



AMSON-NASSAR SPEC BUILDING JSP18-48

AMSON-NASSAR SPEC BUILDING, JSP 18-48

Public hearing of the request of Amson-Nassar Development for Preliminary Site Plan, Woodland Permit, and Storm Water Management Plan approval for a new 90,000 square foot Warehouse/Office building. The subject property contains 10 acres and is located in Section 16, south of Twelve Mile Road and east of West Park Drive, in the OST, Office Service Technology District.

Required Action

Approve or deny the revised Preliminary Site Plan, Woodland Permit and Storm Water Management plan.

REVIEW	RESULT	DATE	COMMENTS
Planning	Approval recommended	4-17-19	<ul style="list-style-type: none"> Items to be addressed by the applicant prior to Final Site Plan approval
Engineering	Approval recommended	4-15-19	<ul style="list-style-type: none"> Items to be addressed by the applicant prior to Final Site Plan approval
Landscaping	Approval recommended	4-3-19	<ul style="list-style-type: none"> Items to be addressed by the applicant prior to Final Site Plan approval
Woodlands	Approval recommended	4-15-19	<ul style="list-style-type: none"> Woodland permit required Woodland Conservation Easement Items to be addressed by the applicant prior to Final Site Plan approval
Wetlands	Not Applicable		
Traffic	Approval recommended	4-15-19	<ul style="list-style-type: none"> Items to be addressed by the applicant prior to Final Site Plan approval
Traffic Impact Statement	Approval recommended	4-15-19	<ul style="list-style-type: none"> The TIS Report should be revised to address the comments noted in the review letter The changes required are not anticipated to alter the results of the TIS, therefore the site plan can be recommended for approval to move forward
Façade	Approval recommended	5-3-19 (rev)	<ul style="list-style-type: none"> Applicant submitted revised building elevations to show changes that will be reflected in the Final Site Plan submittal (South elevation to be revised to reflect material chart) The proposed building is not compliance with the façade ordinance.

Fire	Approval not recommended	3-29-19	<ul style="list-style-type: none">• Secondary emergency access drive required (Applicant submitted revised layout 4-25-19 that shows secondary emergency access drive added)• Items to be addressed by the applicant prior to Final Site Plan approval
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MOTION SHEET

Approval – Preliminary Site Plan

In the matter of Amson-Nassar Spec Building JSP18-48, motion to **approve** the Preliminary Site Plan based on and subject to the following:

- a. Revised elevations to comply with the façade consultant’s review letter to be provided at the time of Final Site Plan;
- b. A secondary emergency access drive meeting Fire Department requirements to be shown at the time of Final Site Plan;
- c. The findings of compliance with Ordinance standards in the staff and consultant review letters and the conditions and the items listed in those letters being addressed on the Final Site Plan; and
- d. *(additional conditions here if any)*

(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.)

- AND -

Approval – Woodland Permit

In the matter of Amson-Nassar Spec Building JSP18-48, motion to **approve** the Woodland Permit based on and subject to the following:

- a. Woodland Conservation Easement shall be provided in order to protect any woodland replacement trees planted on site;
- b. 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; and
- c. *(additional conditions here if any)*

This motion is made because the plan is otherwise in compliance with Chapter 37 of the Code of Ordinances and all other applicable provisions of the Ordinance.

-AND-

Approval – Stormwater Management Plan

In the matter of Amson-Nassar Spec Building JSP18-48, motion to **approve** the Stormwater Management Plan based on and subject to the following:

- a. 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; and
- b. *(additional conditions here if any)*

(This motion is made because the plan is otherwise in compliance with Chapter 11 of the Code of Ordinances and all other applicable provisions of the Ordinance.)

- OR -

Denial – Preliminary Site Plan

In the matter of Amson-Nassar Spec Building JSP18-48, motion to **deny** the Preliminary Site Plan...*(because the plan is not in compliance with Article 3, Article 4, and Article 5 of the Zoning Ordinance and all other applicable provisions of the Ordinance.)*

-AND-

Denial – Woodland Permit

In the matter of Amson-Nassar Spec Building JSP18-48, motion to **deny** the Woodland Permit...*(because the plan is not in compliance with Chapter 37 of the Code of Ordinances and all other applicable provisions of the Ordinance.)*

-AND-

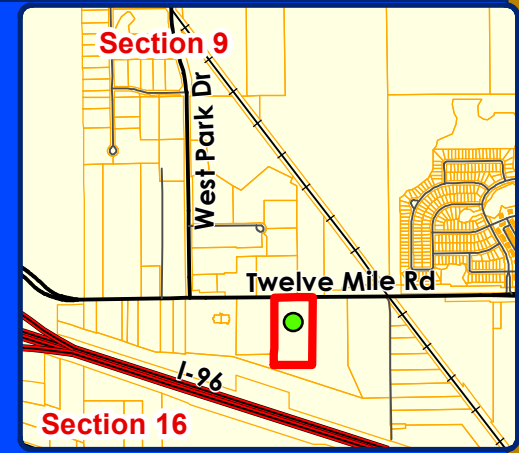
Denial – Stormwater Management Plan

In the matter of Amson-Nassar Spec Building JSP18-48, motion to **deny** the Stormwater Management Plan...*(because the plan is not in compliance with Chapter 11 of the Code of Ordinances and all other applicable provisions of the Ordinance.)*


MAPS
Location
Zoning
Future Land Use
Natural Features

AMSON-NASSAR SPEC BUILDING: JSP18-48

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: 5/2/19
Project: AMSON-NASSAR JSP18-48
Version #: 1



1 inch = 333 feet

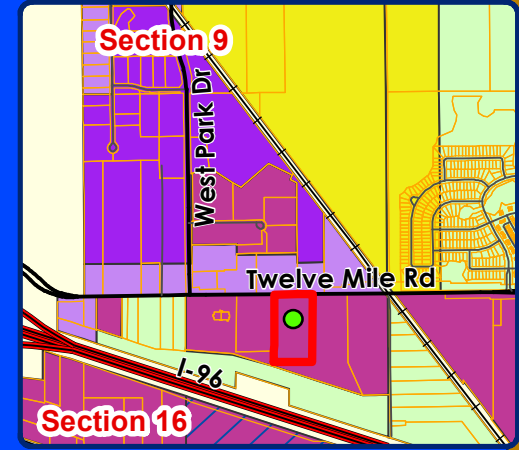
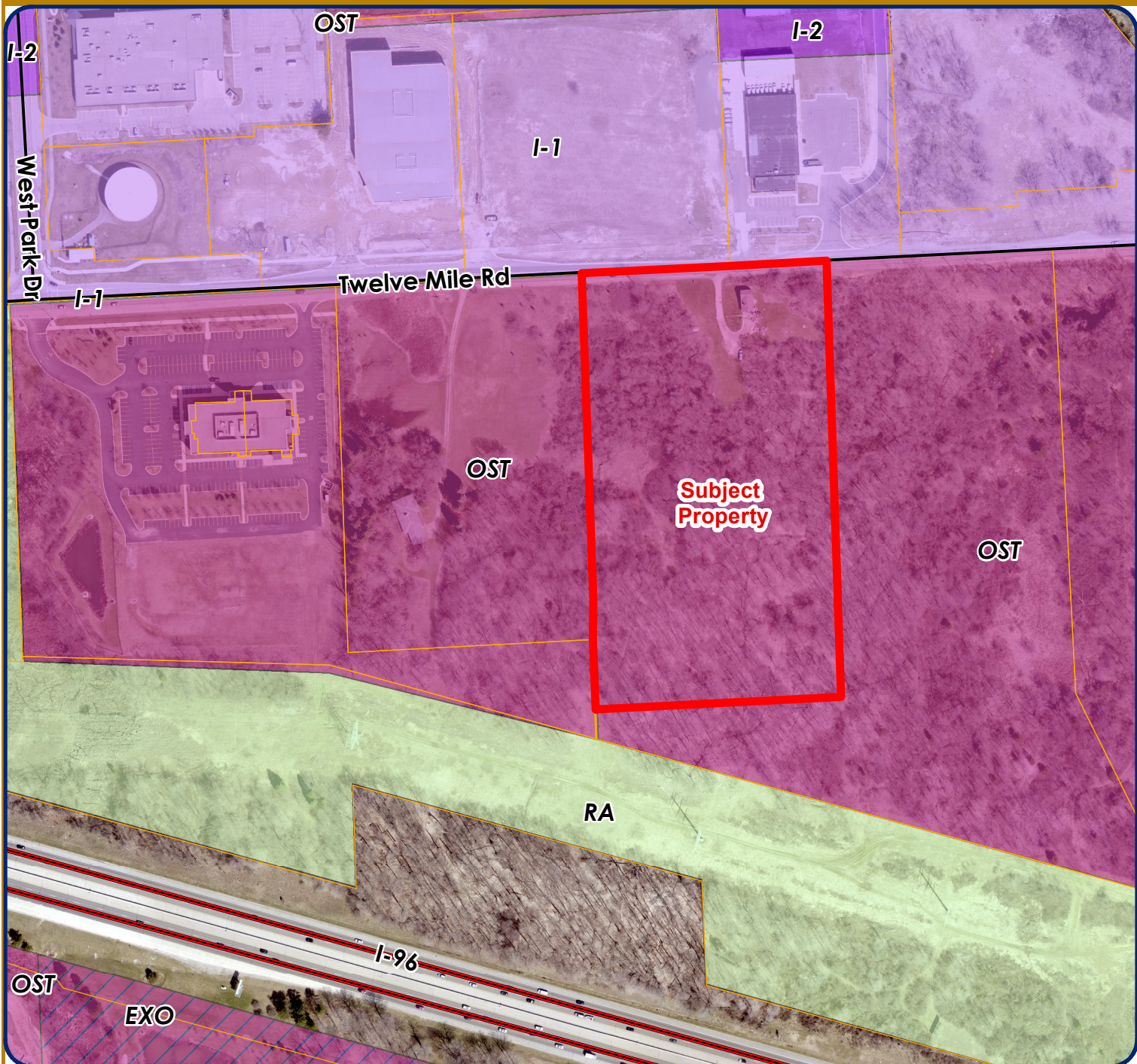


MAP INTERPRETATION NOTICE

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.

AMSON-NASSAR SPEC BUILDING: JSP18-48

ZONING




LEGEND

- R-A: Residential Acreage
- R-1: One-Family Residential District
- EXO: OST District with EXO Overlay
- I-1: Light Industrial District
- I-2: General Industrial District
- OST: Office Service Technology
- 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: 5/2/19
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Version #: 1

0 65 130 260 390 Feet
1 inch = 292 feet

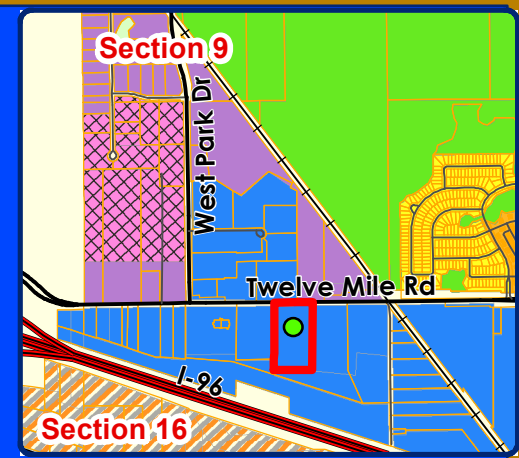


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AMSON-NASSAR SPEC BUILDING: JSP18-48

FUTURE LAND USE



LEGEND

- Single Family
- Multiple Family
- Office Research Development Technology
- Industrial Research Development Technology
- Heavy Industrial
- City West
- Public Park
- Private Park
- Subject Property

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0 65 130 260 390

Feet

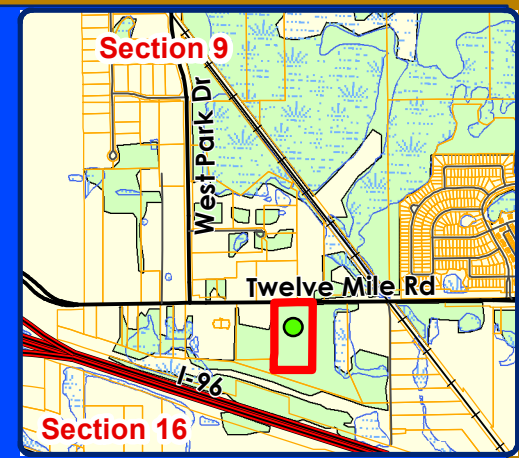
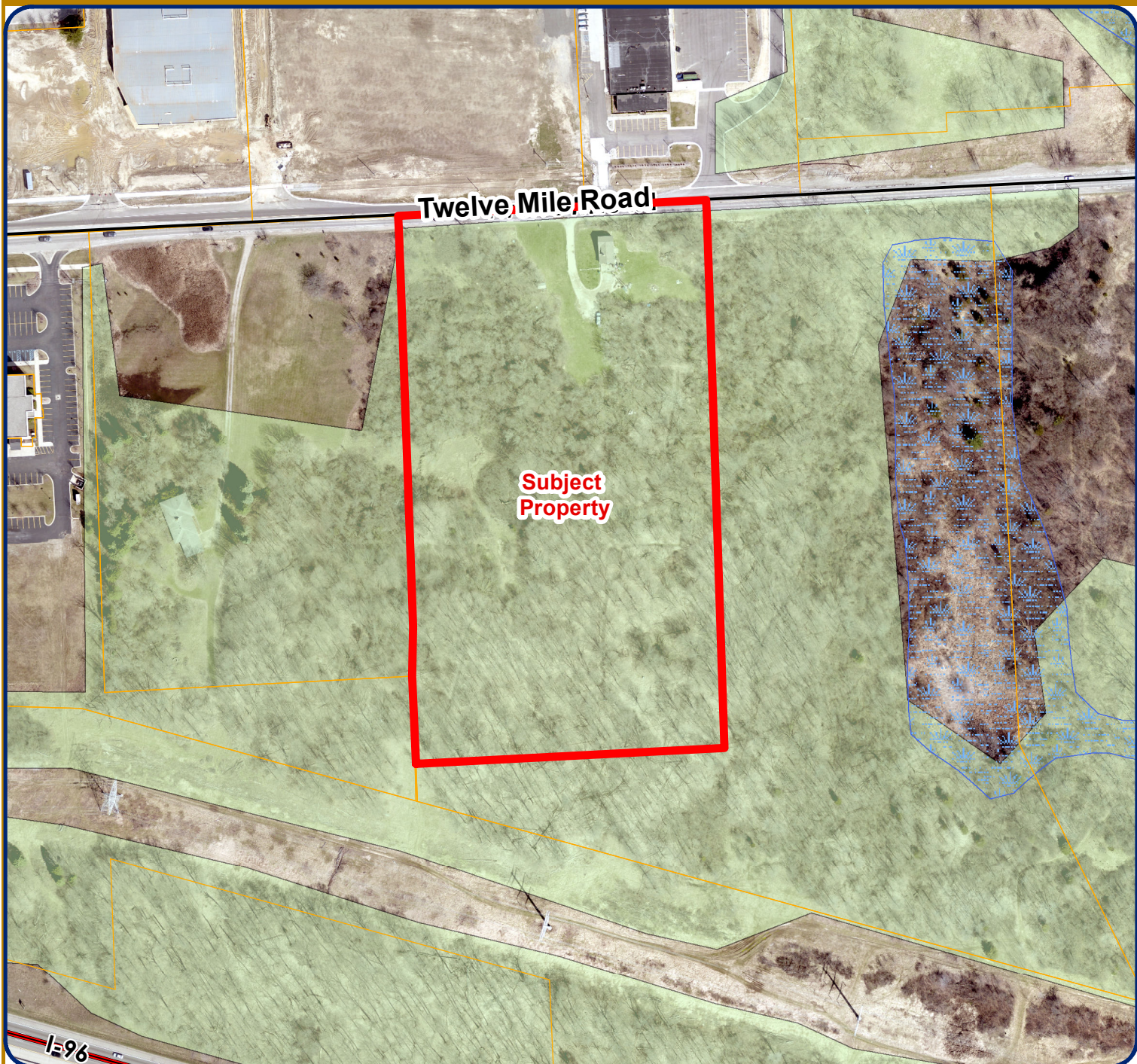
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AMSON-NASSAR SPEC BUILDING: JSP18-48

NATURAL FEATURES




LEGEND

- WETLANDS
- WOODLANDS
- Subject Property

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

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0 50 100 200 300 Feet
1 inch = 232 feet



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SITE PLAN

(Full plan set available for viewing at the Community Development Department.)

BENCHMARKS:

SITE BM #1
CITY OF NOW BENCHMARK #941
3" ON FLANGE BOLT ON HYDRANT,
25' N. OF C.L. 12 MILE ROAD, 800'
W. OF TANK.
ELEVATION: 956.92 (N.A.V.D.88 DATUM)

SITE BM #2
ARROW ON HYDRANT, 25' N. OF C.L. 12
MILE ROAD, OPPOSITE HOUSE NO. 45833.
ELEVATION: 972.29 (N.A.V.D.88 DATUM)

SITE BM #3
ARROW ON HYDRANT, 40' N. OF C.L. 12
MILE ROAD, 802.5' EAST OF WEST PARK DR.
ELEVATION: 952.39 (N.A.V.D.88 DATUM)

*** ESTIMATED CONSTRUCTION MATERIALS:**

6" CURB & GUTTER (DETAIL 3C) - 3500 PSI CONCRETE	3,985 LF
CONCRETE WALK (DETAIL 11B) - 3500 PSI CONCRETE	18,891 SF
ASPHALT PAVEMENT - 4" 5" DEPTH HMA (HEAVY SURFACE)	48,195 SF
ASPHALT PAVEMENT - 6" DEPTH HMA (SURFACE)	63,354 SF
ASPHALT PAVEMENT - ENTRY & LANE WIDENING	2,752 SF
8" 21AA AGGREGATE BASE	5,334 TONS

* CONTRACTOR TO EVALUATE AND DETERMINE ACTUAL QUANTITIES.
ONLY USE ABOVE TABLE AS REFERENCE

GENERAL NOTES:

- THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
- ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
 - REFER TO CITY OF NOW PAVING STANDARD DETAILS FOR ADDITIONAL DETAILS.
 - ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF NOW CURRENT STANDARDS AND SPECIFICATIONS.
 - THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
 - ALL ON-SITE SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH MUTUCCO. PARKING STALL STRIPING SHALL BE 4" WIDE (SINGLE) AND WHITE.
 - THE ACCESSIBLE PARKING SPACE AND ASSOCIATED ASBLE SHALL BE STRIPPED WITH 4" BLUE STRIPES. THE STANDARD SPACE ADJACENT TO AN ACCESSIBLE SPACE, ABUTTING BLUE AND WHITE STRIPES SHALL BE INSTALLED.
 - ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK. 12 MILE ROAD IS IN THE JURISDICTION OF THE ROAD COMMISSION OF OAKLAND COUNTY. 12 MILE ROAD IS POSTED AT 45 MPH.
 - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND/OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.
 - ALL ON-SITE CURB TO BE 18" WIDE AS SHOWN ON CITY OF NOW STANDARD PAVING DETAIL SHEET 2 OF 2. FLARE CURB TO 24" WIDE FOR 10' OTHER SIDE OF CURB DRAINAGE.

LIGHTING NOTES:

- ALL ON-SITE FLEE MOUNTED LIGHTS SHALL BE SHIELDED AND AIMED AT THE AREAS TO BE SECURED (PARKING SPACES, DRIVES, WALKS, ECT.).
- BUILDING MOUNTED FIXTURES SHALL BE DESIGNED TO ILLUMINATE THE FACADE AND NOT ILLUMINATE THE LANDSCAPE AREAS OR PAVED AREAS UNLESS SPECIFICALLY DESIGNED ON THESE PLANS.

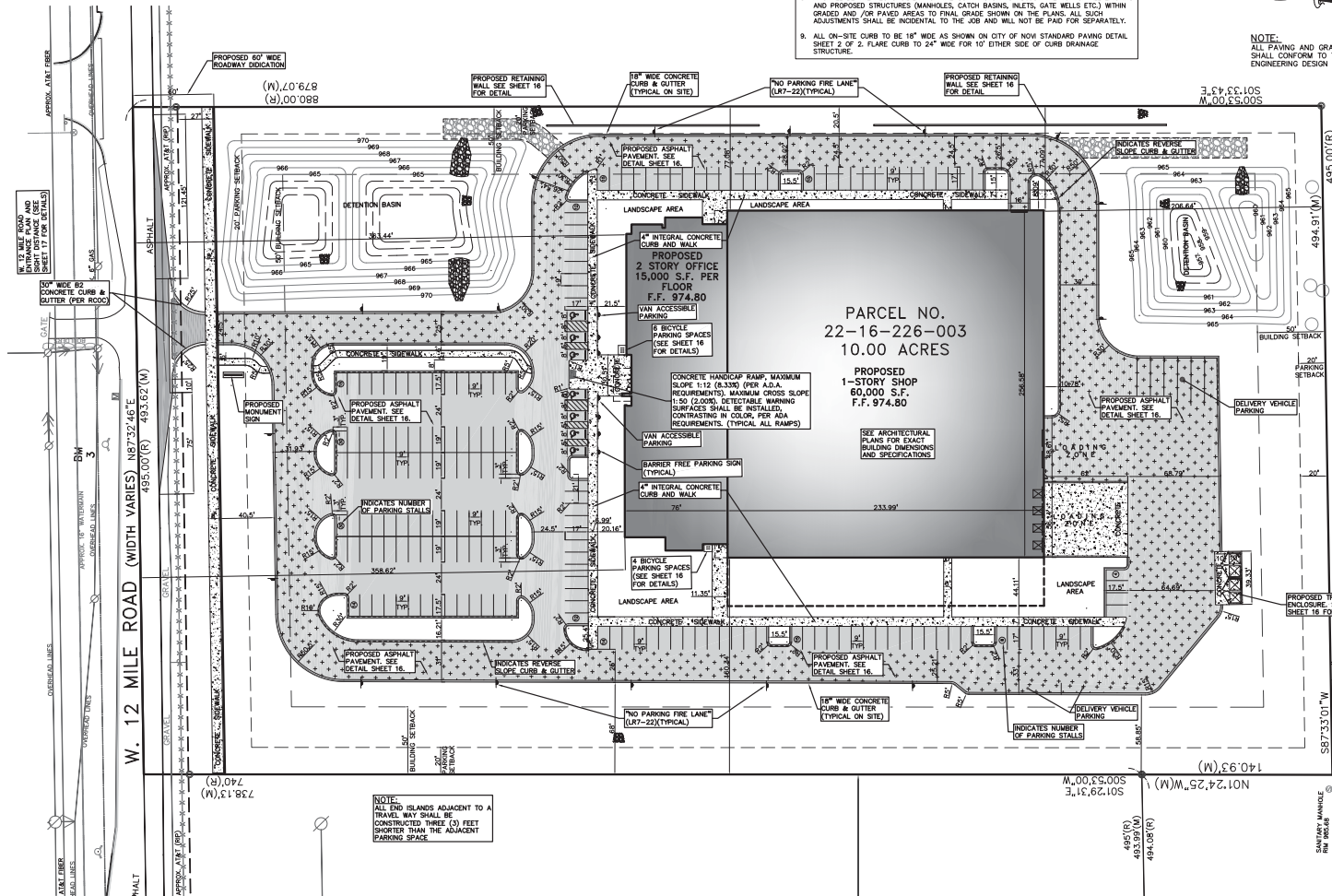
SIGNAGE QUANTITIES

NO PARKING-FIRE LANE (L87-22)	16 EACH
BARRIER FREE PARKING (R7-8)	7 EACH
VAN ACCESSIBLE PARKING (R7-8p)	2 EACH

ALL SIGNAGE AND PAVEMENT MARKINGS SHALL COMPLY WITH CURRENT MUTUCCO STANDARDS AND SPECIFICATIONS



NOTE:
ALL PAVING AND GRADING IMPROVEMENTS SHALL CONFORM TO THE CITY OF NOW ENGINEERING DESIGN STANDARDS.



CURRENT ZONING:

OST, OFFICE SERVICE TECHNOLOGY
PER CITY OF NOW ZONING MAP

BUILDING SETBACKS:

FRONT: 20 FEET
REAR: 50 FEET
SIDE: 20 FEET
PER CITY OF NOW ZONING ORDINANCE

PARKING SETBACKS:

FRONT: 20 FEET
REAR: 20 FEET
SIDE: 20 FEET
PER CITY OF NOW ZONING ORDINANCE

SITE AREA:

TOTAL ACRES: 10.00 ACRES

PARKING DATA:

PROPOSED PARKING: OFFICE SERVICE TECHNOLOGY: 1 SPACE/222 S.F. (115 SPACES)
WAREHOUSE: 1 SPACE/700 S.F. (73 SPACES)
REQUIRED: TOTAL REQUIRED: 189 SPACES, 0 BARRIER-FREE

PROVIDED:

PROPOSED PARKING: 189 SPACES, 0 BARRIER-FREE
OFFICE: 30,000 SF x 0.85 / 222 = 115 SPACES REQUIRED
WAREHOUSE: 60,000 SF x 0.85 / 700 = 73 SPACES REQUIRED
TOTAL REQUIRED PARKING: 189 SPACES
TOTAL PROVIDED PARKING: 189 SPACES (7 BARRIER FREE SPACES)

BUILDING HEIGHT:

PROPOSED BUILDING: 2-STORY, 45' HEIGHT
BUILDING HEIGHT MAXIMUM RESTRICTIONS:
2-STORY, 45' HEIGHT

LOT COVERAGE:

PROPOSED: 75,000/435,000 = 17.2%
REQUIRED: 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 REQUIREMENTS

OUTDOOR STORAGE:

THERE IS NO OUTDOOR STORAGE PROPOSED FOR THIS SITE. ON-SITE PARKING OF DELIVERY VEHICLES WILL TAKE PLACE IN DESIGNATED PARKING AREAS ON THE SOUTH AND SOUTHWEST SIDES OF THE BUILDING.

HOURS OF OPERATION:

8:00 AM - 5:00 PM (MONDAY THROUGH FRIDAY)

PROJECT PHASING:

ONE PHASE - CONSTRUCTION TO COMMENCE SPRING 2019, COMPLETION SPRING 2020

HATCH LEGEND

[Hatch pattern]	LIGHT DUTY ASPHALT
[Hatch pattern]	ASPHALT-HEAVY DUTY
[Hatch pattern]	CONCRETE
[Hatch pattern]	PROPOSED BUILDING
[Hatch pattern]	EXISTING BUILDING

ALL PROPOSED PAVEMENT CROSS-SECTIONS ARE PER CITY OF NOW SPECIFICATIONS, TYP

NOTE:
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AS DISCLOSED BY AVAILABLE UTILITY COMPANY RECORDS AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE COMPANY. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY IF A CONFLICT IS APPARENT.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

PARCEL NO. 22-16-226-003 LEGAL DESCRIPTION (BY OTHERS):
PART OF N 1/2 OF NE 1/4 OF SECTION 16, T. 1N., R. 8E., CITY OF NOW, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT DISTANT EAST 1150.04 FEET FROM THE NORTH 1/4 CORNER, THENCE EAST 490 FEET; THENCE S00°00'00"W 890 FEET, THENCE WEST 490 FEET, THENCE N00°00'00"E 890 FEET TO THE POINT OF BEGINNING, CONTAINING 10.00 ACRES, MORE OR LESS, AND SUBJECT TO ANY EASEMENTS, RESTRICTIONS, OR RIGHTS OF WAY OF RECORD.

RESIDENTIAL
COMMERCIAL

GREENTECH ENGINEERING, INC.
CIVIL ENGINEERS & LAND SURVEYORS

12 MILE ROAD - PARCEL NO. 22-16-226-003
SECTION 16
CITY OF NOW, OAKLAND COUNTY, MICHIGAN

CLIENT: AMSON-NASSAR DEVELOPMENT

PROJECT: LAYOUT & PAVING PLAN

DATE: 1-31-2019

DRAWN BY: RMS/WD/MW

CHECKED BY: DJL

SCALE: HOR 1" = 40 FT. VER 1" = 10 FT.

5

17-130

Seal:



Title:
Landscape Plan

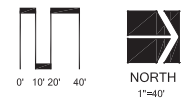
Project:
 46091 West 12 Mile
 Novi, Michigan

Prepared for:
 Amson Nassar Development
 2388 Cole Street, Suite 100
 Birmingham, Michigan 48009
 888.982.6766

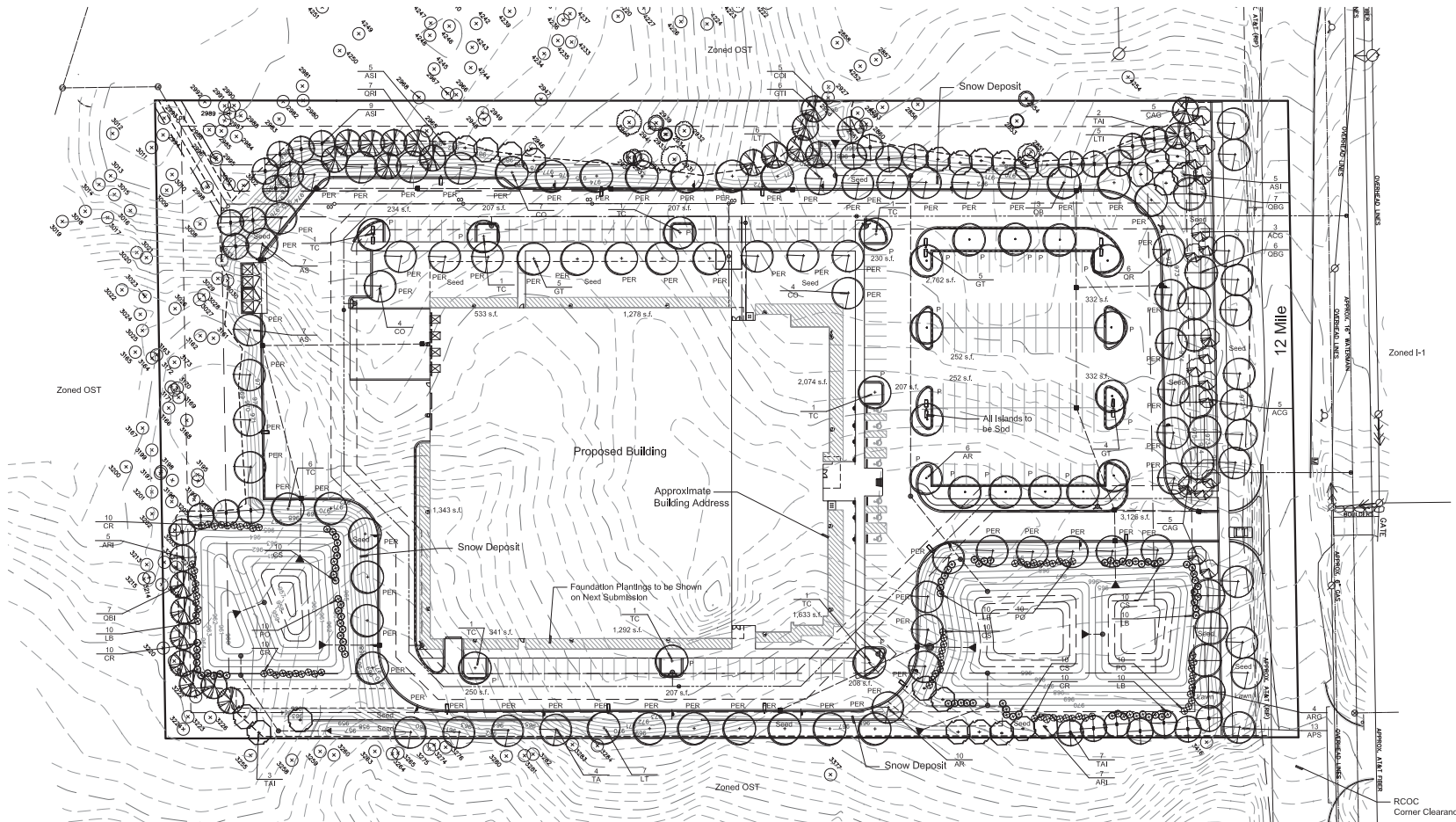
Revision:	Issued:
Review	February 14, 2019
Revised	February 15, 2019
Revised	March 25, 2019
Revised	March 26, 2019

Job Number:
 19-015

Drawn By: jca
 Checked By: jca



Sheet No.

