

## ADAMS NORTH TECHNOLOGY CENTRE JSP19-05

### **ADAMS NORTH TECHNOLOGY CENTRE JSP19-05**

Consideration at the request of Northern Equities Group for Preliminary Site Plan and Storm Water Management plan approval. The subject property contains 6.7 acres and is located in Section 1, on the north side of MacKenzie Drive east of the planned extension of Cabot Drive, part of the Haggerty Corridor Corporate Park. The vacant parcel is zoned OST, Office Service Technology. The applicant is proposing to construct a one-story building with office space and laboratory space totaling 56,429 square feet. This project was approved in 2014 and returned to Planning Commission for approval in 2017, but was never built.

### **Required Action**

Approve/Deny the Preliminary Site Plan and Storm Water Management Plan.

REVIEW	RESULT	DATE	COMMENTS
Planning	Approval recommended	2-20-19	<ul style="list-style-type: none"> <li>• <b>Waiver for end island with 8' outside radius, given the applicant provides a turning movement diagram with the next submittal. Supported by Staff.</b></li> <li>• Items to be addressed by the applicant prior to revised Final Site Plan approval</li> </ul>
Engineering	Approval recommended	2-15-19	<ul style="list-style-type: none"> <li>• Items to be addressed by the applicant prior to revised Final Site Plan approval</li> </ul>
Landscaping	Approval recommended	2-4-19	<ul style="list-style-type: none"> <li>• <b>Waiver for lack of parking lot interior trees within the ITC Corridor (4 trees). Supported by Staff.</b></li> <li>• <b>Waiver for lack of parking lot perimeter trees within the ITC Corridor (7 trees). Supported by Staff.</b></li> <li>• <b>Waiver for lack of building coverage by foundation landscaping (less than 75% of building has landscaping). Supported by Staff.</b></li> <li>• <b>Waiver for lack of landscape screening around transformers (located within paved areas). Supported by Staff.</b></li> <li>• Items to be addressed by the applicant prior to revised Final Site Plan approval</li> </ul>
Woodlands	Not Applicable		
Wetlands	Not Applicable		
Traffic	Approval recommended	2-20-19	<ul style="list-style-type: none"> <li>• <b>Waiver to allow an updated trip generation study in lieu of the Traffic Impact Study at the time of revised Final Site Plan, due to a relatively minor increase in daily trips anticipated for this building. Supported by</b></li> </ul>

			<p><b>Staff.</b></p> <ul style="list-style-type: none"> <li>• Items to be addressed by the applicant prior to revised Final Site Plan approval</li> </ul>
Façade	Approval recommended	2-7-19	<ul style="list-style-type: none"> <li>• <b>Section 9 Waiver for underage of brick on the west façade. Supported by Staff.</b></li> </ul>
Fire	Approval recommended (2-22-19)	1-24-19	<ul style="list-style-type: none"> <li>• <b>Hydrant spacing and separate water lines to the building shall comply with Fire standards at the time of revised Final Site Plan, as shown in the Utility Plan diagram provided with the response letter. Supported by Staff.</b></li> <li>• Items to be addressed by the applicant prior to Final Site Plan approval</li> </ul>

## **MOTION SHEET**

### **Approval – Preliminary Site Plan**

In the matter of Adams North Technology Centre JSP19-05, motion to **approve** the Preliminary Site Plan based on and subject to the following:

- a. A waiver of the required Traffic Impact Study, with the applicant to instead provide a recent traffic study at the time of revised Final Site Plan review, with the reasoning that an initial study (1999) and an updated study (2017) were conducted for the Haggerty Corridor Corporate Park, which is hereby granted;
- b. A waiver from Section 5.3.12 for end islands with smaller than minimum required 15' outside radius (8' proposed) given that a turning movement diagram will be provided by the applicant at the time of revised Final Site Plan to show that it is maneuverable, which is hereby granted;
- c. Landscape waiver from Section 5.5.3.C.ii for not providing parking lot interior trees within the ITC Corridor, with the reasoning that trees may not be planted within the easement, which is hereby granted;
- d. Landscape waiver from Section 5.5.3.c.iv for not providing parking lot perimeter trees within the ITC Corridor, with the reasoning that trees may not be planted within the easement, which is hereby granted;
- e. Landscape waiver from Section 5.5.3.D. for providing landscaping at less than 75% of the building foundation with the reasoning that the missing areas are not visible from the roads and the required area is provided, which is hereby granted;
- f. Landscape waiver from LDM Section 6 for lack of landscape screening around transformers with the reasoning that the transformer locations are mostly screened from view by landscaped berm, which is hereby granted;
- g. A Section 9 waiver for the underage of brick on the west façade, which is hereby granted;
- h. 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 revised Final Site Plan; and
- i. *(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 – Stormwater Management Plan**

In the matter of Adams North Technology Centre JSP19-05, 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 Adams North Technology Centre JSP19-05, 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 – Stormwater Management Plan**

In the matter of Adams North Technology Centre JSP19-05, 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

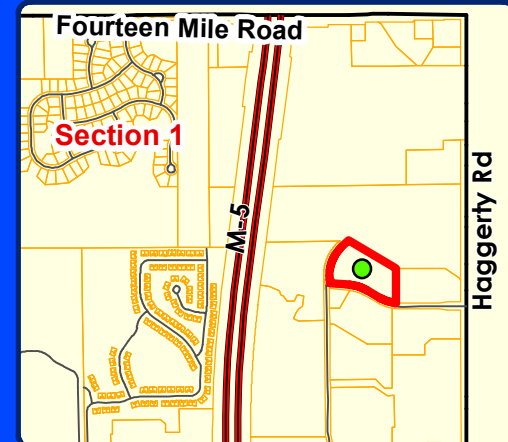
Zoning

Future Land Use

Natural Features

# ADAMS NORTH TECH CENTRE: JSP 19-05

## 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: 2/22/19  
Project: ADAMS NORTH JSP19-05  
Version #: 1

0 55 110 220 330 Feet  
1 inch = 250 feet

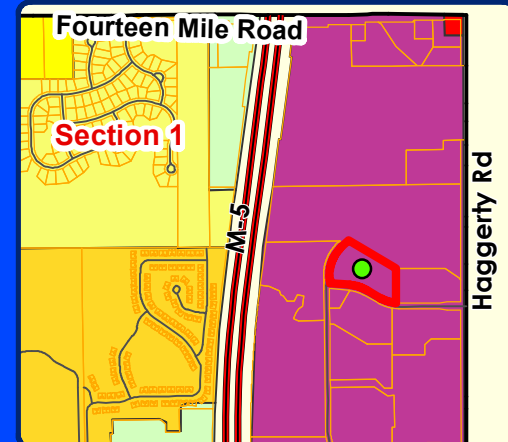
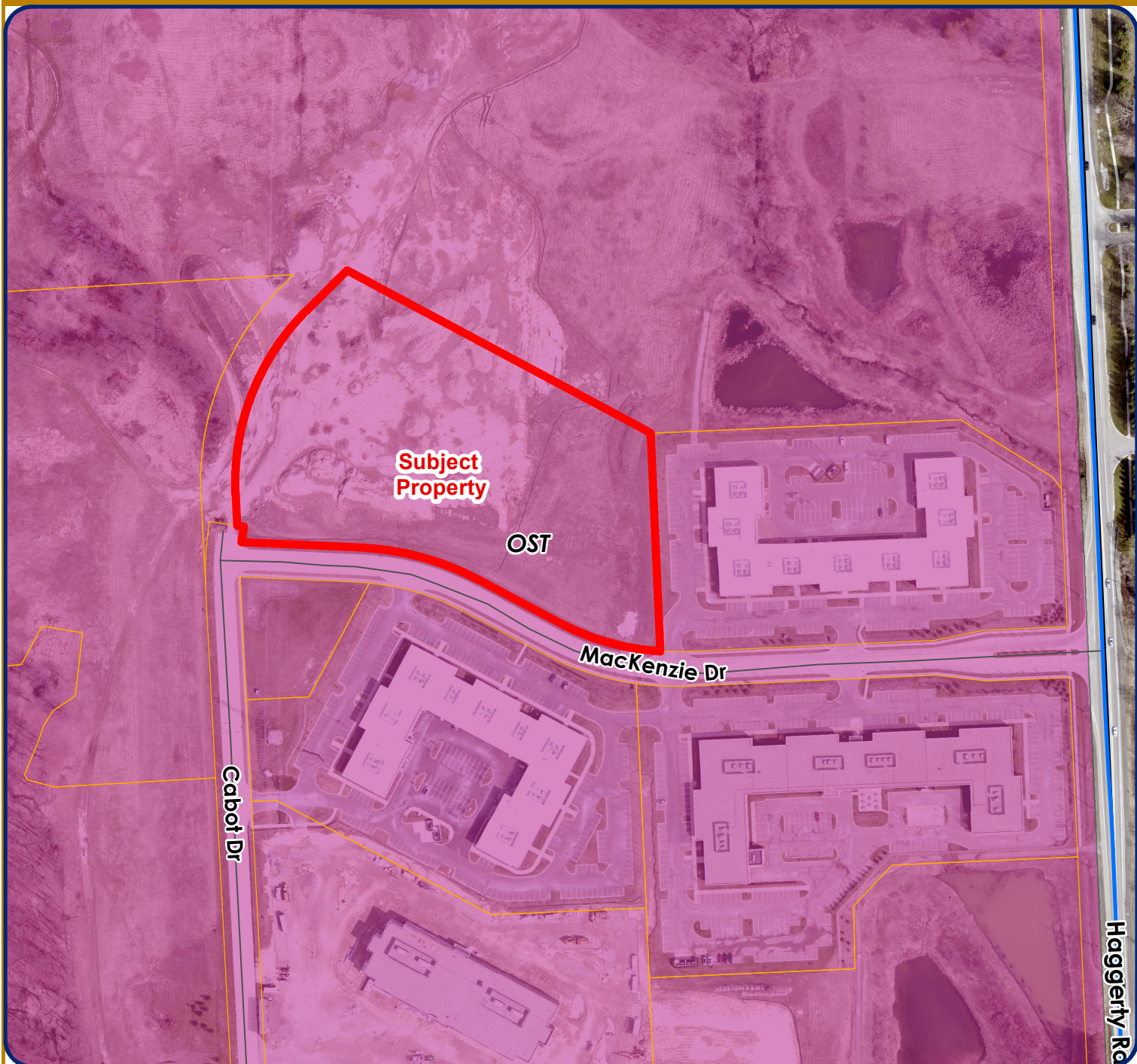


**MAP INTERPRETATION NOTICE**

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.

# ADAMS NORTH TECH CENTRE: JSP 19-05

## ZONING




**LEGEND**

- R-A: Residential Acreage
- R-2: One-Family Residential
- R-4: One-Family Residential District
- RM-1: Low-Density Multiple Family
- B-3: General Business 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: 2/22/19  
Project: ADAMS NORTH JSP19-05  
Version #: 1

0 55 110 220 330 Feet  
1 inch = 250 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.

# ADAMS NORTH TECH CENTRE: JSP 19-05

## FUTURE LAND USE

OFFICE RD TECH



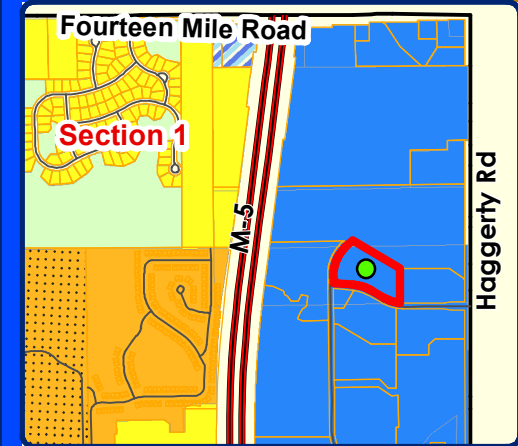
**Subject Property**

OFFICE  
RD TECH

MacKenzie Dr

Cabbot Dr

Haggerty Rd



### LEGEND

- Single Family
- Multiple Family
- PD1
- Community Office
- Office Research Development Technology
- Private Park
- 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: 2/22/19  
Project: ADAMS NORTH JSP19-05  
Version #: 1



1 inch = 250 feet



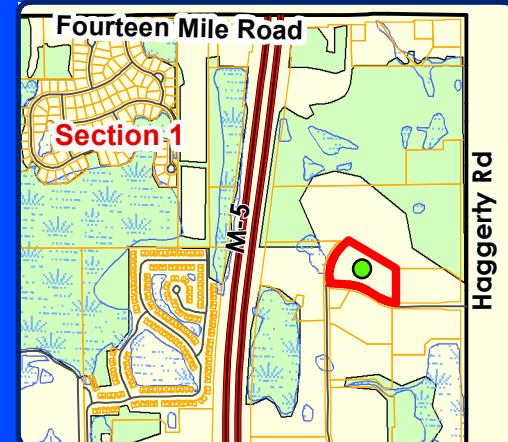
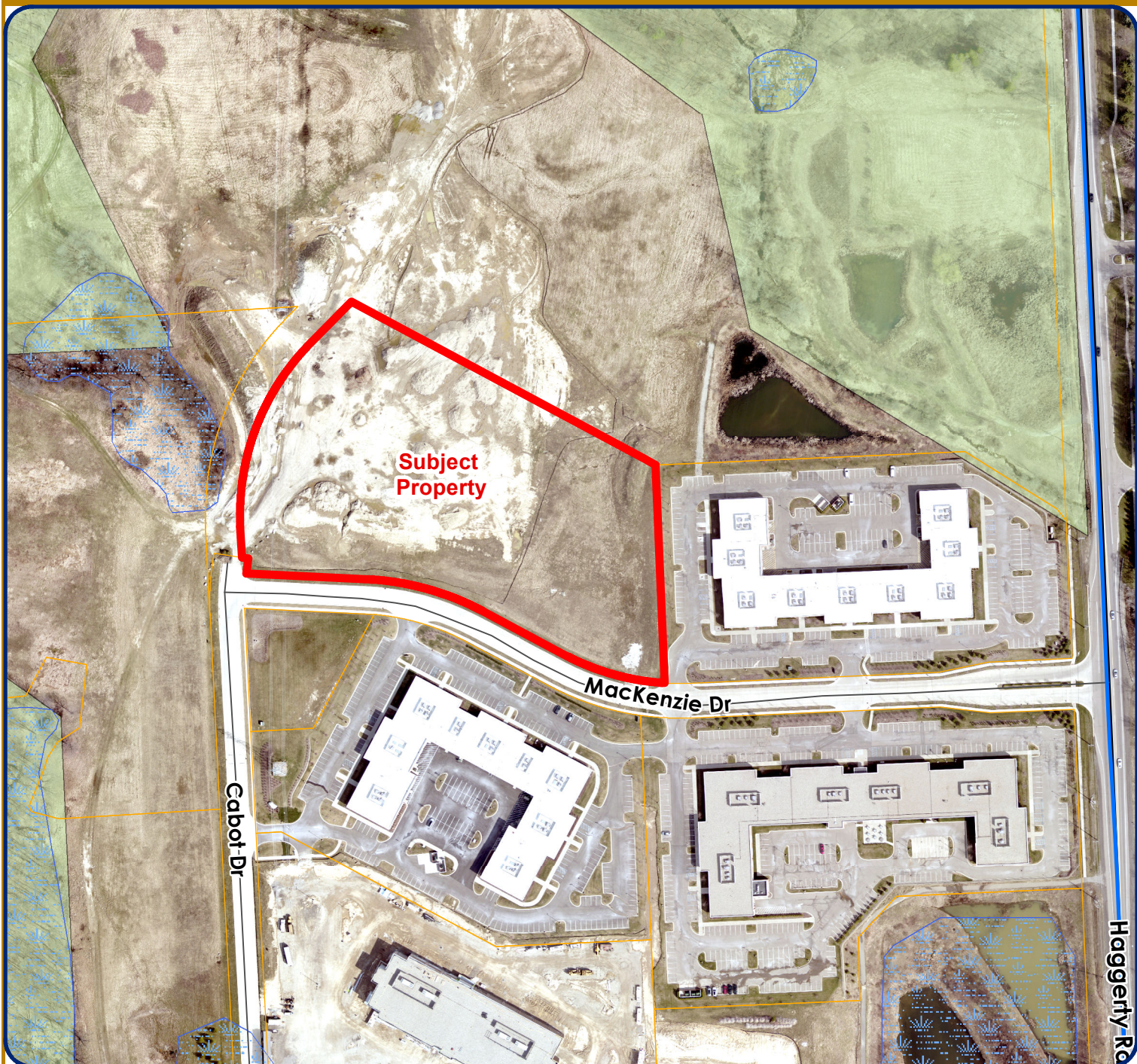
### MAP INTERPRETATION NOTICE

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.



