Road, in order to provide full access at the proposed site driveway.

2.2 Existing Traffic Volumes

F&V subconsultant QC, collected existing weekday Turning Movement Count (TMC) data on Wednesday, January 15, 2025, during the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) at the study intersections:

- 12-Mile Road & Novi Road
- 12-Mile Road & WB-to-EB X/O, West of Novi Road
- 12-Mile Road & EB-to-WB X/O, East of Novi Road
- 12-Mile Road & 12 Oaks Mall Road
- 12-Mile Road & EB-to-WB X/O, East of 12 Oaks Mall Road

During the collection of the TMC data, Peak Hour Factors (PHFs), pedestrian and bicycle volumes, and commercial truck percentages were recorded and used in the traffic analysis. The peak hours for each of the study intersections were utilized and the volumes were balanced upwards through the study roadway network and carried through at the proposed site driveway. Therefore, the traffic volumes used in the analysis and shown in the attached figures may not match the raw traffic volumes shown in the data collection.

The weekday AM and PM peak hours for the adjacent roadway network were observed to generally occur between 8:00 AM to 9:00 AM and 4:45 PM to 5:45 PM, respectively. Additionally, F&V obtained the current signal timing permits from RCOC for the signalized study intersections within the study roadway network. The signalized intersections operate on RCOC's Sydney Coordinated Adaptive Traffic System (SCATS); therefore, the signal timings were optimized for each scenario studies, in order to reflect the true signal operations and real time optimizations made to accommodate the traffic volumes observed by the approach lane detectors. The existing 2025 peak hour traffic volumes used in the analysis are shown in the attached **Figure 3**. All applicable background data referenced in this analysis is attached.

3 Existing Conditions (2025)

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro/SimTraffic (Version 12) traffic analysis software. This analysis was based on the existing lane use and traffic control shown in the attached **Figure 2**, the existing peak hour traffic volumes shown in the attached **Figure 3**, and the methodologies presented in the *Highway Capacity Manual* (HCM).

Note: The clustered and non-NEMA phasing signal operations are not supported by the HCM7 methodologies; therefore, HCM 2000 was utilized for the evaluation of the signalized study intersections.

Descriptions of LOS "A" through "F" as defined in the HCM, are attached. Typically, LOS D is considered acceptable, with LOS A representing minimal delay and LOS F indicating failing conditions. The results of the existing conditions analysis are attached and shown in **Table 2**.

The results of the existing conditions analysis indicates that all approaches and movements at the study intersections are currently operating acceptably, at LOS D or better, during both the AM and PM peak hours. Review of SimTraffic network simulations also indicates acceptable operations throughout the study roadway network during both peak periods. Occasional periods of vehicle queues were observed at the signalized study intersections during the peak periods; however, these queues were observed to be serviced within each cycle lengths, leaving no residual vehicle queueing.

Table 2: Existing Intersection Operations

Intersection		Control	Approach	Existing Conditions			
				AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
10	12-Mile Road & WB-to-EB X/O, W. of Novi Road	Signalized	EB	2.5	A	2.7	A
			SBL	43.4	D	53.3	D
			Overall	**6.8**	**A**	**13.6**	**B**
20 & 21	12-Mile Road & Novi Road	Signalized	EBT	9.8	A	16.4	B
			EBR	13.2	B	21.3	C
			WBT	11.8	B	20.0	B
			WBR	15.7	B	17.7	B
			NBT	27.3	C	29.9	C
			NBR	29.1	C	25.7	C
			SBTR	32.8	C	27.2	C
			Overall	**19.2**	**B**	**19.4**	**B**
30	12-Mile Road & EB-to-WB X/O, E. of Novi Road	Signalized	WB	2.0	A	2.0	A
			NBL	43.4	D	46.4	D
			Overall	**11.3**	**B**	**7.7**	**A**
40	12-Mile Road & 12 Oaks Mall Road	Signalized	EBT	3.4	A	2.7	A
			EBR	2.4	A	0.8	A
			NBR	32.0	C	38.8	D
			SBT	33.9	C	41.0	D
			Overall	**8.7**	**A**	**16.2**	**B**
50	12-Mile Road & EB-to WB X/O, E. of 12 Oaks Mall Road	Signalized	WB	1.2	A	2.3	A
			NBL	39.0	D	52.7	D
			Overall	**1.8**	**A**	**3.2**	**A**

4 BACKGROUND CONDITIONS (2026)

4.1 BACKGROUND GROWTH

Historical population and employment community profile data was obtained for the City of Novi from the Southeast Michigan Council of Government (SEMCOG), in order to calculate a annual background growth rate to project the existing 2025 traffic volumes to the site buildout year of 2026. Population and employment projections from 2020 to 2050 were reviewed and indicate average growth rates of approximately 0.37% and 0.39%, respectively. Therefore, a conservative annual background growth rate of **0.5%** per year was utilized for this study, in order to project the existing 2025 peak hour traffic volumes to buildout year of 2026.

In addition to the background growth, it is important to account for traffic generated by approved developments within the vicinity of the study area that are currently under construction or will be within the buildout year. At the time of this study, no background developments were identified within the vicinity of the project site.

4.2 BACKGROUND CONDITIONS ANALYSIS

Background peak hour vehicle delays and LOS ***without the proposed development*** were calculated at the study intersections based on the existing lane use and traffic control shown in the attached **Figure 2**, the background peak hour traffic volumes shown in the attached **Figure 4**, and the methodologies presented in the HCM 2000. Results of the background conditions analysis are attached and summarized in **Table 3**.

The results of the background conditions analysis indicates that all approaches and movements at the study intersections are expected to continue operating acceptably, at LOS D or better during both peak periods, in a manner similar to the existing conditions analysis, with only minor increases in delays. Review of SimTraffic network simulations also indicates acceptable operations during both peak periods, similar to those observations made during existing conditions.

Table 3: Background Intersection Operations

Intersection		Control	Approach	Existing Conditions				Background Conditions				Difference			
				AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
10	12-Mile Road & WB-to-EB X/O, W. of Novi Road	Signal	EB	2.5	A	2.7	A	2.5	A	2.7	A	0.0	-	0.0	-
			SBL	43.4	D	53.3	D	43.4	D	54.3	D	0.0	-	1.0	-
			Overall	**6.8**	**A**	**13.6**	**B**	**6.7**	**A**	**13.8**	**B**	-0.1	-	0.2	-
20 & 21	12-Mile Road & Novi Road	Signal	EBT	9.8	A	16.4	B	11.5	B	18.2	B	1.7	A→B	1.8	-
			EBR	13.2	B	21.3	C	15.8	B	23.3	C	2.6	-	2.0	-
			WBT	11.8	B	20.0	B	14.0	B	22.7	C	2.2	-	2.7	B→C
			WBR	15.7	B	17.7	B	40.3	D	20.2	C	24.6	B→D	2.5	B→C
			NBT	27.3	C	29.9	C	27.3	C	30.7	C	0.0	-	0.8	-
			NBR	29.1	C	25.7	C	29.2	C	26.3	C	0.1	-	0.6	-
			SBTR	32.8	C	27.2	C	33.0	C	27.8	C	0.2	-	0.6	-
			Overall	**19.2**	**B**	**19.4**	**B**	**20.6**	**C**	**20.4**	**C**	1.4	B→C	1.0	B→C
30	12-Mile Road & EB-to-WB X/O, E. of Novi Road	Signal	WB	2.0	A	2.0	A	2.0	A	2.0	A	0.0	-	0.0	-
			NBL	43.4	D	46.4	D	43.5	D	37.8	D	0.1	-	-8.6	-
			Overall	**11.3**	**B**	**7.7**	**A**	**11.3**	**B**	**6.6**	**A**	0.0	-	-1.1	-
40	12-Mile Road & 12 Oaks Mall Road	Signal	EBT	3.4	A	2.7	A	3.4	A	2.7	A	0.0	-	0.0	-
			EBR	2.4	A	0.8	A	2.4	A	0.7	A	0.0	-	-0.1	-
			NBR	32.0	C	38.8	D	32.0	C	38.7	D	0.0	-	-0.1	-
			SBT	33.9	C	41.0	D	33.9	C	40.9	D	0.0	-	-0.1	-
			Overall	**8.7**	**A**	**16.2**	**B**	**8.7**	**A**	**16.1**	**B**	0.0	-	-0.1	-
50	12-Mile Road & EB-to WB X/O, E. of 12 Oaks Mall Road	Signal	WB	1.2	A	2.3	A	1.2	A	2.3	A	0.0	-	0.0	-
			NBL	39.0	D	52.7	D	39.0	D	51.2	D	0.0	-	-1.5	-
			Overall	**1.8**	**A**	**3.2**	**A**	**1.8**	**A**	**3.2**	**A**	0.0	-	0.0	-

Note: Decreased delays are the result of SCATS real time optimizations and/or HCM weighting methodologies

5 TRIP GENERATION

5.1 SITE TRIP GENERATION

The number of weekday peak hour (AM and PM) and daily vehicle trips that would be generated by the proposed development were forecast based on information published in the ITE *Trip Generation Manual, 11th Edition*. The proposed development includes the construction of a residential multi-family development, located on property that is currently vacant. The site trip generation forecast is summarized in **Table 4**.

Table 4: Site Trip Generation

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Single-Family Attached Housing	215	127	DU	917	15	45	60	42	30	72

6 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roadway network based on the proposed site access plan, the existing peak hour traffic patterns in the adjacent roadway network, and the methodologies published by ITE. The adjacent street traffic volumes were used to develop the trip distribution. To determine residential trips distribution, it was assumed that the trips in the AM are home-to-work based trips, and in the PM are work-to-home based trips. Therefore, the global trip generation is based on trips leaving the development in the AM and exiting the study network, then entering the study network and returning to the development in the PM. The ITE trip distribution methodology assumes that new trips will enter the network and access the development, then leave the development and return to their direction of origin. The site trip distributions used in this analysis is summarized in **Table 5**.

Table 5: Site Trip Distribution

To/From	Via	AM	PM
North	Novi Road	11%	14%
South	Novi Road	31%	25%
East	12-Mile Road	34%	36%
West	12-Mile Road	24%	25%
Total		**100%**	**100%**

The site-generated vehicular traffic volumes shown in **Table 4** were distributed to the study roadway network according to the distribution shown in **Table 5**. The site-generated trips shown in the attached **Figure 5** were added to the background peak hour traffic volumes shown in the attached **Figure 4**, in order to calculate the future peak hour traffic volumes, ***with the addition of the proposed development***. Future peak hour traffic volumes are shown in the attached **Figure 6**.

7 FUTURE CONDITIONS (2026 BUILDOUT)

7.1 FUTURE CONDITIONS ANALYSIS

Future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the proposed lane use and traffic control shown in the attached **Figure 2**, the future peak hour traffic volumes shown in the attached **Figure 6**, and the methodologies presented in the HCM. The results of the future conditions analysis are attached and summarized in **Table 6**.

Note: The site driveway intersections were evaluated utilizing the HCM7 methodologies; however, the signalized study intersection operations are not supported by the HCM7 methodologies, due to the clustered operations and non-NEMA signal phasing; therefore, HCM 2000 was determined to be more appropriate for the evaluation of the signalized study intersections.

Table 6: Future Intersection Operations

Intersection		Control	Approach	Background Conditions				Future Conditions				Difference			
				AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
10	12-Mile Road & WB-to-EB X/O, W. of Novi Road	Signal	EB	2.5	A	2.7	A	2.5	A	2.8	A	0.0	-	0.1	-
			SBL	43.4	D	54.3	D	43.4	D	47.7	D	0.0	-	-6.6	-
			Overall	**6.7**	**A**	**13.8**	**B**	**7.3**	**A**	**12.8**	**B**	**0.6**	-	**-1.0**	-
20 & 21	12-Mile Road & Novi Road	Signal	EBT	11.5	B	18.2	B	11.7	B	18.8	B	0.2	-	0.6	-
			EBR	15.8	B	23.3	C	15.4	B	23.9	C	-0.4	-	0.6	-
			WBT	14.0	B	22.7	C	14.1	B	22.4	C	0.1	-	-0.3	-
			WBR	40.3	D	20.2	C	33.3	C	19.4	B	-7.0	D→C	-0.8	C→B
			NBT	27.3	C	30.7	C	27.3	C	30.7	C	0.0	-	0.0	-
			NBR	29.2	C	26.3	C	29.3	C	26.6	C	0.1	-	0.3	-
			SBTR	33.0	C	27.8	C	33.0	C	27.8	C	0.0	-	0.0	-
			Overall	**20.6**	**C**	**20.4**	**C**	**20.4**	**C**	**20.7**	**C**	**-0.2**	-	**0.3**	-
30	12-Mile Road & EB-to-WB X/O, E. of Novi Road	Signal	WB	2.0	A	2.0	A	2.0	A	1.7	A	0.0	-	-0.3	-
			NBL	43.5	D	37.8	D	43.5	D	31.7	C	0.0	-	-6.1	D→C
			Overall	**11.3**	**B**	**6.6**	**A**	**10.9**	**B**	**5.5**	**A**	**-0.4**	-	**-1.1**	-
40	12-Mile Road & 12 Oaks Mall Road	Signal	EBT	3.4	A	2.7	A	3.5	A	2.7	A	0.1	-	0.0	-
			EBR	2.4	A	0.7	A	2.5	A	1.1	A	0.1	-	0.4	-
			NBR	32.0	C	38.7	D	31.9	C	38.4	D	-0.1	-	-0.3	-
			SBT	33.9	C	40.9	D	37.5	D	40.5	D	3.6	C→D	-0.4	-
			Overall	**8.7**	**A**	**16.1**	**B**	**9.9**	**A**	**16.2**	**B**	**1.2**	-	**0.1**	-

	Intersection	Control	Approach	Background Conditions				Future Conditions				Difference			
				AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
50	12-Mile Road & EB-to WB X/O, E. of 12 Oaks Mall Road	Signal	WB	1.2	A	2.3	A	1.8	A	3.0	A	0.6	-	0.7	-
			NBL	39.0	D	51.2	D	36.0	D	52.8	D	-3.0	-	1.6	-
			Overall	**1.8**	**A**	**3.2**	**A**	**4.5**	**A**	**4.8**	**A**	**2.7**	-	**1.6**	-
60	12-Mile Road & N. Site Drive	Stop (Minor)	EB	N/A				Free				N/A			
			NBR					9.6	A	9.8	A				
70	12 Oaks Mall Road & S. Site Drive	Stop (Minor)	EB	N/A				9.4	A	11.2	B	N/A			
			WB					8.5	A	9.0	A				
			NBL					0.0*	A	0.0*	A				
			SBL					7.3	A	7.8	A				

** Indicates no vehicle volume. Note: Decreased delays are the result of SCATS real time optimizations and/or HCM weighting methodologies.*

The results of the future conditions analysis indicates that all approaches and movements at the existing study intersections and proposed site driveways are expected to continue operating acceptably, at LOS D or better during both peak periods. Review of SimTraffic network simulations also indicates acceptable operations throughout the study roadway during both peak periods. The majority of vehicle queues at the signalized study intersections were observed to be serviced within each cycle length, leaving minimal residual vehicle queueing. Additionally, SimTraffic microsimulations indicate that vehicles at the stop-controlled proposed site driveways were able to find adequate gaps within the through traffic during both peak hours, without experiencing significant delays or excessive vehicle queueing.

8 Access Management

8.1 Right-Turn Treatment Evaluation

12-Mile Road is median divided roadway, with left-turns accommodated via median U-turns (crossovers) intersections; therefore, only the right-turn treatment criteria was evaluated. The RCOC right-turn treatment chart was utilized to determine the need for a right-turn treatment at the proposed N. Site Drive on 12-Mile Road. This analysis was based on the existing AADT volumes along 12-Mile Road and the future peak hour traffic volumes at the site driveway, shown in the attached **Figure 6**. The results of the analysis are shown on the attached RCOC warrant charts and summarized in **Table 7**.

Table 7: Auxiliary Right-Turn Lane Analysis Summary

Site Driveway Intersection	AM Peak Hour	PM Peak Hour	Recommendation
12-Mile Road & N. Site Drive	Right-Turn Taper	Right-Turn Taper	**Right-Turn Taper**

- A right-turn taper is warranted along 12-Mile Road at the proposed N. Site Drive.

8.2 Site Driveway Locations

The proposed site driveway on 12-Mile Road was reviewed, in order to determine if there is adequate spacing from the adjacent crossover and ensure that there are not sight-distance concerns.

- The intersection sight distance at the proposed N. Site Drive on EB 12-Mile Road was reviewed and there is minimal vertical and horizontal deflection along 12-Mile Road, adjacent to the N. Site Drive; therefore, the only potential sight distance limitations are due to trees/vegetation along 12-Mile Road, which should be removed during construction.
- The proposed site driveway location on 12-Mile Road was previously reviewed and approved by RCOC. The potential for the queue lengths generated by the crossover intersection impacting the site driveway was again reviewed with the updated traffic volumes and the addition of the site-generated traffic. The results of this evaluation is summarized in **Table 8** and shows that the projected vehicle queue lengths at the crossover will not impact the operations at the site driveway intersection.

- The proposed S. Site Drive on 12 Oaks Mall Road was also evaluated and shows that existing geometry along 12 Oaks Mall Road will adequately accommodate the projected ingress left-turn movements associated with the proposed site operations.

Table 8: Site Driveway Vehicle Queueing Summary

Intersection Approach	AM Peak Hour			PM Peak Hour			Available Storage
	Average	95th %	Max	Average	95th %	Max	
EB-to-WB X/O, East of 12 Oaks Mall Road[1]	1-feet	12-feet	26-feet	1-feet	11-feet	17-feet	**190-feet**
Southbound Left-Turn at S. Site Drive	0-feet	0-feet	0-feet	3-feet	20-feet	41-feet	**450-feet**
Northbound Left-Turn at S. Site Drive	0-feet	0-feet	0-feet	0-feet	0-feet	0-feet	**350-feet**

Exhibit 1: Proposed Driveway Spacing

9 CONCLUSIONS

The conclusions of this TIS are as follows:

1. Existing Conditions (2025)

- The results of the existing conditions analysis indicates that all approaches and movements at the study intersections are currently operating acceptably, at LOS D or better, during both the AM and PM peak hours. Additionally review of SimTraffic network simulations indicates acceptable operations throughout the study roadway network during both peak periods.

2. Background Conditions (2026)

- A conservative annual background growth rate of **0.5%** per year was utilized to project the existing 2025 traffic volumes to the buildout year of 2026.
- The results of the background conditions analysis indicates that all study intersection approaches and movements are expected to continue operating acceptably, at LOS D or better during both peak periods, in a manner similar to the existing conditions analysis. Review of SimTraffic microsimulations also indicates acceptable operations and minimal vehicle queueing during both peak periods.

[1] This evaluation only included the queue lengths within the tangent section of the storage adjacent to EB 12-Mile Road and did not include the U-turn section, which can accommodate approximately 36-feet (1-2 vehicles).

3. Future Conditions (2026)

- The results of the future conditions analysis indicates that all approaches and movements at the study intersections and proposed site driveways are expected to operate acceptably, at LOS D or better during both peak periods.
- Review of SimTraffic microsimulations also indicates acceptable operations throughout the study roadway network; additionally, SimTraffic microsimulations indicates that vehicles at the proposed stop-controlled site driveway intersections were able to find adequate gaps within the through traffic during both peak hours, without experiencing significant delays or excessive vehicle queueing

4. Access Management

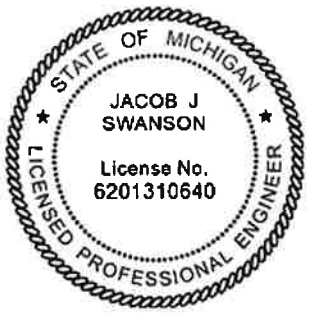
- The City of Novi right-turn treatment warranting criteria was evaluated at the proposed site driveway on 12-Mile Road. The results of the right-turn lane evaluation indicates that a right-turn deceleration taper is recommend at the proposed N. Site Drive.
- The proposed site driveway location on 12-Mile Road was previously reviewed and approved by RCOC. The potential for the queue lengths at the crossover impacting the site driveway was again reviewed with the updated traffic volumes and the site generated traffic. The results show that the projected vehicle queue lengths at the crossover will not impact the site driveway operations.
- The proposed S. Site Drive on 12 Oaks Mall Road was also evaluated and shows that existing geometry on 12 Oaks Mall Road will adequately accommodate the projected ingress left-turn movements associated with the proposed site operations.

10 RECOMMENDATIONS

The recommendations of this TIS are as follows:

- Provide a right-turn taper along eastbound 12-Mile Road at the proposed N. Site Drive.

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



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

Jacob Swanson

Digitally signed by Jacob Swanson
Date: 2025.02.12 15:02:59 -05'00'

Attachments: Figures 1 – 6
Proposed Site Plan
Traffic Volume Data
Signal Timing Permits
SEMCOG Data
Synchro / SimTraffic Results
Auxiliary Right-Turn Warrants

F&V

FIGURE 1

SITE LOCATION

12 MILE TOWNHOMES - NOVI, MI

LEGEND

SITE SITE LOCATION

NORTH

SCALE: NOT TO SCALE

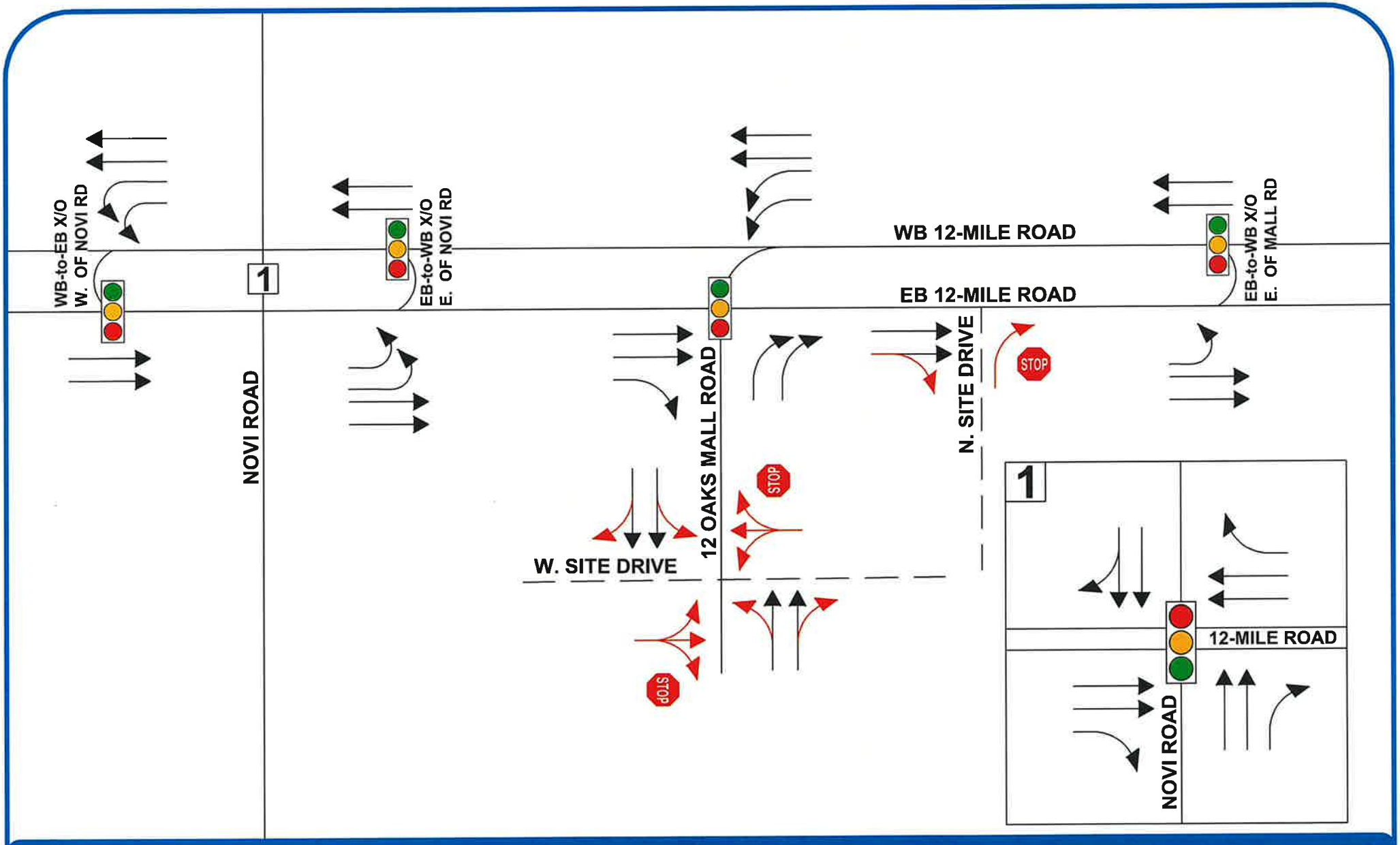


FIGURE 2

LANE USE AND TRAFFIC CONTROL

12 MILE TOWNHOMES - NOVI, MI

LEGEND

ROADS

PROPOSED ROADS

LANE USE

PROPOSED LANE USE

SIGNALIZED INTERSECTION

UNSIGNALIZED INTERSECTION

NORTH

SCALE: NOT TO SCALE

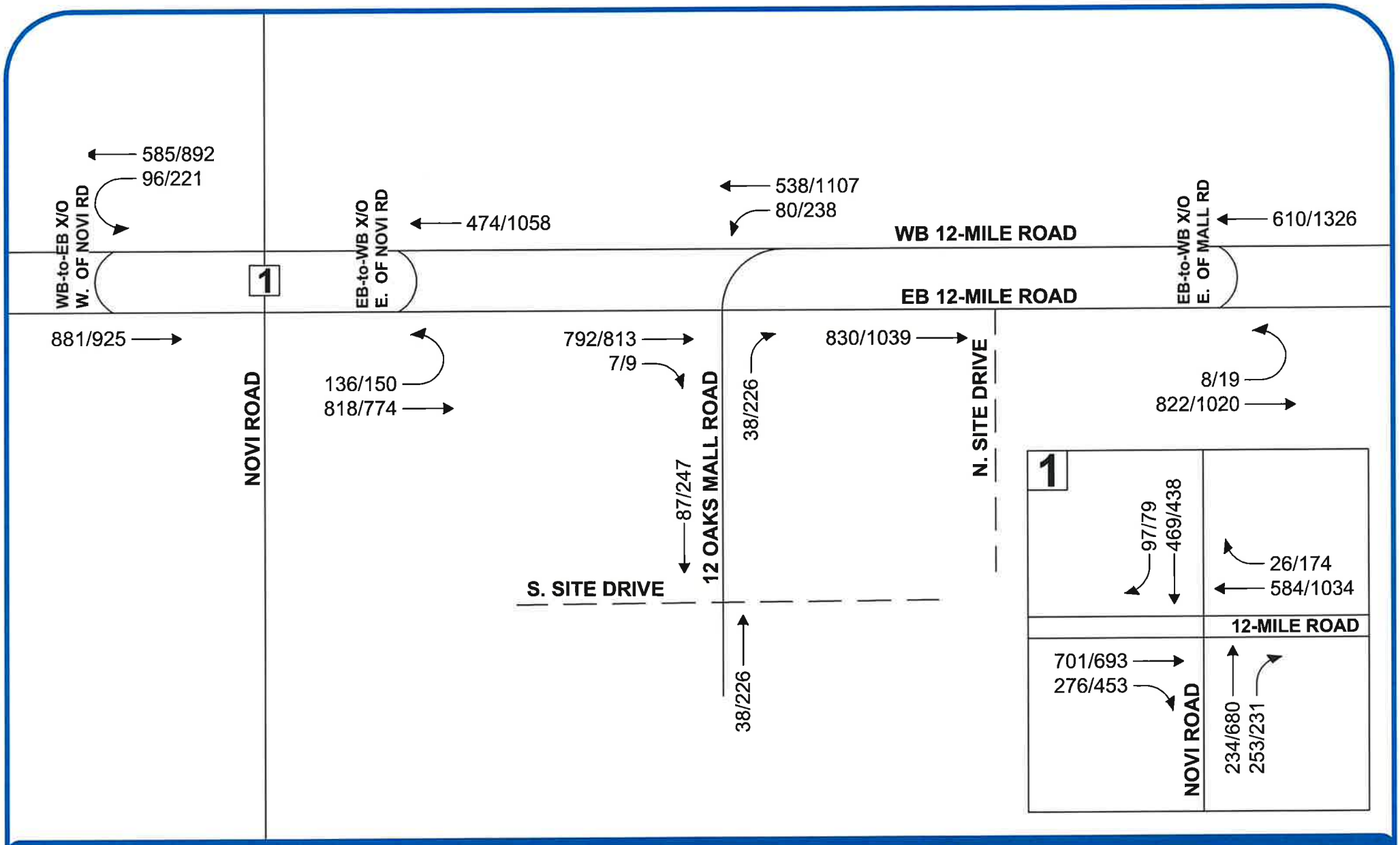


FIGURE 3

EXISTING TRAFFIC VOLUMES

12 MILE TOWNHOMES - NOVI, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE

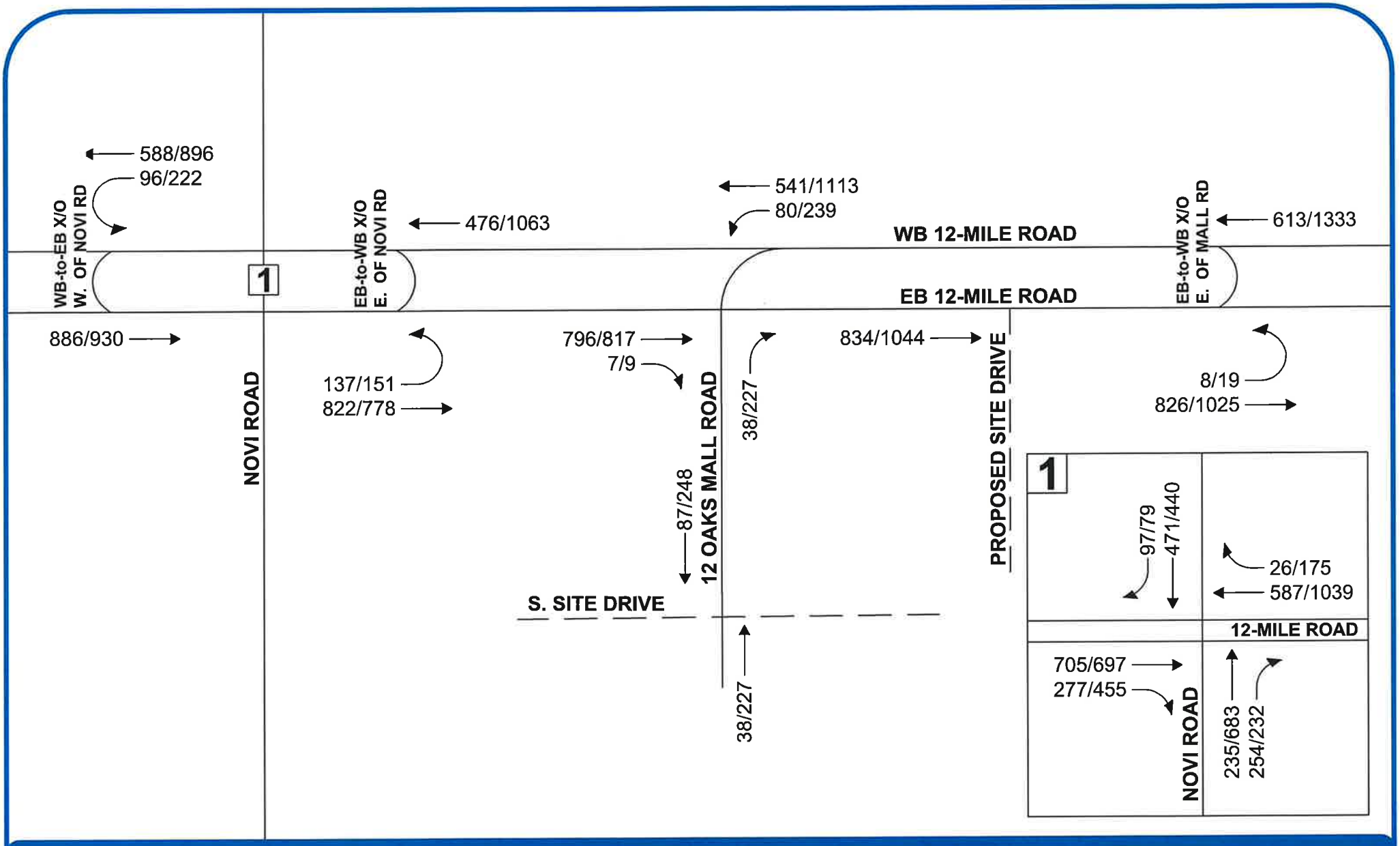


FIGURE 4

BACKGROUND TRAFFIC VOLUMES

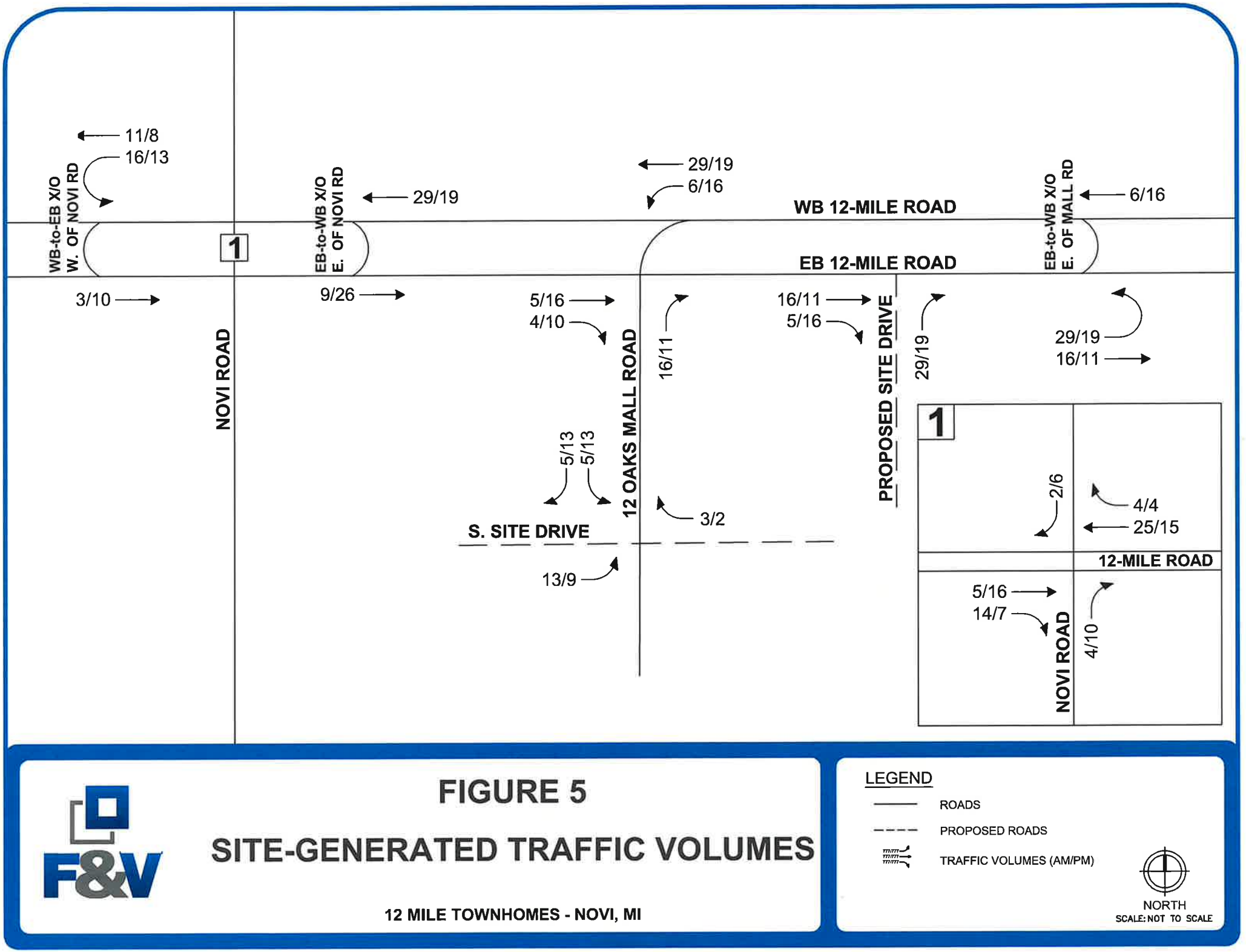
12 MILE TOWNHOMES - NOVI, MI

LEGEND

- ROADS
- PROPOSED ROADS
- TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE


11/8
16/13
WB-to-EB X/O
W. OF NOVI RD
29/19
EB-to-WB X/O
E. OF NOVI RD
29/19
6/16
WB 12-MILE ROAD
6/16
EB-to-WB X/O
E. OF MALL RD
EB 12-MILE ROAD
1
3/10
9/26
NOVI ROAD
5/16
4/10
16/11
5/13
5/13
12 OAKS MALL ROAD
3/2
S. SITE DRIVE
13/9
16/11
5/16
PROPOSED SITE DRIVE
29/19
29/19
16/11
1
2/6
4/4
25/15
12-MILE ROAD
5/16
14/7
NOVI ROAD
4/10
FIGURE 5
SITE-GENERATED TRAFFIC VOLUMES
12 MILE TOWNHOMES - NOVI, MI
LEGEND
ROADS
PROPOSED ROADS
TRAFFIC VOLUMES (AM/PM)
NORTH
SCALE: NOT TO SCALE

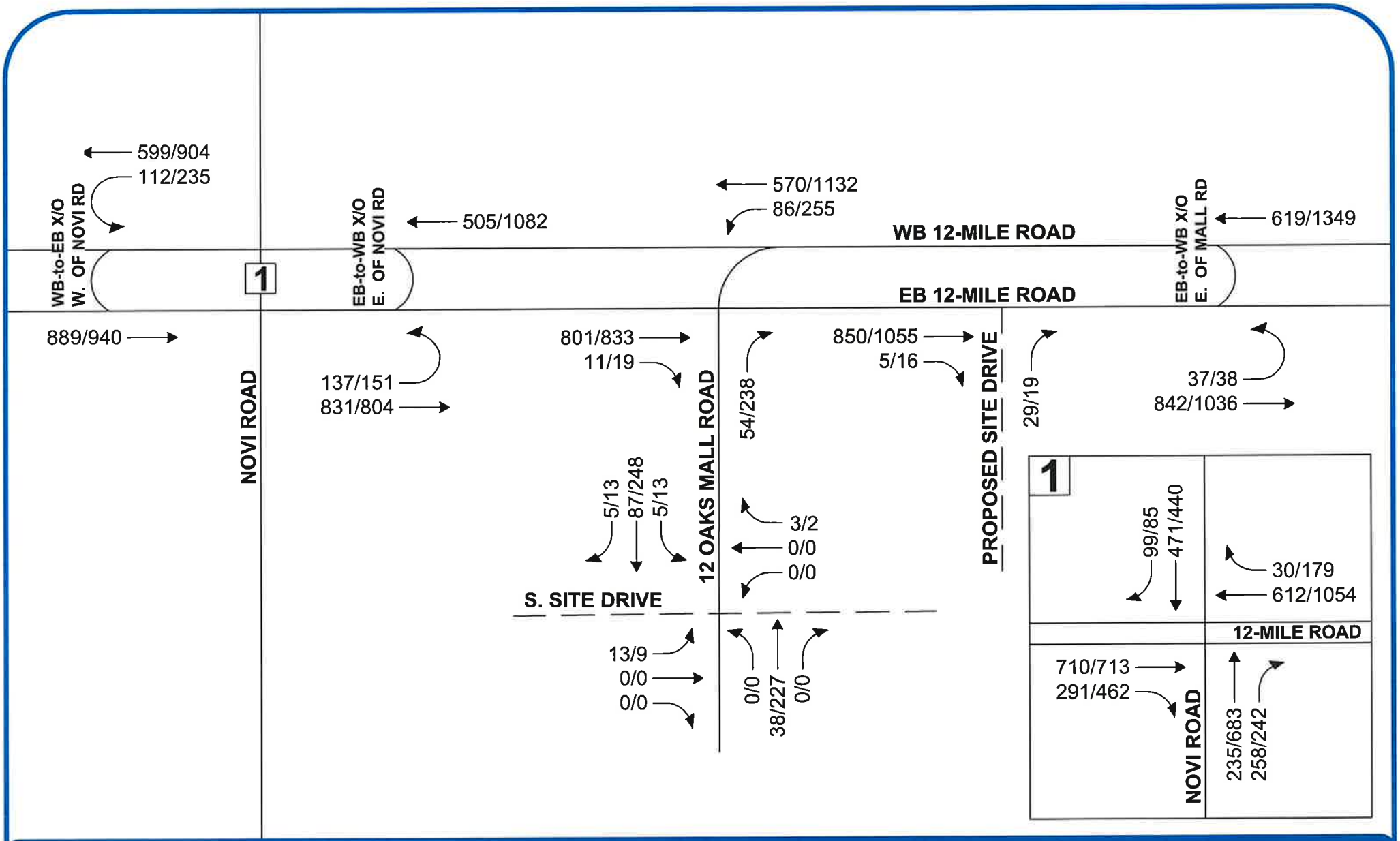


FIGURE 6

FUTURE TRAFFIC VOLUMES

12 MILE TOWNHOMES - NOVI, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (AM/PM)

NORTH

SCALE: NOT TO SCALE

PROPOSED LEGEND

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 inch = 50 ft.

PROJECT NAME:	12 MILE ROAD TOWNES
	SECTION 14, TOWN 1N, RANGE 8E, CITY OF NOVI, OAKLAND COUNTY, MICHIGAN
SHEET TITLE:	SITE PLAN - EAST
PROJECT No.	24-107
SHEET No.	C8

CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP,
MI 48322

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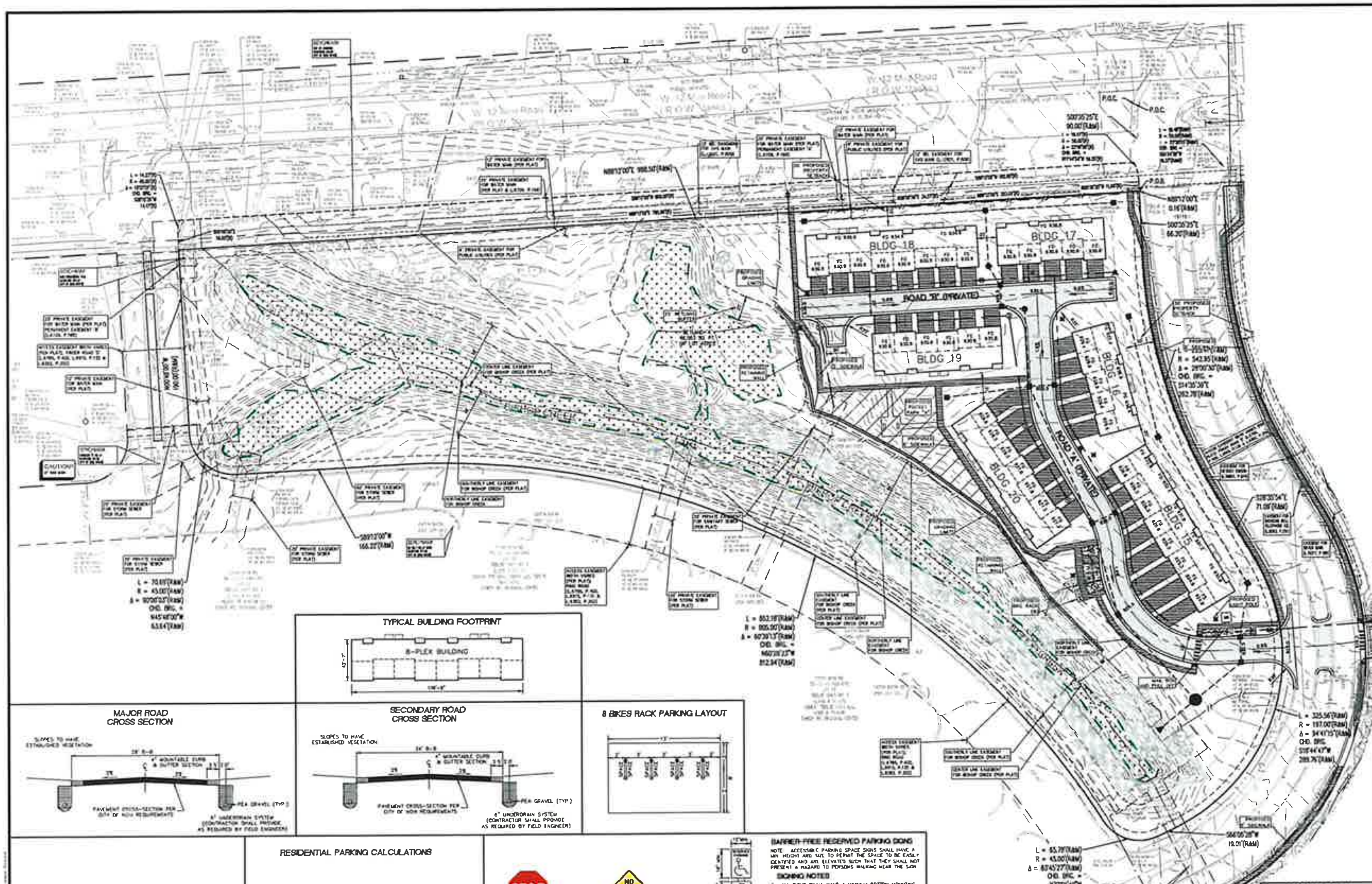
CLAYTON TOWNSHIP OFFICE
FARMINGTON HILLS OFFICE



RESIDENTIAL PARKING CALCULATIONS

PARKING REQUIRED PER SEC. 5.2.12.A
(2.5 SPACES REQUIRED FOR EACH UNIT HAVING 3 OR MORE BEDROOMS)
NO. OF UNITS PROPOSED = 127
PARKING REQUIRED = 127 × 2.5 = 318 SPACES

PARKING PROVIDED =
ATTACHED GARAGE PARKING = 254
APRON GARAGE PARKING = 254
GUEST SURFACE PARKING INCLUDING V.A. SPACE = 17
PARKING PROVIDED = 525 SPACES

ACCESSIBLE PARKING SPACES

TOTAL SURFACE SPACES = 17
ACCESSIBLE SPACES PER 2010 ADA (208.2.3 RESIDENTIAL FACILITIES)
TOTAL REQUIRED: MINIMUM 2% OF THE TOTAL SURFACE SPACES
TOTAL REQUIRED: 17 × 2% = 1 SPACE
TOTAL PROVIDED: 2 VAN ACCESSIBLE SPACE

BIKE RACK REQUIREMENTS

BICYCLE PARKING REQUIRED PER SECTION 5.16.1
(ONE SPACE FOR EACH 5 UNITS REQUIRED)
TOTAL REQUIRED = 127 / 5 = 26 SPACES
TOTAL PROVIDED = 28 SPACES

BUILDINGS COVERAGE

MAXIMUM PERMITTED LOT COVERAGE = 25%
PROVIDED LOT COVERAGE = 17.5%

NOTES AND PROPOSED IMPROVEMENTS

1. MUNICIPAL SEWER TO BE PROVIDED BY CONNECTING TO AN EXISTING 8" SANITARY SEWER FROM EXISTING PHASES TO THE SOUTH.
2. MUNICIPAL WATER TO BE PROVIDED BY CONNECTING TO AN EXISTING 20" WATER MAIN LOCATED ON THE SOUTH SIDE OF TWELVE MILE ROAD, ALSO CONNECTING TO AN EXISTING 8" WATER MAIN LOCATED ON 12 OAKS DRIVE.
3. STORM WATER DETENTION SHALL BE PROVIDED IN THE REGIONAL 12 OAKS BASIN.
4. 5' WIDE CONCRETE SIDEWALKS SHALL BE CONSTRUCTED AS SHOWN.
5. ALL ROADWAYS TO BE PRIVATE.
6. A CITY OF NOVI RIGHT-OF-WAY PERMIT IS REQUIRED FOR WORK WITHIN ANY PUBLIC ROAD RIGHT-OF-WAY.
7. ALL SIDEWALKS AND SIDEWALK RAMPS SHALL A.D.A. COMPLIANT.
8. ALL WORK SHALL CONFORM TO THE CURRENT CITY OF NOVI STANDARDS AND SPECIFICATIONS.
9. PROP. WATER MAIN AND PROP. SANITARY SEWER TO BE CENTERLINE OF 20' WIDE PUBLIC EASEMENT.
10. TRASH TO BE PICKED UP BY CURBSIDE PICK UP.

SIGNAGE NOTES

STOP
NO OUTLET
W14-2

1. STREET NAME SIGNS SHOULD BE PLACED A TOP THE INTERIOR STOP SIGN.
2. STREET-NAME SIGN SHALL COMPLY WITH THE CITY OF NOVI DESIGN STANDARDS.
3. ALL TRAFFIC SIGNAGE SHALL COMPLY WITH THE CURRENT MMUTCD STANDARDS.
4. SIGNS 12"×18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 3 LB. U-CHANNEL POST.
5. SIGNS GREATER THAN 12"×18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST.
6. SIGNS BOTTOM HEIGHT OF 7' FROM FINAL GRADE.
7. SIGNING SHALL BE PLACED 2' FROM THE FACE OF THE CURB OR EDGE OF THE NEAREST SIDEWALK TO THE NEAR EDGE OF THE SIGN.
8. FHWA STANDARD ALPHABET SERIES USED FOR ALL SIGN LANGUAGE.
9. HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETRO-REFLECTIVITY.

BARRIER-FREE PARKING SIGN

POST-MOUNTED

BARRIER-FREE RESERVED PARKING SIGNS

NOTE: ACCESSIBLE PARKING SPACE SIGNS SHALL HAVE A MIN. HEIGHT AND SIZE TO PERMIT THE SPACE TO BE EASILY IDENTIFIED AND ARE ELEVATED SUCH THAT THEY SHALL NOT PRESENT A HAZARD TO PERSONS WALKING NEAR THE SIGN.

SIGNING NOTES

1. ALL SIGNS SHALL HAVE A MINIMUM BOTTOM MOUNTING HEIGHT OF 7' FROM FINAL GRADE FOR GROUND MOUNTED SIGNS. WALL MOUNTED SIGNS MAY HAVE A BOTTOM MOUNTING HEIGHT OF 5'.
2. ALL ROADSIDE SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF THE CURB TO THE NEAR EDGE OF THE SIGN.
3. SINGLE SIGNS WITH NOMINAL DIMENSIONS OF 12"×18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 3 LB. U-CHANNEL POST. MULTIPLE SIGNS AND/OR SIGNS WITH NOMINAL DIMENSIONS GREATER THAN 12"×18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST AS DICTATED BY THE HEIGHT OF THE PROPOSED SIGNS.
4. TRAFFIC CONTROL SIGNS SHALL USE THE FHWA STANDARD ALPHABET SERIES.
5. TRAFFIC CONTROL SIGNS SHALL HAVE A HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETROREFLECTIVITY REQUIREMENTS.