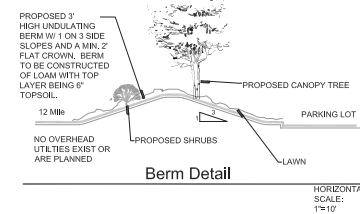


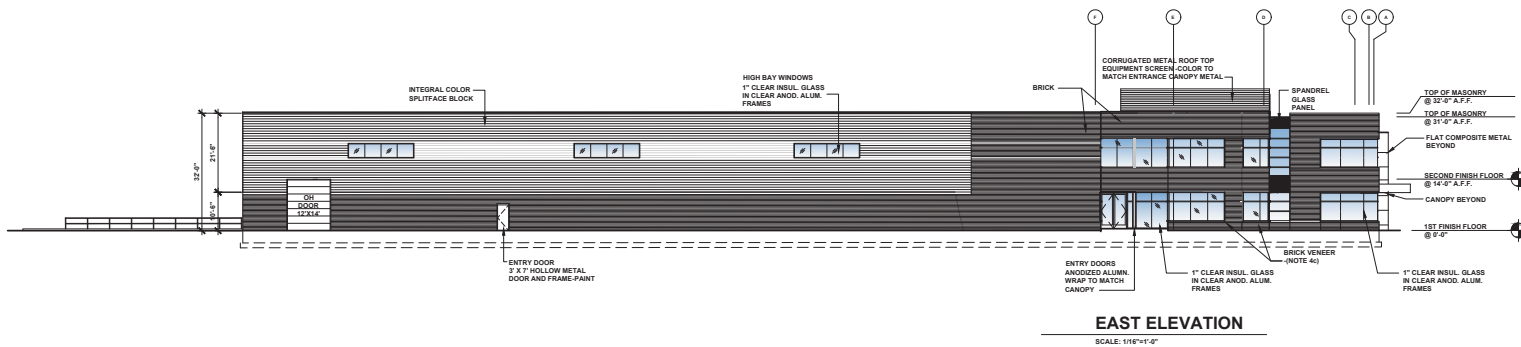
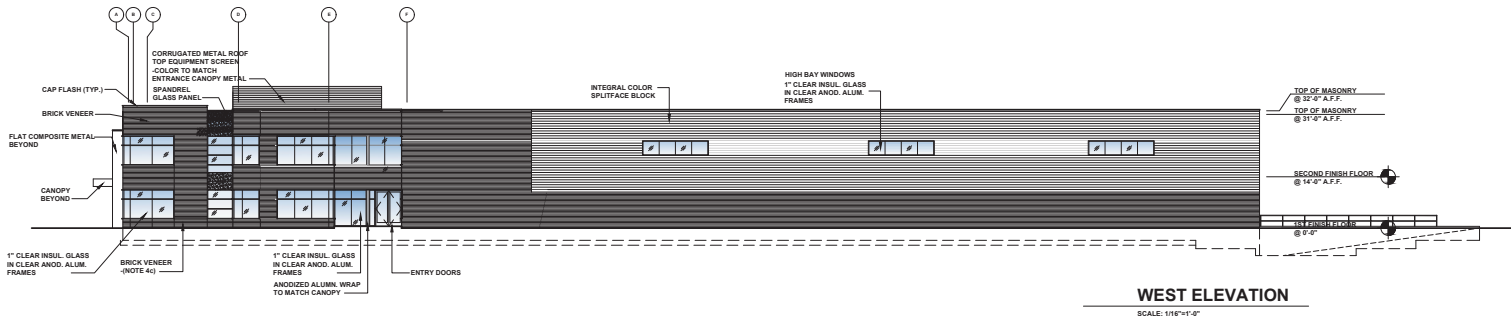
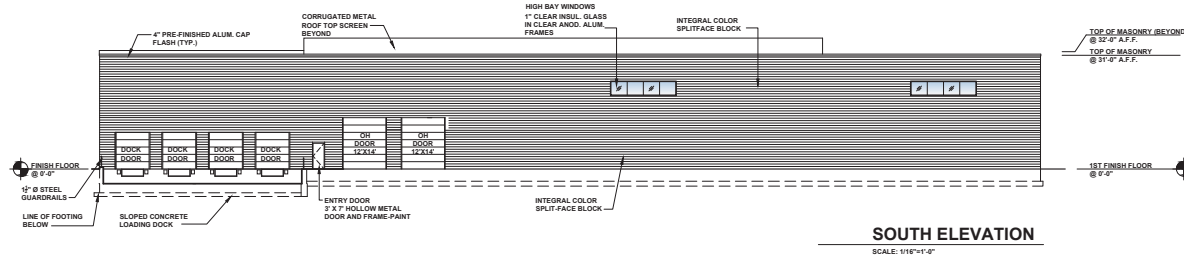
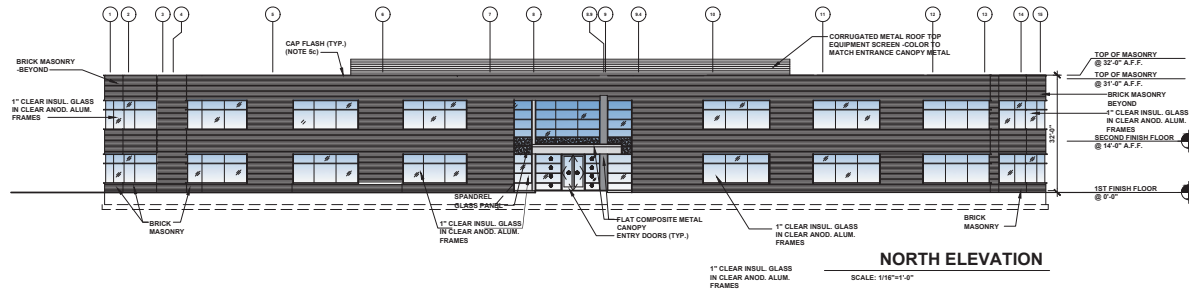
Landscape Summary

Existing Zoning	OST	Greenbelt Plantings - Not Adjacent to Parking Street Frontage	246 LF.
Parking Lot Landscaping		Trees Required	4 Trees (246 LF / 60')
Vehicular Use Area	118,564 s.f.	Trees Shown	4 Trees
Landscape Area Required	4,435 s.f.	Sub-Canopy Trees Required	6 Trees (246 LF / 40')
50,000 s.f. x 7.5% = 3,750 s.f.		Sub-Canopy Trees Shown	6 Trees
68,564 s.f. x 1.0% = 685 s.f.		Street Lawn	
		Street Frontage	468 LF. (493' - 25' drive openings)
Landscape Area Shown	8,806 s.f.	Trees Required	13 Trees (468 LF / 35')
Canopy Trees Required	22 Trees (4,435 / 200)	Trees Shown	13 Trees
Canopy Trees Shown	22 Trees	Detention Pond	
Parking Lot Perimeter		High Water Length	1,060 LF.
Perimeter	2,550 LF.	Landscape Required	742 LF. (1,060' x 70%)
Trees Required	73 Trees (2,550 LF / 35')	Landscape Provided	750 LF. (70.8%)
Trees Shown	73 Trees	Woodland Replacement	
Building Foundation Landscaping		Trees Required	682 Trees
Perimeter of Building	1,060 LF. (1,164' less 104' of Doors)	Trees Provided	73 Trees
Landscape Area Required	8,480 s.f. (1,060 LF. x 8')	Trees Paid Into Fund	609 Trees
Landscape Area Shown	8,494 s.f.		
Greenbelt Plantings - Adjacent to Parking Street Frontage	247 LF.	Notes:	
Trees Required	7 Trees (247 LF / 35')	1. Trees Shall be Planted no Closer than 10' Utility Structure Including Hydrants.	
Trees Shown	7 Trees	2. Trees Shall not be Planted within 4' of Property Lines.	
Sub-Canopy Trees Required	12 Trees (247 LF. / 20')	3. Utility Boxes Shall be Screen per Detail on Sheet L-2.	
Sub-Canopy Trees Shown	12 Trees	4. No Overhangs is Present on-site.	
		5. No Overhead Lines are Present.	

Plant List

Code	Quantity	Latin Name	Common Name	Height	Sp. Sp.	Sp. Sp.	Sp. Sp.	Sp. Sp.	Sp. Sp.	
AS	16	Acer rubrum	Red Maple	3.0'	as shown	BAB	\$ 4,000.00	\$ 6,400.00	11%	24%
AS	14	Acer saccharum	Sugar Maple	3.0'	as shown	BAB	\$ 4,000.00	\$ 5,600.00	10%	24%
CO	15	Cornus occidentalis	Northwest Hackberry	3.0'	as shown	BAB	\$ 4,000.00	\$ 6,000.00	11%	11%
GT	14	Gaillardia hirsuta var. nemota	Thornless Honeylocust	3.0'	as shown	BAB	\$ 4,000.00	\$ 5,600.00	10%	10%
LT	13	Liriodendron tulipifera	Tulip Tree	3.0'	as shown	BAB	\$ 4,000.00	\$ 5,200.00	9%	9%
QR	3	Quercus bicolor	Swamp White Oak	3.0'	as shown	BAB	\$ 4,000.00	\$ 1,200.00	3%	2%
QR	6	Quercus rubra	Red Oak	3.0'	as shown	BAB	\$ 4,000.00	\$ 2,400.00	4%	4%
TA	4	Tilia americana	Basswood	3.0'	as shown	BAB	\$ 4,000.00	\$ 1,600.00	3%	3%
TC	14	Tilia cordata GreenSpire	GreenSpire Linden	3.0'	as shown	BAB	\$ 4,000.00	\$ 5,600.00	10%	10%
Street Lawn and Greenbelt										
AD	9	Androsace spicata	Shadbolt	2.5'	as shown	BAB	\$ 250.00	\$ 2,250.00	6%	6%
AP	13	Aspidistra spicata	Ohio Buckeye	3.0'	as shown	BAB	\$ 4,000.00	\$ 5,200.00	9%	9%
AR	4	Aster rubrum	Red Maple	3.0'	as shown	BAB	\$ 4,000.00	\$ 1,600.00	3%	24%
CA	10	Campanula medium	Alternative Leaf Dogwood	2.5'	as shown	BAB	\$ 250.00	\$ 2,500.00	7%	7%
GB	7	Quercus bicolor	Swamp White Oak	3.0'	as shown	BAB	\$ 4,000.00	\$ 2,800.00	5%	5%
TA	14	Tilia cordata GreenSpire	GreenSpire Linden	3.0'	as shown	BAB	\$ 4,000.00	\$ 5,600.00	10%	10%
Total Parking Lot, Perimeter, Street Lawn and Greenbelt Trees										
Selection Details										
CR	40	Cornus saeomosa	Gray Dogwood	as shown	36"	\$ 50.00	\$ 2,000.00			
LD	40	Cornus saskatchewanensis	Red-osier Dogwood	as shown	36"	\$ 50.00	\$ 2,000.00			
LB	40	Lonicera beroniensis	Spottedleaf	as shown	36"	\$ 50.00	\$ 2,000.00			
PO	30	Physocarpus opulifolius	Eastern Noinak	as shown	36"	\$ 50.00	\$ 1,500.00			
Woodland Replacement										
AR	12	Acer rubrum	Red Maple	2.5'	as shown	BAB	\$ 4,000.00	\$ 4,800.00		
AS	19	Acer saccharum	Sugar Maple	2.5'	as shown	BAB	\$ 4,000.00	\$ 7,600.00		
CO	5	Cornus occidentalis	Northwest Hackberry	2.5'	as shown	BAB	\$ 4,000.00	\$ 2,000.00		
GD	5	Gymnocladus dioica	Kentucky Coffeetree	2.5'	as shown	BAB	\$ 4,000.00	\$ 2,000.00		
GT	5	Gaillardia hirsuta var. nemota	Thornless Honeylocust	2.5'	as shown	BAB	\$ 4,000.00	\$ 2,000.00		
LT	5	Liriodendron tulipifera	Tulip Tree	2.5'	as shown	BAB	\$ 4,000.00	\$ 2,000.00		
QR	7	Quercus bicolor	Swamp White Oak	2.5'	as shown	BAB	\$ 4,000.00	\$ 2,800.00		
QR	7	Quercus rubra	Red Oak	2.5'	as shown	BAB	\$ 4,000.00	\$ 2,800.00		
TA	12	Tilia americana	Basswood	2.5'	as shown	BAB	\$ 4,000.00	\$ 4,800.00		
TA	73	Plantings to be Shown								
Irrigation										
91	4"	Deep Shredded Hardwood Bark Mulch 3" x 3"				\$35	\$ 140.00			
130	Soil 1" x 1"					\$5	\$ 350.00			
884	Soil 1" x 1"					\$2.50	\$ 1,250.00			
							Total	\$ 153,670.00		





PLANNING REVIEW



PLAN REVIEW CENTER REPORT

April 17, 2019

Planning Review

Amson-Nassar Spec Building

JSP 18-48

PETITIONER

Amson-Nassar Development

REVIEW TYPE

Revised Preliminary Site Plan

PROPERTY CHARACTERISTICS

Section	16	
Site Location	South of Twelve Mile, East of West Park Road; 22-16-226-003	
Site School District	Novi Community School District	
Site Zoning	OST: Office Service Technology	
Adjoining Zoning	North	I-1: Light Industrial District
	East	OST: Office Service Technology
	West	OST: Office Service Technology
	South	OST: Office Service Technology
Current Site Use	Single family home	
Adjoining Uses	North	Light Industrial/Corporate park
	East	Vacant
	West	Single family home
	South	Vacant/ ITC corridor
Site Size	10 acres	
Plan Date	March 26, 2019	

PROJECT SUMMARY

The applicant is proposing a new 90,000 square foot Warehouse/Office building on an approximately 10 acre parcel with an existing residential home. Associated parking areas and two stormwater detention basins are also proposed. The parcel is on the south side of Twelve Mile Road, east of West Park Drive. The proposed building does have a potential tenant, which has not been identified but is described as a high-tech business. The site is zoned for OST- Office Service Technology use, and the future land use map indicates Office Research Development Technology.

RECOMMENDATION

Approval of the *Preliminary Site Plan is recommended at this time*. The plan mostly conforms to the requirements of the Zoning Ordinance, with a few deviations to be addressed in subsequent Site Plan submittals. All reviews except Façade and Fire recommend approval. **Planning Commission's approval for Preliminary Site Plan, Woodland Permit and Storm Water Management Plan is required.**

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 charts for information pertaining to ordinance requirements.** Items in **bold** below must be addressed and incorporated as part of the Final Site Plan submittal:

1. Accessory Structures (Sec 4.19.2.A): Note the location of any transformers on the site plan. A transformer is considered an accessory structure and should be located in the rear yard. Location must meet the 20 ft. setback requirement and screening is required.
2. Loading Area Screening (Sec. 3.20.2.A): *Truck service areas and overhead truck loading/unloading doors shall be totally screened from view from any public right-of-way, including freeway right-of-way, and adjacent properties.* Screening of the overhead truck doors does not appear to be proposed from the southern side of the property. **The applicant should show the proper screening from the freeway ROW is achieved.**
3. Parking Calculations (Sec. 3.20.2.B and Sec. 5.2.12.E): In a future submittal, provide a floor plan to verify the assumptions of 85% usable floor area for the warehouse/shop and Gross Leasable Floor space for the office for determining required parking. If these calculations are accurate, the Zoning Ordinance requires 188 parking spaces be provided on the site. The applicant proposes to provide 189 parking spaces.
4. Woodland Protection Ordinance: As noted in the Woodland Review, 20% of the regulated trees surveyed are proposed to be preserved, and 11% of the required Woodland Replacements are proposed to be planted on-site. This is a slight improvement over the previous design. **Options that would allow the preservation of more woodland trees and planting more woodland replacements on-site should continue to be explored.**
5. ROW Permit Note: **Revise ROW Permit Note on sheet 8 to reflect Road Commission for Oakland County and City of Novi ROW permits are required.**
6. Lighting and Photometric Plan (Sec. 5.7.2): **Complete the Statistics chart and include notes that address the Ordinance requirements. See chart for additional details.**
7. Plan Review Chart: There are additional minor clarifications requested in the Plan review chart. Please refer to the chart for additional details.
8. Other Reviews:
 - a. Engineering Review: Additional comments to be addressed with Final Site Plan. Engineering recommends approval.
 - b. Landscape Review: Landscape recommends approval with comments to be addressed in Final Site Plan Submittal. Refer to review letter and chart for more comments.
 - c. Woodlands Review: ECT recommends approval for Woodlands. Refer to review letter for more details.
 - d. Traffic Review: Traffic recommends approval. Additional comments to be addressed with Final Site Plan.
 - e. Facade Review: **Façade consultant does not recommend approval at this time.** The proposed design is not in compliance with façade ordinance. See letter for additional details.
 - f. Fire Review: **Fire does not recommend approval at this time.** A secondary emergency access is needed for approval.

NEXT STEP: SITE PLAN REVISIONS and PLANNING COMMISSION

All reviewers, except Façade and Fire, are recommending approval of the Preliminary Site Plan. Refer to letters for more details. The plans should be revised to address the concerns outlined in their review letters in order to gain approval from all reviewers before the Planning Commission public hearing. **To be placed on the Planning Commission agenda for May 8, 2019, please provide the requested information or modifications from the Façade and Fire reviews in pdf format by noon on Thursday, April 25.**

If found acceptable, you will then be asked to provide via email the following **by 4pm on Thursday, May 2, 2019**:

1. Original Site Plan submittal in PDF format (maximum of 10MB). **NO CHANGES MADE.**
2. A response letter addressing ALL the comments from ALL the review letters and **a request for waivers as you see fit.**

FINAL SITE PLAN SUBMITTAL

After receiving Planning Commission's approval of the Preliminary Site Plan, please follow the [Final Site Plan Checklist](#) and submit for approval:

1. Six copies of Final Site Plan sets addressing all comments from Preliminary review,
2. Response letter addressing ALL comments from ALL the review letters and **refer to sheet numbers where the change is reflected.**
3. [Final Site Plan Application](#)

ELECTRONIC STAMPING SET SUBMITTAL AND RESPONSE LETTER

After receiving Final Site Plan approval, plans addressing the comments in all of the staff and consultant review letters should be submitted electronically for informal review and approval prior to printing Stamping Sets. A letter from either the applicant or the applicant's representative addressing comments in this and other review letters and associated charts is to be submitted with the electronic stamping set. This letter should address all comments in ALL letters and ALL charts and **refer to sheet numbers where the change is reflected.**

STAMPING SET APPROVAL

Stamping sets will be 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 **10 size 24" x 36" copies with original signature and original seals on the cover sheet (subsequent pages may use electronic seal with signature)**, to the Community Development Department for final Stamping Set approval.

If required, drafts for all legal documents with a legal transmittal are to be submitted along with stamping sets.

SIGNAGE

Exterior Signage is not regulated by the Planning Division or Planning Commission. Sign permit applications that relate to construction of a new building or an addition to an existing building may be submitted, reviewed, and approved as part of a site plan application. Proposed signs shall be shown on the preliminary site plan. Alternatively, an applicant may choose to submit a sign application to the Building Official for administrative review. Following preliminary site plan approval, any application to amend a sign permit or for a new or additional sign shall be submitted to the Building Official. Please contact the Ordinance Division 248.735.5678 for information regarding sign permits.

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. If you have questions regarding the checklist or the Pre-Con itself, please contact Sarah Marchioni [248.347.0430 or smarchioni@cityofnovi.org] in the Community Development Department.

CHAPTER 26.5

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 248.347.0484 or lbell@cityofnovi.org.

A handwritten signature in black ink that reads "Lindsay Bell". The signature is written in a cursive, flowing style.

Lindsay Bell – Planner



PLANNING REVIEW CHART: Office Service Technology (OST)

Review Date: April 17, 2019
Review Type: Revised Preliminary Site Plan Review
Project Name: JSP 18-48 Amson-Nassar 12 Mile Buildings
Location: 22-16-226-003
Plan Date: March 26, 2019
Prepared by: Lindsay Bell, Planner
E-mail: lbell@cityofnovi.org; **Phone:** (248) 347-0484

Bold To be addressed with the next submittal
Underline o be addressed with final site plan submittal
Bold and Underline Requires Planning Commission and / or City Council Approval
Italics Noted to be noted

Item	Required Code	Proposed	Meets Code	Comments
Zoning and Use Requirements				
Master Plan <i>(adopted July 26, 2017)</i>	Office research development and technology	1 office/shop building; 90,000 sf	Yes	<i>The Preliminary Site Plan will require a Planning Commission approval</i>
Area Study	The site does not fall under any special category	NA	Yes	
Zoning <i>(Effective January 8, 2015)</i>	OST: Office Service and Technology	OST	Yes	
Uses Permitted (Sec 3.1.23.B & C)	Sec. 3.1.23.B. - Principal Uses Permitted. Sec. 3.1.23.C. - Special Land Uses Permitted.	Office/Warehouse indicated	Yes	Occupant not known
Height, bulk, density and area limitations (Sec 3.1.23.D)				
Frontage on a Public Street. <i>(Sec. 5.12)</i>	Frontage on a Public Street is required	The site has frontage on Twelve Mile Road	Yes	
Access To Major Thoroughfare <i>(Sec. 5.13)</i>	Access to Major Thoroughfare only Access to other roads only if other side of the street has multi-family or non-residential uses, or City makes a determination the property meets the requirements of this section	The site has access to Twelve Mile Road	Yes	
Minimum Zoning Lot Size for each Unit in Ac <i>(Sec 3.6.2.D)</i>	Except where otherwise provided in this Ordinance, the minimum lot area and width, and	10 acres	NA	

Item	Required Code	Proposed	Meets Code	Comments
Minimum Zoning Lot Size for each Unit: Width in Feet (Sec 3.6.2.D)	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	
Maximum % of Lot Area Covered (By All Buildings)	(Sec 3.6.2.D)	22%	NA	
Building Height (Sec. 3.1.23.D & Sec. 3.20.1)	46 feet or 3 stories Additional height can be proposed if met with the conditions listed in Section 3.20	43 feet	Yes	
Building Setbacks (Sec 3.1.23.D)				
Front @ Twelve Mile	50 ft.	303 ft from proposed ROW line	Yes	
Side East	50 ft.	77 ft	Yes	
Rear South	50 ft.	207 ft	Yes	
Side West	50 ft.	160 ft	Yes	
Parking Setback (Sec 3.1.23.D) Refer to applicable notes in Sec 3.6.2				
Front @ Twelve Mile	20 ft.	85 ft	Yes	
Side East	20 ft	45 ft	Yes	
Rear South	20 ft.	80 ft	Yes	
Side West	20 ft.	93 ft	Yes	
Note To District Standards (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.	No exterior side yard	NA	
Off-Street Parking in Front Yard (Sec 3.6.2.E)	Off-street parking is allowed in front yard	Parking is proposed in front yard and meets the parking setback requirements	Yes	
Distance between buildings (Sec 3.6.2.H)	It is governed by sec. 3.8.2 or by the minimum setback requirements, whichever is greater Min. Distance between buildings = LengthBldgA + LengthBldgB + 2(HeightBldgA + HeightBldgB) / 6	One building proposed	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Wetland/Watercourse Setback (Sec 3.6.2.M)	A setback of 25ft from wetlands and from high watermark course shall be maintained	No wetlands on site	Yes	
Parking setback screening (Sec 3.6.2.P)	Required parking setback area shall be landscaped per sec 5.5.3.	Landscape plan provided	Yes	Please refer to landscape review for additional information
Modification of parking setback requirements (Sec 3.6.2.Q)	The Planning Commission may modify setback requirements in those instances where it determines that such modification may result in improved use of the site and/ or in improved landscaping; provided, however, that such modification of the setback requirements does not reduce the total area of setback on a site below the minimum setback area requirements of this Section	Parking setback modification not requested	NA	
OST District Required Conditions (Sec 3.20)				
Additional Height (Sec 3.20.1)	Properties north of Grand River Avenue: Max height: 65 ft with additional setbacks of 2 ft for every 1 ft in excess of 46 ft.	32'	Yes	
Loading and Unloading Screening (Sec 3.20.2.A)	Truck service areas and overhead truck loading/unloading doors shall be totally screened from view from any public right-of-way, including freeway right-of-way, and adjacent properties, except for required driveway access.	The loading dock is proposed in the rear; approx. 3,224 sf	No?	See Section 3.20.2.A – screening of loading/unloading area meeting requirements does not appear to be proposed
Required Parking Calculation (Sec 3.20.2.B)	Required parking computed based on floor area utilized provided a floor plan indicating such uses, and GLF space is graphically and statistically shown	Use numbers given: Office: 30,000 sf *85% Warehouse: 60,000 *85%	No	Floor plan does not indicate uses/GLFS graphically and statistically

Item	Required Code	Proposed	Meets Code	Comments
Additional conditions for permitted uses in 3.1.23.B.ii – v (Sec 3.20.2.C)	Uses permitted under subsections 3.1.23.B.ii - v shall not be located on property sharing a common boundary with property zoned for R-A, R-1, R-2, R-3, R-4 or MH district use unless conditions in section 3.20.2.C are met	Not adjacent to residential districts	NA	
Outdoor storage (Sec 3.20.2.D)	The outdoor storage of goods or materials shall be prohibited.	Note on plans	Yes	
Parking, Loading and Dumpster Requirements				
Number of Parking Spaces Professional Office (Sec.5.2.12.D) Industrial or R&D establishments and related accessory offices (Sec. 5.2.12.E)	Office: one space for each 222 square feet GFA $30,000 \times .85 / 222 = 115$ One (1) space for each seven hundred (700) square feet of usable floor area For $60,000 \times .85 / 700 = 73$ Total= 188 spaces	Total Proposed = 189 spaces	Yes?	When available, provide a floor plan indicating usable floor area graphically and statistically shown on site plan to verify required parking. An index plan with usable area hatched would be helpful
Landbank Parking (Sec.5. 2.14) Land banking may be permitted on the request of the applicant if an applicant can demonstrate that the number of parking spaces required under this Section are in excess of the actual requirements for the functional use of the building, for up to twenty five (25) percent of the required	Maximum number of Landbank spaces: 25% of required parking 25 % of 188 spaces = 47 spaces		NA	
	minimum number of spaces required prior to request for land banking: 45 spaces		NA	
	Alternative layout plan showing land bank parking		NA	
	All areas designated for land banking shall be landscaped open space and may not be used for any other purposes		NA	
	Planning Commission grants the request based on certain conditions		NA	
	The owner of the property shall report any proposed change in use or occupancy for further		NA	

Item	Required Code	Proposed	Meets Code	Comments
number of parking spaces on the site, subject to the following conditions	evaluation			
	Land bank spaces may be installed prior to change in use or occupancy, if determined		NA	
Parking Space Dimensions and Maneuvering Lanes (Sec. 5.3.2)	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - 90° Parking: 9 ft. x 19 ft. - 24 ft. two way drives - 9 ft. x 17 ft. parking spaces with buffer or sidewalk as required - 4" integral curb and sidewalk indicated in front of 17' parking spaces; 	Yes	
Parking stall located adjacent to a parking lot entrance (public or private) (Sec. 5.3.13)	<ul style="list-style-type: none"> - 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 		Yes	
End Islands (Sec. 5.3.12)	<ul style="list-style-type: none"> - 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 	End Islands are proposed wherever applicable	Yes	
Barrier Free Spaces <i>Barrier Free Code</i>	For total 151-200 = 6 total	7 barrier Free parking proposed	Yes	
Barrier Free Space Dimensions <i>Barrier Free Code</i>	<ul style="list-style-type: none"> - 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 2 would be van-accessible – 8' space with 8' and 5' aisles proposed	Yes	

Item	Required Code	Proposed	Meets Code	Comments
Barrier Free Signs <i>Barrier Free Code</i>	One sign for each accessible parking space.	Shown	Yes	
Minimum number of Bicycle Parking <i>(Sec. 5.16.1)</i>	<u>Warehouses/Industrial:</u> Five (5) percent of required automobile Spaces 188 x .05=9 spaces	9 Bike parking spaces proposed	Yes	
Bicycle Parking General requirements <i>(Sec. 5.16)</i>	<ul style="list-style-type: none"> - No farther than 120 ft. from the entrance being served - When 4 or more spaces are required for a building with multiple public 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 	Within 120 ft. 2 locations U design detail provided Accessible via 6 ft sidewalk	Yes	
Covered Bicycle Parking <i>(Sec. 5.16.4)</i>	When 20 or more are required, 25% of bicycle parking spaces shall be covered		NA	
Bicycle Parking Lot layout <i>(Sec 5.16.6)</i>	Parking space width: 6 ft. One tier width: 10 ft. Two tier width: 16 ft. Maneuvering lane width: 4 ft. Parking space depth: 2 ft. single, 2 ½ ft. double	Provided (6' x 7' pad on north side) (6' x 5.5' pad on west side)	Yes	
Loading Spaces <i>Sec. 5.4.1</i>	<ul style="list-style-type: none"> - Within the OS districts, loading space shall be provided in the rear yard or - in the case of a double frontage lot, in the interior side yard, - in the ratio of five (5) square feet per front foot of building up to a total area of three-hundred sixty (360) square feet per building. 	Loading Area in the rear yard	Yes	
Dumpster <i>Sec 4.19.2.F</i>	<ul style="list-style-type: none"> - Located in rear yard - Attached to the building or 	Dumpster located in the rear yard	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	<ul style="list-style-type: none"> - 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 	<p>Farther than 10 ft.</p> <p>Outside the parking setback</p>		
Dumpster Enclosure <i>Sec. 21-145. (c) Chapter 21 of City Code of Ordinances</i>	<ul style="list-style-type: none"> - 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 	- No dumpster enclosure detail provided in this submittal	No	Provide dumpster enclosure detail in next submittal
Exterior lighting <i>Sec. 5.7</i>	Photometric plan and exterior lighting details needed at time of Final Site Plan submittal	Provided	Yes	
Roof top equipment and wall mounted utility equipment <i>Sec. 4.19.2.E.ii</i>	- 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	Roof top equipment indicated with screening	Yes	
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.	Roof top equipment and screening is indicated	Yes	
Non-Motorized Facilities				
Article XI. Off-Road Non-Motorized Facilities	8 foot pathway is required along Twelve Mile	8 foot sidewalk proposed	Yes	
Pedestrian Connectivity	Assure safety and convenience of both	Sidewalks are proposed up to each entrance	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	vehicular and pedestrian traffic both within the site and in relation to access streets	and around the building as well as up to 12 Mile		
Building Code and Other Requirements				
Building Code	Building exits must be connected to sidewalk system or parking lot.	The floor plan indicates each exit is connected to sidewalk	Yes	
Design and Construction Standards Manual	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Legal description for parcel is 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	
Economic Impact	<ul style="list-style-type: none"> - Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known) 	Information Not Provided	No	Please provide the information in the response letter prior to Planning Commission meeting
Development/ Business Sign & Street addressing	<ul style="list-style-type: none"> - Signage if proposed requires a permit. - The applicant should contact the Building Division for an address prior to applying for a building permit. 	Monument sign location noted on west side of driveway Site address will not be issued without a Site plan permit	Yes	Apply for lot addressing prior to stamping set approval For further information contact Maureen Underhill 248-735-5602 .
Project and Street naming	Some projects may need approval from the Street and Project Naming Committee.	This project does not need approval of the Project Name		For approval of project and street naming contact Hannah Smith at 248-735-0579
Property Split	All property splits and combination must be submitted to the Assessing Department	Not proposed	NA	

Item	Required Code	Proposed	Meets Code	Comments
	for approval.			
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	Lighting plan provided	Yes	
Lighting Plan (Sec. 5.7.A.i)	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures		Yes	
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.	Not shown	No	Provide proposed light fixtures on building elevations
Lighting Plan (Sec. 5.7.2.A.ii)	Specifications for all proposed & existing lighting fixtures	Provided	Yes	Provide lighting Hours of Operation on the lighting plan
	Photometric data	Provided	Yes	
	Fixture height	20' and 25'	Yes	
	Mounting & design	Provided	Yes	
	Glare control devices	Provided	Yes	
	Type & color rendition of lamps	LED	Yes	
	Hours of operation	Not indicated	No	
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties	Adjacent properties are vacant	NA	
Maximum 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	25 feet	Yes	
Standard Notes (Sec. 5.7.3.B)	- Electrical service to light fixtures shall be	Notes provided	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	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			
Security Lighting (Sec. 5.7.3.H) Lighting for security purposes shall be directed only onto the area to be secured.	- 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	Notes on sheet 5	Yes	
Average Light Levels (Sec.5.7.3.E)	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1 in parking area	3.1:1 shown	Yes	
Type of Lamps (Sec. 5.7.3.F)	Use of true color rendering lamps such as metal halide is preferred over high & low pressure sodium lamps	LED	Yes	
Min. Illumination (Sec. 5.7.3.K)	Parking areas: 0.2 min	0.8 min	Yes	
	Loading & unloading areas: 0.4 min	0.5 min	Yes	
	Walkways: 0.2 min	Greater than 0.2 min	Yes	
	Building entrances, frequent use: 1.0 min	2.0 min	Yes	
	Building entrances, infrequent use: 0.2 min	1.0 min	Yes	
Max. Illumination adjacent to Non-Residential (Sec. 5.7.3.K)	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle	0.6 max proposed	Yes	
Cut off Angles (Sec. 5.7.3.L)	when adjacent to residential districts - All cut off angles of fixtures must be 90° - maximum illumination at the property line shall not exceed 0.5 foot candle	Not adj to residential district	NA	

Item	Required Code	Proposed	Meets Code	Comments
<p>NOTES:</p> <ol style="list-style-type: none">1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.2. The section of the applicable ordinance or standard is indicated in parenthesis. Please refer to those sections in Article 3, 4 and 5 of the zoning ordinance for further details3. Please include a written response to any points requiring clarification or for any corresponding site plan modifications to the City of Novi Planning Department with future submittals.				

ENGINEERING REVIEW



PLAN REVIEW CENTER REPORT

April 15, 2019

Engineering Review

Amson-Nassar Spec Building
JSP18-0048

Applicant

12M, LLC

Review Type

Revised Preliminary Site Plan

Property Characteristics

- Site Location: South of Twelve Mile Road, West of Taft Road
- Site Size: 9.97 Acres
- Plan Date: 03/26/2019
- Design Engineer: Greentech Engineering, Inc.

Project Summary

- Construction of an approximately 15,000 square-foot two-story office building, a 60,000 square-foot workshop, and associated parking. Site access would be provided via Twelve Mile Road.
- Water service would be provided by a 12-inch extension from the existing 16-inch water main along the north side of Twelve Mile road. A 2-inch domestic lead and an 8-inch fire lead would be provided to serve the building, along with 8 additional hydrants.
- Sanitary sewer service would be provided by a 6-inch extension from the existing 10-inch sanitary gravity main southwest of the parcel.
- Storm water would be collected by a single storm sewer collection system and discharged to one of two detention basins onsite.

Recommendation

Approval of the Revised Preliminary Site Plan and Revised Preliminary Storm Water Management Plan is recommended.

Comments:

The Revised Preliminary Site Plan meets the general requirements of the design and construction standards as set forth in Chapter 11 of the City of Novi Codified Ordinance, the Storm Water Management Ordinance and the Engineering Design Manual with the following items that must be addressed at the time of Final Site Plan submittal:

Additional Comments (to be addressed upon Final Site Plan submittal):

General

1. Revise the proposed building square-footage note on sheet 8 to the correct value.
2. Provide a bypass/passing lane on Twelve Mile Road to service to the development and to minimize backups on the north side of Twelve Mile Road. Coordinate road work with Oakland County.
3. Provide data in the utility crossing table on sheet 8 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.
4. Indicate the typical foundation depth of the light poles to verify that no conflicts with utilities will occur. Light poles in a utility easement will require a License Agreement.
5. Soil borings shall be provided for a preliminary review of the constructability of the proposed development (roads, basin, etc.). Borings identifying soil types, and groundwater elevation should be provided as soon as possible.
6. The Non-domestic User Survey form shall be submitted to the City so it can be forwarded to Oakland County.
7. A right-of-way permit will be required from the City of Novi and the Oakland County Road Commission.
8. The City standard detail sheets are not required for the Final Site Plan submittal. They will be required with the Stamping Set submittal. They can be found on the City's website (www.cityofnovi.org/DesignManual).
9. A letter from either the applicant or the applicant's engineer must be submitted with the Final Site Plan submittal highlighting the changes made to the plans addressing each of the comments in this review.

Water Main

10. Provide a profile for all proposed water main 8-inch and larger **prior to stamping set submittal**.
11. Provide dimensions for all proposed water main extending to hydrants.
12. Provide three (3) signed and sealed sets of revised utility plans along with the MDEQ permit application (06/12 rev.) for water main construction. The Streamlined Water Main Permit 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.

Sanitary Sewer

13. Provide the sanitary sewer monitoring manhole within a dedicated access easement or within the road right-of-way. If not in the right-of-way, provide a 20-foot wide access easement to the monitoring manhole **from the right-of-way** (rather than a public sanitary sewer easement).
14. Show the sanitary sewer easement boundaries for the existing sanitary sewer southwest of the property.
15. Revise the sanitary sewer basis of design on sheet 8 to use a value of 3.2 people per REU.
16. Revise the note on sheet 8 to state that sanitary leads shall be buried at least 5 feet deep **where under the influence of pavement**.