# ADAMS NORTH TECH CENTRE: JSP 19-05

## 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

Map Author: Lindsay Bell  
Date: 2/22/19  
Project: ADAMS NORTH JSP19-05  
Version #: 1

0 55 110 220 330 Feet  
1 inch = 250 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.

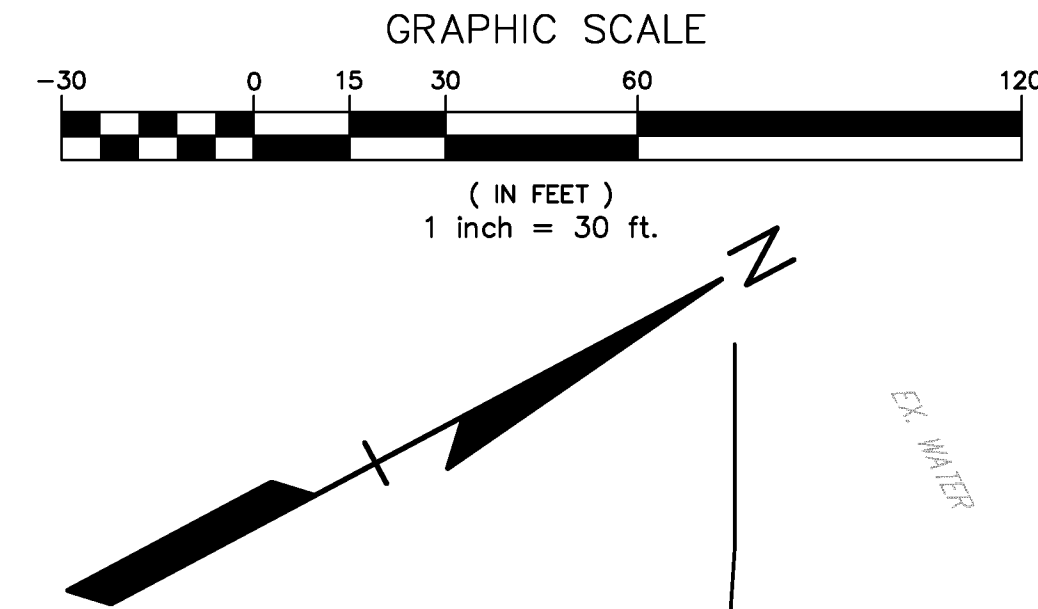
**SITE PLAN**

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



**LEGAL DESCRIPTION - PROPOSED PARCEL**  
 (Part of Tax Parcel ID No. 22-01-200-041, by Professional Engineering Associates)  
 PART OF THE EAST 1/2 OF SECTION 1, TOWN 1 NORTH, RANGE 8 EAST, DESCRIBED AS: COMMENCING AT THE EAST 1/4 CORNER; THENCE S02°30'06"E, 8.24 FEET; THENCE S87°29'54"W, 60.00 FEET TO THE INTERSECTION OF THE WEST LINE OF HAGGERTY ROAD (120' WIDE) AND THE NORTH LINE OF MACKENZIE DRIVE (VARIABLE WIDTH); THENCE ALONG SAID NORTH LINE THE FOLLOWING FOUR (4) COURSES:  
 1. S87°29'39"W, 145.57 FEET;  
 2. S78°16'26"W, 87.38 FEET;  
 3. S87°29'39"W, 430.82 FEET;  
 4. 42.85 ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 420.00 FEET, A CENTRAL ANGLE OF 05°48'30", AND A CHORD WHICH BEARS N89°36'07"W 42.56 FEET TO THE POINT OF BEGINNING;  
 THENCE CONTINUING ALONG THE NORTH LINE OF MACKENZIE ROAD (60' WIDE) THE FOLLOWING FOUR (4) COURSES:  
 1. 181.45 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 420.00 FEET, A CENTRAL ANGLE OF 24°44'51", AND A CHORD WHICH BEARS N74°19'08"W, 180.04 FEET  
 2. N61°56'30"W, 159.14 FEET;  
 3. 212.59 FEET ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A RADIUS OF 480.00 FEET, A CENTRAL ANGLE OF 25°22'34", AND A CHORD WHICH BEARS N74°37'47"W, 210.86 FEET;  
 4. N87°19'07"W, 207.14 FEET TO THE EAST LINE OF CABOT DRIVE (60' WIDE);  
 THENCE 26.43 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 420.00 FEET, A CENTRAL ANGLE OF 03°36'22", AND A CHORD WHICH BEARS N08°34'49"E, 26.43 FEET TO THE NORTH LINE OF SAID CABOT DRIVE; THENCE ALONG SAID NORTH LINE N81°15'14"W, 11.59 FEET;  
 THENCE N02°57'07"W, 53.46 FEET; THENCE 351.10 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 420.00 FEET, A CENTRAL ANGLE OF 47°53'50", AND A CHORD WHICH BEARS N20°58'48"E, 340.97 FEET; THENCE N44°56'42"E, 99.19 FEET; THENCE S61°49'28"E, 576.30 FEET; THENCE S61°07'48"E, 20.00 FEET;  
 THENCE S02°30'21"E, 377.51 FEET TO THE POINT OF BEGINNING, CONTAINING ±6.700 ACRES OF LAND.

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



**SIGN QUANTITIES:**

'NO PARKING FIRE LANE' SIGN (LR7-22)	1	30 EA.
24"x24" 'STOP' SIGN (R1-1)	2	2 EA.
'BARRIER FREE PARKING' SIGN (R7-6)	3	8 EA.
'VAN ACCESSIBLE' SIGN (R7-8P)	4	4 EA.
'NO PARKING LOADING ZONE' SIGN (R7-6)	5	5 EA.

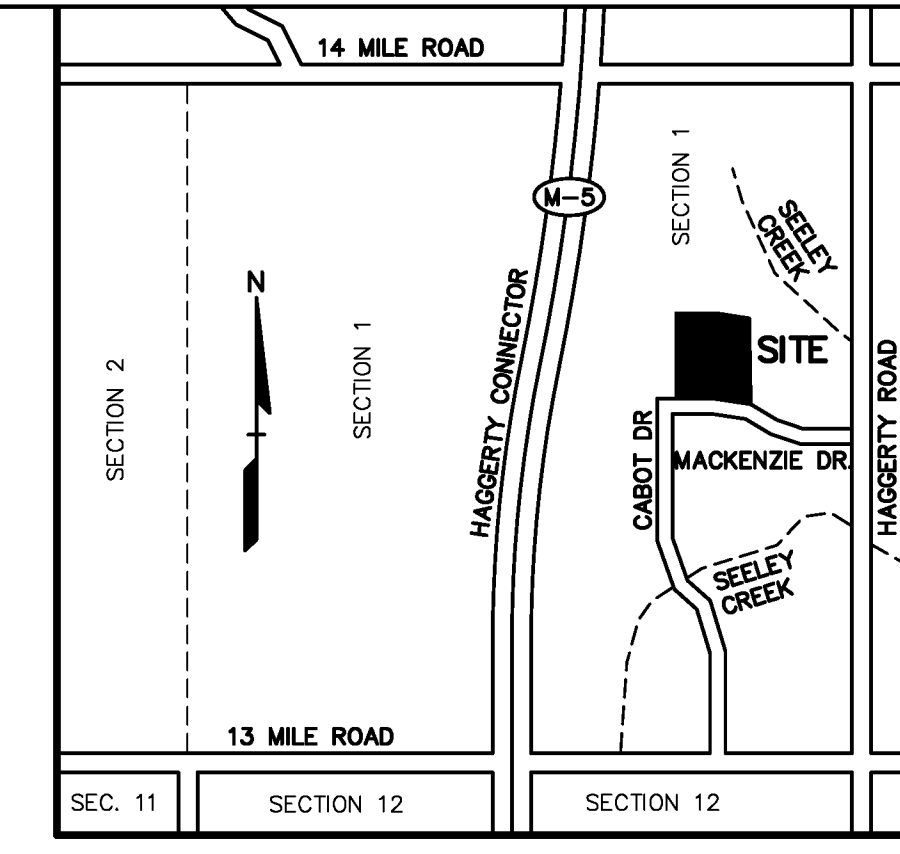
REFER TO SHEET C-9.2 FOR SIGN DETAILS.

**SIDEWALK RAMP LEGEND:**

SIDEWALK RAMP 'TYPE R'	⊗
SIDEWALK RAMP 'TYPE P'	⊙
SIDEWALK RAMP 'TYPE D'	⊕
CURB DROP ONLY	⊗

REFER TO THE LATEST M.D.O.T. R-28 STANDARD PLAN FOR RAMP AND DETECTABLE WARNING DETAILS

**DETECTABLE WARNING PLATE NOTE:**  
 AS SHOWN ON SHEETS C-3.1 AND C-3.2, SOME SIDEWALK RAMPS WILL REQUIRE DETECTABLE WARNING PLATES TO BE INSTALLED.  
 DETECTABLE WARNING PLATES SHOULD BE EAST JORDAN 'DURALAST' IN NATURAL FINISH OR BLACK ASPHALTIC DIP FINISH, OR APPROVED EQUAL.



**LEGEND**

● IRON FOUND	⊗ BRASS PLUG SET	⊕ SEC. CORNER FOUND
⊗ IRON SET	⊙ MONUMENT FOUND	⊗ RECORDED
⊗ NAIL FOUND	⊙ MONUMENT SET	⊗ MEASURED
⊗ NAIL & CAP SET		⊗ CALCULATED

**EXISTING**

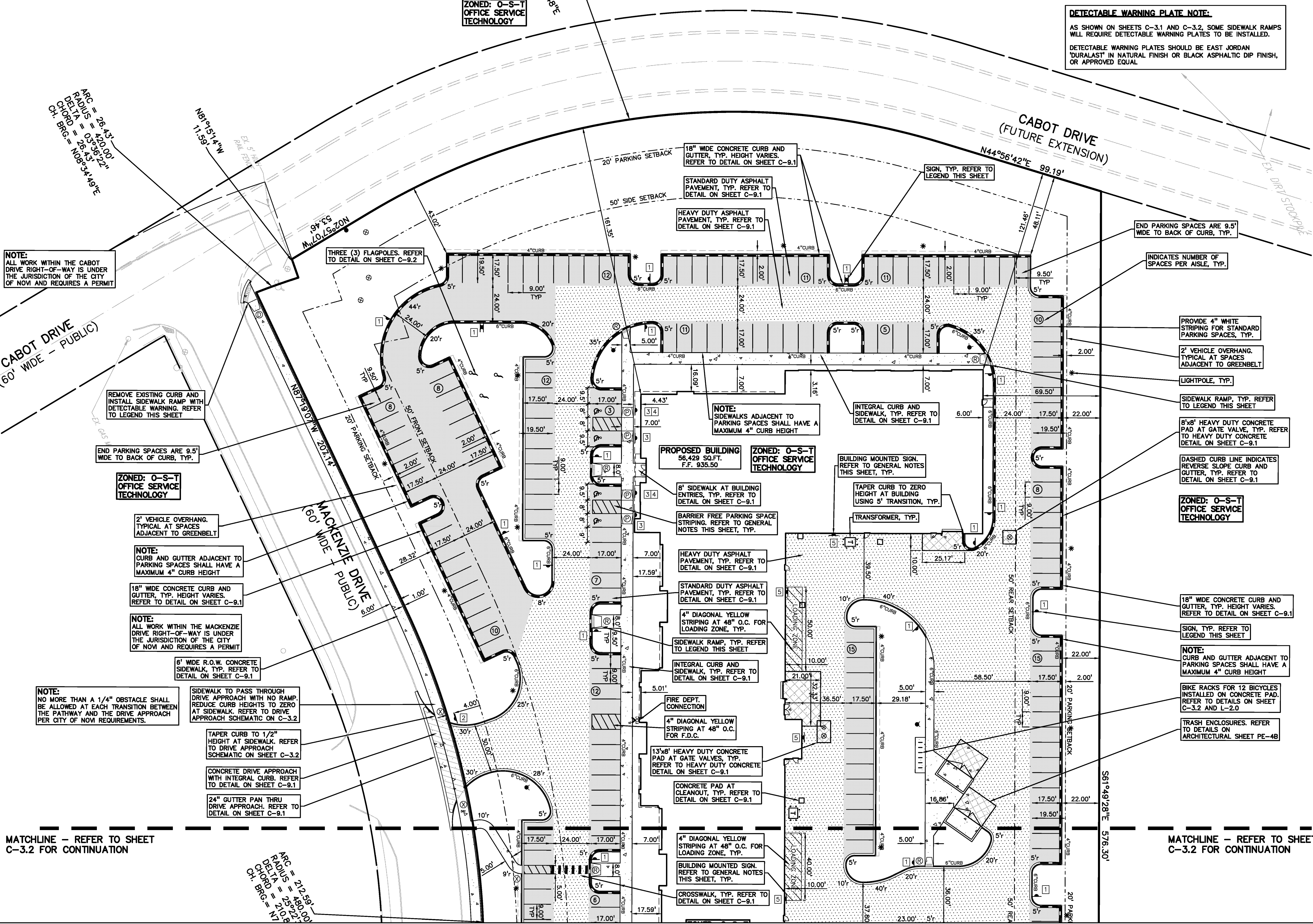
- OH-ELEC-W-O: ELEC. PHONE OR CABLE TV O.H. LINE, POLE & BAY WIRE
- UG-CATV: UNDERGROUND CABLE TV, CATV PEDESTAL
- UG-UG-CABLE: TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- UG-ELEC: ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- UG-GAS: GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD. GATE VALVE, TAPPING SLUVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- CHIMNEY SEWER & MANHOLE
- CATCH BASIN, INLET, WARD GRAB
- POST INDICATOR SIGN
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MALBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE

**PROPOSED**

- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIEN
- CONC.: CONCRETE
- ASPH.: ASPHALT
- GRAVEL: GRAVEL SHOULDER
- STD HEAVY R.O.M. DUTY ONLY
- STD HEAVY DUTY ONLY

**REVISIONS**

NO.	BY	DATE	DESCRIPTION



**REFERENCE DRAWINGS**

- WATER MAIN: HAGGERTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- SANITARY SEWER: HAGGERTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- STORM SEWER: HAGGERTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- ELECTRIC: HAGGERTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- TELEPHONE: HAGGERTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- GAS: HAGGERTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- CONSUMERS ENERGY OUTSIDE SALES MAP 01-58-01-4, DATED AUG. 28, 2008
- NO PARKING SIGN: MICHIGAN DEPARTMENT OF TRANSPORTATION, MICHIGAN DEPARTMENT OF TRANSPORTATION, 2008
- FLOOD PLAN: BRIGHTHOUSE NETWORK SERVICE MAP RECEIVED MARCH 8, 2013
- OTHER: FEMA FIRM PANEL 26125C0493F, DATED SEPT. 29, 2006
- ADAMS TECHNOLOGY CENTER PLANS BY P.E.A. INC. DATED 07/03/13

**TOPOGRAPHIC AND BOUNDARY SURVEY DISCLAIMER:**  
 TOPOGRAPHIC AND BOUNDARY SURVEY, INCLUDING PROPERTY LINES, EXISTING UTILITIES, EXISTING PHYSICAL FEATURES AND STRUCTURES WAS PROVIDED BY MICKALICH ENGINEERING, INC.  
 P.E.A., INC. WILL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THE SURVEY OR FOR DESIGN ERRORS/OMISSIONS RESULTING FROM SURVEY INACCURACIES.