STRIPING NOTES

1. PARKING LOTS SHALL HAVE PARKING AREAS AND RAMP PAVEMENT MARKINGS MARKED BY PAINTED 4-INCH WIDE LINES ACCURATELY AND NEATLY ARRANGED AS INDICATED ON THE PLAN. LINES SHALL BE PAINTED WITH AN APPROVED WHITE TRAFFIC PAINT COMPATIBLE WITH BITUMINOUS/CONCRETE SURFACES SUCH AS SHERWIN WILLIAMS NO. 83 [illegible]; PPG TYPE 11-3 OR 11-4 OR AS APPROVED BY THE OWNER. PROTECT ALL PAINTED AREAS UNTIL PAINT IS COMPLETELY DRY. PARKING AREAS FOR THE PHYSICALLY HANDICAPPED SHALL BE PAINTED WITH BLUE PAINT FOR STRIPING. WHEEL CHAIR SYMBOL SHALL BE PAINTED WHITE. ALL PAINTED MARKINGS AND STRIPING SHALL BE PROVIDED IN TWO COATS.
2. THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY SHALL BE WHITE ON WHITE WITH BLUE BACKGROUND.
3. WHEN A BARRIER FREE PARKING SPACE IS ADJACENT TO A STANDARD PARKING SPACE, BLUE AND WHITE LINES ABUTTING EACH OTHER SHALL BE PROVIDED.

REQUESTED DEVIATIONS

[illegible]

CROSSWALK DETAIL

NOTES:
1. TRANSVERSE LINES SHALL BE 12" WIDE.
2. LONGITUDINAL LINES SHALL BE 24" APART.
3. ALL STRIPING TO BE WHITE PAINT OR APPROVED EQUAL.

WETLAND IMPACT

WETLAND NAME	AREA (AC)	WETLAND IMPACT AREA (AC)	WETLAND FILL VOLUME (CY)	BUFFER DISTURBANCE (AC)
A	1.07	[illegible]	[illegible]	[illegible]
B	0.04	0.02	1307	0.08
C	0.21	0.21	27,443	0.29
TOTAL	1.32	0.23	28,750	0.33

Usable Open Space Calculations SEC. 3.1.7.D

TOTAL No. OF RESIDENTIAL UNITS = 127
USABLE OPEN SPACE REQUIRED = 200 S.F. PER UNIT = 25,400 S.F. = 0.58 AC.
UNIT DECKS (80 S.F. EACH DECK) × 127
UNITS DECKS = 10,160 S.F. = 0.23 AC.
POCKET PARKS = 15,380 S.F. = 0.35 AC.
USABLE OPEN SPACE PROVIDED = [illegible]

SITE DATA

EXISTING ZONING	PD2
GROSS ACRES - WEST	8.80 AC
WETLAND - WEST	1.07 AC
NET ACRES - WEST	7.73 AC
GROSS ACRES - EAST	7.57 AC
WETLAND - EAST	0.25 AC
NET ACRES - EAST	7.32 AC
GROSS ACRES - TOTAL	16.37 AC
WETLAND - TOTAL	1.32 AC
NET ACRES - TOTAL	15.05 AC
NUMBER OF BUILDING	20 EA
NUMBER OF UNITS	127 EA
ALL UNITS HAVE 3 BEDROOMS (4 ROOMS)	
NUMBER OF ROOMS	508 ROOMS
NET AREA REQUIRED	
2000 SF PER ROOM	1,016,000 SF
	23.32 AC
PROPOSED DENSITY	8.4 UNITS/AC

PROPOSED LEGEND

SANITARY SEWER
WATER MAIN
STORM SEWER
DITCH/SWALE
TREE PROTECTION FENCE
SILT FENCE
FLOODPLAIN
WETLANDS
CONTOUR
CURB AND GUTTER
SANITARY MANHOLE
STORM MANHOLE
CATCH BASIN
END SECTION
FIRE HYDRANT
GATE VALVE AND WELL
PAVEMENT (ASPHALT)
PAVEMENT (CONCRETE SIDEWALK)
DIRECTION SURFACE WATER FLOW
GRADE

SEIBER KEAST LEHNER
ENGINEERING | SURVEYING

REVISIONS

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171
TOLL FREE FOR THE LOCATION OF UNDERGROUND FACILITIES

CLIENT:
SINGH DEVELOPMENT, LLC
7125 ORCHARD LAKE RD. #200,
WEST BLOOMFIELD TOWNSHIP, MI 48322

PROJECT NAME:
12 MILE ROAD TOWNES
SECTION 14, TOWN 1N., RANGE 8E., CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SHEET TITLE:
SITE PLAN - WEST

PROJECT NO. 24-197

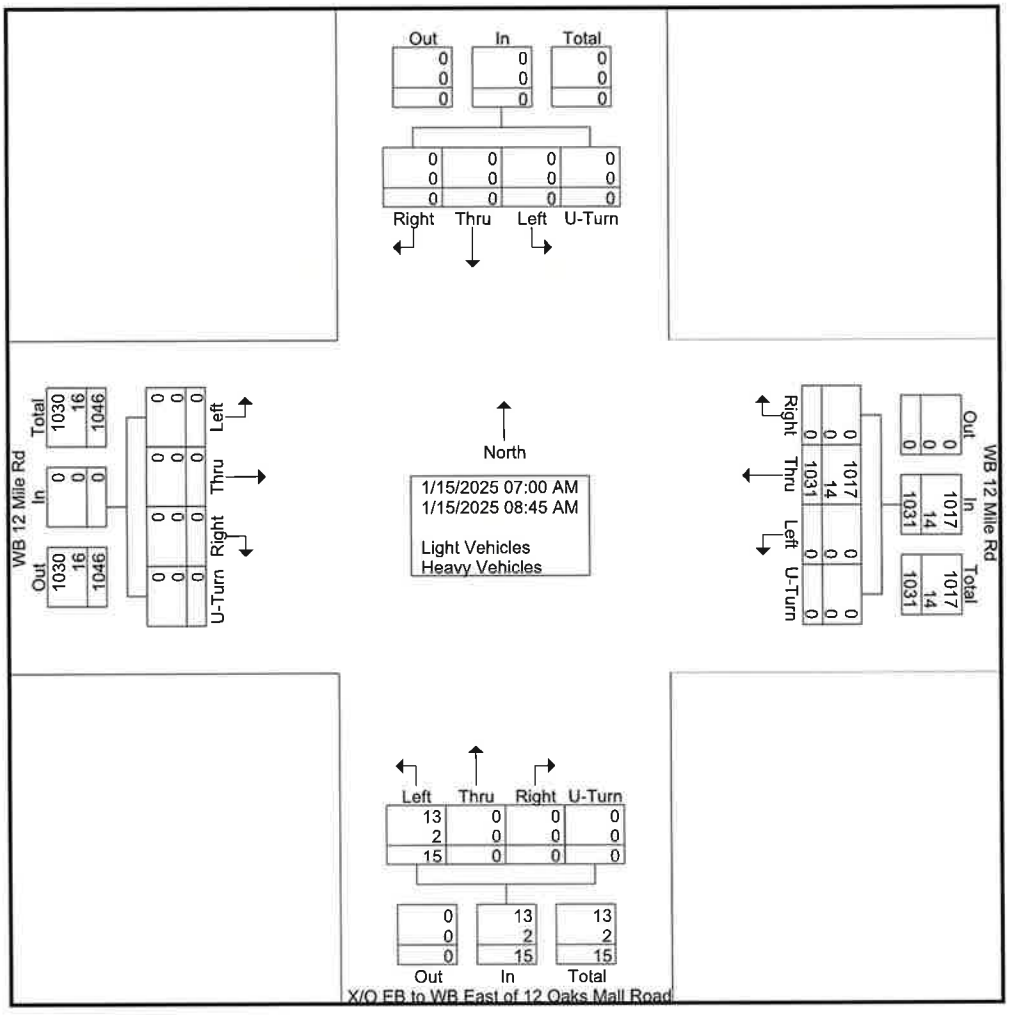
PAGE NO.:
C7

TRUE DATA TO IMPROVE MOBILITY

File Name : 16883001 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883001
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

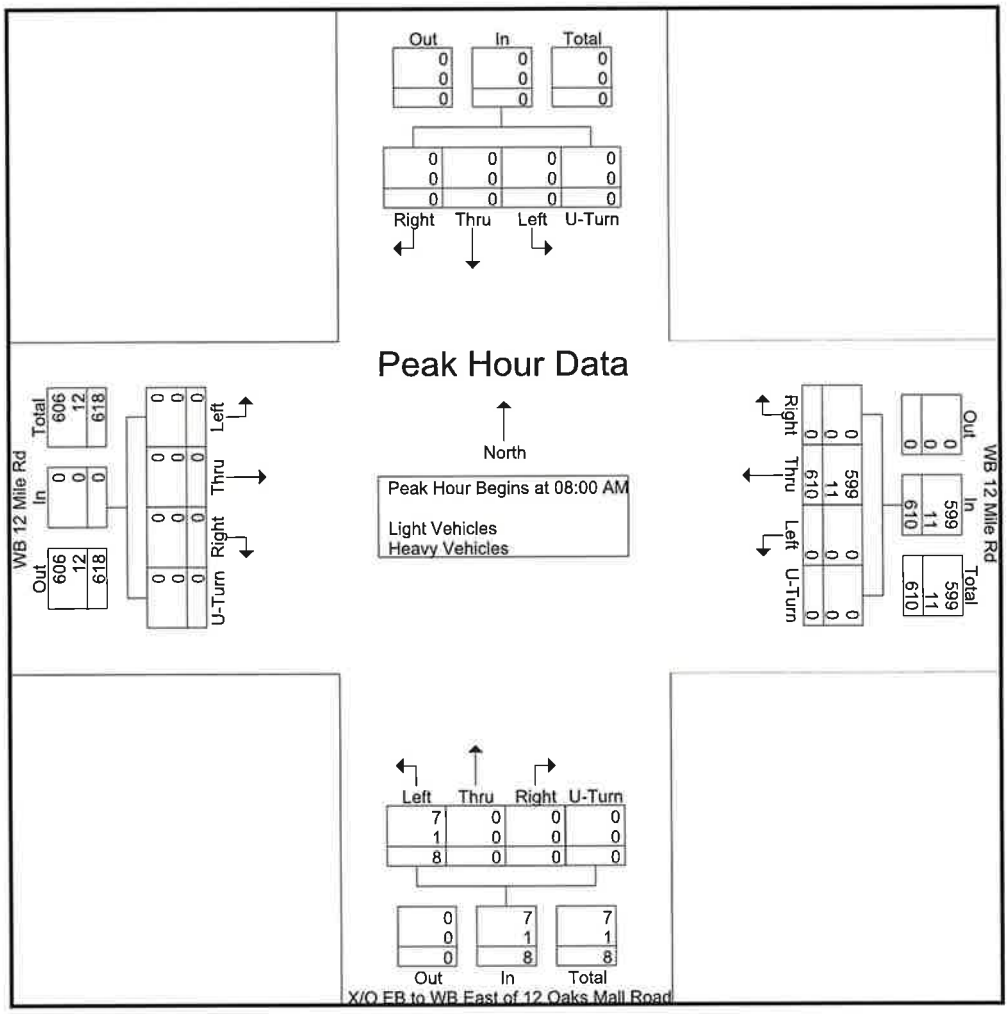
	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	81	0	0	81	2	0	0	0	2	0	0	0	0	0	83
07:15 AM	0	0	0	0	0	0	73	0	0	73	1	0	0	0	1	0	0	0	0	0	74
07:30 AM	0	0	0	0	0	0	131	0	0	131	1	0	0	0	1	0	0	0	0	0	132
07:45 AM	0	0	0	0	0	0	136	0	0	136	3	0	0	0	3	0	0	0	0	0	139
Total	0	0	0	0	0	0	421	0	0	421	7	0	0	0	7	0	0	0	0	0	428
08:00 AM	0	0	0	0	0	0	134	0	0	134	4	0	0	0	4	0	0	0	0	0	138
08:15 AM	0	0	0	0	0	0	132	0	0	132	2	0	0	0	2	0	0	0	0	0	134
08:30 AM	0	0	0	0	0	0	162	0	0	162	0	0	0	0	0	0	0	0	0	0	162
08:45 AM	0	0	0	0	0	0	182	0	0	182	2	0	0	0	2	0	0	0	0	0	184
Total	0	0	0	0	0	0	610	0	0	610	8	0	0	0	8	0	0	0	0	0	618
Grand Total	0	0	0	0	0	0	1031	0	0	1031	15	0	0	0	15	0	0	0	0	0	1046
Apprch %	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	98.6	0	0	98.6	1.4	0	0	0	1.4	0	0	0	0	0	
Light Vehicles	0	0	0	0	0	0	1017	0	0	1017	13	0	0	0	13	0	0	0	0	0	1030
% Light Vehicles	0	0	0	0	0	0	98.6	0	0	98.6	86.7	0	0	0	86.7	0	0	0	0	0	98.5
Heavy Vehicles	0	0	0	0	0	0	14	0	0	14	2	0	0	0	2	0	0	0	0	0	16
% Heavy Vehicles	0	0	0	0	0	0	1.4	0	0	1.4	13.3	0	0	0	13.3	0	0	0	0	0	1.5



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883001 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883001
Start Date : 1/15/2025
Page No : 2

	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	134	0	0	134	**4**	0	0	0	**4**	0	0	0	0	0	138
08:15 AM	0	0	0	0	0	0	132	0	0	132	2	0	0	0	2	0	0	0	0	0	134
08:30 AM	0	0	0	0	0	0	162	0	0	162	0	0	0	0	0	0	0	0	0	0	162
08:45 AM	0	0	0	0	0	0	**182**	0	0	**182**	2	0	0	0	2	0	0	0	0	0	**184**
Total Volume	0	0	0	0	0	0	610	0	0	610	8	0	0	0	8	0	0	0	0	0	618
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.838	.000	.000	.838	.500	.000	.000	.000	.500	.000	.000	.000	.000	.000	.840
Light Vehicles	0	0	0	0	0	0	599	0	0	599	7	0	0	0	7	0	0	0	0	0	606
% Light Vehicles	0	0	0	0	0	0	98.2	0	0	98.2	87.5	0	0	0	87.5	0	0	0	0	0	98.1
Heavy Vehicles	0	0	0	0	0	0	11	0	0	11	1	0	0	0	1	0	0	0	0	0	12
% Heavy Vehicles	0	0	0	0	0	0	1.8	0	0	1.8	12.5	0	0	0	12.5	0	0	0	0	0	1.9

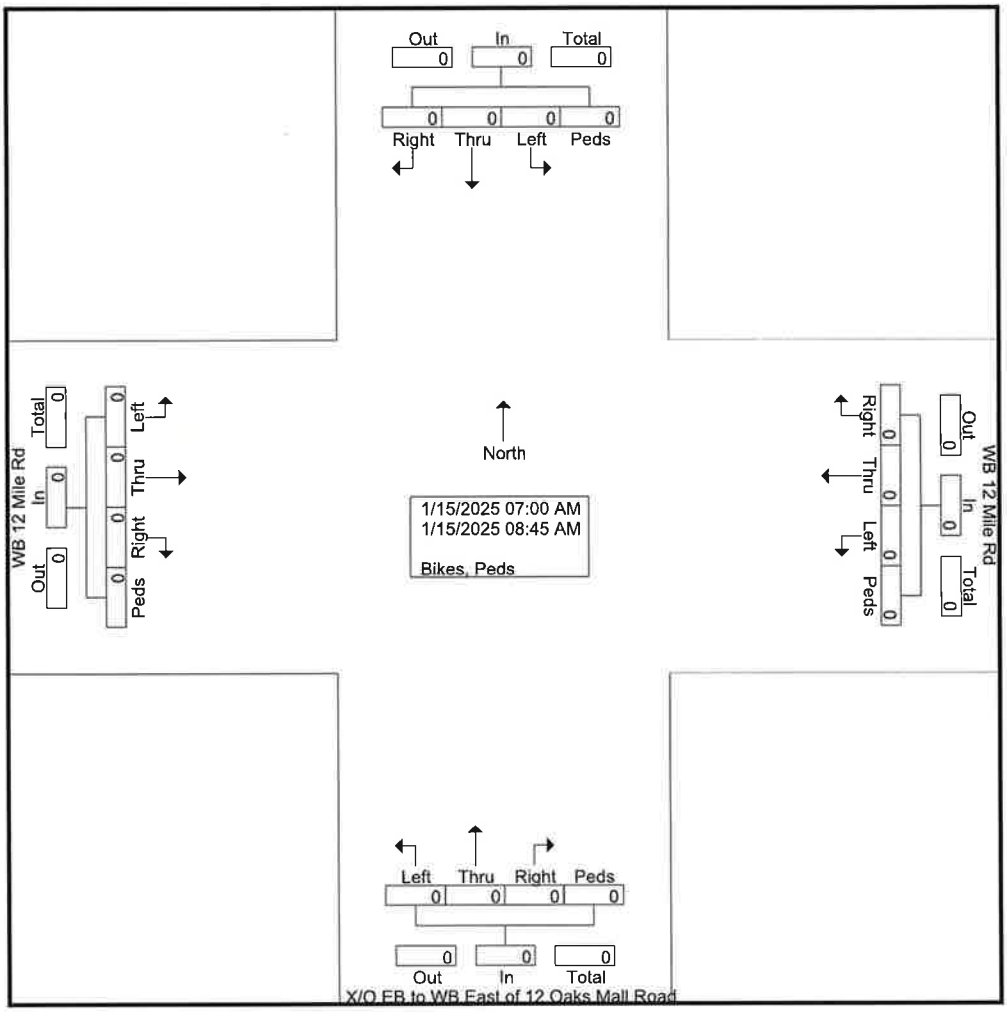


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883001 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883001
Start Date : 1/15/2025

Groups Printed- Bikes, Peds

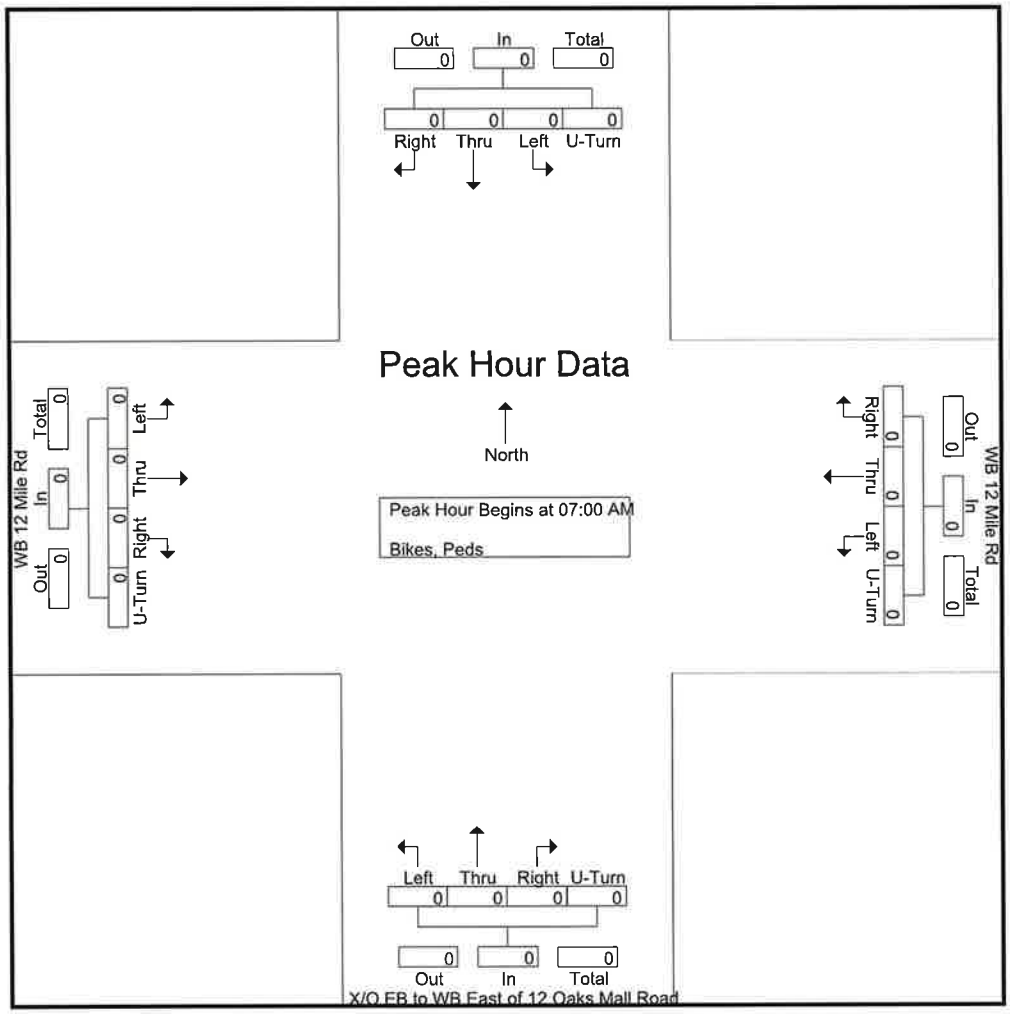
	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883001 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883001
Start Date : 1/15/2025
Page No : 2

	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

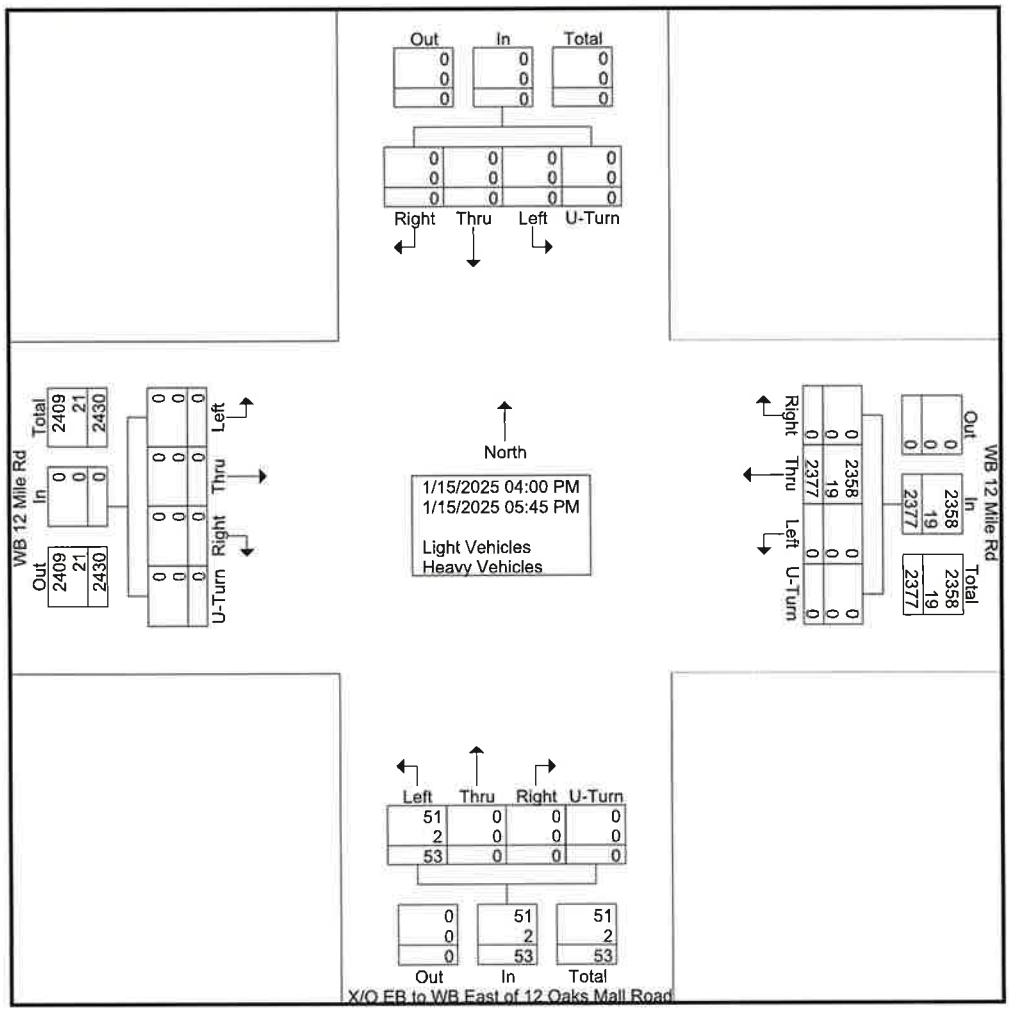


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883002 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883002
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

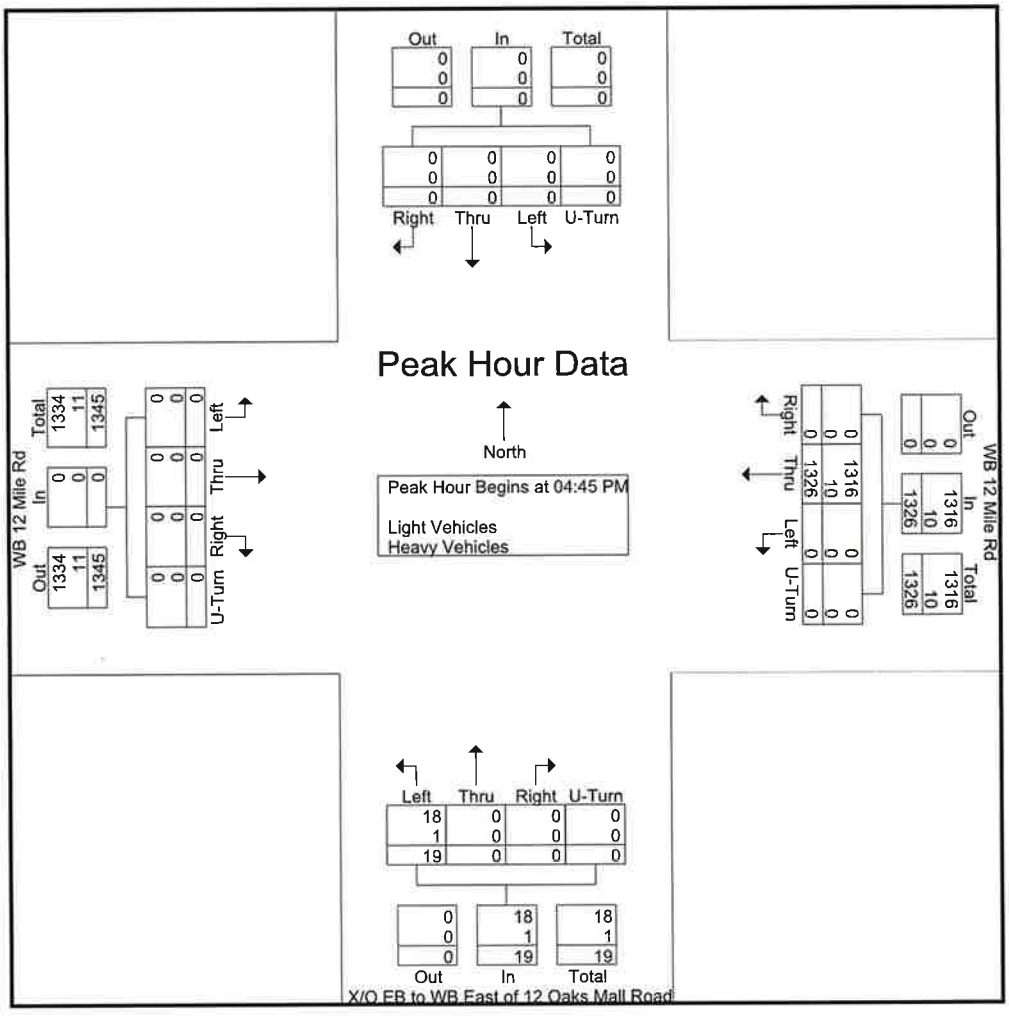
	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	219	0	0	219	13	0	0	0	13	0	0	0	0	0	232
04:15 PM	0	0	0	0	0	0	239	0	0	239	7	0	0	0	7	0	0	0	0	0	246
04:30 PM	0	0	0	0	0	0	267	0	0	267	9	0	0	0	9	0	0	0	0	0	276
04:45 PM	0	0	0	0	0	0	370	0	0	370	4	0	0	0	4	0	0	0	0	0	374
Total	0	0	0	0	0	0	1095	0	0	1095	33	0	0	0	33	0	0	0	0	0	1128
05:00 PM	0	0	0	0	0	0	315	0	0	315	7	0	0	0	7	0	0	0	0	0	322
05:15 PM	0	0	0	0	0	0	334	0	0	334	4	0	0	0	4	0	0	0	0	0	338
05:30 PM	0	0	0	0	0	0	307	0	0	307	4	0	0	0	4	0	0	0	0	0	311
05:45 PM	0	0	0	0	0	0	326	0	0	326	5	0	0	0	5	0	0	0	0	0	331
Total	0	0	0	0	0	0	1282	0	0	1282	20	0	0	0	20	0	0	0	0	0	1302
Grand Total	0	0	0	0	0	0	2377	0	0	2377	53	0	0	0	53	0	0	0	0	0	2430
Apprch %	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	97.8	0	0	97.8	2.2	0	0	0	2.2	0	0	0	0	0	
Light Vehicles	0	0	0	0	0	0	2358	0	0	2358	51	0	0	0	51	0	0	0	0	0	2409
% Light Vehicles	0	0	0	0	0	0	99.2	0	0	99.2	96.2	0	0	0	96.2	0	0	0	0	0	99.1
Heavy Vehicles	0	0	0	0	0	0	19	0	0	19	2	0	0	0	2	0	0	0	0	0	21
% Heavy Vehicles	0	0	0	0	0	0	0.8	0	0	0.8	3.8	0	0	0	3.8	0	0	0	0	0	0.9



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883002 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883002
Start Date : 1/15/2025
Page No : 2

	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	0	**370**	0	0	**370**	4	0	0	0	4	0	0	0	0	0	**374**
05:00 PM	0	0	0	0	0	0	315	0	0	315	**7**	0	0	0	**7**	0	0	0	0	0	322
05:15 PM	0	0	0	0	0	0	334	0	0	334	4	0	0	0	4	0	0	0	0	0	338
05:30 PM	0	0	0	0	0	0	307	0	0	307	4	0	0	0	4	0	0	0	0	0	311
Total Volume	0	0	0	0	0	0	1326	0	0	1326	19	0	0	0	19	0	0	0	0	0	1345
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.896	.000	.000	.896	.679	.000	.000	.000	.679	.000	.000	.000	.000	.000	.899
Light Vehicles	0	0	0	0	0	0	1316	0	0	1316	18	0	0	0	18	0	0	0	0	0	1334
% Light Vehicles	0	0	0	0	0	0	99.2	0	0	99.2	94.7	0	0	0	94.7	0	0	0	0	0	99.2
Heavy Vehicles	0	0	0	0	0	0	10	0	0	10	1	0	0	0	1	0	0	0	0	0	11
% Heavy Vehicles	0	0	0	0	0	0	0.8	0	0	0.8	5.3	0	0	0	5.3	0	0	0	0	0	0.8

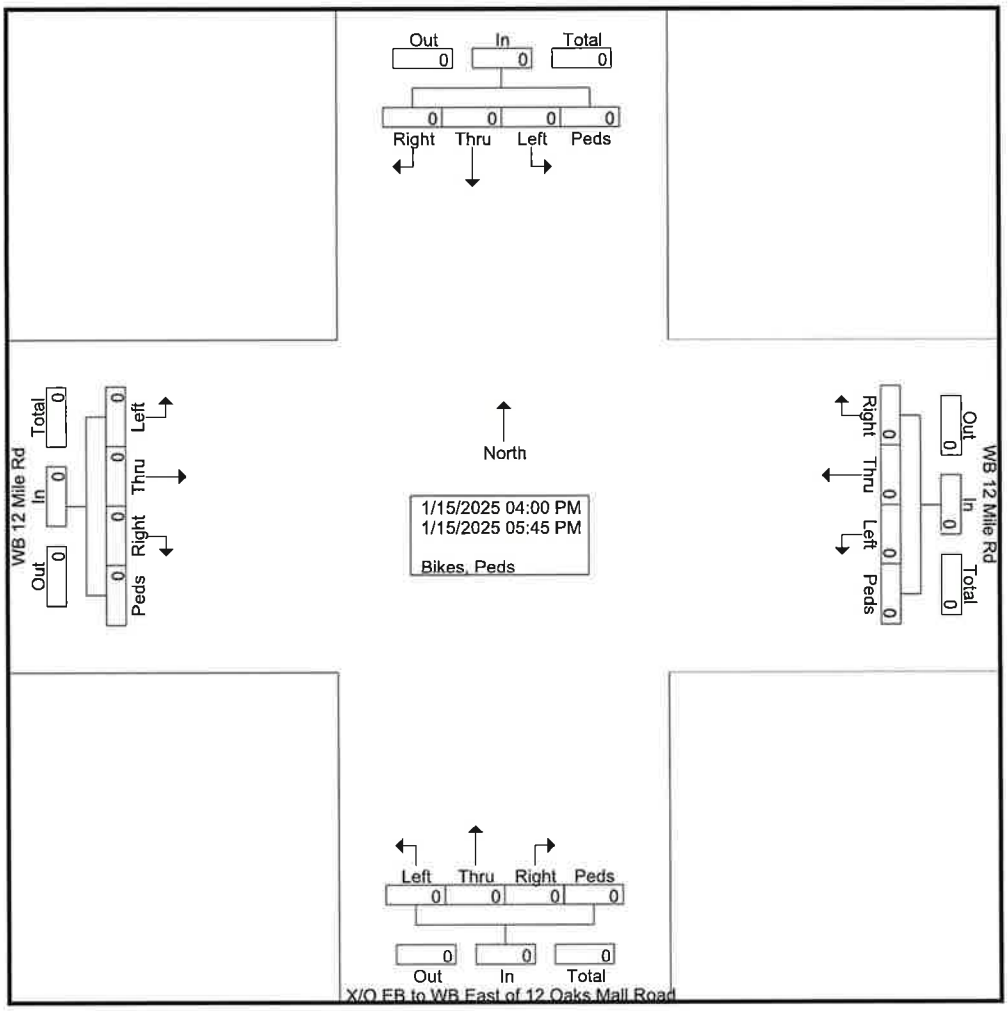


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883002 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883002
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

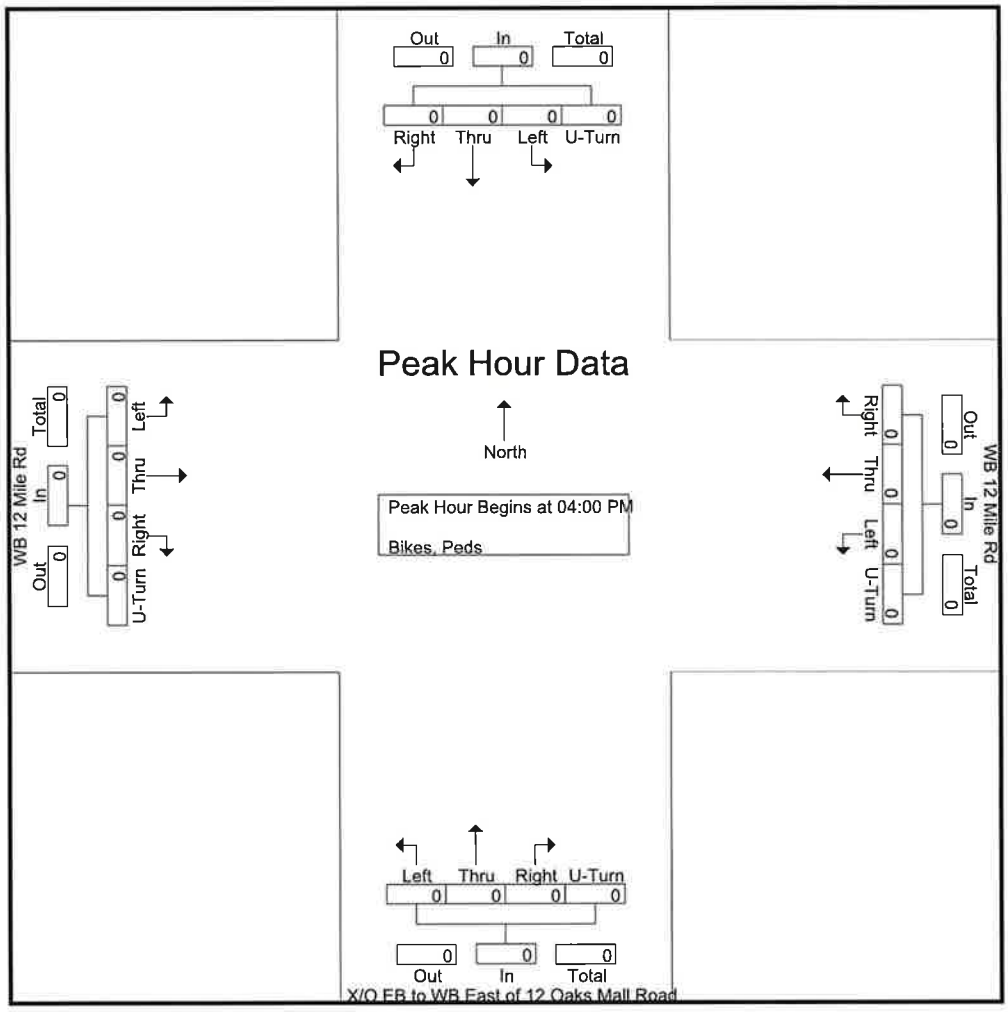
	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883002 - X_O EB to WB East of 12 Oaks Mall Road -- WB 12 Mile Rd
Site Code : 16883002
Start Date : 1/15/2025
Page No : 2

	WB 12 Mile Rd Eastbound					WB 12 Mile Rd Westbound					X/O EB to WB East of 12 Oaks Mall Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

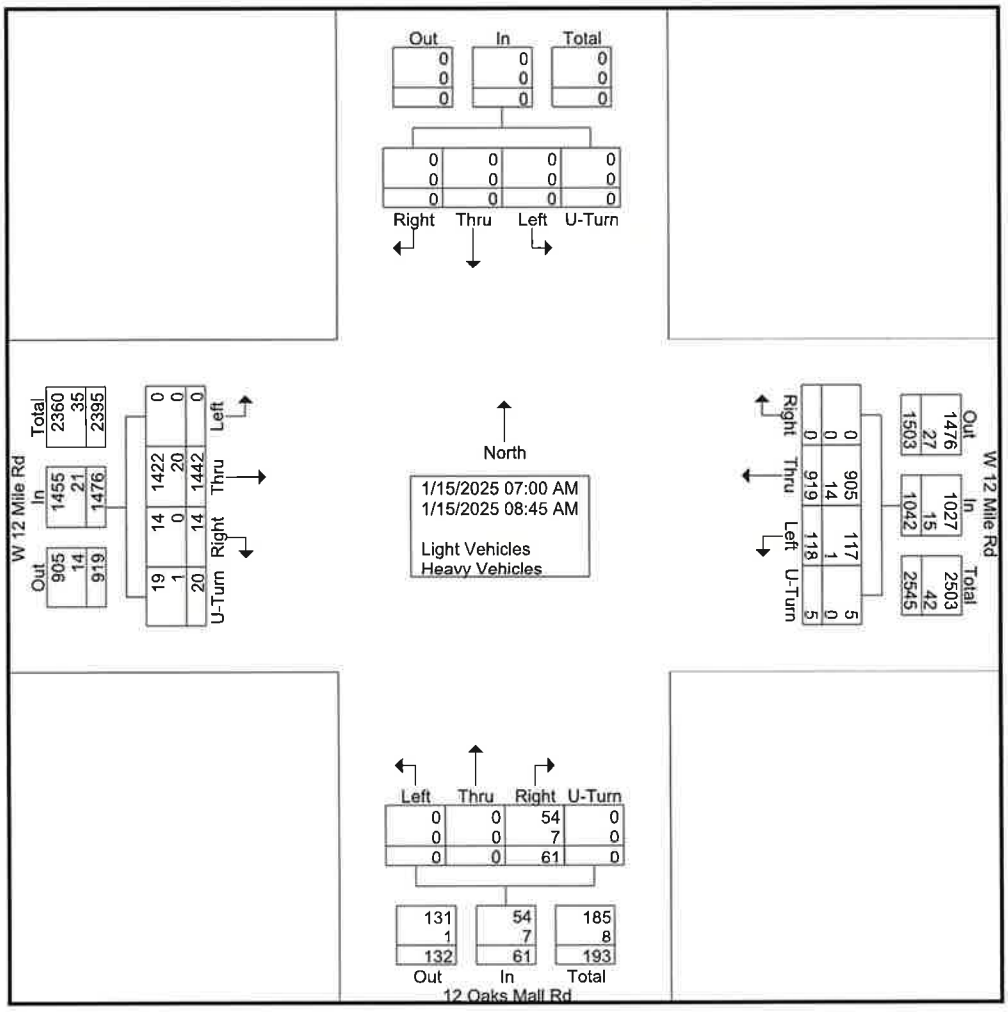


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883003 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883003
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

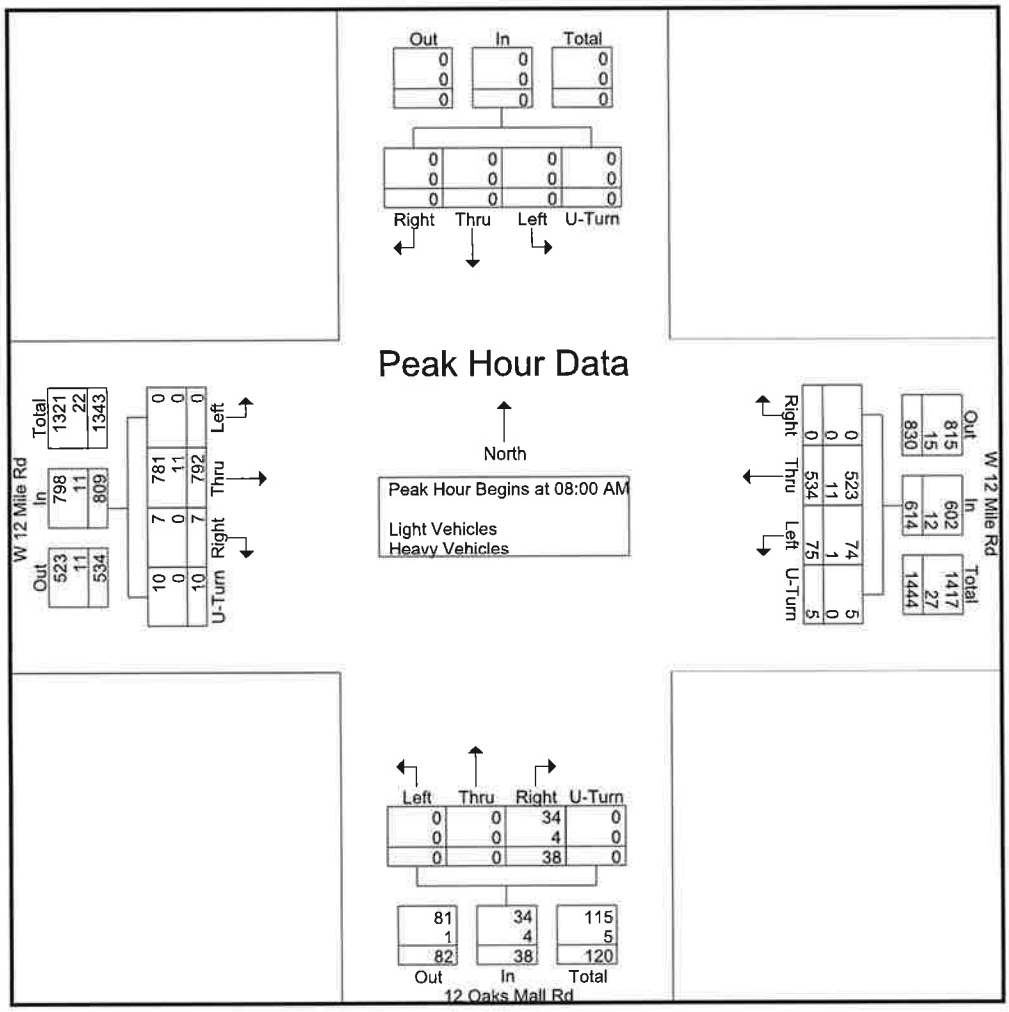
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	0	105	2	3	110	9	71	0	0	80	0	0	5	0	5	0	0	0	0	0	195
07:15 AM	0	147	2	2	151	10	65	0	0	75	0	0	5	0	5	0	0	0	0	0	231
07:30 AM	0	173	1	4	178	3	126	0	0	129	0	0	8	0	8	0	0	0	0	0	315
07:45 AM	0	225	2	1	228	21	123	0	0	144	0	0	5	0	5	0	0	0	0	0	377
Total	0	650	7	10	667	43	385	0	0	428	0	0	23	0	23	0	0	0	0	0	1118
08:00 AM	0	208	2	3	213	16	123	0	0	139	0	0	4	0	4	0	0	0	0	0	356
08:15 AM	0	179	1	2	182	14	117	0	3	134	0	0	13	0	13	0	0	0	0	0	329
08:30 AM	0	211	2	2	215	13	147	0	0	160	0	0	13	0	13	0	0	0	0	0	388
08:45 AM	0	194	2	3	199	32	147	0	2	181	0	0	8	0	8	0	0	0	0	0	388
Total	0	792	7	10	809	75	534	0	5	614	0	0	38	0	38	0	0	0	0	0	1461
Grand Total	0	1442	14	20	1476	118	919	0	5	1042	0	0	61	0	61	0	0	0	0	0	2579
Apprch %	0	97.7	0.9	1.4		11.3	88.2	0	0.5		0	0	100	0		0	0	0	0		
Total %	0	55.9	0.5	0.8	57.2	4.6	35.6	0	0.2	40.4	0	0	2.4	0	2.4	0	0	0	0	0	
Light Vehicles	0	1422	14	19	1455	117	905	0	5	1027	0	0	54	0	54	0	0	0	0	0	2536
% Light Vehicles	0	98.6	100	95	98.6	99.2	98.5	0	100	98.6	0	0	88.5	0	88.5	0	0	0	0	0	98.3
Heavy Vehicles	0	20	0	1	21	1	14	0	0	15	0	0	7	0	7	0	0	0	0	0	43
% Heavy Vehicles	0	1.4	0	5	1.4	0.8	1.5	0	0	1.4	0	0	11.5	0	11.5	0	0	0	0	0	1.7



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883003 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883003
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	208	**2**	**3**	213	16	123	0	0	139	0	0	4	0	4	0	0	0	0	0	356
08:15 AM	0	179	1	2	182	14	117	0	**3**	134	0	0	**13**	0	**13**	0	0	0	0	0	329
08:30 AM	0	**211**	2	2	**215**	13	**147**	0	0	160	0	0	13	0	13	0	0	0	0	0	**388**
08:45 AM	0	194	2	3	199	**32**	147	0	2	**181**	0	0	8	0	8	0	0	0	0	0	388
Total Volume	0	792	7	10	809	75	534	0	5	614	0	0	38	0	38	0	0	0	0	0	1461
% App. Total	0	97.9	0.9	1.2		12.2	87	0	0.8		0	0	100	0		0	0	0	0		
PHF	.000	.938	.875	.833	.941	.586	.908	.000	.417	.848	.000	.000	.731	.000	.731	.000	.000	.000	.000	.000	.941
Light Vehicles	0	781	7	10	798	74	523	0	5	602	0	0	34	0	34	0	0	0	0	0	1434
% Light Vehicles	0	98.6	100	100	98.6	98.7	97.9	0	100	98.0	0	0	89.5	0	89.5	0	0	0	0	0	98.2
Heavy Vehicles	0	11	0	0	11	1	11	0	0	12	0	0	4	0	4	0	0	0	0	0	27
% Heavy Vehicles	0	1.4	0	0	1.4	1.3	2.1	0	0	2.0	0	0	10.5	0	10.5	0	0	0	0	0	1.8

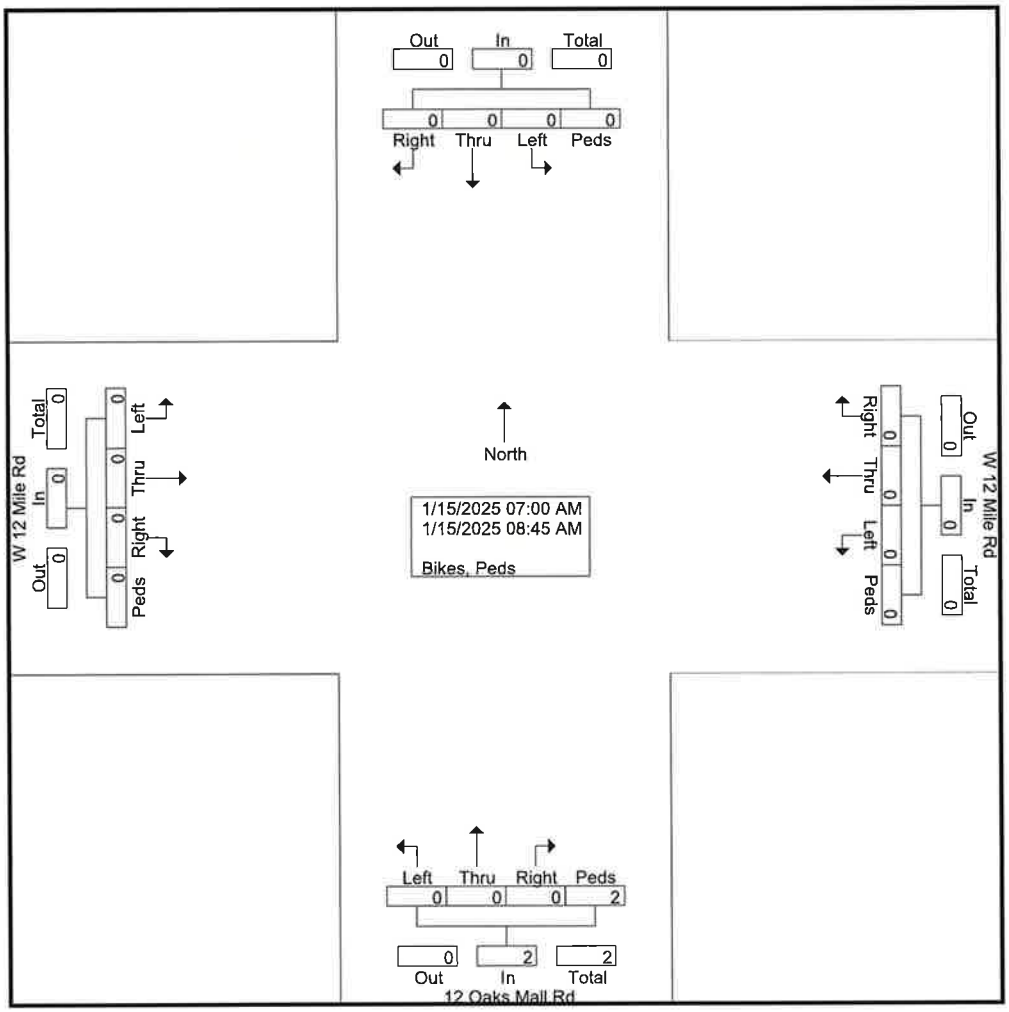


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883003 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883003
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