Storm Sewer

17. Provide a schedule listing the casting type and other relevant information for each proposed storm structure on the utility plan **prior to stamping set submittal**.
18. Show and label all roof conductors, and show where they will tie into the storm sewer system on the layout and on the profile **prior to stamping set submittal**.
19. Provide storm sewer profiles and illustrate all pipes intersecting storm structures **prior to stamping set submittal**.
20. Provide calculations verifying the post-development runoff rate directed to the proposed receiving drainage course does not exceed the pre-development runoff rate for the site.

Storm Water Management Plan

21. The Storm Water Management Plan (SWMP) shall comply with the Storm Water Ordinance and Chapter 5 of the Engineering Design Manual (refer to the runoff coefficients, 1V:4H allowable basin slopes, etc.).
22. A 25-foot vegetated buffer shall be provided around the perimeter of each storm water basin. This buffer **cannot encroach onto driveways** or adjacent property.
23. If no underground detention is proposed, remove the storm water detention basin note on sheet 8 referencing underground detention. Any site with proposed underground detention must meet at least one of these three requirements from the Engineering Design Manual:
 - i. The site is an existing developed site that is proposed to be redeveloped.
 - ii. The site has topographical constraints that would limit the effectiveness of a traditional basin.
 - iii. The site has size constraints (typically two acres or smaller).

Paving & Grading

24. On sheet 15, revise the Heavy Duty Concrete Dumpster Pad Detail to be 8" 3500 PSI MDOT Grade P1 concrete pavement on **8" 21AA compacted aggregate base** per the City's Standard Paving Detail requirements.
25. 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.
26. Per section 5.3.12 of Appendix A of the Zoning Ordinance, end islands must be 3' shorter than adjacent 19' stalls. Provide end island dimensions to verify the City Standards are being met.

Soil Erosion and Sediment Control

27. A SESC permit is required. A full review has not been completed at this time. The review checklist detailing all SESC requirements is attached to this letter. An informal review will be completed with the Final Site Plan if SESC plans are included in the submittal.

Off-Site Easements

28. An off-site sanitary sewer easement must be obtained from the property to the west for the sanitary sewer lead. All off-site easements must be executed **prior to final approval of the plans**. If you have not done so already, drafts of the easements and a recent title search shall be submitted as soon as possible to the Community Development Department for review, and shall be approved by the Engineering Division and the City Attorney prior to executing the easements.

The following must be submitted at the time of Final Site Plan submittal:

29. An itemized construction cost estimate must be submitted to the Community Development Department at the time of Final Site Plan submittal for the determination of plan review and construction inspection fees. This estimate should only include the civil site work and shall not include any costs associated with construction of the building or any demolition work. **The cost estimate must be itemized** for each utility (water, sanitary, storm sewer), on-site paving, right-of-way paving (including proposed right-of-way), grading, and the storm water basin (basin construction, control structure, pretreatment structure and restoration).
30. Draft copies of any off-site utility easements, a recent title search, and legal escrow funds must be submitted to the Community Development Department for review and approved by the Engineering Division and the City Attorney prior to getting executed.

The following must be submitted at the time of Stamping Set submittal:

31. A draft copy of the maintenance agreement for the storm water facilities, as outlined in the Storm Water Management Ordinance, must be submitted to the Community Development Department with the Final Site Plan. Once the

- form of the agreement is approved, this agreement must be approved by City Council and shall be recorded in the office of the Oakland County Register of Deeds.
32. A draft copy of the 20-foot wide easement for the water main to be constructed on the site must be submitted to the Community Development Department.
 33. A draft copy of the 20-foot wide access easement for the sanitary sewer monitoring manhole to be constructed on the site must be submitted to the Community Development Department.

The following must be addressed prior to construction:

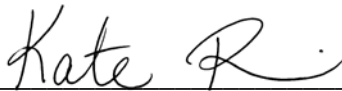
34. A pre-construction meeting shall be required prior to the commencement of any site work. Please contact Sarah Marchioni in the Community Development Department to setup a meeting (248-347-0430).
35. A City of Novi Grading Permit will be required prior to any grading on the site. This permit will be issued at the pre-construction meeting (no application fee).
36. An NPDES permit must be obtained from the MDEQ since the site is over 5 acres in size. The MDEQ requires an approved plan to be submitted with the Notice of Coverage.
37. A Soil Erosion Control Permit must be obtained from the City of Novi. Contact Sarah Marchioni in the Community Development Department (248-347-0430) for forms and information.
38. A permit for work within the right-of-way of Twelve Mile Road must be obtained from the City of Novi. The application is available from the City Engineering Division and should be filed at the time of Final Site Plan submittal. Please contact the Engineering Division at 248-347-0454 for further information.
39. A permit for work within the right-of-way of Twelve Mile Road must be obtained from the Road Commission for Oakland County (RCOC). Please contact the RCOC (248-858-4835) directly with any questions. The applicant must forward a copy of this permit to the City. Provide a note on the plans indicating that all work within the road right-of-way will be constructed in accordance with RCOC standards.
40. A permit for water main construction must be obtained from the MDEQ. This permit application must be submitted through the Water and Sewer Senior Manager after the water main plans have been approved.
41. Construction Inspection Fees will be determined once the construction cost estimate is submitted and must be paid prior to the pre-construction meeting.
42. A storm water performance guarantee, equal to 1.2 times the amount required to complete storm water management and facilities (as specified in

the Storm Water Management Ordinance) must be posted with Community Development.

43. A street sign financial guarantee in an amount to be determined (\$400 per traffic control sign proposed) must be posted with Community Development.

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 Kate Richardson at (248) 347-0586 with any questions.



Kate Richardson, EIT
Plan Review Engineer

cc: Lindsay Bell, Community Development
Darcy Rechten, PE, Engineering
George Melistas, Engineering



CITY OF NOVI ENGINEERING DIVISION SOIL EROSION AND SEDIMENTATION CONTROL PLAN CHECKLIST

PROJECT:	SESC Application #: SE -
Contact Name:	DATE COMPLETED:
Phone Number:	DATE OF PLAN:
Fax Number:	STATUS:

General Requirements – Following the initial Soil Erosion and Sedimentation Control permit application to the Community Development Department, all SESC plan revisions shall be submitted directly to the Engineering Department for further review and/or permit approval. One (1) copy of revised soil erosion plans, including response letter addressing the comments below, shall be submitted for each subsequent review until the plan has been given approval by the Engineering Department, at which point five (5) copies will be required for permit approval. Plans shall be signed and sealed, and the bond must be submitted to the Treasurer’s Office prior to permit issuance.

ITEM NO.	ITEM	Provided on Plans	COMMENTS
1.	Plan shall be at scale of not more than 1" = 200', include legal description, location, proximity to lakes, streams or wetlands, slopes, etc.	<input type="checkbox"/>	
2.	Plan shall include a soil survey or a written description of soil types of the exposed land area.	<input type="checkbox"/>	
3.	Plan shall show the limits of earth disruption.	<input type="checkbox"/>	
4.	Plan shall show tree protection fencing and location of trees to be protected.	<input type="checkbox"/>	
5.	Plan shall show all existing and proposed on-site drainage and dewatering facilities (i.e. structure details, rim elev., etc.)	<input type="checkbox"/>	
6.	Detailed sequence of construction shall be provided on plans structured similar to the following, supplemented with site specific items: 1) Install tracking mat, 2) Install temp. SESC measures, 3) Construct storm water basins and install treatment structures, if applicable, 4) Install storm sewer, with inlet protection to follow immediately, 5) Remove all temp. SESC measures once site is stabilized.	<input type="checkbox"/>	
7.	Plan must address maintenance of soil erosion and sedimentation control measures (temporary and permanent)	<input type="checkbox"/>	
8.	Provide a note stating if dewatering is anticipated or encountered during construction a dewatering plan must be submitted to the Engineering Division for review.	<input type="checkbox"/>	
9.	A grading plan shall be provided, or grade information shown on plan.	<input type="checkbox"/>	

10.	Note that it is the developer's responsibility to grade and stabilize disturbances due to the installation of public utilities.	<input type="checkbox"/>	
11.	The CSWO shall be listed on permit application.	<input type="checkbox"/>	
12.	Plan sealed by registered civil engineer with original signature.	<input type="checkbox"/>	
13.	An itemized cost estimate (Silt Fence, Inlet Filters, Topsoil/Seed/Mulch, Const. Access, etc.) shall be provided.	<input type="checkbox"/>	The SESC financial guarantee will be \$. The SESC inspection fees will be \$.
14.	Potential stockpile areas shall be shown on the plan, with note stating a ring of silt fence will be installed surrounding any stockpiled material.	<input type="checkbox"/>	
15.	Sediment basin: Provide filter on standpipe outlet structure until site is stabilized, then removed. Noted on plan and standpipe detail(s).	<input type="checkbox"/>	
16.	Provide a note on the plan stating the storm water basin will be stabilized prior to directing flow to the basin.	<input type="checkbox"/>	
17.	Pretreatment Structures: Noted to inspect weekly for sediment accumulation until site is stabilized, and will clean as required.	<input type="checkbox"/>	.
18.	Attach the Oakland County standard detail sheet.	<input type="checkbox"/>	
19.	Construction mud tracking entrance: 75'x20', 6" of 1" to 3" stone, on geotextile fabric.	<input type="checkbox"/>	
20.	Silt fence: 6" anchor trench, stakes 6' on center. Prominent line type on plan, with legend.	<input type="checkbox"/>	
21.	Provide Silt Sack with overflow capability as the inlet protection, and provide detail on plans.	<input type="checkbox"/>	
22.	Catch basin inlet filters shall be provided on existing roadways along construction route for reasonable distance from site.	<input type="checkbox"/>	
23.	Street sweeping and dust control shall be noted on plan as responsibility of contractor.	<input type="checkbox"/>	
24.	Vegetation shall be established within 5 days of final grade, or whenever disturbed areas will remain unchanged for 30 days or greater. 3-4" of topsoil will be used where vegetation is required.	<input type="checkbox"/>	
25.	Vegetated buffer strips (25' wide wherever possible) shall be created or retained along the edges of all water bodies, water courses or wetlands.	<input type="checkbox"/>	
26.	Diversion berms or terracing shall be implemented where necessary.	<input type="checkbox"/>	
27.	All drainage ditches shall be stabilized with erosion control blanket and shall utilize check	<input type="checkbox"/>	

	dams as necessary. Drainage ditches steeper than 3% shall be sodded.		
28.	Slopes steeper than 1V:6H (16%) shall be stabilized with erosion control blanket. Add this note as a general note, and also in a prominent location near any berm, etc. where a significant slope is proposed.	<input type="checkbox"/>	
29.	All culvert end sections must contain grouted rip-rap in accordance with ordinance specifications.	<input type="checkbox"/>	

ADDITIONAL COMMENTS:

1. Please note that installation of silt fencing or tree protection fencing shall not occur prior to the initial City pre-construction meeting. When natural features exist on the site, inspection of staking may be required prior to installation of the fencing.
- 2.

Reviewed By:

LANDSCAPE REVIEW



PLAN REVIEW CENTER REPORT

April 3, 2019

Revised Preliminary Site Plan - Landscaping

Amson Nassar Building

Review Type

Revised Preliminary Landscape Review

Job #

JSP18-0048

Property Characteristics

- Site Location: 45833 West Twelve Mile Road
- Site Acreage: 10 acres
- Site Zoning: OST
- Adjacent Zoning: East, West, South: OST North: I-1
- Plan Date: 3/26/2019

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 Final Site Plan submittal. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review and the accompanying Landscape Chart are summaries and are not intended to substitute for any Ordinance.

Recommendation

This project is **recommended for approval** for Preliminary Site Plan. No landscape waivers are required.

Ordinance Considerations

Existing Soils (Preliminary Site Plan checklist #10, #17)

Provided

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

Provided

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

1. The entire site is considered to be regulated woodland on the site, and almost all of the trees are shown as being removed.
2. **Please add the tree protection fencing lines to the Demolition Plan.**

Woodland Replacement Trees (Section 37 Woodland Protection)

1. Based on the tree survey, it appears that there may be room for additional woodland replacement trees to be planted on the site, which would be appreciated. They would help restore some of the wooded habitat lost with the construction of this project.
2. **If the open area is not of high quality habitat (ie is dominated by invasive species), please consider removing those and planting additional replacements, especially of those species that will be removed.** ECT or the City Landscape Architect would be happy to help you evaluate the habitat quality of the areas in question.

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

Property is not adjacent to Residential.

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

1. The required berm is provided.
2. Based on the frontage, a total of 11 canopy trees, 18 subcanopy trees and 13 street trees are required, and all are provided.

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

1. Based on the vehicular use area, 4,435 sf of islands and 22 trees are required. 8,806 sf of islands and 23 trees are provided.
2. **Please check the areas of the northeast, northwest and southwest islands near the building corners to be sure they are at least 200sf. If they're not, please enlarge them.**

Parking Lot Perimeter Canopy Trees (Zoning Sec. 5.5.3.C.(3) Chart footnote)

Based on the perimeter, 73 trees are required and 72 are provided.

Loading Zone Screening (Zoning Sec. 3.14, 3.15, 4.55, 4.56, 5.5)

No loading zone screening is required as the building screens the loading zones from Twelve Mile Road.

Building Foundation Landscape (Zoning Sec 5.5.3.D.)

1. Based on the building perimeter, 8480sf of foundation landscape area is required, and 8494sf in area around the building is proposed.
2. Please provide a detailed foundation landscaping plan in the Final Site Plans.

Plant List (LDM 2.h. and t.)

1. Provided.
2. 15 of 16 species used (94%) are native to Michigan.
3. The tree diversity meets the standards of Landscape Design Manual Section 4.

Planting Notations and Details (LDM)

1. **If native seed mixes are proposed for disturbed areas, please add seeding area maintenance notes.**
2. **Please add the seed mix to be used in the detention basin.**

Storm Basin Landscape (Zoning Sec 5.5.3.E.iv and LDM 1.d.(3))

1. The required detention basin plantings are proposed for both ponds.
2. No Phragmites was found on the site.

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 an irrigation system is to be used, the plan can be submitted in the Electronic Stamping Set.**

Snow Deposit (LDM.2.q.)

1. Provided
2. **Please indicate more areas for snow deposit where landscaping won't be damaged.**

Corner Clearance (Zoning Sec 5.9)

Provided

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 rmeader@cityofnovi.org.

A handwritten signature in black ink that reads "Rick Meader". The signature is written in a cursive, flowing style.

Rick Meader – Landscape Architect

LANDSCAPE REVIEW SUMMARY CHART – REVISED PRELIMINARY SITE PLAN

Review Date: April 3, 2019
Project Name: JSP18-0048: Amson-Nassar Building
Plan Date: March 26, 2019
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 for Final Site Plan.

Item	Required	Proposed	Meets Code	Comments
Landscape Plan Requirements (LDM (2))				
Landscape Plan (Zoning Sec 5.5.2, LDM 2.e.)	<ul style="list-style-type: none"> ▪ 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 ▪ Consistent with plans throughout set 	Scale 1"=40'	Yes	When they are provided in Final Site Plans, foundation plantings may be shown at a different scale than the overall plan if required for clarity.
Project Information (LDM 2.d.)	Name and Address	Yes	Yes	
Owner/Developer Contact Information (LDM 2.a.)	Name, address and telephone number of the owner and developer or association	Yes	Yes	
Landscape Architect contact information (LDM 2.b.)	Name, Address and telephone number of RLA	Yes	Yes	
Sealed by LA. (LDM 2.g.)	Requires original signature	Copy of seal and signature	Yes	<u>Original signature required on final stamping sets.</u>
Miss Dig Note (800) 482-7171 (LDM.3.a.(8))	Show on all plan sheets	Yes	Yes	
Zoning (LDM 2.f.)	Include all adjacent zoning	Site: OST North: I-1 East, South, West: OST	Yes	
Survey information (LDM 2.c.)	<ul style="list-style-type: none"> ▪ Legal description or boundary line survey ▪ Existing topography 	<ul style="list-style-type: none"> ▪ Existing conditions, on Sheet 3 ▪ Legal description on Cover sheet 	Yes	

Item	Required	Proposed	Meets Code	Comments
Existing plant material Existing woodlands or wetlands (LDM 2.e.(2))	<ul style="list-style-type: none"> Show location type and size. Label to be saved or removed. Plan shall state if none exists. 	<ul style="list-style-type: none"> Topographic survey includes tree IDs. Tree Survey and tree chart on Sheets 3, L-3, L-4 	Yes	See the ECT review for a complete discussion of woodland removals and replacements.
Soil types (LDM.2.r.)	<ul style="list-style-type: none"> As determined by Soils survey of Oakland county Show types, boundaries 	Sheet 2	Yes	
Existing and proposed improvements (LDM 2.e.(4))	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	Yes	Yes	
Existing and proposed utilities (LDM 2.e.(4))	<ul style="list-style-type: none"> Overhead and underground utilities, including hydrants Proposed light posts 	All proposed utilities shown on Landscape Plan	Yes	
Proposed grading. 2' contour minimum (LDM 2.e.(1))	Provide proposed contours at 2' interval	Sheet 6, Landscape Plan	Yes	
Snow deposit (LDM.2.q.)	Show snow deposit areas on plan	Yes		
LANDSCAPING REQUIREMENTS				
Berms, Walls and ROW Planting Requirements				
Berms				
<ul style="list-style-type: none"> 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 of loam with 6" top layer of top soil. 				
Residential Adjacent to Non-residential (Sec 5.5.3.A) & (LDM 1.a)				
Berm requirements (Zoning Sec 5.5.A)	The site is not adjacent to residential property so no berm for this requirement is necessary.	No berm is proposed.	Yes	
Planting requirements (LDM 1.a.)	LDM Novi Street Tree List	NA		
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	Retaining walls are proposed along the east side of the property.	TBD	Please provide construction details for retaining walls for review with building plans as some parts of them are taller than 3.5 feet.
Walls greater than 3		None		

Item	Required	Proposed	Meets Code	Comments
½ ft. should be designed and sealed by an Engineer				
ROW Landscape Screening Requirements (Sec 5.5.3.B. ii) and (LDM 1.b)				
Greenbelt width (2)(3) (5)	Adjacent to pkg: 20 feet Not adj. to pkg: 25 feet	<ul style="list-style-type: none"> ▪ 20 ft adj. to parking ▪ 225 feet not adj. 	Yes	
Berm requirements (Zoning Sec 5.5.3.A.(5))				
Min. berm crest width	Adjacent to parking: 3 feet	The crest of the 12 Mile Road berm is 3 feet wide or more	Yes	
Minimum berm height (9)	Adjacent to parking: 3 feet	A berm 3-4' tall is provided between parking lot and 12 Mile Road	Yes	
3' wall	(4)(7)	None are proposed in the greenbelt.		
Canopy deciduous or large evergreen trees Notes (1) (10)	<u>Adjacent to pkg:</u> 1 tree per 35lf frontage (net of access drives) <ul style="list-style-type: none"> • 247/35 = 7 trees <u>Not adjacent to pkg:</u> 1 tree per 60 lf <ul style="list-style-type: none"> • 219/60 = 4 trees 	<u>Adjacent to pkg:</u> 7 trees <u>Not adjacent to pkg:</u> 4 trees	Yes	
Sub-canopy deciduous trees Notes (2)(10)	<u>Adjacent to pkg:</u> 1 tree per 35lf frontage (net of access drives) <ul style="list-style-type: none"> • 247/20 = 12 trees <u>Not adjacent to pkg:</u> 1 tree per 60 lf <ul style="list-style-type: none"> • 219/40 = 5 trees 	<u>Adjacent to pkg:</u> 12 trees <u>Not adjacent to pkg:</u> 6 trees	Yes	
Canopy deciduous trees in area between sidewalk and curb (Novi Street Tree List)	<ul style="list-style-type: none"> • 1 tree per 35lf frontage (net of access drives) • (493-27)/35 = 13 trees 	13 trees	Yes	Any trees not allowed by the RCOC do not need to be provided, but a copy of their denial must be provided.
Cross-Section of Berms (LDM 2.j)				
Slope, height and width	<ul style="list-style-type: none"> • Label contour lines • Maximum 33% • Constructed of loam • 6" top layer of topsoil 	A berm cross section detail is provided.		
Type of Ground Cover		None	No	
Setbacks from Utilities	Overhead utility lines and 15 ft. setback from edge of utility or 20 ft.	<ul style="list-style-type: none"> ▪ Overhead lines are shown on the north side of 12 	Yes	

Item	Required	Proposed	Meets Code	Comments
	setback from closest pole	Mile Road. <ul style="list-style-type: none"> Overhead lines existing within the site are shown as being removed. 		
Parking Area Landscape Requirements LDM 1.c. & Calculations (LDM 2.o.)				
General requirements (LDM 1.c)	<ul style="list-style-type: none"> Clear sight distance within parking islands No evergreen trees 	No evergreens are proposed	Yes	
Name, type and number of ground cover (LDM 1.c.(5))	As proposed on planting islands	Sod is indicated	Yes	
General (Zoning Sec 5.5.3.C.ii)				
Parking lot Islands (a, b. i)	<ul style="list-style-type: none"> A minimum of 200 SF to qualify Minimum 200 SF per tree planted in island 6" curbs Islands minimum width 10' BOC to BOC 	Most islands with trees are sufficiently large in area and width.	TBD	<ol style="list-style-type: none"> Please check the area of the endcap islands at the southwest, northwest and northeast corners of the building. They don't appear to be have 200sf in area. If they aren't, they should be enlarged to have at least 200sf in greenspace.
Curbs and Parking stall reduction (c)	Parking stall can be reduced to 17' and the curb to 4" adjacent to a sidewalk of minimum 7 ft.	Spaces adjacent to open space and 7' wide sidewalks are 17 feet long	Yes	
Contiguous space limit (i)	<ul style="list-style-type: none"> Maximum of 15 contiguous spaces All endcap islands should also be at least 200sf with 1 tree planted in it. 	Maximum bay is 15 spaces long.	Yes	
Plantings around Fire Hydrant (d)	No plantings with matured height greater than 12' within 10 ft. of fire hydrants of utility structures (manholes, catch basins) and 5 feet from underground lines,	Hydrants and nearby trees are shown on the landscape plan.	Yes	<ol style="list-style-type: none"> The tree in the island at the southwest corner of the building is shown on top of a light pole. Please move the light pole to resolve that conflict.
Landscaped area (g)	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	Yes	Yes	

Item	Required	Proposed	Meets Code	Comments
Clear Zones (LDM 2.3.(5))	Road Commission for Oakland County requirements at 12 Mile Road entries	RCOC clear vision zones are provided.	Yes	
Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, C, 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 area up to 50,000 sf x 7.5%	$A = x \text{ SF} \times 7.5\% = A \text{ sf}$ $A = 50,000 \times 7.5\% = 3750 \text{ sf}$			
B = Total square footage of additional paved vehicular use areas over 50,000 SF) x 1 %	$B = (118564 - 50000) \text{ SF} \times 1\% = 685 \text{ sf}$			
Category 2: For: I-1 and I-2 (Zoning Sec 5.5.3.C.iii)				
A = Total square footage of vehicular use area up to 50,000 sf x 5%	$A = x \text{ SF} \times 5\% = A \text{ sf}$	NA		
B = Total square footage of additional paved vehicular use areas over 50,000 SF x 0.5 %	$B = (x \text{ SF} - 50000) \times 0.5\% = B \text{ SF}$	NA		
All Categories				
C = A+B Total square footage of landscaped islands required	$C = 3750 + 685 = 4435 \text{ SF}$	8806 SF	Yes	
D = D/200 Number of canopy trees required	$4435/200 = 22 \text{ trees}$	23 trees	Yes	
Parking Lot Perimeter Trees	<ul style="list-style-type: none"> ▪ 1 Canopy tree per 35 lf; ▪ $2550/35 = 73 \text{ trees}$ 	<ul style="list-style-type: none"> ▪ 72 trees ▪ 6 perimeter trees in greenbelt could be double-counted as greenbelt canopy trees if desired. 	Yes	
Parking land banked	NA	None		
Other Landscaping				
Other Screening				
Screening of outdoor storage, loading/unloading (Zoning Sec. 3.14, 3.15, 4.55, 4.56, 5.5)		The loading zones are in the rear of the building	Yes	The building completely screens the loading area from 12 Mile Road so no landscape screening is required.

Item	Required	Proposed	Meets Code	Comments
Transformers/Utility boxes (LDM 1.e from 1 through 5)	<ul style="list-style-type: none"> ▪ A minimum of 2ft. 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 shown		<ol style="list-style-type: none"> 1. Please provide proper screening for any transformers or other utility boxes. 2. Please add a note to the plan stating that all utility boxes shall be screened per the detail.
Building Foundation Landscape Requirements (Sec 5.5.3.D)				
Interior site landscaping SF	<ul style="list-style-type: none"> ▪ Equals to entire perimeter of the building (less paved access areas) x 8 with a minimum width of 4 ft. ▪ (1164-104)lf x 8ft = 8480 SF 	Hatched areas indicate that 8494sf of foundation landscape area will be provided.	Yes	<u>Please provide detailed foundation planting plans on Final Site Plans.</u>
<i>Zoning Sec 5.5.3.D.ii. All items from (b) to (e)</i>	If visible from public street a minimum of 60% of the exterior building perimeter should be covered in green space	227/257 (88%) of the building frontage facing 12 Mile Road will be landscaped	Yes	
Detention/Retention Basin Requirements (Sec. 5.5.3.E.iv)				
Planting requirements (Sec. 5.5.3.E.iv)	<ul style="list-style-type: none"> ▪ Clusters of large native shrubs shall cover 70-75% of the basin rim area ▪ 10" to 14" tall grass along sides of basin ▪ Refer to wetland for basin mix 	70% of the detention basins' rims will be planted with large native shrubs.	Yes	Please include the seed mix to be used in the detention ponds somewhere in the landscape plans, including the species included in the mix.
Phragmites Control (Sec 5.5.6.C)	<ul style="list-style-type: none"> ▪ Any and all populations of <i>Phragmites australis</i> on site shall be included on tree survey. ▪ Treat populations per MDEQ guidelines and requirements to eradicate it from the site. 	None indicated	TBD	<ol style="list-style-type: none"> 1. Please survey the site for any populations of <i>Phragmites australis</i> and submit plans for its removal. 2. If none is found, please indicate that on the survey.
LANDSCAPING NOTES, DETAILS AND GENERAL REQUIREMENTS				
Landscape Notes – Utilize City of Novi Standard Notes				
Installation date (LDM 2.I. & Zoning Sec 5.5.5.B)	<ul style="list-style-type: none"> • Provide intended dates • Should be between March 15 and November 15. 	Fall or spring 2019 or 2020	Yes	

Item	Required	Proposed	Meets Code	Comments
Maintenance & Statement of intent (LDM 2.m & Zoning Sec 5.5.6)	<ul style="list-style-type: none"> • Include statement of intent to install and guarantee all materials for 2 years. • Include a minimum one cultivation in June, July and August for the 2-year warranty period. 	Yes	Yes	
Plant source (LDM 2.n & LDM 3.a.(2))	Shall be northern nursery grown, No.1 grade.	Yes	Yes	
Irrigation plan (LDM 2.s.)	<ul style="list-style-type: none"> • A fully automatic irrigation system and a method of draining is required with Final Site Plan • If an irrigation plan will not be used, a plan for providing the landscaping with sufficient water for establishment and long-term survival must be provided. 	No	No	<u>Need for final site plan</u>
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	
Plant List (LDM 2.h., LDF 4) - Include all cost estimates				
Quantities and sizes	Refer to LDM suggested plant list	Yes	Yes	
Root type		Yes	Yes	
Botanical and common names		<ul style="list-style-type: none"> ▪ 15 of 16 species (94%) used are native to Michigan ▪ The tree species diversity meets the requirements of LDM Section 4 	Yes	When foundation plantings are added, please keep the number of native species used to no less than 50% (more than 50% is better, ecologically).
Type and amount of lawn		Yes	Yes	If native seed mixes will be proposed for the site, please add instructions for their installation and maintenance to the plans.
Cost estimate (LDM 2.t)		For all new plantings, mulch and sod as listed on the plan	Yes	Yes

Item	Required	Proposed	Meets Code	Comments
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	
Multi-stem Tree		No	No	Please add this detail
Shrub		Yes	Yes	
Perennial/ Ground Cover		Yes	Yes	
Tree stakes and guys. (Wood stakes, fabric guys)		Yes	Yes	
Tree protection fencing	Located at Critical Root Zone (1' outside of dripline)	Silt fencing is shown on the Silt Erosion & Sedimentation Control Plan	No	<ol style="list-style-type: none"> 1. Show tree protection fence lines for all trees to be saved on the Demolition Plan. 2. Show the tree protection fence detail on the Demolition plan.
Other Plant Material Requirements (LDM 3)				
General Conditions (LDM 3.a)	Plant materials shall not be planted within 4 ft. of property line	Note provided on landscape plan	Yes	
Plant Materials & Existing Plant Material (LDM 3.b)	Clearly show trees to be removed and trees to be saved.	Trees to be removed are clearly shown on L-3 and Tree Chart	Yes	
Landscape tree credit (LDM3.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		
Plant Sizes for ROW, Woodland replacement and others (LDM 3.c)	Refer to Landscape Design Manual for requirements	Shown correctly on plant list	Yes	
Plant size credit (LDM3.c.(2))	NA	None taken		
Prohibited Plants (LDM 3.d)	No plants on City Invasive Species List	None proposed	Yes	
Recommended trees for planting under overhead utilities (LDM 3.e)	Label the distance from the overhead utilities	Proposed and existing utility lines are shown.	Yes	
Collected or Transplanted trees		No		

Item	Required	Proposed	Meets Code	Comments
<i>(LDM 3.f)</i>				
Nonliving Durable Material: Mulch <i>(LDM 4)</i>	<ul style="list-style-type: none"> ▪ 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. ▪ Refer to section for additional information 	Yes	Yes	

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.

WOODLAND REVIEW

April 15, 2019
ECT No. 190096-0200

Ms. Barbara McBeth, AICP
City Planner
Community Development Department
City of Novi
45175 West Ten Mile Road
Novi, MI 48375

Re: Amson-Nassar Spec Building (JSP18-0048)
Woodland Review of the Revised Preliminary Site Plan (PSP19-0053)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Revised Preliminary Site Plan for the proposed Amson-Nassar Spec Building project prepared by Greentech Engineering, Inc. dated and stamped "Received" by the City of Novi Community Development Department on March 26, 2019 (Plan). The Plan was reviewed for conformance with the City of Novi Woodland Protection Ordinance Chapter 37. The applicant's woodland consultant, Allen Design, provided a supplemental tree list and updated *Tree List*, *Woodland Plan*, and *Landscape Plan* (dated February 15, 2019) on February 15th via e-mail.

ECT currently recommends approval of the Revised Preliminary Site Plan for Woodlands. We suggest that the applicant further reduce the overall proposed impacts to existing woodlands and provide a greater percentage of on-site Woodland Replacement Tree Credits. The applicant shall address the items noted in the *Woodland Comments* Section of this letter prior to receiving Woodland approval of the Final Site Plan.

The following woodland related items are required for this project:

Item	Required/Not Required/Not Applicable
Woodland Permit	Required
Woodland Fence	Required
Woodland Conservation Easement	Required

The proposed development is located south of Twelve Mile Road and east of West Park Drive in Section 16. The project site includes Parcel 50-22-16-226-003 (9.97 acres). The majority of the project site contains existing woodland areas but also includes an existing house (45833 W. Twelve Mile Road) in the northeastern section of the site. A tree survey has been completed for the site and is included with the current Plan. An existing residence is located on the north side of the property, adjacent to Twelve Mile Road.

Previously, the applicant proposed the construction of a 24,000 square foot 2-story office building, a 72,000 square foot 1-story shop (i.e., 96,000 square feet of total building space), associated parking and utilities, and two (2) stormwater detention basins. The current Plan proposes the construction

of a 15,000 square foot 2-story office building, a 60,000 square foot 1-story shop, associated parking and utilities and two (2) storm water detention basins.

Based on our review of the Plan, Novi aerial photos, Novi GIS, and the City of Novi Official Wetlands and Woodlands Maps (see Figure 1); it appears as if this proposed project site contains City-Regulated Woodlands but does not contain City-Regulated Wetlands.

The purpose of the Woodlands Protection Ordinance is to:

- 1) *Provide for the protection, preservation, replacement, proper maintenance and use of trees and woodlands located in the city in order to minimize disturbance to them and to prevent damage from erosion and siltation, a loss of wildlife and vegetation, and/or from the destruction of the natural habitat. In this regard, it is the intent of this chapter to protect the integrity of woodland areas as a whole, in recognition that woodlands serve as part of an ecosystem, and to place priority on the preservation of woodlands, trees, similar woody vegetation, and related natural resources over development when there are no location alternatives;*
- 2) *Protect the woodlands, including trees and other forms of vegetation, of the city for their economic support of local property values when allowed to remain uncleared and/or unharvested and for their natural beauty, wilderness character of geological, ecological, or historical significance; and*
- 3) *Provide for the paramount public concern for these natural resources in the interest of health, safety and general welfare of the residents of the city.*

What follows is a summary of our review of the woodland information provided on the Plan.

On-Site Woodland Evaluation

ECT has reviewed the City of Novi Official Woodlands Map and completed an onsite Woodland Evaluation on February 21, 2019. ECT's in-office review of available materials included the City of Novi Regulated Woodland map and other available mapping. The subject property is contained within an area that is indicated as City-regulated woodland on the official City of Novi Regulated Wetland and Watercourse Map (see Figure 1).

The applicant has provided a *Tree List* (Sheet L-4) that lists the tree tag numbers, diameter-at-breast-height (DBH), species, and removal status of the existing on-site trees. An existing tree survey has been completed for the site and the tree locations are indicated on the *Woodland Plan* (Sheet L-3). The *Tree List* now includes the Woodland Replacement Credits required for each proposed tree removals.

In general, the on-site trees consist of red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), boxelder (*Acer negundo*), American elm (*Ulmus americana*), black cherry (*Prunus serotina*), black walnut (*Juglans nigra*), apple (*Malus pumila*), white oak (*Quercus alba*), and eastern cottonwood (*Populus deltoides*).

Aside from containing an existing residence, the northern section of the site contains areas of dense shrubs including invasive buckthorn (*Rhamnus cathartica*). The quality of the trees and woodland generally increases in the central and southern sections of the site where there is less buckthorn and the trees are larger in size and diversity of tree species. In terms of habitat quality and diversity of tree species, the overall subject site consists of trees in good condition, as indicated on the *Tree List*. In terms of a scenic asset, wildlife habitat, windblock, noise buffer or other environmental asset, the forested areas located on the subject site appear to be considered to be of fair quality. There are a

significant number of trees to be removed for the proposed development. The majority of the existing trees to be preserved are located along the western and southern edges of the site where site grading will be minimized and the existing trees will be preserved within a landscaped buffer.