**FLOODPLAIN NOTE:**  
 SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD PLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0493F DATED SEPT. 29, 2006.

**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 SHEET C-9.1 FOR ON-SITE PAVING DETAILS.
- REFER TO MDT R-28 STANDARD PLAN FOR SIDEWALK RAMP DETAILS.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF NOVI CURRENT STANDARDS AND REGULATIONS.
- THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- ANY WORK WITHIN THE STREET OR HIGHWAY RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, 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 PARKING SPACE PAVEMENT MARKINGS SHALL BE 4" WHITE WITH THE EXCEPTION OF THE BARRIER FREE SPACES.
- PROVIDE 4" BLUE STRIPING FOR BARRIER FREE PARKING SPACES AND WHITE FOR BARRIER FREE PARKING SYMBOL. NOTE THAT WHERE A BARRIER FREE PARKING SPACE ADJUTS A NON-BARRIER FREE SPACE, THE TWO SPACES SHALL BE SEPARATED BY ABUTTING BLUE AND WHITE STRIPES.
- SIGNS NOTED TO BE MOUNTED ON BUILDING FACADE SHALL HAVE A MINIMUM MOUNTING HEIGHT OF 5 FEET AND A MAXIMUM MOUNTING HEIGHT OF 7 FEET.

**CAUTION!!**  
 THE LOCATION AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

THIS DRAWING AND DESIGN ARE THE PROPERTY OF PROFESSIONAL ENGINEERING ASSOCIATES, INC. THEY ARE NOT TO BE USED, REPRODUCED OR COPIED, IN WHOLE OR IN PART, FOR ANY PROJECT OTHER THAN THAT FOR WHICH THEY WERE PREPARED. INFORMATION IS PROVIDED WITHOUT THE PROMISE OF PROFESSIONAL ENGINEERING ASSOCIATES, INC. ALL COMMON LAW RIGHTS OF COPYRIGHT AND OTHER RIGHTS ARE HEREBY SPECIFICALLY RESERVED. © 2014 PROFESSIONAL ENGINEERING ASSOCIATES, INC.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR SHALL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY THAT IS NEARBY TO THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL AGENCIES, LOCAL, STATE OR FEDERAL, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

**3 FULL WORKING DAYS BEFORE YOU DIG CALL**

**811**  
 Know what's below  
 Call before you dig  
 MISSISSIPPI SYSTEM, INC.  
 1-800-482-7171 www.missdig.net



**PEA, Inc.**  
 2430 Rochester Ct., Ste. 100  
 Troy, MI 48063-1872  
 T: 248.689.9090  
 F: 248.689.1044  
 www.peainc.com

**NORTHERN EQUITIES GROUP**  
 39000 COUNTRY CLUB DRIVE  
 FARMINGTON HILLS, MICHIGAN 48331

**DIMENSION & PAVING PLAN - WEST**  
**ADAMS NORTH TECHNOLOGY CENTRE**  
 SECTION 1 - CITY OF NOVI, OAKLAND COUNTY, MICHIGAN 48377

DES: PB DN LGD SUR M.E.I. P.M. SAS  
 DATE: 01/22/2019

ORIGINAL ISSUE DATE: JANUARY 22, 2019  
 PEA JOB NO. 2014-016  
 SCALE: 1" = 30'  
 DRAWING NUMBER: C-3.1

XREF: S:\PROJECTS\2014\2014016\DWG\TOPBASE-14016.DWG  
 XREF: S:\PROJECTS\2014\2014016\DWG\CONSTRUCTION-2019\VBASE-14016.DWG  
 XREF: S:\PROJECTS\2014\2014016\DWG\CONSTRUCTION-2019\14016-14016.DWG



**SANITARY SEWER BASIS OF DESIGN:**

THE FOLLOWING DESIGN CALCULATIONS UTILIZE THE UNIT FACTOR METHOD, WHERE 1 RESIDENTIAL EQUIVALENT UNIT (R.E.U.) IS EQUAL TO 3.5 PEOPLE AT 100 GALLONS PER PERSON PER DAY OR 350 GPD. UNIT ASSIGNMENTS USED FROM OAKLAND COUNTY SCHEDULE OF UNIT ASSIGNMENT FACTORS:

OFFICE BUILDING = 0.40 UNITS PER 1000 SQ.FT.

TOTAL NUMBER OF R.E.U.'s = 56,429/1000 x 0.40 = 22.57 REU's

AVERAGE DAILY FLOW = 22.57 REU x 350 GPD = 7900 GPD

PEAKING FACTOR =  $(18 + (P)^{0.5}) / (4 + (P)^{0.5}) = 18.281 / 4.281 = 4.27$

PEAK FLOW = 4.27 x 7900 GPD x 0.1337 C.F. PER GALLON/86400 SECONDS PER DAY = 0.052 CFS

CAPACITY OF 6" PVC PIPE AT 5.00% = 1.61 CFS

NOTE: 'P' = POPULATION IN THOUSANDS.

**WATER MAIN BASIS OF DESIGN:**

THE FOLLOWING DESIGN CALCULATIONS UTILIZE THE UNIT FACTOR METHOD, WHERE 1 RESIDENTIAL EQUIVALENT UNIT (R.E.U.) IS EQUAL TO 3.5 PEOPLE AT 150 GALLONS PER PERSON PER DAY OR 525 GPD. UNIT ASSIGNMENTS USED FROM OAKLAND COUNTY SCHEDULE OF UNIT ASSIGNMENT FACTORS:

OFFICE BUILDING = 0.40 UNITS PER 1000 SQ.FT.

TOTAL NUMBER OF R.E.U.'s = 56,429/1000 x 0.40 = 22.57 R.E.U.

AVERAGE DAILY FLOW = 22.57 REU x 525 GPD = 11,849 GPD = 0.01185 MGD

MAXIMUM DAILY FLOW = 2 x AVERAGE DAILY FLOW = 2 x 11,849 GPD = 23,698 GPD = 0.02370 MGD

**SANITARY SEWER QUANTITIES:**

6" PVC SDR 23.5 PIPE	100 LF
4" DIA. MONITORING MANHOLE	1 EA.
CONNECT TO EX. WYE/LEAD	1 EA.

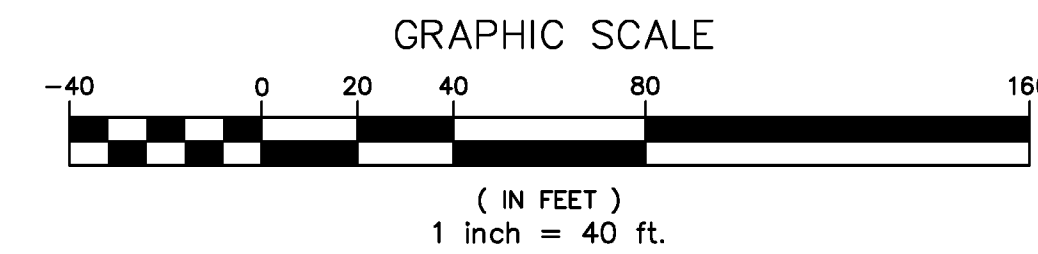
**WATER MAIN QUANTITIES:**

2" COPPER 'K' WATER LEAD	20 LF
6" D.I.W.M. CLASS 54	85 LF
8" D.I.W.M. CLASS 54	2031 LF
24" D.I.W.M. CLASS 54	50 LF
2" VALVE AND BOX	1 EA.
8" GATE VALVE AND WELL	1 EA.
24" GATE VALVE AND WELL	1 EA.
8"x8" T.S.V. AND WELL	1 EA.
HYDRANT ASSEMBLY	6 EA.

**STORM SEWER QUANTITIES:**

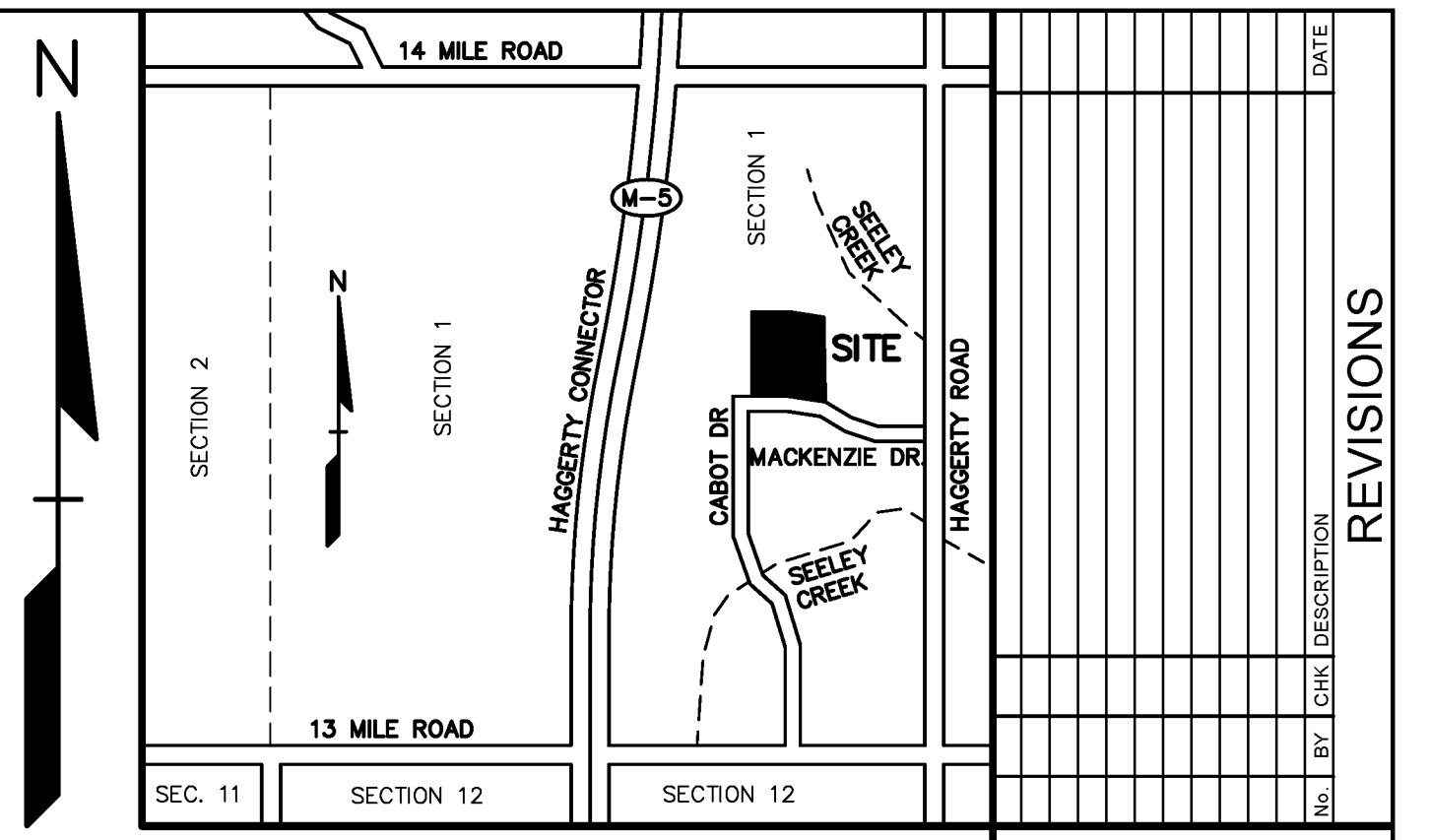
4" HDPE RADIAL UNDERDRAIN	19 EA.
4" HDPE UNDERDRAIN BEHIND CURB	1,208 LF
6" PVC SDR 26 PIPE	229 LF
8" PVC SDR 26 PIPE	89 LF
12" RCP CL-IV PIPE	758 LF
15" RCP CL-IV PIPE	322 LF
18" RCP CL-IV PIPE	633 LF
20" DUCTILE IRON CL-54 PIPE	37 LF
24" RCP CL-IV PIPE	241 LF
CLEANOUT AND BOX	7 EA.
4" DIA. CATCH BASIN	17 EA.
4" DIA. MANHOLE	3 EA.
5" DIA. CATCH BASIN	2 EA.
5" DIA. OIL/GAS SEPARATOR CB	2 EA.
CONNECT TO EXISTING STUB	2 EA.

**NOTE:**  
CONTRACTOR TO VERIFY ALL QUANTITIES. ANY DEMIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF PROFESSIONAL ENGINEERING ASSOCIATES, INC. FOR VERIFICATION, PRIOR TO BIDDING.