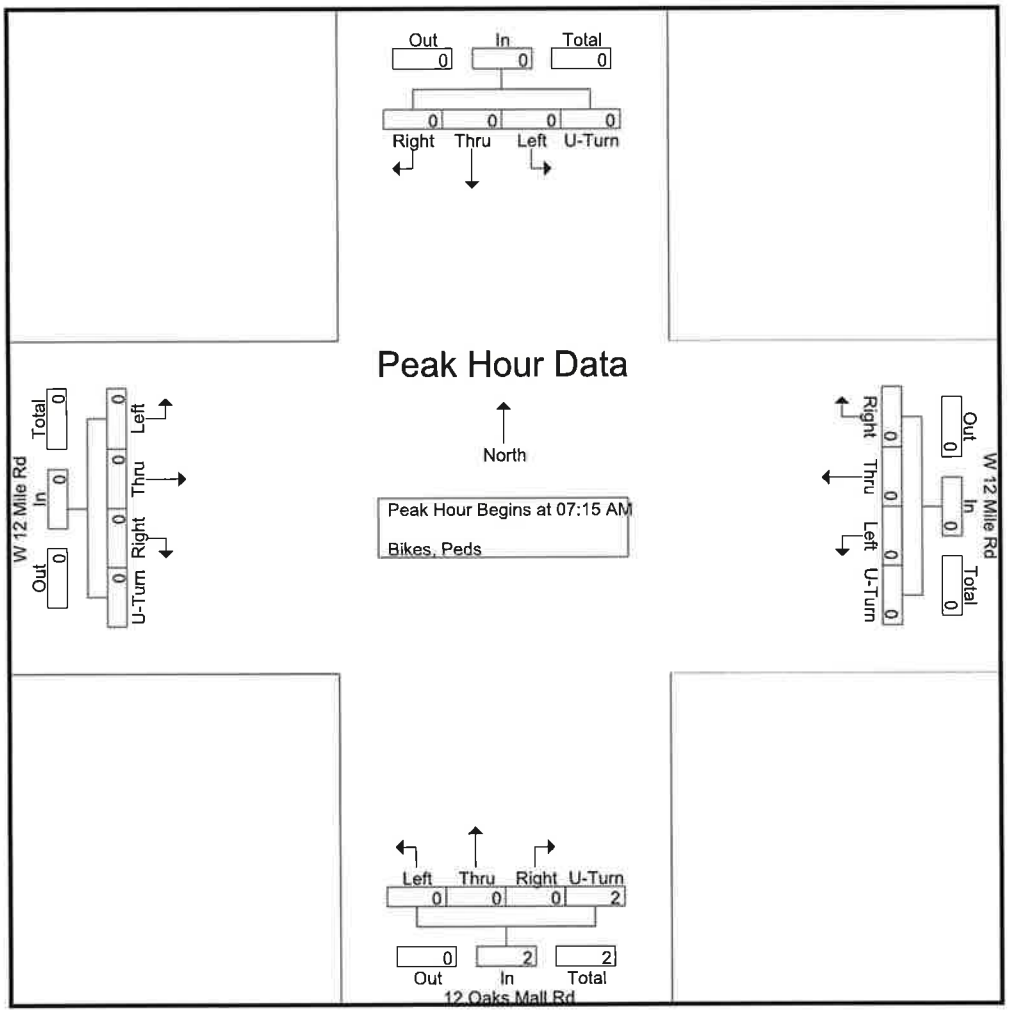
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
Apprch %	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883003 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883003
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	**2**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

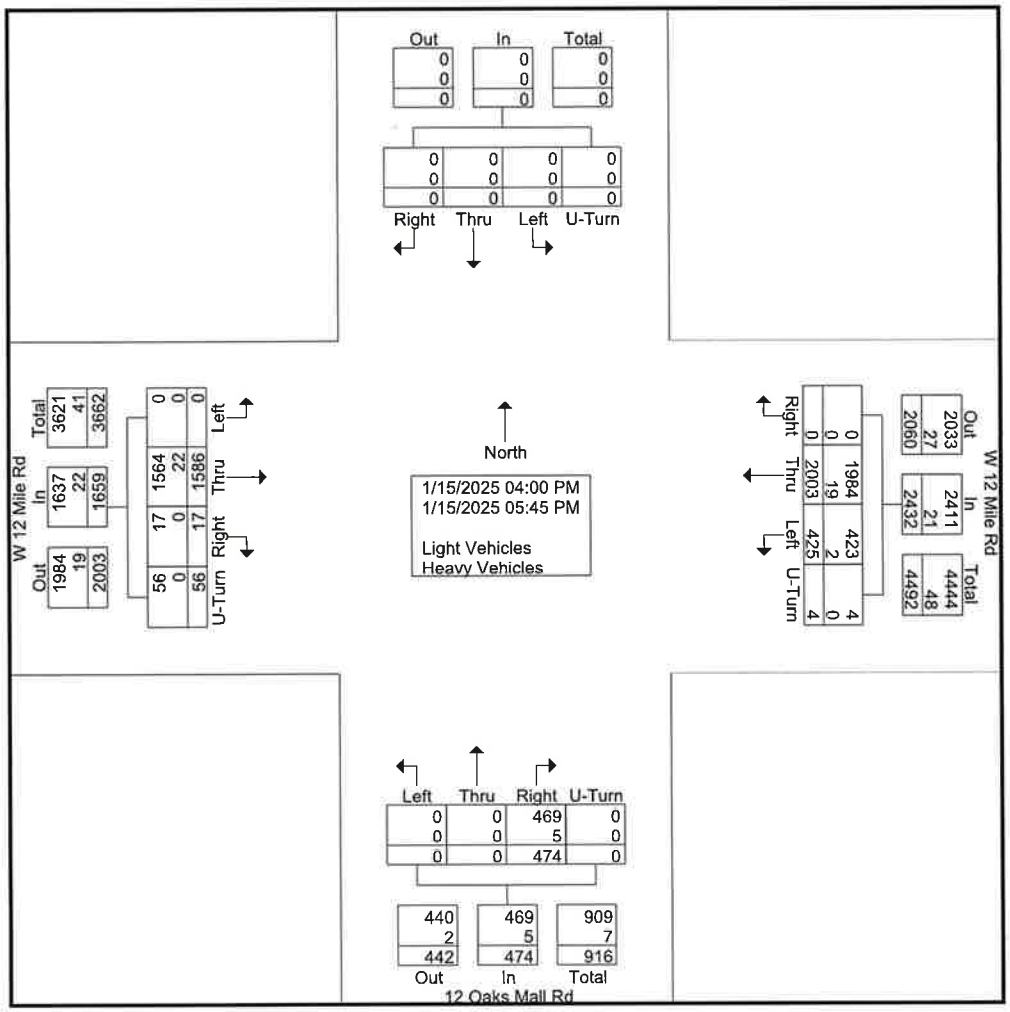


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883004 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883004
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

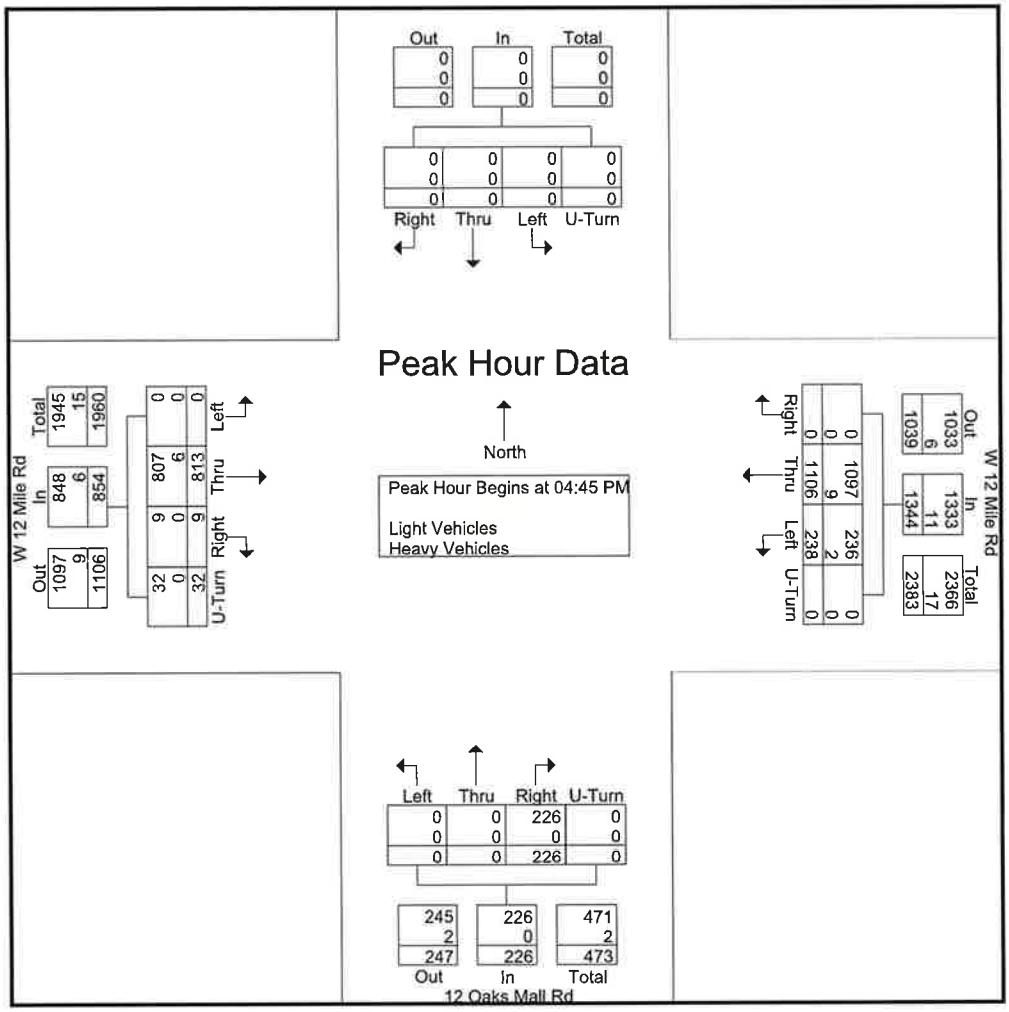
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	0	217	1	4	222	47	184	0	0	231	0	0	72	0	72	0	0	0	0	0	525
04:15 PM	0	211	4	6	221	36	207	0	2	245	0	0	54	0	54	0	0	0	0	0	520
04:30 PM	0	193	2	10	205	30	250	0	0	280	0	0	64	0	64	0	0	0	0	0	549
04:45 PM	0	195	2	12	209	63	300	0	0	363	0	0	50	0	50	0	0	0	0	0	622
Total	0	816	9	32	857	176	941	0	2	1119	0	0	240	0	240	0	0	0	0	0	2216
05:00 PM	0	217	2	4	223	50	277	0	0	327	0	0	62	0	62	0	0	0	0	0	612
05:15 PM	0	225	2	8	235	59	278	0	0	337	0	0	61	0	61	0	0	0	0	0	633
05:30 PM	0	176	3	8	187	66	251	0	0	317	0	0	53	0	53	0	0	0	0	0	557
05:45 PM	0	152	1	4	157	74	256	0	2	332	0	0	58	0	58	0	0	0	0	0	547
Total	0	770	8	24	802	249	1062	0	2	1313	0	0	234	0	234	0	0	0	0	0	2349
Grand Total	0	1586	17	56	1659	425	2003	0	4	2432	0	0	474	0	474	0	0	0	0	0	4565
Apprch %	0	95.6	1	3.4		17.5	82.4	0	0.2		0	0	100	0		0	0	0	0		
Total %	0	34.7	0.4	1.2	36.3	9.3	43.9	0	0.1	53.3	0	0	10.4	0	10.4	0	0	0	0	0	
Light Vehicles	0	1564	17	56	1637	423	1984	0	4	2411	0	0	469	0	469	0	0	0	0	0	4517
% Light Vehicles	0	98.6	100	100	98.7	99.5	99.1	0	100	99.1	0	0	98.9	0	98.9	0	0	0	0	0	98.9
Heavy Vehicles	0	22	0	0	22	2	19	0	0	21	0	0	5	0	5	0	0	0	0	0	48
% Heavy Vehicles	0	1.4	0	0	1.3	0.5	0.9	0	0	0.9	0	0	1.1	0	1.1	0	0	0	0	0	1.1



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883004 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883004
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	195	2	**12**	209	63	**300**	0	0	**363**	0	0	50	0	50	0	0	0	0	0	622
05:00 PM	0	217	2	4	223	50	277	0	0	327	0	0	**62**	0	**62**	0	0	0	0	0	612
05:15 PM	0	**225**	2	8	**235**	59	278	0	0	337	0	0	61	0	61	0	0	0	0	0	**633**
05:30 PM	0	176	**3**	8	187	**66**	251	0	0	317	0	0	53	0	53	0	0	0	0	0	557
Total Volume	0	813	9	32	854	238	1106	0	0	1344	0	0	226	0	226	0	0	0	0	0	2424
% App. Total	0	95.2	1.1	3.7		17.7	82.3	0	0		0	0	100	0		0	0	0	0		
PHF	.000	.903	.750	.667	.909	.902	.922	.000	.000	.926	.000	.000	.911	.000	.911	.000	.000	.000	.000	.000	.957
Light Vehicles	0	807	9	32	848	236	1097	0	0	1333	0	0	226	0	226	0	0	0	0	0	2407
% Light Vehicles	0	99.3	100	100	99.3	99.2	99.2	0	0	99.2	0	0	100	0	100	0	0	0	0	0	99.3
Heavy Vehicles	0	6	0	0	6	2	9	0	0	11	0	0	0	0	0	0	0	0	0	0	17
% Heavy Vehicles	0	0.7	0	0	0.7	0.8	0.8	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.7

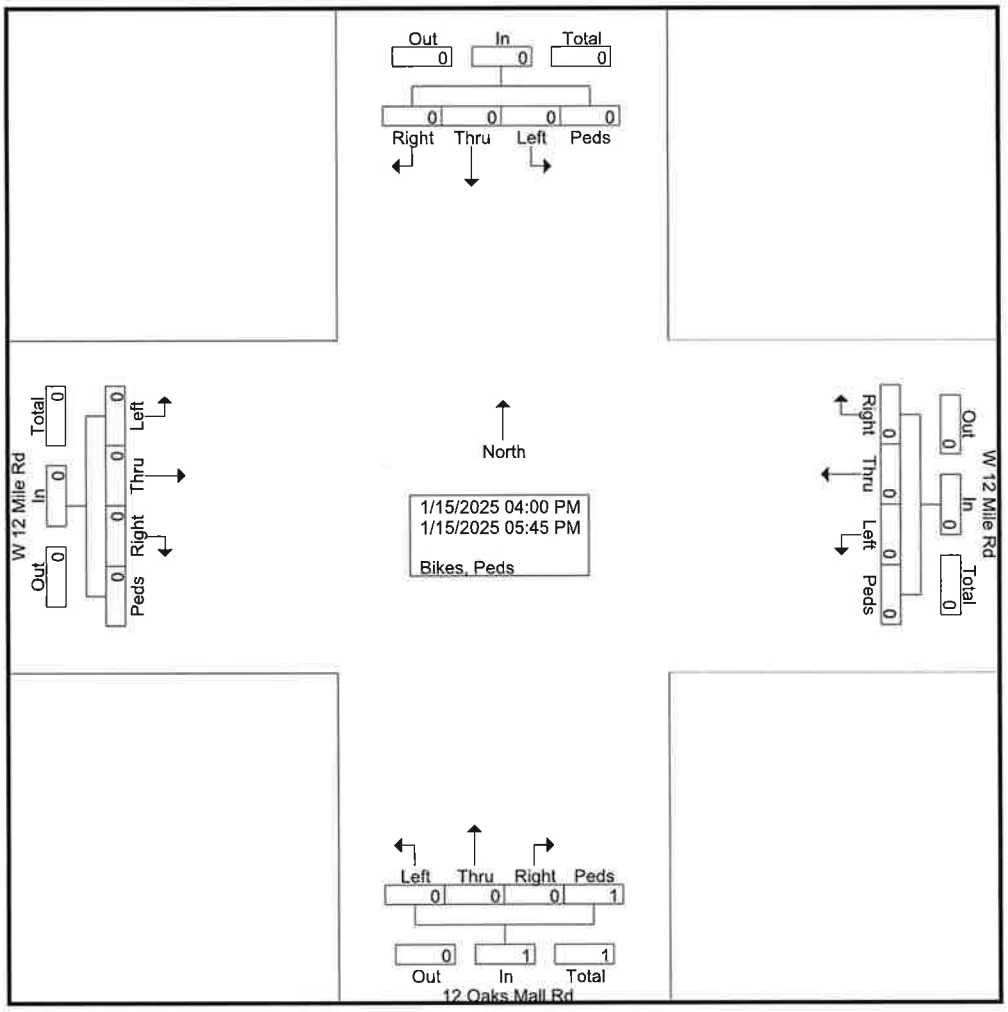


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883004 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883004
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

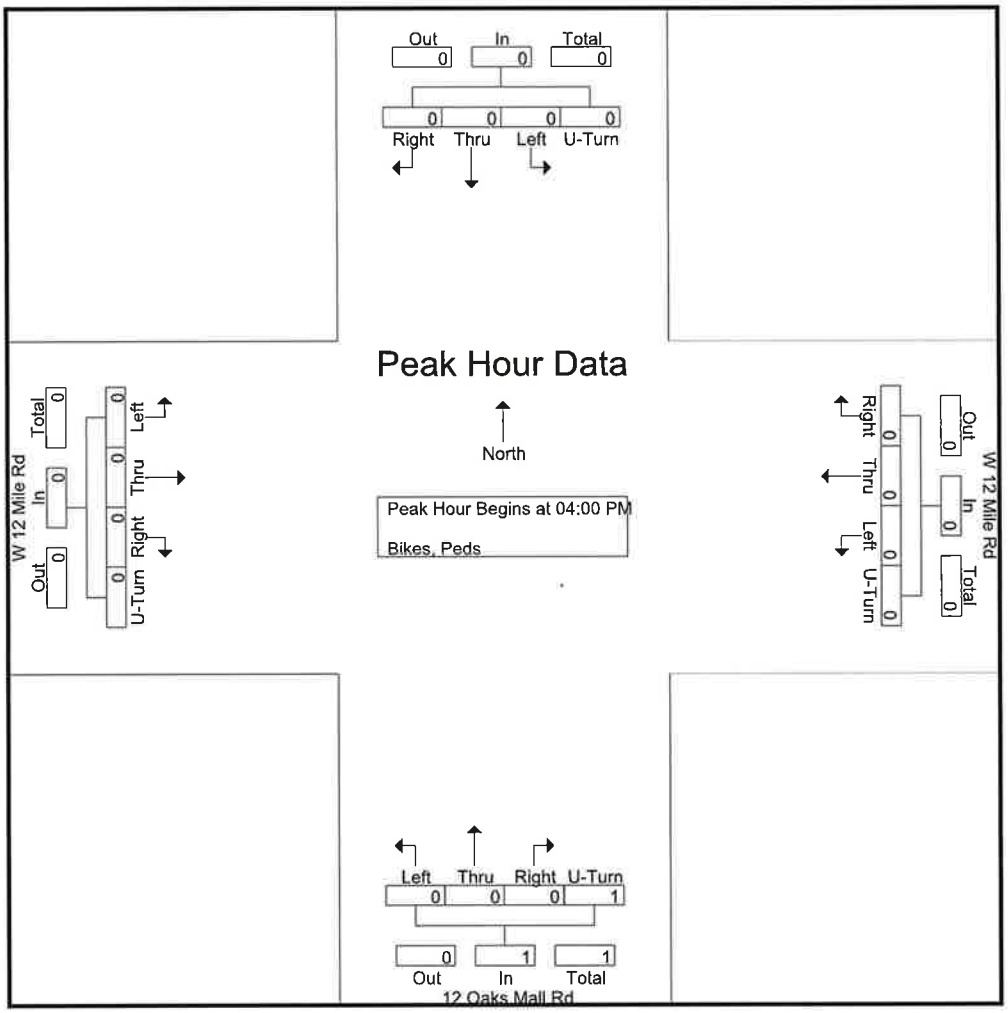
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Apprch %	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	0	



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883004 - 12 Oaks Mall Rd -- W 12 Mile Rd
Site Code : 16883004
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					12 Oaks Mall Rd Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

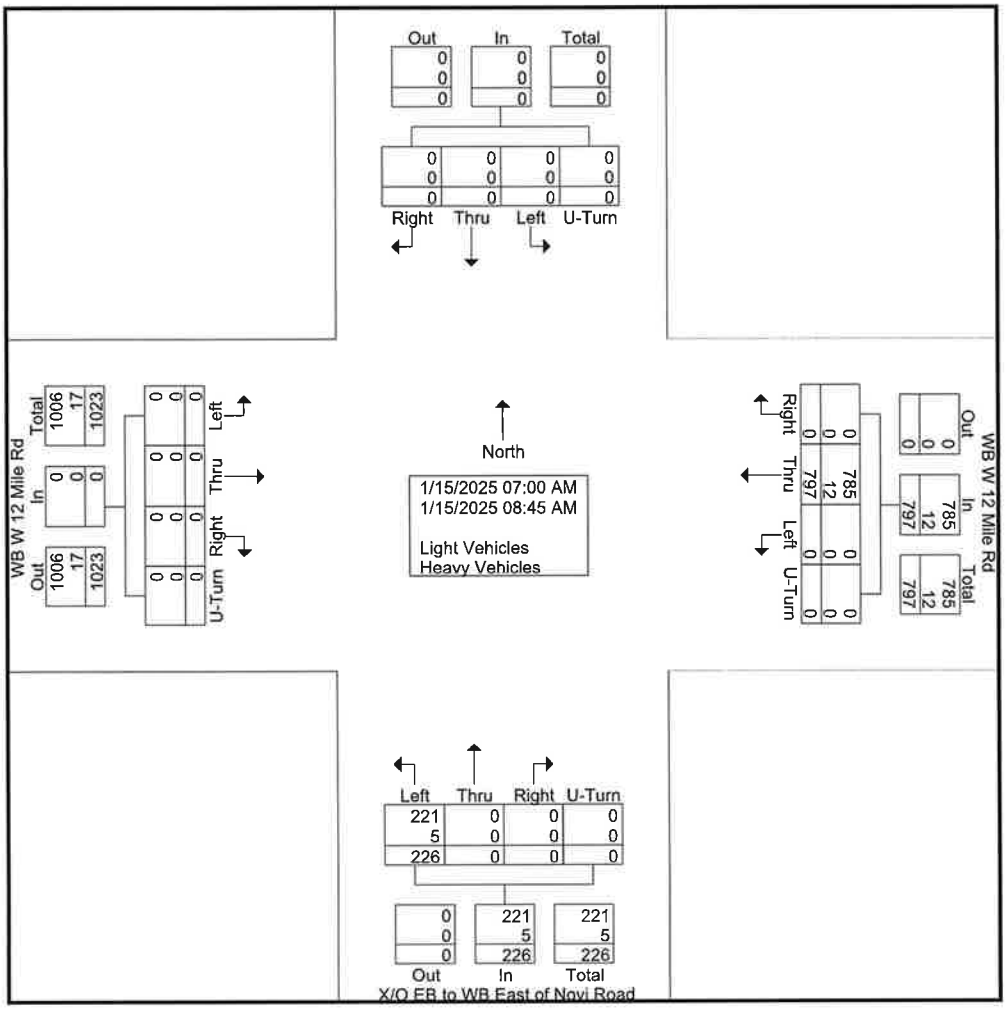


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883005 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883005
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

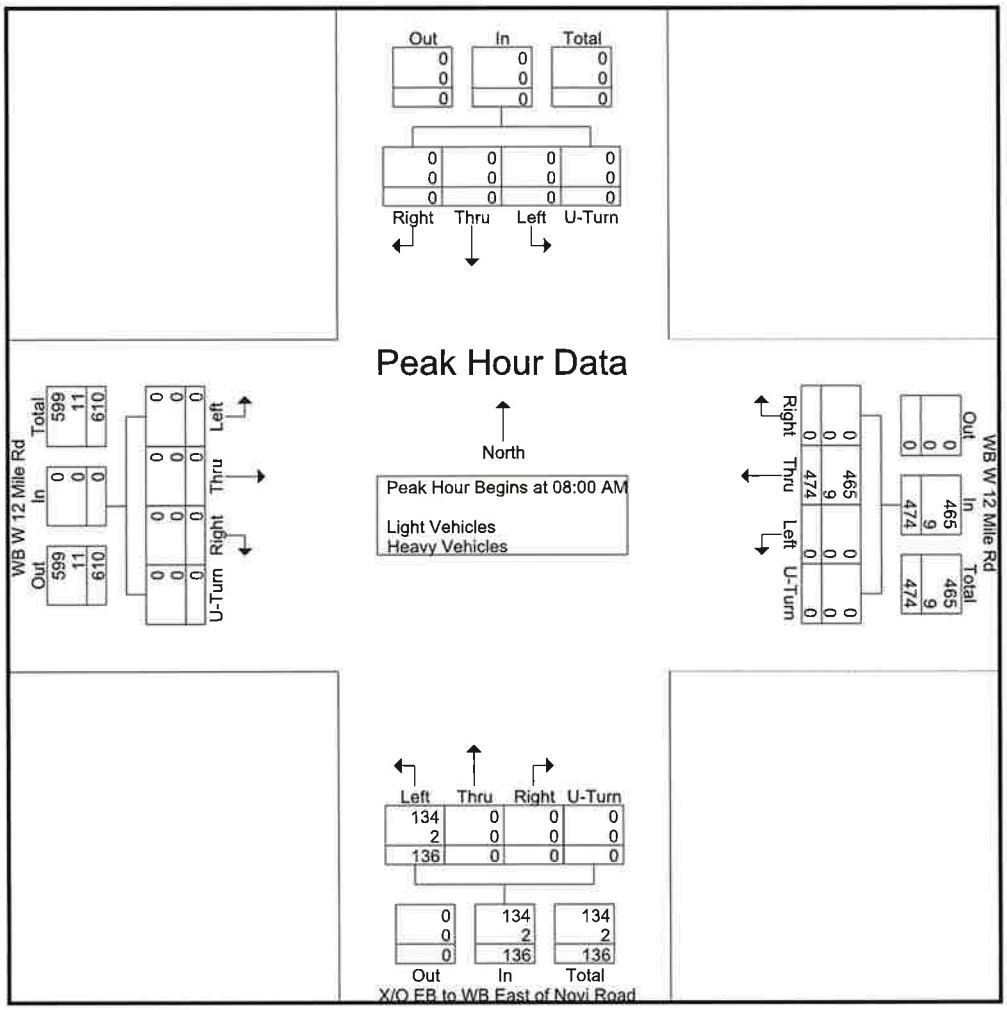
	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	57	0	0	57	15	0	0	0	15	0	0	0	0	0	72
07:15 AM	0	0	0	0	0	0	54	0	0	54	26	0	0	0	26	0	0	0	0	0	80
07:30 AM	0	0	0	0	0	0	109	0	0	109	23	0	0	0	23	0	0	0	0	0	132
07:45 AM	0	0	0	0	0	0	103	0	0	103	26	0	0	0	26	0	0	0	0	0	129
Total	0	0	0	0	0	0	323	0	0	323	90	0	0	0	90	0	0	0	0	0	413
08:00 AM	0	0	0	0	0	0	111	0	0	111	34	0	0	0	34	0	0	0	0	0	145
08:15 AM	0	0	0	0	0	0	102	0	0	102	40	0	0	0	40	0	0	0	0	0	142
08:30 AM	0	0	0	0	0	0	138	0	0	138	31	0	0	0	31	0	0	0	0	0	169
08:45 AM	0	0	0	0	0	0	123	0	0	123	31	0	0	0	31	0	0	0	0	0	154
Total	0	0	0	0	0	0	474	0	0	474	136	0	0	0	136	0	0	0	0	0	610
Grand Total	0	0	0	0	0	0	797	0	0	797	226	0	0	0	226	0	0	0	0	0	1023
Apprch %	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	77.9	0	0	77.9	22.1	0	0	0	22.1	0	0	0	0	0	
Light Vehicles	0	0	0	0	0	0	785	0	0	785	221	0	0	0	221	0	0	0	0	0	1006
% Light Vehicles	0	0	0	0	0	0	98.5	0	0	98.5	97.8	0	0	0	97.8	0	0	0	0	0	98.3
Heavy Vehicles	0	0	0	0	0	0	12	0	0	12	5	0	0	0	5	0	0	0	0	0	17
% Heavy Vehicles	0	0	0	0	0	0	1.5	0	0	1.5	2.2	0	0	0	2.2	0	0	0	0	0	1.7



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883005 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883005
Start Date : 1/15/2025
Page No : 2

	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	111	0	0	111	34	0	0	0	34	0	0	0	0	0	145
08:15 AM	0	0	0	0	0	0	102	0	0	102	**40**	0	0	0	**40**	0	0	0	0	0	142
08:30 AM	0	0	0	0	0	0	**138**	0	0	**138**	31	0	0	0	31	0	0	0	0	0	**169**
08:45 AM	0	0	0	0	0	0	123	0	0	123	31	0	0	0	31	0	0	0	0	0	154
Total Volume	0	0	0	0	0	0	474	0	0	474	136	0	0	0	136	0	0	0	0	0	610
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.859	.000	.000	.859	.850	.000	.000	.000	.850	.000	.000	.000	.000	.000	.902
Light Vehicles	0	0	0	0	0	0	465	0	0	465	134	0	0	0	134	0	0	0	0	0	599
% Light Vehicles	0	0	0	0	0	0	98.1	0	0	98.1	98.5	0	0	0	98.5	0	0	0	0	0	98.2
Heavy Vehicles	0	0	0	0	0	0	9	0	0	9	2	0	0	0	2	0	0	0	0	0	11
% Heavy Vehicles	0	0	0	0	0	0	1.9	0	0	1.9	1.5	0	0	0	1.5	0	0	0	0	0	1.8

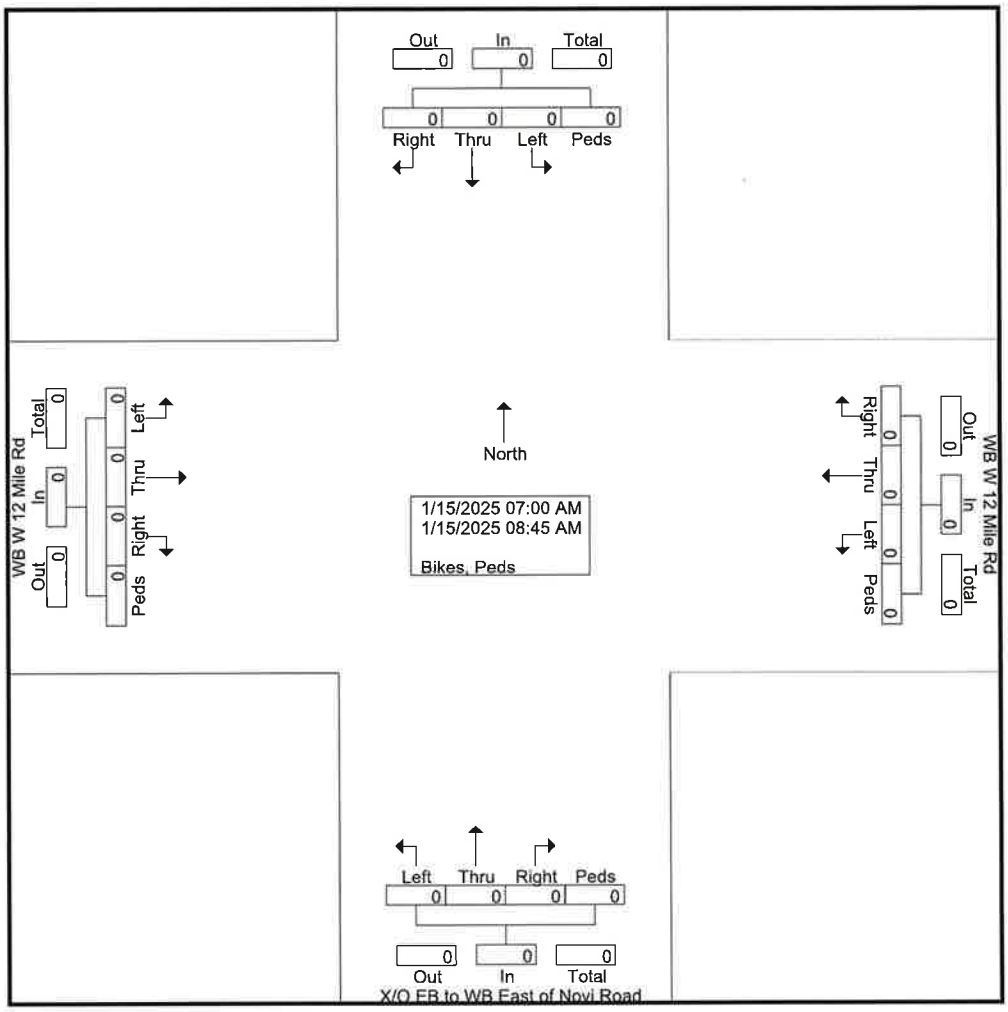


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883005 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883005
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

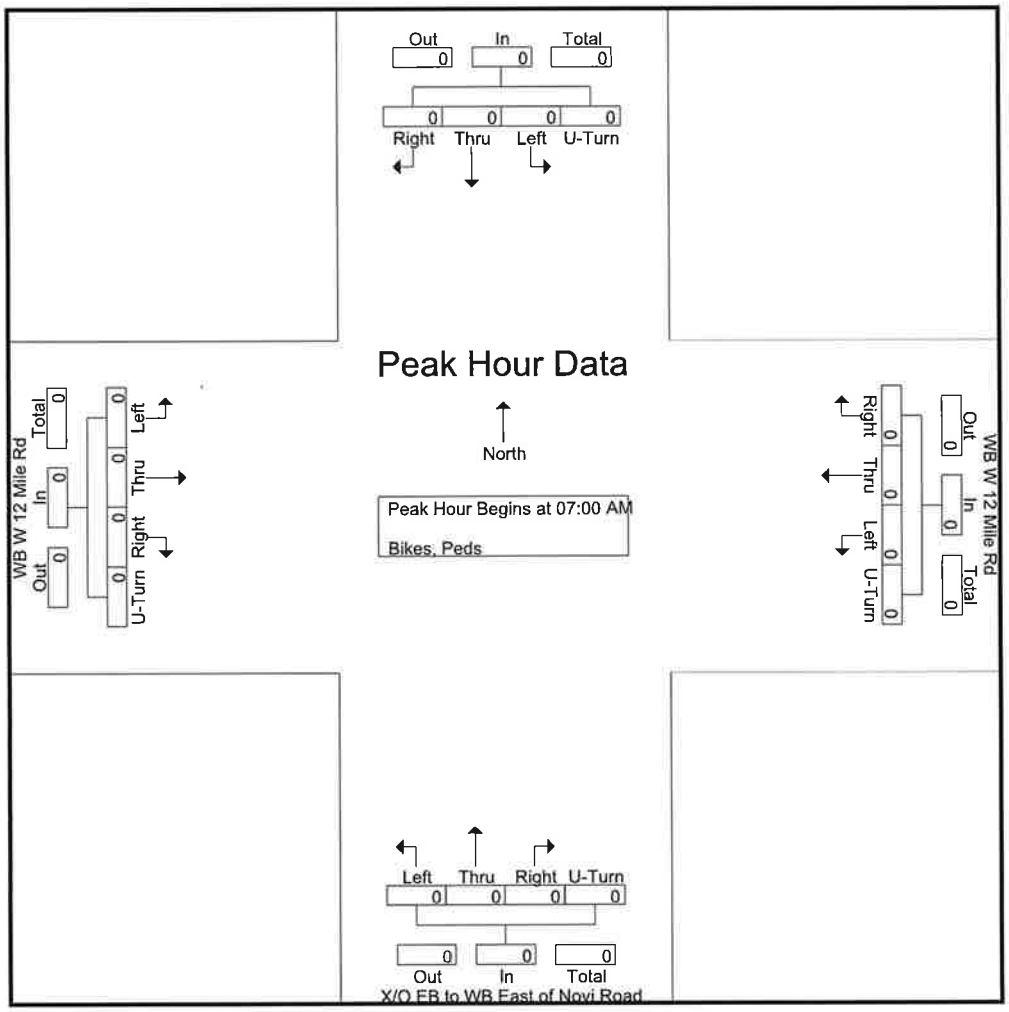
	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883005 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883005
Start Date : 1/15/2025
Page No : 2

	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

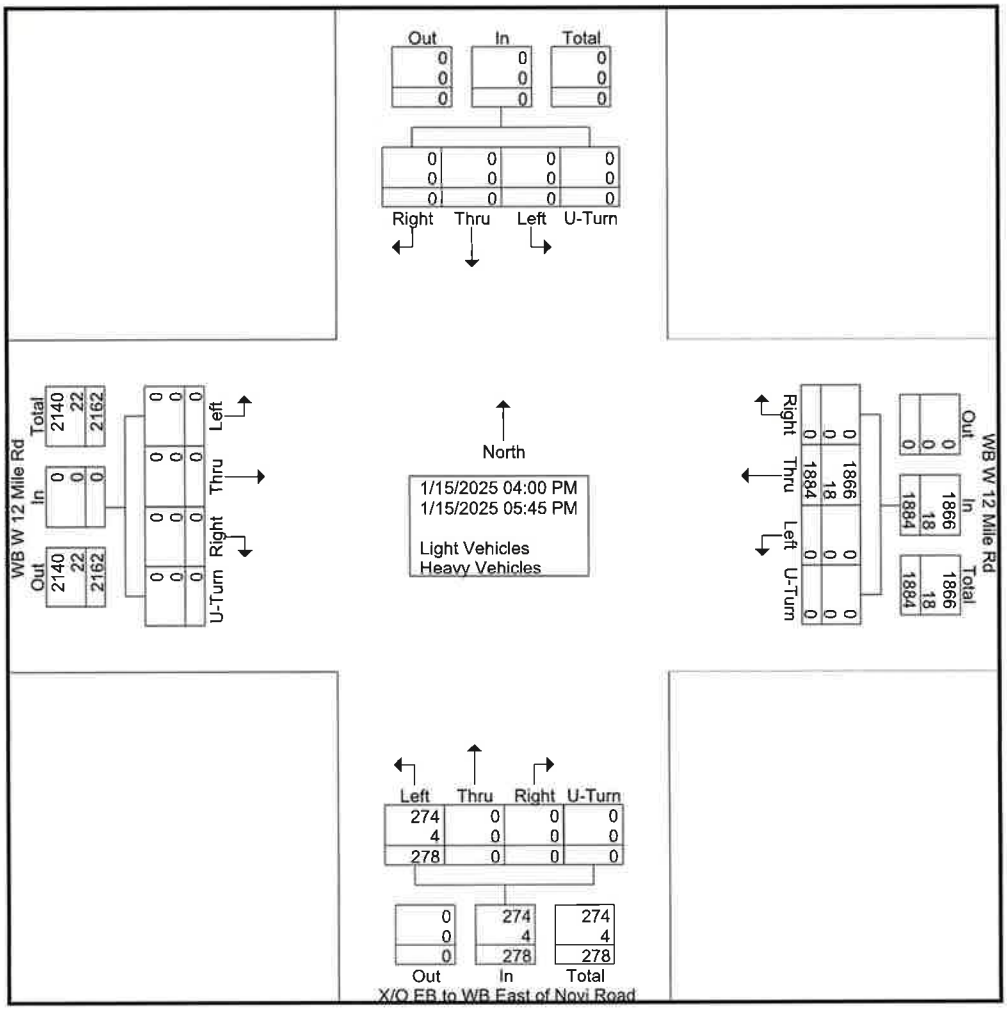


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883006 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883006
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

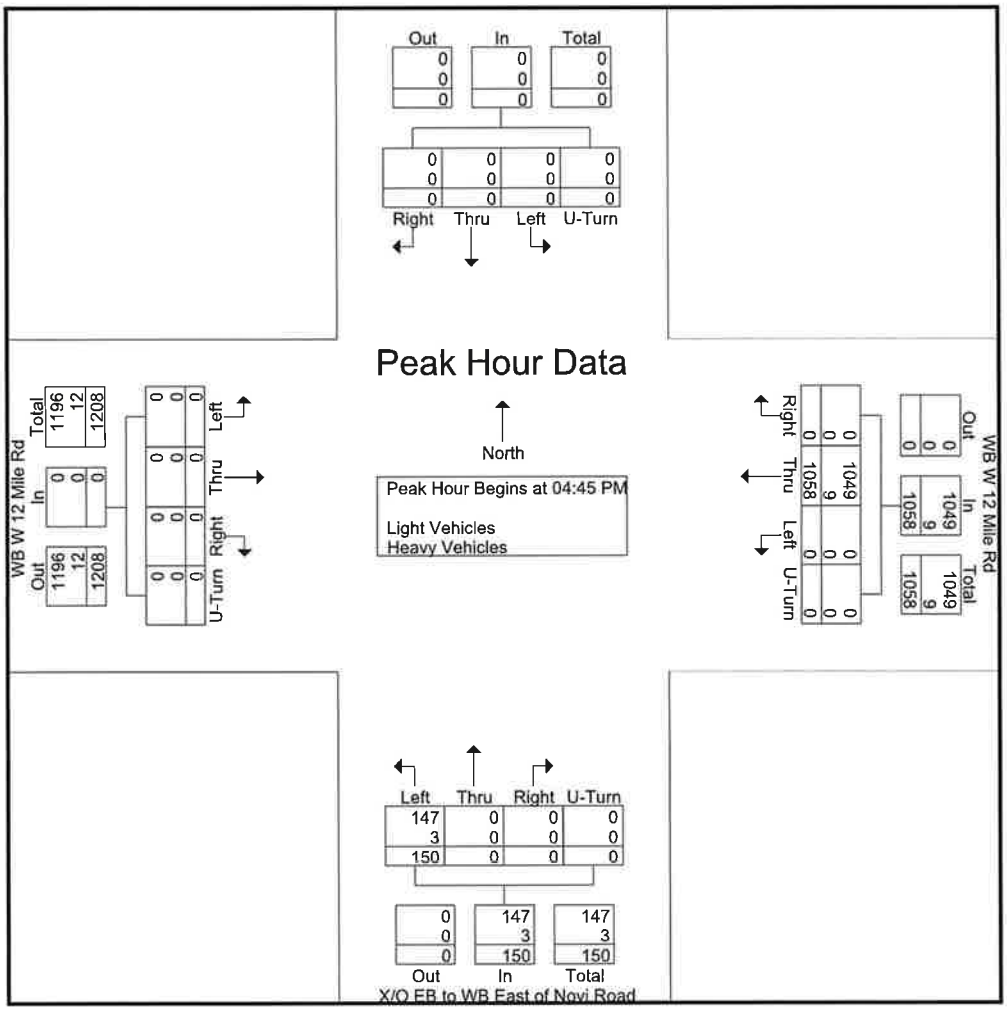
	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	183	0	0	183	36	0	0	0	36	0	0	0	0	0	219
04:15 PM	0	0	0	0	0	0	189	0	0	189	34	0	0	0	34	0	0	0	0	0	223
04:30 PM	0	0	0	0	0	0	220	0	0	220	33	0	0	0	33	0	0	0	0	0	253
04:45 PM	0	0	0	0	0	0	305	0	0	305	39	0	0	0	39	0	0	0	0	0	344
Total	0	0	0	0	0	0	897	0	0	897	142	0	0	0	142	0	0	0	0	0	1039
05:00 PM	0	0	0	0	0	0	264	0	0	264	45	0	0	0	45	0	0	0	0	0	309
05:15 PM	0	0	0	0	0	0	254	0	0	254	33	0	0	0	33	0	0	0	0	0	287
05:30 PM	0	0	0	0	0	0	235	0	0	235	33	0	0	0	33	0	0	0	0	0	268
05:45 PM	0	0	0	0	0	0	234	0	0	234	25	0	0	0	25	0	0	0	0	0	259
Total	0	0	0	0	0	0	987	0	0	987	136	0	0	0	136	0	0	0	0	0	1123
Grand Total	0	0	0	0	0	0	1884	0	0	1884	278	0	0	0	278	0	0	0	0	0	2162
Apprch %	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	87.1	0	0	87.1	12.9	0	0	0	12.9	0	0	0	0	0	
Light Vehicles	0	0	0	0	0	0	1866	0	0	1866	274	0	0	0	274	0	0	0	0	0	2140
% Light Vehicles	0	0	0	0	0	0	99	0	0	99	98.6	0	0	0	98.6	0	0	0	0	0	99
Heavy Vehicles	0	0	0	0	0	0	18	0	0	18	4	0	0	0	4	0	0	0	0	0	22
% Heavy Vehicles	0	0	0	0	0	0	1	0	0	1	1.4	0	0	0	1.4	0	0	0	0	0	1



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883006 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883006
Start Date : 1/15/2025
Page No : 2

	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	0	**305**	0	0	**305**	39	0	0	0	39	0	0	0	0	0	**344**
05:00 PM	0	0	0	0	0	0	264	0	0	264	**45**	0	0	0	**45**	0	0	0	0	0	309
05:15 PM	0	0	0	0	0	0	254	0	0	254	33	0	0	0	33	0	0	0	0	0	287
05:30 PM	0	0	0	0	0	0	235	0	0	235	33	0	0	0	33	0	0	0	0	0	268
Total Volume	0	0	0	0	0	0	1058	0	0	1058	150	0	0	0	150	0	0	0	0	0	1208
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.867	.000	.000	.867	.833	.000	.000	.000	.833	.000	.000	.000	.000	.000	.878
Light Vehicles	0	0	0	0	0	0	1049	0	0	1049	147	0	0	0	147	0	0	0	0	0	1196
% Light Vehicles	0	0	0	0	0	0	99.1	0	0	99.1	98.0	0	0	0	98.0	0	0	0	0	0	99.0
Heavy Vehicles	0	0	0	0	0	0	9	0	0	9	3	0	0	0	3	0	0	0	0	0	12
% Heavy Vehicles	0	0	0	0	0	0	0.9	0	0	0.9	2.0	0	0	0	2.0	0	0	0	0	0	1.0

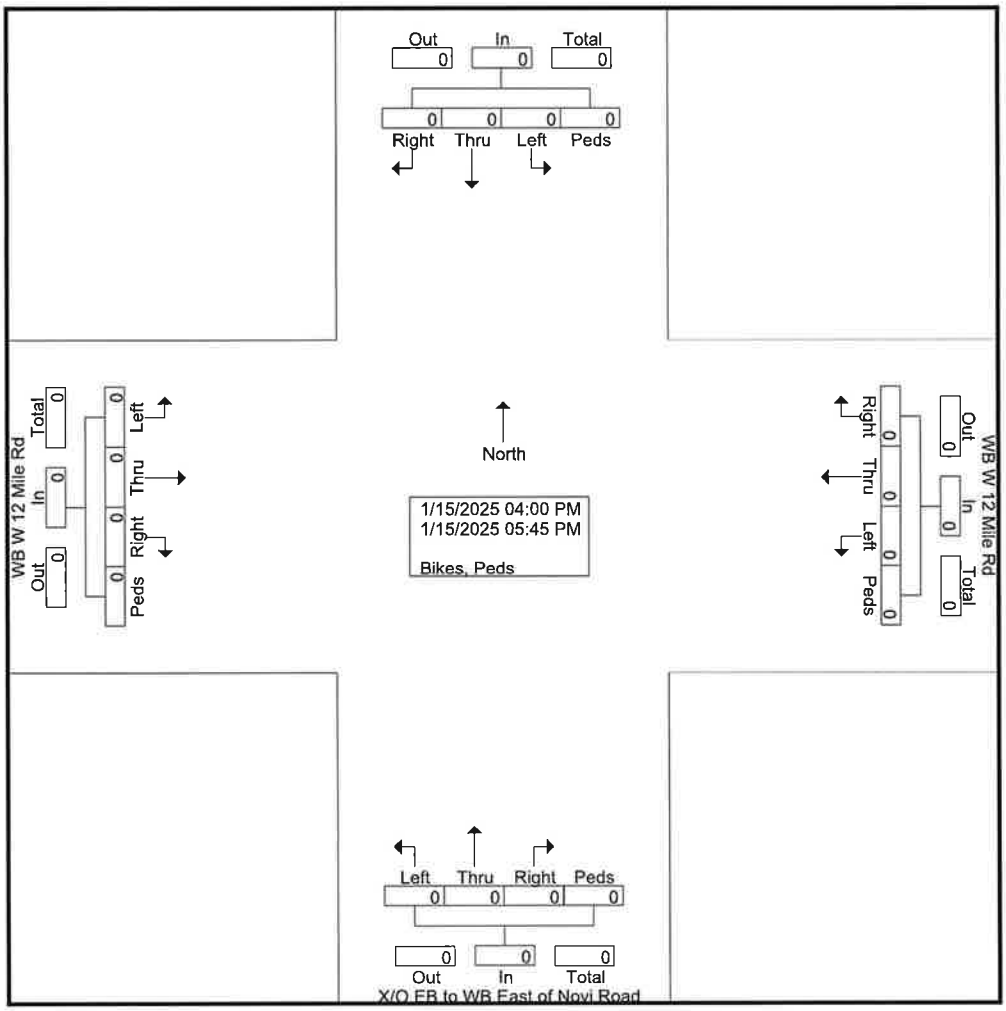


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883006 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883006
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

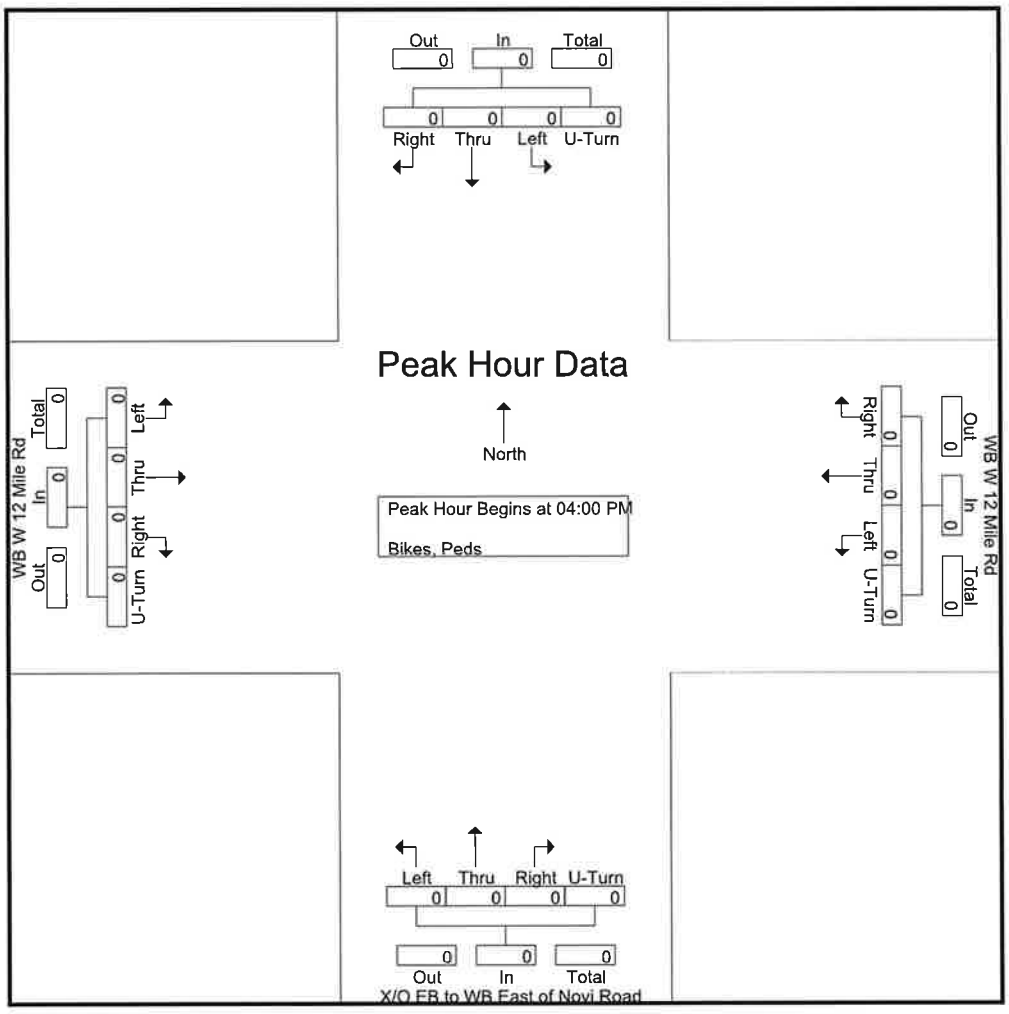
	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883006 - X_O EB to WB East of Novi Road -- WB W 12 Mile Rd
Site Code : 16883006
Start Date : 1/15/2025
Page No : 2