Proposed Woodland Impacts and Replacements

A review of the Plan (*Woodland Plan*, Sheet L-3) indicates the following:

- Total Trees Surveyed: 545
- Less Non-Regulated (Dead) Trees: 44
- Net Regulated Trees: 501

- Regulated Trees Removed: 399 (80% of total regulated trees)
- Regulated Trees Preserved: 102 (20% of total regulated trees)

- Stems to be Removed 8” to 11”: 200 x 1 replacement (Requiring 200 Replacements)
- Stems to be Removed 11” to 20”: 143 x 2 replacements (Requiring 286 Replacements)
- Stems to be Removed 20” to 30”: 10 x 3 replacements (Requiring 30 Replacements)
- Stems to be Removed 30”+: 1 x 4 replacements (Requiring 4 Replacements)
- Multi-Stemmed Trees (45 trees): (Requires 162 Replacements)

- Total Woodland Replacement Credits Required **682**

It should be noted that some of the surveyed trees are located off of the proposed parcel, however, based on the *Woodland Plan*, a total of **399** existing regulated trees are to be removed (this is down from **432** on the previous plan submittal, i.e., 33 fewer regulated trees being removed). This is a removal of **80% of the total regulated trees**. The Plan appears to include a landscaped area along the west and southwest sides of the site. A total of **102** of the existing regulated trees are to be preserved (**20%** of the total regulated trees). The proposed tree removals require a Woodland Replacement of **682** Credits (this is reduced from 736 required Woodland Replacement Credits on the previous Plan).

Although the number of regulated trees to be removed has decreased by 33 trees, ECT encourages the Applicant to minimize impacts to on-site Woodlands to the greatest extent practicable. ECT stated that it was our opinion that the previous site layout was not consistent with upholding the intent and goals of the City’s Woodland Ordinance. Several large trees located at the south end of the site (i.e., Tree #3009, #3026, and #3169) could potentially be preserved through a modification of the site layout or potentially by providing retaining walls to reduce grading impacts, etc. The applicant has modified the site plan and as a result these three (3) noted trees are now proposed to be preserved.

In addition, ECT previously noted that over twenty (20) good quality, mature trees are proposed to be removed for the construction of the stormwater detention basin in the southeast section of the site and that the applicant should explore other stormwater detention layouts or options in an attempt to preserve additional trees. The current Plan continues to propose a stormwater detention basin in the southeast corner of the site and it appears as if approximately **28** regulated trees are to be removed within the limits of disturbance of the basin.

The applicant's woodland consultant has provided a Landscape Plan (Sheet L-1). The Landscape Plan indicates that a total of **73** deciduous trees (2.5" caliper) are proposed to be planted on-site as Woodland Replacement Trees (this is an increase of 5 on-site Woodland Replacement Trees from the previous plan). As such, the remainder of the Woodland Replacement credits required (i.e., **609**) shall be paid in the City of Novi Tree Fund. The current Plan provides for the **on-site planting of approximately 11%** of the total required Woodland Replacement Credits (an increase from 9% on the previous plan).

In general, the proposed Woodland Replacement trees being provided are to be located along the outer perimeter of the development in the corners of the site. The applicant has proposed the following woodland replacement trees:

- 12 red maple (*Acer rubrum*);
 - 19 sugar map (*Acer saccharum*);
 - 5 northern hackberry (*Celtis occidentalis*);
 - 6 thornless honeylocust (*Gleditsia triacanthos var. inermis*);
 - 5 tuliptree (*Liriodendron tulipifera*);
 - 7 swamp white oak (*Quercus bicolor*);
 - 7 red oak (*Quercus rubra*);
 - 12 basswood (*Tilia americana*)
- 73 Total Woodland Replacement Credits**

City of Novi Woodland Review Standards and Woodland Permit Requirements

Based on Section 37-29 (*Application Review Standards*) of the City of Novi Woodland Ordinance, the following standards shall govern the grant or denial of an application for a use permit required by this article:

No application shall be denied solely on the basis that some trees are growing on the property under consideration. However, the protection and conservation of irreplaceable natural resources from pollute on, impairment, or destruction is of paramount concern. Therefore, the preservation of woodlands, trees, similar woody vegetation, and related natural resources shall have priority over development when there are location alternatives.

In addition,

“The removal or relocation of trees shall be limited to those instances when necessary for the location of a structure or site improvements and when no feasible and prudent alternative location for the structure or improvements can be had without causing undue hardship”.

A Woodland Permit from the City of Novi would be required for proposed impacts to any trees 8-inch diameter-at-breast-height (DBH) or greater located within those areas designated as Regulated Woodland Areas or impacts to any tree 36" DBH or greater regardless of location. Such trees shall be relocated or replaced by the permit grantee.

Woodland Comments

The following are repeat comments from our Woodland Review of the Preliminary Site Plan (PSP19-0023) letter dated February 22, 2019. The current status of each comment follows in ***bold italics***. ECT recommends that the Applicant address the items noted below prior to submittal of the Final Site Plan submittal:

1. ECT encourages the Applicant to minimize impacts to on-site Woodlands to the greatest extent practicable. It is our opinion that the current site layout is not consistent with upholding the intent and goals of the City's Woodland Ordinance. Several large trees located at the south end of the site (i.e., Tree #3009, #3026, and #3169) could potentially be preserved through a modification of the site layout or potentially by providing retaining walls to reduce grading impacts, etc. In addition, over twenty (20) good quality, mature trees are proposed to be removed for the construction of the stormwater detention basin in the southeast section of the site. The applicant should explore other stormwater detention layouts or options in an attempt to preserve additional trees.

This comments still applies. The total number of regulated trees being removed has decreased by 33 trees from 432 to 399 trees. The required Woodland Replacement credits required has decreased by 54 Credits from 736 to 682 Credits. The current Plan is proposing a total of 73 on-site Woodland Replacement Credits. This is up 5 credits from the previous plan. The current Plan provides for the on-site planting of approximately 11% of the total required Woodland Replacement Credits (an increase from 9% on the previous plan).

2. A Woodland Permit from the City of Novi would be required for proposed impacts to any trees 8-inch diameter-at-breast-height (DBH) or greater and located within an area designated as City Regulated Woodland, or any tree 36-inches DBH regardless of location on the site. Such trees shall be relocated or replaced by the permit grantee. All deciduous replacement trees shall be two and one-half (2 ½) inches caliper or greater and count at a 1-to-1 replacement ratio and all coniferous replacement trees shall be six (6) feet in height (minimum) and count at a 1.5-to-1 replacement ratio. All Woodland Replacement trees shall be species that are listed on the City's Woodland Tree Replacement Chart (attached).

This comment still applies.

3. The applicant should provide documentation indicating alternative building/parking layouts that reduce and/or minimize impacts to woodlands or provide an increased number of on-site woodland replacements.

This comment still applies. Has the applicant considered the use of underground stormwater detention systems?

4. A Woodland Replacement financial guarantee for the planting of replacement trees will be required. This financial guarantee will be based on the number of on-site woodland replacement trees (credits) being provided at a per tree value of \$400. Currently, the Plan proposes **68** on-site Woodland Replacement Credits. The Woodland Replacement financial guarantee will be **\$27,200** (68 Woodland Replacements Required x \$400/Credit).

This comment still applies; however, the current Plan proposes a total of 73 on-site Woodland Replacement Credits. The Woodland Replacement financial guarantee will be \$29,200 (73 Woodland Replacements Required x \$400/Credit).

5. Based on a successful inspection of the installed on-site Woodland Replacement trees, the Woodland Replacement financial guarantee will be returned to the Applicant. A Woodland Maintenance financial guarantee in the amount of twenty-five percent (25%) of the original Woodland Replacement financial guarantee shall then be provided by the applicant. This Woodland Maintenance financial guarantee will be kept for a period of 2-years after the successful inspection of the on-site woodland replacement tree installation. Based on the current Plan, this Woodland Maintenance financial guarantee will be **\$6,800** (68 Woodland Replacements Required x \$400/Credit x 0.25).

This comment still applies, however, based on the current Plan, this Woodland Maintenance financial guarantee will be \$7,300 (73 Woodland Replacements Required x \$400/Credit x 0.25).

6. The Applicant will be required to pay the City of Novi Tree Fund at a value of \$400/credit for any Woodland Replacement tree credits that cannot be placed on-site. Currently, the applicant will be required to pay **\$267,200** (668 Woodland Replacement Credits Required x \$400/Credit) to the City of Novi Tree Fund. We believe that a greater percentage of required Woodland Replacement Tree Credits can and should be located on-site.

This comment still applies. Currently, the applicant will be required to pay \$243,600 (609 Woodland Replacement Credits Required x \$400/Credit) to the City of Novi Tree Fund.

7. The Applicant shall provide preservation/conservation easements as directed by the City of Novi Community Development Department for any areas of woodland replacement trees. 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. These easement areas shall be indicated on the Plan.

This comment still applies.

8. Replacement material should not be located 1) within 10' of built structures or the edges of utility easements and 2) over underground structures/utilities or within their associated easements. In addition, replacement tree spacing should follow the *Plant Material Spacing Relationship Chart for Landscape Purposes* found in the City of Novi *Landscape Design Manual*.

Amson-Nassar Spec Building (JSP18-0048)
Woodland Review of the Revised Preliminary Site Plan (PSP19-0053)
April 15, 2019
Page 7 of 11

This comment still applies,

Woodland Recommendation

ECT currently recommends approval of the Revised Preliminary Site Plan for Woodlands. We suggest that the applicant further reduce the overall proposed impacts to existing woodlands and provide a greater percentage of on-site Woodland Replacement Tree Credits. The applicant shall address the items noted in the *Woodland Comments* Section of this letter prior to receiving Woodland approval of the Final Site Plan.

If you have any questions regarding the contents of this letter, please contact us.

Respectfully submitted,
ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.



Pete Hill, P.E.
Senior Associate Engineer

cc: Lindsay Bell, City of Novi Planner
Sri Komaragiri, City of Novi Planner
Rick Meader, City of Novi Landscape Architect
Hannah Smith, City of Novi Planning Assistant

Attachments: Figure 1 – City of Novi Regulated Wetland & Woodland Map
Woodland Tree Replacement Chart
Site Photos



Figure 1. City of Novi Regulated Wetland & Woodland Map (approximate project boundary shown in red). Regulated Woodland areas are shown in green and Regulated Wetland areas are shown in blue.

Woodland Tree Replacement Chart

(from Chapter 37 Woodlands Protection)
 (All canopy trees to be 2.5" cal or larger, evergreens as listed)

Common Name	Botanical Name
Black Maple	Acer nigrum
Striped Maple	Acer pennsylvanicum
Red Maple	Acer rubrum
Sugar Maple	Acer saccharum
Mountain Maple	Acer spicatum
Ohio Buckeye	Aesculus glabra
Downy Serviceberry	Amelanchier arborea
Smooth Shadbush	Amelanchier laevis
Yellow Birch	Betula alleghaniensis
Paper Birch	Betula papyrifera
American Hornbeam	Carpinus caroliniana
Bitternut Hickory	Carya cordiformis
Pignut Hickory	Carya glabra
Shagbark Hickory	Carya ovata
Northern Hackberry	Celtis occidentalis
Eastern Redbud	Cercis canadensis
Pagoda Dogwood	Cornus alternifolia
Flowering Dogwood	Cornus florida
American Beech	Fagus grandifolia
Thornless Honeylocust	Gleditsia triacanthos inermis
Kentucky Coffeetree	Gymnocladus dioica
Walnut	Juglans nigra or Juglans cinerea
Eastern Larch	Larix laricina
Tuliptree	Liriodendron tulipifera
Tupelo	Nyssa sylvatica
American Hophornbeam	Ostrya virginiana
White Spruce_(1.5:1 ratio) (6' ht.)	Picea glauca
Black Spruce_(1.5:1 ratio) (6' ht.)	Picea mariana
Red Pine_(1.5:1 ratio) (6' ht.)	Pinus resinosa
White Pine_(1.5:1 ratio) (6' ht.)	Pinus strobus
American Sycamore	Platanus occidentalis
Black Cherry	Prunus serotina
White Oak	Quercus alba
Swamp White Oak	Quercus bicolor
Scarlet Oak	Quercus coccinea
Shingle Oak	Quercus imbricaria
Burr Oak	Quercus macrocarpa
Chinkapin Oak	Quercus muehlenbergii
Red Oak	Quercus rubra
Black Oak	Quercus velutina
American Basswood	Tilia americana

Site Photos



Photo 1. Looking east at existing house located in the northeast section of the site (ECT, February 21, 2019). This area contains some sections of relatively dense buckthorn growth.



Photo 2. Looking north within the northern section of the property (ECT, February 21, 2019).



Photo 3. Looking west along southern portion of the project site within area of higher quality woodland (ECT, February 21, 2019).



Photo 4. Looking west at Tree #3169 (33" red maple). This tree is located near the southern edge of the site and is proposed for removal (ECT, February 21, 2019).

TRAFFIC REVIEW



AECOM
 27777 Franklin Road
 Southfield
 MI, 48034
 USA
 aecom.com

Project name:
 JSP18-0048 Amson-Nassar Revised Preliminary
 Site Plan Traffic Review

From:
 AECOM

Date:
 April 15, 2019

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

CC:
 Sri Komaragiri, Lindsay Bell, George Melistas, Darcy
 Rechten, Hannah Smith, Kate Richardson

Memo

Subject: JSP18-0048 Amson-Nassar Revised Preliminary Site Plan 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 with the condition that the comments provided below are adequately addressed to the satisfaction of the City.

GENERAL COMMENTS

1. The applicant, Amson Nassar Development, is proposing a 90,000 SF building with 30,000 SF two story office (15,000 SF per story) and 60,000 SF one story shop on the south side 12 Mile Road, east of West Park Drive.
2. Twelve Mile Road is under the jurisdiction of the Road Commission for Oakland County (RCOC).
3. The site is currently zoned OST, Office Service Technology.
4. Summary of traffic-related waivers/variances:
 - a. **A waiver may be required for driveway spacing.**

TRAFFIC IMPACTS

1. AECOM performed an initial trip generation estimate based on the ITE Trip Generation Manual, 10th Edition, as follows.

ITE Code: 715 (Single Tenant Office Building), 110 (General Light Industrial)
 Development-specific Quantity: 30,000 SF, 60,000 SF
 Zoning Change: N/A

Trip Generation Summary				
	Estimated Trips (Office + Industrial)	Estimated Peak-Direction Trips (Office + Industrial)	City of Novi Threshold	Above Threshold ?
AM Peak-Hour Trips	68+25 = 93	60+19 = 79	100	Yes

PM Peak-Hour Trips	74+29 = 103	63+25 = 88	100	Yes
Daily (One-Directional) Trips	338+818 = 1156	N/A	750	Yes

The number of trips exceeds the City's threshold of more than 750 trips per day or 100 trips per either the AM or PM peak hour. AECOM recommends performing the following traffic impact study in accordance with the City's requirements.

Trip Impact Study Recommendation	
Type of Study:	Justification
Traffic Impact Study (TIS)	The number of trips exceeds the City's thresholds.

A Traffic Impact Study was submitted by the applicant on March 18, 2019 and will be reviewed under a separate cover letter.

EXTERNAL SITE ACCESS AND OPERATIONS

The following comments relate to the external interface between the proposed development and the surrounding roadway(s).

1. The applicant has proposed one (1) driveway on 12 Mile Road.
 - a. The applicant has indicated that the driveway is 24.5' in width, with 25' entering and exiting radii. The width and radii, while within the allowable range, do not meet the standard. The applicant should consider changing the driveway dimensions to match the standard or provide reasoning as to why different values are being used. Refer to Figure IX.1 in the City's Code of Ordinances for more information.
2. The applicant should provide driveway spacing dimensions along 12 Mile Road in accordance with Section 11-216.d.1.d and Figure IX.12 in the City's Code of Ordinances. **If spacing cannot be met, a waiver would be required.**
3. There is a proposed right turn taper on 12 Mile Road. The applicant should refer to Figures IX.8 and IX.10 in the City's Code of Ordinances to determine if right turn lanes/tapers or left turn passing lanes are required. Any modification made to 12 Mile Road must be reviewed and approved by RCOC.
 - a. Based on the average annual daily traffic on 12 Mile Road (14,210 vehicles per day (SEMCOG, 2012)) and the estimated number of peak-hour right and left turns into the development (approximately 65 left turns and right turns assuming a 50/50 split at each driveway during the AM peak entering period), the applicant is required to provide a left turn passing lane and a right turn taper into the development at each of the site driveways.
 - b. The applicant should review the City Code of Ordinances Section 11-216 (d)(5) and coordinate with the City on the requirement to extend the existing left-turn lane to the west of the proposed site, and provide dimensioned plans, as applicable.
 - c. The applicant has dimensioned a right turn lane and while the dimensions are within the allowable range, the applicant should consider revising to meet the standards shown in Figure IX.11 in the City's Code of Ordinances.
4. The applicant has provided sight distance dimensions along 12 Mile Road that are in compliance with Figure VIII-E in the City's Code of Ordinances. Note that on sheet 5 there is a note to see sheet 17 for sight distance. This note should be revised to see sheet 16.
5. The applicant is proposing a sidewalk along 12 Mile Road. Per the City's Non-Motorized Master Plan, sidewalk should be placed along the site connecting to the existing sidewalk to the west. Further details should be provided in future submittals such as location of ramps.
6. The applicant should include proposed maintaining traffic plans for any work within 12 Mile Road, as applicable.

INTERNAL SITE OPERATIONS

The following comments relate to the on-site design and traffic flow operations.

1. General Traffic Flow
 - a. The applicant should indicate turning patterns throughout the site for the largest vehicle that is expected to access the site.
 - b. The applicant has indicated aisle widths throughout the site, ranging from 24' to 25.21'. The applicant could consider reducing the 24.5' aisles to the minimum of 24'.
 - c. The applicant should include dimensions for the width of all the proposed end islands throughout the site to review accessibility and compliance with City requirements as stated in Section 5.3.12 of the Zoning Ordinance. Radii for the islands as well as select island widths have been included.
 - i. Note that all end islands adjacent to a travel way shall be constructed three (3) feet shorter than the adjacent parking space. This is indicated as typical for the floating islands, but does not appear to be applicable to the islands adjacent to the building.
 - d. The applicant has proposed a trash receptacle on the south side of the site.
 - i. The applicant should provide trash collection vehicle travel patterns to access the trash receptacle.
 - ii. The location of the trash receptacle is generally acceptable.
 - e. The applicant has indicated a loading zone on the south side of the building.
 - i. The applicant has indicated the size of the proposed loading zone as 56.14' by 62', which is a total area of 3480 square feet, which is in compliance with Section 5.4 of the Zoning Ordinance.
 - ii. The applicant should provide truck travel patterns throughout the site to confirm accessibility to/from the loading zone.
2. Parking Facilities
 - a. The applicant has indicated through dimensions, the length and width of the proposed parking spaces. Curb heights are indicated on the grading plan.
 - i. The applicant should include six inch curbs when the curb is abutting a 19 foot long parking space and four inch curbs when abutting a 17 foot long parking space. When a 17 foot long space abuts a sidewalk, the sidewalk width should be increased to seven feet in order to account for two feet of vehicle overhang and the minimum five foot sidewalk width. Bumper blocks must be 17' from the end of the parking space.
 - ii. The applicant has indicated two (2) spaces are designated as van accessible and provided dimensions.
 - iii. The detail of the barrier free parking spaces on sheet 15 does not match the dimensions on sheet 5 for the barrier free spaces. The applicant should ensure the dimensions match.
 - b. The applicant shall refer to the Planning Review Letter for parking quantity requirements.
 - c. The applicant has indicated 10 bicycle parking spaces on site, as required by Section 5.16.1 of the Zoning Ordinance.
 - i. The applicant should update the note for the bicycle parking to refer to the correct sheet.
 - ii. The applicant has included the dimensions of the bicycle rack layout which are in compliance with Figure 5.16.6.
3. Sidewalk Requirements
 - a. The applicant should dimension the width of all proposed sidewalks. Many have been included, but several are missing.
 - i. The applicant has included a sidewalk connection from the facilities to the street. This sidewalk connection should be dimensioned on the floating island.
 - ii. Sidewalks throughout the site are required to be a minimum of 5' wide.

- iii. Note that when a 17' parking space abuts a sidewalk, the sidewalk shall be four inches in height and a minimum of 7' wide to accommodate a 2' vehicle overhand and provide 5' of unobstructed travel way for non-motorized users.
- iv. The applicant should add additional ramps on the sidewalk along Twelve Mile Road, as the grading plan indicates 6" curbs and no ramps.
- b. The applicant has labeled one sidewalk ramp on the plans and included the latest Michigan Department of Transportation (MDOT) detail. Additional ramps should be added where needed for pedestrian access.

SIGNING AND STRIPING

1. All on-site signing and pavement markings shall be in compliance with the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). The following is a discussion of the proposed signing and striping.
2. All signing and striping details are required by the final site plan, but will be reviewed if provided earlier.
3. The applicant has included parking space striping notes to indicate that:
 - a. The standard parking spaces shall be striped with four (4) inch white stripes.
 - b. The accessible parking space and associated aisle should be striped with four (4) inch blue stripes.
 - c. Where a standard space is adjacent to an accessible space, abutting blue and white stripes shall be installed.
4. The applicant has provided a detail for the proposed international symbol for accessibility pavement markings that may be placed in the accessible parking space. The symbol shall be white or white with a blue background and white border with rounded corners.
5. The applicant shall include signing and/or striping details for any modifications to 12 Mile Road.
6. The applicant should include a stop (R1-1) sign at the driveway at 12 Mile Road.
7. The applicant has indicated the proposed signing on site and provided notes and details related to the proposed signing.
 - a. Single signs with nominal dimensions of 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U-channel post. Multiple signs and/or signs with nominal dimension greater than 12" x 18" shall be mounted on a galvanized 3 lb. or greater U-channel post as dictated by the weight of the proposed signs.
 - b. The applicant should indicate a bottom height of 7' from final grade for all signs installed.
 - c. The applicant has indicated that all signing shall be placed 2' from the face of the curb or edge of the nearest sidewalk to the near edge of the sign, however the sign placement on the site plan does not reflect this.
 - d. Traffic control signs shall use the FHWA Standard Alphabet series.
 - e. Traffic control signs shall have High Intensity Prismatic (HIP) sheeting to meet FHWA retroreflectivity requirements.

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

Sincerely,

AECOM



Josh A. Bocks, AICP, MBA
Senior Transportation Planner/Project Manager



Patricia Thompson, EIT
Traffic Engineer

TRAFFIC IMPACT STUDY REVIEW



AECOM
27777 Franklin Road
Southfield
MI, 48034
USA
aecom.com

Project name:
JSP18-0048 Amson-Nassar 12 Mile Building
Traffic Impact Study Review Letter

From:
AECOM

Date:
April 15, 2019

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

CC:
Sri Komaragiri, Lindsay Bell, George Melistas, Darcy
Rechtien, Hannah Smith, Kale Richardson

Memo

Subject: JSP18-0048 Amson-Nassar 12 Mile Building Traffic Impact Study Review Letter

The traffic impact study (TIS) for the Amson-Nassar 12 Mile Building was reviewed to the level of detail provided and AECOM **recommends approval** of the TIS; however, the applicant should review the comments provided below and provide an update to the City.

GENERAL COMMENTS

1. The memo will provide comments on a section-by-section basis following the format of the submitted report.

TRAFFIC COUNTS

1. Turning movement counts were collected during the AM (7 am to 9 am) and PM (4 pm to 6 pm) on October 10th at Twelve Mile and W Park Drive and on November 13th at Twelve Mile and Cabaret Drive.
 - a. The applicant should revise the wording of the paragraph to clearly indicate if the dates are respective to the intersections or peak periods.

BACKGROUND TRAFFIC SCENARIO

1. The applicant has indicated the following developments are included in the background traffic scenario.
 - a. Hino Motors
 - b. Dixon Meadows
 - c. A123
 - d. Novi Corporate Campus
 - e. Fountain View
2. A review of the trips added from existing conditions to background conditions showed that the background condition appears to include only trips generated by Novi Corporate Campus Parcel 1. The background trips included in the Novi Corporate Campus (JSP18-43) TIS analysis were used as the existing traffic conditions even though only some of those developments are active while others are still under development. Additionally, the existing traffic figure values are inconsistent with the traffic count data included in the appendix, as the count data is from the Fleis & VandenBrink TIS for JSP18-43's existing conditions. **The applicant should revise the report and existing and background traffic conditions such that they are consistent with the developments indicated as included in the body of the report.**

TRIP GENERATION

1. The applicant used land use code 710, or general office, for the office space portion of the building. The report preparer has indicated to AECOM that at the time the report was drafted, the developer did not have a tenant. There is now a single tenant for the entire building, so land use code 715, single tenant office, is recommended. This change will result in an increase in peak hour trips.
2. **The applicant should revise the report for the single tenant when addressing the other comments in this letter.**

TRIP DISTRIBUTION

1. The applicant has indicated that the AM and PM peak hour traffic distribution used by Fleis & VandenBrink was utilized to distribute the traffic generated by this site.

LEVEL OF SERVICE ANALYSIS

1. The applicant could consider revising “all approaches” to “most approaches” when an exception to the generalization is being given.
2. For the signalized intersection at Twelve Mile Road and West Park Drive, the applicant proposes the improvement of restriping West Park Drive to have a through and left turn lane and a dedicated right turn lane and provide a right turn overlap phase. The restriping and turning phase would improve operations at the intersection from LOS F to LOS E during the PM peak hour.
3. For the signalized intersection at Twelve Mile Road and Cabaret Drive, the applicant proposes the improvement of running the signal with the PM peak timing plan, rather than flash operations. This would improve operations for the southbound approach from LOS F to LOS D, while Eastbound Twelve Mile Road would remain at LOS A and Northbound Cabaret Drive would change from LOS C with approximately 17 seconds of delay to LOS D, with approximately 40 seconds of delay.
4. The unsignalized site driveway is anticipated to operate at LOS F for both the AM and PM peak periods.
 - a. The site is served by a single driveway, which is wide enough for 2 lanes of traffic, one for inbound vehicles and one for exiting vehicles. **The applicant could consider providing a second driveway or widening the existing driveway to allow for right turners to queue separately from left turners to improve access through the single driveway.**

CONCLUSIONS AND RECOMMENDATIONS

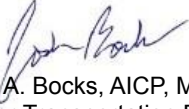
1. In summary, the impacts of the development (with or without the proposed mitigation measures) are not anticipated to degrade intersection levels of services beyond those under existing conditions during either the AM or PM peak periods.
2. The applicant should coordinate with the City of Novi and the Road Commission for Oakland County regarding the proposed mitigation measures and determine if/what should be further considered to move forward with implementing.
3. The applicant should review the remaining comments contained herein and provide a revised study to the City.

Memo

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

Sincerely,

AECOM



Josh A. Bocks, AICP, MBA
Senior Transportation Planner/Project Manager



Patricia A. Thompson, EIT
Traffic Engineer

FAÇADE REVIEW



May 3, 2019

Review Status Summary:
Approved, full compliance

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

Re: FACADE ORDINANCE – Revised Preliminary Site Plan
Amson-Nassar Spec. Building, JSP18-48
 Façade Region: 1, Zoning District: I-1

Dear Ms. McBeth;

The following is the Façade Review for Preliminary Site Plan Approval of the above referenced project. This review is based on the Biddison Architecture & Design, dated 4/25/19. The percentages of materials proposed for each façade are as shown below. Materials that are in violation of the Ordinance, if any, are shown on bold. The sample board required by Section 5.15.4.D was not provided at the time of this review.

	North (Front)	South	West	East	Façade Ordinance Section 5.15 Maximum (Minimum)
Brick	90%	84%	87%	87%	100%
Flat Metal Panels (Canopy)	2%	0%	0%	0%	50%
Spandrel Glass	2%	0%	1%	1%	50%
Vertical Flat Metal Panels (Roof Screens)	6%	6%	2%	2%	50%
Split Faced CMU	0%	10%	10%	10%	10%

Recommendation - The applicant has revised the design in response to the review comments offered in our letter dated 4/14/19. All façade materials are now in full compliance with the Façade Ordinance. The discrepancies on sheet A.201 between the façade material percentage chart and the drawing notes and graphic patterns should be corrected. A sample board as required by Section 5.15.4.D of the Ordinance should be provided not less than 5 days prior to the Planning Commission meeting.

The dumpster enclosure must also comply with the Façade Ordinance. The detail on sheet 15 indicates “Architectural Masonry to Match Block Proposed for Building”. The dumpster should have 30% minimum brick, the percentage of Split Faced CMU must not exceed 10%, and all materials should match those used on primary building. The dumpster detail should be revised accordingly.

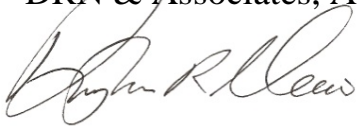
Notes to the Applicant:

1. Roof equipment screens are indicated only on the office portion of the building. It should be noted that any roof equipment on the shop area would also require screening from all vantage points both on and off site.

2. Inspections – The Façade Ordinance requires inspection(s) for all projects. It is the applicant’s responsibility to request the inspection of each façade material at the appropriate time (before installation). In this case the materials should match the adjacent existing materials with respect to color and texture. Inspections may be requested using the Novi Building Department’s Online Inspection Portal with the following link. Please click on “Click here to Request an Inspection” under “Contractors”, then click “Façade”.

<http://www.cityofnovi.org/Services/CommDev/OnlineInspectionPortal.asp>.

Sincerely,
DRN & Associates, Architects PC



Douglas R. Necci, AIA



April 14, 2019

Review Status Summary:
Not Approved, Section 9 Waiver Not Recommended

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

Re: FACADE ORDINANCE – Revised Preliminary Site Plan
Amson-Nassar Spec. Building, JSP18-48
 Façade Region: 1, Zoning District: I-1

Dear Ms. McBeth;

The following is the Façade Review for Preliminary Site Plan Approval of the above referenced project based on the drawings prepared by Biddison Architecture & Design, dated 3/29/19. The percentages of materials proposed for each façade are as shown below. Materials that are in violation of the Ordinance, if any, are shown on bold. The sample board required by Section 5.15.4.D was not provided at the time of this review.

	North (Front)	South	West	East	Façade Ordinance Section 2520 Maximum
Brick	90%	0%	57%	57%	100%
Flat Metal Panels (Canopy)	2%	0%	0%	0%	50%
Spandrel Glass	2%	0%	1%	1%	50%
Corrugated Metal Panels (Roof Screen)	6%	6%	2%	2%	0%
Split Faced CMU	0%	94%	40%	40%	10%

As shown above the minimum percentage of Brick is not provided on the south façade and the percentage of Split Faced CMU and Corrugated Metal Panels exceeds the maximum amount allowed on the south, west and east facades.

Recommendation – We are unable to recommend approval at this time due to the significant deviations from the Façade Ordinance, most notably the overage of Split Faced CMU on the south, west and east facades. It is recommended that the percentage of Split Faced CMU be reduced to more closely match the Ordinance. In this case the Corrugated Metal Panels are used only on roof equipment screens and would qualify for a Section 9 Waiver based on past precedent. Roof equipment screens are indicated only on the office portion of the building. It should be noted that any roof equipment on the shop are would also require screening from all vantage points both on and off site. A sample board as required by Section 5.15.4.D of the Ordinance should be provided at the time of the next submittal.

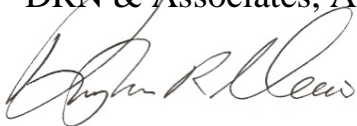
The dumpster enclosure must also comply with the Façade Ordinance. The detail on sheet 15 indicates “Architectural Masonry to Match Block Proposed for Building”. The dumpster should have 30% minimum brick, the percentage of Split Faced CMU must not exceed 10%, and all materials should match those used on primary building. The dumpster detail should be revised accordingly.

Notes to the Applicant:

1. Inspections – The Façade Ordinance requires inspection(s) for all projects. It is the applicant’s responsibility to request the inspection of each façade material at the appropriate time (before installation). In this case the materials should match the adjacent existing materials with respect to color and texture. Inspections may be requested using the Novi Building Department’s Online Inspection Portal with the following link. Please click on “Click here to Request an Inspection” under “Contractors”, then click “Façade”.

<http://www.cityofnovi.org/Services/CommDev/OnlineInspectionPortal.asp>.

Sincerely,
DRN & Associates, Architects PC



Douglas R. Necci, AIA

FIRE REVIEW



March 29, 2019

TO: Barbara McBeth- City Planner
Sri Ravali Komaragiri- Plan Review Center
Lindsay Bell-Plan Review Center
Hannah Smith-Planning Assistant

CITY COUNCIL

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Bob Gatt

Mayor Pro Tem
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Chief of Police**
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Director of EMS/Fire Operations
Jeffery R. Johnson

Assistant Chief of Police
Erick W. Zinser

Assistant Chief of Police
Scott R. Baetens

RE: Amson-Nassar

PSP#19-0053

JSP18-48

PSP#19-0023

PSP#18-0149

Project Description:

Build a two-story 30,000 S.Q.F.T. office building with an attached single story 60,000 S.Q.F.T. shop off of Twelve Mile Road.

Comments:

- **All** fire hydrants **MUST** be installed and operational prior to any building construction beginning.
- **CORRECTED 3/29/19** - Water-mains **MUST** be put on the plans for review.
- **CORRECTED 2/13/19 KSP**-Fire hydrant spacing is no greater than 300' from fire hydrant to fire hydrant. **Novi City Ordinance 11-68(F)(1)c.**
- **CORRECTED 2/13/19 KSP**-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. **Novi City Ordinance 11-68(a)(9).**
- **CORRECTED 2/13/19 KSP**-The distribution system in all developments requiring more than eight hundred (800) feet of water main shall have a minimum of two (2) connections to a source of supply and shall be a looped system. **Novi City Ordinance 11-68(a).**
- **CORRECTED 2/13/19 KSP**-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.
- **CORRECTED 2/13/19 KSP**-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. **IFC 912.3.**

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

cityofnovi.org

- **NOT CORRECTED or RECEIVED as of 3/29/19** - 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.
- **CORRECTED 3/29/19** - Turning radius for the driveway coming from the west in front of the structure turning to the north doesn't meet city standards. *Fire apparatus access drives to and from buildings through parking lots shall have a minimum fifty (50) feet outside turning radius and designed to support a minimum of thirty-five (35) tons. (D.C.S. Sec 11-239(b)(5))*
- **CHANGE MADE FROM PREVIOUS REVIEWS and NOW "NOT ACCEPTABLE" as of 3/29/19.** The secondary access driveway has been removed on this "revised" preliminary site plan and IS REQUIRED for final approval.

Recommendation:

This revised preliminary site plan is **NOT ACCEPTABLE** at this time. The above items must be addressed. The secondary emergency access was removed from previous reviews and is required. The Haz-Chem survey form can be submitted during construction phases.

Sincerely,

Andrew Copeland – Acting Fire Marshal
City of Novi Fire Department

cc: file

APPLICANT RESPONSE LETTER

April 25, 2019

Lindsay Bell - Planner
City of Novi – Planning Department
47175 10 Mile Road
Novi, MI 48375

For: Amson-Nassar Spec Building
Parcel ID: 22-16-226-003

Dear Lindsay:

Please find this letter in response to the April 17, 2019 review package. The responses outlined in this letter will be included as part of all future submittals for this site as applicable.