**GENERAL UTILITY NOTES:**

1. ALL UTILITY LINES, STRUCTURES AND TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE CITY OF NOVI.
2. NO PHYSICAL CONNECTION TO THE EXISTING WATER MAIN CAN BE MADE UNTIL ALL NEW WATER MAIN PASSES PRESSURE AND BACTERIOLOGICAL TESTS TO THE SATISFACTION OF THE CITY.
3. ALL WATER MAIN AND FITTINGS (3" DIAMETER AND LARGER) SHALL BE DUCTILE IRON, CLASS 54.
4. WATER MAIN SERVICE LEADS SHALL BE TYPE 'K' ANNEALED SEAMLESS COPPER WITH FLARED FITTINGS, UNLESS OTHERWISE NOTED.
5. ALL WATER MAIN SHALL BE PROVIDED WITH 6' OF COVER UNLESS OTHERWISE NOTED.
6. ALL FIRE HYDRANTS SHALL BE ELJW "WATERMASTER" #58R MODEL #250 PER CITY OF NOVI STANDARDS.
7. ALL HYDRANTS TO BE A MINIMUM OF 5' FROM BACK OF CURB, TYP.
8. ALL NECESSARY FITTINGS, THRUST BLOCKS, RESTRAINING GLANDS, BLOW OFFS, ETC. FOR WATER MAIN ARE CONSIDERED INCIDENTAL TO THIS PROJECT. THE CONTRACTOR SHALL INSTALL THESE ITEMS AS NECESSARY AND AS REQUIRED BY THE CITY OF NOVI.
9. ALL SANITARY SEWER 8" OR LARGER SHALL BE P.V.C. TRUSS PIPE (ASTM D2680) AND FITTINGS, WITH ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
10. ALL SANITARY SEWER LEADS SHALL BE POLYVINYL CHLORIDE (PVC) SDR 23.5 PIPE AND FITTINGS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
11. SANITARY SEWER SHALL BE PROVIDED WITH CLEANOUTS EVERY 100 FEET AND AT EVERY BEND AS SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH E.J.I.W. #1565 BOX OR EQUAL.
12. ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE REINFORCED CONCRETE PIPE (RCP C-76) CLASS IV WITH MODIFIED TONGUE AND GROOVE JOINT WITH RUBBER GASKETS.
13. ALL STORM SEWER LEADS SHALL BE PVC SDR 26 WITH PUSH-ON JOINTS UNLESS OTHERWISE NOTED.
14. PIPE LENGTHS ARE GIVEN FROM CENTER OF STRUCTURE AND TO END OF FLARED END SECTION UNLESS NOTED OTHERWISE.
15. THE CITY OF NOV STANDARD DETAIL SHEETS ARE INCORPORATED INTO AND MADE A PART OF THESE PLANS. CONTRACTOR TO REFER TO THE CITY OF NOV STANDARD DETAIL SHEETS FOR ALL STRUCTURE, PIPE MATERIALS, BEDDING, TESTING, ETC. NOTES AND DETAILS.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS, INVERTS AND GRADES PRIOR TO THE START OF ANY WORK, PER CITY OF NOV REQUIREMENTS.
17. TWO (2) COPIES OF AS-BUILT PLANS SHALL BE SUBMITTED TO THE CITY ENGINEER WITHIN THIRTY (30) DAYS OF THE COMPLETION OF THE UTILITY INSTALLATION AS PER CITY OF NOV ORDINANCE SECTION 31-7(c).



**LEGEND**

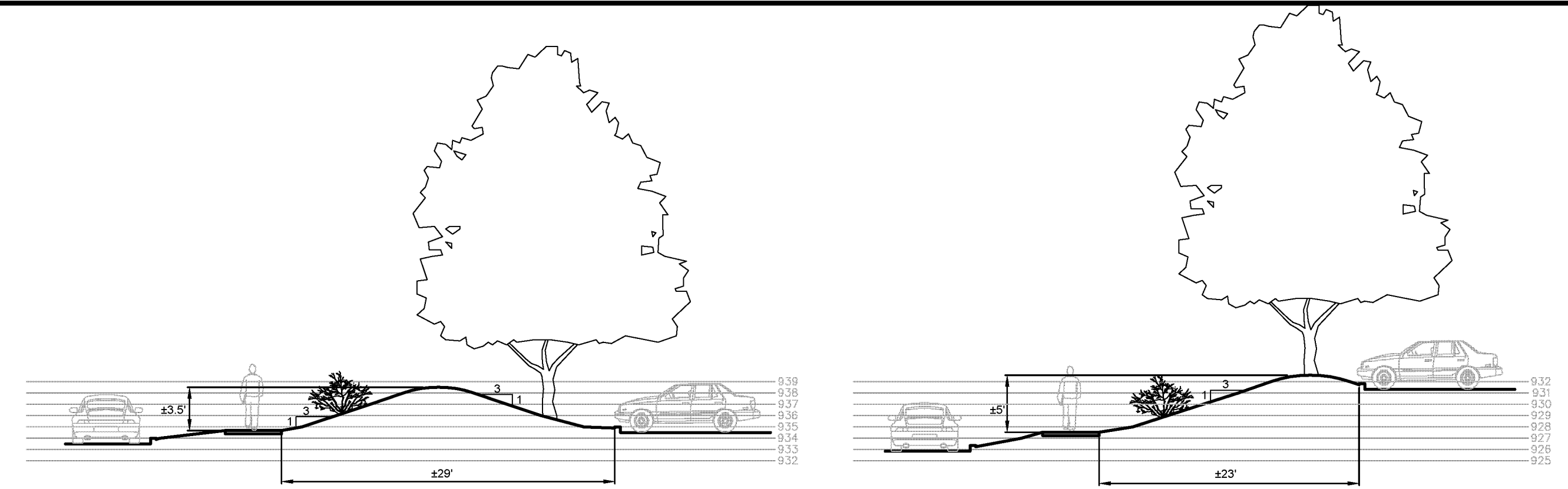
● IRON FOUND	⊗ BRASS PLUG SET	⊙ SEC. CORNER FOUND
⊗ IRON SET	⊗ MONUMENT FOUND	⊗ RECORDED
⊗ NAIL FOUND	⊗ NAIL & CAP SET	⊗ MEASURED
⊗ NAIL & CAP SET		⊗ CALCULATED

**EXISTING**

- OH-ELEC—V—C— ELEC. OR PHONE TV OH. LINE, POLE & CURE WYE
- OH-CATV—E—B— UNDERGROUND CABLE TV, CATV, FIBER
- UG—PHONE—C— TELEPHONE U.G. CABLE, MANHOLE, METER & MANHOLE
- UG—ELEC—E—E—E— ELECTRIC U.G. CABLE, MANHOLE, METER & MANHOLE
- UG—GAS—E—E—E— GAS MAIN, VALVE & GAS LINE WABSER
- UG—WATER—E—E—E— WATERMAIN, HYD. GATE VALVE, TAPPING SLEEVE & VALVE
- UG—SEWER—E—E—E— SANITARY SEWER, CLEANOUT & MANHOLE
- UG—STORM—E—E—E— STORM SEWER, CLEANOUT & MANHOLE
- UG—COMB—E—E—E— COMBINED SEWER & MANHOLE
- UG—DRAIN—E—E—E— CATCH BASIN, INLET, YARD DRAIN
- UG—INDICATOR—E—E—E— POST INDICATOR VALVE
- UG—WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- UG—MOTOR, TRANSFORMER, PREGATION CONTROL, SERVICE
- UG—UNDEVELOPED STRUCTURE
- UG—SPOT ELEVATION
- UG—CONTOUR LINE
- UG—FENCE
- UG—GUARD RAIL
- UG—STREET LIGHT
- UG—SIGN

**PROPOSED**

- 6" SDR 23.5 PVC SDR 23.5
- 8" SDR 23.5 PVC SDR 23.5
- 12" SDR 23.5 PVC SDR 23.5
- 15" SDR 23.5 PVC SDR 23.5
- 18" SDR 23.5 PVC SDR 23.5
- 20" SDR 23.5 PVC SDR 23.5
- 24" SDR 23.5 PVC SDR 23.5
- 30" SDR 23.5 PVC SDR 23.5
- 36" SDR 23.5 PVC SDR 23.5
- 42" SDR 23.5 PVC SDR 23.5
- 48" SDR 23.5 PVC SDR 23.5
- 54" SDR 23.5 PVC SDR 23.5
- 60" SDR 23.5 PVC SDR 23.5
- 72" SDR 23.5 PVC SDR 23.5
- 84" SDR 23.5 PVC SDR 23.5
- 96" SDR 23.5 PVC SDR 23.5
- 108" SDR 23.5 PVC SDR 23.5
- 120" SDR 23.5 PVC SDR 23.5
- 144" SDR 23.5 PVC SDR 23.5
- 168" SDR 23.5 PVC SDR 23.5
- 192" SDR 23.5 PVC SDR 23.5
- 216" SDR 23.5 PVC SDR 23.5
- 240" SDR 23.5 PVC SDR 23.5
- 270" SDR 23.5 PVC SDR 23.5
- 300" SDR 23.5 PVC SDR 23.5
- 324" SDR 23.5 PVC SDR 23.5
- 360" SDR 23.5 PVC SDR 23.5
- 408" SDR 23.5 PVC SDR 23.5
- 456" SDR 23.5 PVC SDR 23.5
- 504" SDR 23.5 PVC SDR 23.5
- 540" SDR 23.5 PVC SDR 23.5
- 576" SDR 23.5 PVC SDR 23.5
- 612" SDR 23.5 PVC SDR 23.5
- 648" SDR 23.5 PVC SDR 23.5
- 684" SDR 23.5 PVC SDR 23.5
- 720" SDR 23.5 PVC SDR 23.5
- 756" SDR 23.5 PVC SDR 23.5
- 792" SDR 23.5 PVC SDR 23.5
- 828" SDR 23.5 PVC SDR 23.5
- 864" SDR 23.5 PVC SDR 23.5
- 900" SDR 23.5 PVC SDR 23.5
- 936" SDR 23.5 PVC SDR 23.5
- 972" SDR 23.5 PVC SDR 23.5
- 1008" SDR 23.5 PVC SDR 23.5
- 1044" SDR 23.5 PVC SDR 23.5
- 1080" SDR 23.5 PVC SDR 23.5
- 1116" SDR 23.5 PVC SDR 23.5
- 1152" SDR 23.5 PVC SDR 23.5
- 1188" SDR 23.5 PVC SDR 23.5
- 1224" SDR 23.5 PVC SDR 23.5
- 1260" SDR 23.5 PVC SDR 23.5
- 1296" SDR 23.5 PVC SDR 23.5
- 1332" SDR 23.5 PVC SDR 23.5
- 1368" SDR 23.5 PVC SDR 23.5
- 1404" SDR 23.5 PVC SDR 23.5
- 1440" SDR 23.5 PVC SDR 23.5
- 1476" SDR 23.5 PVC SDR 23.5
- 1512" SDR 23.5 PVC SDR 23.5
- 1548" SDR 23.5 PVC SDR 23.5
- 1584" SDR 23.5 PVC SDR 23.5
- 1620" SDR 23.5 PVC SDR 23.5
- 1656" SDR 23.5 PVC SDR 23.5
- 1692" SDR 23.5 PVC SDR 23.5
- 1728" SDR 23.5 PVC SDR 23.5
- 1764" SDR 23.5 PVC SDR 23.5
- 1800" SDR 23.5 PVC SDR 23.5
- 1836" SDR 23.5 PVC SDR 23.5
- 1872" SDR 23.5 PVC SDR 23.5
- 1908" SDR 23.5 PVC SDR 23.5
- 1944" SDR 23.5 PVC SDR 23.5
- 1980" SDR 23.5 PVC SDR 23.5
- 2016" SDR 23.5 PVC SDR 23.5
- 2052" SDR 23.5 PVC SDR 23.5
- 2088" SDR 23.5 PVC SDR 23.5
- 2124" SDR 23.5 PVC SDR 23.5
- 2160" SDR 23.5 PVC SDR 23.5
- 2196" SDR 23.5 PVC SDR 23.5
- 2232" SDR 23.5 PVC SDR 23.5
- 2268" SDR 23.5 PVC SDR 23.5
- 2304" SDR 23.5 PVC SDR 23.5
- 2340" SDR 23.5 PVC SDR 23.5
- 2376" SDR 23.5 PVC SDR 23.5
- 2412" SDR 23.5 PVC SDR 23.5
- 2448" SDR 23.5 PVC SDR 23.5
- 2484" SDR 23.5 PVC SDR 23.5
- 2520" SDR 23.5 PVC SDR 23.5
- 2556" SDR 23.5 PVC SDR 23.5
- 2592" SDR 23.5 PVC SDR 23.5
- 2628" SDR 23.5 PVC SDR 23.5
- 2664" SDR 23.5 PVC SDR 23.5
- 2700" SDR 23.5 PVC SDR 23.5
- 2736" SDR 23.5 PVC SDR 23.5
- 2772" SDR 23.5 PVC SDR 23.5
- 2808" SDR 23.5 PVC SDR 23.5
- 2844" SDR 23.5 PVC SDR 23.5
- 2880" SDR 23.5 PVC SDR 23.5
- 2916" SDR 23.5 PVC SDR 23.5
- 2952" SDR 23.5 PVC SDR 23.5
- 2988" SDR 23.5 PVC SDR 23.5
- 3024" SDR 23.5 PVC SDR 23.5
- 3060" SDR 23.5 PVC SDR 23.5
- 3096" SDR 23.5 PVC SDR 23.5
- 3132" SDR 23.5 PVC SDR 23.5
- 3168" SDR 23.5 PVC SDR 23.5
- 3204" SDR 23.5 PVC SDR 23.5
- 3240" SDR 23.5 PVC SDR 23.5
- 3276" SDR 23.5 PVC SDR 23.5
- 3312" SDR 23.5 PVC SDR 23.5
- 3348" SDR 23.5 PVC SDR 23.5
- 3384" SDR 23.5 PVC SDR 23.5
- 3420" SDR 23.5 PVC SDR 23.5
- 3456" SDR 23.5 PVC SDR 23.5
- 3492" SDR 23.5 PVC SDR 23.5
- 3528" SDR 23.5 PVC SDR 23.5
- 3564" SDR 23.5 PVC SDR 23.5
- 3600" SDR 23.5 PVC SDR 23.5
- 3636" SDR 23.5 PVC SDR 23.5
- 3672" SDR 23.5 PVC SDR 23.5
- 3708" SDR 23.5 PVC SDR 23.5
- 3744" SDR 23.5 PVC SDR 23.5
- 3780" SDR 23.5 PVC SDR 23.5
- 3816" SDR 23.5 PVC SDR 23.5
- 3852" SDR 23.5 PVC SDR 23.5
- 3888" SDR 23.5 PVC SDR 23.5
- 3924" SDR 23.5 PVC SDR 23.5
- 3960" SDR 23.5 PVC SDR 23.5
- 3996" SDR 23.5 PVC SDR 23.5
- 4032" SDR 23.5 PVC SDR 23.5
- 4068" SDR 23.5 PVC SDR 23.5
- 4104" SDR 23.5 PVC SDR 23.5
- 4140" SDR 23.5 PVC SDR 23.5
- 4176" SDR 23.5 PVC SDR 23.5
- 4212" SDR 23.5 PVC SDR 23.5
- 4248" SDR 23.5 PVC SDR 23.5
- 4284" SDR 23.5 PVC SDR 23.5
- 4320" SDR 23.5 PVC SDR 23.5
- 4356" SDR 23.5 PVC SDR 23.5
- 4392" SDR 23.5 PVC SDR 23.5
- 4428" SDR 23.5 PVC SDR 23.5
- 4464" SDR 23.5 PVC SDR 23.5
- 4500" SDR 23.5 PVC SDR 23.5
- 4536" SDR 23.5 PVC SDR 23.5
- 4572" SDR 23.5 PVC SDR 23.5
- 4608" SDR 23.5 PVC SDR 23.5
- 4644" SDR 23.5 PVC SDR 23.5
- 4680" SDR 23.5 PVC SDR 23.5
- 4716" SDR 23.5 PVC SDR 23.5
- 4752" SDR 23.5 PVC SDR 23.5
- 4788" SDR 23.5 PVC SDR 23.5
- 4824" SDR 23.5 PVC SDR 23.5
- 4860" SDR 23.5 PVC SDR 23.5
- 4896" SDR 23.5 PVC SDR 23.5
- 4932" SDR 23.5 PVC SDR 23.5
- 4968" SDR 23.5 PVC SDR 23.5
- 5004" SDR 23.5 PVC SDR 23.5
- 5040" SDR 23.5 PVC SDR 23.5
- 5076" SDR 23.5 PVC SDR 23.5
- 5112" SDR 23.5 PVC SDR 23.5
- 5148" SDR 23.5 PVC SDR 23.5
- 5184" SDR 23.5 PVC SDR 23.5
- 5220" SDR 23.5 PVC SDR 23.5
- 5256" SDR 23.5 PVC SDR 23.5
- 5292" SDR 23.5 PVC SDR 23.5
- 5328" SDR 23.5 PVC SDR 23.5
- 5364" SDR 23.5 PVC SDR 23.5
- 5400" SDR 23.5 PVC SDR 23.5
- 5436" SDR 23.5 PVC SDR 23.5
- 5472" SDR 23.5 PVC SDR 23.5
- 5508" SDR 23.5 PVC SDR 23.5
- 5544" SDR 23.5 PVC SDR 23.5
- 5580" SDR 23.5 PVC SDR 23.5
- 5616" SDR 23.5 PVC SDR 23.5
- 5652" SDR 23.5 PVC SDR 23.5
- 5688" SDR 23.5 PVC SDR 23.5
- 5724" SDR 23.5 PVC SDR 23.5
- 5760" SDR 23.5 PVC SDR 23.5
- 5796" SDR 23.5 PVC SDR 23.5
- 5832" SDR 23.5 PVC SDR 23.5
- 5868" SDR 23.5 PVC SDR 23.5
- 5904" SDR 23.5 PVC SDR 23.5
- 5940" SDR 23.5 PVC SDR 23.5
- 5976" SDR 23.5 PVC SDR 23.5
- 6012" SDR 23.5 PVC SDR 23.5
- 6048" SDR 23.5 PVC SDR 23.5
- 6084" SDR 23.5 PVC SDR 23.5
- 6120" SDR 23.5 PVC SDR 23.5
- 6156" SDR 23.5 PVC SDR 23.5
- 6192" SDR 23.5 PVC SDR 23.5
- 6228" SDR 23.5 PVC SDR 23.5
- 6264" SDR 23.5 PVC SDR 23.5
- 6300" SDR 23.5 PVC SDR 23.5
- 6336" SDR 23.5 PVC SDR 23.5
- 6372" SDR 23.5 PVC SDR 23.5
- 6408" SDR 23.5 PVC SDR 23.5
- 6444" SDR 23.5 PVC SDR 23.5
- 6480" SDR 23.5 PVC SDR 23.5
- 6516" SDR 23.5 PVC SDR 23.5
- 6552" SDR 23.5 PVC SDR 23.5
- 6588" SDR 23.5 PVC SDR 23.5
- 6624" SDR 23.5 PVC SDR 23.5
- 6660" SDR 23.5 PVC SDR 23.5
- 6696" SDR 23.5 PVC SDR 23.5
- 6732" SDR 23.5 PVC SDR 23.5
- 6768" SDR 23.5 PVC SDR 23.5
- 6804" SDR 23.5 PVC SDR 23.5
- 6840" SDR 23.5 PVC SDR 23.5
- 6876" SDR 23.5 PVC SDR 23.5
- 6912" SDR 23.5 PVC SDR 23.5
- 6948" SDR 23.5 PVC SDR 23.5
- 6984" SDR 23.5 PVC SDR 23.5
- 7020" SDR 23.5 PVC SDR 23.5
- 7056" SDR 23.5 PVC SDR 23.5
- 7092" SDR 23.5 PVC SDR 23.5
- 7128" SDR 23.5 PVC SDR 23.5
- 7164" SDR 23.5 PVC SDR 23.5
- 7200" SDR 23.5 PVC SDR 23.5
- 7236" SDR 23.5 PVC SDR 23.5
- 7272" SDR 23.5 PVC SDR 23.5
- 7308" SDR 23.5 PVC SDR 23.5
- 7344" SDR 23.5 PVC SDR 23.5
- 7380" SDR 23.5 PVC SDR 23.5
- 7416" SDR 23.5 PVC SDR 23.5
- 7452" SDR 23.5 PVC SDR 23.5
- 7488" SDR 23.5 PVC SDR 23.5
- 7524" SDR 23.5 PVC SDR 23.5
- 7560" SDR 23.5 PVC SDR 23.5
- 7596" SDR 23.5 PVC SDR 23.5
- 7632" SDR 23.5 PVC SDR 23.5
- 7668" SDR 23.5 PVC SDR 23.5
- 7704" SDR 23.5 PVC SDR 23.5
- 7740" SDR 23.5 PVC SDR 23.5
- 7776" SDR 23.5 PVC SDR 23.5
- 7812" SDR 23.5 PVC SDR 23.5
- 7848" SDR 23.5 PVC SDR 23.5
- 7884" SDR 23.5 PVC SDR 23.5
- 7920" SDR 23.5 PVC SDR 23.5
- 7956" SDR 23.5 PVC SDR 23.5
- 7992" SDR 23.5 PVC SDR 23.5
- 8028" SDR 23.5 PVC SDR 23.5
- 8064" SDR 23.5 PVC SDR 23.5
- 8100" SDR 23.5 PVC SDR 23.5
- 8136" SDR 23.5 PVC SDR 23.5
- 8172" SDR 23.5 PVC SDR 23.5
- 8208" SDR 23.5 PVC SDR 23.5
- 8244" SDR 23.5 PVC SDR 23.5
- 8280" SDR 23.5 PVC SDR 23.5
- 8316" SDR 23.5 PVC SDR 23.5
- 8352" SDR 23.5 PVC SDR 23.5
- 8388" SDR 23.5 PVC SDR 23.5
- 8424" SDR 23.5 PVC SDR 23.5
- 8460" SDR 23.5 PVC SDR 23.5
- 8496" SDR 23.5 PVC SDR 23.5
- 8532" SDR 23.5 PVC SDR 23.5
- 8568" SDR 23.5 PVC SDR 23.5
- 8604" SDR 23.5 PVC SDR 23.5
- 8640" SDR 23.5 PVC SDR 23.5
- 8676" SDR 23.5 PVC SDR 23.5
- 8712" SDR 23.5 PVC SDR 23.5
- 8748" SDR 23.5 PVC SDR 23.5
- 8784" SDR 23.5 PVC SDR 23.5
- 8820" SDR 23.5 PVC SDR 23.5
- 8856" SDR 23.5 PVC SDR 23.5
- 8892" SDR 23.5 PVC SDR 23.5
- 8928" SDR 23.5 PVC SDR 23.5
- 8964" SDR 23.5 PVC SDR 23.5
- 9000" SDR 23.5 PVC SDR 23.5
- 9036" SDR 23.5 PVC SDR 23.5
- 9072" SDR 23.5 PVC SDR 23.5
- 9108" SDR 23.5 PVC SDR 23.5
- 9144" SDR 23.5 PVC SDR 23.5
- 9180" SDR 23.5 PVC SDR 23.5
- 9216" SDR 23.5 PVC SDR 23.5
- 9252" SDR 23.5 PVC SDR 23.5
- 9288" SDR 23.5 PVC SDR 23.5
- 9324" SDR 23.5 PVC SDR 23.5
- 9360" SDR 23.5 PVC SDR 23.5
- 9396" SDR 23.5 PVC SDR 23.5
- 9432" SDR 23.5 PVC SDR 23.5
- 9468" SDR 23.5 PVC SDR 23.5
- 9504" SDR 23.5 PVC SDR 23.5
- 9540" SDR 23.5 PVC SDR 23.5
- 9576" SDR 23.5 PVC SDR 23.5
- 9612" SDR 23.5 PVC SDR 23.5
- 9648" SDR 23.5 PVC SDR 23.5
- 9684" SDR 23.5 PVC SDR 23.5
- 9720" SDR 23.5 PVC SDR 23.5
- 9756" SDR 23.5 PVC SDR 23.5
- 9792" SDR 23.5 PVC SDR 23.5
- 9828" SDR 23.5 PVC SDR 23.5
- 9864" SDR 23.5 PVC SDR 23.5
- 9900" SDR 23.5 PVC SDR 23.5
- 9936" SDR 23.5 PVC SDR 23.5
- 9972" SDR 23.5 PVC SDR 23.5
- 10008" SDR 23.5 PVC SDR 23.5
- 10044" SDR 23.5 PVC SDR 23.5
- 10080" SDR 23.5 PVC SDR 23.5
- 10116" SDR 23.5 PVC SDR 23.5
- 10152" SDR 23.5 PVC SDR 23.5
- 10188" SDR 23.5 PVC SDR 23.5
- 10224" SDR 23.5 PVC SDR 23.5
- 10260" SDR 23.5 PVC SDR 23.5
- 10296" SDR 23.5 PVC SDR