	WB W 12 Mile Rd Eastbound					WB W 12 Mile Rd Westbound					X/O EB to WB East of Novi Road Northbound					Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

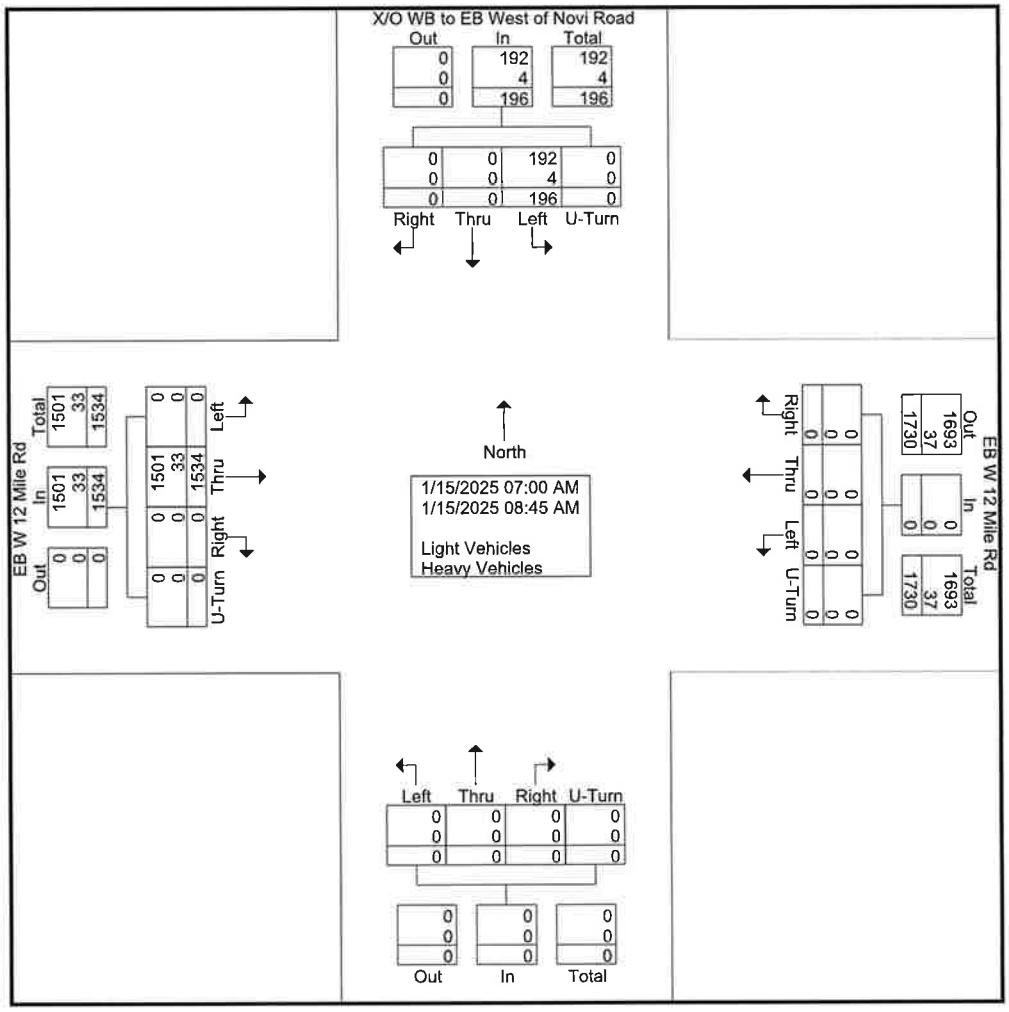


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883007 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883007
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

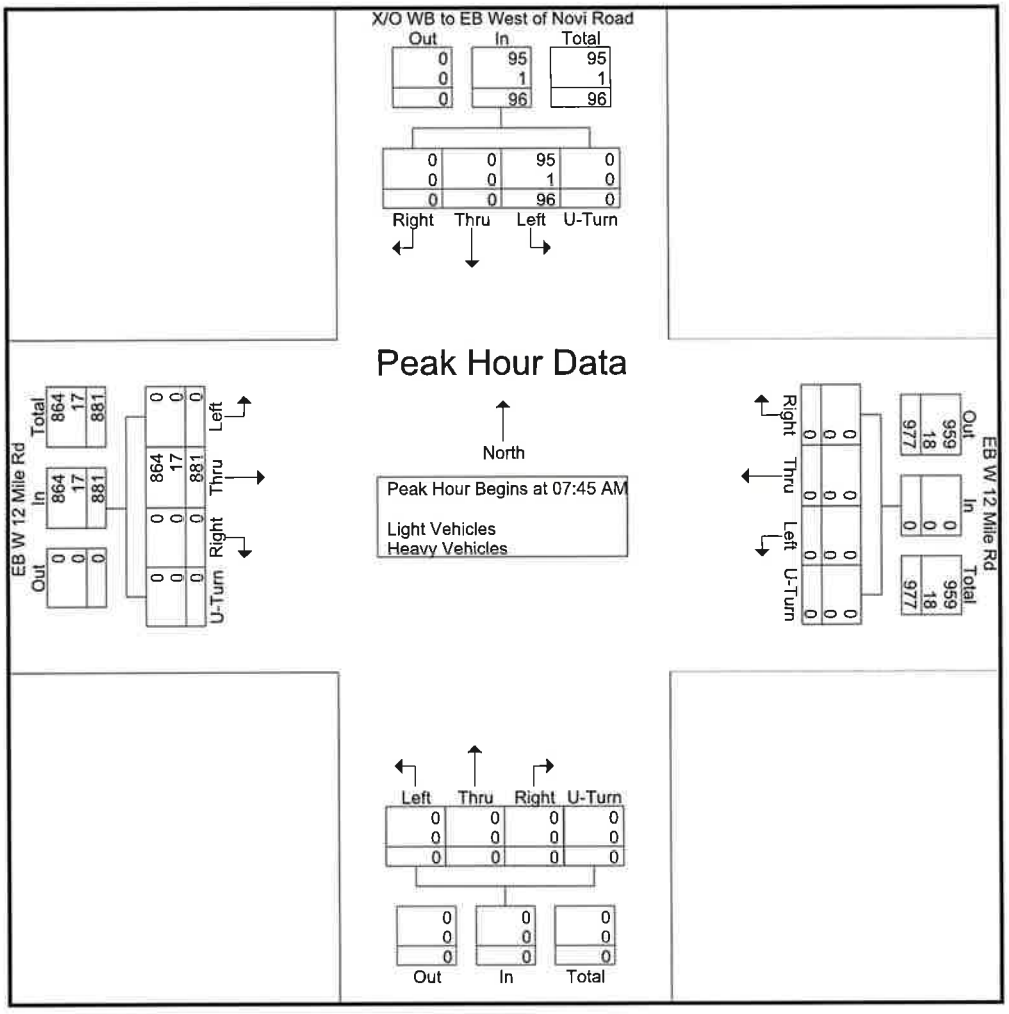
	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	0	104	0	0	104	0	0	0	0	0	0	0	0	0	0	14	0	0	0	14	118
07:15 AM	0	136	0	0	136	0	0	0	0	0	0	0	0	0	0	19	0	0	0	19	155
07:30 AM	0	191	0	0	191	0	0	0	0	0	0	0	0	0	0	28	0	0	0	28	219
07:45 AM	0	248	0	0	248	0	0	0	0	0	0	0	0	0	0	17	0	0	0	17	265
Total	0	679	0	0	679	0	0	0	0	0	0	0	0	0	0	78	0	0	0	78	757
08:00 AM	0	212	0	0	212	0	0	0	0	0	0	0	0	0	0	21	0	0	0	21	233
08:15 AM	0	189	0	0	189	0	0	0	0	0	0	0	0	0	0	29	0	0	0	29	218
08:30 AM	0	232	0	0	232	0	0	0	0	0	0	0	0	0	0	29	0	0	0	29	261
08:45 AM	0	222	0	0	222	0	0	0	0	0	0	0	0	0	0	39	0	0	0	39	261
Total	0	855	0	0	855	0	0	0	0	0	0	0	0	0	0	118	0	0	0	118	973
Grand Total	0	1534	0	0	1534	0	0	0	0	0	0	0	0	0	0	196	0	0	0	196	1730
Apprch %	0	100	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
Total %	0	88.7	0	0	88.7	0	0	0	0	0	0	0	0	0	0	11.3	0	0	0	11.3	
Light Vehicles	0	1501	0	0	1501	0	0	0	0	0	0	0	0	0	0	192	0	0	0	192	1693
% Light Vehicles	0	97.8	0	0	97.8	0	0	0	0	0	0	0	0	0	0	98	0	0	0	98	97.9
Heavy Vehicles	0	33	0	0	33	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	37
% Heavy Vehicles	0	2.2	0	0	2.2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2.1



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883007 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883007
Start Date : 1/15/2025
Page No : 2

	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**248**	0	0	**248**	0	0	0	0	0	0	0	0	0	0	17	0	0	0	17	**265**
08:00 AM	0	212	0	0	212	0	0	0	0	0	0	0	0	0	0	21	0	0	0	21	233
08:15 AM	0	189	0	0	189	0	0	0	0	0	0	0	0	0	0	**29**	0	0	0	**29**	218
08:30 AM	0	232	0	0	232	0	0	0	0	0	0	0	0	0	0	29	0	0	0	29	261
Total Volume	0	881	0	0	881	0	0	0	0	0	0	0	0	0	0	96	0	0	0	96	977
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.888	.000	.000	.888	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.828	.000	.000	.000	.828	.922
Light Vehicles	0	864	0	0	864	0	0	0	0	0	0	0	0	0	0	95	0	0	0	95	959
% Light Vehicles	0	98.1	0	0	98.1	0	0	0	0	0	0	0	0	0	0	99.0	0	0	0	99.0	98.2
Heavy Vehicles	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	18
% Heavy Vehicles	0	1.9	0	0	1.9	0	0	0	0	0	0	0	0	0	0	1.0	0	0	0	1.0	1.8

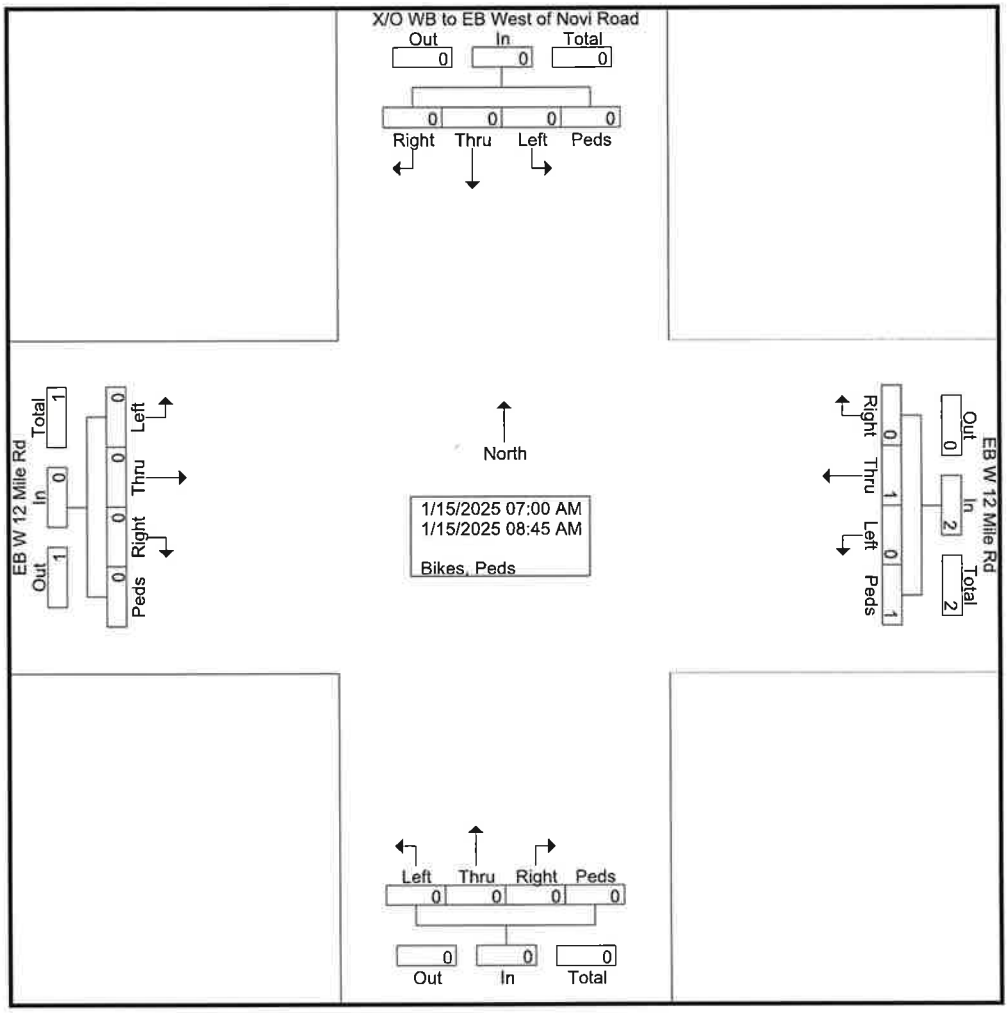


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883007 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883007
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

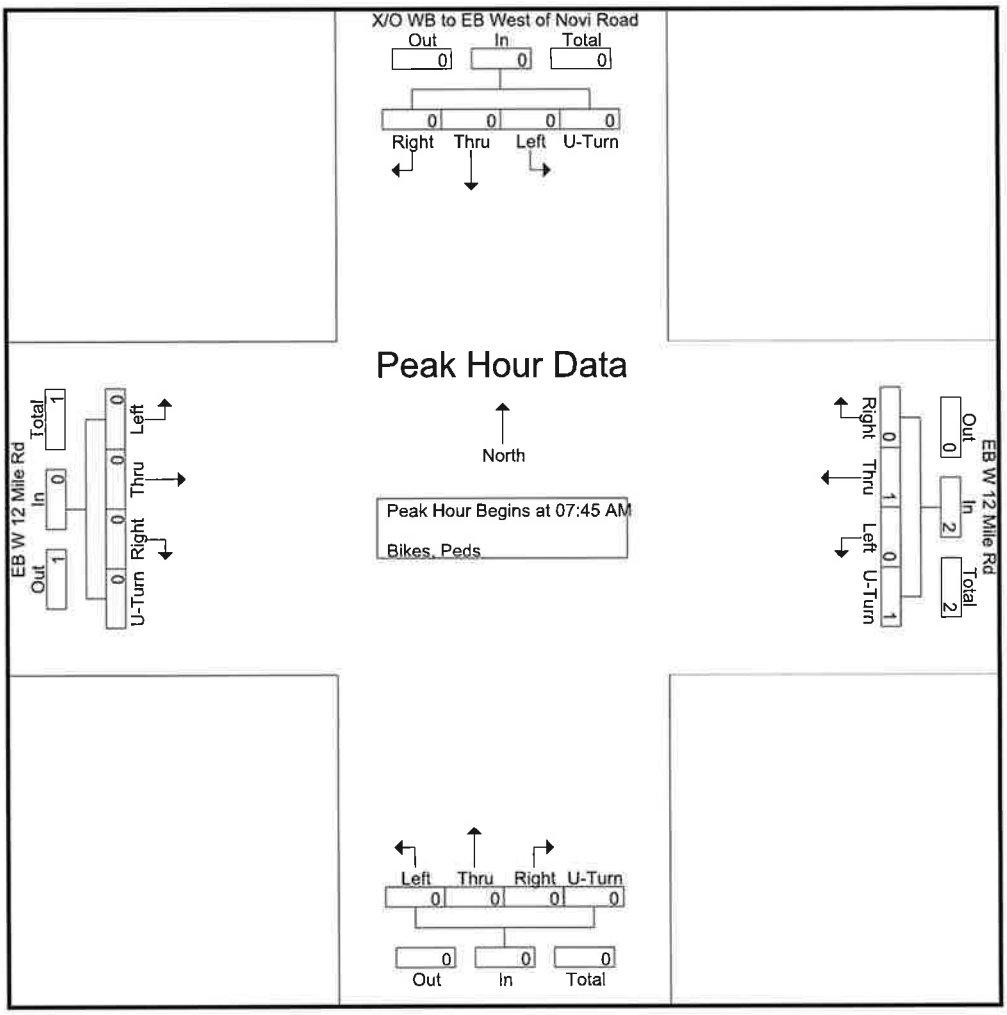
	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	2
Apprch %	0	0	0	0		0	50	0	50		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	50	0	50	100	0	0	0	0	0	0	0	0	0	0	



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883007 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883007
Start Date : 1/15/2025
Page No : 2

	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	**1**
08:30 AM	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	0	0	0		0	50	0	50		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

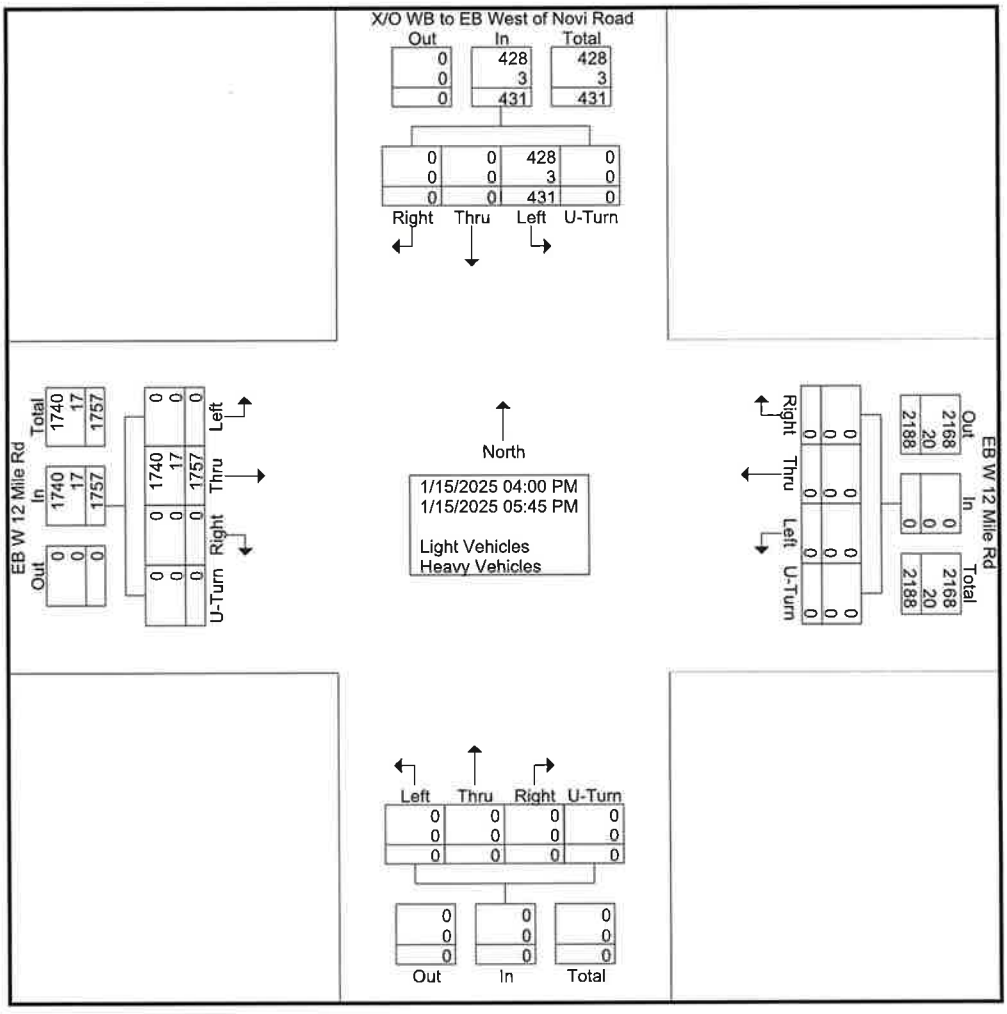


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883008 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883008
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

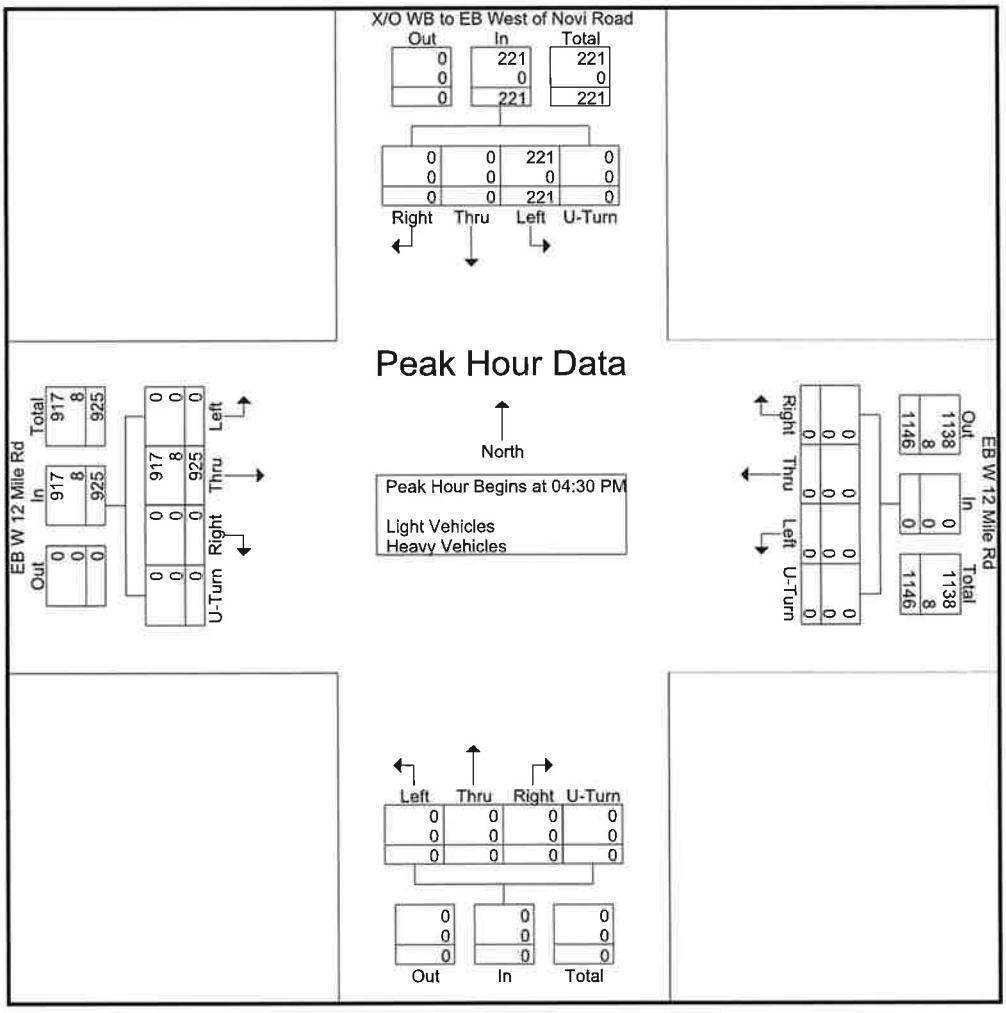
	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	0	250	0	0	250	0	0	0	0	0	0	0	0	0	0	53	0	0	0	53	303
04:15 PM	0	219	0	0	219	0	0	0	0	0	0	0	0	0	0	46	0	0	0	46	265
04:30 PM	0	224	0	0	224	0	0	0	0	0	0	0	0	0	0	41	0	0	0	41	265
04:45 PM	0	198	0	0	198	0	0	0	0	0	0	0	0	0	0	57	0	0	0	57	255
Total	0	891	0	0	891	0	0	0	0	0	0	0	0	0	0	197	0	0	0	197	1088
05:00 PM	0	249	0	0	249	0	0	0	0	0	0	0	0	0	0	53	0	0	0	53	302
05:15 PM	0	254	0	0	254	0	0	0	0	0	0	0	0	0	0	70	0	0	0	70	324
05:30 PM	0	196	0	0	196	0	0	0	0	0	0	0	0	0	0	60	0	0	0	60	256
05:45 PM	0	167	0	0	167	0	0	0	0	0	0	0	0	0	0	51	0	0	0	51	218
Total	0	866	0	0	866	0	0	0	0	0	0	0	0	0	0	234	0	0	0	234	1100
Grand Total	0	1757	0	0	1757	0	0	0	0	0	0	0	0	0	0	431	0	0	0	431	2188
Apprch %	0	100	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
Total %	0	80.3	0	0	80.3	0	0	0	0	0	0	0	0	0	0	19.7	0	0	0	19.7	
Light Vehicles	0	1740	0	0	1740	0	0	0	0	0	0	0	0	0	0	428	0	0	0	428	2168
% Light Vehicles	0	99	0	0	99	0	0	0	0	0	0	0	0	0	0	99.3	0	0	0	99.3	99.1
Heavy Vehicles	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	20
% Heavy Vehicles	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0.7	0.9



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883008 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883008
Start Date : 1/15/2025
Page No : 2

	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	224	0	0	224	0	0	0	0	0	0	0	0	0	0	41	0	0	0	41	265
04:45 PM	0	198	0	0	198	0	0	0	0	0	0	0	0	0	0	57	0	0	0	57	255
05:00 PM	0	249	0	0	249	0	0	0	0	0	0	0	0	0	0	53	0	0	0	53	302
05:15 PM	0	**254**	0	0	**254**	0	0	0	0	0	0	0	0	0	0	**70**	0	0	0	**70**	**324**
Total Volume	0	925	0	0	925	0	0	0	0	0	0	0	0	0	0	221	0	0	0	221	1146
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.910	.000	.000	.910	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.789	.000	.000	.000	.789	.884
Light Vehicles	0	917	0	0	917	0	0	0	0	0	0	0	0	0	0	221	0	0	0	221	1138
% Light Vehicles	0	99.1	0	0	99.1	0	0	0	0	0	0	0	0	0	0	100	0	0	0	100	99.3
Heavy Vehicles	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
% Heavy Vehicles	0	0.9	0	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7

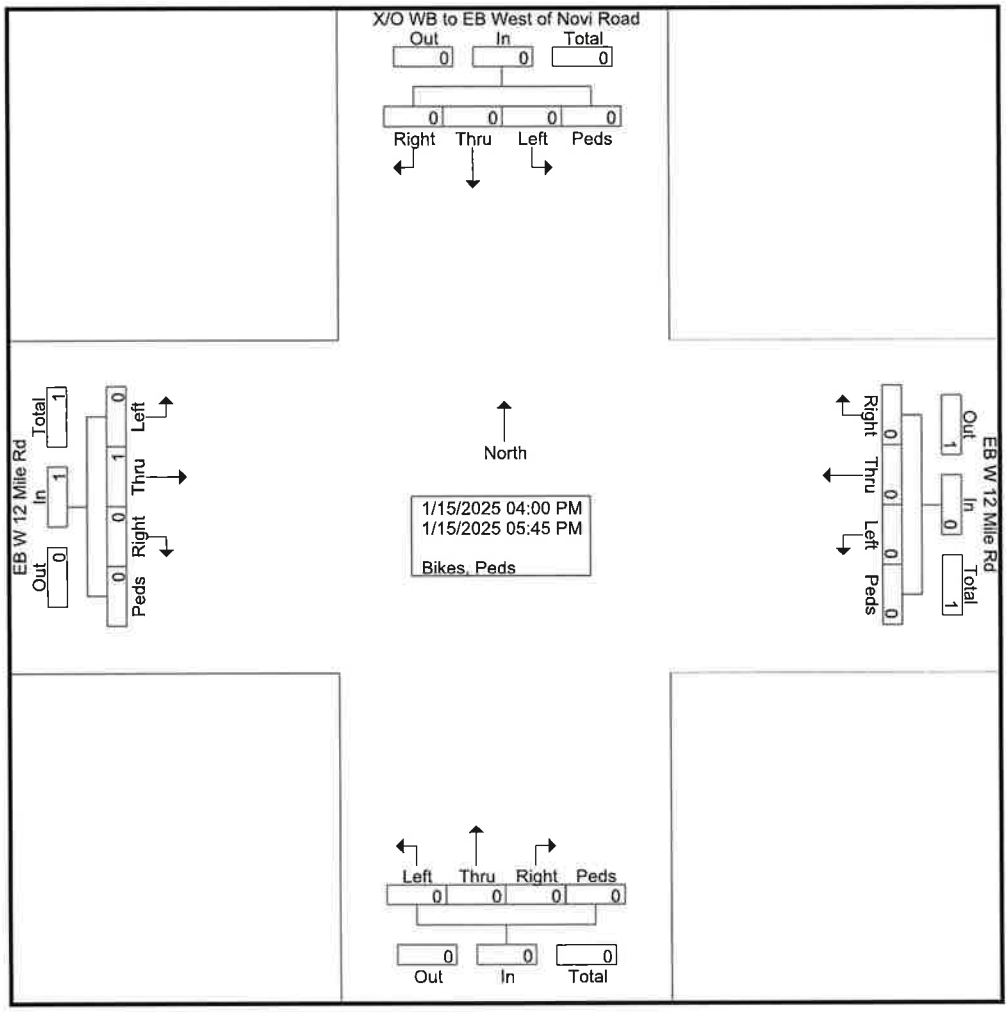


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883008 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883008
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

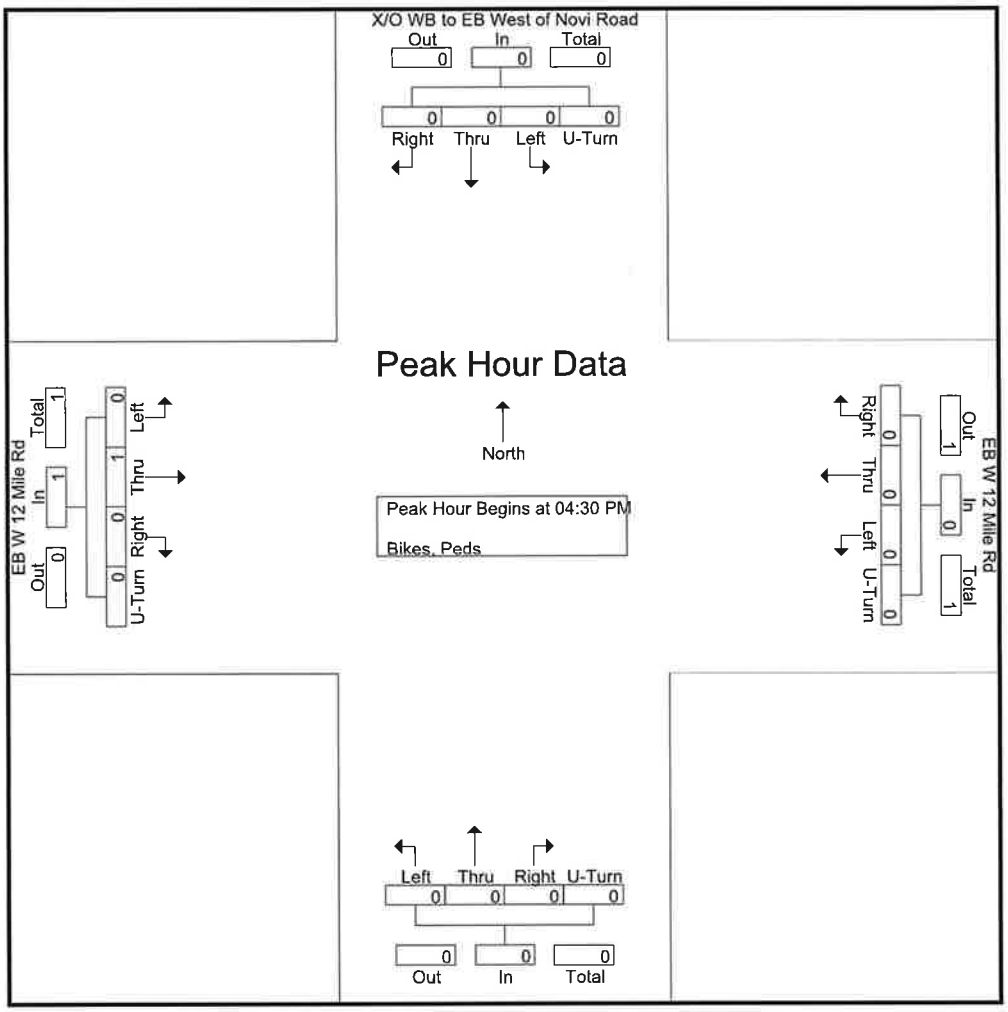
	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	100	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883008 - X_O WB to EB West of Novi Road -- EB W 12 Mile Rd
Site Code : 16883008
Start Date : 1/15/2025
Page No : 2

	EB W 12 Mile Rd Eastbound					EB W 12 Mile Rd Westbound					Northbound					X/O WB to EB West of Novi Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

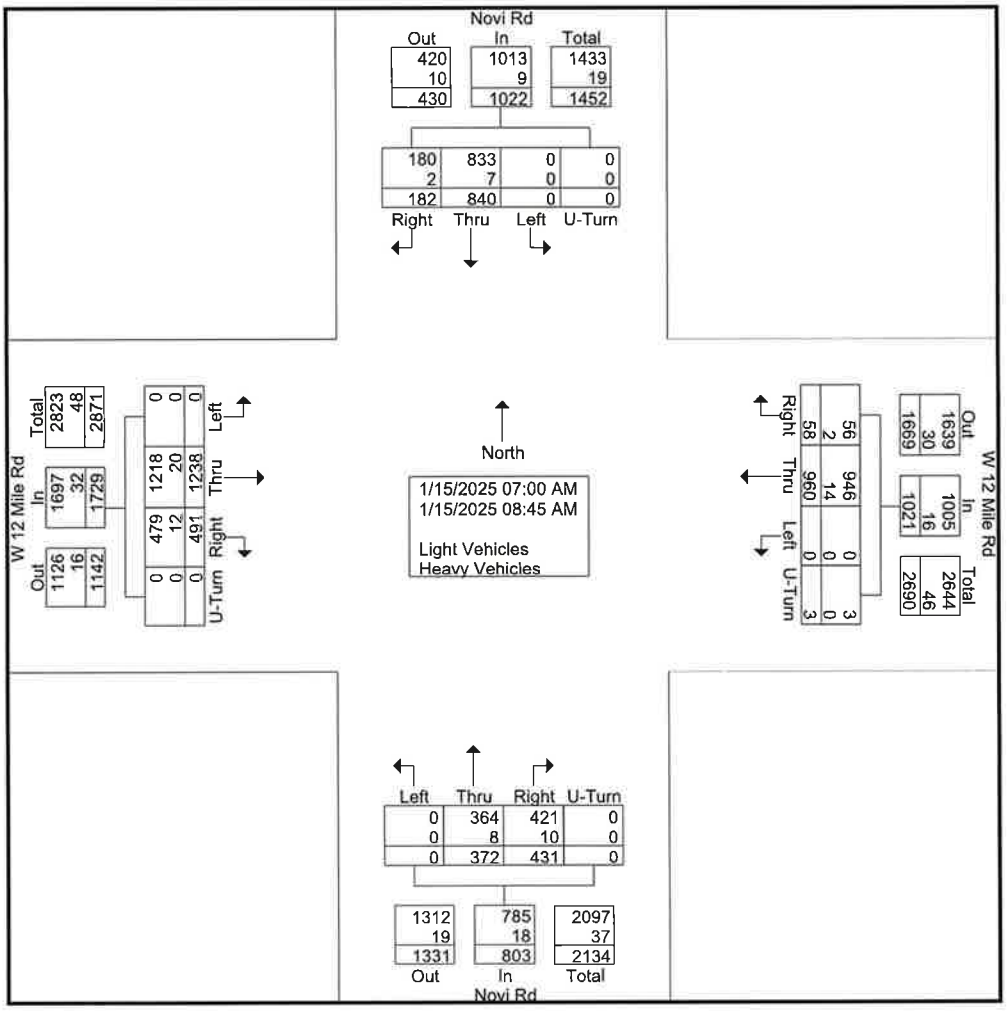


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883009 - Novi Rd -- W 12 Mile Rd
Site Code : 16883009
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

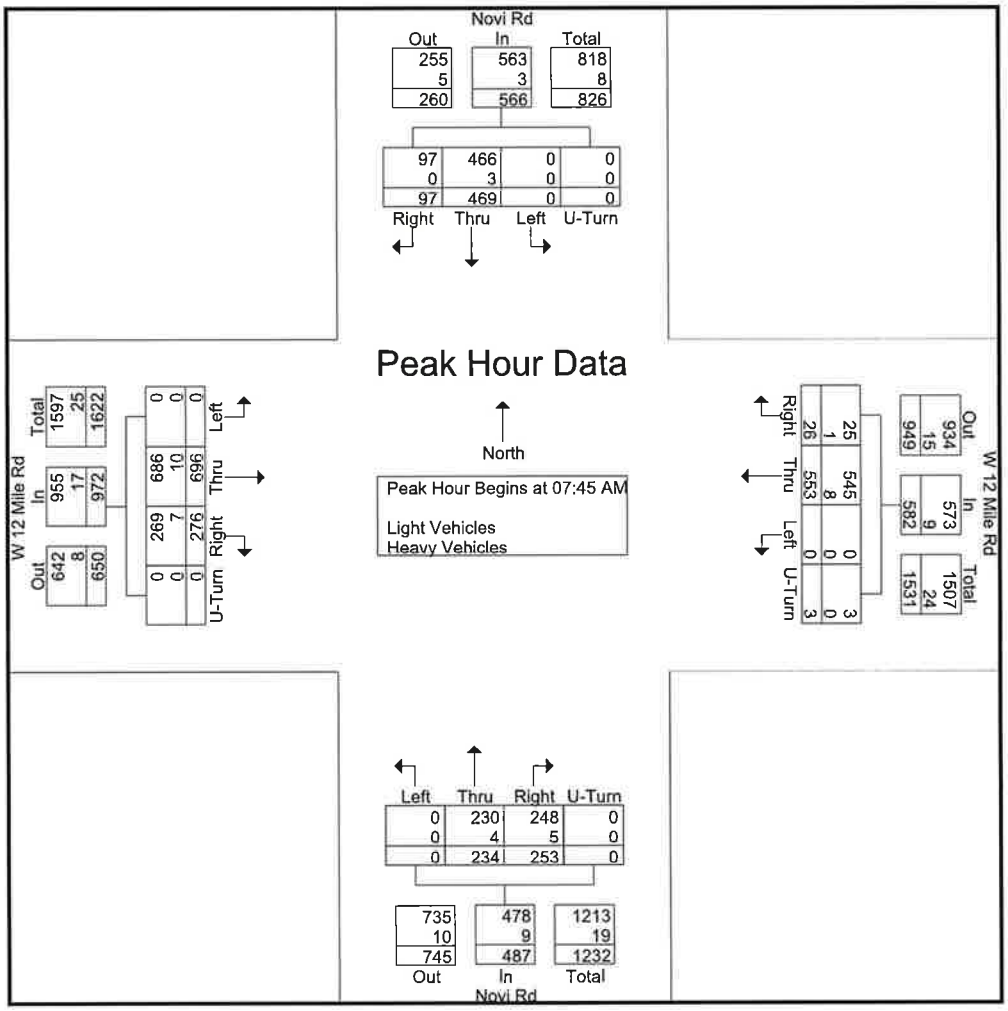
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	0	88	33	0	121	0	61	4	0	65	0	24	40	0	64	0	50	16	0	66	316
07:15 AM	0	123	42	0	165	0	82	7	0	89	0	29	48	0	77	0	69	14	0	83	414
07:30 AM	0	153	60	0	213	0	121	11	0	132	0	49	38	0	87	0	112	22	0	134	566
07:45 AM	0	197	69	0	266	0	120	6	1	127	0	64	61	0	125	0	154	26	0	180	698
Total	0	561	204	0	765	0	384	28	1	413	0	166	187	0	353	0	385	78	0	463	1994
08:00 AM	0	162	64	0	226	0	140	4	0	144	0	59	66	0	125	0	120	22	0	142	637
08:15 AM	0	144	76	0	220	0	133	7	0	140	0	47	69	0	116	0	89	24	0	113	589
08:30 AM	0	193	67	0	260	0	160	9	2	171	0	64	57	0	121	0	106	25	0	131	683
08:45 AM	0	178	80	0	258	0	143	10	0	153	0	36	52	0	88	0	140	33	0	173	672
Total	0	677	287	0	964	0	576	30	2	608	0	206	244	0	450	0	455	104	0	559	2581
Grand Total	0	1238	491	0	1729	0	960	58	3	1021	0	372	431	0	803	0	840	182	0	1022	4575
Apprch %	0	71.6	28.4	0		0	94	5.7	0.3		0	46.3	53.7	0		0	82.2	17.8	0		
Total %	0	27.1	10.7	0	37.8	0	21	1.3	0.1	22.3	0	8.1	9.4	0	17.6	0	18.4	4	0	22.3	
Light Vehicles	0	1218	479	0	1697	0	946	56	3	1005	0	364	421	0	785	0	833	180	0	1013	4500
% Light Vehicles	0	98.4	97.6	0	98.1	0	98.5	96.6	100	98.4	0	97.8	97.7	0	97.8	0	99.2	98.9	0	99.1	98.4
Heavy Vehicles	0	20	12	0	32	0	14	2	0	16	0	8	10	0	18	0	7	2	0	9	75
% Heavy Vehicles	0	1.6	2.4	0	1.9	0	1.5	3.4	0	1.6	0	2.2	2.3	0	2.2	0	0.8	1.1	0	0.9	1.6



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883009 - Novi Rd -- W 12 Mile Rd
Site Code : 16883009
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**197**	69	0	**266**	0	120	6	1	127	0	**64**	61	0	**125**	0	**154**	**26**	0	**180**	**698**
08:00 AM	0	162	64	0	226	0	140	4	0	144	0	59	66	0	125	0	120	22	0	142	637
08:15 AM	0	144	**76**	0	220	0	133	7	0	140	0	47	**69**	0	116	0	89	24	0	113	589
08:30 AM	0	193	67	0	260	0	**160**	**9**	**2**	**171**	0	64	57	0	121	0	106	25	0	131	683
Total Volume	0	696	276	0	972	0	553	26	3	582	0	234	253	0	487	0	469	97	0	566	2607
% App. Total	0	71.6	28.4	0		0	95	4.5	0.5		0	48	52	0		0	82.9	17.1	0		
PHF	.000	.883	.908	.000	.914	.000	.864	.722	.375	.851	.000	.914	.917	.000	.974	.000	.761	.933	.000	.786	.934
Light Vehicles	0	686	269	0	955	0	545	25	3	573	0	230	248	0	478	0	466	97	0	563	2569
% Light Vehicles	0	98.6	97.5	0	98.3	0	98.6	96.2	100	98.5	0	98.3	98.0	0	98.2	0	99.4	100	0	99.5	98.5
Heavy Vehicles	0	10	7	0	17	0	8	1	0	9	0	4	5	0	9	0	3	0	0	3	38
% Heavy Vehicles	0	1.4	2.5	0	1.7	0	1.4	3.8	0	1.5	0	1.7	2.0	0	1.8	0	0.6	0	0	0.5	1.5

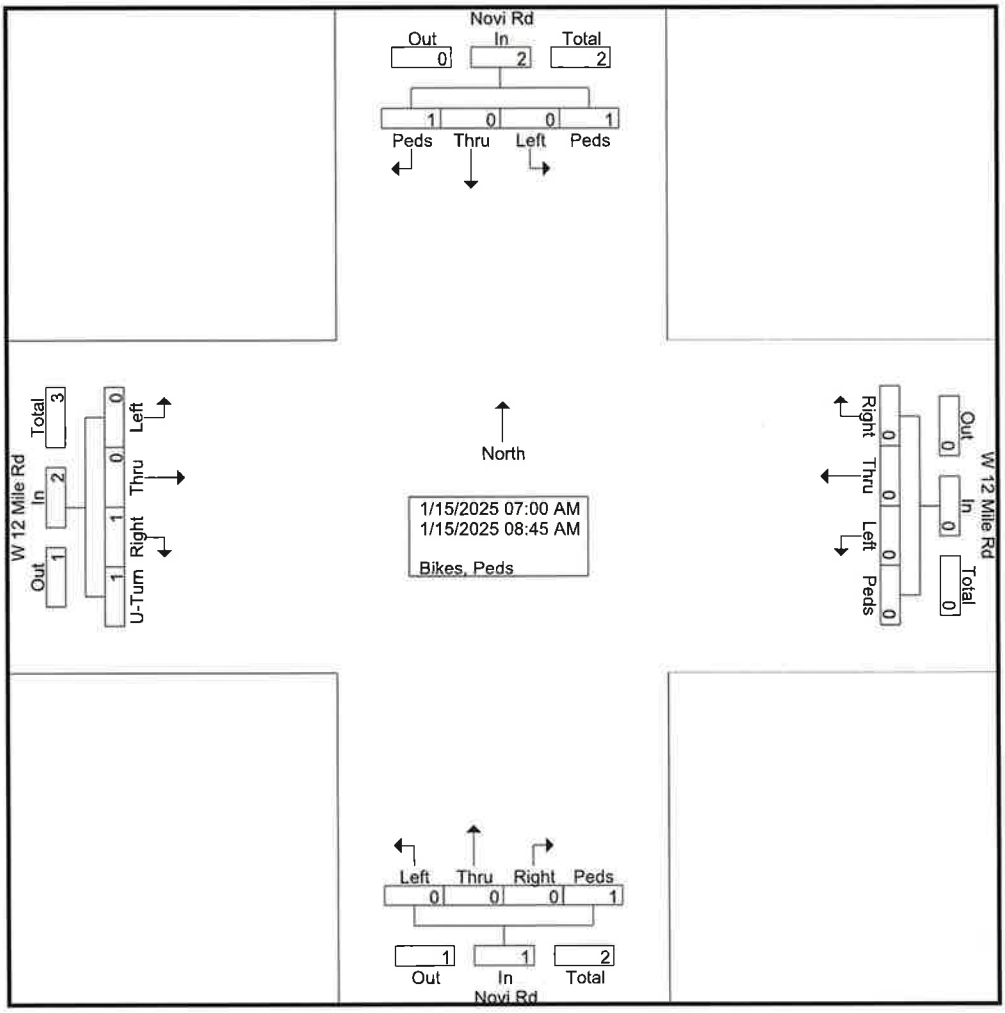


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883009 - Novi Rd -- W 12 Mile Rd
Site Code : 16883009
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

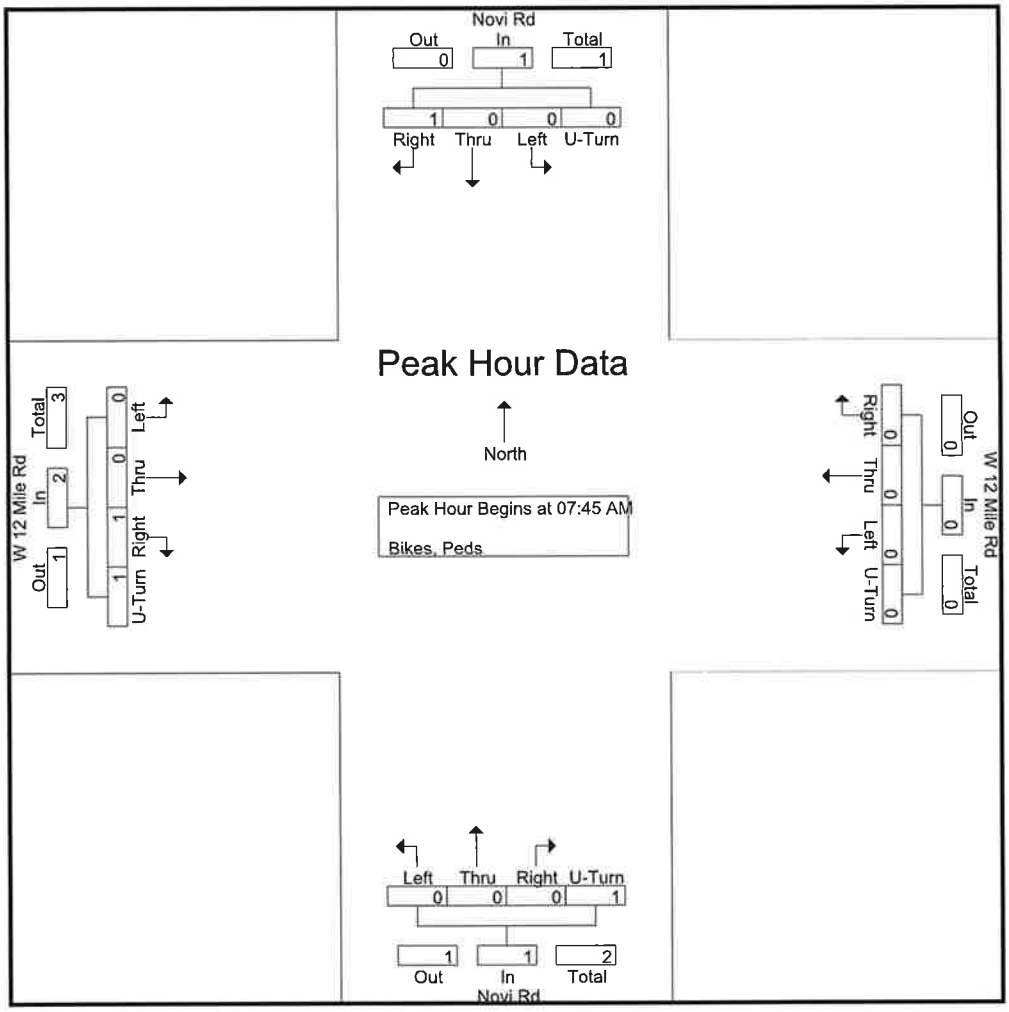
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	4
Grand Total	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	0	0	1	1	2	5
Apprch %	0	0	50	50		0	0	0	0		0	0	0	100		0	0	50	50		
Total %	0	0	20	20	40	0	0	0	0	0	0	0	0	20	20	0	0	20	20	40	