We will incorporate all of the comments that were included in the Plan Review Center Report as part of the final site plan submittal package and will include the following:

Plan Review Center Report dated January 16, 2019:

2. *Loading and Screening:* Additional screening will be provided to screen the overhead truck loading/unloading area from the freeway.
4. This site plan submittal is the result of extensive revisions and design changes from the previous site layout. The site layout as proposed provides a substantial reduction in woodlands removal from the previous design.
5. The note on Sheet 8 will be revised to reflect the Road Commission for Oakland County and City of Novi ROW permits are required.
6. The lighting statistics chart will be completed as part of the final site plan submittal.
8. e) Please refer to the response from the project architect that addresses the building façade changes
- f) A secondary emergency access will be provided as part of the final site plan submittal package. A copy of the revised plan which includes the secondary emergency access has previously been submitted to the fire marshal for review.

Plan Review Chart April 19, 2019:

- Uses Permitted: The building occupant will be a technology company that utilizes both office and warehouse areas as part of their daily business.
- Parking Setback Screening: See the separate response letter from Allen Design.
- Loading and Unloading Screening: See the separate response letter from Allen Design.
- Required Parking Calculation: The updated parking calculations for the building will be provided on the final site plan submittal.

- Number of Parking Spaces: The floor plans and site plans indicating usable floor area will be submitted as part of the final site plan approval package.
- Dumpster Enclosure: The dumpster enclosure detail will be provided as part of the final site plan submittal package.
- Economic Impact:
- Parking Space Dimensions and Maneuvering Lanes: The grading plan has been revised to reflect the 4" high curb at the head of all 17' parking spaces. See sheet 6.
- End Islands: Dimensions have been added to all end islands. See sheet 5.
- Barrier Free Space Dimensions: The barrier free parking spaces have been revised and dimensioned. See sheet 5.
- Barrier Free Signs: The barrier free sign locations are indicated on sheet 5 with the sign detail being on sheet 16.
- Minimum Number of Bicycle Parking: The bicycle parking space calculations and bicycle parking locations are shown on sheet 5.
- Bicycle Parking General requirements: The bicycle parking space and bike rack details with dimensions are shown on sheet 16.
- Bicycle Parking Lot Layout: The bicycle parking layout is shown on the detail on sheet 16.
- Economic Impact: See the economic letter attached.
- Street Addressing: We will apply for lot addressing prior to stamping set approval.
- Building Lighting: The building light fixtures will be shown on the final building elevations.
- Lighting Plan: The lighting hours of operation will be included as part of the final site plan submittal package.

Engineering Review: (dated April 15, 2019)

Kate Richardson, EIT City of Novi

Water Main:

10. Profiles of all water main lines 8" and larger will be indicated as part of the stamping sets.

Sanitary Sewer:

13. The 20' wide sanitary sewer easement from the public road right of way to the monitoring manhole will be shown as part of the final site plan submittal package.
16. The note on the sanitary sewer sheet 8 will be revised to indicate that the sanitary leads shall be buried at least 5' deep where under the influence of pavement.

Storm Sewer:

17. A storm sewer casting schedule will be included on the final site plan submittal.
18. All roof conductors will be shown on the final site plan submittal.
19. Storm sewer profiles will be included as part of the final site plan submittal.

Storm Water Management Plan:

22. We believe the storm water management plan follows the Chapter 5 requirements. If necessary, we will revise the plan to provide a 25' buffer area adjacent to the driveways.

Paving & Grading:

24. The concrete dumpster pad detail pavement section will be revised as part of the final site plan submittal package.

Off-Site Easements

28. There is an existing easement over the off-site sanitary sewer. A copy of the off-site easement will be provided to staff as part of the final site plan submittal package.

Final Site Plan Submittal Items:

29. A cost opinion will be provided as part of the final site plan submittal package.

Please see the attached response letter from Allen Design that addresses the items raised by the landscaping review letter.

AECOM Review: (dated April 15, 2019)

We will incorporate all of the comments into the final site plan submittal package.

AECOM Traffic Impact Study Review: (dated April 15, 2019)

We will revise the traffic impact study to incorporate all review comments as part of the final site plan submittal package.

DRN & Associates Architects Façade Review: (dated April 14, 2019)

Please see the attached response letter from Biddison Architecture & Design that addresses the items raised by the façade consultants review letter.

City of Novi Fire Marshal Review: (dated April 29, 2019)

A hazardous chemical survey will be submitted to the Planning & Community Development Department during the construction phases of the building and as the information becomes available from the building occupant.

Please feel free to contact our office with any questions or concerns, regarding the response letter or updated plans.

Sincerely,

A handwritten signature in blue ink that reads "Daniel J. LeClair". The signature is written in a cursive style and is positioned above the typed name.

Daniel LeClair, P.E.
GreenTech Engineering, Inc.

April 22, 2019
Mr. Rick Meader, Landscape Architect
City of Novi Community Development
45175 West 10 Mile
Novi, MI 48375

RE: Amson Nassar Building

Dear Mr. Meader:

Below are our landscape review responses to your review dated April 3, 2019:

Landscape Comments:

- The tree protection fencing will be added to the demolition plan.
- The open area along the western property line is dominated by invasive species. This area will be cleared and planted with replacement trees.
- The corner islands adjacent to the building are a minimum 200 s.f..
- Native seed mixes will be added to the plans.
- An irrigation plan will be provided for electronic stamping sets.
- Additional snow deposit areas will be identified.
- Foundation plantings will be provided at the next submission.
- The retaining wall details will be provided by others.
- Hydrants and light poles will be adjusted to avoid conflicts with trees.
- Utility boxes are not known at this time. A note on Sheet L-1 states the boxes will be screened per the detail on Sheet L-2.
- Phragmites is not present on this site. A note will be added stating this.
- A multi-stem planting detail will be added.

Woodland Comments:

1. We anticipate additional tree preservation with the next submission.
2. A woodland permit will be required. Species shown on the plan conform to the Woodland Replacement Tree Chart.
3. The site plan has been adjusted providing additional preservation. The initial plan called for 432 trees to be removed. The current plan proposes the removal of 399 trees. We anticipate further reducing the woodland impact and will discuss with the project engineer the possibility of underground detention.
4. A financial guarantee will be provided for the proposed on-site woodland replacement trees.
5. Noted.


April 22, 2019

Page 2

6. Noted.
7. Conservation easements will be provided for Final Site Plan.
8. Replacement trees are shown a minimum 10' from utilities and are outside of utility easements.

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

Sincerely,

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

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

April 25, 2019

City of Novi
Community Development Department
45175 West Ten Mile Road
Novi, Michigan 48375

Attn: Lindsay Bell
Planner

Re: JSP 18-48 Amson-Nassar Spec Building
Response to Planning review for Site Plan Review

Dear Ms. Bell,

We have revised the Site Plan Package for the referenced property to reflect the review comments and recommendations noted in your April 17th, 2019 Site Plan Review. We offer the following comments in response to the items listed in that review:

Planning Review Chart

1. Final floor Plan uses for GLFS can be provided at time of a proposed Tenant is known.
2. Refer to sheet SP-102 for the requested Dumpster Enclosure Detail.
3. Please refer to the Revised Elevation Sheet A-201 showing the proposed wall mounted lighting locations.

Façade Review Chart

1. Refer to the revised Elevation sheet A-201 for the revised elevation materials and charts to meet the city requirements as required.

Engineering Review

1. Refer to attached Response Letter by Green Tech Engineering.

Utilities

1. Refer to attached Response Letter by Green Tech Engineering.

Paving & Grading

1. Refer to attached Response Letter by Green Tech Engineering.

Storm Water Management Plan

1. Refer to attached Response Letter by Green Tech Engineering.

Offsite Easements

1. Refer to attached Response Letter by Green Tech Engineering.

Landscape Review

1. Refer to attached Response Letter Allen Design.

Traffic Review

1. Refer to attached Response Letter by Green Tech Engineering.

Fire Department Review

1. Refer to attached Response Letter by Green Tech Engineering.

Please contact our office if you have any additional questions or need any additional information at this time.

Regards,

Kevin Biddison AIA
Biddison Architecture



April 25, 2019

Lindsay Bell
Planner
City of Novi – Planning Department
45175 10 Mile Road
Novi, MI 48375

RE: 45833 W 12 Mile Road

Lindsey,

The total cost for the proposed building and site improvements for the property located at 45833 W 12 Mile Road is \$9,900,000.

The number of anticipated jobs created during construction is 200, and the number of anticipated jobs after the building is completed is 175.

Please feel free to contact our office with any further questions.

Thank you,



Oleg Amcheslavsky
Owner
Amson Nassar Development

TRAFFIC IMPACT STUDY



ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention.™

Memorandum

To: Daniel J. LeClair, PE, PS
GreenTech Engineering, Inc.

From: Michael J. Labadie, PE
Senior Project Manager

Date: March 18, 2019

RE: Proposed Office/Research Mixed-Use Development
Traffic Impact Assessment, City of Novi, MI

ROWE Professional Services Company has completed our traffic impact assessment related to the proposed office/research and development center to be located on the south side of Twelve Mile Road east of W. Park Drive in the City of Novi, Oakland County. The current site plan (included in the materials attached to this memorandum) indicates 30,000 square feet of general office space and 60,000 square feet of research and development center space. This traffic impact assessment has been completed in accordance with the requirements specified by the City of Novi and the Road Commission for Oakland County (RCOC).

Traffic Counts

Previously collected turning movement traffic counts, collected during the weekday AM (7 to 9 a.m.) and PM (4 to 6 p.m.) peak periods on October 10th and November 13, 2018 at the intersections of Twelve Mile Road with W. Park Drive and Cabaret Drive, respectively. The existing turning movement traffic counts are shown in Figure 2 attached to this memorandum.

Background Traffic Scenario

The development is anticipated to be completed and opened in 2020. Historical traffic volume data, as documented in Fleis & VandenBrink's approved Novi Corporate Campus Mixed-use Development Traffic Impact Study dated October 23, 2018, as well as in our previous traffic report for the Fountain View Development dated January 14, 2019, indicates that Average Annual Daily Traffic (AADT) volumes for Twelve Mile Road have been stagnant. Due to this, a background growth rate was not applied for the analysis of background traffic conditions without the proposed development.

However, the following developments were identified in the above referenced reports and included in the background traffic forecast:

- Hino Motors – under construction.
 - 124,418-square-foot two-story building to serve as headquarters for Hino Motors USA.
- Dixon Meadows (on Dixon Drive) – under construction.
 - 90-unit single-family development.
- A123 – under construction.
 - A 128,936-square-foot office/lab space and a 53,469-square-foot assembly building to serve as headquarters for A123 Systems.

- Novi Corporate Campus
 - 37,020 square-foot office and 56,300 square-foot research center.
- Fountain View
 - 40,240 square-foot medical office development.

The background traffic volumes are shown in Figure 3 attached to this memorandum, and the Fleis & VandenBrink and ROWE reports with the background development and trip distribution information are included in the appendix materials.

Trip Generation

Using the information and methodologies specified in the latest version of *Trip Generation (10th Edition)* published by the Institute of Transportation Engineers (ITE), ROWE forecast the weekday AM and PM peak hour trips associated with the proposed office/research center development. The results of the trip generation forecasts for the proposed site are provided below in Table 1.

Table 1
ITE Trip Generation for Proposed Office/Research Center Development

Land Use	Land Use Code	Size (sq. ft.)	AM Peak Hour			PM Peak Hour			Week Day
			In	Out	Total	In	Out	Total	
General Office	710	30,000	47	8	55	6	30	36	330
Research and Development Center	760	60,000	19	6	25	4	25	29	818
TOTAL TRIPS			66	14	80	10	55	65	1,148

Trip Distribution

The existing traffic volumes, as outlined in the Fleis & VandenBrink's approved Novi Corporate Campus Mixed-use Development Traffic Impact Study dated October 23, 2018, were used to develop a trip distribution model for the AM and PM peak hours for traffic generated by the proposed development. The existing traffic patterns indicate the following probable distribution for the proposed development:

AM Peak Hour

20% to and from the east (Twelve Mile Road)
46% to and from the west (Twelve Mile Road)
34% to and from the north (W. Park Drive)

PM Peak Hour

31% to and from the east (Twelve Mile Road)
50% to and from the west (Twelve Mile Road)
19% to and from the north (W. Park Drive)

The proposed trip distribution for the site is shown in Figure 4 attached to this memorandum. The background traffic volumes were combined with the site generated traffic volumes to obtain the total future traffic volumes, which are shown in Figure 5 attached to this memorandum.

Level of Service Analysis

Level of service (LOS) analyses for existing and background (no build) conditions for the AM and PM peak hours was performed for the intersections of Twelve Mile Road with W. Park Drive and Cabaret Drive. The proposed site driveway intersection was analyzed under total future conditions.

According to the most recent edition (6th Edition) of the Highway Capacity Manual, level of service is a qualitative measure describing operational conditions of a traffic stream or intersection. Level of service ranges from A to F, with LOS A being the best. LOS D is generally considered to be acceptable. Tables 2

and 3 present the criteria for defining the various levels of service for unsignalized and signalized intersections, respectively.

The operational analysis of the intersection of eastbound Twelve Mile Road and Cabaret Drive was performed utilizing 2000 HCM methodology, since Twelve Mile Road is a boulevard at this location and the HCM 6th Edition does not support analysis of one-way approaches at intersections.

Table 2
Level of Service Criteria (Unsignalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤10
B	>10 and ≤ 15
C	>15 and ≤ 25
D	>25 and ≤ 35
E	>35 and ≤ 50
F	> 50

Note: LOS “D” is considered acceptable in urban/suburban areas.

Table 3
Level of Service Criteria (Signalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Note: LOS “D” is considered acceptable in urban/suburban areas.

The results of the level of service analyses for the intersections listed above are summarized in Tables 4 through 8.

Signalized Intersection of Twelve Mile Road and W. Park Drive

The intersection of Twelve Mile Road and W. Park Drive is part of the RCOG SCATS system, which continually monitors traffic and adjusts signal timing depending on demand, so the intersection continually undergoes an optimization process and cannot be further optimized. The operational results for the Existing conditions represent the default or “starting” timings provided in the controller, while the background, background with improvement, and total future conditions represent the operational results possible under forecast demand conditions and balancing of vehicle delays on all approaches. Following is a summary of our operational review for the intersection.

The results of the level of service analysis for the signalized intersection of Twelve Mile Road and W. Park Drive indicate that, under existing conditions, all approaches to the intersection operate at an LOS C or better during the AM peak hour and at an LOS D or better during the PM peak hour, except for the southbound approach which operates at an LOS E during the AM peak period and at an LOS F during the PM peak hour. The overall intersection operates at an LOS C during the AM peak hour and at an LOS F during the PM peak hour.

With the addition of background traffic and accounting for possible SCATS optimization of the intersection signal timing, all approaches to the intersection would operate at an LOS D or better during both peak periods, but the southbound approach would continue to operate at an LOS F during the PM peak hour. The overall intersection would continue to operate at an LOS C during the AM peak hour and at an LOS F during the PM peak hour.

With the background improvement of restriping the southbound approach to a shared left-through lane and a right-turn only lane, providing a right-turn overlap phase for the southbound approach, and SCATS optimization of the traffic signal timing, all approaches to the intersection would operate at an LOS D or better during both peak periods, except for the southbound approach which would operate at an LOS E during the PM peak period. The overall intersection would continue to operate at an LOS C during the AM peak period and would operate at an LOS E during the PM peak period.

With the addition of site generated traffic, all approaches to the intersection would operate at an LOS D or better during both the AM and PM peak hours, except for the westbound and southbound approaches, which would operate at an LOS E. The overall intersection would operate at an LOS C during the AM peak hour and at an LOS E during the PM peak hour.

Due to geometric and right-of-way constraints at the intersection, additional geometric improvements are not practical, since they would require roadway widenings adjacent to fully developed properties. Additionally, the intersection improvements reviewed here would indicate a signification reduction in vehicle delays.

The operational results for the intersection of Twelve Mile Road and W. Park Drive are presented in Tables 4 and 5.

Table 4
AM Peak Hour
Level of Service Analysis for Twelve Mile Road and W. Park Drive

Approach	2019 Existing¹	2020 Background²	2020 Background w/ Imp.³	2020 Total Future⁴
Eastbound Twelve Mile Road	B (16.0)	B (18.5)	B (18.5)	C (20.4)
Westbound Twelve Mile Road	C (20.4)	C (22.8)	C (22.8)	C (24.6)
Northbound Medical Office Driveway	C (24.4)	C (22.3)	C (22.3)	C (21.0)
Southbound W. Park Drive	E (62.9)	D (54.6)	D (52.5)	D (50.1)
Overall Intersection	C (32.4)	C (31.3)	C (30.6)	C (31.1)

(XX.X) Average seconds of delay per vehicle.

1. Operational results represent existing splits provided in timing permit.
2. Operational results represent SCATS optimization.
3. Consists of restriping the southbound approach to a left-through and right-turn only lanes, providing a right-turn overlap phase for the southbound approach, and SCATS optimization.
4. Total future condition assumes background improvements and SCATS optimization.

Table 5
PM Peak Hour
Level of Service Analysis for Twelve Mile Road and W. Park Drive

Approach	2019 Existing¹	2020 Background²	2020 Background w/ Imp.³	2020 Total Future⁴
Eastbound Twelve Mile Road	C (28.4)	D (42.2)	D (42.2)	D (42.0)
Westbound Twelve Mile Road	C (34.4)	D (52.7)	D (52.7)	E (60.0)
Northbound Medical Office Driveway	D (41.2)	D (40.1)	D (40.1)	D (40.1)
Southbound W. Park Drive	F (217.5)	F (157.8)	E (78.3)	E (79.0)
Overall Intersection	F (99.4)	F (87.6)	E (59.3)	E (62.4)

(XX.X) Average seconds of delay per vehicle.

1. Operational results represent existing splits provided in timing permit.
2. Operational results represent SCATS optimization.
3. Consists of restriping the southbound approach to a left-through and right-turn only lanes, providing a right-turn overlap phase for the southbound approach, and SCATS optimization.
4. Total future condition assumes background improvements and SCATS optimization.

Signalized Intersection of Twelve Mile Road and Cabaret Drive

The intersection of Twelve Mile Road and Cabaret Drive is part of the RCO SCATS system, which continually monitors traffic and adjusts signal timing depending on demand, so the intersection continually undergoes an optimization process, and cannot be further optimized. Currently, this intersection operates in flash mode during the AM peak period, so the operational analysis for this time period was performed using the unsignalized methodology. Below is a summary of our operational review for the intersection.

The results of the level of service analysis for the signalized intersection of Twelve Mile Road and Cabaret Drive indicate that, under existing conditions, all approaches to the intersection operate at an LOS D or better during both the AM and PM peak hours, except for the southbound approach, which operates at an LOS F during the AM peak period. The overall intersection operates at an LOS C during the PM peak hour (overall intersection operational results are not provided for in the methodology for two-way stop-controlled intersections).

The intersection would continue to operate in a manner like existing conditions with the addition of background traffic. With inclusion of the recommended background improvement of operating the traffic signal during the AM peak period with the timing plan utilized during the PM peak period, all approaches to the intersection would operate at an LOS D or better during the AM peak period. The overall intersection would operate at an LOS B during the AM peak period.

The intersection would operate in a manner like background (PM peak period) and background with improvements (AM peak period) with the addition of site generated traffic. Therefore, the proposed development would have a minimal impact on the operation of this intersection.

The operational results for the intersection of Twelve Mile Road and Cabaret Drive are presented in Tables 6 and 7.

Table 6
AM Peak Hour
Level of Service Analysis for Twelve Mile Road and Cabaret Drive

Approach	2019 Existing	2020 Background	2020 Background w/ Imp.¹	2020 Total Future¹
Eastbound Twelve Mile Road	A (-)	A (-)	A (6.1)	A (6.1)
Northbound Cabaret Drive	C (16.3)	C (17.0)	D (40.1)	D (40.2)
Southbound Crossover	F (114.5)	F (142.0)	D (42.8)	D (42.9)
Overall Intersection			B (14.2)	B (14.1)²

(XX.X) Average seconds of delay per vehicle.

(-) Approach is unopposed and experiences no delay.

1. Consists of operating the traffic signal at the intersection with the PM peak period signal timings.
2. Reduction of overall delay at intersection by a tenth of a second the result of rounding in analysis software.

Table 7
PM Peak Hour
Level of Service Analysis for Twelve Mile Road and Cabaret Drive

Approach	2019 Existing	2020 Background¹	2020 Total Future¹
Eastbound Twelve Mile Road	B (12.0)	B (10.8)	B (11.0)
Northbound Cabaret Drive	D (51.2)	D (51.8)	D (52.0)
Southbound Crossover	D (35.0)	C (34.8)	C (34.6)
Overall Intersection	C (23.8)	C (23.2)	C (23.2)

(XX.X) Average seconds of delay per vehicle.

1. Increase in volumes at intersection result in improved efficiency of signal timings, resulting in minor reduction in overall vehicle delays.

Unsignalized Intersection of Twelve Mile Road and the Site Driveway

The site driveway will be located on the south side of Twelve Mile Road approximately 1,100 feet west of Taft Road. The results of the level of service analysis for this intersection indicate that, under future traffic conditions, the site driveway would operate at an LOS F during both the AM and PM peak periods. The Twelve Mile Road approaches would operate at an LOS A during both peak periods.

The RCOC requirements for right-turn deceleration lanes and left-turn by-pass lanes at driveways were evaluated for the site driveway. The Average Daily Traffic (ADT) on Twelve Mile Road at the location of the proposed site driveway would be approximately 17,350 vehicles per day, based on information in the report previously referenced in this memorandum. The peak hour left-turns into the site would be 13 and the peak hour right-turns would be 53. Based on this, only a right-turn taper is required at the site driveway, as indicated on the current site plan. The RCOC turn lane warrant analysis sheets are included in the appendix materials attached to this memorandum.

The operational results for the intersection of Twelve Mile Road and the site driveway are presented in Table 8.

Table 8
Level of Service Analysis for Twelve Mile Road and the Site Driveway

Approach	2020 Future AM	2020 Future PM
Eastbound Twelve Mile Road	A (-)	A (-)
Westbound Twelve Mile Road	B (13.1) ¹	A (9.7) ¹
Northbound Site Driveway	F (61.1)	F (163.2)

(XX.X) Average seconds of delay per vehicle.

(-) Approach is unopposed and experiences no delay.

1. Operational results for left-turn movements; through movements are unopposed and experience minimal delays.

Conclusions and Recommendations

The proposed office/research center development in the City of Novi consists of 30,000 square feet of office space and 60,000 square feet of research and development center space. The proposed development will have access to Twelve Mile Road via a single site driveway.

The proposed development is forecast to generate 80 trips during the AM peak hour (66 inbound and 14 outbound from the site) and 65 trips during the PM peak hour (10 inbound and 55 outbound from the site).

An operational analysis was performed for the existing, background, and total future conditions for the signalized intersections of Twelve Mile Road with W. Park Drive and Cabaret Drive. To reduce existing and forecast vehicle delays at the intersection of Twelve Mile Road and W. Park Drive, it is recommended that the southbound approach to the intersection be restriped to provide a shared left-through lane and a right-turn only lane and provide a right-turn overlap phase for the southbound approach. At the intersection of Twelve Mile Road and Cabaret Drive, it is recommended that the signal not operate in flash mode during the AM peak period.

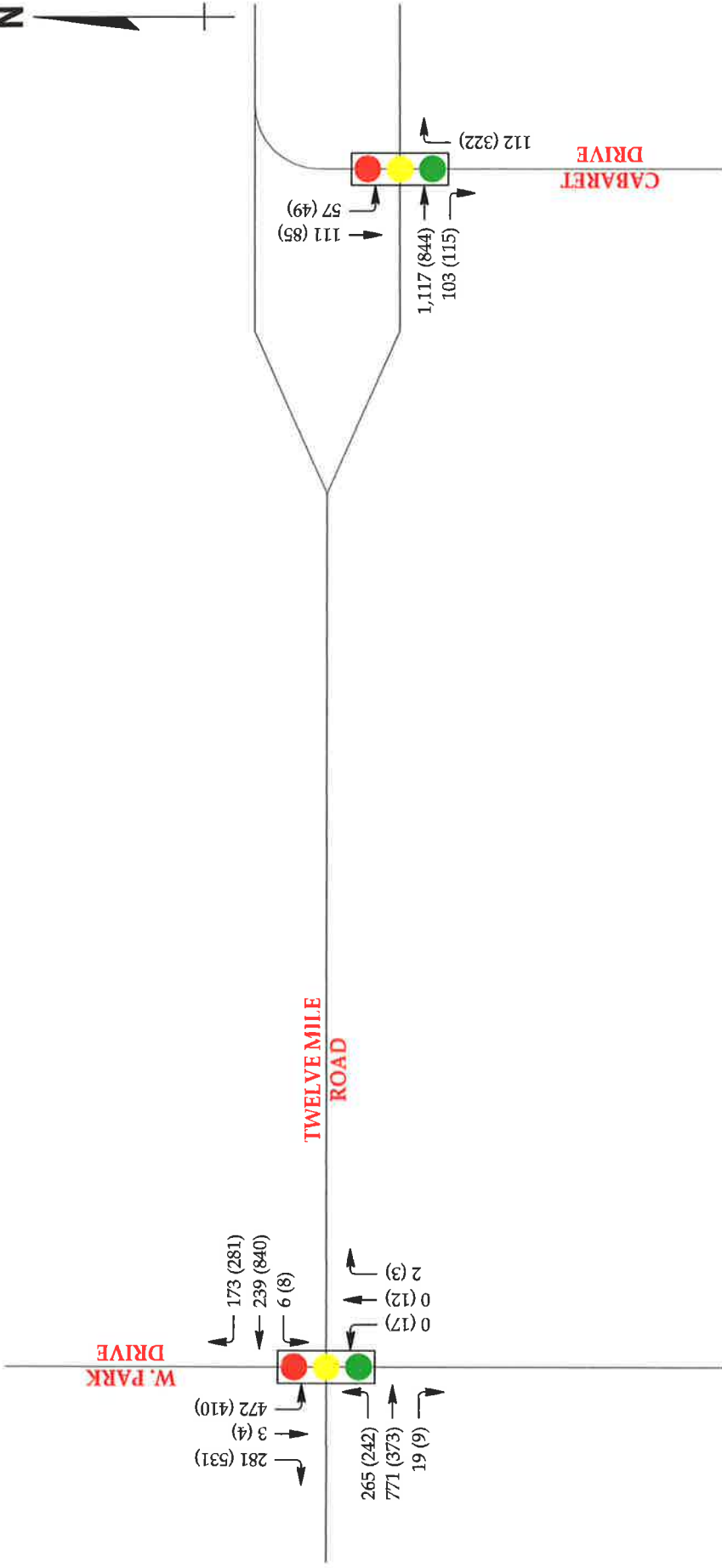
The site driveway approach would operate poorly during both peak periods; however, forecast volumes would not be enough to warrant signalization, and geometric improvements would not noticeably improve operations at the intersection. An evaluation of RCOC turn lane warrants indicated that only a right-turn taper is warranted, and currently shown on the site plan.

Attachments

\\sem\cad\Projects\19F0014\Docs\Novi_Research_TIA_Letter mjl.docx

SITE PLAN

REPORT FIGURES

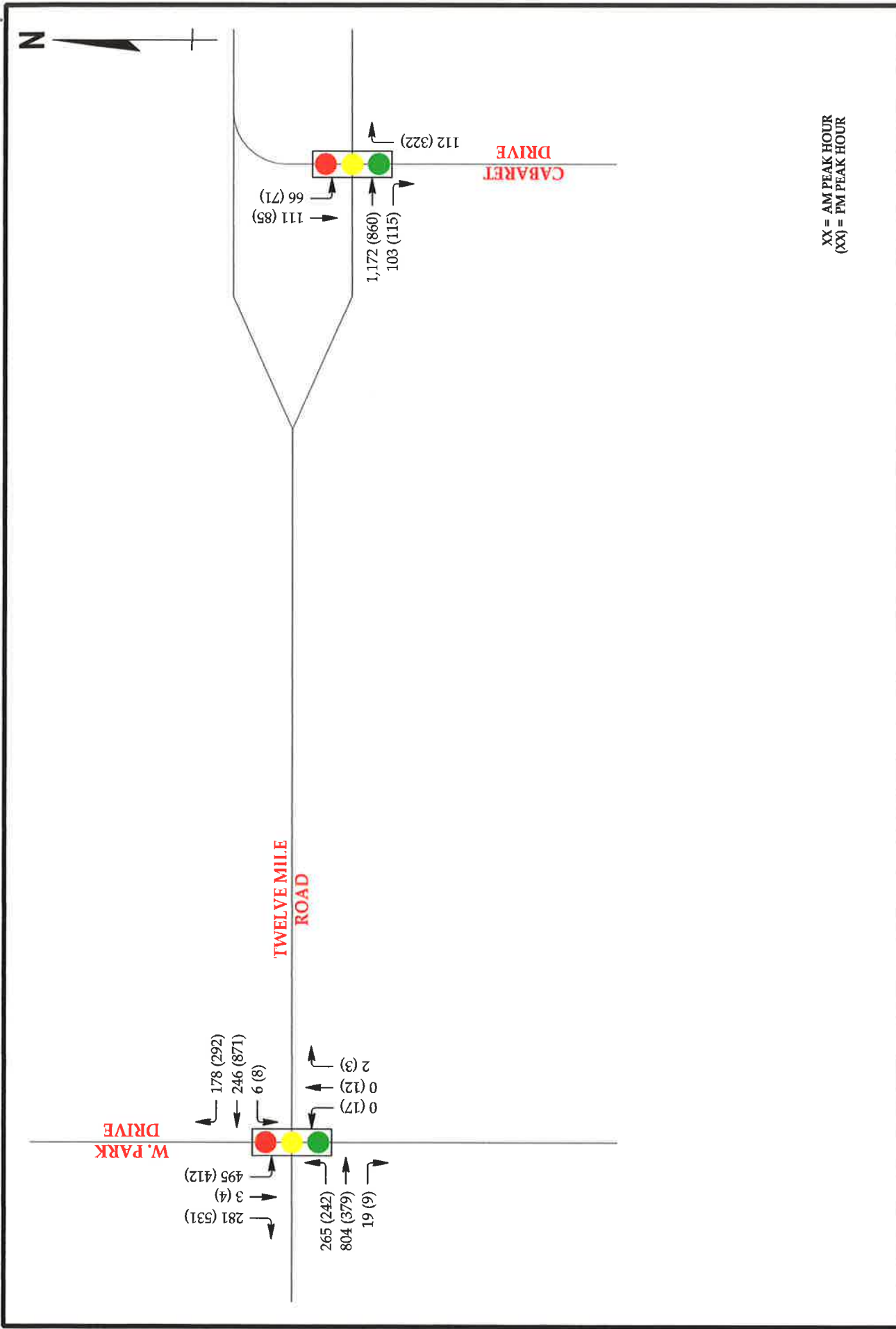


XX = AM PEAK HOUR
(XX) = PM PEAK HOUR

2019 EXISTING AM (PM) PEAK HOUR TRAFFIC VOLUMES

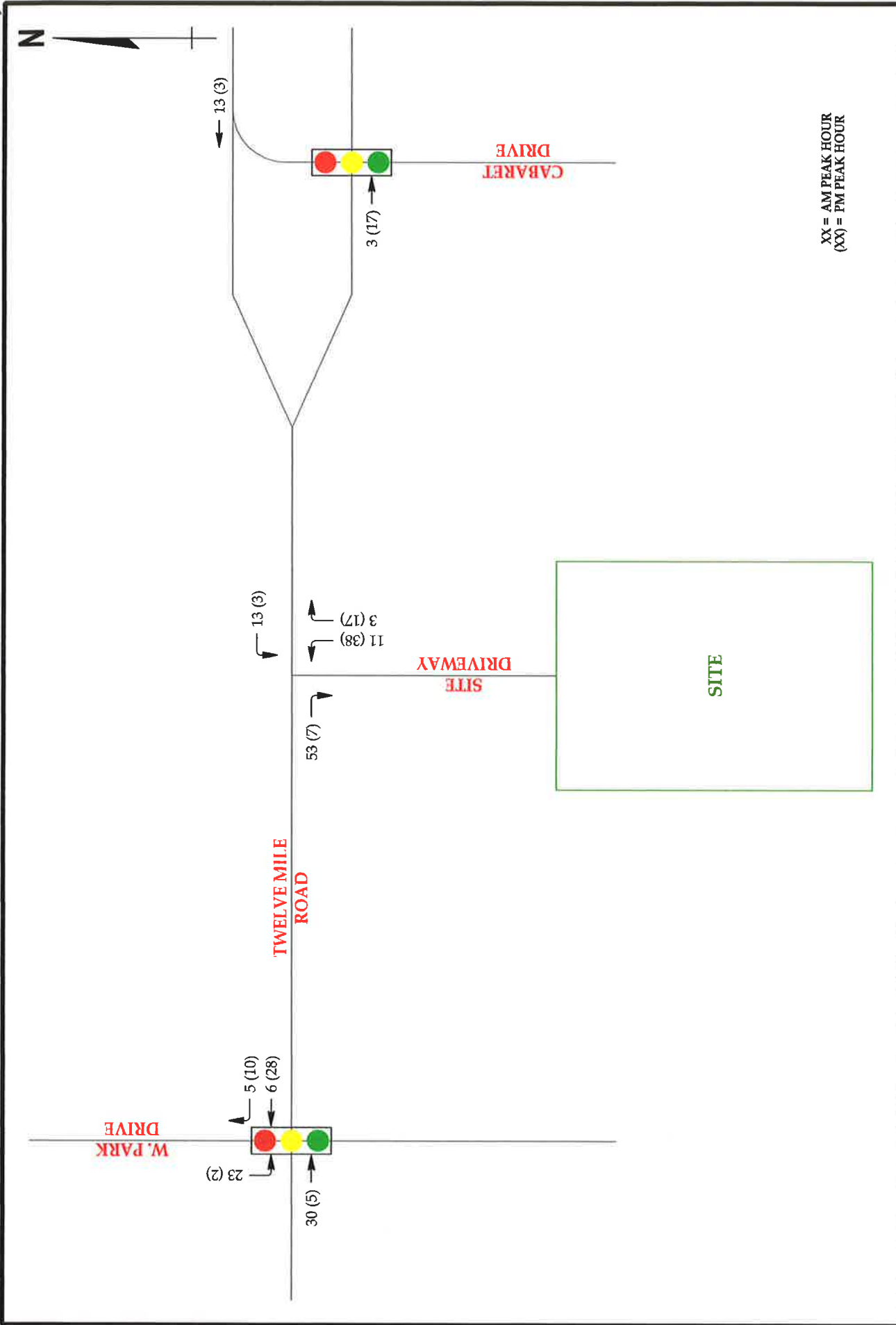


FIGURE 2

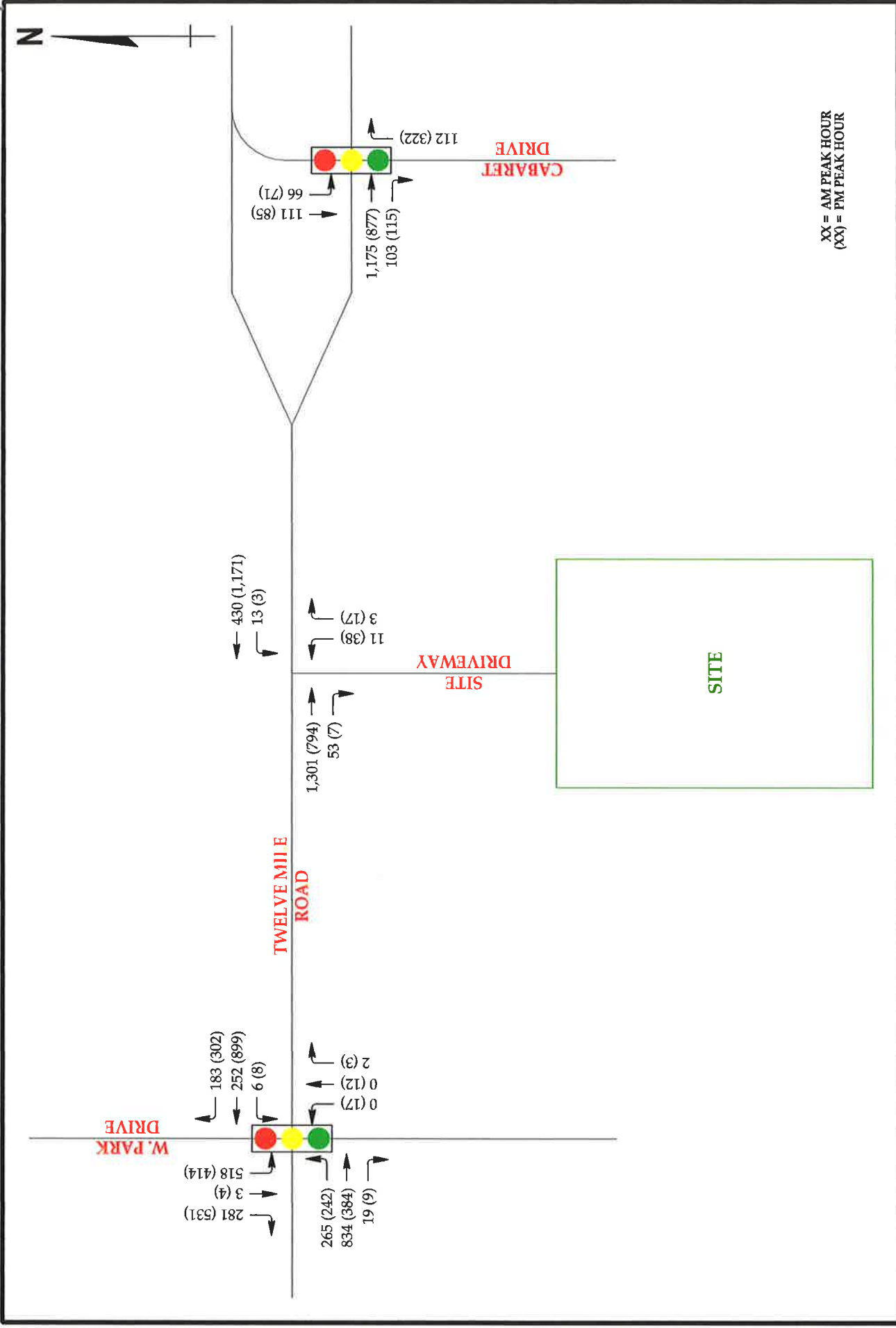


2020 BACKGROUND AM (PM) PEAK HOUR TRAFFIC VOLUMES

FIGURE 3



SITE GENERATED AM (PM) PEAK HOUR TRAFFIC VOLUMES



2020 TOTAL FUTURE AM (PM) PEAK HOUR TRAFFIC VOLUMES

FIGURE 5

TRAFFIC COUNTS

Traffic Data Collection, LLC

www.tdccounts.com

Phone: 586.786-5407



Traffic Study Performed For: Fleis & Vandenberg

Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Rain PM Deg's 60's
Count By Miovision Video VCU 1US NE

File Name : TMC_1 12 Mile & West Park_10-10-18
Site Code : TMC_1
Start Date : 10/10/2018
Page No : 1

4 Hour traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM - 9:00 AM morning & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session.