**TREE PLANT LIST: L-1.0**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	COMMENT	GENUS %	SPECIES %
13	AR3	Red Maple	<i>Acer rubrum</i>	3" Cal.	B&B	Native	11%	
5	AS3	Sugar Maple	<i>Acer saccharum</i>	3" Cal.	B&B	Native	4%	16%
12	AL8	Allegheny Serviceberry	<i>Amelanchier laevis</i>	8-10' Ht.	B&B	Native	10%	10%
8	GB3	Magyar Ginkgo	<i>Ginkgo biloba 'Magyar'</i>	3" Cal.	B&B		7%	7%
14	GT3	Skyline Honeylocust	<i>Gleditsia triacanthos</i>	3" Cal.	B&B	Native	12%	12%
8	LT3	Tulip Tree	<i>Liriodendron tulipifera</i>	3" Cal.	B&B	Native	7%	7%
7	MP3	Prairie Fire Crab	<i>Malus 'Prairie Fire'</i>	3" Cal.	B&B		6%	6%
10	PO3	American Sycamore	<i>Platanus occidentalis</i>	3" Cal.	B&B	Native	9%	9%
10	QB3	Swamp White Oak	<i>Quercus bicolor</i>	3" Cal.	B&B	Native	9%	9%
6	QR3	Red Oak	<i>Quercus rubra</i>	3" Cal.	B&B	Native	5%	14%
10	SR3	Japanese Tree Lilac	<i>Syringa reticulata</i>	3" Cal.	B&B		9%	9%
12	TA3	American Linden	<i>Tilia americana</i>	3" Cal.	B&B	Native	10%	10%
115	<b>TOTAL DEC. TREES</b>							

No more than 25% of one genus, 15% of one species

**EVERGREEN PLANT LIST:**

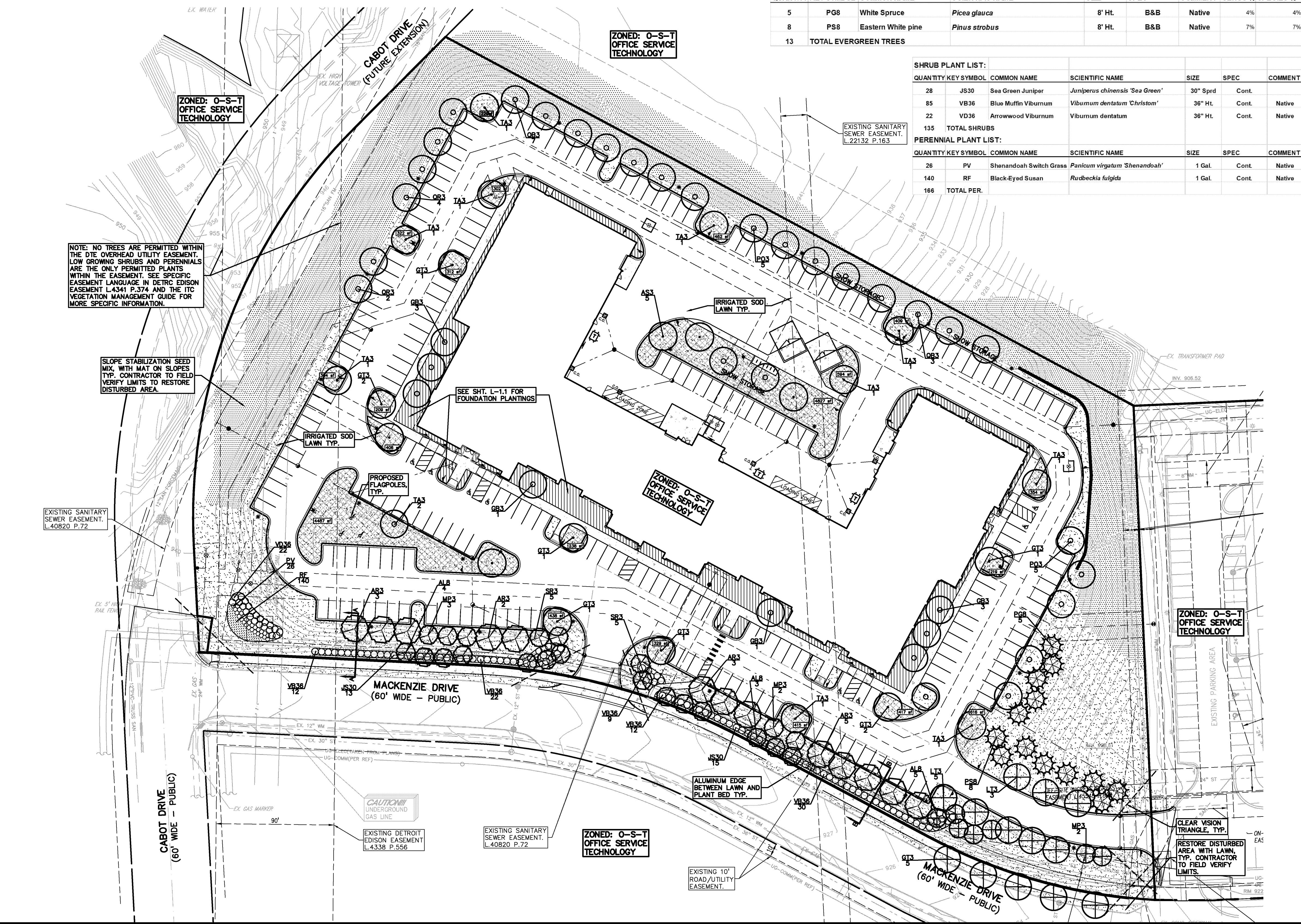
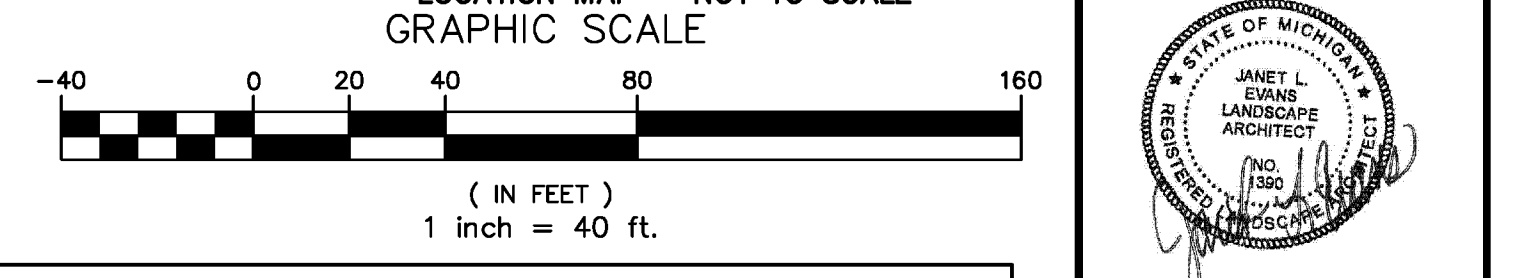
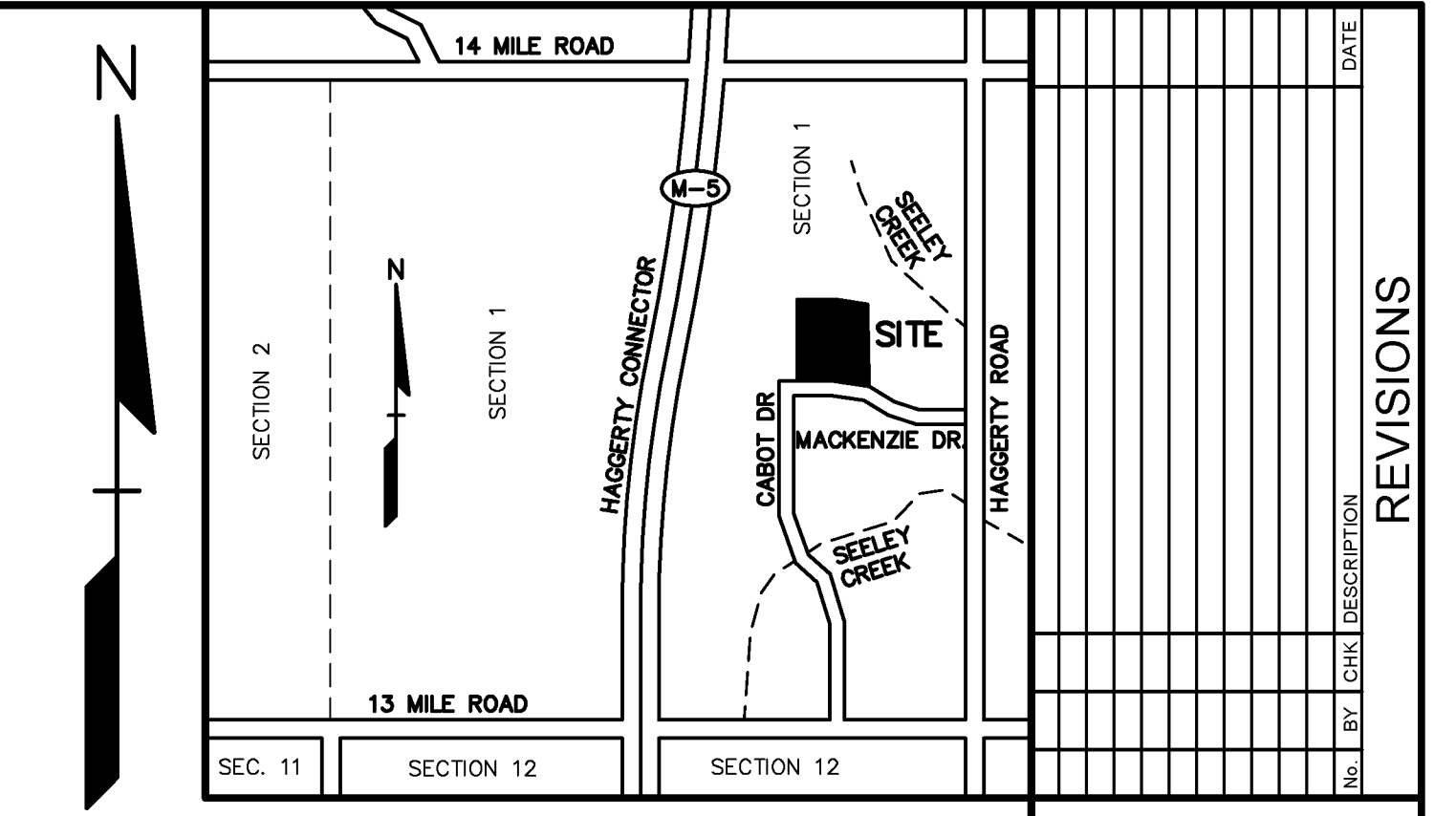
QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	COMMENT	GENUS %	SPECIES %
5	PG8	White Spruce	<i>Picea glauca</i>	8' Ht.	B&B	Native	4%	4%
8	PS8	Eastern White Pine	<i>Pinus strobus</i>	8' Ht.	B&B	Native	7%	7%
13	<b>TOTAL EVERGREEN TREES</b>							