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883009 - Novi Rd -- W 12 Mile Rd
Site Code : 16883009
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	**1**	**1**	**2**	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	**3**
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	1
Total Volume	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	4
% App. Total	0	0	50	50		0	0	0	0		0	0	0	100		0	0	100	0		
PHF	.000	.000	.250	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.250	.000	.250	.333

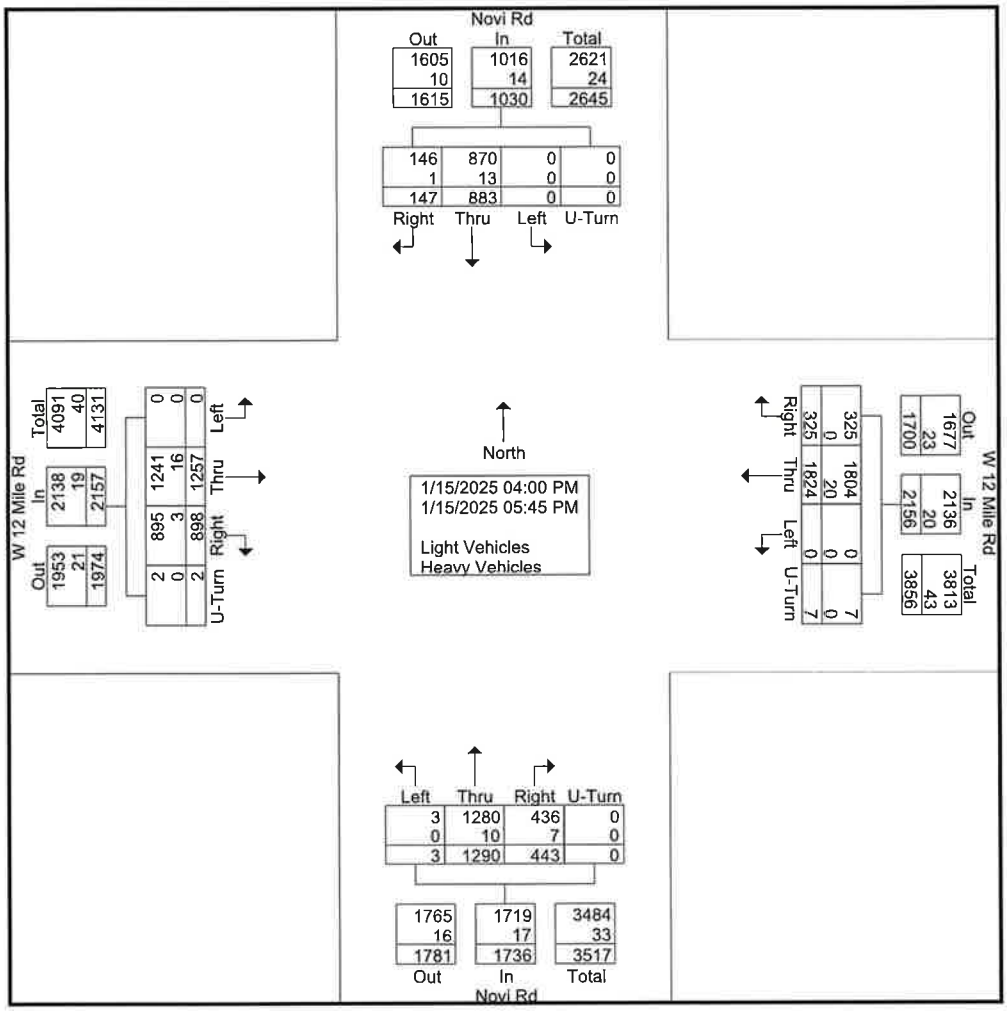


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883010 - Novi Rd -- W 12 Mile Rd
Site Code : 16883010
Start Date : 1/15/2025
Page No : 1

Groups Printed- Light Vehicles - Heavy Vehicles

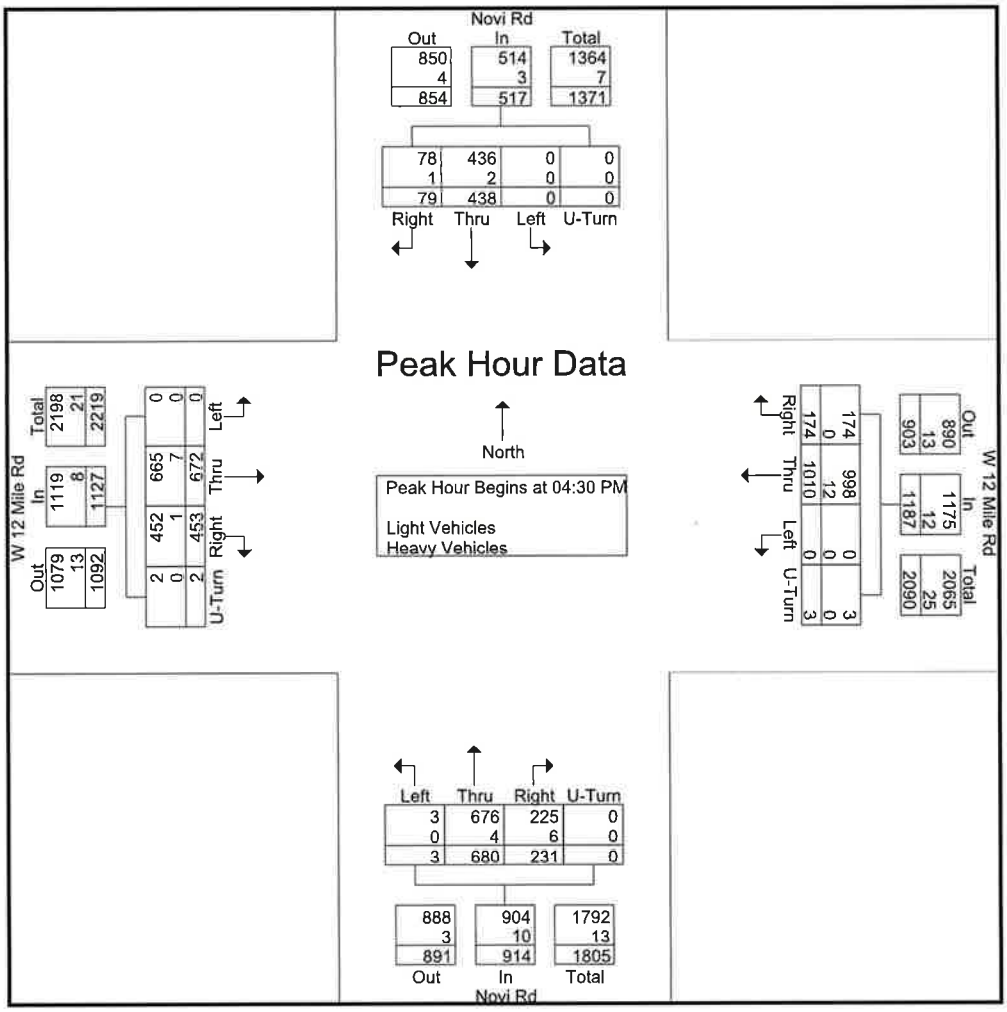
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	0	186	115	0	301	0	175	44	0	219	0	155	45	0	200	0	110	18	0	128	848
04:15 PM	0	156	109	0	265	0	187	29	2	218	0	168	77	0	245	0	109	13	0	122	850
04:30 PM	0	152	102	0	254	0	208	45	1	254	0	170	59	0	229	0	106	19	0	125	862
04:45 PM	0	159	101	1	261	0	291	44	1	336	0	144	56	0	200	0	107	21	0	128	925
Total	0	653	427	1	1081	0	861	162	4	1027	0	637	237	0	874	0	432	71	0	503	3485
05:00 PM	0	176	112	0	288	0	271	41	0	312	1	161	59	0	221	0	105	16	0	121	942
05:15 PM	0	185	138	1	324	0	240	44	1	285	2	205	57	0	264	0	120	23	0	143	1016
05:30 PM	0	128	116	0	244	0	218	51	2	271	0	152	54	0	206	0	113	19	0	132	853
05:45 PM	0	115	105	0	220	0	234	27	0	261	0	135	36	0	171	0	113	18	0	131	783
Total	0	604	471	1	1076	0	963	163	3	1129	3	653	206	0	862	0	451	76	0	527	3594
Grand Total	0	1257	898	2	2157	0	1824	325	7	2156	3	1290	443	0	1736	0	883	147	0	1030	7079
Apprch %	0	58.3	41.6	0.1		0	84.6	15.1	0.3		0.2	74.3	25.5	0		0	85.7	14.3	0		
Total %	0	17.8	12.7	0	30.5	0	25.8	4.6	0.1	30.5	0	18.2	6.3	0	24.5	0	12.5	2.1	0	14.6	
Light Vehicles	0	1241	895	2	2138	0	1804	325	7	2136	3	1280	436	0	1719	0	870	146	0	1016	7009
% Light Vehicles	0	98.7	99.7	100	99.1	0	98.9	100	100	99.1	100	99.2	98.4	0	99	0	98.5	99.3	0	98.6	99
Heavy Vehicles	0	16	3	0	19	0	20	0	0	20	0	10	7	0	17	0	13	1	0	14	70
% Heavy Vehicles	0	1.3	0.3	0	0.9	0	1.1	0	0	0.9	0	0.8	1.6	0	1	0	1.5	0.7	0	1.4	1



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883010 - Novi Rd -- W 12 Mile Rd
Site Code : 16883010
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	152	102	0	254	0	208	**45**	**1**	254	0	170	**59**	0	229	0	106	19	0	125	862
04:45 PM	0	159	101	**1**	261	0	**291**	44	1	**336**	0	144	56	0	200	0	107	21	0	128	925
05:00 PM	0	176	112	0	288	0	271	41	0	312	1	161	59	0	221	0	105	16	0	121	942
05:15 PM	0	**185**	**138**	1	**324**	0	240	44	1	285	**2**	**205**	57	0	**264**	0	**120**	**23**	0	**143**	**1016**
Total Volume	0	672	453	2	1127	0	1010	174	3	1187	3	680	231	0	914	0	438	79	0	517	3745
% App. Total	0	59.6	40.2	0.2		0	85.1	14.7	0.3		0.3	74.4	25.3	0		0	84.7	15.3	0		
PHF	.000	.908	.821	.500	.870	.000	.868	.967	.750	.883	.375	.829	.979	.000	.866	.000	.913	.859	.000	.904	.922
Light Vehicles	0	665	452	2	1119	0	998	174	3	1175	3	676	225	0	904	0	436	78	0	514	3712
% Light Vehicles	0	99.0	99.8	100	99.3	0	98.8	100	100	99.0	100	99.4	97.4	0	98.9	0	99.5	98.7	0	99.4	99.1
Heavy Vehicles	0	7	1	0	8	0	12	0	0	12	0	4	6	0	10	0	2	1	0	3	33
% Heavy Vehicles	0	1.0	0.2	0	0.7	0	1.2	0	0	1.0	0	0.6	2.6	0	1.1	0	0.5	1.3	0	0.6	0.9

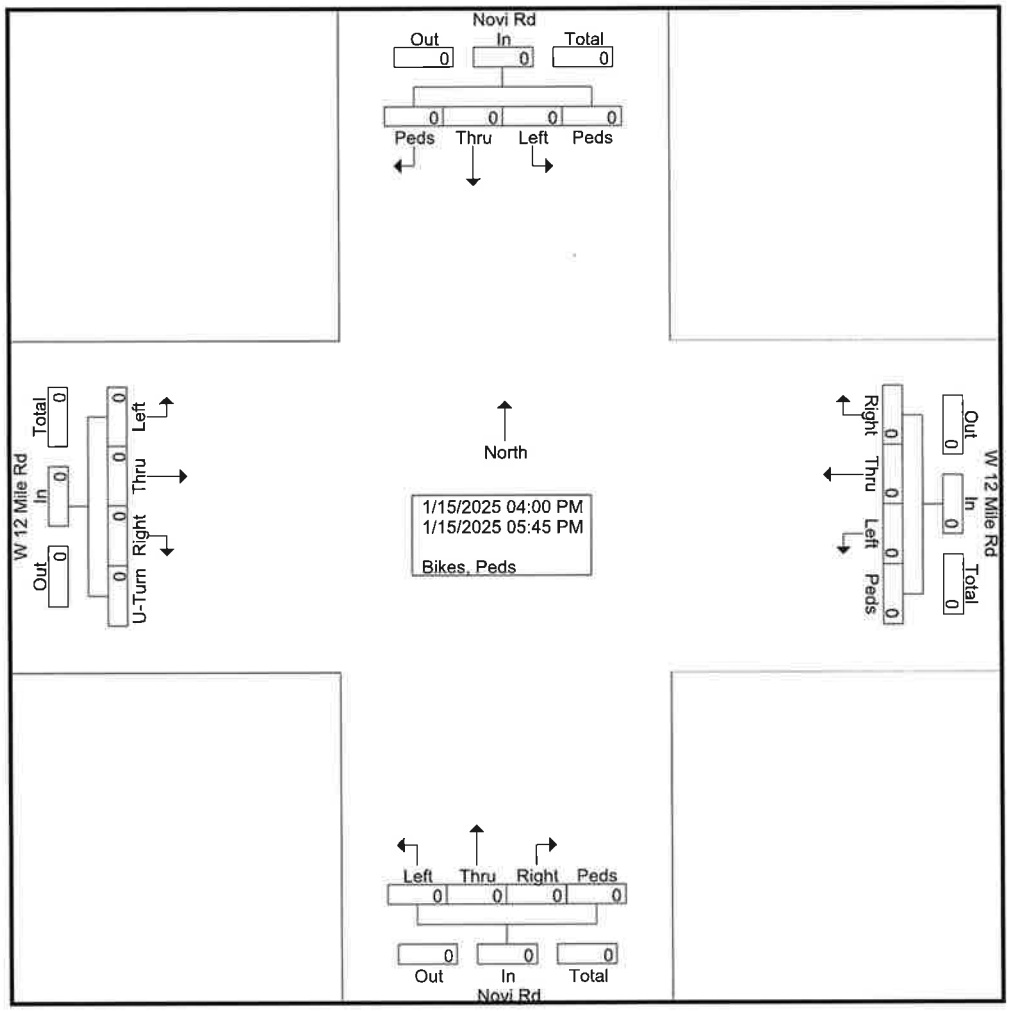


TRUE DATA TO IMPROVE MOBILITY

File Name : 16883010 - Novi Rd -- W 12 Mile Rd
Site Code : 16883010
Start Date : 1/15/2025
Page No : 1

Groups Printed- Bikes, Peds

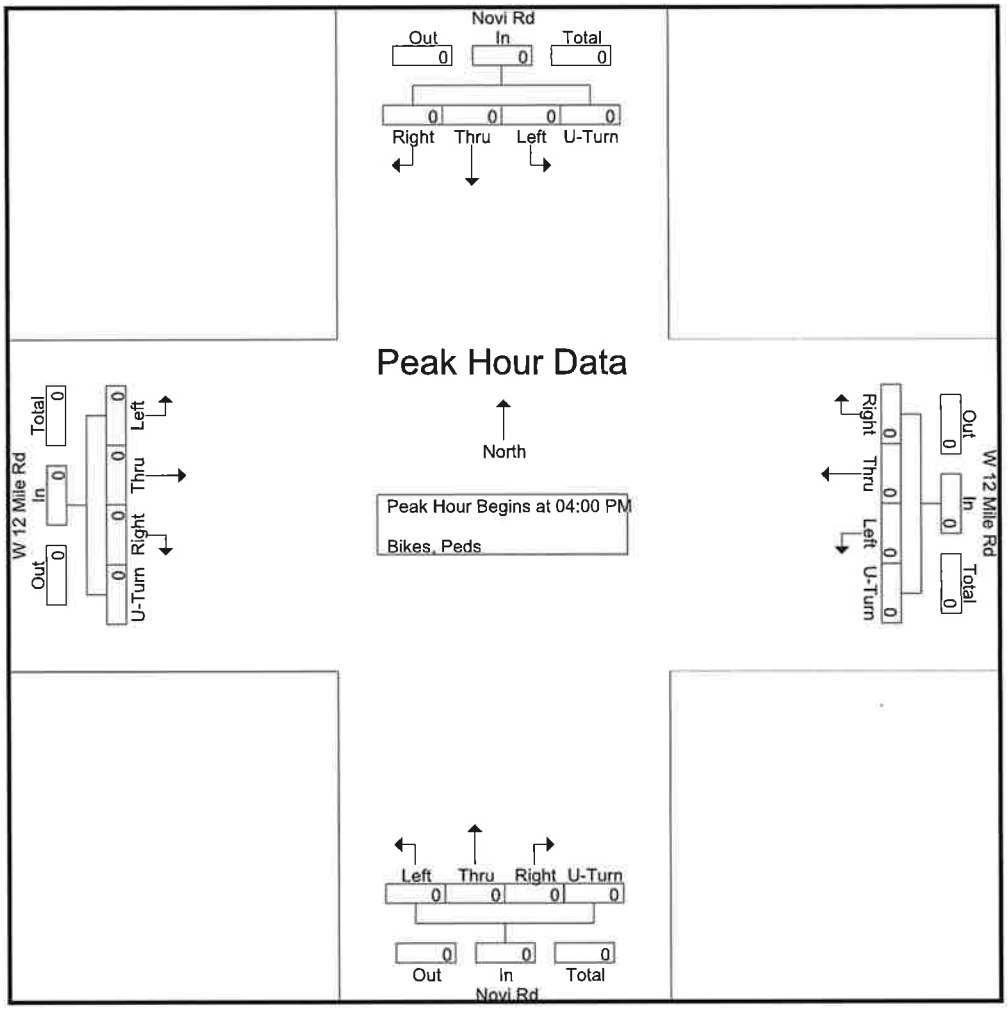
	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
Total %																					



TRUE DATA TO IMPROVE MOBILITY

File Name : 16883010 - Novi Rd -- W 12 Mile Rd
Site Code : 16883010
Start Date : 1/15/2025
Page No : 2

	W 12 Mile Rd Eastbound					W 12 Mile Rd Westbound					Novi Rd Northbound					Novi Rd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Disclaimer: The Michigan Department of Transportation (MDOT) works with individual agencies (cities/villages, counties, metropolitan planning organizations (MPOs), regional planning organizations (RPOs), and other areas of MDOT) to identify existing traffic count programs and/or traffic data. ... more

List View | All DIRs | Report Center

Record 1 of 1 Goto Record go

Location ID	63-3804	**MPO ID**	
Type	SPOT	**HPMS ID**	
On NHS	Yes	**On HPMS**	No
LRS ID	4462980	**LRS Loc Pt.**	3.1403358
SF Group	Urban Non State (2024)	**Route Type**	
AF Group	NoFactor (2024)	**Route**	
GF Group	Urban Non State (2024)	**Active**	Yes
Class Dist Grp	NTL_3 (2024)	**Category**	Primary
Seas Clss Grp			
WIM Group			
QC Group	Default		
Fnct'l Class	(3) Other Principal Arterial	**Milepost**	
Located On	12 MILE RD		
Loc On Alias			
EAST OF	Meadowbrook Rd		
More Detail			

STATION DATA

Directions: 2-WAY | EB | WB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2023	25,911[3]		11	53	25,030 (97%)	881 (3%)	Grown from 2022
2022	25,353[3]		11	53	24,567 (97%)	786 (3%)	Grown from 2021
2021	25,328	2,808	11	53	24,935 (98%)	393 (2%)	
2020	28,377[3]		14	79	27,355 (96%)	1,022 (4%)	Grown from 2019
2019	33,228[2]		14	79	31,966 (96%)	1,262 (4%)	

VOLUME COUNT

	Date	Int	Total
	Wed 8/25/2021	15	25,054
	Tue 8/24/2021	15	25,602

VOLUME TREND

Year	Annual Growth
2023	2%
2022	0%
2021	-11%
2020	-15%

CLASSIFICATION

	Date	Int	Total
	Wed 8/25/2021	15	25,054
	Tue 8/24/2021	15	25,602

MDOT Michigan Department of Transportation

Traffic Count (TCDS)

Home | Locate | Locate All | Email This | Auto-Locate:

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List View | All DIRs | Report Center

Record 1 of 1 Goto Record go

Location ID	63-5367	**MPO ID**	40358
Type	SPOT	**HPMS ID**	
On NHS	No	**On HPMS**	No
LRS ID	0621910	**LRS Loc Pt.**	0.7661009
SF Group	Urban Non State (2024)	**Route Type**	
AF Group	NoFactor (2024)	**Route**	
GF Group	Urban Non State (2024)	**Active**	Yes
Class Dist Grp	NTL_4 (2024)	**Category**	Primary
Seas Clss Grp			
WIM Group			
QC Group	Default		
Fnct'l Class	(4) Minor Arterial	**Milepost**	
Located On	Novi Rd		
Loc On Alias			
BETWEEN	12 1/2 Mile Rd AND 12 Mile Rd		
More Detail			

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2023	6,022[3]				5,860 (97%)	162 (3%)	Grown from 2022
2022	5,892[3]				5,721 (97%)	171 (3%)	Grown from 2021
2021	5,886[3]				5,609 (95%)	277 (5%)	Grown from 2020
2020	5,166[3]				4,918 (95%)	248 (5%)	Grown from 2019
2019	6,049[3]				5,814 (96%)	235 (4%)	Grown from 2018

|< < > >>| 1-5 of 8

VOLUME COUNT

	Date	Int	Total
No Data			

VOLUME TREND

Year	Annual Growth
2023	2%
2022	0%
2021	14%
2020	-15%
2019	0%
2018	0%
2017	4%

CLASSIFICATION

Disclaimer: The Michigan Department of Transportation (MDOT) works with individual agencies (cities/villages, counties, metropolitan planning organizations (MPOs), regional planning organizations (RPOs), and other areas of MDOT) to identify existing traffic count programs and/or traffic data. ... more

List View | All DIRs | Report Center

Record 1 of 1 Goto Record go

Location ID	63-5369	**MPO ID**	
Type	SPOT	**HPMS ID**	
On NHS	Yes	**On HPMS**	No
LRS ID	0621910	**LRS Loc Pt.**	1.438199
SF Group	Urban Non State (2024)	**Route Type**	
AF Group	NoFactor (2024)	**Route**	
GF Group	Urban Non State (2024)	**Active**	Yes
Class Dist Grp	NTL_3 (2024)	**Category**	Primary
Seas Clss Grp			
WIM Group			
QC Group	Default		
Fnct'l Class	(3) Other Principal Arterial	**Milepost**	
Located On	NOVI RD		
Loc On Alias			
	0.1 MILE N OF I-96 OVERPASS (IN NOVI)		
More Detail			

STATION DATA

Directions: 2-WAY | NB | SB

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2023	36,126[3]		9	53	34,898 (97%)	1,228 (3%)	Grown from 2022
2022	35,348[3]		9	53	34,252 (97%)	1,096 (3%)	Grown from 2021
2021	35,313	3,107	9	53	34,880 (99%)	433 (1%)	
2020	31,075[3]		9	62	29,957 (96%)	1,118 (4%)	Grown from 2019
2019	36,388[3]		9	62	35,005 (96%)	1,383 (4%)	Grown from 2018

<< < > >>| 1-5 of 8

VOLUME COUNT

	Date	Int	Total
	Wed 5/19/2021	15	35,666
	Tue 5/18/2021	15	34,960
	Tue 9/25/2018	15	36,571
	Tue 10/22/2013	60	42,527

VOLUME TREND

Year	Annual Growth
2023	2%
2022	0%
2021	14%
2020	-15%
2019	-1%
2018	-20%
2017	4%

CLASSIFICATION

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Novi + 12 Mile DATE: 9/13/19

CITY/TOWNSHIP: Novi BY: C. Markel

COUNTY#: 25 STATE#: — CHARGES: 54551.0981

PLEASE PERFORM THE FOLLOWING:

____ ELECTRICAL DEVICE: ____ INSTALL ____ MODERNIZE ____ MAINTENANCE

____ UNDERGROUND: _____

____ EDISON OK: ____ YES ____ NO JOB#: _____

____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
____ CHANGE TIMING.....																			
____ CHANGE OFFSET.....																			
____ CHANGE CYCLE LENGTH.....																			
____ ADD DIAL/SPLIT.....																			

____CHANGE BREAKOUT OR EPROM: _____

____ CHANGE HOURS OF OPERATION:

OLD: _____ SEP 23 2019

NEW: _____

____ REPROGRAM TBC

____ INSTALL INTERCONNECT: ____ TBC ____ MINITROL ____ TONE

____ MBT OK: ____ YES ____ NO

____ NO CHANGE - RECORD CORRECTION

X OTHER: Meet w/ contractor on Monday 9/16/19 at 9AM.
Wire Flash Program for 12 Mile (LS2) FLR. Take signal
out of flash. Please call TOC.

APPROVED BY: _____ DATE: 9/13/19

DATE INSTALLED: 9/16/19

INSTALLED BY: JS

INTERSECTION :- 25 12 Mile & Novi
DESCRIPTION PROMS :- X00025D / F2403
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE TYPE :- Mod 52 SCATS

INPUTS :-

1. WB 12 MILE L PRES (LK)
2. WB 12 MILE C PRES (LK)
3. WB 12 MILE R PRES (LK)
4. SB NOVI L PRES (LK)
5. SB NOVI R PRES (LK)
6. EB 12 MILE L PRES (LK)
7. EB 12 MILE C PRES (LK)
8. EB 12 MILE R PRES (LK)
9. NB NOVI L PRES (LK)
10. NB NOVI C PRES (LK)
11. NB NOVI R PRES (LK)
12. -
13. -
14. -
15. -
16. -

17. NOTE :- ALL DETECTORS ARE LOOPS.
18. -
19. -
20. -
21. -
22. -
23. Opticom 2 (BACKPANEL 167 - VD7)
24. Opticom 1 (BACKPANEL 175 - VD8)

PED 2: 12 MILE PED P.B.(WA)
PED 4: NOVI PED P.B.(WB)

APPROACHES :-

A APPR 1 : WB 12 MILE L,C,R
B APPR 1 : SB NOVI L,R
A APPR 2 : EB 12 MILE L,C,R
B APPR 2 : NB NOVI L,C,R

FLEXIDATA :-		
SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		
LOOKAHEAD		

PEDESTRIANS :-

1. NO PED 1
2. 12 MILE PED (P-)
3. NO PED 3
4. NOVI PED (P+)

SPECIAL FEATURES :-

The personality revision number is currently 3 (=C).

Opticom 1 calls A stage.
Opticom 2 calls B stage.

Ped 12 MILE PED introduction is suppressed when OPTICOM is active.
Ped NOVI PED introduction is suppressed when OPTICOM is active.

NOVI NEAR has early cut-off operation in B stage.

BACKPANEL :- SIZE P44-12 CABINET

LOAD SWITCH 2 - 12 MILE	A	FLR
LOAD SWITCH 3 - NOVI FAR	C	FLR
LOAD SWITCH 4 - NOVI NEAR	B	FLR
LOAD SWITCH 9 - 12 MILE PED	WA	
LOAD SWITCH 10 - NOVI PED	WB	

JUMPERS :-
195-196,197-198,199-200,201-202,207-208,211-212,213-214,215-216,217-218,
219-220,221-222,223-224,229-230,321-PB1,325-326,327-328,329-PB1,334-335,
343-344,345-346,347-348,349-350,351-PB1,356-357,365-PB1,369-PB1,373-PB1,
387-PB1,391-PB1,395-PB1,298-302.

SIGNAL MONITOR :- 3-4.
All switched OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,3,4.
Minimum Flash = 4 + 2 + 1.

```
********************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO.    25       *
*         CARISSA MARKEL       *
*    DATE :- 13-SEP-2019       *
********************************
```

CHECKSUMS
TIMES: 64/144
PERS: 02/002
TOTAL: 66/146

FLEXILINK PLAN DATA

Intersection # 25 **State #** _____ **Date:** 10/07/08 **Prepared By:** Rachel Jones

Intersection: 12 Mile Road and Novi Road **City:** Novi

Flash: None **Approved By:** Deneau

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	100	100					
1	A		0	0	0					
2	B		45	55	55					
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		54	75	75					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: STAGES WITH ONE SECOND PHASE TIMES ARE SKIPPED
BLANK ENTRIES ARE DEFAULT VALUES = 0 FOR ENTRIES #0 - #7, #16 - #17
254 FOR ENTRIES #8 - #15 'C' ENTRY MEANS CONTINOUS = 255

							Timers		
Phase	Direction	Min	Max	ECO	Amber	All Red	Gap	Hdwy	Waste
A	12 Mile Road	15.0	45.0		4.3	2.1	3.0	1.2	6.0
B	Novi Road	10.0	35.0	3.0	4.3	1.2	3.0	1.2	6.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	8	6:00	2
SC2	8	9:30	1
SC3	8	15:00	3
SC4	8	19:00	1
SC5	14	0:00	1
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2
12 Mile Ped	7.0	17.0	4.3
Novi Ped	7.0	6.0	4.3

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

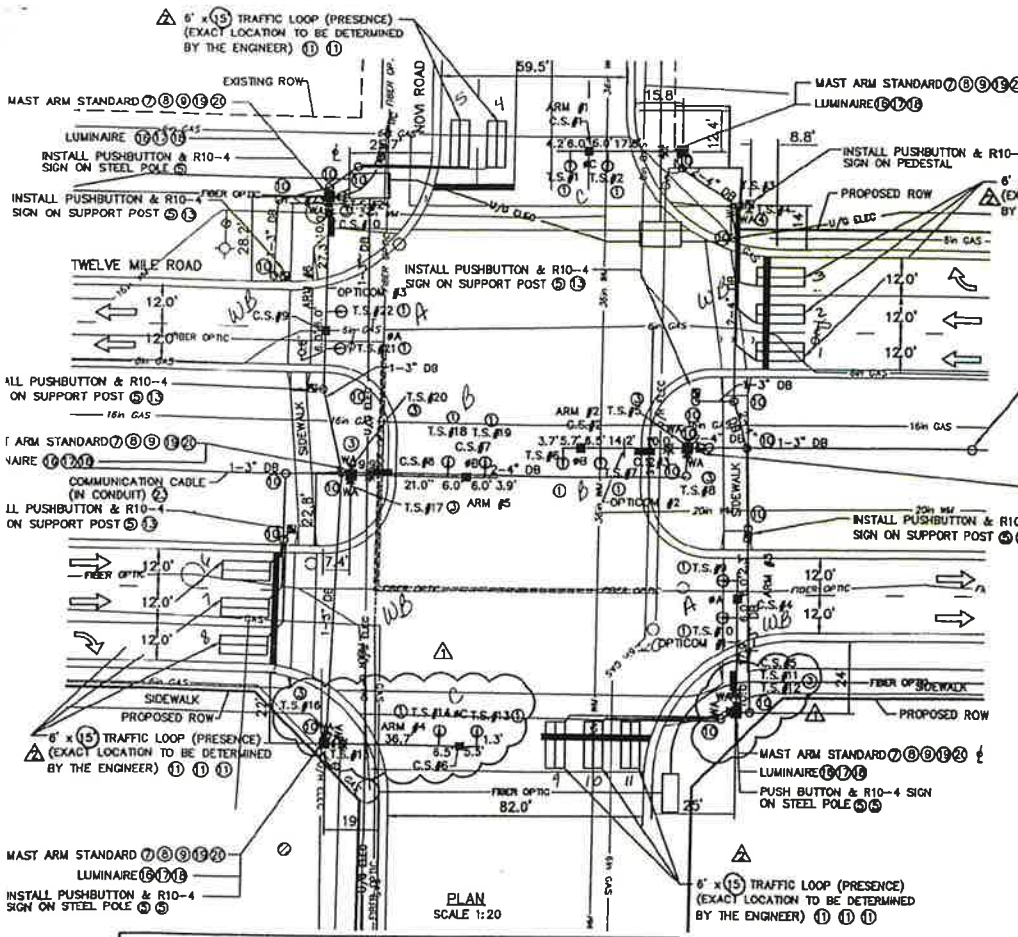
Gap = add to min green

*Only for the later intersection

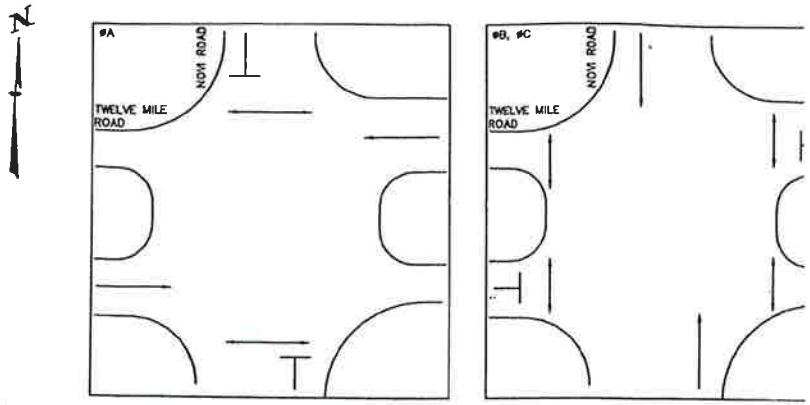
D Connector Form for Mod 50 w/Loops

Intersection Name: 12 Mile & Novi Rd
County No: 25
Date: 2-23-06

Detecton Number on Print	Detector Description	D-Conn Term #	D-Conn Description	Phase
1	WB 12 Mile L	1	Det. 9	2
2	WB 12 Mile C	2	Det. 10	2
3	WB 12 Mile R	3	Det. 11	2
4	SB Novi L	4	Det. 12	4
5	SB Novi R	5	Det. 13	4
6	EB 12 Mile L	6	Det. 14	2
7	EB 12 Mile C	7	Det. 15	2
8	EB 12 Mile R	8	Det. 16	2
9	NB Novi L	9	Det. 17	4
10	NB Novi C	10	Det. 18	4
11	NB Novi R	11	Det. 19	4
		12	Det. 20	
		13	Det. 21	
		14	Det. 22	
		15	Det. 23	
		16	Det. 24	
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		



PLAN
SCALE 1:20



PHASING DIAGRAM

NOTE:
1. ALL TRAFFIC LOOPS SHALL BE 1-1/C#14 P.E. (I.M.S.A. 51-5) (3 TURNS)
2. SIGNAL MAST ARM AND POLE ASSEMBLY PER "NOSTALGIC" STYLE MAST ARM SIGNAL DETAIL
3. ALL MAST ARMS, SIGNAL POLES (INCLUDING POLE BASES AND FINIALS), SIGNAL MOUNTING HARDWARE, CONTROLLER CABINETS, STREET NAME SIGNS, STREET LIGHTING ASSEMBLIES AND ALL ASSOCIATED HARDWARE SHALL BE PAINTED TO MATCH VALMONT'S DARK GREEN (PAINT CODE #923).
4. PAYMENT FOR OPTICOM TO BE INCLUDED WITH "MAST ARM". EQUIPMENT WILL BE PROVIDED BY THE CITY OF NOVI. CONTRACTOR TO WIRE AND INSTALL OPTICOM EQUIPMENT (2 EYES FOR 12 MILE ROAD AND 1 EYE FOR NOVI ROAD) AS SHOWN ON THE PLANS.

(2)(2)(2) (2)(2)(2) INSTALL TWO-WAY ILLUMINATED CASE SIGN, 24" BY 30"

CASE SIGN LEGEND (C.S. #1)
NO TURNS
FACING SOUTH — FACING NORTH (BLANK)

CASE SIGN LEGEND (C.S. #4)
FACING WEST — FACING EAST (BLANK)

CASE SIGN LEGEND (C.S. #7)
ONE WAY
FACING NORTH — FACING SOUTH (BLANK)

CASE SIGN LEGEND (C.S. #2)
ONE WAY
FACING SOUTH — FACING NORTH (BLANK)

CASE SIGN LEGEND (C.S. #6)
NO TURNS
FACING NORTH — FACING SOUTH (BLANK)

CASE SIGN LEGEND (C.S. #9)
FACING EAST — FACING WEST (BLANK)

(2)(2)(2)(2) INSTALL TWO WAY ILLUMINATED STREET NAME SIGN, 96" BY 22"

CASE SIGN LEGEND (C.S. #5, C.S. #10)
Novi Rd
FACING EAST & WEST

CASE SIGN LEGEND (C.S. #3, #8)
Twelve Mile Rd
FACING NORTH & SOUTH

LIST OF MATERIALS

NO	ITEM	QUANTITIES
(1)	ONE-WAY MAST ARM MOUNTED TRAFFIC SIGNAL	12 EA.
(2)	TWO-WAY CASE SIGN, 24" BY 30"	8 EA.
(3)	TWO-WAY BRACKET ARM MOUNTED PEDESTRIAN TRAFFIC SIGNAL	5 EA.
(4)	TWO-WAY PEDESTAL MOUNTED PEDESTRIAN TRAFFIC SIGNAL	1 EA.
(5)	PUSHBUTTON & SIGN	13 EA.
(6)	SOLID STATE ACTUATED CONTROLLER AND CABINET	1 EA.
	SOLID STATE ACTUATED CONTROLLER AND CABINET, DELIVERED	1 EA.
(7)	MAST ARM (VALMONT CURVED ROUND DS-32)	6 EA.
(8)	MAST ARM STANDARD (VALMONT ROUND TAPERED POLE AND BASE)	6 EA.
(9)	MAST ARM STANDARD FOUNDATION	6 EA.
(10)	HANDHOLE (ROUND)	19 EA.
(11)	TRAFFIC LOOP (PRESENCE)	11 EA.
(12)	ALUMINUM PEDESTAL	1 EA.
(13)	SUPPORT POST	5 EA.
(14)	SUBSOIL BURIAL CONDUIT 2-4"	267 LFT.
(15)	SERVICE DISCONNECT	1 EA.
(16)	VALMONT S-SHAPED BRACKET ARM (DS-32) AND BRACKET	6 EA.
(17)	KING LUMINAIRE FINIAL - CONNECTOR (KPL-20)	6 EA.
(18)	UNION METAL "AUSTIN" LUMINAIRE - w/#157 LENS & 250 W H.P. SODIUM	6 EA.
(19)	CLAMP ON BRACKETS	6 EA.
(20)	VALMONT SINGLE POLE ECP	6 EA.
(21)	DIGITAL LOOP DETECTOR	6 EA.
(22)	TWO-WAY ILLUMINATED STREET NAME SIGN, 96" BY 22"	2 EA.

MAST ARM INFORMATION

MAST ARM	LENGTH
#1	40'
#2	40'
#3	45'
#4	50'
#5	50'
#6	50'

CO. 25

APPROVED FOR CONSTRUCTION
3/30/01

CYCLIC WA
STEADY W

PERMANENT MAST ARM SIGNAL SHEET

NO.	DESCRIPTION	DATE	BY	APP'D
1	SIGNAL REVISIONS	11/8/00	DMF	DW

SCALE

12 MILE ROAD & NOVI ROAD

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: 12 Mile + 12 Oaks Mall Dr East DATE: 6/9/17

CITY/TOWNSHIP: Nov. BY: C. Markel

COUNTY#: 725 STATE#: — CHARGES: Material: 53391.0981
Labor: 53391.0989

PLEASE PERFORM THE FOLLOWING:

____ ELECTRICAL DEVICE: ____ INSTALL ____ MODERNIZE ____ MAINTENANCE

____ UNDERGROUND: _____

____ EDISON OK: ____ YES ____ NO JOB#: _____ JUL 31 2017

____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
____ CHANGE TIMING.....																			
____ CHANGE OFFSET.....																			
____ CHANGE CYCLE LENGTH.....																			
____ ADD DIAL/SPLIT.....																			

X CHANGE BREAKOUT OR EPROM: Change Personality → Rev#4

____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

____ REPROGRAM TBC

____ INSTALL INTERCONNECT: ____ TBC ____ MINITROL ____ TONE

____ MBT OK: ____ YES ____ NO

____ NO CHANGE - RECORD CORRECTION

X OTHER: Swap out existing 2070 SCATS controller w/ Mod 52 SCATS Controller. Swap out d-connector. Hook up cameras per AS sheet. Requires a checksum change.

APPROVED BY: _____ DATE: 6/9/17

DATE INSTALLED: 7/29/17

INSTALLED BY: D-8

INTERSECTION :- 725 12 MILE & 12 OAKS MALL DR EAST / X/O
DESCRIPTION PROMS :- X00725D / F2202
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE TYPE :- MOD 52 SCATS

INPUTS :-
1. X/O L (LK)
2. X/O R (LK)
3. 12 MILE L PRES (LK)
4. 12 MILE R PRES (LK)
5. 12 MILE RT PRES (LK)
6. NB 12 OAKS MALL EAST RT L (5 SEC)
7. NB 12 OAKS MALL EAST RT R (5 SEC)
8. -
9. -
10. -
11. -
12. -
13. -
14. -
15. -
16. Opticom 1 (Pin S on D-connector)(FOR FUTURE USE)
17. NOTE :- ALL DETECTORS ARE AUTOSCOPE
18. (2004 CAMERAS).
19. -
20. -
21. -
22. -
23. -
24. -

PED 2: 12 MILE PED SOUTH P.B. (WA)

APPROACHES :-
A APPR 1 : 12 MILE L,R,RT
B APPR 1 : X/O L,R
B APPR 2 : 12 OAKS MALL DR EAST RT L,RT R

FLEXIDATA :-

SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		
LOOKAHEAD		

PEDESTRIANS :-
1. NO PED 1
2. 12 MILE PED SOUTH (P-)

SPECIAL FEATURES :-
The personality revision number is currently 4 (=D).

A STAGE HAS A PERMANENT DEMAND.
DEMAND FOR B STAGE IN FLEXI AND ISOLATED, SET ZNEG TO DISABLE.

Opticom 1 calls A stage.

Pedestrians have automatic introduction using SCATS Y-.

Night Flash code: Set Y+ to activate the night flash in Flexilink.

BACKPANEL :- SIZE P44-12 CABINET

LOAD SWITCH 2: 12 MILE	A	FLA
LOAD SWITCH 4: 12 OAKS MALL DR EAST / X/O	B	FLR
LOAD SWITCH 9: 12 MILE PED SOUTH	WA	

JUMPERS :-
195-196,197-198,199-200,201-202,207-208,217-218,219-220,221-222,298-302,
321-PB1,325-326,327-328,329-PB1,334-335,343-PB1,347-348,349-350,351-PB1,
365-PB1,369-PB1,373-PB1,387-PB1,391-PB1,395-PB1.

SIGNAL MONITOR :- NONE.
All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,4.
Minimum Flash = 4 + 2 + 1.

```
********************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO.   725       *
*       CARISSA MARKEL         *
*    DATE :09-JUN-2017         *
********************************
```

CHECKSUMS
TIMES: 3D/075
PERS: EF/357
TOTAL: D2/322

FLEXILINK PLAN DATA

Intersection # 725 **State #** _____ **Date:** 06/09/17 **Prepared By:** Carissa Markel

Intersection: 12 Mile & 12 Oaks Mall Dr East **City:** Novi

Hours of Operation: 7 Days: 9am - 10pm **Approved By:** Rachel Jones

Hours of Flashing: 7 Days: 10pm - 9am

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	100						
1	A		0	0						
2	B		45	55						
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		14	15						
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0. Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	**Direction**	**Min**	**Max**	**ECO**	**Amber**	**All Red**	**Gap**	**Hdwy**	**Waste**
A	12 Mile	10.0	40.0		4.3	1.8	3.0	1.2	10.0
B	12 Oaks Mall Dr East / X/O	7.0	20.0		3.5	1.6	3.2	1.2	10.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	14	0:00	0
SC2	14	9:00	1
SC3	8	15:00	2
SC4	8	19:00	1
SC5	14	22:00	0
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2
12 Mile Ped South	7.0	18.0	3.1

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

Autoscope 37-Pin Male Output Harness (33457G2) Wiring

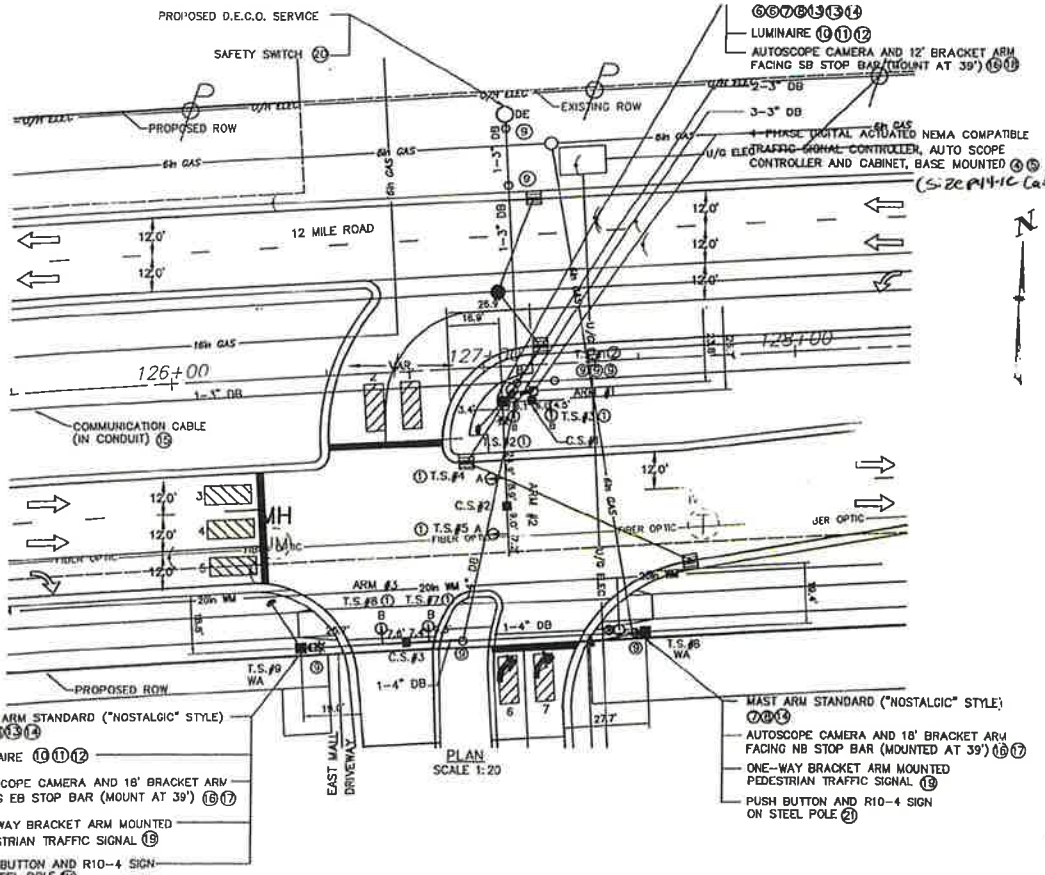
Autoscope Output Harness Pins #1 & #20 to Logic Common & Pins #18 & # 37 to +24 VDC

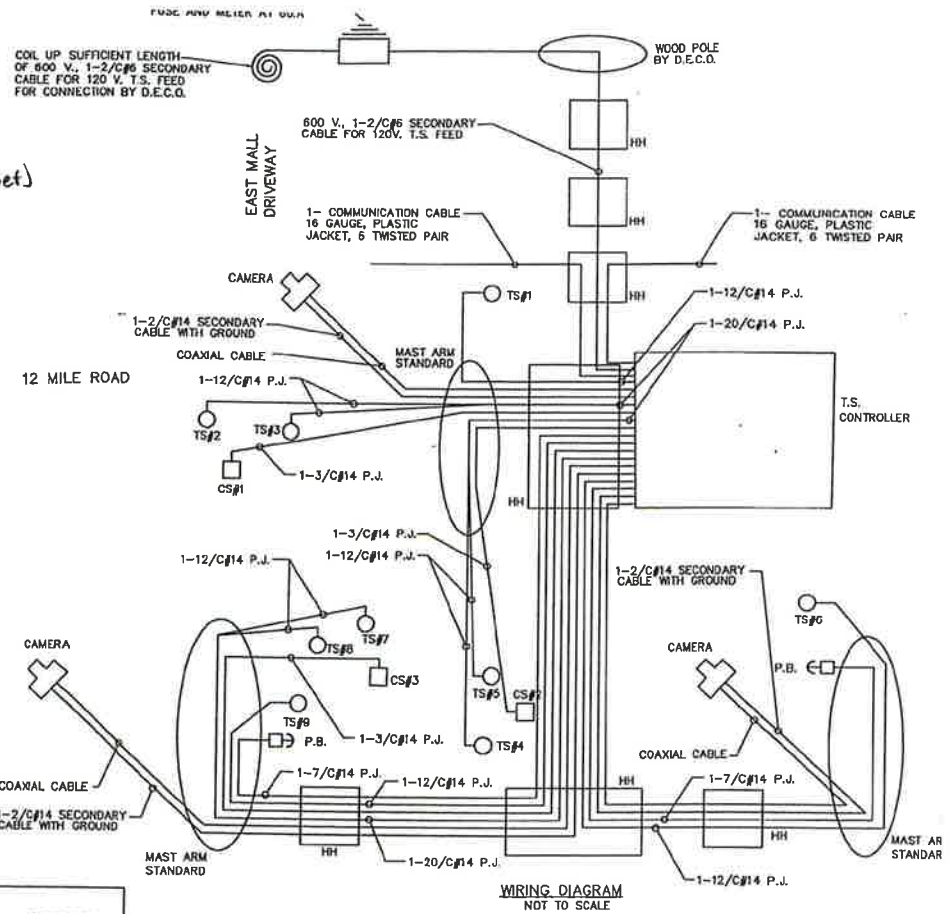
C O#725

Camera Number	EIM Switch Position	EIM LED#	Output Harness Pin#	D-Conn Pin (1,2,..)	Vehicle Detector No.		Detector Description	Phase No (1 ,2,3,...)
					D-Conn format (9,10,...)	On Print (1,2,..)		
1	1	1	29	1	9	1	X/O L	4
	1	2	30	2	10	2	X/O R	4
	1	3	31					
	1	4	32					
	1	5	33					
	1	6	34					
	1	7	35					
	1	8	36					
2	2	1	10	3	11	3	EB 12 MILE L	2
	2	2	11	4	12	4	EB 12 MILE R	2
	2	3	12	5	13	5	EB 12 MILE RT	2
	2	4	13					
	2	5	14					
	2	6	15					
	2	7	16					
	2	8	17					
3	3	1	21	6	14	6	NB 12 OAKS MALL RT L	4
	3	2	22	7	15	7	NB 12 OAKS MALL RT R	4
	3	3	23					
	3	4	24					
	3	5	25					
	3	6	26					
	3	7	27					
	3	8	28					
	4	1	2					
	4	2	3					
	4	3	4					
	4	4	5					
	4	5	6					
	4	6	7					
	4	7	8					
	4	8	9					

Autoscope 37-Pin Female Input Harness (33457G3) Wiring

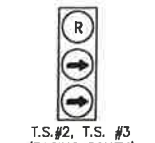
EIM Switch Position	EIM LED#	Input Harness Pin#	Phase Status Input From +24 VDC	Backpanel Terminal Position and Number
5	1	29	Phase 8 Green	
5	1	30	Phase 7 Green	
5	1	31	Phase 6 Green	
5	1	32	Phase 5 Green	
5	1	33	Phase 4 Green	LS 4 Green 221
5	1	34	Phase 3 Green	
5	1	35	Phase 2 Green	LS 2 Green 199
5	1	36	Phase 1 Green	
6	2	10	Phase 8 Red	
6	2	11	Phase 7 Red	
6	2	12	Phase 6 Red	
6	2	13	Phase 5 Red	
6	2	14	Phase 4 Red	LS 4 Red 217
6	2	15	Phase 3 Red	
6	2	16	Phase 2 Red	LS 2 Red 195
6	2	17	Phase 1 Red	





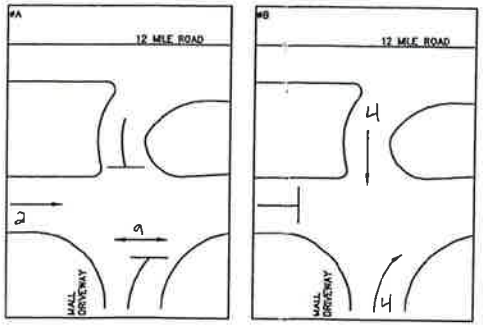
WIRING DIAGRAM
NOT TO SCALE

LIST OF MATERIALS		
NO.	ITEM	QUANTITIES
(1)	ONE-WAY MAST ARM MOUNTED TRAFFIC SIGNAL (LED)	6 EA.
(2)	ONE-WAY BRACKET ARM MOUNTED TRAFFIC SIGNAL (LED)	1 EA.
(3)	TWO WAY CASE SIGN, 24" BY 30"	3 EA.
(4)	SOLID STATE ACTUATED CONTROLLER AND CABINET	1 EA.
	SOLID STATE ACTUATED CONTROLLER AND CABINET, DELIVERED	1 EA.
(5)	BASE MOUNT CONTROLLER FOUNDATION	1 EA.
(6)	MAST ARM (VALMONT CURVED ROUND DS-32)	3 EA.
(7)	MAST ARM STANDARD (VALMONT ROUND TAPERED POLE AND BASE)	3 EA.
(8)	MAST ARM STANDARD FOUNDATION	3 EA.
(9)	HANDHOLE (ROUND)	8 EA.
(10)	VALMONT S-SHAPED BRACKET ARM (DS-32) AND BRACKET	2 EA.
(11)	KING LUMINAIRE FINIAL CONNECTOR (KPL-20)	2 EA.
(12)	UNION METAL "AUSTIN" LUMINAIRE - w/#157 LENS &250 W H.P. SODIUM	2 EA.
(13)	CLAMP ON BRACKETS	3 EA.
(14)	VALMONT "SPIKE" POLE TOP	3 EA.
(15)	COMMUNICATION CABLE, 16 GAUGE, PLASTIC JACKET, 6 TWISTED PAIR	220 LFT.
(16)	AUTOSCOPE CAMERA	3 EA.
(17)	CLAMP-ON BRACKET ARM, 18'	2 EA.
(18)	CLAMP-ON BRACKET ARM, 12'	1 EA.
(19)	ONE-WAY BRACKET ARM MOUNTED PEDESTRIAN TRAFFIC SIGNAL (LED)	2 EA.
(20)	SAFETY SWITCH	1 EA.
(21)	PUSH BUTTON AND SIGN	2 EA.
	DIRECT BURIAL CONDUIT 1-3"	305 LFT.
	DIRECT BURIAL CONDUIT 1-4"	190 LFT.
	DIRECT BURIAL CONDUIT 2-3"	10 LFT.