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

Start Time	West Park Drive Southbound					12 Mile Road Westbound					Office Building Driveway Northbound					12 Mile Road Eastbound					Inl. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	56	1	71	0	128	20	34	0	0	54	0	0	0	0	0	2	115	41	0	158	340
07:15 AM	67	2	77	0	146	18	43	3	0	64	0	0	0	0	0	1	170	49	0	220	430
07:30 AM	68	0	97	0	165	28	51	2	0	81	0	0	0	1	1	2	152	46	0	200	447
07:45 AM	77	0	100	0	177	51	65	0	0	116	1	0	0	0	1	6	155	75	0	236	530
Total	268	3	345	0	616	117	193	5	0	315	1	0	0	1	2	11	592	211	0	814	1747
08:00 AM	70	0	96	0	166	48	62	1	0	111	1	0	0	0	1	4	158	64	0	226	504
08:15 AM	66	2	111	0	179	42	46	5	0	93	0	0	0	0	0	7	177	68	0	252	524
08:30 AM	68	1	85	0	154	24	57	0	0	81	0	0	0	0	0	2	165	58	0	225	460
08:45 AM	49	2	82	0	133	32	50	5	0	87	1	0	1	0	2	5	170	49	0	224	446
Total	253	5	374	0	632	146	215	11	0	372	2	0	1	0	3	18	670	239	0	927	1934

*** BREAK ***

04:00 PM	101	0	79	0	180	52	186	1	0	239	2	3	6	0	11	1	118	34	0	153	583
04:15 PM	74	1	71	0	146	76	209	1	0	286	0	1	9	1	11	4	112	34	0	150	593
04:30 PM	135	1	90	0	226	48	201	3	0	252	1	3	6	0	10	6	100	51	0	157	645
04:45 PM	122	2	107	0	231	55	186	2	0	243	0	4	3	0	7	1	99	68	0	168	649
Total	432	4	347	0	783	231	782	7	0	1020	3	11	24	1	39	12	429	187	0	628	2470
05:00 PM	114	0	95	0	209	54	182	3	0	239	1	1	3	0	5	2	78	54	0	134	587
05:15 PM	160	1	108	0	269	69	170	0	0	239	1	4	5	0	10	0	85	69	0	154	672
05:30 PM	103	0	96	0	199	74	173	1	0	248	1	3	3	0	7	0	89	46	0	135	589
05:45 PM	65	0	78	0	143	76	177	3	0	256	1	3	5	1	10	2	95	36	0	133	542
Total	442	1	377	0	820	273	702	7	0	982	4	11	16	1	32	4	347	205	0	556	2390
Grand Total	1395	13	1443	0	2851	767	1892	30	0	2689	10	22	41	3	76	45	2038	842	0	2925	8541
Apprch %	48.9	0.5	50.6	0		28.5	70.4	1.1	0		13.2	28.9	53.9	3.9		1.5	69.7	28.8	0		
Total %	16.3	0.2	16.9	0	33.4	9	22.2	0.4	0	31.5	0.1	0.3	0.5	0	0.9	0.5	23.9	9.9	0	34.2	
Pass Cars	1350	13	1428	0	2791	753	1856	29	0	2638	9	21	41	0	71	43	2002	820	0	2865	8365
% Pass Cars	96.8	100	99	0	97.9	98.2	98.1	96.7	0	98.1	90	95.5	100	0	93.4	95.6	98.2	97.4	0	97.9	97.9
Single Units	26	0	9	0	35	10	26	1	0	37	1	1	0	0	2	2	31	14	0	47	121
% Single Units	1.9	0	0.6	0	1.2	1.3	1.4	3.3	0	1.4	10	4.5	0	0	2.6	4.4	1.5	1.7	0	1.6	1.4
Heavy Trucks	19	0	6	0	25	4	10	0	0	14	0	0	0	0	0	0	5	8	0	13	52
% Heavy Trucks	1.4	0	0.4	0	0.9	0.5	0.5	0	0	0.5	0	0	0	0	0	0	0.2	1	0	0.4	0.6
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	3
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3.9	0	0	0	0	0	0

TDC Traffic Comments: Signalized intersection with push button ped. signals for all quadrants. Video VCU camera was located within NE intersection quadrant. Note: Peds. are excluded from peak hour reports.

Traffic Data Collection, LLC

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Phone: 586.786-5407

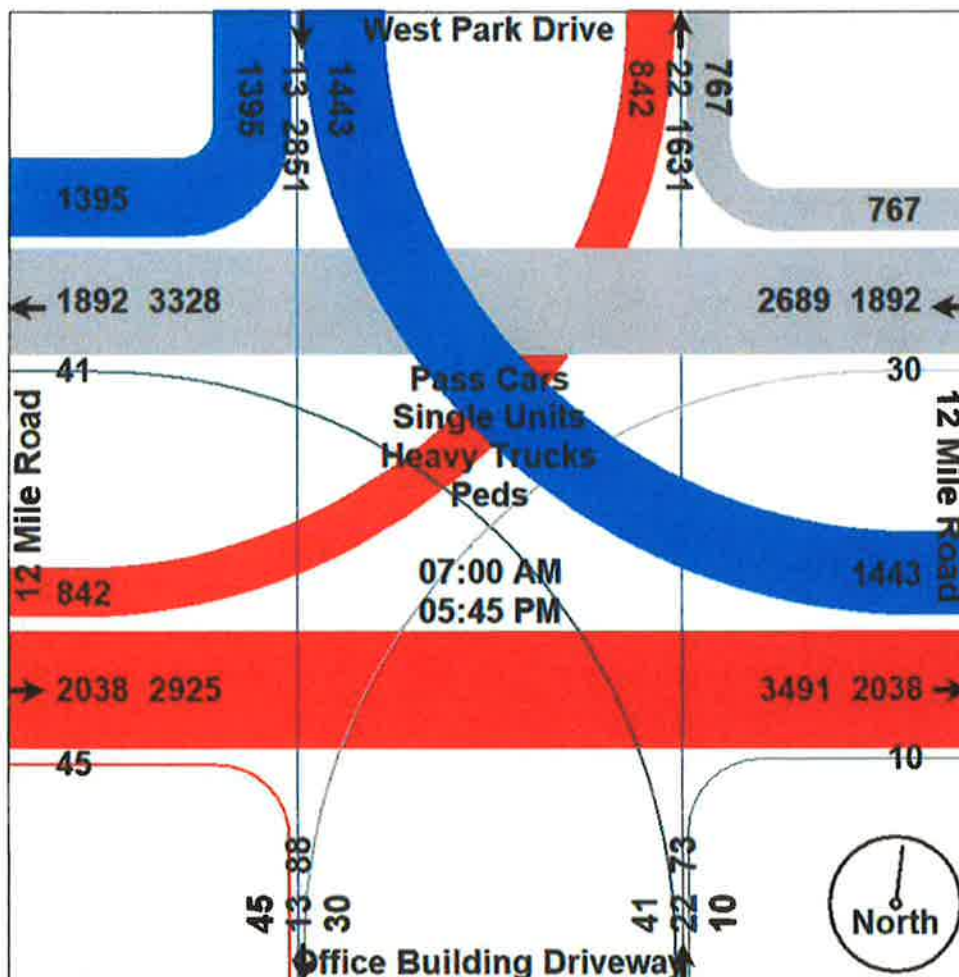
Traffic Study Performed For:

Fleis & Vandenbrink



Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Rain PM Deg's 60's
Count By: Mlovislon Video VCU 1US NE

File Name : TMC_1 12 Mile & West Park_10-10-18
Site Code : TMC_1
Start Date : 10/10/2018
Page No : 2



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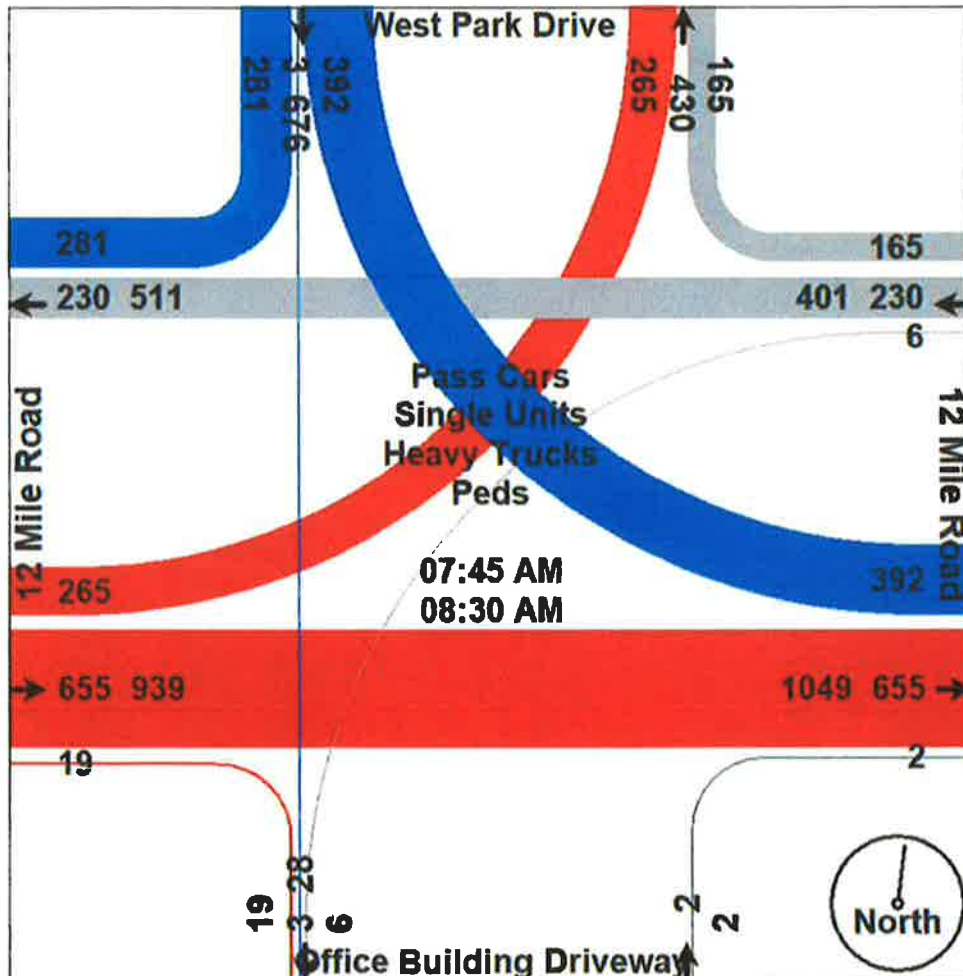
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Start Date : 10/10/2018
Page No : 3

Start Time	West Park Drive Southbound				12 Mile Road Westbound				Office Building Driveway Northbound				12 Mile Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	77	0	100	177	61	65	0	116	1	0	0	1	6	155	75	236	530
08:00 AM	70	0	96	166	48	62	1	111	1	0	0	1	4	158	64	226	504
08:15 AM	66	2	111	179	42	46	5	93	0	0	0	0	7	177	68	252	524
08:30 AM	68	1	85	154	24	57	0	81	0	0	0	0	2	165	58	225	460
Total Volume	281	3	392	676	165	230	6	401	2	0	0	2	19	655	265	939	2018
% App. Total	41.6	0.4	58		41.1	57.4	1.5		100	0	0		2	69.8	28.2		
PHF	.912	.375	.883	.944	.809	.885	.300	.864	.500	.000	.000	.500	.679	.925	.883	.932	.952
Pass Cars	267	3	386	656	162	223	6	391	1	0	0	1	19	641	255	915	1963
% Pass Cars	95.0	100	98.5	97.0	98.2	97.0	100	97.5	50.0	0	0	50.0	100	97.9	96.2	97.4	97.3
Single Units	10	0	4	14	3	6	0	9	1	0	0	1	0	12	10	22	46
% Single Units	3.6	0	1.0	2.1	1.8	2.6	0	2.2	50.0	0	0	50.0	0	1.8	3.8	2.3	2.3
Heavy Trucks	4	0	2	6	0	1	0	1	0	0	0	0	0	2	0	2	9
% Heavy Trucks	1.4	0	0.5	0.9	0	0.4	0	0.2	0	0	0	0	0	0.3	0	0.2	0.4
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Phone: 586.786-5407

Traffic Study Performed For:

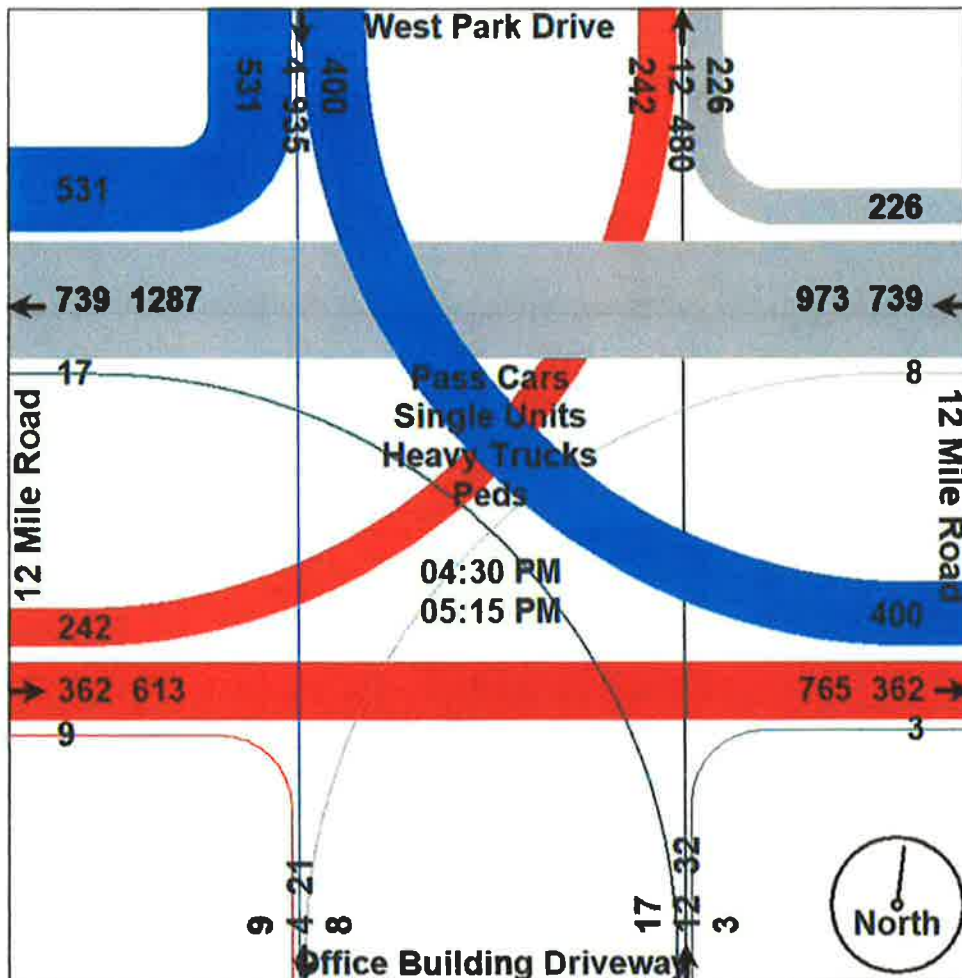
Fleis & Vandenbrink



Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Rain PM Deg's 60's
Count By Miovision Video VCU 1US NE

File Name : TMC_1 12 Mile & West Park_10-10-18
Site Code : TMC_1
Start Date : 10/10/2018
Page No : 4

Start Time	West Park Drive Southbound				12 Mile Road Westbound				Office Building Driveway Northbound				12 Mile Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	135	1	90	226	48	201	3	252	1	3	6	10	6	100	51	157	645
04:45 PM	122	2	107	231	55	186	2	243	0	4	3	7	1	99	68	168	649
05:00 PM	114	0	95	209	54	182	3	239	1	1	3	5	2	78	54	134	587
05:15 PM	160	1	108	269	69	170	0	239	1	4	5	10	0	85	69	154	672
Total Volume	531	4	400	935	226	739	8	973	3	12	17	32	9	362	242	613	2553
% App. Total	56.8	0.4	42.8		23.2	76	0.8		9.4	37.5	53.1		1.5	59.1	39.5		
PHF	.830	.500	.926	.869	.819	.919	.667	.965	.750	.750	.708	.800	.375	.905	.877	.912	.950
Pass Cars	524	4	397	925	221	730	8	959	3	12	17	32	9	361	236	606	2522
% Pass Cars	98.7	100	99.3	98.9	97.8	98.8	100	98.6	100	100	100	100	100	99.7	97.5	98.9	98.8
Single Units	2	0	1	3	4	7	0	11	0	0	0	0	0	1	3	4	18
% Single Units	0.4	0	0.3	0.3	1.8	0.9	0	1.1	0	0	0	0	0	0.3	1.2	0.7	0.7
Heavy Trucks	5	0	2	7	1	2	0	3	0	0	0	0	0	0	3	3	13
% Heavy Trucks	0.9	0	0.5	0.7	0.4	0.3	0	0.3	0	0	0	0	0	0	1.2	0.5	0.5
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Phone: 586.786-5407

Traffic Study Performed For:

Fleis & Vandenbrink



Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Rain PM Deg's 60's
Count By: Mlovision Video VCU 1US NE

File Name : TMC_1 12 Mile & West Park_10-10-18
Site Code : TMC_1
Start Date : 10/10/2018
Page No : 5

Aerial Photo



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Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company



Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry Deg's 40's
Count By: Miovision Video VCU 24L NE

File Name : TMC_1 EB 12Mile & Cabaret_11-13-18
Site Code : TMC_1
Start Date : 11/13/2018
Page No : 1

4 Hour video traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM - 9:00 AM morning & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session.

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds.

Start Time	WB>EB Crossover Southbound					EB 12 Mile Road Westbound					Cabaret Drive Northbound					EB 12 Mile Road Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	1	5	0	6	0	0	0	0	0	10	0	0	0	10	2	205	0	0	207	223
07:15 AM	0	3	4	0	7	0	0	0	0	0	31	0	0	0	31	5	232	0	0	237	275
07:30 AM	0	1	5	0	6	0	0	0	0	0	17	0	0	0	17	5	267	0	0	272	295
07:45 AM	0	0	11	0	11	0	0	0	0	0	21	0	0	0	21	6	243	0	0	249	281
Total	0	5	25	0	30	0	0	0	0	0	79	0	0	0	79	18	947	0	0	965	1074
08:00 AM	0	3	4	0	7	0	0	0	0	0	17	0	0	0	17	8	263	0	0	271	295
08:15 AM	0	2	7	0	9	0	0	0	0	0	22	0	0	0	22	8	255	0	0	263	294
08:30 AM	0	7	8	0	15	0	0	0	0	0	21	0	0	0	21	6	280	0	0	286	322
08:45 AM	0	3	8	0	11	0	0	0	0	0	26	0	0	0	26	13	269	0	0	282	319
Total	0	15	27	0	42	0	0	0	0	0	86	0	0	0	86	35	1067	0	0	1102	1230

*** BREAK ***

04:00 PM	0	8	9	0	17	0	0	0	0	0	33	0	0	0	33	14	147	0	0	161	211
04:15 PM	0	7	4	0	11	0	0	0	0	0	28	0	0	0	28	33	110	0	0	143	182
04:30 PM	0	10	2	0	12	0	0	0	0	0	40	0	0	0	40	18	149	0	0	167	219
04:45 PM	0	12	13	0	25	0	0	0	0	0	30	0	0	0	30	25	179	0	0	204	259
Total	0	37	28	0	65	0	0	0	0	0	131	0	0	0	131	90	585	0	0	675	871
05:00 PM	0	19	8	0	27	0	0	0	0	0	44	0	0	0	44	29	177	0	0	206	277
05:15 PM	0	12	11	0	23	0	0	0	0	0	36	0	0	0	36	24	204	0	0	228	287
05:30 PM	0	20	7	0	27	0	0	0	0	0	46	0	0	0	46	22	199	0	0	221	294
05:45 PM	0	15	6	0	21	0	0	0	0	0	35	0	0	0	35	41	164	0	0	205	261
Total	0	66	32	0	98	0	0	0	0	0	161	0	0	0	161	116	744	0	0	860	1119

Grand Total	0	123	112	0	235	0	0	0	0	0	457	0	0	0	457	259	3343	0	0	3602	4294
Apprch %	0	52.3	47.7	0		0	0	0	0		100	0	0	0		7.2	92.8	0	0		
Total %	0	2.9	2.6	0	5.5	0	0	0	0	0	10.6	0	0	0	10.6	6	77.9	0	0	83.9	
Pass Cars	0	120	110	0	230	0	0	0	0	0	452	0	0	0	452	258	3298	0	0	3556	4238
% Pass Cars	0	97.6	98.2	0	97.9	0	0	0	0	0	98.9	0	0	0	98.9	99.6	98.7	0	0	98.7	98.7
Single Units	0	1	2	0	3	0	0	0	0	0	3	0	0	0	3	1	33	0	0	34	40
% Single Units	0	0.8	1.8	0	1.3	0	0	0	0	0	0.7	0	0	0	0.7	0.4	1	0	0	0.9	0.9
Heavy Trucks	0	2	0	0	2	0	0	0	0	0	2	0	0	0	2	0	12	0	0	12	16
% Heavy Trucks	0	1.6	0	0	0.9	0	0	0	0	0	0.4	0	0	0	0.4	0	0.4	0	0	0.3	0.4
Peds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TDC Traffic Comments: Signalized intersection with push button ped. signals for south leg. Video VCU camera was located within NE intersection quadrant. Note: Peds. are excluded from peak hour reports. Traffic study was conducted for City of Novi Stringer Traffic Impact Study for ROWE Professional Services Company.

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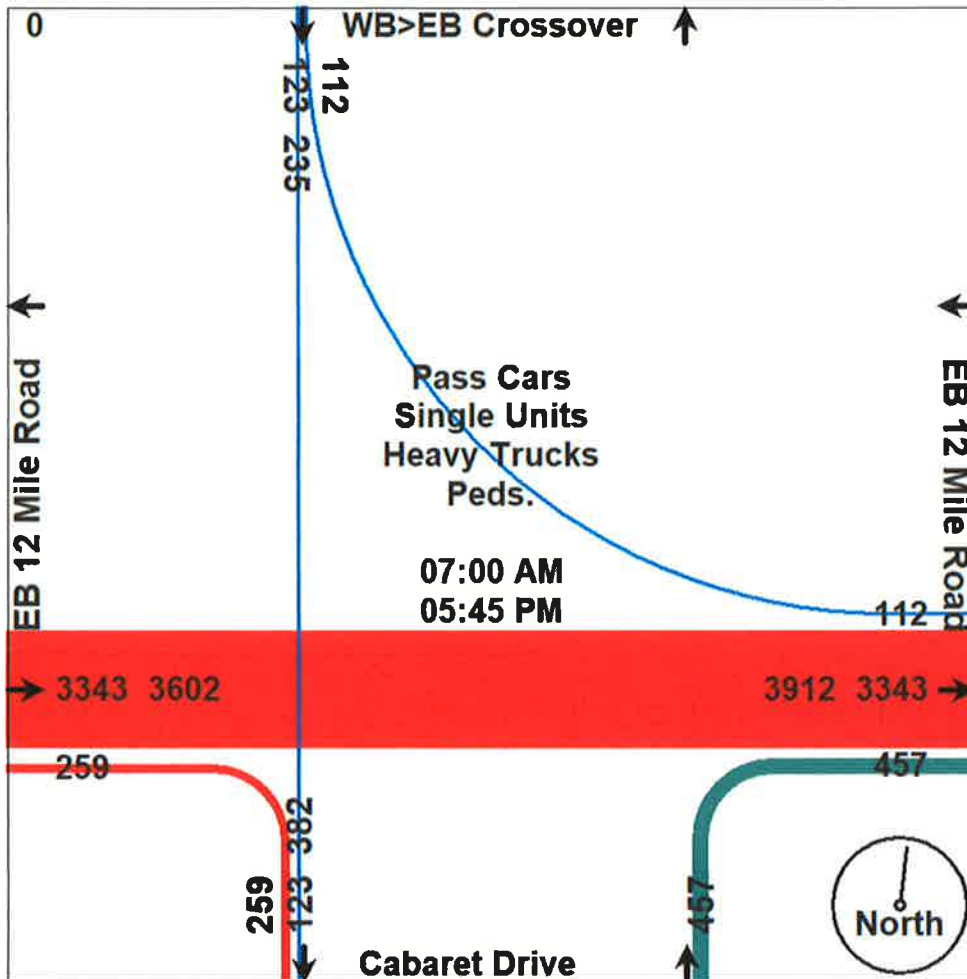
Traffic Study Performed For:

ROWE Professional Services Company



Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry Deg's 40's
Count By Miovision Video VCU 24L NE

File Name : TMC_1 EB 12Mile & Cabaret_11-13-18
Site Code : TMC_1
Start Date : 11/13/2018
Page No : 2



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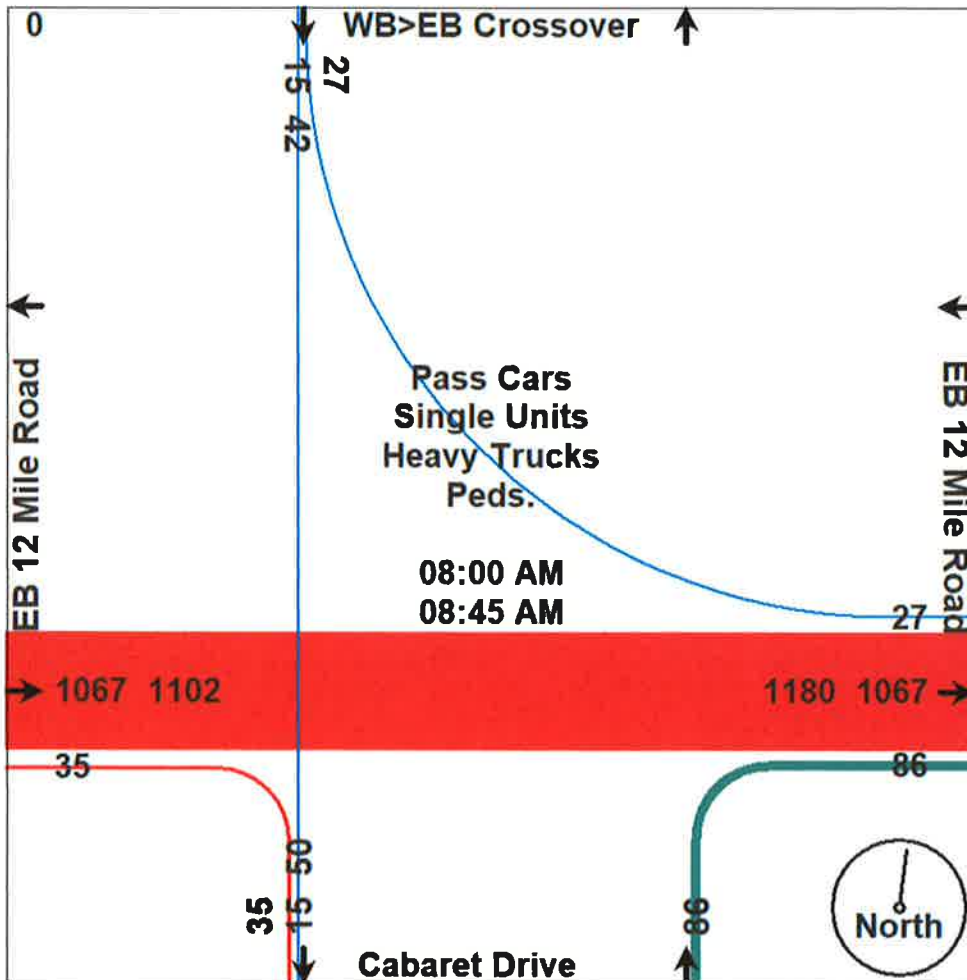
Traffic Study Performed For:

ROWE Professional Services Company

Project: Novi Traffic Impact Study
 Study: 4 Hr. Video Turning Movement Count
 Weather: Sunny/Cldy. Dry Deg's 40's
 Count By Miovision Video VCU 24L NE

File Name : TMC_1 EB 12Mile & Cabaret_11-13-18
 Site Code : TMC_1
 Start Date : 11/13/2018
 Page No : 3

Start Time	WB>EB Crossover Southbound				EB 12 Mile Road Westbound				Cabaret Drive Northbound				EB 12 Mile Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	3	4	7	0	0	0	0	17	0	0	17	8	263	0	271	295
08:15 AM	0	2	7	9	0	0	0	0	22	0	0	22	8	255	0	263	294
08:30 AM	0	7	8	15	0	0	0	0	21	0	0	21	6	280	0	286	322
08:45 AM	0	3	8	11	0	0	0	0	26	0	0	26	13	269	0	282	319
Total Volume	0	15	27	42	0	0	0	0	86	0	0	86	35	1067	0	1102	1230
% App. Total	0	35.7	64.3		0	0	0	0	100	0	0	100	3.2	96.8	0		
PHF	.000	.536	.844	.700	.000	.000	.000	.000	.827	.000	.000	.827	.673	.953	.000	.963	.955
Pass Cars	0	14	27	41	0	0	0	0	86	0	0	86	34	1049	0	1083	1210
% Pass Cars	0	93.3	100	97.6	0	0	0	0	100	0	0	100	97.1	98.3	0	98.3	98.4
Single Units	0	0	0	0	0	0	0	0	0	0	0	0	1	12	0	13	13
% Single Units	0	0	0	0	0	0	0	0	0	0	0	0	2.9	1.1	0	1.2	1.1
Heavy Trucks	0	1	0	1	0	0	0	0	0	0	0	0	0	6	0	6	7
% Heavy Trucks	0	6.7	0	2.4	0	0	0	0	0	0	0	0	0	0.6	0	0.5	0.6
Peds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Traffic Study Performed For:

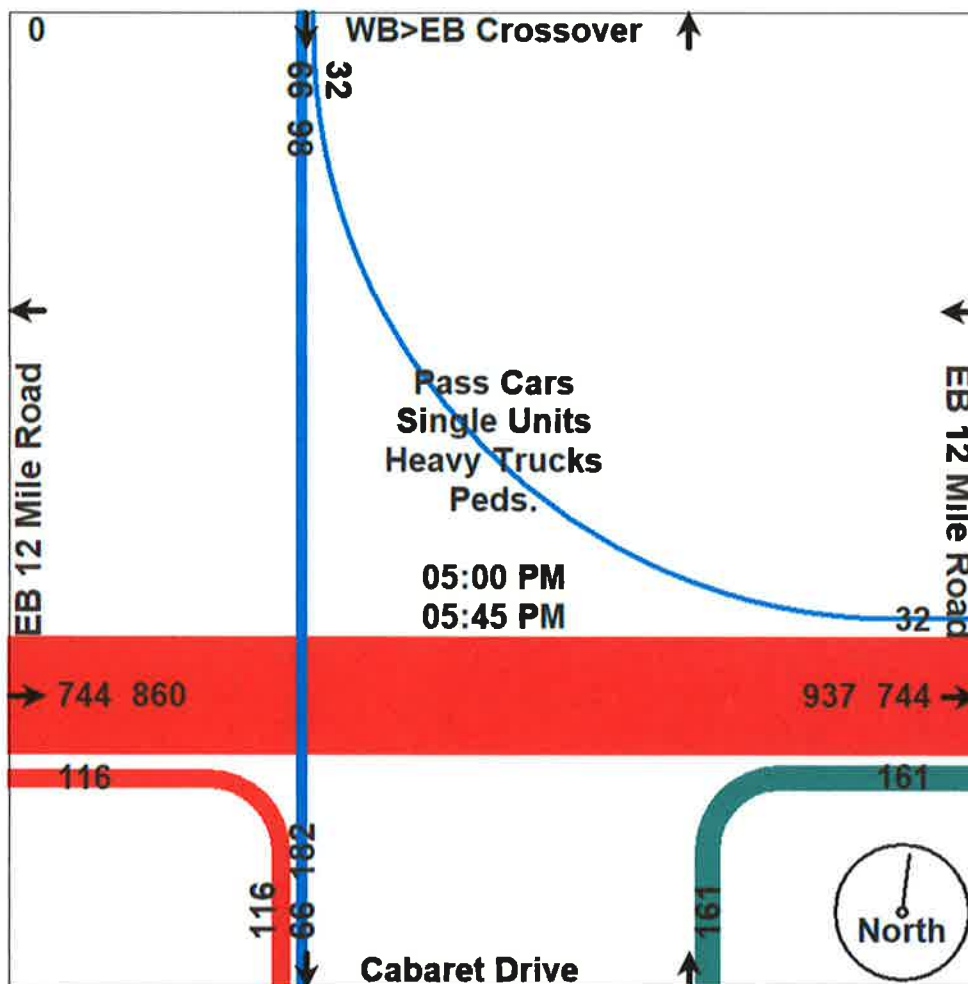
ROWE Professional Services Company



Project: Novi Traffic Impact Study
 Study: 4 Hr. Video Turning Movement Count
 Weather: Sunny/Cldy. Dry Deg's 40's
 Count By Miovision Video VCU 24L NE

File Name : TMC_1 EB 12Mile & Cabaret_11-13-18
 Site Code : TMC_1
 Start Date : 11/13/2018
 Page No : 4

Start Time	WB>EB Crossover Southbound				EB 12 Mile Road Westbound				Cabaret Drive Northbound				EB 12 Mile Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	19	8	27	0	0	0	0	44	0	0	44	29	177	0	206	277
05:15 PM	0	12	11	23	0	0	0	0	36	0	0	36	24	204	0	228	287
05:30 PM	0	20	7	27	0	0	0	0	46	0	0	46	22	199	0	221	294
05:45 PM	0	15	6	21	0	0	0	0	35	0	0	35	41	164	0	205	261
Total Volume	0	66	32	98	0	0	0	0	161	0	0	161	116	744	0	860	1119
% App. Total	0	67.3	32.7		0	0	0		100	0	0		13.5	86.5	0		
PHF	.000	.825	.727	.907	.000	.000	.000	.000	.875	.000	.000	.875	.707	.912	.000	.943	.952
Pass Cars	0	66	31	97	0	0	0	0	159	0	0	159	116	738	0	854	1110
% Pass Cars	0	100	96.9	99.0	0	0	0	0	98.8	0	0	98.8	100	99.2	0	99.3	99.2
Single Units	0	0	1	1	0	0	0	0	2	0	0	2	0	5	0	5	8
% Single Units	0	0	3.1	1.0	0	0	0	0	1.2	0	0	1.2	0	0.7	0	0.6	0.7
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0.1
Peds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Traffic Study Performed For:

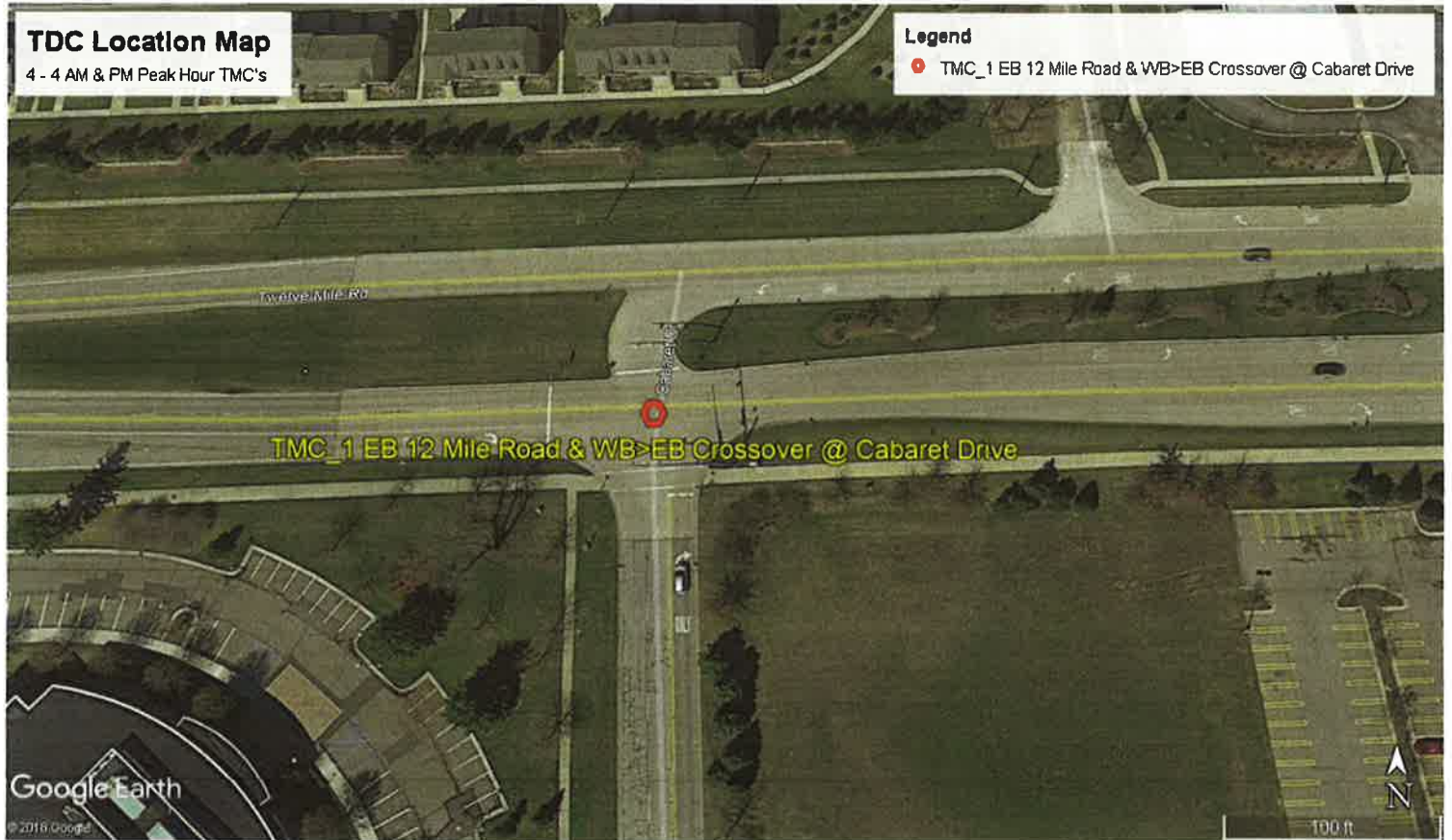
ROWE Professional Services Company



Project: Novi Traffic Impact Study
Study: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry Deg's 40's
Count By Miovision Video VCU 24L NE

File Name : TMC_1 EB 12Mile & Cabaret_11-13-18
Site Code : TMC_1
Start Date : 11/13/2018
Page No : 5

Aerial Photo



LEVEL OF SERVICE

OUTPUT REPORTS

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2019 Existing AM

03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	771	19	6	239	173	0	0	2	472	3	281
Future Volume (veh/h)	265	771	19	6	239	173	0	0	2	472	3	281
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	1953	1953	1953	1953	1953	1220	1220	1220	1953	1953	1953
Adj Flow Rate, veh/h	285	829	20	7	278	201	0	0	3	502	3	299
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.60	0.60	0.60	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	50	50	50	3	3	3
Cap, veh/h	555	1907	46	327	822	697	72	0	313	494	5	497
Arrive On Green	0.10	0.51	0.51	0.01	0.42	0.42	0.00	0.00	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1860	3703	89	1860	1953	1655	668	0	1034	1403	16	1641
Grp Volume(v), veh/h	285	415	434	7	278	201	0	0	3	502	0	302
Grp Sat Flow(s),veh/h/ln	1860	1856	1937	1860	1953	1655	668	0	1034	1403	0	1658
Q Serve(g_s), s	8.3	14.0	14.0	0.2	9.6	8.0	0.0	0.0	0.2	30.1	0.0	15.5
Cycle Q Clear(g_c), s	8.3	14.0	14.0	0.2	9.6	8.0	0.0	0.0	0.2	30.3	0.0	15.5
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	555	955	997	327	822	697	72	0	313	494	0	502
V/C Ratio(X)	0.51	0.43	0.43	0.02	0.34	0.29	0.00	0.00	0.01	1.02	0.00	0.60
Avail Cap(c_a), veh/h	555	955	997	501	822	697	72	0	313	494	0	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.4	15.2	15.2	16.5	19.5	19.1	0.0	0.0	24.4	37.1	0.0	29.7
Incr Delay (d2), s/veh	0.8	1.4	1.4	0.0	1.1	1.0	0.0	0.0	0.0	44.6	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.7	5.9	0.1	4.3	3.1	0.0	0.0	0.0	18.1	0.0	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.2	16.6	16.5	16.6	20.7	20.1	0.0	0.0	24.4	81.7	0.0	31.7
LnGrp LOS	B	B	B	B	C	C	A	A	C	F	A	C
Approach Vol, veh/h		1134			486			3				804
Approach Delay, s/veh		16.0			20.4			24.4				62.9
Approach LOS		B			C			C				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	57.4		36.0	16.0	48.0		36.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 42		* 30	* 10	* 42		* 30				
Max Q Clear Time (g_c+I1), s	2.2	16.0		32.3	10.3	11.6		2.2				
Green Ext Time (p_c), s	0.0	2.5		0.0	0.0	1.4		0.0				

Intersection Summary






















HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

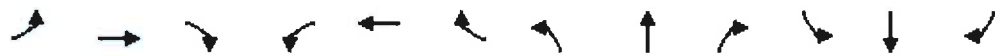
2020 No Build AM
03/15/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	804	19	6	246	178	0	0	2	495	3	281
Future Volume (veh/h)	265	804	19	6	246	178	0	0	2	495	3	281
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	1953	1953	1953	1953	1953	1220	1220	1220	1953	1953	1953
Adj Flow Rate, veh/h	285	865	20	7	286	207	0	0	3	527	3	299
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.60	0.60	0.60	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	50	50	50	3	3	3
Cap, veh/h	517	1798	42	290	764	647	72	0	344	536	5	547
Arrive On Green	0.10	0.48	0.48	0.01	0.39	0.39	0.00	0.00	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1860	3708	86	1860	1953	1655	668	0	1034	1403	16	1641
Grp Volume(v), veh/h	285	433	452	7	286	207	0	0	3	527	0	302
Grp Sat Flow(s), veh/h/ln	1860	1856	1938	1860	1953	1655	668	0	1034	1403	0	1658
Q Serve(g_s), s	8.8	15.7	15.7	0.2	10.4	8.7	0.0	0.0	0.2	33.1	0.0	14.9
Cycle Q Clear(g_c), s	8.8	15.7	15.7	0.2	10.4	8.7	0.0	0.0	0.2	33.3	0.0	14.9
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	517	900	940	290	764	647	72	0	344	536	0	552
V/C Ratio(X)	0.55	0.48	0.48	0.02	0.37	0.32	0.00	0.00	0.01	0.98	0.00	0.55
Avail Cap(c_a), veh/h	517	900	940	464	764	647	72	0	344	536	0	552
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	17.3	17.3	18.4	21.7	21.2	0.0	0.0	22.3	35.4	0.0	27.2
Incr Delay (d2), s/veh	1.3	1.8	1.8	0.0	1.4	1.3	0.0	0.0	0.0	34.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.5	6.8	0.1	4.8	3.4	0.0	0.0	0.0	17.8	0.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	19.1	19.1	18.4	23.1	22.5	0.0	0.0	22.3	69.7	0.0	28.3
LnGrp LOS	B	B	B	B	C	C	A	A	C	E	A	C
Approach Vol, veh/h		1170			500			3				829
Approach Delay, s/veh		18.5			22.8			22.3				54.6
Approach LOS		B			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	54.4		39.0	16.0	45.0		39.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 39		* 33	* 10	* 39		* 33				
Max Q Clear Time (g_c+I1), s	2.2	17.7		35.3	10.8	12.4		2.2				
Green Ext Time (p_c), s	0.0	2.6		0.0	0.0	1.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			31.3									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2020 No Build AM Imp.

03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	804	19	6	246	178	0	0	2	495	3	281
Future Volume (veh/h)	265	804	19	6	246	178	0	0	2	495	3	281
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	1953	1953	1953	1953	1953	1220	1220	1220	1953	1953	1953
Adj Flow Rate, veh/h	285	865	20	7	286	207	0	0	3	527	3	299
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.60	0.60	0.60	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	50	50	50	3	3	3
Cap, veh/h	517	1798	42	290	764	647	72	0	344	534	3	718
Arrive On Green	0.10	0.48	0.48	0.01	0.39	0.39	0.00	0.00	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1860	3708	86	1860	1953	1655	668	0	1034	1389	8	1655
Grp Volume(v), veh/h	285	433	452	7	286	207	0	0	3	530	0	299
Grp Sat Flow(s),veh/h/ln	1860	1856	1938	1860	1953	1655	668	0	1034	1397	0	1655
Q Serve(g_s), s	8.8	15.7	15.7	0.2	10.4	8.7	0.0	0.0	0.2	33.1	0.0	12.5
Cycle Q Clear(g_c), s	8.8	15.7	15.7	0.2	10.4	8.7	0.0	0.0	0.2	33.3	0.0	12.5
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	0.99		1.00
Lane Grp Cap(c), veh/h	517	900	940	290	764	647	72	0	344	537	0	718
V/C Ratio(X)	0.55	0.48	0.48	0.02	0.37	0.32	0.00	0.00	0.01	0.99	0.00	0.42
Avail Cap(c_a), veh/h	517	900	940	464	764	647	72	0	344	537	0	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	17.3	17.3	18.4	21.7	21.2	0.0	0.0	22.3	35.5	0.0	19.5
Incr Delay (d2), s/veh	1.3	1.8	1.8	0.0	1.4	1.3	0.0	0.0	0.0	35.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	6.5	6.8	0.1	4.8	3.4	0.0	0.0	0.0	18.0	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	19.1	19.1	18.4	23.1	22.5	0.0	0.0	22.3	70.9	0.0	19.9
LnGrp LOS	B	B	B	B	C	C	A	A	C	E	A	B
Approach Vol, veh/h		1170			500			3				829
Approach Delay, s/veh		18.5			22.8			22.3				52.5
Approach LOS		B			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	54.4		39.0	16.0	45.0		39.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 39		* 33	* 10	* 39		* 33				
Max Q Clear Time (g_c+I1), s	2.2	17.7		35.3	10.8	12.4		2.2				
Green Ext Time (p_c), s	0.0	2.6		0.0	0.0	1.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2020 Build AM
03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↘		↖	↗	↖	↖	↗			↗	↖
Traffic Volume (veh/h)	265	834	19	6	252	183	0	0	2	518	3	281
Future Volume (veh/h)	265	834	19	6	252	183	0	0	2	518	3	281
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	1953	1953	1953	1953	1953	1220	1220	1220	1953	1953	1953
Adj Flow Rate, veh/h	285	897	20	7	293	213	0	0	3	551	3	299
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.60	0.60	0.60	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	50	50	50	3	3	3
Cap, veh/h	490	1725	38	263	725	614	72	0	365	562	3	751
Arrive On Green	0.10	0.46	0.46	0.01	0.37	0.37	0.00	0.00	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1860	3711	83	1860	1953	1655	668	0	1034	1390	8	1655
Grp Volume(v), veh/h	285	448	469	7	293	213	0	0	3	554	0	299
Grp Sat Flow(s), veh/h/ln	1860	1856	1938	1860	1953	1655	668	0	1034	1397	0	1655
Q Serve(g_s), s	9.2	17.1	17.1	0.2	11.1	9.3	0.0	0.0	0.2	35.1	0.0	12.0
Cycle Q Clear(g_c), s	9.2	17.1	17.1	0.2	11.1	9.3	0.0	0.0	0.2	35.3	0.0	12.0
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	0.99		1.00
Lane Grp Cap(c), veh/h	490	863	901	263	725	614	72	0	365	565	0	751
V/C Ratio(X)	0.58	0.52	0.52	0.03	0.40	0.35	0.00	0.00	0.01	0.98	0.00	0.40
Avail Cap(c_a), veh/h	490	863	901	438	725	614	72	0	365	565	0	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	18.9	18.9	19.7	23.3	22.7	0.0	0.0	21.0	34.4	0.0	18.2
Incr Delay (d2), s/veh	1.7	2.2	2.1	0.0	1.7	1.5	0.0	0.0	0.0	32.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	7.2	7.5	0.1	5.1	3.7	0.0	0.0	0.0	18.4	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	21.1	21.0	19.8	24.9	24.3	0.0	0.0	21.0	67.2	0.0	18.5
LnGrp LOS	B	C	C	B	C	C	A	A	C	E	A	B
Approach Vol, veh/h		1202			513			3				853
Approach Delay, s/veh		20.4			24.6			21.0				50.1
Approach LOS		C			C			C				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	52.4		41.0	16.0	43.0		41.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 37		* 35	* 10	* 37		* 35				
Max Q Clear Time (g_c+I1), s	2.2	19.1		37.3	11.2	13.1		2.2				
Green Ext Time (p_c), s	0.0	2.6		0.0	0.0	1.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C























Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2019 Existing PM

03/15/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 										
Traffic Volume (veh/h)	242	373	9	8	840	281	17	12	3	410	4	531
Future Volume (veh/h)	242	373	9	8	840	281	17	12	3	410	4	531
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1984	1984	2000	2000	2000	1984	1984	1984
Adj Flow Rate, veh/h	266	410	10	8	884	296	21	15	4	471	5	610
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.80	0.80	0.80	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	294	2159	53	556	954	809	72	370	99	403	3	406
Arrive On Green	0.10	0.57	0.57	0.01	0.48	0.48	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1890	3761	92	1890	1984	1682	820	1521	406	1404	14	1670
Grp Volume(v), veh/h	266	205	215	8	884	296	21	0	19	471	0	615
Grp Sat Flow(s),veh/h/ln	1890	1885	1968	1890	1984	1682	820	0	1927	1404	0	1684
Q Serve(g_s), s	8.4	5.2	5.2	0.2	41.7	11.1	0.0	0.0	0.8	23.5	0.0	24.3
Cycle Q Clear(g_c), s	8.4	5.2	5.2	0.2	41.7	11.1	24.3	0.0	0.8	24.3	0.0	24.3
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.21	1.00		0.99
Lane Grp Cap(c), veh/h	294	1082	1130	556	954	809	72	0	468	403	0	409
V/C Ratio(X)	0.91	0.19	0.19	0.01	0.93	0.37	0.29	0.00	0.04	1.17	0.00	1.50
Avail Cap(c_a), veh/h	294	1082	1130	732	954	809	72	0	468	403	0	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.8	10.2	10.2	13.1	24.3	16.3	50.0	0.0	28.9	40.3	0.0	37.9
Incr Delay (d2), s/veh	29.7	0.4	0.4	0.0	16.0	1.3	2.2	0.0	0.0	99.9	0.0	238.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	2.0	2.1	0.1	21.5	4.2	0.6	0.0	0.3	20.9	0.0	36.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.5	10.6	10.6	13.1	40.3	17.6	52.2	0.0	29.0	140.2	0.0	276.7
LnGrp LOS	E	B	B	B	D	B	D	A	C	F	A	F
Approach Vol, veh/h		686			1188			40				1086
Approach Delay, s/veh		28.4			34.4			41.2				217.5
Approach LOS		C			C			D				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	63.3		30.0	16.0	54.0		30.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 48		* 24	* 10	* 48		* 24				
Max Q Clear Time (g_c+I1), s	2.2	7.2		26.3	10.4	43.7		26.3				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	1.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	99.4
HCM 6th LOS	F






















Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2020 No Build PM

03/15/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	379	9	8	871	292	17	12	3	412	4	531
Future Volume (veh/h)	242	379	9	8	871	292	17	12	3	412	4	531
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1984	1984	2000	2000	2000	1984	1984	1984
Adj Flow Rate, veh/h	266	416	10	8	917	307	21	15	4	474	5	610
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.80	0.80	0.80	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	263	2047	49	524	895	758	72	415	111	445	4	456
Arrive On Green	0.10	0.54	0.54	0.01	0.45	0.45	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1890	3763	90	1890	1984	1682	820	1521	406	1404	14	1670
Grp Volume(v), veh/h	266	208	218	8	917	307	21	0	19	474	0	615
Grp Sat Flow(s),veh/h/ln	1890	1885	1968	1890	1984	1682	820	0	1927	1404	0	1684
Q Serve(g_s), s	10.1	5.7	5.7	0.2	45.1	12.3	0.0	0.0	0.7	26.6	0.0	27.3
Cycle Q Clear(g_c), s	10.1	5.7	5.7	0.2	45.1	12.3	27.3	0.0	0.7	27.3	0.0	27.3
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.21	1.00		0.99
Lane Grp Cap(c), veh/h	263	1026	1071	524	895	758	72	0	526	445	0	460
V/C Ratio(X)	1.01	0.20	0.20	0.02	1.02	0.40	0.29	0.00	0.04	1.06	0.00	1.34
Avail Cap(c_a), veh/h	263	1026	1071	700	895	758	72	0	526	445	0	460
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	11.7	11.7	14.7	27.4	18.4	50.0	0.0	26.7	38.9	0.0	36.4
Incr Delay (d2), s/veh	58.6	0.4	0.4	0.0	36.5	1.6	2.2	0.0	0.0	60.9	0.0	166.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	2.3	2.3	0.1	28.1	4.7	0.6	0.0	0.3	18.3	0.0	31.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.4	12.1	12.1	14.7	63.9	20.0	52.2	0.0	26.7	99.7	0.0	202.6
LnGrp LOS	F	B	B	B	F	C	D	A	C	F	A	F
Approach Vol, veh/h		692			1232			40			1089	
Approach Delay, s/veh		42.2			52.7			40.1			157.8	
Approach LOS		D			D			D			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	60.3		33.0	16.0	51.0		33.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 45		* 27	* 10	* 45		* 27				
Max Q Clear Time (g_c+I1), s	2.2	7.7		29.3	12.1	47.1		29.3				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				87.6								
HCM 6th LOS				F								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2020 No Build PM Imp.
03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕		↘	↕	↘	↘	↕			↕	↘
Traffic Volume (veh/h)	242	379	9	8	871	292	17	12	3	412	4	531
Future Volume (veh/h)	242	379	9	8	871	292	17	12	3	412	4	531
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1984	1984	2000	2000	2000	1984	1984	1984
Adj Flow Rate, veh/h	266	416	10	8	917	307	21	15	4	474	5	610
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.80	0.80	0.80	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	263	2047	49	524	895	758	72	415	111	442	4	629
Arrive On Green	0.10	0.54	0.54	0.01	0.45	0.45	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1890	3763	90	1890	1984	1682	820	1521	406	1357	14	1682
Grp Volume(v), veh/h	266	208	218	8	917	307	21	0	19	479	0	610
Grp Sat Flow(s),veh/h/ln	1890	1885	1968	1890	1984	1682	820	0	1927	1371	0	1682
Q Serve(g_s), s	10.1	5.7	5.7	0.2	45.1	12.3	0.0	0.0	0.7	26.6	0.0	27.3
Cycle Q Clear(g_c), s	10.1	5.7	5.7	0.2	45.1	12.3	27.3	0.0	0.7	27.3	0.0	27.3
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.21	0.99		1.00
Lane Grp Cap(c), veh/h	263	1026	1071	524	895	758	72	0	526	446	0	629
V/C Ratio(X)	1.01	0.20	0.20	0.02	1.02	0.40	0.29	0.00	0.04	1.07	0.00	0.97
Avail Cap(c_a), veh/h	263	1026	1071	700	895	758	72	0	526	446	0	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	11.7	11.7	14.7	27.4	18.4	50.0	0.0	26.7	38.8	0.0	30.7
Incr Delay (d2), s/veh	58.6	0.4	0.4	0.0	36.5	1.6	2.2	0.0	0.0	63.8	0.0	28.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	2.3	2.3	0.1	28.1	4.7	0.6	0.0	0.3	18.7	0.0	18.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.4	12.1	12.1	14.7	63.9	20.0	52.2	0.0	26.7	102.7	0.0	59.1
LnGrp LOS	F	B	B	B	F	C	D	A	C	F	A	E
Approach Vol, veh/h		692			1232			40			1089	
Approach Delay, s/veh		42.2			52.7			40.1			78.3	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	60.3		33.0	16.0	51.0		33.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 45		* 27	* 10	* 45		* 27				
Max Q Clear Time (g_c+I1), s	2.2	7.7		29.3	12.1	47.1		29.3				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	59.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
1085: West Park Drive & Twelve Mile Road

2020 Build PM
03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕		↘	↕	↗	↘	↕			↕	↗
Traffic Volume (veh/h)	242	384	9	8	899	302	17	12	3	414	4	531
Future Volume (veh/h)	242	384	9	8	899	302	17	12	3	414	4	531
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1984	1984	2000	2000	2000	1984	1984	1984
Adj Flow Rate, veh/h	266	422	10	8	946	318	21	15	4	476	5	610
Peak Hour Factor	0.91	0.91	0.91	0.95	0.95	0.95	0.80	0.80	0.80	0.87	0.87	0.87
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	1	1	1
Cap, veh/h	263	2048	48	522	895	758	72	415	111	442	4	629
Arrive On Green	0.10	0.54	0.54	0.01	0.45	0.45	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1890	3764	89	1890	1984	1682	820	1521	406	1357	14	1682
Grp Volume(v), veh/h	266	211	221	8	946	318	21	0	19	481	0	610
Grp Sat Flow(s), veh/h/ln	1890	1885	1968	1890	1984	1682	820	0	1927	1371	0	1682
Q Serve(g_s), s	10.1	5.7	5.8	0.2	45.1	12.8	0.0	0.0	0.7	26.6	0.0	27.3
Cycle Q Clear(g_c), s	10.1	5.7	5.8	0.2	45.1	12.8	27.3	0.0	0.7	27.3	0.0	27.3
Prop In Lane	1.00		0.05	1.00		1.00	1.00		0.21	0.99		1.00
Lane Grp Cap(c), veh/h	263	1026	1071	522	895	758	72	0	526	446	0	629
V/C Ratio(X)	1.01	0.21	0.21	0.02	1.06	0.42	0.29	0.00	0.04	1.08	0.00	0.97
Avail Cap(c_a), veh/h	263	1026	1071	698	895	758	72	0	526	446	0	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	11.7	11.7	14.7	27.4	18.6	50.0	0.0	26.7	38.8	0.0	30.7
Incr Delay (d2), s/veh	58.6	0.5	0.4	0.0	46.3	1.7	2.2	0.0	0.0	65.3	0.0	28.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	2.3	2.4	0.1	30.6	4.9	0.6	0.0	0.3	18.9	0.0	18.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.4	12.2	12.1	14.7	73.8	20.3	52.2	0.0	26.7	104.1	0.0	59.1
LnGrp LOS	F	B	B	B	F	C	D	A	C	F	A	E
Approach Vol, veh/h		698			1272			40			1091	
Approach Delay, s/veh		42.0			60.0			40.1			79.0	
Approach LOS		D			E			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	60.3		33.0	16.0	51.0		33.0				
Change Period (Y+Rc), s	* 5.9	* 5.9		* 5.7	* 5.9	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 45		* 27	* 10	* 45		* 27				
Max Q Clear Time (g_c+I1), s	2.2	7.8		29.3	12.1	47.1		29.3				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 62.4
HCM 6th LOS E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Int Delay, s/veh 17.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑	↑	↑	
Traffic Vol, veh/h	0	1117	103	0	0	0	0	0	112	57	111	0
Future Vol, veh/h	0	1117	103	0	0	0	0	0	112	57	111	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	16983	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	83	83	83	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1176	108	0	0	0	0	0	135	81	159	0

Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0	-	-	-	588	588	1284	-		
Stage 1	-	-	-	-	-	-	-	0	0	-		
Stage 2	-	-	-	-	-	-	-	588	1284	-		
Critical Hdwy	-	-	-	-	-	-	6.94	7.54	6.54	-		
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-		
Follow-up Hdwy	-	-	-	-	-	-	3.32	3.52	4.02	-		
Pot Cap-1 Maneuver	0	-	-	-	-	-	0	0	452	392	164	0
Stage 1	0	-	-	-	-	-	0	0	-	-	-	0
Stage 2	0	-	-	-	-	-	0	0	-	462	234	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	452	275	164	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	275	164	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	324	234	-

Approach	EB	NB	SB
HCM Control Delay, s	0	16.3	114.5
HCM LOS		C	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1	SBLn2
Capacity (veh/h)	452	-	-	275	174
HCM Lane V/C Ratio	0.299	-	-	0.197	1.067
HCM Control Delay (s)	16.3	-	-	21.3	141.7
HCM Lane LOS	C	-	-	C	F
HCM 95th %tile Q(veh)	1.2	-	-	0.7	9.1

Intersection

Int Delay, s/veh 22.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑	↑	↑	
Traffic Vol, veh/h	0	1172	103	0	0	0	0	0	112	66	111	0
Future Vol, veh/h	0	1172	103	0	0	0	0	0	112	66	111	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	16983	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	83	83	83	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1234	108	0	0	0	0	0	135	94	159	0

Major/Minor	Major1	Major2	Major3	Minor1	Minor2	Minor3	Minor4	Minor5	
Conflicting Flow All	-	0	0	-	-	617	617	1342	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	617	1342	-
Critical Hdwy	-	-	-	-	-	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	433	374	~ 151	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	444	219	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	433	257	~ 151	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	~ 151	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	306	219	-

Approach	EB	NB	SB
HCM Control Delay, s	0	17	142
HCM LOS		C	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1	SBLn2
Capacity (veh/h)	433	-	-	257	162
HCM Lane V/C Ratio	0.312	-	-	0.245	1.173
HCM Control Delay (s)	17	-	-	23.5	181.2
HCM Lane LOS	C	-	-	C	F
HCM 95th %tile Q(veh)	1.3	-	-	0.9	10.4

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM Signalized Intersection Capacity Analysis
1141: Cabaret Drive & Eastbound Twelve Mile Road

2020 No Build AM Imp.
03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑	↑	↑	
Traffic Volume (vph)	0	1172	103	0	0	0	0	0	112	66	111	0
Future Volume (vph)	0	1172	103	0	0	0	0	0	112	66	111	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.8	5.8						6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00						1.00	0.95	0.95	
Fr _t		1.00	0.85						0.86	1.00	1.00	
Fl _t Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		3725	1667						1696	1770	1858	
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		3725	1667						1696	1770	1858	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.70	0.70	0.70
Adj. Flow (vph)	0	1234	108	0	0	0	0	0	135	94	159	0
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	74	74	27	0
Lane Group Flow (vph)	0	1234	81	0	0	0	0	0	61	11	141	0
Turn Type		NA	Perm						Perm	Perm	NA	
Protected Phases		2									4	
Permitted Phases			2						8	4		
Actuated Green, G (s)		75.4	75.4						12.8	12.8	12.8	
Effective Green, g (s)		75.4	75.4						12.8	12.8	12.8	
Actuated g/C Ratio		0.75	0.75						0.13	0.13	0.13	
Clearance Time (s)		5.8	5.8						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		2808	1256						217	226	237	
v/s Ratio Prot		c0.33										
v/s Ratio Perm			0.05						0.04	0.01	0.08	
v/c Ratio		0.44	0.06						0.28	0.05	0.59	
Uniform Delay, d ₁		4.5	3.2						39.4	38.3	41.2	
Progression Factor		1.29	1.71						1.00	1.00	1.00	
Incremental Delay, d ₂		0.4	0.1						0.7	0.1	4.0	
Delay (s)		6.2	5.5						40.1	38.3	45.1	
Level of Service		A	A						D	D	D	
Approach Delay (s)		6.1		0.0				40.1			42.8	
Approach LOS		A		A				D			D	
Intersection Summary												
HCM 2000 Control Delay			14.2						HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			100.0						Sum of lost time (s)		11.8	
Intersection Capacity Utilization			59.2%						ICU Level of Service		B	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1141: Cabaret Drive & Eastbound Twelve Mile Road

2020 Build AM
 03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↑						↑	↑	↑		
Traffic Volume (vph)	0	1175	103	0	0	0	0	0	112	66	111	0	
Future Volume (vph)	0	1175	103	0	0	0	0	0	112	66	111	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Total Lost time (s)		5.8	5.8						6.0	6.0	6.0		
Lane Util. Factor		0.95	1.00						1.00	0.95	0.95		
Frt		1.00	0.85						0.86	1.00	1.00		
Flt Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		3725	1667						1696	1770	1858		
Flt Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		3725	1667						1696	1770	1858		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.83	0.83	0.83	0.70	0.70	0.70	
Adj. Flow (vph)	0	1237	108	0	0	0	0	0	135	94	159	0	
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	73	73	27	0	
Lane Group Flow (vph)	0	1237	81	0	0	0	0	0	62	12	141	0	
Turn Type		NA	Perm						Perm	Perm	NA		
Protected Phases		2									4		
Permitted Phases			2						8	4			
Actuated Green, G (s)		75.4	75.4						12.8	12.8	12.8		
Effective Green, g (s)		75.4	75.4						12.8	12.8	12.8		
Actuated g/C Ratio		0.75	0.75						0.13	0.13	0.13		
Clearance Time (s)		5.8	5.8						6.0	6.0	6.0		
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0		
Lane Grp Cap (vph)		2808	1256						217	226	237		
v/s Ratio Prot		c0.33											
v/s Ratio Perm			0.05						0.04	0.01	0.08		
v/c Ratio		0.44	0.06						0.28	0.05	0.59		
Uniform Delay, d1		4.5	3.2						39.5	38.3	41.2		
Progression Factor		1.27	1.63						1.00	1.00	1.00		
Incremental Delay, d2		0.4	0.1						0.7	0.1	4.0		
Delay (s)		6.1	5.3						40.2	38.4	45.1		
Level of Service		A	A						D	D	D		
Approach Delay (s)		6.1		0.0				40.2			42.9		
Approach LOS		A		A				D			D		
Intersection Summary													
HCM 2000 Control Delay			14.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.46										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	11.8
Intersection Capacity Utilization			59.6%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1141: Cabaret Drive & Eastbound Twelve Mile Road