**SHRUB PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	COMMENT
28	JS30	Sea Green Juniper	<i>Juniperus chinensis 'Sea Green'</i>	30" Sprd	Cont.	
85	VB36	Blue Muffin Viburnum	<i>Viburnum dentatum 'Christom'</i>	36" Ht.	Cont.	Native
22	VD36	Arrowwood Viburnum	<i>Viburnum dentatum</i>	36" Ht.	Cont.	Native
135	<b>TOTAL SHRUBS</b>					

**PERENNIAL PLANT LIST:**

QUANTITY	KEY SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	SPEC	COMMENT
26	PV	Shenandoah Switch Grass	<i>Panicum virgatum 'Shenandoah'</i>	1 Gal.	Cont.	Native
140	RF	Black-Eyed Susan	<i>Rudbeckia fulgida</i>	1 Gal.	Cont.	Native
166	<b>TOTAL PER.</b>					



**LANDSCAPE CALCULATION:**  
PER CITY OF NOW ZONING ORDINANCE - ZONED OST  
PER AMENDED LANDSCAPE ORDINANCE AFFECTIVE 6/22/17

**INTERIOR PARKING LOT LANDSCAPE**  
REQUIRED:  
A. SF OF PAVED AREA UNDER 50,000 SF = 50,000 X 7.5% = 3,750 SF  
B. SF OF ADDITIONAL PAVED AREA OVER 50,000 SF = 60,559 X 1% = 605.6 SF  
A+B=C 3750 + 606 = 4,356 SF OF ISLANDS REQUIRED  
E. C/200, 4356/200 = 22 CANOPY TREES REQUIRED

**PARKING LOT PERIMETER**  
REQUIRED: 1 TREE PER 35 LF OF PAVED VEHICULAR PER. (LESS DRIVE OPENINGS) MUST BE WITHIN 15' OF PARKING LOT  
1829 LF OF PARKING LOT - 40' DRIVE OPENINGS / 35 LF = 51.1 TREES REQ.

**RIGHT OF WAY ADJACENT TO PARKING**  
REQUIRED: 1 LARGE DEC OR EVG / 35 LF OF FRONTAGE  
1 SUB CANOPY DEC / 20 LF OF FRONTAGE  
1 CANOPY DEC TREE / 35 LF BETWEEN SIDEWALK & CURB  
MACKENZIE DR: 485-40 ST. LENGTH = 445'  
445/35 = 13 LARGE DEC/EVG. TREE  
445/20 = 22 SUB CANOPY TREE  
445/35 = 13 CANOPY DEC. BTWN. WALK AND CURB

**RIGHT OF WAY NOT ADJACENT TO PARKING**  
REQUIRED: 1 LARGE DEC OR EVG / 60 LF OF FRONTAGE  
1 SUB CANOPY DEC / 40 LF OF FRONTAGE  
1 CANOPY DEC TREE / 35 LF BETWEEN SIDEWALK & CURB  
MACKENZIE DR: 87' WEST END + 193' EAST END = 280'  
280 LF/60 = 5 LARGE DEC OR EVG. REQUIRED  
280 LF/40 = 7 SUB CANOPY REQUIRED  
280 LF/35 = 8 CANOPY TREES BTWN WALK & CURB

**FOUNDATION PLANTINGS**  
REQUIRED: LF OF BUILDING LESS PAVED ACCESS POINTS X 8  
1707 TOT. BLDG-502 LF PAVED ACCESS = 1,205 X 8 = 9,640 SF INTERIOR SITE LANDSCAPING  
PROVIDED: 10,295 SF OF FOUNDATION LANDSCAPING ADJACENT TO BUILDING.

**NOTES PER CITY OF NOW:**  
PLANT MATERIAL SHALL NOT BE PLANTED WITHIN 4' OF PROPERTY LINE.  
NO TREES SHALL BE PLANTED CLOSER THAN 15' FROM OVERHEAD UTILITY, 10' FROM FIRE HYDRANT, CATCH BASIN OR MANHOLE, 5' FROM UNDERGROUND UTILITIES AND 3' OFF BACK OF CURB.  
NO TREE TO BE LOCATED IN FRONT OF ANY SIGN OR BLOCK BUILDING ADDRESS. FIELD ADJUST TREES AS NECESSARY.  
ALL TRANSFORMER AND UTILITY BOXES TO BE SCREENED PER NOW CITY DETAIL AND IN THE CASE ADDITIONAL BOXES ARE ADDED TO THE SITE AFTER PLAN APPROVAL. SEE LANDSCAPE DETAIL SHT. L-1.2  
EXISTING DISEASED TREES WILL BE REMOVED AND IN-FILLED WITH NEW PLANTINGS PER CITY'S APPROVAL AND DIRECTION.

**EXISTING CONDITIONS NOTES:**  
THERE ARE NO EXISTING REGULATED WOODLANDS OR EXISTING TREES ONSITE.

**REVISIONS**

NO.	BY	DATE	DESCRIPTION

**STATE OF MICHIGAN**  
JANET L. ADAMS  
LANDSCAPE ARCHITECT  
1550  
1550

**3 FULL WORKING DAYS BEFORE YOU DIG CALL 811**  
Know what's below  
Call before you dig  
MISS DIG System, Inc.  
1-800-482-7171 www.missdig.net

**PEA, Inc.**  
2430 Rochester Ct., Ste. 100  
Troy, MI 48063-1872  
T: 248.689.9090  
F: 248.689.1044  
www.peainc.com

**NORTHERN EQUITIES GROUP**  
39000 COUNTRY CLUB DRIVE  
FARMINGTON HILLS, MICHIGAN 48331

**LANDSCAPE PLAN**  
**ADAMS NORTH TECHNOLOGY CENTRE**  
N.E.C. MACKENZIE DRIVE & CABOT DRIVE  
SECTION 1 - CITY OF NOVI, OKLAND COUNTY, MICHIGAN 48377

DES. JLE DN. SUR. M.E.I. P.M. SAS  
S:\PROJECTS\2014\2014016.DWG\CONSTRUCTION-2019\BASE-14016.DWG  
S:\PROJECTS\2014\2014016.DWG\CONSTRUCTION-2019\BLK-14016.DWG

ORIGINAL ISSUE DATE:  
JANUARY 22, 2019

PEA JOB NO. 2014-016

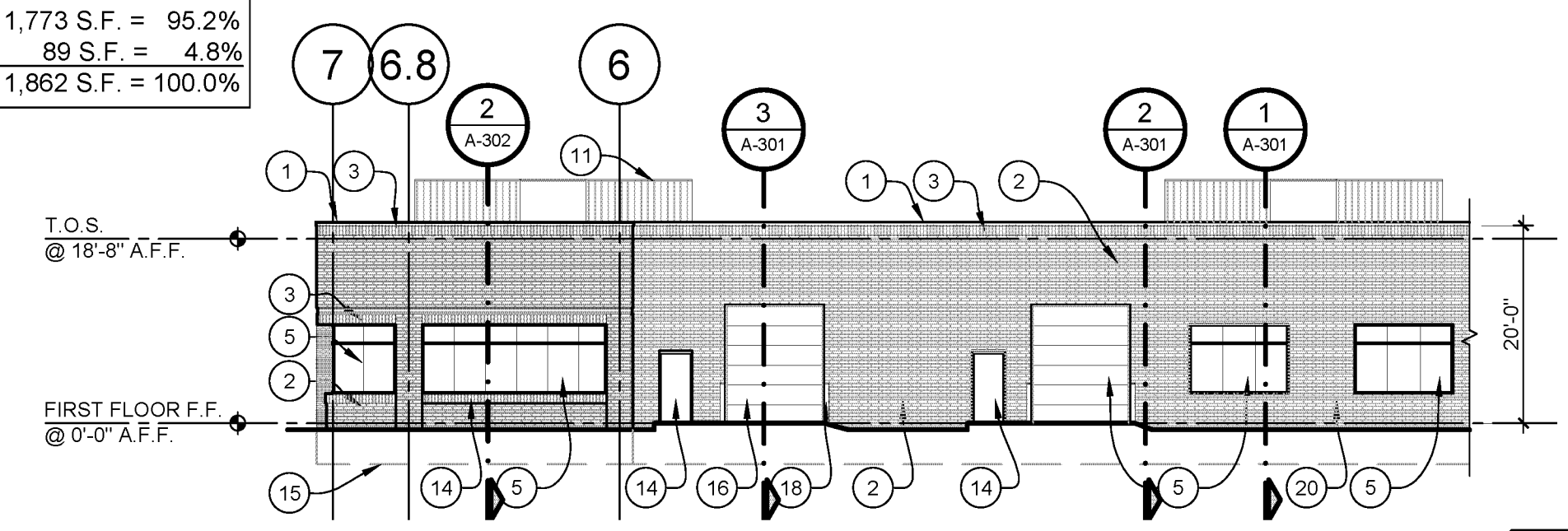
SCALE: 1" = 40'

DRAWING NUMBER:  
**L-1.0**

**EXTERIOR MATERIAL SCHEDULE**

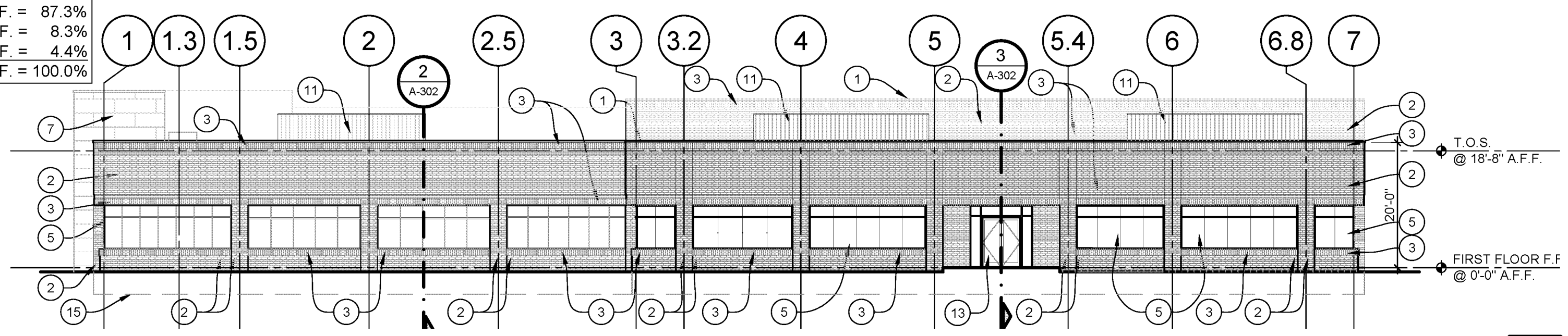
1	PREFINISHED METAL COPING	8	ARCHITECTURAL FLUSH METAL PANEL (ACCENT) COLOR: TBD	15	CONC. TRENCH FOOTING BELOW
2	4" UTILITY BRICK - FIELD COLOR COLOR: TBD	9	ARCHITECTURAL FLUSH METAL PANEL (CANOPY) COLOR: TBD	16	10'x12' SECTIONAL INSULATED OVERHEAD DOOR
3	BRICK ACCENT - SOLIDER COURSE COLOR: TBD	10	VERTICAL METAL PANEL COLOR: TBD	17	12'x12' SECTIONAL INSULATED OVERHEAD DOOR
4	BRICK ACCENT - STACK BOND COURSE COLOR: TBD	11	FLUSH METAL SIDING	18	6" DIA. CONC. FILLED STEEL GUARDPOST
5	1" TINTED LOW 'E' INSUL. VISION GLAZING IN CLEAR ANOD. ALUM. THERMAL BREAK FRAMES	12	3'x8' CLEAR ANOD. ALUM. ENTRY DOOR W/ TINTED TEMPERED GLASS	19	10'x12' BRICK KNOCKOUT PANEL
6	1" TINTED INSULATED SPANDREL GLAZING IN CLEAR ANOD. ALUM. THERMAL BREAK FRAMES	13	6'x8' CLEAR ANOD. ALUM. ENTRY DOOR W/ TINTED TEMPERED GLASS	20	3'-4"x7'-4" BRICK KNOCKOUT PANEL
7	ARCHITECTURAL FLUSH METAL PANEL (FIELD) COLOR: TBD	14	3'x7' HOLLOW METAL DOOR AND FRAME	21	ARCHITECTURAL FLUSH METAL PANEL COLOR: MULTI-COLOR TBD