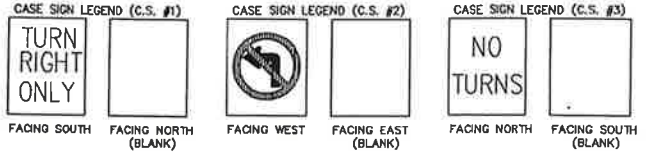
T.S.#2, T.S. #3
(FACING SOUTH)

MAST ARM INFORMATION	
MAST ARM	LENGTH
#1	20'
#2	50'
#3	50'



PHASING DIAGRAM

(3)(3)(3) INSTALL TWO WAY ILLUMINATED CASE SIGN, 24" BY 30"



NOTE:

1. SIGNAL MAST ARM AND POLE ASSEMBLY PER "NOSTALGIC" STYLE MAST ARM SIGNALS DETAIL
2. ALL MAST ARMS, SIGNAL POLES (INCLUDING POLE BASES AND FINIALS), SIGNALS MOUNTING HARDWARD, CONTROLLER CABINETS, STREET NAME SIGNS, STREET LIGHTING ASSEMBLIES, CLAMP-ON BRACKET ARM AND ALL ASSOCIATED HARDWARE SHALL BE PAINTED TO MATCH VALMONT'S DARK GREEN (PAINT CODE #923).

#125

12 MILE ROAD & EAST MALL DRIVEWAY
PERMANENT MAST ARM SIGNAL SHEET

CYCLIC WA
STEADY WA
TSI
NO

ROAD COMMISSION

REV. NO.	DESCRIPTION	DATE	BY	APP'D
1	REVISED PER RCOC	4/1/21	DMF	
2	REVISED PER RCOC	7/14/21	DMF	

FINKBEINER, PETTIS & STROUT, INC.
CONSULTING ENGINEERS

SCALE: AS NOTED
DESIGNED BY: D.M.F.

12 MILE ROAD IMPROVEMENTS
EAST OF NOVI TO

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: 12 Mile & x/o E/O Novi. DATE: 3-2-17

CITY/TOWNSHIP: Novi BY: RACHEL JONES

COUNTY#: 1142 STATE#: _____ CHARGES: 53391-0989 (labor)

PLEASE PERFORM THE FOLLOWING: 53391-0981 (materials)

____ ELECTRICAL DEVICE: ____ INSTALL ____ MODERNIZE ____ MAINTENANCE

____ UNDERGROUND: _____

____ EDISON OK: ____ YES ____ NO JOB#: _____ JUN 13 2017

____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
____ CHANGE TIMING.....																			
____ CHANGE OFFSET.....																			
____ CHANGE CYCLE LENGTH.....																			
____ ADD DIAL/SPLIT.....																			

X CHANGE BREAKOUT OR EPROM: REV 2

____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

____ REPROGRAM TBC

____ INSTALL INTERCONNECT: ____ TBC ____ MINITROL ____ TONE

____ MBT OK: ____ YES ____ NO

____ NO CHANGE - RECORD CORRECTION

X OTHER: Swap out 2070 w/ MOD 52 SCATS controller
Swap out D-connector and hook up loops per paperwork.
Requires a checksum change.

APPROVED BY: _____ DATE: 3/2/17

DATE INSTALLED: 6-10-17

INSTALLED BY: Jordan - Paulsen

INTERSECTION :- 1142 12 Mile & X/O East of Novi Rd.
DESCRIPTION PROMS :- X01142D / F2002
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE :- MOD 52 SCATS

INPUTS :-
1. XOVER L PRES (LK)
2. XOVER C PRES (LK)
3. XOVER R PRES (LK)
4. 12 MILE L PRES (LK)
5. 12 MILE R PRES (LK)

Note: All detectors are loops.

APPROACHES :-
A APPR 1 : 12 MILE L,R
B APPR 1 : XOVER L,C,R

FLEXIDATA :-

SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		
LOOKAHEAD		

SPECIAL FEATURES :-
The personality revision number is currently 2 (=B).

A stage has a permanent demand.
Demand for B stage in flexi and isol, set ZNEG to disable.

BACKPANEL 8 PHASE EAGLE

LOAD SWITCH 2 - 12 MILE ROAD	A	FLA
LOAD SWITCH 4 - CROSSOVER	B	FLR

JUMPERS
298-302,195-196,197-198,199-200,217-218,219-220,221-222,321-PB1,
325-326-327-328,329-PB1,343-PB1,347-348,349-350,351-PB1,365-PB1,
369-PB1,373-PB1,387-PB1,391-PB1,395-PB1.

SIGNAL MONITOR: NONE.
All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,4.
Minimum Flash = 4 + 2 + 1

```
********************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO.  1142       *
*         Rachel Jones         *
*    DATE :- 2-MAR-2017        *
********************************
```

Checksums:
Times C5 / 305
Pers 58 / 130
Total 9D / 235

FLEXILINK PLAN DATA

Intersection # 1142 **State #** _____ **Date:** 03/02/17 **Prepared By:** Rachel Jones

Intersection: 12 Mile & X/O E/O Novi **City:** Novi

Hours of Operation: 7 Days: 24 Hours **Approved By:** R. Jones

Hours of Flashing: None

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	100	100					
1	A		0	0	0					
2	B		43	53	53					
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		47	68	68					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0. Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	**Direction**	**Min**	**Max**	**ECO**	**Amber**	**All Red**	**Gap**	**Hdwy**	**Waste**
A	12 Mile	10.0	30.0		4.3	1.2	3.0	1.2	6.0
B	X-Over	7.0	20.0		3.5	1.8	3.0	1.2	6.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	8	6:00	2
SC2	8	9:30	1
SC3	8	15:00	3
SC4	8	19:00	1
SC5	14	0:00	1
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

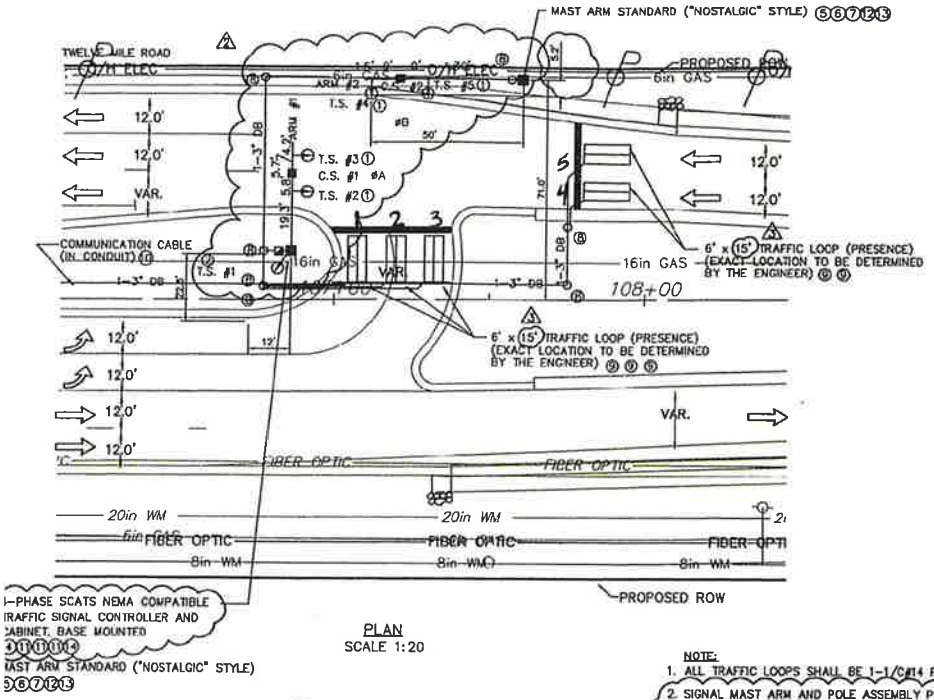
DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

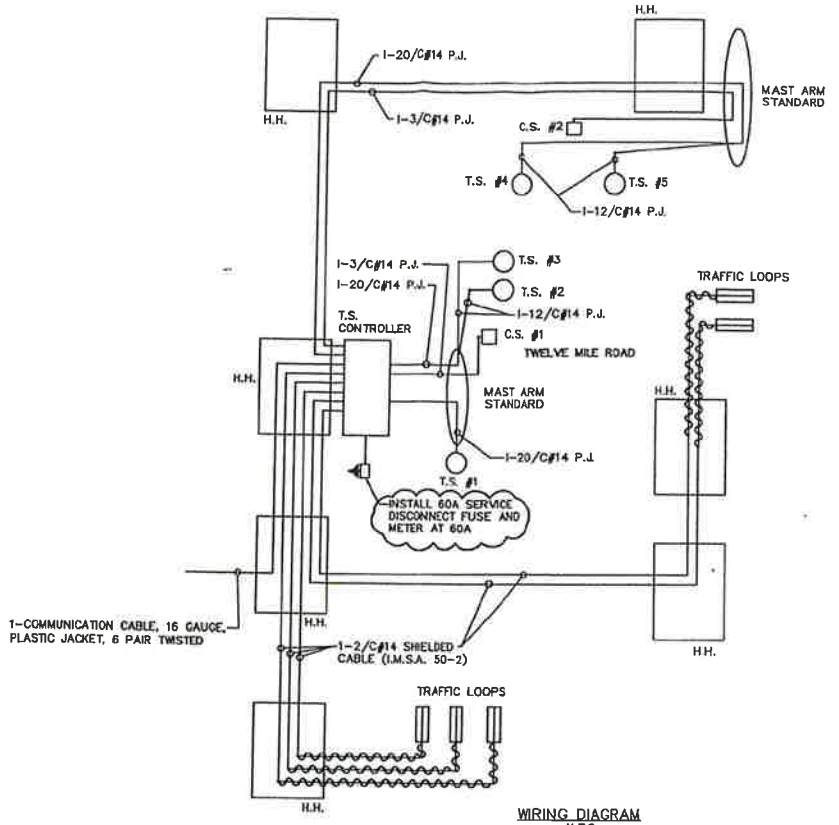
D Connector Form for Mod 52 w/Loops

Intersection Name: 12 Mile & X/O E/O Novi
County No: 1142
Date: 3/2/2017

Detector # on Print	Detector Description	D-Conn Term #	D-Conn Description	Phase
1	X-Over L	1	Det. 9	4
2	X-Over C	2	Det. 10	4
3	X-Over R	3	Det. 11	4
4	12 Mile L	4	Det. 12	2
5	12 Mile R	5	Det. 13	2
		6	Det. 14	
		7	Det. 15	
		8	Det. 16	
		9	Det. 17	
		10	Det. 18	
		11	Det. 19	
		12	Det. 20	
		13	Det. 21	
		14	Det. 22	
		15	Det. 23	
		16	Det. 24	
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		



PLAN
SCALE 1:20

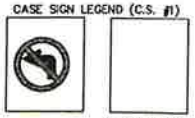


WIRING DIAGRAM
N.T.S.

NOTE:
1. ALL TRAFFIC LOOPS SHALL BE 1-1/C#14 P.E. (I.M.S.A. 51-5) (3 TURNS)
2. SIGNAL MAST ARM AND POLE ASSEMBLY PER "NOSTALGIC" STYLE MAST ARM SIGNAL DETAIL
3. ALL MAST ARMS, SIGNAL POLES (INCLUDING POLE BASES AND FINIALS), SIGNAL MOUNTING HARDWARE, CONTROLLER CABINETS, STREET NAME SIGNS, STREET LIGHTING ASSEMBLIES AND ALL ASSOCIATED HARDWARE SHALL BE PAINTED TO MATCH VALMONT'S DARK GREEN (PAINT CODE #923).
4. STANDARD T.S. WITH GREEN ARROW MASK AND AMBER ARROW MASK, AS SHOWN:

⑤⑥ INSTALL TWO WAY ILLUMINATED CASE SIGN, 24" BY 30"

CASE SIGN LEGEND (C.S. #1)



FACING EAST — FACING WEST (BLANK)

CASE SIGN LEGEND (C.S. #2)

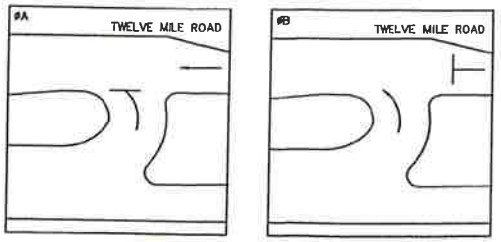
FACING SOUTH — FACING NORTH (BLANK)

MAST ARM INFORMATION

MAST ARM	LENGTH
#1	35'
#2	50'

LIST OF MATERIALS

NO.	ITEM	QUANTITIES
①	ONE-WAY MAST ARM MOUNTED TRAFFIC SIGNAL	1 EA.
②	ONE-WAY BRACKET ARM MOUNTED TRAFFIC SIGNAL	1 EA.
③	TWO WAY CASE SIGN, 24" BY 30"	2 EA.
④	SOLID STATE ACTUATED CONTROLLER AND CABINET	1 EA.
	SOLID STATE ACTUATED CONTROLLER AND CABINET, DELIVERED	1 EA.
⑤	MAST ARM (VALMONT CURVED ROUND DS-32)	2 EA.
⑥	MAST ARM STANDARD (VALMONT ROUND TAPERED POLE)	2 EA.
⑦	MAST ARM STANDARD FOUNDATION	2 EA.
⑧	HANDHOLE (ROUND)	7 EA.
⑨	TRAFFIC LOOP (PRESENCE)	5 EA.
⑩	COMMUNICATION CABLE, 16 GAUGE, PLASTIC JACKET, 6 TWISTED PAIR	482 LFT.
⑪	DIGITAL LOOP DETECTOR	3 EA.
⑫	CLAMP ON BRACKETS	2 EA.
⑬	VALMONT "SPIKE" POLE TOP	2 EA.
	DIRECT BURIAL CONDUIT 1-3"	507 FT.
	SERVICE DISCONNECT	1 EA.



PHASING DIAGRAM

#1142

APPROVED FOR CONSTRUCTION
3/30/01
PERMANENT MAST ARM SIGNAL SHEET

CYCLIC WATTS:
STEADY WATTS:

NO.	DESCRIPTION	DATE	BY	APP'D
1	SIGNAL REVISIONS	8/17/00	DMF	CDF
2	SIGNAL REVISIONS	12/8/00	DMF	CDF
3	PER RCOC COMMENTS	2/1/01	DMF	CDF
4	PER RCOC COMMENTS			

FINKBEINER, PETTIS & STROUT, INC.
CONSULTING ENGINEERS

SCALE: HORIZ. AS NOTED VERT.
DESIGNED BY: D.M.F.

12 MILE ROAD TURNAROUND
EAST OF NOVI ROAD
S.A.D.

CAD NAME: TSPLAN
PROJECT NO.: NOV95
CONTRACT

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: 12 Mile & x/o W/O Novi DATE: 3-3-17

CITY/TOWNSHIP: Novi BY: RACHEL JONES

COUNTY#: 1143 STATE#: — CHARGES: 53391-0989 (labor)
53391-0981 (materials)

PLEASE PERFORM THE FOLLOWING:

____ ELECTRICAL DEVICE: ____ INSTALL ____ MODERNIZE ____ MAINTENANCE

____ UNDERGROUND: _____

____ EDISON OK: ____ YES ____ NO JOB#: _____ JUN 13 2017

____ COORDINATE W/DISTRICT 7: _____

	DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
	SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
____	CHANGE TIMING.....																			
____	CHANGE OFFSET.....																			
____	CHANGE CYCLE LENGTH.....																			
____	ADD DIAL/SPLIT.....																			

x CHANGE BREAKOUT OR EPROM: REV 2

____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

____ REPROGRAM TBC

____ INSTALL INTERCONNECT: ____ TBC ____ MINITROL ____ TONE

____ MBT OK: ____ YES ____ NO

____ NO CHANGE - RECORD CORRECTION

x OTHER: Swap out 2070 for MOD 52 SCATS controller. Swap out D-connector and hook up loops per paperwork. Requires a checksum change

APPROVED BY: _____ DATE: 3/3/17

DATE INSTALLED: 6-10-17

INSTALLED BY: Jordan - Paulsen

INTERSECTION :- 1143 12 Mile & X/O West of Novi Rd.
DESCRIPTION PROMS :- X01143D / F2002
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE :- MOD 52 SCATS

INPUTS :-
1. X-OVER L PRES (LK)
2. X-OVER C PRES (LK)
3. X-OVER R PRES (LK)
4. 12 MILE RD L PRES (LK)
5. 12 MILE RD R PRES (LK)

Note: All detectors are loops.

APPROACHES :-
A APPR 1 : 12 MILE RD L,R
B APPR 1 : X-OVER L,C,R

FLEXIDATA :-

SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		
LOOKAHEAD		

SPECIAL FEATURES :-
The personality revision number is currently 2 (=B).

A stage has a permanent demand.
Demand for B stage in flexi and isol, set ZNEG to disable.

BACKPANEL 8 PHASE EAGLE

LOAD SWITCH 2 - 12 MILE RD	A	FLA
LOAD SWITCH 4 - CROSSOVER	B	FLR

JUMPERS
195-196,197-198,199-200,217-218,219-220,221-222,321-PB1,325-326,
327-328,329-PB1,343-PB1,347-348,349-350,351-PB1,365-PB1,369-PB1,
373-PB1,387-PB1,391-PB1,395-PB1,298-305.

SIGNAL MONITOR: NONE.
All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,4.
Minimum Flash = 4 + 2 + 1.

```
*********************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO.  1143       *
*        Rachel Jones          *
*    DATE :- 3-Mar-2017        *
*********************************
```

Checksums:
Times E7 / 347
Pers 5A / 132
Total BD / 275

FLEXILINK PLAN DATA

Intersection # 1143 **State #** _____ **Date:** 03/03/17 **Prepared By:** Rachel Jones

Intersection: 12 Mile & X/O W/O Novi **City:** Novi

Hours of Operation: 7 Days: 24 Hours **Approved By:** R. Jones

Hours of Flashing: None

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	100	100					
1	A		0	0	0					
2	B		43	53	53					
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		47	68	68					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0. Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	Direction	Min	Max	ECO	Amber	All Red	Gap	Hdwy	Waste
A	12 Mile	10.0	30.0		4.3	1.2	3.0	1.2	6.0
B	X-Over	7.0	20.0		3.5	1.9	3.0	1.2	6.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	8	6:00	2
SC2	8	9:30	1
SC3	8	15:00	3
SC4	8	19:00	1
SC5	14	0:00	1
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

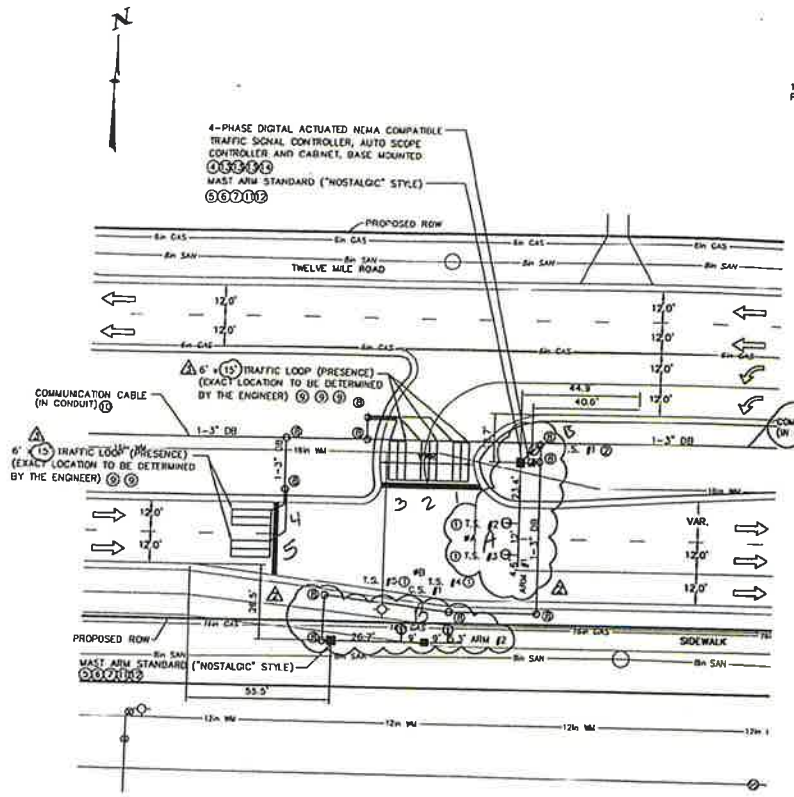
DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

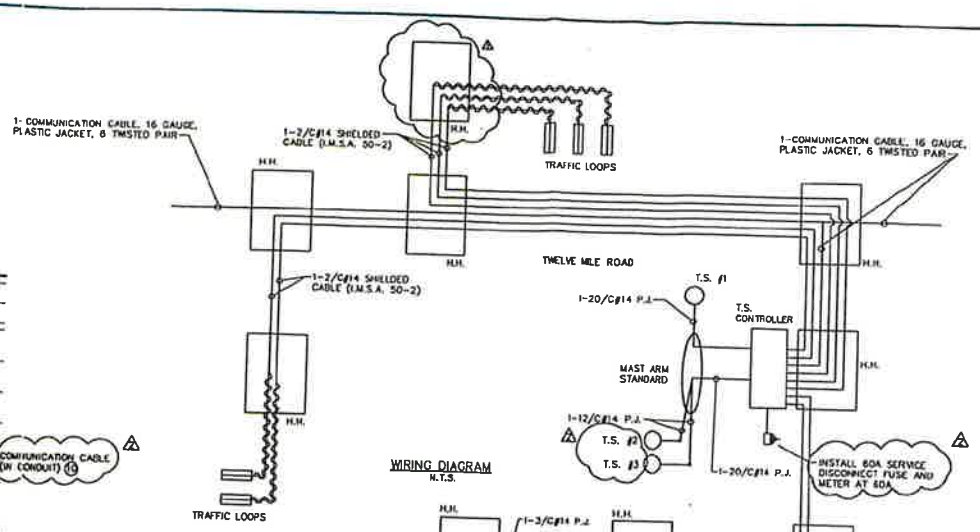
D Connector Form for Mod 52 w/Loops

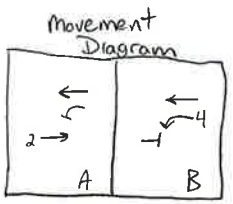
Intersection Name: 12 Mile & X/O W/O Novi
County No: 1143
Date: 3/3/2017

Detector # on Print	Detector Description	D-Conn Term #	D-Conn Description	Phase
1	X-Over L	1	Det. 9	4
2	X-Over C	2	Det. 10	4
3	X-Over R	3	Det. 11	4
4	12 Mile L	4	Det. 12	2
5	12 Mile R	5	Det. 13	2
		6	Det. 14	
		7	Det. 15	
		8	Det. 16	
		9	Det. 17	
		10	Det. 18	
		11	Det. 19	
		12	Det. 20	
		13	Det. 21	
		14	Det. 22	
		15	Det. 23	
		16	Det. 24	
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		
		Backpanel		

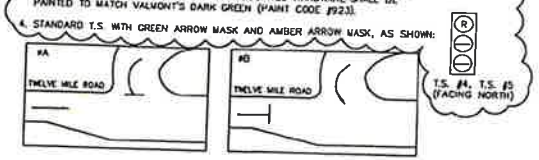


PLAN
SCALE 1:20





NOTE:
1. ALL TRAFFIC LOOPS SHALL BE 1-12/C#14 P.E. (I.M.S.A. 51-5) (3 TURNS)
2. SIGNAL MAST ARM AND POLE ASSEMBLY PER "NOSTALGIC" STYLE MAST ARM SIGNAL DETAIL
3. ALL MAST ARMS, SIGNAL POLES (INCLUDING POLE BASES AND FINIALS), SIGNAL MOUNTING HARDWARE, CONTROLLER CABINETS, STREET NAME SIGNS, STREET LIGHTING ASSEMBLIES AND ALL ASSOCIATED HARDWARE SHALL BE PAINTED TO MATCH VALMONT'S DARK GREEN (PAINT CODE #923).
4. STANDARD T.S WITH GREEN ARROW MASK AND AMBER ARROW MASK, AS SHOWN:



PHASING DIAGRAM

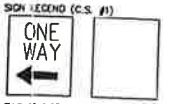
LIST OF MATERIALS

NO.	ITEM	QUANTITIES
①	ONE-WAY MAST ARM MOUNTED TRAFFIC SIGNAL	4 EA.
②	ONE-WAY BRACKET ARM MOUNTED TRAFFIC SIGNAL	1 EA.
③	TWO WAY CASE SIGN, 24" BY 30"	2 EA.
④	SOLID STATE ACTUATED CONTROLLER AND CABINET	1 EA.
	SOLID STATE ACTUATED CONTROLLER AND CABINET, DELIVERED	1 EA.
⑤	MAST ARM (VALMONT CURVED ROUND 05-32)	2 EA.
⑥	MAST ARM STANDARD (VALMONT ROUND TAPERED POLE AND BASE)	2 EA.
⑦	MAST ARM STANDARD FOUNDATION	2 EA.
⑧	HANDHOLE (ROUND)	10 EA.
⑨	TRAFFIC LOOP (PRESENCE)	5 EA.
⑩	COMMUNICATION CABLE 16 GAUGE, PLASTIC JACKET, 6 TWISTED PAIR	835 LFT.
⑪	CLAMP ON BRACKETS	2 EA.
⑫	VALMONT "SPIKE" POLE TOP	2 EA.
⑬	DIGITAL LOOP DETECTOR	3 EA.
⑭	BASE MOUNT CONTROLLER FOUNDATION	1 EA.
	DIRECT BURIAL CONDUIT 1-3"	900 LFT.
	SERVICE DISCONNECT	1 EA.

MAST ARM INFORMATION	
MAST ARM	LENGTH
#1	40'
#2	50'

③ INSTALL TWO WAY ILLUMINATED CASE SIGN, 24" BY 30"

CASE SIGN LEGEND (C.S. #1)



FACING NORTH FACING SOUTH (BLANK)

NO.	DESCRIPTION	DATE	BY	APP'D
△	SIGNAL REVISIONS	9/11/00	DMF	CDF
△	SIGNAL REVISIONS	10/8/00	DMF	CDF
△	PER MDOT COMMENTS	1/1/01	DMF	CDF

FINKBEINER, PETTIS & STROUT, INC.
CONSULTING ENGINEERS
NOVI, MICHIGAN

SCALE: HORIZ. AS NOTED VERT.
DESIGNED BY: D.M.F.
DRAWN BY: D.M.F.
CHECKED BY: C.D.F.

12 MILE ROAD TURNAROUND
WEST OF NOVI ROAD
S.A.D.
IMPROVEMENTS
CITY OF NOVI

APPROVED FOR CONSTRUCTION
3/30/01
PERMANENT MAST ARM SIGNAL SHEET

CYCLIC WATTS: 2700
STEADY WATTS: 200

CAD NUMBER: TSPLAN01
PROJECT NUMBER: NOV9804B
CONTRACT:
DATE: 5/24/00
109

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

JUN 10 2016

LOCATION: 12 Mile + Nov E/O 12 Oaks West DATE: 2/1/16

CITY/TOWNSHIP: Novi BY: C. Markel

COUNTY#: 1190 STATE#: — CHARGES: Labor: 53051.0989
Materials: 53051.0981

PLEASE PERFORM THE FOLLOWING:

____ ELECTRICAL DEVICE: ____ INSTALL ____ MODERNIZE ____ MAINTENANCE

____ UNDERGROUND: _____

____ EDISON OK: ____ YES ____ NO JOB#: _____

____ COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
____ CHANGE TIMING.....																			
____ CHANGE OFFSET.....																			
____ CHANGE CYCLE LENGTH.....																			
____ ADD DIAL/SPLIT.....																			

X CHANGE BREAKOUT OR EPROM: Change Personality → Rev#5

____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

____ REPROGRAM TBC

____ INSTALL INTERCONNECT: ____ TBC ____ MINITROL ____ TONE

____ MBT OK: ____ YES ____ NO

____ NO CHANGE - RECORD CORRECTION

X OTHER: Swap out existing 2070 SCATS controller w/ Mod 52 SCATS 530 controllers. Swap out d-connector. Hook up cameras per AS sheet. Install + hook up wireless digi. Requires a checksum change. Add jumper 298-302.

APPROVED BY: _____ DATE: 2/3/16

DATE INSTALLED: 6/3/16

INSTALLED BY: WELCH / JAMES

INTERSECTION :- 1190 12 MILE & X/O E/O 12 OAKS WEST
DESCRIPTION PROMS :- X01190 / F2002
CONTROLLER TYPE :- STANDARD PERSONALITY
SOFTWARE TYPE :- MOD 52 SCATS

INPUTS :-
1. X/O E/O 12 OAKS WEST L (NL) NOTE :- ALL DETECTORS ARE AUTOSCOPE
2. X/O E/O 12 OAKS WEST R (NL) (2004 CAMERAS).
3. 12 MILE L (LK)
4. 12 MILE R (LK)

APPROACHES :-
A APP 1 : 12 MILE L,R
B APP 1 : X/O E/O 12 OAKS WEST L,R

FLEXIDATA :-		PEDESTRIANS :-
SEQUENCE	A,B	A,B
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL		
Q+ REL		

SPECIAL FEATURES :-
Personality revision is 5 (=E).

A STAGE HAS A PERMANENT DEMAND
DEMAND FOR STAGE B IN FLEXI AND ISOLATED, SET ZNEG TO DISABLE.

BACKPANEL :- SIZE P44-12 CABINET
LOAD SWITCH 2 - 12 MILE A FLA
LOAD SWITCH 4 - X/O E/O 12 OAKS WEST B FLR

JUMPERS :-
195-196,197-198,199-200,217-218,219-220,221-222,298-302,321-PB1,
325-326,327-328,329-PB1,343-PB1,347-348,349-350,351-PB1,365-PB1,
369-PB1,373-PB1,387-PB1,391-PB1,395-PB1.

SIGNAL MONITOR :- NONE.
All switches OFF EXCEPT: Dual Select A&B; G&Y Enable; SSM 2,4.
Minimum Flash = 4 + 2 + 1.

```
**********************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO. 1190        *
*       CARISSA MARKEL         *
*         01-Feb-2016          *
**********************************
```

CHECKSUMS
TIMES: F5/365
PERS: 05/005
TOTAL: F0/360

FLEXILINK PLAN DATA

Intersection # 1190 **State #** _____ **Date:** 02/01/16 **Prepared By:** Carissa Markel

Intersection: 12 Mile & X/O E/O 12 Oaks West **City:** Novi

Hours of Operation: 7 Days: 9am - 10pm **Approved By:** Rachel Jones

Hours of Flashing: 7 Days: 10pm - 9am

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		80	100						
1	A		0	0						
2	B		60	70						
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+		C	C						
10	Of (Y-)		3	24						
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: Stages with 1 second of phase time are skipped. Blank entries are default values equal to 0. Except for an AWA controller, entries #8 to #15 (=254) and 'C' entry means continuous (=255).

							Timers		
Phase	Direction	Min	Max	ECO	Amber	All Red	Gap	Hdwy	Waste
A	12 Mile	10.0	30.0		4.3	1.0	3.0	1.2	10.0
B	X/O E/O 12 Oaks West	5.0	20.0		3.5	1.4	3.0	1.2	10.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	14	0:00	0
SC2	14	9:00	1
SC3	8	15:00	2
SC4	8	19:00	1
SC5	14	22:00	0
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

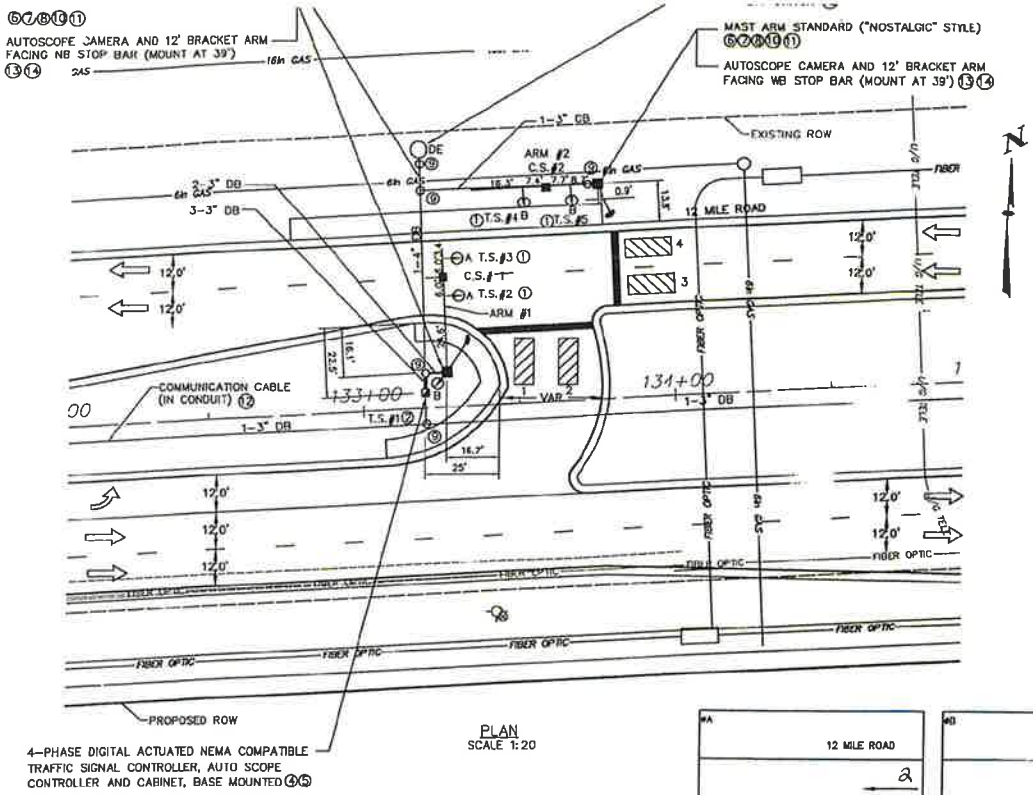
Autoscope 37-Pin Male Output Harness (33457G2) Wiring

Autoscope Output Harness Pins #1 & #20 to Logic Common & Pins #18 & # 37 to +24 VDC CO#

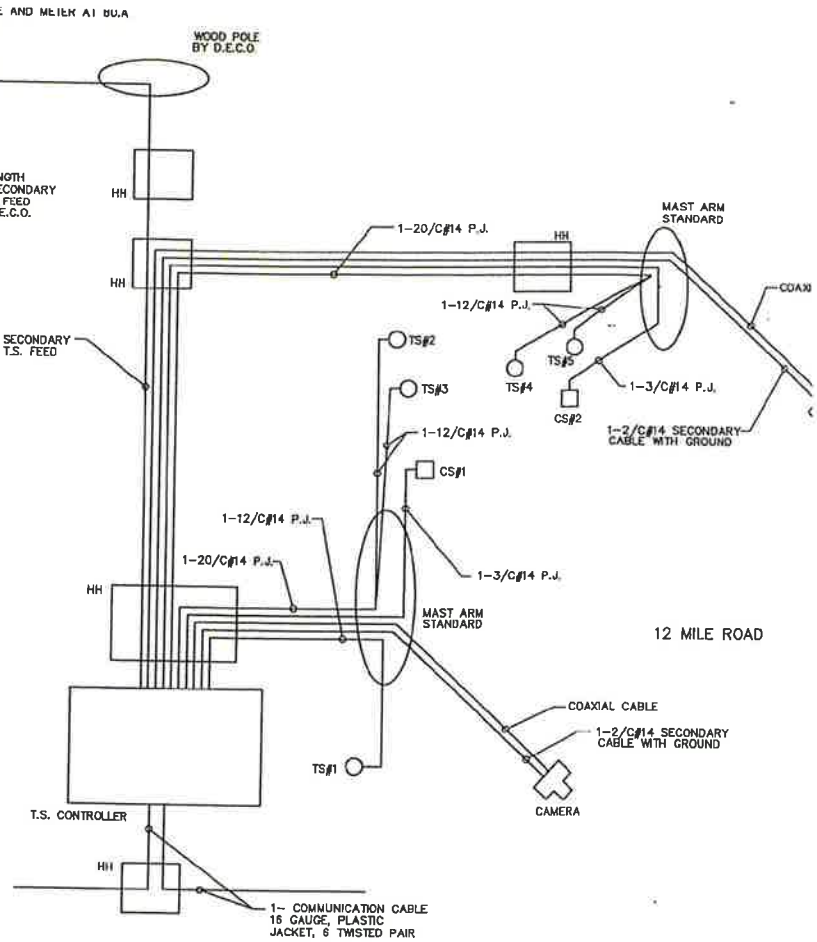
Camera Number	EIM Switch Position	EIM LED#	Output Harness Pin#	D-Conn Pin (1,2,..)	Vehicle Detector No.		Detector Description	Phase No. (1,2,3,...)
					D-Conn format (9,10,...)	On Print (1,2,..)		
1	1	1	29	1	9	1	X/O E/O 12 Oaks West L	4
	1	2	30	2	10	2	X/O E/O 12 Oaks West R	4
	1	3	31					
	1	4	32					
	1	5	33					
	1	6	34					
	1	7	35					
	1	8	36					
2	2	1	10	3	11	3	12 Mile L	2
	2	2	11	4	12	4	12 Mile R	2
	2	3	12					
	2	4	13					
	2	5	14					
	2	6	15					
	2	7	16					
	2	8	17					
3	3	1	21					
	3	2	22					
	3	3	23					
	3	4	24					
	3	5	25					
	3	6	26					
	3	7	27					
	3	8	28					
4	4	1	2					
	4	2	3					
	4	3	4					
	4	4	5					
	4	5	6					
	4	6	7					
	4	7	8					
	4	8	9					

Autoscope 37-Pin Female Input Harness (33457G3) Wiring

EIM Switch Position	EIM LED#	Input Harness Pin#	Phase Status Input From +24 VDC	Backpanel Terminal Position and Number
5	1	29	Phase 8 Green	
5	1	30	Phase 7 Green	
5	1	31	Phase 6 Green	
5	1	32	Phase 5 Green	
5	1	33	Phase 4 Green	LS 4 Green 221
5	1	34	Phase 3 Green	
5	1	35	Phase 2 Green	LS 2 Green 199
5	1	36	Phase 1 Green	
6	2	10	Phase 8 Red	
6	2	11	Phase 7 Red	
6	2	12	Phase 6 Red	
6	2	13	Phase 5 Red	
6	2	14	Phase 4 Red	LS 4 Red 217
6	2	15	Phase 3 Red	
6	2	16	Phase 2 Red	LS 2 Red 195
6	2	17	Phase 1 Red	

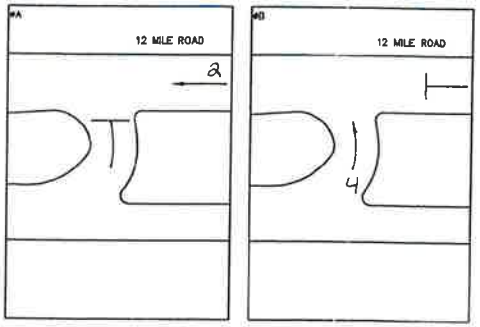


PLAN
SCALE 1:20



WIRING DIAGRAM
NOT TO SCALE

MAST ARM INFORMATION	
MAST ARM	LENGTH
#1	40'
#2	40'



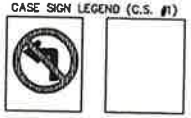
PHASING DIAGRAM

NOTE:

1. SIGNAL MAST ARM AND POLE ASSEMBLY PER "NOSTALGIC" STYLE MAST ARM SIGNALS DETAIL
2. ALL MAST ARMS, SIGNAL POLES (INCLUDING POLE BASES AND FINIALS), SIGNAL MOUNTING HARDWARD, CONTROLLER CABINETS, STREET NAME SIGNS, STREET LIGHTING ASSEMBLIES, CLAMP-ON BRACKET ARM AND ALL ASSOCIATED HARDWARE SHALL BE PAINTED TO MATCH VALMONT'S DARK GREEN (PAINT CODE #923).

③③ INSTALL TWO WAY ILLUMINATED CASE SIGN, 24" BY 30"

CASE SIGN LEGEND (C.S. #1)



FACING EAST | FACING WEST (BLANK)

CASE SIGN LEGEND (C.S. #2)

FACING SOUTH | FACING NORTH (BLANK)

LIST OF MATERIALS		
NO.	ITEM	QUANTITIES
①	ONE-WAY MAST ARM MOUNTED TRAFFIC SIGNAL (LED)	4 EA.
②	ONE-WAY BRACKET ARM MOUNTED TRAFFIC SIGNAL (LED)	1 EA.
③	TWO WAY CASE SIGN, 24" BY 30"	2 EA.
④	SOLID STATE ACTUATED CONTROLLER AND CABINET	1 EA.
	SOLID STATE ACTUATED CONTROLLER AND CABINET, DELIVERED	1 EA.
⑤	BASE MOUNT CONTROLLER FOUNDATION	1 EA.
⑥	MAST ARM (VALMONT CURVED ROUND DS-32)	2 EA.
⑦	MAST ARM STANDARD (VALMONT ROUND TAPERED POLE AND BASE)	2 EA.
⑧	MAST ARM STANDARD FOUNDATION	2 EA.
⑨	HANDHOLE (ROUND)	5 EA.
⑩	CLAMP ON BRACKETS	2 EA.
⑪	VALMONT "SPIKE" POLE TOP	2 EA.
⑫	COMMUNICATION CABLE, 16 GAUGE, PLASTIC JACKET, 6 TWISTED PAIR	220 LFT.
⑬	AUTOSCOPE CAMERA	2 EA.
⑭	CLAMP-ON BRACKET ARM, 12'	2 EA.
⑮	SAFETY SWITCH	1 EA.
	DIRECT BURIAL CONDUIT 1-3"	300 LFT.
	DIRECT BURIAL CONDUIT 1-4"	60 LFT.
	DIRECT BURIAL CONDUIT 2-3"	10 LFT.
	DIRECT BURIAL CONDUIT 3-3"	10 LFT.

#1190

12 Mile & ½ E of 12 Oaks Mall Dr West

PERMANENT MAST ARM SIGNAL SHEET

ROAD COMMISSION

NO.	DESCRIPTION	DATE	BY	APP'D

FINKBEINER, PETTIS & STROUT, INC.
CONSULTING ENGINEERS

SCALE: AS NOTED
DESIGNED BY: D.M.F.

12 MILE ROAD IMPROVEMENTS
EAST OF NOVI TO

CYCLIC W.
STEADY W

SEMCOG | Southeast Michigan Council of Governments

Community Profiles

YOU ARE VIEWING DATA FOR:

City of Novi

45175 W 10 Mile Rd
Novi, MI 48375-3024
http://www.cityofnovi.org

SEMCOG MEMBER

Census 2020 Population: 66,243
Area: 31.2 square miles

VIEW COMMUNITY EXPLORER MAP VIEW 2020 CENSUS MAP

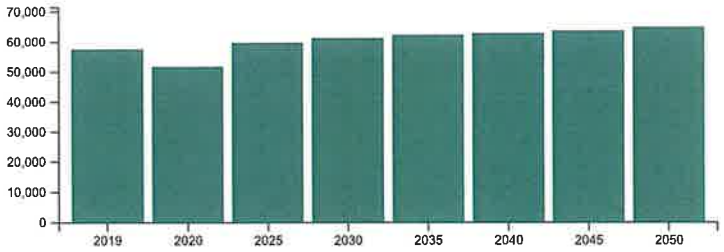
Economy & Jobs

Link to American Community Survey (ACS) Profiles: **Select a Year** 2019-2023 **Economic**

Historic Population and Employment by Minor Civil Division, Southeast Michigan

Forecasted Jobs

NUMBER OF J
64,985



Note: The base year for the employment forecast is 2019, as 2020 employment was artificially low due to the COVID recession.

Source: **SEMCOG 2050 Regional Development Forecast**

Forecasted Jobs by Industry Sector

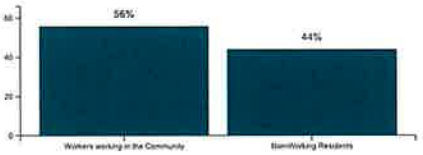
Forecasted Jobs By Industry Sector	2019	2020	2025	2030	2035	2040	2045	2050	Change 2019-2050	Pct Change 2019-2050
Natural Resources, Mining, & Construction	2,219	2,200	3,029	3,015	2,991	2,906	2,831	2,840	621	28%
Manufacturing	4,670	4,239	4,627	4,575	4,344	4,101	3,935	3,913	-757	-16.2%
Wholesale Trade	3,118	2,929	3,139	3,197	3,288	3,266	3,202	3,138	20	0.6%
Retail Trade	7,892	6,944	7,207	6,823	6,338	6,029	5,777	5,623	-2,269	-28.8%
Transportation, Warehousing, & Utilities	1,418	1,410	1,667	1,701	1,747	1,751	1,774	1,783	365	25.7%
Information & Financial Activities	6,576	6,145	7,173	7,806	8,290	8,615	8,922	9,254	2,678	40.7%
Professional and Technical Services & Corporate HQ	8,452	7,940	9,299	9,800	10,237	10,599	11,019	11,441	2,989	35.4%
Administrative, Support, & Waste Services	3,477	3,026	3,421	3,565	3,729	3,854	3,960	4,107	630	18.1%
Education Services	2,212	2,060	2,213	2,286	2,347	2,362	2,379	2,398	186	8.4%
Healthcare Services	7,679	7,095	7,941	8,216	8,579	8,969	9,388	9,839	2,160	28.1%
Leisure & Hospitality	7,103	5,217	7,105	7,275	7,317	7,335	7,346	7,405	302	4.3%
Other Services	2,137	1,851	2,247	2,373	2,429	2,452	2,499	2,513	376	17.6%
Public Administration	719	682	718	732	736	732	732	731	12	1.7%
Total Employment Numbers	57,672	51,738	59,786	61,364	62,372	62,971	63,764	64,985	7,313	12.7%

Note: The base year for the employment forecast is 2019, as 2020 employment was artificially low due to the COVID recession.

Source: **SEMCOG 2050 Regional Development Forecast**

Daytime Population

Daytime Population	ACS 2022
Workers working in the Community	36,078
Non-Working Residents	28,531
Age 15 and under	12,980
Not in labor force	14,353
Unemployed	1,198
Daytime Population	64,609



Source: **2018-2022 American Community Survey 5-Year Estimates**. For additional information, visit SEMCOG's **Interactive Commuting Patterns Map**

Note: The number of residents attending school outside Southeast Michigan is not available. Likewise, the number of students commuting into Southeast Michigan to attend school is also not known.