2019 Existing PM
03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↑						↑	↑	↑		
Traffic Volume (vph)	0	844	115	0	0	0	0	0	322	49	85	0	
Future Volume (vph)	0	844	115	0	0	0	0	0	322	49	85	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Total Lost time (s)		5.8	5.8						6.0	6.0	6.0		
Lane Util. Factor		0.95	1.00						1.00	0.95	0.95		
Frt		1.00	0.85						0.86	1.00	1.00		
Flt Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		3762	1683						1713	1787	1876		
Flt Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		3762	1683						1713	1787	1876		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.85	0.85	0.85	0.94	0.94	0.94	
Adj. Flow (vph)	0	898	122	0	0	0	0	0	379	52	90	0	
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	143	39	26	0	
Lane Group Flow (vph)	0	898	86	0	0	0	0	0	236	8	69	0	
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	
Turn Type		NA	Perm						Perm	Perm	NA		
Protected Phases		2									4		
Permitted Phases			2						8	4			
Actuated Green, G (s)		70.5	70.5						17.7	17.7	17.7		
Effective Green, g (s)		70.5	70.5						17.7	17.7	17.7		
Actuated g/C Ratio		0.70	0.70						0.18	0.18	0.18		
Clearance Time (s)		5.8	5.8						6.0	6.0	6.0		
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0		
Lane Grp Cap (vph)		2652	1186						303	316	332		
v/s Ratio Prot		c0.24											
v/s Ratio Perm			0.05						c0.14	0.00	0.04		
v/c Ratio		0.34	0.07						0.78	0.03	0.21		
Uniform Delay, d1		5.7	4.6						39.3	34.0	35.2		
Progression Factor		1.92	3.82						1.00	1.00	1.00		
Incremental Delay, d2		0.3	0.1						11.9	0.0	0.3		
Delay (s)		11.2	17.6						51.2	34.1	35.5		
Level of Service		B	B						D	C	D		
Approach Delay (s)		12.0			0.0			51.2				35.0	
Approach LOS		B			A			D				D	
Intersection Summary													
HCM 2000 Control Delay			23.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	11.8
Intersection Capacity Utilization			81.3%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
1141: Cabaret Drive & Eastbound Twelve Mile Road

2020 No Build PM

03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑						↑	↑	↑	
Traffic Volume (vph)	0	860	115	0	0	0	0	0	322	71	85	0
Future Volume (vph)	0	860	115	0	0	0	0	0	322	71	85	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.8	5.8						6.0	6.0	6.0	
Lane Util. Factor		0.95	1.00						1.00	0.95	0.95	
Frt		1.00	0.85						0.86	1.00	1.00	
Flt Protected		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (prot)		3762	1683						1713	1787	1874	
Flt Permitted		1.00	1.00						1.00	0.95	1.00	
Satd. Flow (perm)		3762	1683						1713	1787	1874	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	0	915	122	0	0	0	0	0	379	76	90	0
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	138	56	25	0
Lane Group Flow (vph)	0	915	86	0	0	0	0	0	241	12	73	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type		NA	Perm						Perm	Perm	NA	
Protected Phases		2									4	
Permitted Phases			2						8	4		
Actuated Green, G (s)		70.3	70.3						17.9	17.9	17.9	
Effective Green, g (s)		70.3	70.3						17.9	17.9	17.9	
Actuated g/C Ratio		0.70	0.70						0.18	0.18	0.18	
Clearance Time (s)		5.8	5.8						6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0	
Lane Grp Cap (vph)		2644	1183						306	319	335	
v/s Ratio Prot		c0.24										
v/s Ratio Perm			0.05						c0.14	0.01	0.04	
v/c Ratio		0.35	0.07						0.79	0.04	0.22	
Uniform Delay, d1		5.8	4.6						39.2	33.9	35.1	
Progression Factor		1.72	3.14						1.00	1.00	1.00	
Incremental Delay, d2		0.3	0.1						12.6	0.0	0.3	
Delay (s)		10.3	14.7						51.8	34.0	35.4	
Level of Service		B	B						D	C	D	
Approach Delay (s)		10.8		0.0				51.8			34.8	
Approach LOS		B		A				D			C	
Intersection Summary												
HCM 2000 Control Delay			23.2									C
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			100.0						11.8			
Intersection Capacity Utilization			82.8%									E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
1141: Cabaret Drive & Eastbound Twelve Mile Road

2020 Build PM
03/15/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑↑	↑						↑	↑	↑			
Traffic Volume (vph)	0	877	115	0	0	0	0	0	322	71	85	0		
Future Volume (vph)	0	877	115	0	0	0	0	0	322	71	85	0		
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000		
Total Lost time (s)		5.8	5.8						6.0	6.0	6.0			
Lane Util. Factor		0.95	1.00						1.00	0.95	0.95			
Flt		1.00	0.85						0.86	1.00	1.00			
Flt Protected		1.00	1.00						1.00	0.95	1.00			
Satd. Flow (prot)		3762	1683						1713	1787	1874			
Flt Permitted		1.00	1.00						1.00	0.95	1.00			
Satd. Flow (perm)		3762	1683						1713	1787	1874			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.85	0.85	0.85	0.94	0.94	0.94		
Adj. Flow (vph)	0	933	122	0	0	0	0	0	379	76	90	0		
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	133	56	25	0		
Lane Group Flow (vph)	0	933	85	0	0	0	0	0	246	12	73	0		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%		
Turn Type		NA	Perm						Perm	Perm	NA			
Protected Phases		2									4			
Permitted Phases			2						8	4				
Actuated Green, G (s)		70.0	70.0						18.2	18.2	18.2			
Effective Green, g (s)		70.0	70.0						18.2	18.2	18.2			
Actuated g/C Ratio		0.70	0.70						0.18	0.18	0.18			
Clearance Time (s)		5.8	5.8						6.0	6.0	6.0			
Vehicle Extension (s)		3.0	3.0						3.0	3.0	3.0			
Lane Grp Cap (vph)		2633	1178						311	325	341			
v/s Ratio Prot		c0.25												
v/s Ratio Perm			0.05						c0.14	0.01	0.04			
v/c Ratio		0.35	0.07						0.79	0.04	0.21			
Uniform Delay, d1		6.0	4.7						39.1	33.7	34.8			
Progression Factor		1.70	3.08						1.00	1.00	1.00			
Incremental Delay, d2		0.3	0.1						12.9	0.0	0.3			
Delay (s)		10.5	14.7						52.0	33.7	35.1			
Level of Service		B	B						D	C	D			
Approach Delay (s)		11.0			0.0			52.0			34.6			
Approach LOS		B			A			D			C			
Intersection Summary														
HCM 2000 Control Delay			23.2									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.44											
Actuated Cycle Length (s)			100.0						11.8				Sum of lost time (s)	
Intersection Capacity Utilization			83.3%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↘	
Traffic Vol, veh/h	1301	53	13	430	11	3
Future Vol, veh/h	1301	53	13	430	11	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1414	58	14	467	12	3

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0 1472	0 1938 1443
Stage 1	-	-	- 1443 -
Stage 2	-	-	- 495 -
Critical Hdwy	-	- 4.12	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	-	- 2.218	- 3.518 3.318
Pot Cap-1 Maneuver	-	- 458	- 72 162
Stage 1	-	-	- 217 -
Stage 2	-	-	- 613 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	- 458	- 69 162
Mov Cap-2 Maneuver	-	-	- 69 -
Stage 1	-	-	- 217 -
Stage 2	-	-	- 588 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	61.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	79	-	-	458	-
HCM Lane V/C Ratio	0.193	-	-	0.031	-
HCM Control Delay (s)	61.1	-	-	13.1	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection

Int Delay, s/veh 4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	794	7	3	1171	38	17
Future Vol, veh/h	794	7	3	1171	38	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	863	8	3	1273	41	18

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	871	0	2146 867
Stage 1	-	-	-	-	867 -
Stage 2	-	-	-	-	1279 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	774	-	53 352
Stage 1	-	-	-	-	411 -
Stage 2	-	-	-	-	281 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	774	-	52 352
Mov Cap-2 Maneuver	-	-	-	-	52 -
Stage 1	-	-	-	-	411 -
Stage 2	-	-	-	-	258 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	163.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	71	-	-	774	-
HCM Lane V/C Ratio	0.842	-	-	0.004	-
HCM Control Delay (s)	163.2	-	-	9.7	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	4.1	-	-	0	-

**ROAD COMMISSION FOR
OAKLAND COUNTY
(RCOC)**

**TURN LANE TREATMENT
WARRANT ANALYSES**

**ROAD COMMISSION FOR OAKLAND COUNTY
PERMIT RULES, SPECIFICATIONS AND GUIDELINES**



ROAD COMMISSION FOR OAKLAND COUNTY

DEPARTMENT OF CUSTOMER SERVICES

PERMITS DIVISION

2420 PONTIAC LAKE ROAD

WATERFORD, MI 48328

MARCH 14, 2013

FIGURE 6-2

WARRANT FOR PERMITTING
LEFT TURNS

(BASED ON TOTAL DEVELOPMENT)

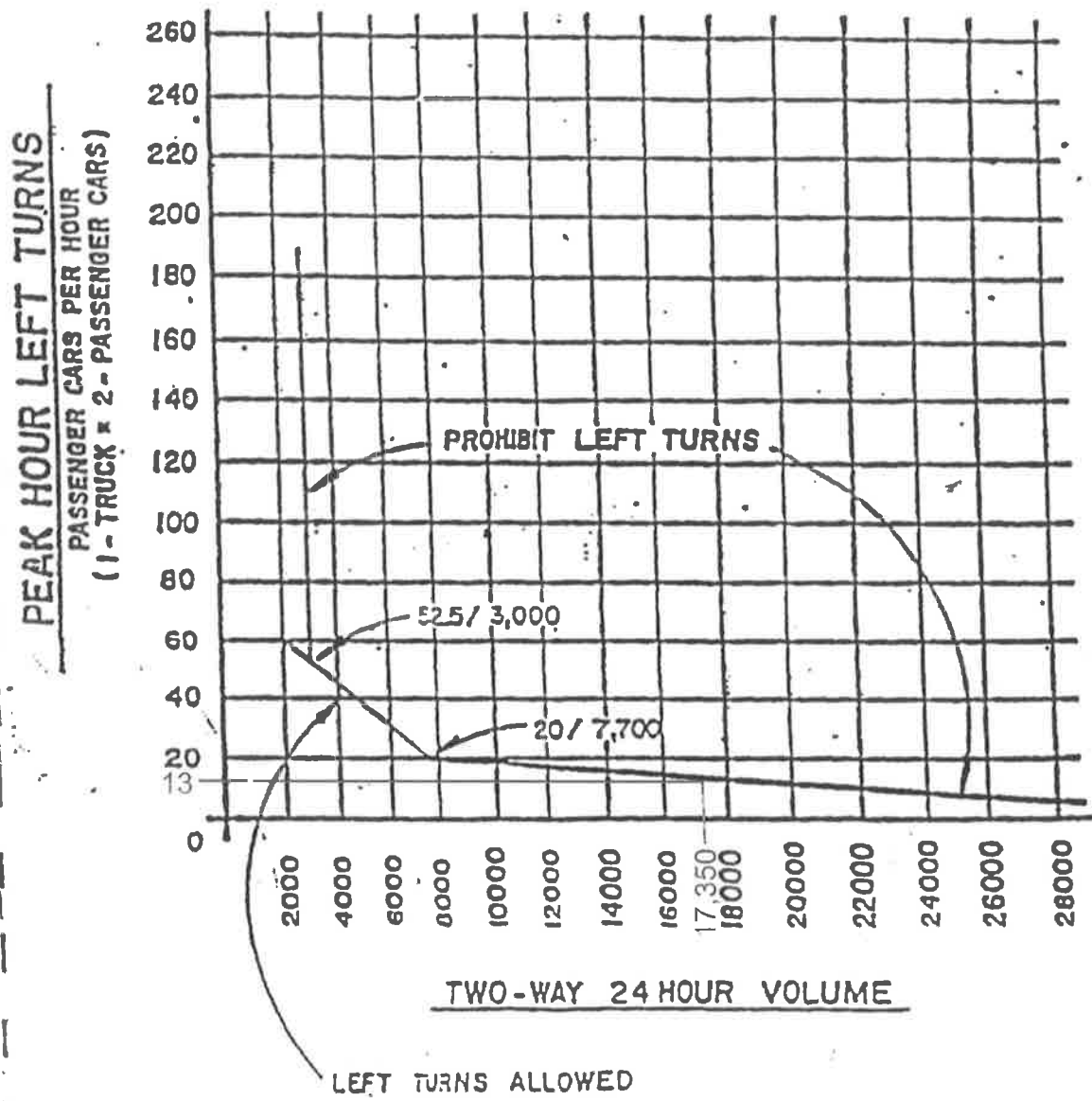
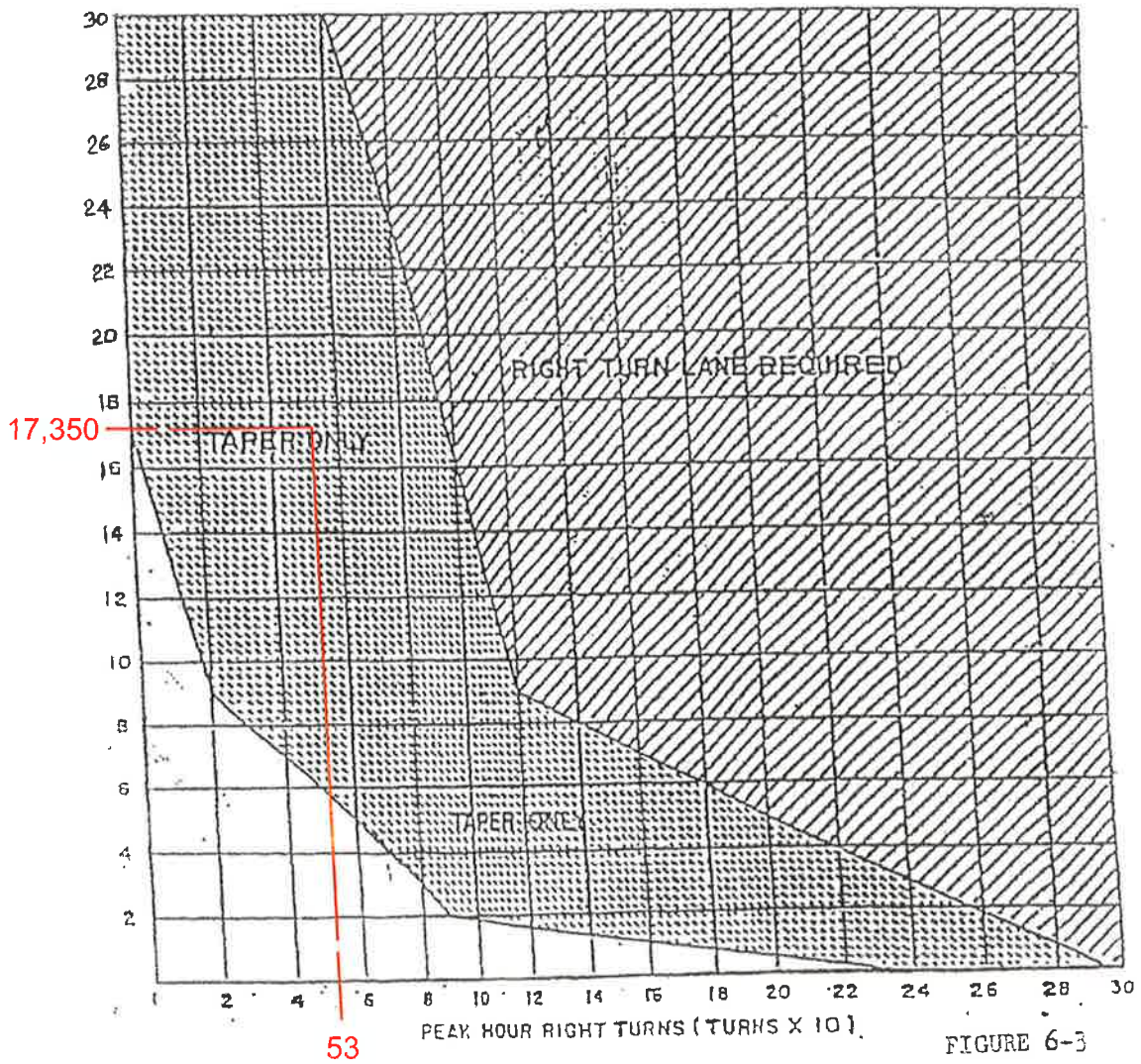


FIGURE 6-2
REVISED 8-6-79

FIGURE 6-3

WARRANTS FOR RIGHT TURN DECELERATION LANE OR TAPER



SITE PLAN REVISIONS 4-25-2019

BENCHMARKS:
SITE BM #1
 CITY OF NOW BENCHMARK #941
 7" ON FLANGE BOLT ON HYDRANT,
 25' N. OF C.L. 12 MILE ROAD, 800'
 W. OF TART.
 ELEVATION: 956.92 (N.A.V.D.88 DATUM)
SITE BM #2
 ARROW ON HYDRANT, 25' N. OF C.L. 12
 MILE ROAD, OPPOSITE HOUSE NO. 45833.
 ELEVATION: 972.29 (N.A.V.D.88 DATUM)
SITE BM #3
 ARROW ON HYDRANT, 40' N. OF C.L. 12
 MILE ROAD, 802.5' EAST OF WEST PARK DR.
 ELEVATION: 952.39 (N.A.V.D.88 DATUM)

*** ESTIMATED CONSTRUCTION MATERIALS:**

4" CURB & GUTTER	300 LF
CONCRETE WALK	3,505 LF
6" CURB & GUTTER	14,536 SF
ASPHALT PAVEMENT	49,585 SF
ASPHALT PAVEMENT (HEAVY DUTY)	62,957 SF
ASPHALT PAVEMENT - ENTRY & LANE WIDENING	2,975 SF
4" CONCRETE WALK	14,535 SF
8" CONCRETE DUMPS/TER PAD & LOADING ZONE	4,245 SF
8" 21AA AGGREGATE BASE	79,841 CF

* CONTRACTOR TO EVALUATE AND DETERMINE ACTUAL QUANTITIES.
 ONLY USE ABOVE TABLE AS REFERENCE

GENERAL NOTES:
 THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
 1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
 2. REFER TO CITY OF NOW PAVING STANDARD DETAILS FOR ADDITIONAL DETAILS.
 3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF NOW CURRENT STANDARDS AND SPECIFICATIONS.
 4. THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
 5. ALL ON-SITE SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH MUTUO. PARKING STALL STRIPING SHALL BE 4" WIDE (SINGLE) AND WHITE.
 6. THE ACCESSIBLE PARKING SPACE AND ASSOCIATED ASBLE SHALL BE STRIPPED WITH 4" BLUE STRIPES. THE STANDARD SPACE ADJACENT TO AN ACCESSIBLE SPACE, ABUTTING BLUE AND WHITE STRIPES SHALL BE INSTALLED.
 7. ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK. 12 MILE ROAD IS IN THE JURISDICTION OF THE ROAD COMMISSION OF OAKLAND COUNTY. 12 MILE ROAD IS POSTED AT 45 MPH.
 8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND/OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.
 9. ALL ON-SITE CURB TO BE 18" WIDE AS SHOWN ON CITY OF NOW STANDARD PAVING DETAIL SHEET 2 OF 2. FLARE CURB TO 24" WIDE FOR 10' OTHER SIDE OF CURB DRAINAGE.

LIGHTING NOTES:
 1. ALL ON-SITE FLEE MOUNTED LIGHTS SHALL BE SHIELDED AND AIMED AT THE AREAS TO BE SECURED (PARKING SPACES, DRIVES, WALKS, ECT.).
 2. BUILDING MOUNTED FIXTURES SHALL BE DESIGNED TO ILLUMINATE THE FACADE AND NOT ILLUMINATE THE LANDSCAPE AREAS OR PAVEMENT AREAS UNLESS SPECIFICALLY DESIGNED ON THESE PLANS.

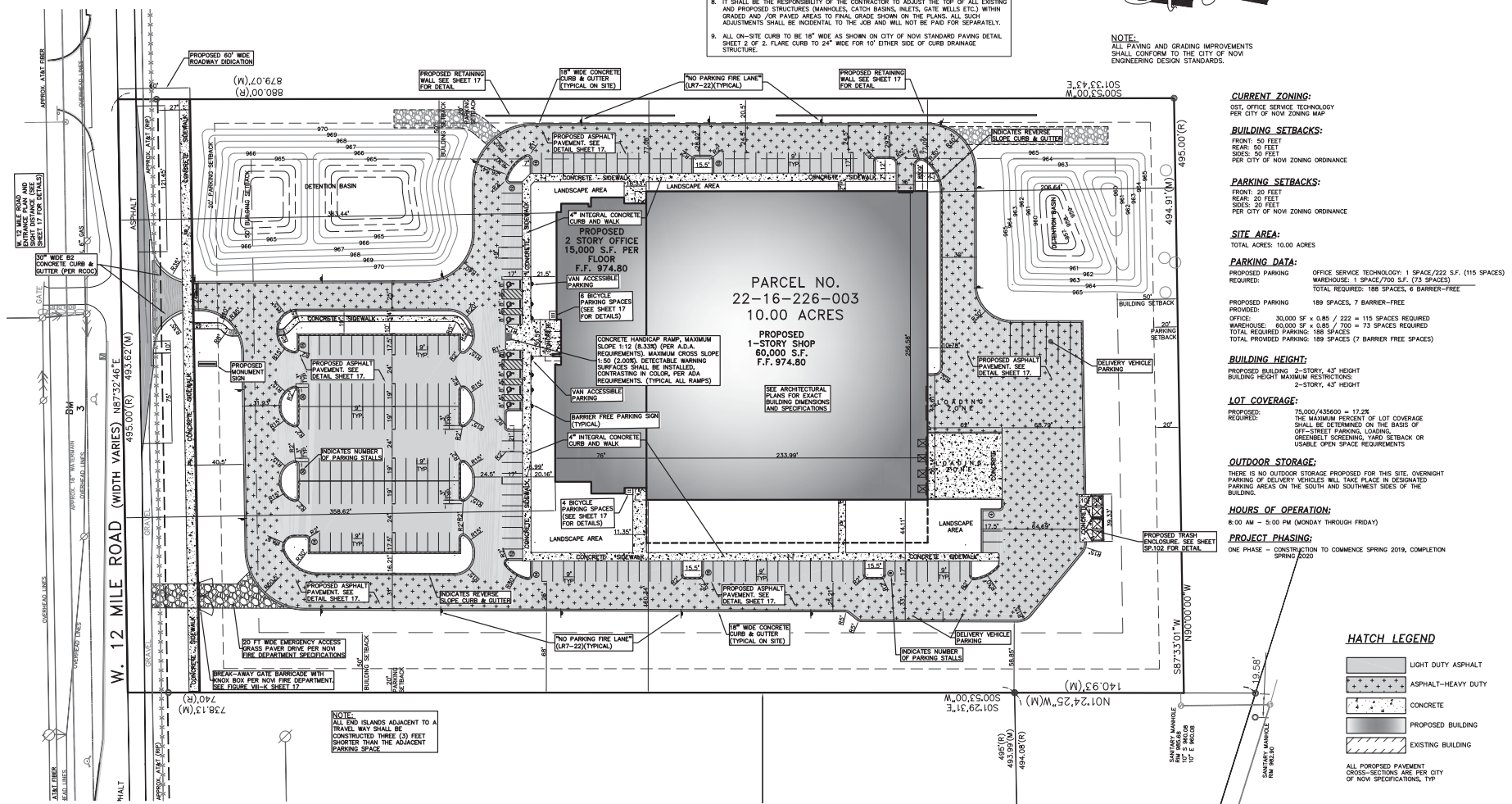
SIGNAGE QUANTITIES

NO PARKING-FIRE LANE (LR7-22)	16 EACH
BARRIER FREE PARKING (R7-8)	7 EACH
VAN ACCESSIBLE PARKING (R7-8p)	2 EACH

ALL SIGNAGE AND PAVEMENT MARKINGS SHALL COMPLY WITH CURRENT MUTUO STANDARDS AND SPECIFICATIONS



NOTE:
 ALL PAVING AND GRADING IMPROVEMENTS SHALL CONFORM TO THE CITY OF NOW ENGINEERING DESIGN STANDARDS.



CURRENT ZONING:
 OST, OFFICE SERVICE TECHNOLOGY
 PER CITY OF NOW ZONING MAP

BUILDING SETBACKS:
 FRONT: 20 FEET
 REAR: 50 FEET
 SIDES: 50 FEET
 PER CITY OF NOW ZONING ORDINANCE

PARKING SETBACKS:
 FRONT: 20 FEET
 REAR: 20 FEET
 SIDES: 20 FEET
 PER CITY OF NOW ZONING ORDINANCE

SITE AREA:
 TOTAL ACRES: 10.00 ACRES

PARKING DATA:
 OFFICE SERVICE TECHNOLOGY: 1 SPACE/222 S.F. (115 SPACES)
 WAREHOUSE: 1 SPACE/700 S.F. (73 SPACES)
 TOTAL PROVIDED: 189 SPACES, 8 BARRIER-FREE
 TOTAL REQUIRED: 189 SPACES, 7 BARRIER-FREE

PROPOSED PARKING: 189 SPACES, 7 BARRIER-FREE
PROVIDED:
 OFFICE: 30,000 SF x 0.85 / 222 = 115 SPACES REQUIRED
 WAREHOUSE: 60,000 SF x 0.85 / 700 = 73 SPACES REQUIRED
 TOTAL PROVIDED PARKING: 189 SPACES
 TOTAL PROVIDED PARKING: 189 SPACES (7 BARRIER FREE SPACES)

BUILDING HEIGHT:
 PROPOSED BUILDING: 2-STORY, 45' HEIGHT
 BUILDING HEIGHT MAXIMUM RESTRICTIONS:
 2-STORY, 45' HEIGHT

LOT COVERAGE:
 PROPOSED: 75,000/435,600 = 17.2%
 REQUIRED: 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 REQUIREMENTS

OUTDOOR STORAGE:
 THERE IS NO OUTDOOR STORAGE PROPOSED FOR THIS SITE. ON-STREET PARKING OF DELIVERY VEHICLES WILL TAKE PLACE IN DESIGNATED PARKING AREAS ON THE SOUTH AND SOUTHWEST SIDES OF THE BUILDING.

HOURS OF OPERATION:
 8:00 AM - 5:00 PM (MONDAY THROUGH FRIDAY)

PROJECT PHASING:
 ONE PHASE - CONSTRUCTION TO COMMENCE SPRING 2019, COMPLETION SPRING 2020

HATCH LEGEND

[Pattern]	LIGHT DUTY ASPHALT
[Pattern]	ASPHALT-HEAVY DUTY
[Pattern]	CONCRETE
[Pattern]	PROPOSED BUILDING
[Pattern]	EXISTING BUILDING

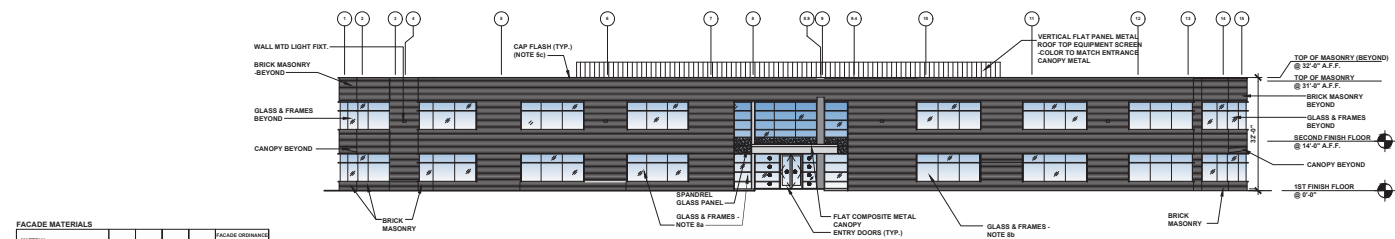
ALL PROPOSED PAVEMENT CROSS-SECTIONS ARE PER CITY OF NOW SPECIFICATIONS, TYP

NOTE:
 THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AS DISCLOSED BY AVAILABLE UTILITY COMPANY RECORDS AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE COMPANY. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY IF A CONFLICT IS APPARENT.

NOTICE:
 CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

PARCEL NO. 22-16-226-003 LEGAL DESCRIPTION (BY OTHERS):
 PART OF N 1/2 OF NE 1/4 OF SECTION 16, T. 1N., R. 8E., CITY OF NOW, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT DISTANT EAST 1150.04 FEET FROM THE NORTH 1/4 CORNER, THENCE EAST 490 FEET; THENCE S00°33'00"W 890 FEET, THENCE WEST 490 FEET, THENCE N00°33'00"E 890 FEET TO THE POINT OF BEGINNING, CONTAINING 10.00 ACRES, MORE OR LESS, AND SUBJECT TO ANY EASEMENTS, RESTRICTIONS, OR RIGHTS OF WAY OF RECORD.

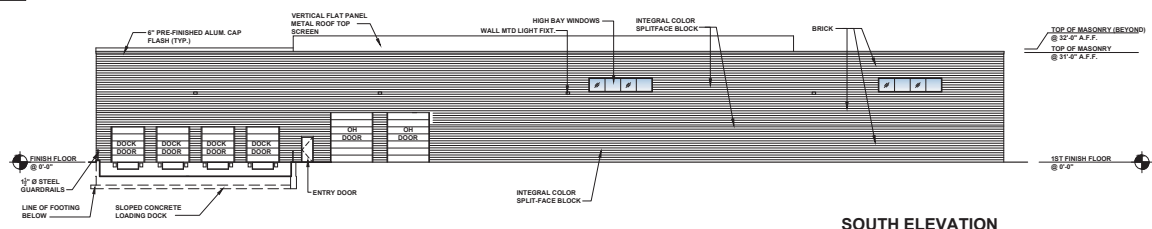
GREENTECH ENGINEERING, INC.
 CIVIL ENGINEERS & LAND SURVEYORS
 811
 Know what's below
 Call before you dig.
 AMSON-NASSAR DEVELOPMENT
 LAYOUT & PAVING PLAN
 45833 W. 12 MILE ROAD - PARCEL NO. 22-16-226-003
 SECTION 16
 CITY OF NOW, MICHIGAN
 OAKLAND COUNTY, MICHIGAN
 CLIENT: AMSON-NASSAR DEVELOPMENT
 REVISIONS:
 2019-02-22 REV. BUILDING
 2019-03-28 PER REVIEW
 2019-04-25 PER REVIEW
 DATE: 1-31-2019
 DRAWN BY: RMS/WD/MW
 CHECKED BY: DJL
 SCALE: HOR 1" = 40 FT.
 VER 1" = 10 FT.
 5
 17-130



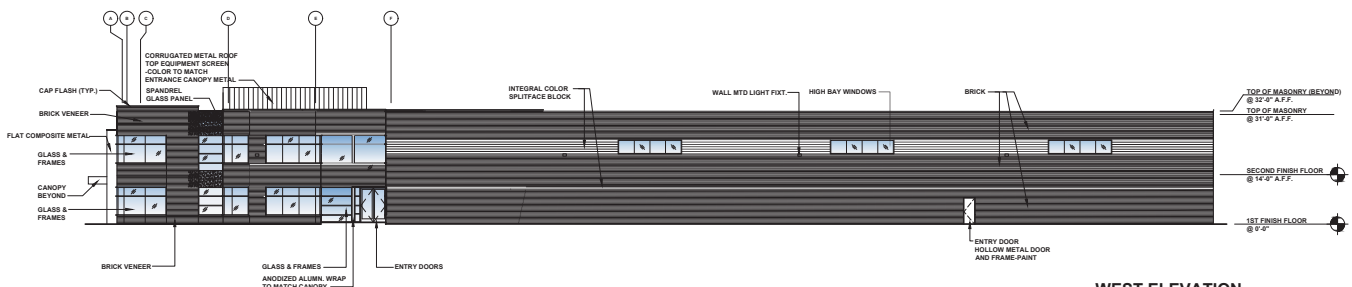
NORTH ELEVATION
SCALE: 1/16"=1'-0"

FAÇADE MATERIALS

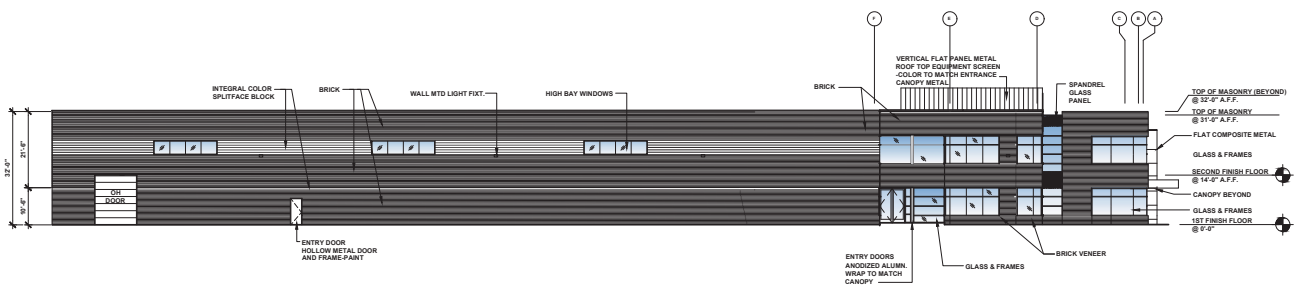
MATERIAL	NORTH	SOUTH	WEST	EAST	FAÇADE ORNAMENT SECTION 2000 - MASONRY
CLAY BRICK	80%	80%	80%	80%	100%
FLAT METAL PANEL (CANOPY)	2%	0%	0%	0%	0%
SPANDREL GLASS	2%	0%	1%	1%	0%
VERTICALLY CORRUGATED METAL PANEL (DOOR/SCREEN)	0%	0%	0%	0%	0%
SPANDREL GLASS	0%	0%	0%	0%	0%



SOUTH ELEVATION
SCALE: 1/16"=1'-0"



WEST ELEVATION
SCALE: 1/16"=1'-0"



EAST ELEVATION
SCALE: 1/16"=1'-0"