**BUILDING FACADE MATERIAL BREAKDOWN**  
(EXCLUDES VISION GLASS & OPENINGS)  
BRICK: 1,773 S.F. = 95.2%  
FLUSH METAL SIDING (ROOF SCREEN): 89 S.F. = 4.8%  
TOTAL MATERIAL SQUARE FOOTAGE: 1,862 S.F. = 100.0%



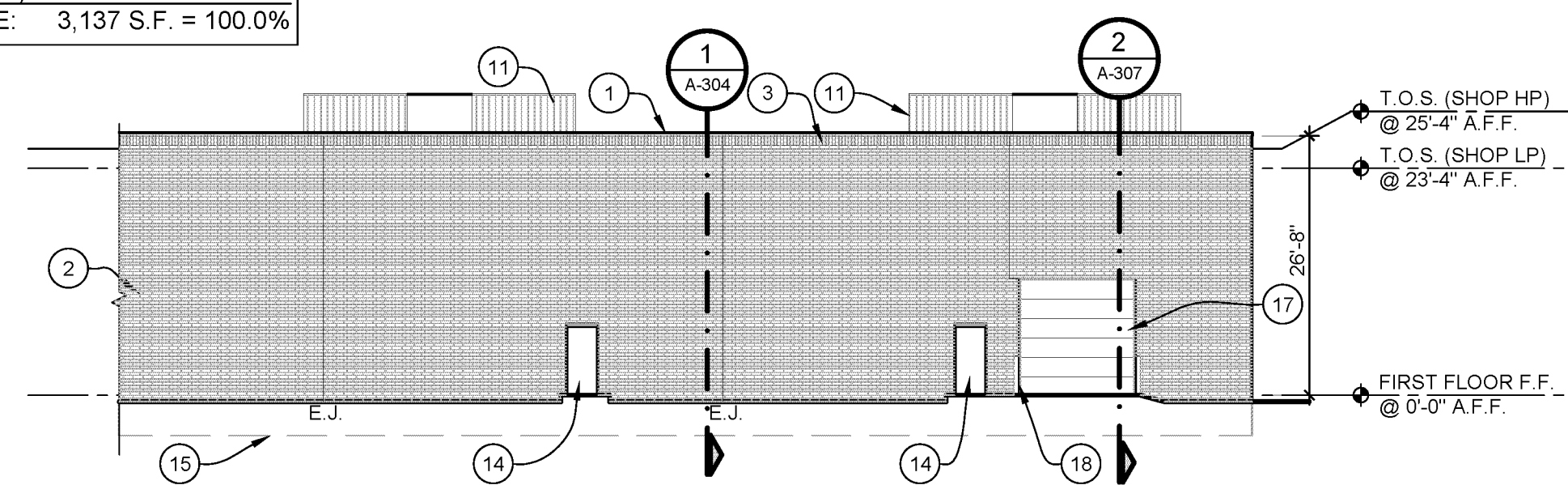
**WEST COURTYARD ELEVATION**  
SCALE: 1/16" = 1'-0"  
**6**

**BUILDING FACADE MATERIAL BREAKDOWN**  
(EXCLUDES VISION GLASS & OPENINGS)  
BRICK: 3,498 S.F. = 87.3%  
FLUSH METAL SIDING (ROOF SCREEN): 332 S.F. = 8.3%  
FLUSH METAL PANEL: 175 S.F. = 4.4%  
TOTAL MATERIAL SQUARE FOOTAGE: 4,005 S.F. = 100.0%



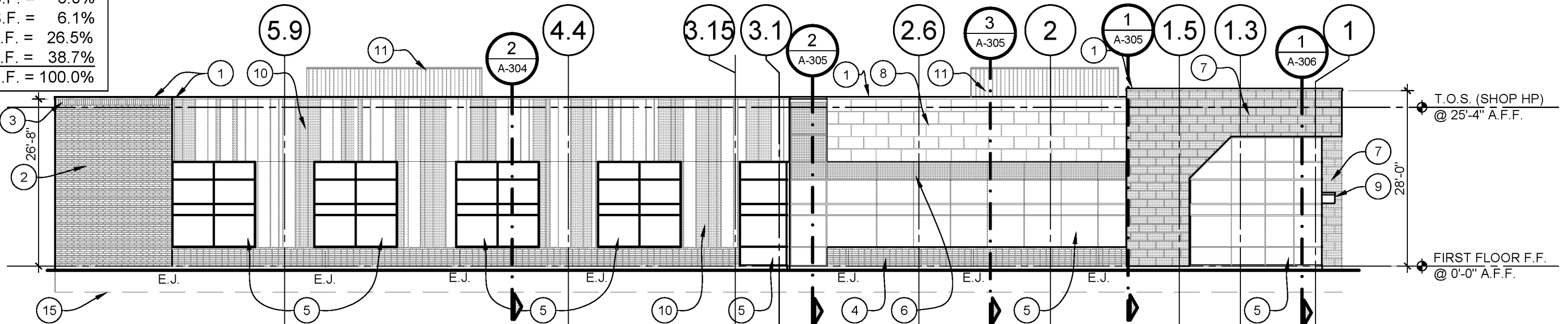
**EAST ELEVATION**  
SCALE: 1/16" = 1'-0"  
**5**

**BUILDING FACADE MATERIAL BREAKDOWN**  
(EXCLUDES VISION GLASS & OPENINGS)  
BRICK: 2,974 S.F. = 94.8%  
FLUSH METAL SIDING (ROOF SCREEN): 163 S.F. = 5.2%  
TOTAL MATERIAL SQUARE FOOTAGE: 3,137 S.F. = 100.0%



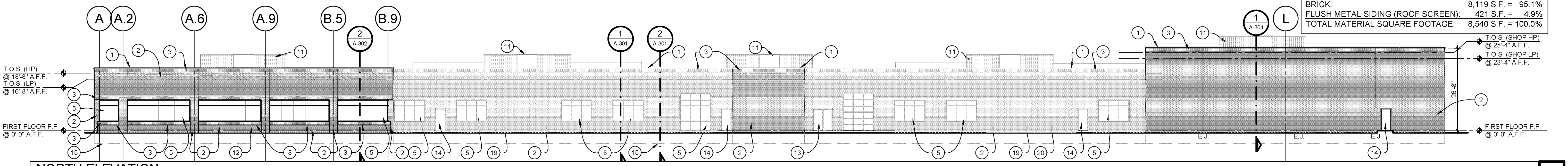
**EAST COURTYARD ELEVATION**  
SCALE: 1/16" = 1'-0"  
**4**

**BUILDING FACADE MATERIAL BREAKDOWN**  
(EXCLUDES VISION GLASS & OPENINGS)  
BRICK: 913 S.F. = 23.7%  
SPANDREL: 192 S.F. = 5.0%  
FLUSH METAL SIDING (ROOF SCREEN): 232 S.F. = 6.1%  
FLUSH METAL PANEL: 1,022 S.F. = 26.5%  
VERTICAL METAL PANEL: 1,497 S.F. = 38.7%  
TOTAL MATERIAL SQUARE FOOTAGE: 3,856 S.F. = 100.0%



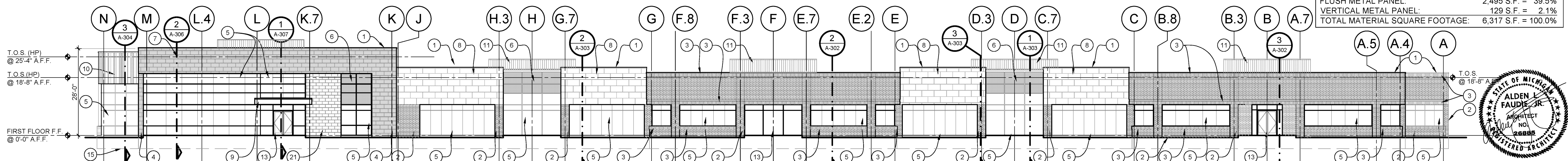
**WEST ELEVATION**  
SCALE: 1/16" = 1'-0"  
**3**

**BUILDING FACADE MATERIAL BREAKDOWN**  
(EXCLUDES VISION GLASS & OPENINGS)  
BRICK: 8,119 S.F. = 95.1%  
FLUSH METAL SIDING (ROOF SCREEN): 421 S.F. = 4.9%  
TOTAL MATERIAL SQUARE FOOTAGE: 8,540 S.F. = 100.0%

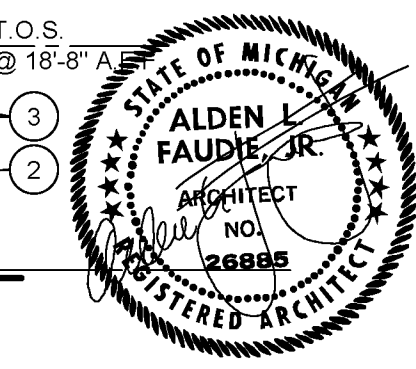


**NORTH ELEVATION**  
SCALE: 1/16" = 1'-0"  
**2**

**BUILDING FACADE MATERIAL BREAKDOWN**  
(EXCLUDES VISION GLASS & OPENINGS)  
BRICK: 2,906 S.F. = 46.0%  
SPANDREL: 330 S.F. = 5.2%  
FLUSH METAL SIDING (ROOF SCREEN): 457 S.F. = 7.2%  
FLUSH METAL PANEL: 2,495 S.F. = 39.5%  
VERTICAL METAL PANEL: 129 S.F. = 2.1%  
TOTAL MATERIAL SQUARE FOOTAGE: 6,317 S.F. = 100.0%



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



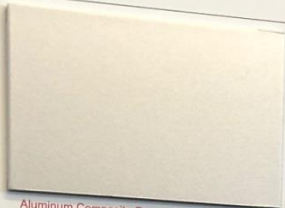


## FAÇADE BOARD

BLACK BRICK



Flush Vertical Metal Siding



Aluminum Composite Panel (ACM)



Aluminum Composite Panel (ACM)



Low 'E' Tinted Glazing



Field Brick (Utility size)



Clear Anodized Aluminum Curtain Wall System



Proposed Material Board for:  
Adams North Spec Building

## FAÇADE ELEVATIONS



Proposed Exterior Rendering for:

**Adams North Technology Center**



**FAUDIE ARCHITECTURE**

Design to Inspire

## PLANNING REVIEW



# PLAN REVIEW CENTER REPORT

February 20, 2019

## Planning Review

Adams North Technology Centre  
JSP19-05

### PETITIONER

Northern Equities Group

### REVIEW TYPE

Preliminary/Final Site Plan

### PROPERTY CHARACTERISTICS

- Site Location: Section 1; North of MacKenzie Drive, East of Cabot Drive
- Site Zoning: OST: Office Service Technology District
- Adjoining Zoning: OST: Office Service Technology District
- Site Use(s): Vacant
- Adjoining Uses: North: Vacant Office/Technology, East: MacKenzie North Tech Centre Office/Technology, South: Adams North Office/Technology, West: Vacant Office/Technology
- Site Size: 6.7 acres
- Building Size: 1-story office building with a total of 56,429 square feet
- Plan Date: 01.22.2019

### PROJECT SUMMARY

The applicant is proposing to construct a 1-story speculative building, consisting of 45,142 square feet of office space and 11,287 square feet of laboratory space, with associated parking and landscaping. This site is located on the north side of MacKenzie Drive, east of the planned extension of Cabot Drive. The site plan indicates a U-shaped building similar to the existing surrounding buildings. This project was approved in 2014 and returned for Planning Commission approval in 2017, but was never built.

### RECOMMENDATION

Approval of the ***Preliminary Site Plan is recommended***, and approval of the ***Final Site Plan is not recommended at this time***. The plan mostly conforms to the requirements of the Zoning Ordinance with some deviations listed below. Additional details and changes are requested in a revised Final Site Plan submittal. **Planning Commission's approval of Preliminary Site 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 a revised Final Site Plan submittal:

1. Property Combination/Split: The site plan indicates a proposed property split from the larger parent parcel. This parcel split has been applied for with the Assessing Department and a new parcel number has been assigned. The new parcel number should be indicated on future submittals, assigned by Assessing Department as 50-22-01-200-048. **The applicant should clarify the intent of the parcel split in relation to the existing condominium and if the Master Deed will be updated.**
2. Future Road Development: An extension of Cabot Drive is indicated on the site plan. The previous review letter from 2014 indicated this extension as Phase II. **The applicant should indicate the plan for the future extension of Cabot Drive. The applicant should work with City Staff and City Attorney at the time of revised Final Site Plan to determine the mechanism needed to insure landscaping and sidewalk improvements along future Cabot Drive extension upon construction.**
3. Economic Impact Information: Economic Impact Information such as total cost of the building and site improvements, number of jobs created, etc. is not included. **Please provide an Economic Impact Statement for the Planning Commission's consideration.**
4. End Islands (Sec. 5.3.12): End islands should have a minimum 15 foot outside radius. The plan indicates only an 8' radius and 10' radius for some end islands. **The applicant should provide a turning movement plan to show maneuverability around the end islands and indicate a request for the waiver, or adjust the plans to meet requirements.**
5. Bicycle Parking General Requirements (Sec. 5.16): The Ordinance requires that when 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations. The 12 provided bike parking spaces are located near the back entrances of the building. **The applicant should consider providing some spaces near the public entrance at the front of the building.** Please see details in the Planning Review Chart.
6. Lighting and Photometric Plan (Sec. 5.7): Additional details and data should be provided on the Photometric Plan. See details in the Planning Review Chart.
7. Additional comments and requirements: Please refer to the Planning review chart for additional comments and requirements to be addressed.
8. Other Reviews:
  - a. Landscape Review: **Four waivers are required for lack of parking lot interior trees and perimeter trees within the ITC Corridor, lack of building coverage by foundation landscape, and lack of screening around transformers.** Given that the waivers must be granted by the Planning Commission, the revisions can be addressed on a revised Final Site Plan. Landscape recommends approval of Preliminary Site Plan, but not Final Site Plan. Additional comments to be addressed with revised Final Site Plan submittal.
  - b. Traffic Review: **Traffic review indicates that the number of trips exceeds the City threshold and recommends a Traffic Impact Study for the site, or that a waiver be requested with justification provided. If an updated trip generation study can be provided, Traffic is in support of a waiver for an additional traffic study.** Traffic recommends approval of Preliminary Site plan, but not Final Site Plan. Additional comments to be addressed with revised Final Site Plan submittal.
  - c. Engineering Review: Engineering recommends approval of the Preliminary Site Plan, but not the Final Site Plan. Additional comments to be addressed with revised Final Site Plan submittal.
  - d. Facade Review: **Section 9 waiver should be requested for the underage of Brick on the west façade and the overage of Flat Metal Panels on the south façade.** Façade supports the waiver and recommends approval.
  - e. Fire Review: **Fire is not recommending approval at this time.** See comments in Fire Review letter. The applicant may submit a utility plan addressing Fire comments regarding separate water lines and hydrants.