Household Income

Income (in 2022 dollars)	ACS 2010	ACS 2022	Change 2010-2022	Percent Change 2010-2022
Median Household Income	$107,571	$110,588	$3,017	2.8%
Per Capita Income	$56,969	$60,396	$3,427	6%

Source: **U.S. Census Bureau, 2006-2010 and 2018-2022 American Community Survey 5-Year Estimates**

SEMCOG | Southeast Michigan Council of Governments

Community Profiles

YOU ARE VIEWING DATA FOR:

City of Novi

45175 W 10 Mile Rd
Novi, MI 48375-3024
http://www.cityofnovi.org

SEMCOG MEMBER

Census 2020 Population: 66,243
Area: 31.2 square miles

VIEW COMMUNITY EXPLORER MAP VIEW 2020 CENSUS MAP

Population and Households

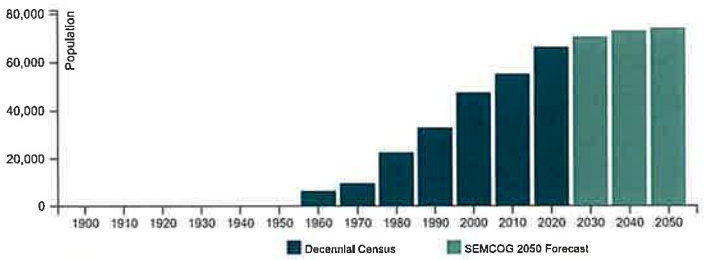
Link to American Community Survey (ACS) Profiles: **Select a Year** 2019-2023 **Social | Demographic**

Population and Household Estimates for Southeast Michigan, 2024

Historic Population and Employment by Minor Civil Division, Southeast Michigan

Population Forecast

POPULATION:



Note for City of Novi : Incorporated as of the 1970 Census from Village of Novi. Population numbers prior to 1970 are of the village. The Village of Novi was incorporated in 1958 from the majority of Novi Township. Population numbers not available before 1960 as area was part of Novi Township.

Population and Households

Population and Households	Census 2020	Census 2010	Change 2010-2020	Pct Change 2010-2020	SEMCOG Jul 2023	SEMCOG 2050
Total Population	66,243	55,224	11,019	20.0%	68,080	74,081
Group Quarters Population	332	360	-28	-7.8%	604	763
Household Population	65,911	54,864	11,047	20.1%	67,476	73,318
Housing Units	27,863	24,226	3,637	15.0%	28,613	-
Households (Occupied Units)	26,458	22,258	4,200	18.9%	27,710	29,484
Residential Vacancy Rate	5.0%	8.1%	-3.1%	-	3.2%	-
Average Household Size	2.49	2.46	0.03	-	2.44	2.49

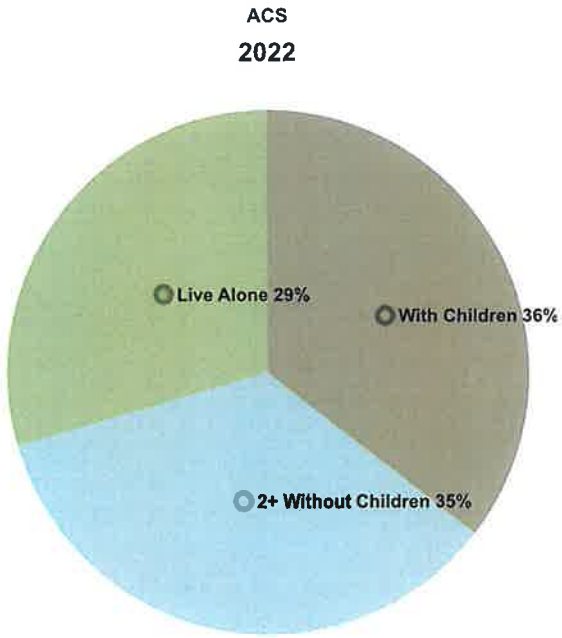
Source: **U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates**, and **SEMCOG 2050 Regional Development Forecast**

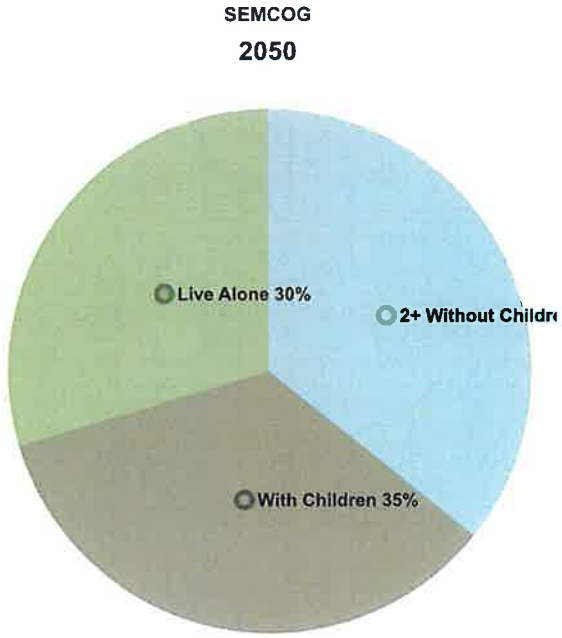
Components of Population Change

Components of Population Change	2010-2020 Avg.	2020-2022 Avg.
Natural Increase (Births - Deaths)	186	39
Births	622	594
Deaths	436	555
Net Migration (Movement In - Movement Out)	916	131
Population Change (Natural Increase + Net Migration)	1,102	170

Source: **Michigan Department of Community Health Vital Statistics, U.S. Census Bureau**, and SEMCOG

Household Types





Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Exhibit 20-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular controlled movement is a function three (capacity) factors: distribution of gaps in the major-street traffic stream, driver judgment in selecting gaps through which to execute the desired maneuvers, and the follow-up headways required by each driver in a queue.

The basic capacity model assumes gaps in the conflicting movements are randomly distributed. When traffic signals are present on the major street, upstream of the subject intersection, flows may not be random but will likely have some platoon structure. Although the procedures in this chapter provide a method for approximating the operations of a TWSC intersection with an upstream signal, the operations of such an intersection is arguably best handled by including it in a complete simulation

Exhibit 20-2. Level of Service Criteria for Stop-Controlled Intersections (Motor Vehciles)

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. A total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The LOS criteria for TWSC intersections differ somewhat from the criteria used in Chapter 19 for signalized intersections, primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection.

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 6th Edition. Transportation Research Board, National Research Council

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle. The criteria are given in Exhibit 19-8. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

LOS A describes operations with a control delay of 10 s/veh or less. This level is typically assigned when the volume-to-capacity ratio is low and either progression is extremely favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during a green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Exhibit 19.8. Level-of-Service Criteria for Signalized Intersections (Motorized Vehicles)

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	>80.0

1. If the v/c ratio for a lane group exceeds 1.0, a LOS F is assigned to the individual lane group. LOS for approach-based and intersection-wide assessments are determined solely by the control delay.

LOS C describes operations with control delay between 20 and 35 s/veh. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e. one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number if vehicle stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level, considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. This level is typically assigned when the volume-to-capacity ratio is high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, 6th Edition. Transportation Research Board, National Research Council

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	881	0	0	96	0
Future Volume (vph)	0	881	0	0	96	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.5			5.4	
Lane Util. Factor		0.95			0.97	
Frpb, ped/bikes		1.00			1.00	
Flpb, ped/bikes		1.00			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3725			3650	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3725			3650	
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.83	0.83
Adj. Flow (vph)	0	990	0	0	116	0
RTOR Reduction (vph)	0	0	0	0	108	0
Lane Group Flow (vph)	0	990	0	0	8	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		82.1			7.0	
Effective Green, g (s)		82.1			7.0	
Actuated g/C Ratio		0.82			0.07	
Clearance Time (s)		5.5			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		3058			255	
v/s Ratio Prot		c0.27			c0.00	
v/s Ratio Perm						
v/c Ratio		0.32			0.03	
Uniform Delay, d1		2.2			43.3	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.3			0.0	
Delay (s)		2.5			43.4	
Level of Service		A			D	
Approach Delay (s/veh)		2.5	0.0		43.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	584	26	0	234	0	0	469	97
Future Volume (vph)	0	0	0	0	584	26	0	234	0	0	469	97
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.4	6.4		5.5			5.5	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frpb, ped/bikes					1.00	0.99		1.00			1.00	
Flpb, ped/bikes					1.00	1.00		1.00			1.00	
Frt					1.00	0.85		1.00			0.97	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3725	1646		3725			3657	
Flt Permitted					1.00	1.00		1.00			1.00	
Satd. Flow (perm)					3725	1646		3725			3657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.95	0.95	0.95	0.79	0.79	0.79
Adj. Flow (vph)	0	0	0	0	687	31	0	246	0	0	594	123
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	0	0	22	0
Lane Group Flow (vph)	0	0	0	0	687	18	0	246	0	0	695	0
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	
Protected Phases					6			4			8	
Permitted Phases						6						
Actuated Green, G (s)					59.3	59.3		28.8			28.8	
Effective Green, g (s)					59.3	59.3		28.8			28.8	
Actuated g/C Ratio					0.59	0.59		0.29			0.29	
Clearance Time (s)					6.4	6.4		5.5			5.5	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					2208	976		1072			1053	
v/s Ratio Prot					c0.18			0.07			c0.19	
v/s Ratio Perm						0.01						
v/c Ratio					0.31	0.02		0.23			0.66	
Uniform Delay, d1					10.2	8.4		27.1			31.3	
Progression Factor					1.13	1.87		0.02			1.00	
Incremental Delay, d2					0.4	0.0		0.1			1.5	
Delay (s)					11.8	15.7		0.8			32.8	
Level of Service					B	B		A			C	
Approach Delay (s/veh)		0.0			12.0			0.8			32.8	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	701	276	0	0	0	0	234	253	0	469	0
Future Volume (vph)	0	701	276	0	0	0	0	234	253	0	469	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.4	6.4					5.5	5.5		5.5	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.99					1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00		1.00	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3725	1645					3725	1667		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3725	1645					3725	1667		3762	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.95	0.95	0.95	0.79	0.79	0.79
Adj. Flow (vph)	0	770	303	0	0	0	0	246	266	0	594	0
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	78	0	0	0
Lane Group Flow (vph)	0	770	229	0	0	0	0	246	188	0	594	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		2						8			4	
Permitted Phases			2						8			
Actuated Green, G (s)		59.3	59.3					28.8	28.8		28.8	
Effective Green, g (s)		59.3	59.3					28.8	28.8		28.8	
Actuated g/C Ratio		0.59	0.59					0.29	0.29		0.29	
Clearance Time (s)		6.4	6.4					5.5	5.5		5.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		2208	975					1072	480		1083	
v/s Ratio Prot		c0.21						0.07			c0.16	
v/s Ratio Perm			0.14						0.11			
v/c Ratio		0.35	0.23					0.23	0.39		0.55	
Uniform Delay, d1		10.4	9.6					27.1	28.6		30.1	
Progression Factor		0.89	1.31					1.00	1.00		0.06	
Incremental Delay, d2		0.4	0.5					0.1	0.5		0.5	
Delay (s)		9.8	13.2					27.3	29.1		2.3	
Level of Service		A	B					C	C		A	
Approach Delay (s/veh)		10.7			0.0			28.2			2.3	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰↰	
Traffic Volume (vph)	0	0	0	474	136	0
Future Volume (vph)	0	0	0	474	136	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.5	5.3	
Lane Util. Factor				0.95	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3725	3614	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3725	3614	
Peak-hour factor, PHF	0.92	0.92	0.86	0.86	0.85	0.85
Adj. Flow (vph)	0	0	0	551	160	0
RTOR Reduction (vph)	0	0	0	0	149	0
Lane Group Flow (vph)	0	0	0	551	11	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.2	7.0	
Effective Green, g (s)				82.2	7.0	
Actuated g/C Ratio				0.82	0.07	
Clearance Time (s)				5.5	5.3	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3061	252	
v/s Ratio Prot				c0.15	c0.00	
v/s Ratio Perm						
v/c Ratio				0.18	0.04	
Uniform Delay, d1				1.9	43.4	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.1	0.1	
Delay (s)				2.0	43.4	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.0	43.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

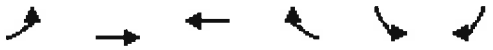
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱						↱↱		↑↑	
Traffic Volume (vph)	0	792	7	0	0	0	0	0	38	0	80	0
Future Volume (vph)	0	792	7	0	0	0	0	0	38	0	80	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.1	6.1						5.1		5.1	
Lane Util. Factor		0.95	1.00						0.88		0.95	
Frpb, ped/bikes		1.00	0.99						1.00		1.00	
Flpb, ped/bikes		1.00	1.00						1.00		1.00	
Frt		1.00	0.85						0.85		1.00	
Flt Protected		1.00	1.00						1.00		1.00	
Satd. Flow (prot)		3762	1662						2695		3762	
Flt Permitted		1.00	1.00						1.00		1.00	
Satd. Flow (perm)		3762	1662						2695		3762	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.73	0.73	0.73	0.60	0.60	0.60
Adj. Flow (vph)	0	843	7	0	0	0	0	0	52	0	133	0
RTOR Reduction (vph)	0	0	2	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	0	843	5	0	0	0	0	0	6	0	133	0
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	11%	11%	11%	1%	1%	1%
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									4	
Permitted Phases			2						8			
Actuated Green, G (s)		60.3	60.3						8.5		8.5	
Effective Green, g (s)		60.3	60.3						8.5		8.5	
Actuated g/C Ratio		0.75	0.75						0.11		0.11	
Clearance Time (s)		6.1	6.1						5.1		5.1	
Vehicle Extension (s)		3.0	3.0						3.2		3.2	
Lane Grp Cap (vph)		2835	1252						286		399	
v/s Ratio Prot		c0.22									c0.04	
v/s Ratio Perm			0.00						0.00			
v/c Ratio		0.30	0.00						0.02		0.33	
Uniform Delay, d1		3.1	2.4						32.0		33.1	
Progression Factor		1.00	1.00						1.00		1.01	
Incremental Delay, d2		0.3	0.0						0.0		0.5	
Delay (s)		3.4	2.4						32.0		33.9	
Level of Service		A	A						C		C	
Approach Delay (s/veh)		3.4			0.0			32.0			33.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰	
Traffic Volume (vph)	0	0	0	610	8	0
Future Volume (vph)	0	0	0	610	8	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.3	4.9	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3725	1681	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3725	1681	
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.60	0.60
Adj. Flow (vph)	0	0	0	726	13	0
RTOR Reduction (vph)	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	726	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	13%	13%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				68.7	1.1	
Effective Green, g (s)				68.7	1.1	
Actuated g/C Ratio				0.86	0.01	
Clearance Time (s)				5.3	4.9	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3198	23	
v/s Ratio Prot				c0.19	c0.00	
v/s Ratio Perm						
v/c Ratio				0.23	0.01	
Uniform Delay, d1				1.0	38.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.1	
Delay (s)				1.2	39.0	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			1.2	39.0	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↰↰	
Traffic Volume (vph)	0	925	0	0	221	0
Future Volume (vph)	0	925	0	0	221	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.5			5.4	
Lane Util. Factor		0.95			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3762			3686	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3762			3686	
Peak-hour factor, PHF	0.91	0.91	0.92	0.92	0.79	0.79
Adj. Flow (vph)	0	1016	0	0	280	0
RTOR Reduction (vph)	0	0	0	0	229	0
Lane Group Flow (vph)	0	1016	0	0	51	0
Heavy Vehicles (%)	1%	1%	2%	2%	0%	0%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		81.3			7.8	
Effective Green, g (s)		81.3			7.8	
Actuated g/C Ratio		0.81			0.08	
Clearance Time (s)		5.5			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		3058			287	
v/s Ratio Prot		c0.27			c0.01	
v/s Ratio Perm						
v/c Ratio		0.33			0.18	
Uniform Delay, d1		2.4			43.1	
Progression Factor		1.00			1.23	
Incremental Delay, d2		0.3			0.3	
Delay (s)		2.7			53.3	
Level of Service		A			D	
Approach Delay (s/veh)		2.7	0.0		53.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1034	174	0	680	0	0	438	79
Future Volume (vph)	0	0	0	0	1034	174	0	680	0	0	438	79
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.4	6.4		5.5			5.5	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.98	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3762	1683		3762			3676	
Flt Permitted					1.00	1.00		1.00			1.00	
Satd. Flow (perm)					3762	1683		3762			3676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	1175	198	0	782	0	0	487	88
RTOR Reduction (vph)	0	0	0	0	0	30	0	0	0	0	16	0
Lane Group Flow (vph)	0	0	0	0	1175	168	0	782	0	0	559	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	
Protected Phases					6			4			8	
Permitted Phases						6						
Actuated Green, G (s)					55.6	55.6		32.5			32.5	
Effective Green, g (s)					55.6	55.6		32.5			32.5	
Actuated g/C Ratio					0.56	0.56		0.33			0.33	
Clearance Time (s)					6.4	6.4		5.5			5.5	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					2091	935		1222			1194	
v/s Ratio Prot					c0.31			c0.21			0.15	
v/s Ratio Perm						0.10						
v/c Ratio					0.56	0.18		0.64			0.47	
Uniform Delay, d1					14.3	11.0		28.8			26.9	
Progression Factor					1.32	1.58		0.02			1.00	
Incremental Delay, d2					1.0	0.4		0.9			0.3	
Delay (s)					20.0	17.7		1.6			27.2	
Level of Service					B	B		A			C	
Approach Delay (s/veh)		0.0			19.6			1.6			27.2	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	693	453	0	0	0	0	680	231	0	438	0
Future Volume (vph)	0	693	453	0	0	0	0	680	231	0	438	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.4	6.4					5.5	5.5		5.5	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3762	1683					3762	1683		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3762	1683					3762	1683		3762	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	0	797	521	0	0	0	0	782	266	0	487	0
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	92	0	0	0
Lane Group Flow (vph)	0	797	433	0	0	0	0	782	174	0	487	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		2						8			4	
Permitted Phases			2						8			
Actuated Green, G (s)		55.6	55.6					32.5	32.5		32.5	
Effective Green, g (s)		55.6	55.6					32.5	32.5		32.5	
Actuated g/C Ratio		0.56	0.56					0.33	0.33		0.33	
Clearance Time (s)		6.4	6.4					5.5	5.5		5.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		2091	935					1222	546		1222	
v/s Ratio Prot		0.21						c0.21			0.13	
v/s Ratio Perm			c0.26						0.10			
v/c Ratio		0.38	0.46					0.64	0.32		0.40	
Uniform Delay, d1		12.5	13.3					28.8	25.4		26.2	
Progression Factor		1.27	1.49					1.00	1.00		0.06	
Incremental Delay, d2		0.5	1.6					1.1	0.3		0.2	
Delay (s)		16.4	21.3					29.9	25.7		1.8	
Level of Service		B	C					C	C		A	
Approach Delay (s/veh)		18.4			0.0			28.8			1.8	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1058	150	0
Future Volume (vph)	0	0	0	1058	150	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.5	5.3	
Lane Util. Factor				0.95	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3762	3614	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3762	3614	
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.83	0.83
Adj. Flow (vph)	0	0	0	1216	181	0
RTOR Reduction (vph)	0	0	0	0	168	0
Lane Group Flow (vph)	0	0	0	1216	13	0
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.1	7.1	
Effective Green, g (s)				82.1	7.1	
Actuated g/C Ratio				0.82	0.07	
Clearance Time (s)				5.5	5.3	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3088	256	
v/s Ratio Prot				c0.32	c0.00	
v/s Ratio Perm						
v/c Ratio				0.39	0.05	
Uniform Delay, d1				2.4	43.3	
Progression Factor				0.69	1.07	
Incremental Delay, d2				0.4	0.1	
Delay (s)				2.0	46.4	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.0	46.4	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	813	9	0	0	0	0	0	226	0	238	0
Future Volume (vph)	0	813	9	0	0	0	0	0	226	0	238	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.1	6.1						5.1		5.1	
Lane Util. Factor		0.95	1.00						0.88		0.95	
Frpb, ped/bikes		1.00	0.99						1.00		1.00	
Flpb, ped/bikes		1.00	1.00						1.00		1.00	
Frt		1.00	0.85						0.85		1.00	
Flt Protected		1.00	1.00						1.00		1.00	
Satd. Flow (prot)		3762	1662						2992		3762	
Flt Permitted		1.00	1.00						1.00		1.00	
Satd. Flow (perm)		3762	1662						2992		3762	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	0	893	10	0	0	0	0	0	248	0	264	0
RTOR Reduction (vph)	0	0	2	0	0	0	0	0	217	0	0	0
Lane Group Flow (vph)	0	893	8	0	0	0	0	0	31	0	264	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									4	
Permitted Phases			2						8			
Actuated Green, G (s)		76.3	76.3						12.5		12.5	
Effective Green, g (s)		76.3	76.3						12.5		12.5	
Actuated g/C Ratio		0.76	0.76						0.13		0.13	
Clearance Time (s)		6.1	6.1						5.1		5.1	
Vehicle Extension (s)		3.0	3.0						3.2		3.2	
Lane Grp Cap (vph)		2870	1268						374		470	
v/s Ratio Prot		c0.24									c0.07	
v/s Ratio Perm			0.00						0.01			
v/c Ratio		0.31	0.01						0.08		0.56	
Uniform Delay, d1		3.7	2.8						38.7		41.2	
Progression Factor		0.66	0.28						1.00		0.96	
Incremental Delay, d2		0.3	0.0						0.1		1.5	
Delay (s)		2.7	0.8						38.8		41.0	
Level of Service		A	A						D		D	
Approach Delay (s/veh)		2.7			0.0			38.8			41.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1326	19	0
Future Volume (vph)	0	0	0	1326	19	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.3	4.9	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3762	1810	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3762	1810	
Peak-hour factor, PHF	0.92	0.92	0.90	0.90	0.68	0.68
Adj. Flow (vph)	0	0	0	1473	28	0
RTOR Reduction (vph)	0	0	0	0	11	0
Lane Group Flow (vph)	0	0	0	1473	17	0
Heavy Vehicles (%)	2%	2%	1%	1%	5%	5%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				85.3	4.5	
Effective Green, g (s)				85.3	4.5	
Actuated g/C Ratio				0.85	0.05	
Clearance Time (s)				5.3	4.9	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3208	81	
v/s Ratio Prot				c0.39	c0.01	
v/s Ratio Perm						
v/c Ratio				0.46	0.22	
Uniform Delay, d1				1.8	46.0	
Progression Factor				1.00	1.12	
Incremental Delay, d2				0.5	1.3	
Delay (s)				2.3	52.7	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.3	52.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 10: EB 12-Mile Road & WB-to-EB X/O, W. of Novi Rd

Movement	EB	EB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	106	101	65	77
Average Queue (ft)	42	36	20	45
95th Queue (ft)	86	81	51	76
Link Distance (ft)	1724	1724	23	23
Upstream Blk Time (%)			11	28
Queuing Penalty (veh)			5	14
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: WB-to-EB X/O, W. of Novi Rd & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	13	35
Average Queue (ft)	1	2
95th Queue (ft)	8	18
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Novi Road & WB 12-Mile Road

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	T	TR
Maximum Queue (ft)	206	208	43	32	10	240	237
Average Queue (ft)	92	98	10	4	0	119	118
95th Queue (ft)	159	164	33	20	5	192	196
Link Distance (ft)	617	617	617	44	44	2348	2348
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 21: Novi Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	199	186	94	119	107	130	38	20
Average Queue (ft)	93	92	45	60	42	56	7	2
95th Queue (ft)	168	159	79	105	87	102	27	11
Link Distance (ft)	608	608	608	2381	2381		44	44
Upstream Blk Time (%)							1	0
Queuing Penalty (veh)							1	0
Storage Bay Dist (ft)						650		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 30: EB-to-WB X/O, E. of Novi Rd & WB 12-Mile Road

Movement	WB	WB	NB	NB
Directions Served	T	T	L	L
Maximum Queue (ft)	83	82	62	84
Average Queue (ft)	30	27	26	48
95th Queue (ft)	65	66	58	77
Link Distance (ft)	833	833	23	23
Upstream Blk Time (%)			12	30
Queuing Penalty (veh)			8	21
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 31: EB 12-Mile Road & EB-to-WB X/O, E. of Novi Rd

Movement	EB	EB
Directions Served	L	L
Maximum Queue (ft)	23	44
Average Queue (ft)	1	2
95th Queue (ft)	12	19
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: 12 Oaks Mall Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	T	T	R	R	R	T	T
Maximum Queue (ft)	97	117	16	56	11	49	75
Average Queue (ft)	30	44	1	17	1	9	36
95th Queue (ft)	78	95	9	42	8	34	66
Link Distance (ft)	965	965		406	406	21	21
Upstream Blk Time (%)						3	30
Queuing Penalty (veh)						2	13
Storage Bay Dist (ft)			250				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 41: 12 Oaks Mall Road & WB 12-Mile Road

Movement	WB
Directions Served	L
Maximum Queue (ft)	14
Average Queue (ft)	0
95th Queue (ft)	7
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	450
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 50: EB-to-WB X/O, E. of 12 Oaks & WB 12-Mile Road

Movement	WB	WB	NB
Directions Served	T	T	L
Maximum Queue (ft)	44	36	48
Average Queue (ft)	4	2	7
95th Queue (ft)	22	18	28
Link Distance (ft)	1852	1852	36
Upstream Blk Time (%)			2
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 51: EB 12-Mile Road & EB-to-WB X/O, E. of 12 Oaks

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 60: N. Site Drive & EB 12-Mile Road

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 70: 12 Oaks Mall Road & S. Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 65

Intersection: 10: EB 12-Mile Road & WB-to-EB X/O, W. of Novi Rd

Movement	EB	EB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	128	146	58	78
Average Queue (ft)	56	64	33	63
95th Queue (ft)	103	118	66	91
Link Distance (ft)	1724	1724	23	23
Upstream Blk Time (%)			21	42
Queuing Penalty (veh)			25	47
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: WB-to-EB X/O, W. of Novi Rd & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	64	79
Average Queue (ft)	4	16
95th Queue (ft)	27	58
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Novi Road & WB 12-Mile Road

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	T	TR
Maximum Queue (ft)	331	319	116	34	36	194	210
Average Queue (ft)	190	191	48	7	5	100	96
95th Queue (ft)	302	301	90	25	23	166	172
Link Distance (ft)	617	617	617	44	44	2348	2348
Upstream Blk Time (%)				0	1		
Queuing Penalty (veh)				1	2		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 21: Novi Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	239	240	137	231	236	123	37	14
Average Queue (ft)	127	120	69	134	130	49	6	1
95th Queue (ft)	208	198	114	208	211	98	26	7
Link Distance (ft)	608	608	608	2381	2381		44	44
Upstream Blk Time (%)							1	
Queuing Penalty (veh)							3	
Storage Bay Dist (ft)						650		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 30: EB-to-WB X/O, E. of Novi Rd & WB 12-Mile Road

Movement	WB	WB	NB	NB
Directions Served	T	T	L	L
Maximum Queue (ft)	115	125	61	89
Average Queue (ft)	56	55	31	51
95th Queue (ft)	109	107	63	80
Link Distance (ft)	833	833	23	23
Upstream Blk Time (%)			20	34
Queuing Penalty (veh)			16	26
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 31: EB 12-Mile Road & EB-to-WB X/O, E. of Novi Rd

Movement	EB	EB
Directions Served	L	L
Maximum Queue (ft)	49	65
Average Queue (ft)	4	4
95th Queue (ft)	25	29
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: 12 Oaks Mall Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	T	T	R	R	R	T	T
Maximum Queue (ft)	177	175	22	103	75	60	86
Average Queue (ft)	49	66	2	44	18	39	67
95th Queue (ft)	113	128	14	79	50	68	90
Link Distance (ft)	966	966		404	404	21	21
Upstream Blk Time (%)						27	57
Queuing Penalty (veh)						32	68
Storage Bay Dist (ft)			250				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 41: 12 Oaks Mall Road & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	66	86
Average Queue (ft)	11	18
95th Queue (ft)	43	62
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 50: EB-to-WB X/O, E. of 12 Oaks & WB 12-Mile Road

Movement	WB	WB	NB
Directions Served	T	T	L
Maximum Queue (ft)	111	83	69
Average Queue (ft)	26	16	20
95th Queue (ft)	82	56	55
Link Distance (ft)	1852	1852	36
Upstream Blk Time (%)			14
Queuing Penalty (veh)			3
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 51: EB 12-Mile Road & EB-to-WB X/O, E. of 12 Oaks

Movement	EB
Directions Served	L
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	178
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 60: N. Site Drive & EB 12-Mile Road

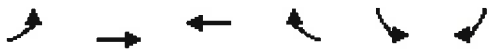
Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 70: 12 Oaks Mall Road & S. Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 224



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↰↰	
Traffic Volume (vph)	0	886	0	0	96	0
Future Volume (vph)	0	886	0	0	96	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.5			5.4	
Lane Util. Factor		0.95			0.97	
Frpb, ped/bikes		1.00			1.00	
Flpb, ped/bikes		1.00			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3725			3650	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3725			3650	
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.83	0.83
Adj. Flow (vph)	0	996	0	0	116	0
RTOR Reduction (vph)	0	0	0	0	108	0
Lane Group Flow (vph)	0	996	0	0	8	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		82.1			7.0	
Effective Green, g (s)		82.1			7.0	
Actuated g/C Ratio		0.82			0.07	
Clearance Time (s)		5.5			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		3058			255	
v/s Ratio Prot		c0.27			c0.00	
v/s Ratio Perm						
v/c Ratio		0.33			0.03	
Uniform Delay, d1		2.2			43.3	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.3			0.0	
Delay (s)		2.5			43.4	
Level of Service		A			D	
Approach Delay (s/veh)		2.5	0.0		43.4	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	587	26	0	235	0	0	471	97
Future Volume (vph)	0	0	0	0	587	26	0	235	0	0	471	97
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.4	6.4		5.5			8.5	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frpb, ped/bikes					1.00	0.99		1.00			1.00	
Flpb, ped/bikes					1.00	1.00		1.00			1.00	
Frt					1.00	0.85		1.00			0.97	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3725	1646		3725			3657	
Flt Permitted					1.00	1.00		1.00			1.00	
Satd. Flow (perm)					3725	1646		3725			3657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.95	0.95	0.95	0.79	0.79	0.79
Adj. Flow (vph)	0	0	0	0	691	31	0	247	0	0	596	123
RTOR Reduction (vph)	0	0	0	0	0	14	0	0	0	0	21	0
Lane Group Flow (vph)	0	0	0	0	691	17	0	247	0	0	698	0
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	
Protected Phases					6			4			8	
Permitted Phases						6						
Actuated Green, G (s)					56.4	56.4		31.7			28.7	
Effective Green, g (s)					56.4	56.4		31.7			28.7	
Actuated g/C Ratio					0.56	0.56		0.32			0.29	
Clearance Time (s)					6.4	6.4		5.5			8.5	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					2100	928		1180			1049	
v/s Ratio Prot					c0.19			0.07			c0.19	
v/s Ratio Perm						0.01						
v/c Ratio					0.33	0.02		0.21			0.67	
Uniform Delay, d1					11.7	9.6		25.0			31.4	
Progression Factor					1.17	4.20		0.00			1.00	
Incremental Delay, d2					0.4	0.0		0.1			1.6	
Delay (s)					14.0	40.3		0.1			33.0	
Level of Service					B	D		A			C	
Approach Delay (s/veh)		0.0			15.2			0.1			33.0	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	705	277	0	0	0	0	235	254	0	471	0
Future Volume (vph)	0	705	277	0	0	0	0	235	254	0	471	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.4	6.4					8.5	8.5		5.5	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.99					1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00		1.00	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3725	1645					3725	1667		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3725	1645					3725	1667		3762	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.95	0.95	0.95	0.79	0.79	0.79
Adj. Flow (vph)	0	775	304	0	0	0	0	247	267	0	596	0
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	78	0	0	0
Lane Group Flow (vph)	0	775	225	0	0	0	0	247	189	0	596	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		2						8			4	
Permitted Phases			2						8			
Actuated Green, G (s)		56.4	56.4					28.7	28.7		31.7	
Effective Green, g (s)		56.4	56.4					28.7	28.7		31.7	
Actuated g/C Ratio		0.56	0.56					0.29	0.29		0.32	
Clearance Time (s)		6.4	6.4					8.5	8.5		5.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		2100	927					1069	478		1192	
v/s Ratio Prot		c0.21						0.07			c0.16	
v/s Ratio Perm			0.14						0.11			
v/c Ratio		0.37	0.24					0.23	0.40		0.50	
Uniform Delay, d1		12.0	11.0					27.2	28.7		27.7	
Progression Factor		0.92	1.38					1.00	1.00		0.04	
Incremental Delay, d2		0.5	0.6					0.1	0.5		0.3	
Delay (s)		11.5	15.8					27.3	29.2		1.3	
Level of Service		B	B					C	C		A	
Approach Delay (s/veh)		12.7			0.0			28.3			1.3	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	476	137	0
Future Volume (vph)	0	0	0	476	137	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.5	5.3	
Lane Util. Factor				0.95	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3725	3614	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3725	3614	
Peak-hour factor, PHF	0.92	0.92	0.86	0.86	0.85	0.85
Adj. Flow (vph)	0	0	0	553	161	0
RTOR Reduction (vph)	0	0	0	0	150	0
Lane Group Flow (vph)	0	0	0	553	11	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.2	7.0	
Effective Green, g (s)				82.2	7.0	
Actuated g/C Ratio				0.82	0.07	
Clearance Time (s)				5.5	5.3	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3061	252	
v/s Ratio Prot				c0.15	c0.00	
v/s Ratio Perm						
v/c Ratio				0.18	0.04	
Uniform Delay, d1				1.9	43.4	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.1	0.1	
Delay (s)				2.0	43.5	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.0	43.5	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

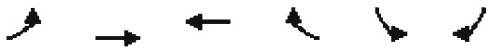
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	796	7	0	0	0	0	0	38	0	80	0
Future Volume (vph)	0	796	7	0	0	0	0	0	38	0	80	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.1	6.1						5.1		5.1	
Lane Util. Factor		0.95	1.00						0.88		0.95	
Frpb, ped/bikes		1.00	0.99						1.00		1.00	
Flpb, ped/bikes		1.00	1.00						1.00		1.00	
Frt		1.00	0.85						0.85		1.00	
Flt Protected		1.00	1.00						1.00		1.00	
Satd. Flow (prot)		3762	1662						2695		3762	
Flt Permitted		1.00	1.00						1.00		1.00	
Satd. Flow (perm)		3762	1662						2695		3762	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.73	0.73	0.73	0.60	0.60	0.60
Adj. Flow (vph)	0	847	7	0	0	0	0	0	52	0	133	0
RTOR Reduction (vph)	0	0	2	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	0	847	5	0	0	0	0	0	6	0	133	0
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	11%	11%	11%	1%	1%	1%
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									4	
Permitted Phases			2						8			
Actuated Green, G (s)		60.3	60.3						8.5		8.5	
Effective Green, g (s)		60.3	60.3						8.5		8.5	
Actuated g/C Ratio		0.75	0.75						0.11		0.11	
Clearance Time (s)		6.1	6.1						5.1		5.1	
Vehicle Extension (s)		3.0	3.0						3.2		3.2	
Lane Grp Cap (vph)		2835	1252						286		399	
v/s Ratio Prot		c0.23									c0.04	
v/s Ratio Perm			0.00						0.00			
v/c Ratio		0.30	0.00						0.02		0.33	
Uniform Delay, d1		3.1	2.4						32.0		33.1	
Progression Factor		1.00	1.00						1.00		1.01	
Incremental Delay, d2		0.3	0.0						0.0		0.5	
Delay (s)		3.4	2.4						32.0		33.9	
Level of Service		A	A						C		C	
Approach Delay (s/veh)		3.4			0.0			32.0			33.9	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	613	8	0
Future Volume (vph)	0	0	0	613	8	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.3	4.9	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3725	1681	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3725	1681	
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.60	0.60
Adj. Flow (vph)	0	0	0	730	13	0
RTOR Reduction (vph)	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	730	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	13%	13%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				68.7	1.1	
Effective Green, g (s)				68.7	1.1	
Actuated g/C Ratio				0.86	0.01	
Clearance Time (s)				5.3	4.9	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3198	23	
v/s Ratio Prot				c0.20	c0.00	
v/s Ratio Perm						
v/c Ratio				0.23	0.01	
Uniform Delay, d1				1.0	38.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.1	
Delay (s)				1.2	39.0	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			1.2	39.0	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↰↰	
Traffic Volume (vph)	0	930	0	0	222	0
Future Volume (vph)	0	930	0	0	222	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.5			5.4	
Lane Util. Factor		0.95			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3762			3686	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3762			3686	
Peak-hour factor, PHF	0.91	0.91	0.92	0.92	0.79	0.79
Adj. Flow (vph)	0	1022	0	0	281	0
RTOR Reduction (vph)	0	0	0	0	225	0
Lane Group Flow (vph)	0	1022	0	0	56	0
Heavy Vehicles (%)	1%	1%	2%	2%	0%	0%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		81.3			7.8	
Effective Green, g (s)		81.3			7.8	
Actuated g/C Ratio		0.81			0.08	
Clearance Time (s)		5.5			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		3058			287	
v/s Ratio Prot		c0.27			c0.02	
v/s Ratio Perm						
v/c Ratio		0.33			0.20	
Uniform Delay, d1		2.4			43.2	
Progression Factor		1.00			1.25	
Incremental Delay, d2		0.3			0.3	
Delay (s)		2.7			54.3	
Level of Service		A			D	
Approach Delay (s/veh)		2.7	0.0		54.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1039	175	0	683	0	0	440	79
Future Volume (vph)	0	0	0	0	1039	175	0	683	0	0	440	79
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.4	6.4		5.5			8.5	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.98	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3762	1683		3762			3676	
Flt Permitted					1.00	1.00		1.00			1.00	
Satd. Flow (perm)					3762	1683		3762			3676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	1181	199	0	785	0	0	489	88
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	0	1181	168	0	785	0	0	562	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	
Protected Phases					6			4			8	
Permitted Phases						6						
Actuated Green, G (s)					53.3	53.3		34.8			31.8	
Effective Green, g (s)					53.3	53.3		34.8			31.8	
Actuated g/C Ratio					0.53	0.53		0.35			0.32	
Clearance Time (s)					6.4	6.4		5.5			8.5	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					2005	897		1309			1168	
v/s Ratio Prot					c0.31			c0.21			0.15	
v/s Ratio Perm						0.10						
v/c Ratio					0.59	0.19		0.60			0.48	
Uniform Delay, d1					15.9	12.1		26.9			27.5	
Progression Factor					1.35	1.63		0.00			1.00	
Incremental Delay, d2					1.2	0.4		0.6			0.3	
Delay (s)					22.7	20.2		0.6			27.8	
Level of Service					C	C		A			C	
Approach Delay (s/veh)		0.0			22.4			0.6			27.8	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	697	455	0	0	0	0	683	232	0	440	0
Future Volume (vph)	0	697	455	0	0	0	0	683	232	0	440	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.4	6.4					8.5	8.5		5.5	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3762	1683					3762	1683		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3762	1683					3762	1683		3762	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	0	801	523	0	0	0	0	785	267	0	489	0
RTOR Reduction (vph)	0	0	92	0	0	0	0	0	92	0	0	0
Lane Group Flow (vph)	0	801	431	0	0	0	0	785	175	0	489	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		2						8			4	
Permitted Phases			2						8			
Actuated Green, G (s)		53.3	53.3					31.8	31.8		34.8	
Effective Green, g (s)		53.3	53.3					31.8	31.8		34.8	
Actuated g/C Ratio		0.53	0.53					0.32	0.32		0.35	
Clearance Time (s)		6.4	6.4					8.5	8.5		5.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		2005	897					1196	535		1309	
v/s Ratio Prot		0.21						c0.21			0.13	
v/s Ratio Perm			c0.26						0.10			
v/c Ratio		0.40	0.48					0.66	0.33		0.37	
Uniform Delay, d1		13.9	14.7					29.4	26.0		24.4	
Progression Factor		1.27	1.47					1.00	1.00		0.03	
Incremental Delay, d2		0.6	1.8					1.3	0.4		0.2	
Delay (s)		18.2	23.3					30.7	26.3		1.0	
Level of Service		B	C					C	C		A	
Approach Delay (s/veh)		20.2			0.0			29.6			1.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

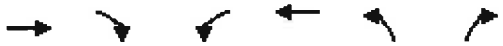
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1063	151	0
Future Volume (vph)	0	0	0	1063	151	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.5	5.3	
Lane Util. Factor				0.95	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3762	3614	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3762	3614	
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.83	0.83
Adj. Flow (vph)	0	0	0	1222	182	0
RTOR Reduction (vph)	0	0	0	0	169	0
Lane Group Flow (vph)	0	0	0	1222	13	0
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.1	7.1	
Effective Green, g (s)				82.1	7.1	
Actuated g/C Ratio				0.82	0.07	
Clearance Time (s)				5.5	5.3	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3088	256	
v/s Ratio Prot				c0.32	c0.00	
v/s Ratio Perm						
v/c Ratio				0.40	0.05	
Uniform Delay, d1				2.4	43.3	
Progression Factor				0.69	0.87	
Incremental Delay, d2				0.4	0.1	
Delay (s)				2.0	37.8	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.0	37.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱						↱↱		↑↑	
Traffic Volume (vph)	0	817	9	0	0	0	0	0	227	0	239	0
Future Volume (vph)	0	817	9	0	0	0	0	0	227	0	239	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.1	6.1						5.1		5.1	
Lane Util. Factor		0.95	1.00						0.88		0.95	
Frpb, ped/bikes		1.00	0.99						1.00		1.00	
Flpb, ped/bikes		1.00	1.00						1.00		1.00	
Frt		1.00	0.85						0.85		1.00	
Flt Protected		1.00	1.00						1.00		1.00	
Satd. Flow (prot)		3762	1662						2992		3762	
Flt Permitted		1.00	1.00						1.00		1.00	
Satd. Flow (perm)		3762	1662						2992		3762	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	0	898	10	0	0	0	0	0	249	0	266	0
RTOR Reduction (vph)	0	0	2	0	0	0	0	0	218	0	0	0
Lane Group Flow (vph)	0	898	8	0	0	0	0	0	31	0	266	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									4	
Permitted Phases			2						8			
Actuated Green, G (s)		76.2	76.2						12.6		12.6	
Effective Green, g (s)		76.2	76.2						12.6		12.6	
Actuated g/C Ratio		0.76	0.76						0.13		0.13	
Clearance Time (s)		6.1	6.1						5.1		5.1	
Vehicle Extension (s)		3.0	3.0						3.2		3.2	
Lane Grp Cap (vph)		2866	1266						376		474	
v/s Ratio Prot		c0.24									c0.07	
v/s Ratio Perm			0.00						0.01			
v/c Ratio		0.31	0.01						0.08		0.56	
Uniform Delay, d1		3.7	2.8						38.6		41.1	
Progression Factor		0.65	0.25						1.00		0.96	
Incremental Delay, d2		0.3	0.0						0.1		1.4	
Delay (s)		2.7	0.7						38.7		40.9	
Level of Service		A	A						D		D	
Approach Delay (s/veh)		2.7			0.0			38.7			40.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1333	19	0
Future Volume (vph)	0	0	0	1333	19	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.3	4.9	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3762	1810	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3762	1810	
Peak-hour factor, PHF	0.92	0.92	0.90	0.90	0.68	0.68
Adj. Flow (vph)	0	0	0	1481	28	0
RTOR Reduction (vph)	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	1481	18	0
Heavy Vehicles (%)	2%	2%	1%	1%	5%	5%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				85.3	4.5	
Effective Green, g (s)				85.3	4.5	
Actuated g/C Ratio				0.85	0.05	
Clearance Time (s)				5.3	4.9	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3208	81	
v/s Ratio Prot				c0.39	c0.01	
v/s Ratio Perm						
v/c Ratio				0.46	0.23	
Uniform Delay, d1				1.8	46.1	
Progression Factor				1.00	1.08	
Incremental Delay, d2				0.5	1.4	
Delay (s)				2.3	51.2	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.3	51.2	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 10: EB 12-Mile Road & WB-to-EB X/O, W. of Novi Rd

Movement	EB	EB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	104	123	54	75
Average Queue (ft)	44	39	15	42
95th Queue (ft)	88	91	44	72
Link Distance (ft)	1724	1724	23	23
Upstream Blk Time (%)			9	27
Queuing Penalty (veh)			4	13
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: WB-to-EB X/O, W. of Novi Rd & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	6	20
Average Queue (ft)	0	1
95th Queue (ft)	4	10
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Novi Road & WB 12-Mile Road

Movement	WB	WB	WB	NB	SB	SB
Directions Served	T	T	R	T	T	TR
Maximum Queue (ft)	204	197	39	4	189	202
Average Queue (ft)	98	105	9	0	117	113
95th Queue (ft)	164	166	31	4	177	185
Link Distance (ft)	617	617	617	44	2348	2348
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 21: Novi Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	NB
Directions Served	T	T	R	T	T	R
Maximum Queue (ft)	220	215	88	130	118	152
Average Queue (ft)	103	100	44	63	43	56
95th Queue (ft)	174	173	73	107	93	107
Link Distance (ft)	608	608	608	2381	2381	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						650
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 30: EB-to-WB X/O, E. of Novi Rd & WB 12-Mile Road

Movement	WB	WB	NB	NB
Directions Served	T	T	L	L
Maximum Queue (ft)	70	81	63	86
Average Queue (ft)	33	27	26	49
95th Queue (ft)	65	65	59	80
Link Distance (ft)	833	833	23	23
Upstream Blk Time (%)			13	29
Queuing Penalty (veh)			9	20
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 31: EB 12-Mile Road & EB-to-WB X/O, E. of Novi Rd

Movement	EB	EB
Directions Served	L	L
Maximum Queue (ft)	30	38
Average Queue (ft)	1	3
95th Queue (ft)	13	22
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: 12 Oaks Mall Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	T	T	R	R	R	T	T
Maximum Queue (ft)	111	119	16	57	11	44	71
Average Queue (ft)	29	46	1	15	1	10	38
95th Queue (ft)	82	100	10	41	6	35	70
Link Distance (ft)	965	965		406	406	21	21
Upstream Blk Time (%)						7	31
Queuing Penalty (veh)						4	14
Storage Bay Dist (ft)			250				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 41: 12 Oaks Mall Road & WB 12-Mile Road

Movement	WB
Directions Served	L
Maximum Queue (ft)	7
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	450
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 50: EB-to-WB X/O, E. of 12 Oaks & WB 12-Mile Road

Movement	WB	WB	NB
Directions Served	T	T	L
Maximum Queue (ft)	51	32	50
Average Queue (ft)	3	2	5
95th Queue (ft)	19	16	26
Link Distance (ft)	1852	1852	36
Upstream Blk Time (%)			2
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 51: EB 12-Mile Road & EB-to-WB X/O, E. of 12 Oaks

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 60: N. Site Drive & EB 12-Mile Road

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 70: 12 Oaks Mall Road & S. Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 64

Intersection: 10: EB 12-Mile Road & WB-to-EB X/O, W. of Novi Rd

Movement	EB	EB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	121	167	58	77
Average Queue (ft)	58	65	32	65
95th Queue (ft)	106	126	66	90
Link Distance (ft)	1724	1724	23	23
Upstream Blk Time (%)			20	46
Queuing Penalty (veh)			23	52
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: WB-to-EB X/O, W. of Novi Rd & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	55	102
Average Queue (ft)	6	21
95th Queue (ft)	31	72
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Novi Road & WB 12-Mile Road

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	T	TR
Maximum Queue (ft)	366	360	109	4	10	205	206
Average Queue (ft)	203	207	48	0	1	97	95
95th Queue (ft)	322	327	91	2	7	162	168
Link Distance (ft)	617	617	617	44	44	2348	2348
Upstream Blk Time (%)					0		
Queuing Penalty (veh)					0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 21: Novi Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	NB	SB
Directions Served	T	T	R	T	T	R	T
Maximum Queue (ft)	247	230	192	219	220	110	4
Average Queue (ft)	133	124	80	136	129	46	0
95th Queue (ft)	212	203	139	202	206	90	3
Link Distance (ft)	608	608	608	2381	2381		44
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)						650	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 30: EB-to-WB X/O, E. of Novi Rd & WB 12-Mile Road

Movement	WB	WB	NB	NB
Directions Served	T	T	L	L
Maximum Queue (ft)	144	138	58	91
Average Queue (ft)	56	62	31	50
95th Queue (ft)	110	118	61	82
Link Distance (ft)	833	833	23	23
Upstream Blk Time (%)			20	35
Queuing Penalty (veh)			15	27
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 31: EB 12-Mile Road & EB-to-WB X/O, E. of Novi Rd

Movement	EB	EB
Directions Served	L	L
Maximum Queue (ft)	40	46
Average Queue (ft)	3	4
95th Queue (ft)	18	24
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: 12 Oaks Mall Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	T	T	R	R	R	T	T
Maximum Queue (ft)	138	164	23	107	74	69	77
Average Queue (ft)	44	63	2	41	17	43	67
95th Queue (ft)	104	125	12	78	51	71	88
Link Distance (ft)	966	966		404	404	21	21
Upstream Blk Time (%)						31	54
Queuing Penalty (veh)						37	64
Storage Bay Dist (ft)			250				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 41: 12 Oaks Mall Road & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	90	112
Average Queue (ft)	15	24
95th Queue (ft)	57	77
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 50: EB-to-WB X/O, E. of 12 Oaks & WB 12-Mile Road

Movement	WB	WB	NB
Directions Served	T	T	L
Maximum Queue (ft)	123	99	62
Average Queue (ft)	24	17	19
95th Queue (ft)	78	60	50
Link Distance (ft)	1852	1852	36
Upstream Blk Time (%)			11
Queuing Penalty (veh)			2
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 51: EB 12-Mile Road & EB-to-WB X/O, E. of 12 Oaks

Movement	EB
Directions Served	L
Maximum Queue (ft)	10
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	178
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 60: N. Site Drive & EB 12-Mile Road

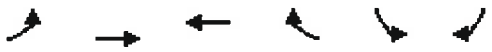
Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 70: 12 Oaks Mall Road & S. Site Drive

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Zone Summary

Zone wide Queuing Penalty: 221



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↰↰	
Traffic Volume (vph)	0	889	0	0	112	0
Future Volume (vph)	0	889	0	0	112	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.5			5.4	
Lane Util. Factor		0.95			0.97	
Frpb, ped/bikes		1.00			1.00	
Flpb, ped/bikes		1.00			1.00	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3725			3650	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3725			3650	
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.83	0.83
Adj. Flow (vph)	0	999	0	0	135	0
RTOR Reduction (vph)	0	0	0	0	126	0
Lane Group Flow (vph)	0	999	0	0	9	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		82.1			7.0	
Effective Green, g (s)		82.1			7.0	
Actuated g/C Ratio		0.82			0.07	
Clearance Time (s)		5.5			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		3058			255	
v/s Ratio Prot		c0.27			c0.00	
v/s Ratio Perm						
v/c Ratio		0.33			0.04	
Uniform Delay, d1		2.2			43.4	
Progression Factor		1.00			1.00	
Incremental Delay, d2		0.3			0.1	
Delay (s)		2.5			43.4	
Level of Service		A			D	
Approach Delay (s/veh)		2.5	0.0		43.4	
Approach LOS		A	A		D	

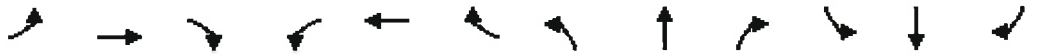
Intersection Summary			
HCM 2000 Control Delay (s/veh)	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	612	30	0	235	0	0	471	99
Future Volume (vph)	0	0	0	0	612	30	0	235	0	0	471	99
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.4	6.4		5.5			8.5	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frpb, ped/bikes					1.00	0.99		1.00			1.00	
Flpb, ped/bikes					1.00	1.00		1.00			1.00	
Frt					1.00	0.85		1.00			0.97	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3725	1646		3725			3656	
Flt Permitted					1.00	1.00		1.00			1.00	
Satd. Flow (perm)					3725	1646		3725			3656	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.95	0.95	0.95	0.79	0.79	0.79
Adj. Flow (vph)	0	0	0	0	720	35	0	247	0	0	596	125
RTOR Reduction (vph)	0	0	0	0	0	15	0	0	0	0	21	0
Lane Group Flow (vph)	0	0	0	0	720	20	0	247	0	0	700	0
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	
Protected Phases					6			4			8	
Permitted Phases						6						
Actuated Green, G (s)					56.3	56.3		31.8			28.8	
Effective Green, g (s)					56.3	56.3		31.8			28.8	
Actuated g/C Ratio					0.56	0.56		0.32			0.29	
Clearance Time (s)					6.4	6.4		5.5			8.5	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					2097	926		1184			1052	
v/s Ratio Prot					c0.19			0.07			c0.19	
v/s Ratio Perm						0.01						
v/c Ratio					0.34	0.02		0.21			0.67	
Uniform Delay, d1					11.8	9.7		24.9			31.4	
Progression Factor					1.15	3.44		0.00			1.00	
Incremental Delay, d2					0.4	0.0		0.1			1.6	
Delay (s)					14.1	33.3		0.1			33.0	
Level of Service					B	C		A			C	
Approach Delay (s/veh)		0.0			15.0			0.1			33.0	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	710	291	0	0	0	0	235	258	0	471	0
Future Volume (vph)	0	710	291	0	0	0	0	235	258	0	471	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.4	6.4					8.5	8.5		5.5	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.99					1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00		1.00	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3725	1645					3725	1667		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3725	1645					3725	1667		3762	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.95	0.95	0.95	0.79	0.79	0.79
Adj. Flow (vph)	0	780	320	0	0	0	0	247	272	0	596	0
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	0	780	241	0	0	0	0	247	196	0	596	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		2						8			4	
Permitted Phases			2						8			
Actuated Green, G (s)		56.3	56.3					28.8	28.8		31.8	
Effective Green, g (s)		56.3	56.3					28.8	28.8		31.8	
Actuated g/C Ratio		0.56	0.56					0.29	0.29		0.32	
Clearance Time (s)		6.4	6.4					8.5	8.5		5.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		2097	926					1072	480		1196	
v/s Ratio Prot		c0.21						0.07			c0.16	
v/s Ratio Perm			0.15						0.12			
v/c Ratio		0.37	0.26					0.23	0.41		0.50	
Uniform Delay, d1		12.1	11.2					27.1	28.7		27.6	
Progression Factor		0.93	1.31					1.00	1.00		0.04	
Incremental Delay, d2		0.5	0.7					0.1	0.6		0.3	
Delay (s)		11.7	15.4					27.3	29.3		1.3	
Level of Service		B	B					C	C		A	
Approach Delay (s/veh)		12.8			0.0			28.3			1.3	
Approach LOS		B			A			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	505	137	0
Future Volume (vph)	0	0	0	505	137	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.5	5.3	
Lane Util. Factor				0.95	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3725	3614	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3725	3614	
Peak-hour factor, PHF	0.92	0.92	0.86	0.86	0.85	0.85
Adj. Flow (vph)	0	0	0	587	161	0
RTOR Reduction (vph)	0	0	0	0	150	0
Lane Group Flow (vph)	0	0	0	587	11	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.2	7.0	
Effective Green, g (s)				82.2	7.0	
Actuated g/C Ratio				0.82	0.07	
Clearance Time (s)				5.5	5.3	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3061	252	
v/s Ratio Prot				c0.16	c0.00	
v/s Ratio Perm						
v/c Ratio				0.19	0.04	
Uniform Delay, d1				1.9	43.4	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.1	0.1	
Delay (s)				2.0	43.5	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			2.0	43.5	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	801	11	0	0	0	0	0	54	0	86	0
Future Volume (vph)	0	801	11	0	0	0	0	0	54	0	86	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.1	6.1						5.1		5.1	
Lane Util. Factor		0.95	1.00						0.88		0.95	
Frpb, ped/bikes		1.00	0.99						1.00		1.00	
Flpb, ped/bikes		1.00	1.00						1.00		1.00	
Frt		1.00	0.85						0.85		1.00	
Flt Protected		1.00	1.00						1.00		1.00	
Satd. Flow (prot)		3762	1662						2695		3762	
Flt Permitted		1.00	1.00						1.00		1.00	
Satd. Flow (perm)		3762	1662						2695		3762	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.73	0.73	0.73	0.60	0.60	0.60
Adj. Flow (vph)	0	852	12	0	0	0	0	0	74	0	143	0
RTOR Reduction (vph)	0	0	3	0	0	0	0	0	66	0	0	0
Lane Group Flow (vph)	0	852	9	0	0	0	0	0	8	0	143	0
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	11%	11%	11%	1%	1%	1%
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									4	
Permitted Phases			2						8			
Actuated Green, G (s)		60.1	60.1						8.7		8.7	
Effective Green, g (s)		60.1	60.1						8.7		8.7	
Actuated g/C Ratio		0.75	0.75						0.11		0.11	
Clearance Time (s)		6.1	6.1						5.1		5.1	
Vehicle Extension (s)		3.0	3.0						3.2		3.2	
Lane Grp Cap (vph)		2826	1248						293		409	
v/s Ratio Prot		c0.23									c0.04	
v/s Ratio Perm			0.01						0.00			
v/c Ratio		0.30	0.01						0.03		0.35	
Uniform Delay, d1		3.2	2.5						31.9		33.0	
Progression Factor		1.00	1.00						1.00		1.12	
Incremental Delay, d2		0.3	0.0						0.0		0.5	
Delay (s)		3.5	2.5						31.9		37.5	
Level of Service		A	A						C		D	
Approach Delay (s/veh)		3.5			0.0			31.9			37.5	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰	
Traffic Volume (vph)	0	0	0	619	37	0
Future Volume (vph)	0	0	0	619	37	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.3	4.9	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3725	1681	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3725	1681	
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.60	0.60
Adj. Flow (vph)	0	0	0	737	62	0
RTOR Reduction (vph)	0	0	0	0	59	0
Lane Group Flow (vph)	0	0	0	737	3	0
Heavy Vehicles (%)	2%	2%	2%	2%	13%	13%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				65.4	4.4	
Effective Green, g (s)				65.4	4.4	
Actuated g/C Ratio				0.82	0.06	
Clearance Time (s)				5.3	4.9	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3045	92	
v/s Ratio Prot				c0.20	c0.00	
v/s Ratio Perm						
v/c Ratio				0.24	0.04	
Uniform Delay, d1				1.7	35.8	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.2	
Delay (s)				1.8	36.0	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			1.8	36.0	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑					↱
Traffic Vol, veh/h	850	5	0	0	0	29
Future Vol, veh/h	850	5	0	0	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	92	92	92	92
Heavy Vehicles, %	1	1	2	2	2	2
Mvmt Flow	904	5	0	0	0	32

Major/Minor	Major1			Minor1	
Conflicting Flow All	0	0		-	455
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	-		-	7.14
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	-		-	3.92
Pot Cap-1 Maneuver	-	-		0	*818
Stage 1	-	-		0	-
Stage 2	-	-		0	-
Platoon blocked, %	-	-			0
Mov Cap-1 Maneuver	-	-		-	*818
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	NB
HCM Control Delay, s/v	0	9.57
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	818	-	-
HCM Lane V/C Ratio	0.039	-	-
HCM Control Delay (s/veh)	9.6	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

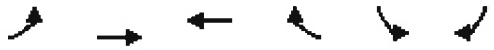
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	0	0	0	0	3	0	38	0	5	87	5
Future Vol, veh/h	13	0	0	0	0	3	0	38	0	5	87	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	73	73	73	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	11	11	11	2	2	2
Mvmt Flow	14	0	0	0	0	3	0	52	0	6	102	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	143	169	54	115	172	26	108	0	0	52	0	0
Stage 1	117	117	-	52	52	-	-	-	-	-	-	-
Stage 2	26	52	-	63	120	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.32	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.31	-	-	2.22	-	-
Pot Cap-1 Maneuver	838	739	1031	877	736	1044	1436	-	-	1552	-	-
Stage 1	897	811	-	954	851	-	-	-	-	-	-	-
Stage 2	988	851	-	964	808	-	-	-	-	-	-	-
Platoon blocked, %	0	0	0	0	0		0	-	-		-	-
Mov Cap-1 Maneuver	832	736	1031	874	734	1044	1436	-	-	1552	-	-
Mov Cap-2 Maneuver	832	736	-	874	734	-	-	-	-	-	-	-
Stage 1	893	808	-	954	851	-	-	-	-	-	-	-
Stage 2	985	851	-	961	805	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	9.4	8.46	0	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1436	-	-	832	1044	172	-	-
HCM Lane V/C Ratio	-	-	-	0.017	0.003	0.004	-	-
HCM Control Delay (s/veh)	0	-	-	9.4	8.5	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

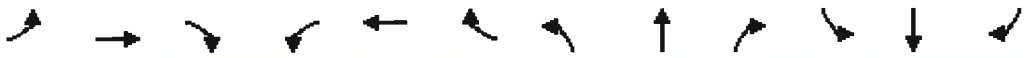


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↰↰	
Traffic Volume (vph)	0	940	0	0	235	0
Future Volume (vph)	0	940	0	0	235	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.5			5.4	
Lane Util. Factor		0.95			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		3762			3686	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		3762			3686	
Peak-hour factor, PHF	0.91	0.91	0.92	0.92	0.79	0.79
Adj. Flow (vph)	0	1033	0	0	297	0
RTOR Reduction (vph)	0	0	0	0	219	0
Lane Group Flow (vph)	0	1033	0	0	78	0
Heavy Vehicles (%)	1%	1%	2%	2%	0%	0%
Turn Type		NA			Prot	
Protected Phases		2			4	
Permitted Phases						
Actuated Green, G (s)		81.0			8.1	
Effective Green, g (s)		81.0			8.1	
Actuated g/C Ratio		0.81			0.08	
Clearance Time (s)		5.5			5.4	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		3047			298	
v/s Ratio Prot		c0.27			c0.02	
v/s Ratio Perm						
v/c Ratio		0.34			0.26	
Uniform Delay, d1		2.5			43.1	
Progression Factor		1.00			1.10	
Incremental Delay, d2		0.3			0.4	
Delay (s)		2.8			47.7	
Level of Service		A			D	
Approach Delay (s/veh)		2.8	0.0		47.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1054	179	0	683	0	0	440	85
Future Volume (vph)	0	0	0	0	1054	179	0	683	0	0	440	85
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)					6.4	6.4		5.5			8.5	
Lane Util. Factor					0.95	1.00		0.95			0.95	
Frt					1.00	0.85		1.00			0.98	
Flt Protected					1.00	1.00		1.00			1.00	
Satd. Flow (prot)					3762	1683		3762			3671	
Flt Permitted					1.00	1.00		1.00			1.00	
Satd. Flow (perm)					3762	1683		3762			3671	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	1198	203	0	785	0	0	489	94
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	0	0	16	0
Lane Group Flow (vph)	0	0	0	0	1198	172	0	785	0	0	567	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type					NA	Perm		NA			NA	
Protected Phases					6			4			8	
Permitted Phases						6						
Actuated Green, G (s)					53.3	53.3		34.8			31.8	
Effective Green, g (s)					53.3	53.3		34.8			31.8	
Actuated g/C Ratio					0.53	0.53		0.35			0.32	
Clearance Time (s)					6.4	6.4		5.5			8.5	
Vehicle Extension (s)					3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)					2005	897		1309			1167	
v/s Ratio Prot					c0.32			c0.21			0.15	
v/s Ratio Perm						0.10						
v/c Ratio					0.60	0.19		0.60			0.49	
Uniform Delay, d1					16.0	12.1		26.9			27.5	
Progression Factor					1.32	1.56		0.00			1.00	
Incremental Delay, d2					1.2	0.4		0.6			0.3	
Delay (s)					22.4	19.4		0.6			27.8	
Level of Service					C	B		A			C	
Approach Delay (s/veh)		0.0			22.0			0.6			27.8	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱					↑↑	↱		↑↑	
Traffic Volume (vph)	0	713	462	0	0	0	0	683	242	0	440	0
Future Volume (vph)	0	713	462	0	0	0	0	683	242	0	440	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.4	6.4					8.5	8.5		5.5	
Lane Util. Factor		0.95	1.00					0.95	1.00		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3762	1683					3762	1683		3762	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3762	1683					3762	1683		3762	
Peak-hour factor, PHF	0.87	0.87	0.87	0.92	0.92	0.92	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	0	820	531	0	0	0	0	785	278	0	489	0
RTOR Reduction (vph)	0	0	92	0	0	0	0	0	87	0	0	0
Lane Group Flow (vph)	0	820	439	0	0	0	0	785	191	0	489	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		2						8			4	
Permitted Phases			2						8			
Actuated Green, G (s)		53.3	53.3					31.8	31.8		34.8	
Effective Green, g (s)		53.3	53.3					31.8	31.8		34.8	
Actuated g/C Ratio		0.53	0.53					0.32	0.32		0.35	
Clearance Time (s)		6.4	6.4					8.5	8.5		5.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		2005	897					1196	535		1309	
v/s Ratio Prot		0.22						c0.21			0.13	
v/s Ratio Perm			c0.26						0.11			
v/c Ratio		0.41	0.49					0.66	0.36		0.37	
Uniform Delay, d1		13.9	14.7					29.4	26.2		24.4	
Progression Factor		1.30	1.50					1.00	1.00		0.04	
Incremental Delay, d2		0.6	1.8					1.3	0.4		0.2	
Delay (s)		18.8	23.9					30.7	26.6		1.1	
Level of Service		B	C					C	C		A	
Approach Delay (s/veh)		20.8			0.0			29.6			1.1	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1082	151	0
Future Volume (vph)	0	0	0	1082	151	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.5	5.3	
Lane Util. Factor				0.95	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3762	3614	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3762	3614	
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.83	0.83
Adj. Flow (vph)	0	0	0	1244	182	0
RTOR Reduction (vph)	0	0	0	0	169	0
Lane Group Flow (vph)	0	0	0	1244	13	0
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.0	7.2	
Effective Green, g (s)				82.0	7.2	
Actuated g/C Ratio				0.82	0.07	
Clearance Time (s)				5.5	5.3	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3084	260	
v/s Ratio Prot				c0.33	c0.00	
v/s Ratio Perm						
v/c Ratio				0.40	0.05	
Uniform Delay, d1				2.4	43.2	
Progression Factor				0.55	0.73	
Incremental Delay, d2				0.4	0.1	
Delay (s)				1.7	31.7	
Level of Service				A	C	
Approach Delay (s/veh)	0.0			1.7	31.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱						↱↱		↑↑	
Traffic Volume (vph)	0	833	19	0	0	0	0	0	238	0	255	0
Future Volume (vph)	0	833	19	0	0	0	0	0	238	0	255	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.1	6.1						5.1		5.1	
Lane Util. Factor		0.95	1.00						0.88		0.95	
Frpb, ped/bikes		1.00	0.99						1.00		1.00	
Flpb, ped/bikes		1.00	1.00						1.00		1.00	
Frt		1.00	0.85						0.85		1.00	
Flt Protected		1.00	1.00						1.00		1.00	
Satd. Flow (prot)		3762	1662						2992		3762	
Flt Permitted		1.00	1.00						1.00		1.00	
Satd. Flow (perm)		3762	1662						2992		3762	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	0	915	21	0	0	0	0	0	262	0	283	0
RTOR Reduction (vph)	0	0	5	0	0	0	0	0	228	0	0	0
Lane Group Flow (vph)	0	915	16	0	0	0	0	0	34	0	283	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	1%	1%	1%
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									4	
Permitted Phases			2						8			
Actuated Green, G (s)		75.8	75.8						13.0		13.0	
Effective Green, g (s)		75.8	75.8						13.0		13.0	
Actuated g/C Ratio		0.76	0.76						0.13		0.13	
Clearance Time (s)		6.1	6.1						5.1		5.1	
Vehicle Extension (s)		3.0	3.0						3.2		3.2	
Lane Grp Cap (vph)		2851	1259						388		489	
v/s Ratio Prot		c0.24									c0.08	
v/s Ratio Perm			0.01						0.01			
v/c Ratio		0.32	0.01						0.09		0.58	
Uniform Delay, d1		3.9	3.0						38.3		40.9	
Progression Factor		0.64	0.38						1.00		0.95	
Incremental Delay, d2		0.3	0.0						0.1		1.6	
Delay (s)		2.7	1.1						38.4		40.5	
Level of Service		A	A						D		D	
Approach Delay (s/veh)		2.7			0.0			38.4			40.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1349	38	0
Future Volume (vph)	0	0	0	1349	38	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Total Lost time (s)				5.3	4.9	
Lane Util. Factor				0.95	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				3762	1810	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				3762	1810	
Peak-hour factor, PHF	0.92	0.92	0.90	0.90	0.68	0.68
Adj. Flow (vph)	0	0	0	1499	56	0
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	0	1499	47	0
Heavy Vehicles (%)	2%	2%	1%	1%	5%	5%
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Actuated Green, G (s)				82.8	7.0	
Effective Green, g (s)				82.8	7.0	
Actuated g/C Ratio				0.83	0.07	
Clearance Time (s)				5.3	4.9	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				3114	126	
v/s Ratio Prot				c0.40	c0.03	
v/s Ratio Perm						
v/c Ratio				0.48	0.37	
Uniform Delay, d1				2.5	44.4	
Progression Factor				1.00	1.15	
Incremental Delay, d2				0.5	1.8	
Delay (s)				3.0	52.8	
Level of Service				A	D	
Approach Delay (s/veh)	0.0			3.0	52.8	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑					↱
Traffic Vol, veh/h	1055	16	0	0	0	19
Future Vol, veh/h	1055	16	0	0	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	92	92	92	92
Heavy Vehicles, %	1	1	2	2	2	2
Mvmt Flow	1159	18	0	0	0	21

Major/Minor	Major1			Minor1	
Conflicting Flow All	0	0		-	588
Stage 1	-	-		-	-
Stage 2	-	-		-	-
Critical Hdwy	-	-		-	7.14
Critical Hdwy Stg 1	-	-		-	-
Critical Hdwy Stg 2	-	-		-	-
Follow-up Hdwy	-	-		-	3.92
Pot Cap-1 Maneuver	-	-		0	*777
Stage 1	-	-		0	-
Stage 2	-	-		0	-
Platoon blocked, %	-	-			0
Mov Cap-1 Maneuver	-	-		-	*777
Mov Cap-2 Maneuver	-	-		-	-
Stage 1	-	-		-	-
Stage 2	-	-		-	-

Approach	EB	NB
HCM Control Delay, s/v	0	9.76
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR
Capacity (veh/h)	777	-	-
HCM Lane V/C Ratio	0.027	-	-
HCM Control Delay (s/veh)	9.8	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Vol, veh/h	9	0	0	0	0	2	0	227	0	13	248	13
Future Vol, veh/h	9	0	0	0	0	2	0	227	0	13	248	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	91	91	91	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	1	1	1
Mvmt Flow	10	0	0	0	0	2	0	249	0	14	267	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	426	551	140	411	558	125	281	0	0	249	0	0
Stage 1	302	302	-	249	249	-	-	-	-	-	-	-
Stage 2	125	249	-	161	309	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.2	-	-	2.21	-	-
Pot Cap-1 Maneuver	601	492	*1033	618	488	903	1381	-	-	1321	-	-
Stage 1	779	723	-	733	699	-	-	-	-	-	-	-
Stage 2	866	699	-	949	718	-	-	-	-	-	-	-
Platoon blocked, %	0	0	0	0	0		0	-	-		-	-
Mov Cap-1 Maneuver	593	487	*1033	611	482	903	1381	-	-	1321	-	-
Mov Cap-2 Maneuver	593	487	-	611	482	-	-	-	-	-	-	-
Stage 1	770	715	-	733	699	-	-	-	-	-	-	-
Stage 2	864	699	-	938	709	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	11.17	9	0	0.44
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1381	-	-	593	903	160	-	-
HCM Lane V/C Ratio	-	-	-	0.016	0.002	0.011	-	-
HCM Control Delay (s/veh)	0	-	-	11.2	9	7.8	0.1	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection: 10: EB 12-Mile Road & WB-to-EB X/O, W. of Novi Rd

Movement	EB	EB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	110	103	53	80
Average Queue (ft)	51	38	19	50
95th Queue (ft)	95	84	49	79
Link Distance (ft)	1724	1724	23	23
Upstream Blk Time (%)			9	30
Queuing Penalty (veh)			5	17
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: WB-to-EB X/O, W. of Novi Rd & WB 12-Mile Road

Movement	WB
Directions Served	L
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	14
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 20: Novi Road & WB 12-Mile Road

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	R	T	TR
Maximum Queue (ft)	192	198	44	226	224
Average Queue (ft)	97	105	12	118	115
95th Queue (ft)	157	167	37	189	195
Link Distance (ft)	617	617	617	2348	2348
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: Novi Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	NB
Directions Served	T	T	R	T	T	R
Maximum Queue (ft)	210	211	107	116	95	131
Average Queue (ft)	103	100	46	62	38	57
95th Queue (ft)	170	163	79	104	81	106
Link Distance (ft)	608	608	608	2381	2381	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						650
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 30: EB-to-WB X/O, E. of Novi Rd & WB 12-Mile Road

Movement	WB	WB	NB	NB
Directions Served	T	T	L	L
Maximum Queue (ft)	82	91	55	78
Average Queue (ft)	30	27	25	46
95th Queue (ft)	65	67	53	72
Link Distance (ft)	833	833	23	23
Upstream Blk Time (%)			12	27
Queuing Penalty (veh)			9	19
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 31: EB 12-Mile Road & EB-to-WB X/O, E. of Novi Rd

Movement	EB	EB
Directions Served	L	L
Maximum Queue (ft)	12	20
Average Queue (ft)	0	1
95th Queue (ft)	6	11
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: 12 Oaks Mall Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	T	T	R	R	R	T	T
Maximum Queue (ft)	111	120	22	68	22	48	74
Average Queue (ft)	33	46	2	22	4	13	38
95th Queue (ft)	84	98	12	54	16	40	70
Link Distance (ft)	965	965		406	406	21	21
Upstream Blk Time (%)						8	30
Queuing Penalty (veh)						4	15
Storage Bay Dist (ft)			250				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 41: 12 Oaks Mall Road & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	6	21
Average Queue (ft)	0	1
95th Queue (ft)	4	9
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 50: EB-to-WB X/O, E. of 12 Oaks & WB 12-Mile Road

Movement	WB	WB	NB
Directions Served	T	T	L
Maximum Queue (ft)	74	65	86
Average Queue (ft)	21	13	31
95th Queue (ft)	61	45	73
Link Distance (ft)	1852	1852	36
Upstream Blk Time (%)			13
Queuing Penalty (veh)			5
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 51: EB 12-Mile Road & EB-to-WB X/O, E. of 12 Oaks

Movement	EB
Directions Served	L
Maximum Queue (ft)	26
Average Queue (ft)	1
95th Queue (ft)	12
Link Distance (ft)	178
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 60: N. Site Drive & EB 12-Mile Road

Movement	EB	NB
Directions Served	TR	R
Maximum Queue (ft)	10	52
Average Queue (ft)	0	20
95th Queue (ft)	8	49
Link Distance (ft)	370	230
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 70: 12 Oaks Mall Road & S. Site Drive

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (ft)	23	28
Average Queue (ft)	7	3
95th Queue (ft)	23	17
Link Distance (ft)	196	323
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 74

Intersection: 10: EB 12-Mile Road & WB-to-EB X/O, W. of Novi Rd

Movement	EB	EB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	135	152	58	77
Average Queue (ft)	61	65	33	63
95th Queue (ft)	111	119	67	90
Link Distance (ft)	1724	1724	23	23
Upstream Blk Time (%)			19	42
Queuing Penalty (veh)			23	50
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: WB-to-EB X/O, W. of Novi Rd & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	63	86
Average Queue (ft)	7	17
95th Queue (ft)	35	59
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Novi Road & WB 12-Mile Road

Movement	WB	WB	WB	NB	SB	SB
Directions Served	T	T	R	T	T	TR
Maximum Queue (ft)	364	359	124	14	176	176
Average Queue (ft)	203	204	48	1	96	92
95th Queue (ft)	330	326	95	6	153	158
Link Distance (ft)	617	617	617	44	2348	2348
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 21: Novi Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	T	T	R	T	T	R	T	T
Maximum Queue (ft)	237	220	204	224	213	120	4	4
Average Queue (ft)	131	128	74	129	119	48	0	0
95th Queue (ft)	213	205	135	194	193	93	4	4
Link Distance (ft)	608	608	608	2381	2381		44	44
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)						650		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 30: EB-to-WB X/O, E. of Novi Rd & WB 12-Mile Road

Movement	WB	WB	NB	NB
Directions Served	T	T	L	L
Maximum Queue (ft)	117	110	64	86
Average Queue (ft)	49	50	30	46
95th Queue (ft)	98	98	62	75
Link Distance (ft)	833	833	23	23
Upstream Blk Time (%)			19	34
Queuing Penalty (veh)			15	26
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 31: EB 12-Mile Road & EB-to-WB X/O, E. of Novi Rd

Movement	EB	EB
Directions Served	L	L
Maximum Queue (ft)	36	48
Average Queue (ft)	3	1
95th Queue (ft)	19	15
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 40: 12 Oaks Mall Road & EB 12-Mile Road

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	T	T	R	R	R	T	T
Maximum Queue (ft)	137	158	29	104	74	60	83
Average Queue (ft)	44	63	4	46	20	43	69
95th Queue (ft)	101	118	19	83	50	70	88
Link Distance (ft)	966	966		404	404	21	21
Upstream Blk Time (%)						32	55
Queuing Penalty (veh)						41	71
Storage Bay Dist (ft)			250				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 41: 12 Oaks Mall Road & WB 12-Mile Road

Movement	WB	WB
Directions Served	L	L
Maximum Queue (ft)	82	90
Average Queue (ft)	15	26
95th Queue (ft)	56	73
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 50: EB-to-WB X/O, E. of 12 Oaks & WB 12-Mile Road

Movement	WB	WB	NB
Directions Served	T	T	L
Maximum Queue (ft)	119	123	82
Average Queue (ft)	39	32	33
95th Queue (ft)	97	90	72
Link Distance (ft)	1852	1852	36
Upstream Blk Time (%)			24
Queuing Penalty (veh)			10
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 51: EB 12-Mile Road & EB-to-WB X/O, E. of 12 Oaks

Movement	EB
Directions Served	L
Maximum Queue (ft)	17
Average Queue (ft)	1
95th Queue (ft)	11
Link Distance (ft)	178
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 60: N. Site Drive & EB 12-Mile Road

Movement	NB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	14
95th Queue (ft)	39
Link Distance (ft)	230
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 70: 12 Oaks Mall Road & S. Site Drive

Movement	EB	WB	SB
Directions Served	LTR	LTR	LT
Maximum Queue (ft)	21	22	41
Average Queue (ft)	6	3	3
95th Queue (ft)	22	17	20
Link Distance (ft)	194	323	404
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 235

PLANNING COMMISSION DRAFT MINUTES

EXCERPT JULY 9, 2025

PLANNING COMMISSION MINUTES

CITY OF NOVI
Regular Meeting

July 9, 2025 7:00 PM

Council Chambers | Novi Civic Center
45175 Ten Mile Road, Novi, MI 48375 (248) 347-0475

CALL TO ORDER

The meeting was called to order at 7:00 PM.

ROLL CALL

Present:	Chair Pehrson, Member Lynch, Member Becker, Member Roney, Member Verma
Absent Excused:	Member Avdoulos, Member Dismondy
Staff:	Barbara McBeth, City Planner; Elizabeth Saarela, City Attorney; Lindsay Bell, Senior Planner; Diana Shanahan, Planner; Rick Meader, Landscape Architect; Milad Alesmail, Project Engineer.

PLEDGE OF ALLEGIANCE

Member Lynch led the meeting attendees in the recitation of the Pledge of Allegiance.

APPROVAL OF AGENDA

Motion made by Member Lynch and seconded by Member Becker to approve the July 9, 2025 Planning Commission Agenda.

VOICE VOTE ON MOTION TO APPROVE THE JULY 9, 2025 PLANNING COMMISSION AGENDA MOVED BY MEMBER LYNCH AND SECONDED BY MEMBER BECKER. *Motion carried 5-0.*

AUDIENCE PARTICIPATION

Chair Pehrson invited members of the audience who wished to address the Planning Commission during the first audience participation to come forward. Seeing no one, Chair Pehrson closed the first public audience participation.

CORRESPONDENCE

There was not any correspondence.

COMMITTEE REPORTS

There were no Committee reports.

CITY PLANNER REPORT

There was no City Planner report.

CONSENT AGENDA - REMOVALS AND APPROVALS

1. **JF25-09 POTTERY BARN FAÇADE**
   Approval at the request of Ashley Montague of Rebecca Olson Architect, LLC, on behalf of Pottery Barn, for a Section 9 Façade waiver. The subject site is on a portion of the 18.74 acre parcel located at 27500 Novi Road at Twelve Oaks Mall (Section 14). The site is zoned R-C: Regional Center. The applicant requests approval to paint the existing brick on the east (front) façade of the former California Pizza Kitchen space as part of the Pottery Barn storefront modification.

Motion to approve the JF25-09 Pottery Barn Façade Section 9 Façade Waiver made by Member Lynch and seconded my Member Roney.

In the matter of JF25-09 Pottery Barn Façade, at the request of Ashley Montague, Rebecca Olson Architects, LLC, motion to approve a Section 9 Façade Waiver based on and subject to the following:

a. **Painting of existing brick on the east (front) façade (33% proposed, 0% permitted) will not adversely affect the aesthetic quality of the building. The proposed paint will improve color coordination between existing and proposed materials, and the overall design is consistent with the intent and purpose of the Façade Ordinance Section 5.15.**

This motion is made 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.

ROLL CALL VOICE VOTE ON MOTION TO APPROVE THE JF25-09 POTTERY BARN FAÇADE SECTION 9 FAÇADE WAIVER MOVED BY MEMBER LYNCH AND SECONDED BY MEMBER RONEY. *Motion carried 5-0*.

2. **JSP21-33 MAPLE MEDICAL OFFICE**
   Approval of the request of AJSS Property, LLC for the first one-year extension of the Final Site Plan approval. The subject property is located east of Novi Road and south of Fourteen Mile Road, in the RA, Residential Acreage District, with a Planned Unit Development. The applicant is proposing to construct a 2558 square foot medical office building. The Planning Commission approved the Preliminary Site Plan on June 8, 2022. Final Site Plan approval was granted August 2, 2023.

Motion to approve the one-year extension of the Final Site Plan approval made by Member Lynch and seconded by Member Becker.

ROLL CALL VOICE VOTE ON MOTION TO APPROVE THE JSP21-33 MAPLE MEDICAL OFFICE ONE-YEAR EXTENSION OF THE FINAL SITE PLAN APPROVAL MADE BY MEMBER LYNCH AND SECONDED BY MEMBER BECKER. *Motion carried 5-0.*

PUBLIC HEARINGS

1. **JSP25-03 TWELVE MILE TOWNES**
   Public hearing at the request of Singh Development, LLC for JSP25-03 Twelve Mile Townes for Planning Commission's recommendation to the City Council for a Preliminary Site Plan with a PD-2 Option, Special Land Use, Wetland Permit, and Stormwater Management Plan approval. The subject property is located at the southeast and southwest corners of Twelve Mile Road and Twelve Oaks Mall access drive in Section 14. The applicant proposes utilizing the Planned Development 2 (PD-2) option to develop 125 townhome units.

Senior Planner Lindsay Bell stated the subject property is approximately 16 acres and is located south of Twelve Mile Road, northeast of the Twelve Oaks Mall in Section 14. The property is zoned RC Regional Center, with the same to the east (which is a medical office facility) and west. To the south is zoned RM-1 Low Rise Residential and developed with the Waltonwood senior living facility, and RC, the Twelve Oaks Mall property. To the north is part of the MSU Tollgate Farm property, which is zoned RA Residential Acreage, and an assisted living center, zoned OS-1.

The Future Land Use map indicates Regional Commercial with a Planned Development option (PD-2) for the subject property and those to the west, Educational Facility and Community Office to the north, Office R&D Technology to the east, and Multiple family and Regional Center to the south.

Senior Planner Bell noted you may recall a few years ago you reviewed a project on the eastern parcel only called Griffin Novi. That project contained both apartment buildings and townhomes with a total of about 174 units. It was approved by the City Council, but the applicant never completed the final steps for Stamping Set approval.

The applicant has now redesigned the site to incorporate the parcels on the western side of the Twelve Oaks Mall finger road. They are now proposing to develop the vacant parcels with 125 townhome units in 20 buildings using the PD-2 Option, which is about 8 dwellings per acre. The project would be completed in 3 phases as shown in the Phasing Plan. Pocket park amenities and decks are shown on the plan to fulfill the requirement for usable open space. Parking would be provided in direct-entry garages for the townhomes as well as driveway aprons, with a few off-street spaces for visitors. A private street network is proposed to connect the development to Twelve Mile Road and the Twelve Oaks Mall access drive. Sidewalks are provided to the "front" of the units or along the roadways for the most part, as well as an off-site sidewalk to the south along the east side of Twelve Oaks Mall road for residents to be able to walk to the mall area. There is also a SMART bus stop at the corner of Twelve Mile and 12 Oaks Mall access drive.

Stormwater management for the west side would be collected and discharged to Bishop Creek, while the east side would be collected and discharged to the existing storm water system along Huron Circle. On-site detention will be required before release. Public utility connections would be made for water and sewer service.

Section 3.31.4 of the zoning ordinance outlines the review procedures for Preliminary Site Plans using the PD-2 Option. This requires the Preliminary Site Plan to receive a recommendation for approval or denial from the Planning Commission with the City Council ultimately approving or denying the proposed plan. It also outlines specific factors the Planning Commission and City Council shall consider in the review, as well as the findings for Special Land Use review, and demonstrating compliance with Section 3.31.7.B as it relates to standards for residential developments. These findings and standards are all listed in the Planning Review in your packet. The Final Site Plan would be reviewed administratively if the preliminary receives approval.

Under the PD-2 Option, the City Council is authorized to grant deviations from the strict requirements of the Zoning Ordinance related to area, bulk, yard and dimensions. For this project the applicant is requesting 15 deviations, which are listed in the draft motion. Several of these are for building setbacks. Because the site will have road frontage on 3 sides this does create some constraints. The applicant also states the setbacks for the district are more suburban-style development while they describe their proposal as more urban in nature. Deviations for distance between buildings are also requested for certain buildings, with a similar justification that the project is more of an urban style, as well as site topography. There are several landscaping deviations requested. A few of these are necessary due to the presence of utilities or existing trees that provide alternative screening, and others due to the constrained layout. All deviations are supported.

The proposed Section 9 façade waiver is recommended by our Façade consultant for the underage of brick on some elevations because it is minor in nature and not detrimental to the aesthetic quality. The applicant has provided a façade board.

A wetland delineation indicated there are two small wetland areas on the site, which will be permanently impacted by the proposed development. The proposed fill amount requires a Non-Minor Wetland Permit, but the area of impact does not meet the City's threshold for mitigation. There are no regulated woodlands on the site.

The Planning Commission is asked to hold the public hearing and consider making a recommendation to City Council to either approve or deny the Preliminary Site Plan with PD-2 Option and Phasing, Special Land Use Permit, Wetland permit, and preliminary Storm Water Management Plan. The City's engineer and traffic consultant are also here to answer any questions you may have. The applicant Matt Delapp from Singh Development and engineer Jason Rickard are here to tell you more about their project. Thank you for your time.

Chair Pehrson invited the applicant to address the Planning Commission.

Mr. Matthew Delapp with Singh Development thanked the Planning Commission for their time and consideration and stated they are requesting a recommendation for approval of the Twelve Mile Townes Project. The project is located on Twelve Mile Road between Meadowbrook Road and Novi Road. The property is zoned RC with a planned development PD-2 option being utilized. He noted the project proposes 125 townhome units split between 20 separate buildings to be built in three phases.

Mr. Delapp stated they expect the project to have a tremendously positive impact on the community. Building residential units near the mall provides additional customers for the mall as well as the surrounding businesses. Additionally, it provides a place for the employees of those businesses to live. He noted the 125 additional units will create an added tax base for the City of Novi. Lastly, during the course of construction a substantial number of jobs will be created.

Mr. Delapp shared elevations from Pulte's Townes at Main Street project which is currently under construction. He stated the plans that are being proposed are very similar and the Townes at Main Street elevations give a very good idea of what the proposed project will look like. The elevations consist predominantly of brick and stone with fiber cement siding. Architectural details such as metal roof overhangs and decorative brackets are included. Mr. Delapp stated each unit has ground level parking with additional parking provided on the site itself. The units begin with three bedrooms and two and a half bathrooms with customized options to add more. It was noted a unique aspect of the design is the option for the addition of a loft to the top level with an additional option for a deck. These options for the townhomes help to create an urban aesthetic and feel. Site amenities included are pocket parks, benches, and bike racks.

Mr. Delapp stated it is always a great process working through site plan approval with staff before coming before the Planning Commission. He noted they are happy to say so far everyone is recommending approval and hope to count on the Planning Commission's approval this evening.

Chair Perhson opened the public hearing and invited members of the audience who wished to speak to approach the podium. Seeing no one, and confirming there was no correspondence received, Chair Pehrson closed the public hearing and turned the matter over to the Planning Commission for consideration.

Member Lynch stated typically when this many deviations are requested, he is concerned. He stated there are two strategic reasons in this case that alleviate the concern. The first reason being there is an entrance off Twelve Mile. The second reason being we have been strategically aiming to achieve higher density closer to the mall as there are more businesses in that area. He noted this proposal meets the strategic objective to have higher density populations closer to where the businesses are. He stated he thinks this project will fit in very nicely.

Member Becker inquired if there are sidewalks planned for the driveway side of any of the buildings.

Mr. Jason Rickard with Seiber Keast Lehner stated there are no proposed sidewalks on the driveway side. He noted that typically with this type of product the road and driveways are already overwhelmed with concrete, so the pathway system is usually in front of the homes.

Member Becker stated he likes the basic idea of this project as it addresses the need for this type of

residential option while also potentially providing additional nearby customers for the businesses at Twelve Oaks Mall and West Oaks. Additionally, the development will not visually or aesthetically clash with other types of buildings in the vicinity. This development could add 125 additional families to a relativity compact space; it is on a property where roads were specifically developed to accommodate a large amount of traffic for Twelve Oaks Mall. Member Becker noted the mall in the current state generates far less traffic than the roads were designed to handle so he does not see a problem with the additional concentration of traffic twice a day getting in and out of the development.

Member Becker stated what he wished he'd seen in this site plan was a nod toward another specific type of residential option which is truly needed in Novi but seems to be difficult to address. Single floor residences are needed for those who no longer want to take care of a home or lawn, negotiate stairs in their residences, and want to age in place in Novi. He noted in looking at the proposed building layout he couldn't help but wonder if some of the buildings could be reimagined as single floor residences. He stated building 17 could potentially go from 5 three story residences to 3 single story residences, the footprint would have to be bigger. Additionally, buildings 16, 19, or 13 could go from four residences to two. Member Becker inquired if going from 125 residences to 119 residences would make the project physically impossible to do. He expressed he had thought about at which point in his life he would have been interested in a townhome like this. Would it have been as a double income couple with no kids, when a family was started, as an empty nester? He noted it seemed curious to walk up three flights of stairs to the bedrooms.

Member Becker stated the largest issue he sees involves safety. All the interior streets are marked as fire lanes with no street parking allowed. The applicant has indicted that there are ten extra parking spaces provided. In phase one there are forty-one residences with a total of five designated parking spaces including one designated for handicap parking. This visitor parking area is on the far south end of phase one making it virtually unusable for guests in the northern half of this phase. For the forty-one residences in this phase there are just four visitor parking spaces that can be used by anyone, averaging one space for every ten families. In phase two there are forty-five residences with no guest parking spaces provided. In phase three there are thirty-nine residences with a visitor parking area for five spaces with one dedicated for handicap parking. This visitor parking area is on the far south end of phase three and is unusable for those living in the northern section of the area. In phase three there are just four spaces that anybody can use. It was noted each residence can accommodate two vehicles in their own driveway for visitors to park in. There are very few visitor parking spaces provided, and all the interior streets are designated as fire lanes with no parking. This site plan will force visitors to ignore the no parking designation and park in the street if they pull up to their destination and find that the driveway is full. When this happens on both sides of the street there are safety issues for traffic, delivery vehicles, the fire department, and emergency vehicles. Member Becker stated we are being asked to believe that all residents will limit the number of visitors coming to their homes to no more than two vehicles. With this site plan, a guest who arrives at a residence whose driveway is already filled has been left with no real option other than to park illegally on the street. There are almost no sidewalks on the driveway side of the buildings, if a guest does park illegally on the street, they will have to walk in the street to get to the residence they are going to. The same applies to visitors who happen to find one of the designated visitor parking spaces, they will have to walk in the street a long way to get to where they are going. He stated he tried to find an intractable reason why there could not be more off-street parking spaces, something to do with the topography of the land or wetlands and could not come up with one. Additional off-street parking for visitors would be easy to accomplish but it would mean having fewer residences to sell. It was noted according to the information provided by the planning department staff that the applicant has more than met the ordinance requirement for off-street parking by providing space for two vehicles to park in each residence's driveway. These residences have three bedrooms and are meant for families with children. There will be birthday parties and holiday parties, to expect that these events will never exceed the parking capacity for two vehicles in the driveway is not realistic. It was stated while it is true that the applicant's plan has provided 516 off-street parking spaces with 250 of those in the garages. The deeper truth is each resident only has four parking spaces to use, two in the garage and two in the driveway with a mere handful of others located somewhere in the development.

Member Becker expressed during public hearings the Planning Commission is often accused of being more interested in encouraging development, because it increases tax revenues, than looking for other concerns and issues. The concern that has been raised this evening is not about cutting down trees, possible traffic congestion, or causing Novi Public Schools to have to deal with an influx in the student population. The concern is about the safety of people. For this project the applicant could increase the off-street parking to mitigate the public safety concerns that have been raised. Member Becker noted single-floor residences could be included, which would help meet a very real need in the City for single-floor residences. Addressing both concerns would mean fewer residences to sell. He expressed that the applicant has done nothing wrong with the way the project is being presented; but sometimes when realistic concerns and needs that are relatively easy to address are present good enough really isn't good enough.

Member Verma stated since there are no sidewalks along the road, he has concern due to the proximity to the shopping center. Secondly, he expressed concern regarding students who will be walking to the bus stop for school.

Senior Planner Lindsay Bell clarified where the sidewalks are being proposed, indicating where the sidewalks are located on the slideshow presented. It was stated the location of the bus stop is yet to be determined.

Member Roney stated he remembers the previous project for this location that was looked at a few years ago and likes this project much better. In the previous project proposal, the density was much higher in a smaller space. He noted he was concerned back then that the density seemed too high, so this current project pleases him in that regard. Another concern two years ago was the number of deviations. He noted he read through the rationale for the deviations requested for this project and understands the rationale behind them. He stated he likes this project much better.

Chair Pehrson stated he also approves of the project. Relative to the Special Land Use Permit it was stated that criteria items one through seven are reviewed anytime a special land use comes before the Planning Commission. Chair Pehrson stated he concurs that the proposed use will not cause detrimental impact on the throughfare of the area and is consistent with the goals and objectives recommended in the City's Master Plan for housing options. He noted he is in agreement with Member Becker regarding wishing to see a developer come in with single family homes on a single level. He stated he also believes the project fulfills criteria number six, in that it will promote the use of land in a socially and economically desirable manner.

Motion to recommend approval to the City Council for JSP25-03 Twelve Mile Townes Special Land Use made by Member Roney and seconded by Member Lynch.

In the matter of JSP25-03 Twelve Mile Townes, motion to recommend approval to the City Council for Special Land Use based on and subject to the following:

1. **The proposed use will not cause detrimental impact on existing thoroughfares *(based on Traffic review);***
2. **The proposed use will not cause a detrimental impact on the capabilities of public services and facilities *(based on Engineering review);***
3. **The proposed use is compatible with the natural features and characteristics of the land *(because there are no regulated woodlands on site, and minimal impacts to wetland areas are proposed);***
4. **The proposed use is compatible with adjacent uses of land *(because the proposed use is similar to the residential community to the south and complements other nearby uses);***
5. **The proposed use is consistent with the goals, objectives, and recommendations of the City's Master Plan for Land Use *(as it fulfills the Master Plan objectives to provide a wide range of housing options and to provide residential developments that support healthy lifestyles);***
6. **The proposed use will promote the use of land in a socially and economically desirable**

manner *(as it fulfills one of the Master Plan objectives to ensure compatibility between residential and non-residential developments);*

7. **The proposed use is (1) listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and (2) is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located.**

This motion is made because the plan is otherwise in compliance with Article 3, Article 4, Article 5, and Article 6 of the Zoning Ordinance and all other applicable provisions of the Ordinance.

ROLL CALL VOICE VOTE TO RECOMMEND APPROVAL TO THE CITY COUNCIL FOR JSP25-03 TWELVE MILE TOWNES SPECIAL LAND USE MADE BY MEMBER RONEY AND SECONDED BY MEMBER LYNCH. *Motion carried 4-1 (Becker).*

Motion to recommend approval to the City Council for JSP25-03 Twelve Mile Townes Preliminary Site Plan with a PD-2 Option and Phasing Plan made by Member Roney and seconded by Member Lynch.

In the matter of JSP25-03 Twelve Mile Townes, motion to recommend approval to the City Council for Preliminary Site Plan with a PD-2 Option and Phasing Plan based on and subject to the following:

1. **Planning Commission findings that the standards of Section 3.31.4 of the Zoning Ordinance are adequately addressed, as identified in the Planning Review Letter.**
2. **Planning Commission findings that the standards of Section 3.31.7.B.viii.d of the Zoning Ordinance are adequately addressed, as identified in the Planning Review Letter.**
3. **The recommendation includes the following ordinance deviations for consideration by the Planning Commission in its recommendation to the City Council:**
    - ***i.*** **Deviation from Section 3.31.7.D for not meeting the minimum building setback requirements for front yard (Twelve Mile frontage). A minimum of 50 feet is required, 20 feet is provided. *The standard setbacks of the district are for a more suburban style of development and the deviations would be consistent with a more urban development as they propose.***
    - **ii. Deviation from Section 3.31.7.D for not meeting the minimum building setback requirements for the exterior side yard (Twelve Oaks Mall Road frontage). A minimum of 50 feet is required, 30 feet is provided. *The setbacks of the district are for a more suburban style of development and the deviations would be consistent with a more urban development as they propose.***
    - **iii. Deviation from Section 3.31.7.D for not meeting the minimum building setback requirements for the eastern side yard. A minimum of 35 feet is required, 20 feet is provided. *The setbacks of the district are for a more suburban style of development and the deviations would be consistent with a more urban development as they propose.***
    - **iv. Deviation from Section 3.6.2.H for not meeting the requirement for additional setback from a residential district to the south. A minimum of 111 feet is required for a building 37 feet in height, 40 feet is provided. *This deviation is supported as the uses are both multi-family residential and the additional protection afforded by the larger setback is not warranted. However, the ZBA granted conditional approval for a setback variance for the Waltonwood Phase 2 in 2003 that stated any building on the subject property would be a minimum of 150 feet from those buildings. The applicant will need to seek ZBA's amendment of the previous conditions of approval and amend the deed restriction that was placed on the property prior to Final Site Plan approval.***
    - ***v.*** **Deviation from Section 3.8.2.H to allow a reduction in the minimum distance between buildings (20 feet proposed, at least 30 feet required), as *the layout seeks to optimize the space to maintain adequate open space and circulation.***
    - ***vi.*** **Deviation from Section 3.31.7.B.viii.b.xi for the lack of sidewalk on the west side of Twelve Oaks Mall Road south of the entrance, and on the south side of Bishop Drive**

as shown on the plan.

vii. **Deviation from Sec. 5.10.1.B to allow perpendicular parking along a Major Drive. There are 4 spaces proposed on the west side of the project along Bishop Road, which is anticipated to have low traffic volume.**

viii. **Landscape deviation from Section 5.5.3.B.ii and iii for lack of 4.5-6 foot landscaped berm along eastern property line. *Supported by staff as alternative screening is provided with six-foot fencing.***

ix. **Landscape deviation from Section 5.5.3.B.ii and iii for lack of berm or wall in the greenbelt of Twelve Mile Road for the western 616 feet, *to preserve the existing vegetation in the area that is not being developed.***

x. **Landscape deviation from Section 5.5.3.B.ii and iii for deficiency in street trees on Twelve Oaks Drive north of the entry drives on the west side, *due to utility conflicts and lack of space between curb and sidewalk.***

xi. **Landscape deviation from Section 5.5.3.B.ii and iii for deficiency in street trees on Twelve Mile Road for the western part of the site, *due to utility conflicts.***

xii. **Façade deviations from Section 5.15 for an underage of brick on the rear facades of the high-visibility buildings (25% proposed, 30% required), and an underage of brick on all facades of the standard visibility buildings (23-28% proposed, 30% required), *as the deviation is minor in nature and not detrimental to the aesthetic quality. No vinyl siding is permitted.***

4. **The findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan.**

This motion is made 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.

ROLL CALL VOICE VOTE TO RECOMMEND APPROVAL TO THE CITY COUNCIL FOR JSP25-03 TWELVE MILE TOWNES PRELIMINARY SITE PLAN WITH A PD-2 OPTION AND PHASING PLAN MADE BY MEMBER RONEY AND SECONDED BY MEMBER LYNCH. *Motion carried 4-1 (Becker).*

Motion to approve the JSP25-03 Twelve Mile Townes Wetland Permit made by Member Roney and seconded by Member Lynch.

In the matter of JSP 25-03 Twelve Mile Townes, motion to approve the Wetland Permit based on and subject to the findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan. *This motion is made because the plan is otherwise in compliance with Chapter 12, Article V of the Code of Ordinances and all other applicable provisions of the Ordinance.*

ROLL CALL VOICE VOTE TO APPROVE THE JSP25-03 TWELVE MILE TOWNES WETLAND PERMIT MADE BY MEMBER RONEY AND SECONDED BY MEMBER LYNCH. *Motion carried 5-0.*

Motion to recommend approval to the City Council for JSP25-03 Twelve Mile Townes Stormwater Management Plan made by Member Roney and seconded by Member Lynch.

In the matter of JSP 25-03 Twelve Mile Townes, motion to recommend approval to the City Council for Stormwater Management Plan based on and subject to the findings of compliance with Ordinance standards in the staff and consultant review letters, and the conditions and items listed in those letters being addressed on the Final Site Plan. *This motion is made because it is otherwise in compliance with Chapter 11 of the Code of Ordinances and all other applicable provisions of the Ordinance.*

ROLL CALL VOICE VOTE TO RECOMMEND APPROVAL TO THE CITY COUNCIL FOR JSP25-03 TWELVE MILE TOWNES STORMWATER MANAGEMENT PLAN MADE BY MEMBER RONEY AND SECONDED BY