### **NEXT STEP: PLANNING COMMISSION MEETING**

This site plan has been scheduled for consideration by the Planning Commission on February 27, 2019 meeting. Please provide via email the following **no later than noon on February 22, 2019** if you wish to keep this schedule.

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.**
3. A utility plan addressing Fire review comments.
4. A color rendering of the Site Plan, if any. (Previously provided)
5. A sample board of building materials as requested by our Façade Consultant. The applicant can bring the material samples to the Planning Commission meeting. (Previously provided)

### **REVISED FINAL SITE PLAN SUBMITTAL AND RESPONSE LETTER**

Planning, Engineering Traffic, Landscaping, and Fire are not recommending approval of the Final Site Plan. Refer to letters for more details. Please submit the following for reconsideration if the Planning Commission approves the Preliminary Site Plan:

1. A [site plan revision application](#)
2. **Five** copies of Final Site Plan addressing all comments from the review letters
3. Response letter **addressing all comments and refer to sheet numbers where the change is reflected**
4. Hazardous Materials Packet (Non-residential developments)
5. No Revision Façade Affidavit (if no changes are proposed for Façade)
6. Legal Documents as required
7. Drafts of any legal documents (note that off-site easements need to be executed and any on-site easements need to be submitted in draft form before stamping sets will be stamped)

### **ELECTRONIC STAMPING SET SUBMITTAL AND RESPONSE LETTER**

After receiving Final Site Plan approval, please submit the following for Electronic stamping set approval:

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

### **STAMPING SET APPROVAL**

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

### **SITE ADDRESSING**

**A new address is required for this project.** The applicant should contact the Building Division for an address prior to applying for a building permit. Building permit applications cannot be processed without a correct address. The address application can be found by clicking on this [link](#). Please contact the Ordinance Division 248.735.5678 in the Community Development Department with any specific questions regarding addressing of sites.



### **STREET AND PROJECT NAME**

---

**This project has received project name approval from the Street and Project Naming Committee.** Please contact Hannah Smith (248-347-0579) in the Community Development Department for additional information.

### **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](mailto: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 248.347.0579 or [hsmith@cityofnovi.org](mailto:hsmith@cityofnovi.org).



---

Hannah Smith, Planning Assistant



## PLANNING REVIEW CHART: Office Service Technology (OST)

**Review Date:** February 7, 2019  
**Review Type:** Preliminary & Final Site Plan Review  
**Project Name:** JSP 19-05 Adams North Technology Centre 2019  
**Location:** Parcel 50-22-01-200-041, Mackenzie Drive and Cabot Drive  
**Plan Date:** January 22, 2019  
**Prepared by:** Hannah Smith, Planning Assistant  
**E-mail:** hsmith@cityofnovi.org; **Phone:** (248) 347-0579

<b>Bold</b>	To be addressed with the next submittal
<u>Underline</u>	To be addressed with final site plan submittal
<b><u>Bold and Underline</u></b>	Requires Planning Commission and/or City Council Approval
<i>Italics</i>	To be noted

Item	Required Code	Proposed	Meets Code	Comments
<b>Zoning and Use Requirements</b>				
<b>Master Plan</b> <i>(adopted August 25, 2010)</i>	Office, Research, Development & Technology	Professional Office Building with Laboratory Space	Yes	
<b>Area Study</b>	The site does not fall under any special category	NA	NA	
<b>Zoning</b> <i>(Effective December 25, 2013)</i>	OST: Office Service and Technology	OST	Yes	
<b>Uses Permitted</b> <i>(Sec 3.1.23.B &amp; C)</i>	Sec. 3.1.23.B. - Principal Uses Permitted. Sec. 3.1.23.C. – Special Land Uses Permitted.	Professional Office Building, Laboratory	Yes	
<b>Height, bulk, density and area limitations</b> <i>(Sec 3.1.21.D)</i>				
<b>Frontage on a Public Street.</b> <i>(Sec. 5.12)</i> <b>Access To Major Thoroughfare</b> <i>(Sec. 5.12)</i>	Frontage on a Public Street is required  Vehicular access shall be provided only to an existing or planned major thoroughfare or freeway service drive OR access driveway on other street type is not across street from existing or planned single-family uses	Frontage on MacKenzie Drive  Access to Haggerty via MacKenzie Drive, Access to Thirteen Mile via Cabot Drive, across from non-residential uses	Yes	
<b>Minimum Zoning Lot Size</b> 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 the		NA	

Item	Required Code	Proposed	Meets Code	Comments
<b>Minimum Zoning Lot Size</b> for each Unit: Width in Feet (Sec 3.6.2.D)	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	
<b>Maximum % of Lot Area Covered</b> (By All Buildings)	(Sec 3.6.2.D)	Building: 56,429 SF Footprint: 56,249 SF Site: 6.7 acres Coverage: 19.3%	NA	
<b>Building Height</b> (Sec. 3.20)	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.	Maximum height: 28.0'	Yes	
<b>Building Setbacks</b> (Sec 3.1.23.D)				
Front (MacKenzie Drive)	50'	92.53'	Yes	
Rear (North)	50'	69.5'	Yes	
Side (East)	50'	82.54'	Yes	
Side (West)	50'	161.35'	Yes	
<b>Parking Setback</b> (Sec 3.1.23.D) Refer to applicable notes in Sec 3.6.2				
Front (MacKenzie Drive)	20 ft.	21.87'	Yes	
Rear (North)	20 ft.	22'		
Side (East)	20 ft.	40'	Yes	<b>Please provide measurement on the plans</b>
Side (West)	20 ft.	43.02'	Yes	
<b>Note To District Standards</b> (Sec 3.6.2)				
<b>Exterior Side Yard Abutting a Street</b> (Sec 3.6.2.C)	All exterior side yards abutting a street shall be provided with a setback equal to front yard.	Exterior side yard (west) abutting Cabot Drive observes greater than a 50' setback	Yes	
<b>Off-Street Parking in Front Yard</b> (Sec 3.6.2.E)	Off-street parking is allowed in front yard, not outside of the parking setback	Parking is proposed in front yard and meets the parking setback requirements	Yes	
<b>Distance between buildings</b> (Sec 3.6.2.H)	It is governed by Sec. 3.8.2.H or by the minimum setback requirements, whichever is greater	Only one building proposed	NA	

Item	Required Code	Proposed	Meets Code	Comments
<b>Wetland/Watercourse Setback</b> (Sec 3.6.2.M)	A setback of 25ft from wetlands and from high watermark course shall be maintained	No wetlands on site	NA	
<b>Parking setback screening</b> (Sec 3.6.2.P)	Required parking setback area shall be landscaped per 5.5.3.	A landscape plan is provided		<b>Please refer to landscape review for additional comments</b>
<b>Modification of parking setback requirements</b> (Sec 3.6.2.Q)	The Planning Commission may modify parking setback requirements based on its determination according to Sec 3.6.2.Q	No setback modifications proposed	NA	
<b>OST District Required Conditions (Sec 3.20)</b>				
<b>Additional Height</b> (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.	Maximum height: 28.0'	Yes	
<b>Loading and Unloading Screening (Sec 3.20.2.A)</b>	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. Such screening shall be accomplished by the courtyard design of the principal building itself, etc.	Two loading areas (500 sf, 400 sf) located behind building, screened by u-shaped building	Yes	
<b>Additional conditions for permitted uses in 3.1.23.B.ii – v (Sec 3.20.2.C)</b>	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	Use falls under subsection 3.1.23.B.i and 3.1.23.B.iii	NA	
<b>Outdoor storage</b> (Sec 3.20.2.D)	The outdoor storage of goods or materials shall be prohibited.			<b>Note should be added</b>
<b>Parking, Loading and Dumpster Requirements</b>				

Item	Required Code	Proposed	Meets Code	Comments
<p><b>Number of Parking Spaces</b>                      Office                      (Sec.5.2.12.D)</p>	<p>"Business/Professional Office": 1 space for every 222 SF of GLA.                      "Research establishments": 1 space for every 700 SF of UFA.</p> <p>45,142 SF office                      45,142/222 = 203 spaces required                      11,287 SF laboratory                      11,287/700 = 16 spaces require  <b>Total 219 spaces required</b></p>	<p><b>234 spaces provided</b></p>	<p>Yes</p>	
<p><b>Parking stall located adjacent to a parking lot entrance</b>(public or private)                      (Sec. 5.3.13)</p>	<p>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</p>		<p>Yes</p>	
<p><b>End Islands</b>                      (Sec. 5.3.12)</p>	<ul style="list-style-type: none"> <li>- End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles.</li> <li>- 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</li> </ul>	<p>Some end islands with 8' outside radius and some with 10' outside radius</p>	<p><b>No</b></p>	<p><b>Please adjust to meet the requirements or provide a turning movement plan to show maneuverability</b></p>
<p><b>Parking Space Dimensions and Maneuvering Lanes</b>                      (Sec. 5.3.2)</p>	<ul style="list-style-type: none"> <li>- 90° Parking: 9 ft. x 19 ft.</li> <li>- 24 ft. two way drives</li> <li>- 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</li> </ul>	<ul style="list-style-type: none"> <li>- 24 ft. two way drives</li> <li>- 9 ft. x 19.5 ft. spaces</li> <li>- 9 ft. x 17 ft. and 9 ft. x 17.5 ft. spaces indicate a 4" overhang at these locations</li> </ul>	<p>Yes</p>	<p><b>Please refer to Traffic review letter regarding parking space dimensions</b></p>

Item	Required Code	Proposed	Meets Code	Comments
<b>Barrier Free Spaces</b> <i>Barrier Free Code</i>	201-300 spaces requires 5 regular handicap + 2 van handicap	4 regular & 4 van spaces proposed	Yes	
<b>Barrier Free Space Dimensions</b> <i>Barrier Free Code</i>	- 8' wide with an 8' wide access aisle for van accessible spaces - 8' wide with a 5' wide access aisle for regular accessible spaces	Two types of accessible spaces are provided	Yes	
<b>Barrier Free Signs</b> <i>Barrier Free Code</i>	One sign for each accessible parking space.	Sign detail shown and location indicated on plan	Yes	
<b>Minimum number of Bicycle Parking</b> <i>(Sec. 5.16.1)</i>	General Offices/ Research and Development: Five (5) percent of required automobile spaces, minimum two (2) spaces For 219 required spaces, 11 bike spaces	12 bike parking spaces shown	Yes	
<b>Bicycle Parking General requirements</b> <i>(Sec. 5.16)</i>	- No farther than 120 ft. from the entrance being served - When 4 or more spaces are required for a building with multiple entrances, the spaces shall be provided in multiple locations - Spaces to be paved and the bike rack shall be inverted "U" design - Shall be accessible via 6 ft. paved sidewalk	Within 120 feet from entrances on back of building  All 12 spaces provided at rear of building  Ring style bicycle rack  Accessible via 5 ft. sidewalk	Yes	<b>Consider providing some spaces near public entrance at front of building in order to serve multiple entrances</b>  <b>Refer to Traffic review letter regarding sidewalk width near the bike rack</b>
<b>Bicycle Parking Lot layout</b> <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	Layout shown	Yes	<b>Please correct bike rack note on sheet C-3.1 to reference correct page for bike rack details (L-1.2 instead of L-2.0)</b>
<b>Loading Spaces</b> <i>Sec. 5.4.1</i>	- 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	Loading Area in the rear yard – 900 SF (400 SF, 500 SF) proposed	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	<ul style="list-style-type: none"> <li>yard,</li> <li>- 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.</li> <li>- When in use should not cut off or diminish access to parking spaces or service drives</li> </ul>			
<p><b>Dumpster</b>                      Sec 4.19.2.F</p>	<ul style="list-style-type: none"> <li>- Located in rear yard</li> <li>- Attached to the building or</li> <li>- No closer than 10 ft. from building if not attached</li> <li>- Not located in parking setback</li> <li>- If no setback, then it cannot be any closer than 10 ft. from property line.</li> <li>- Away from Barrier free Spaces</li> <li>- When in use should not cut off or diminish access to parking spaces or service drives</li> </ul>	<p>Dumpsters located in the rear yard                      Not attached to building                      Farther than 10 ft.</p> <p>Outside the parking setback                      20' from property line</p> <p>Away from the barrier free spaces</p>	<p>Yes</p>	<p><b>Please refer to Traffic review comment regarding truck turning patterns</b></p>
<p><b>Dumpster Enclosure</b>                      Sec. 21-145. (c)                      Chapter 21 of City Code of Ordinances</p>	<ul style="list-style-type: none"> <li>- Screened from public view</li> <li>- A wall or fence 1 ft. higher than height of refuse bin</li> <li>- And no less than 5 ft. on three sides</li> <li>- Posts or bumpers to protect the screening</li> <li>- Hard surface pad.</li> <li>- Screening Materials: Masonry, wood or evergreen shrubbery</li> </ul>	<ul style="list-style-type: none"> <li>- 6' tall enclosure</li> <li>- White cedar wood and masonry materials</li> <li>- Guard posts provided to protect screening</li> <li>- Concrete pad</li> </ul>	<p>Yes</p>	
<p><b>Roof top equipment and wall mounted utility equipment</b>                      Sec. 4.19.2.E.ii</p>	<p>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</p>	<p>RTU screen of Metal Panel Siding shown on plans</p>	<p>Yes</p>	

Item	Required Code	Proposed	Meets Code	Comments
	building			
<b>Roof top appurtenances screening</b>	Roof top appurtenances shall be screened in accordance with applicable facade regulations, and shall not be visible from any street, road or adjacent property.	RTU screen shown on plans	Yes	
<b>Non-Motorized Facilities</b>				
<b>Article XI. Off-Road Non-Motorized Facilities</b>	A 6 foot sidewalk is required along collector and arterial roads	6' sidewalk shown along MacKenzie Drive	Yes	
<b>Pedestrian Connectivity</b>	Assure safety and convenience of both vehicular and pedestrian traffic both within the site and in relation to access streets	7' sidewalks provided around the building  Sidewalks are proposed throughout the site and connection to existing 6' sidewalk on MacKenzie	Yes	<i>Sidewalk along Cabot Drive should be built when road extension is completed</i>
<b>Building Code</b>	Building exits must be connected to sidewalk system or parking lot.	All exits are connected to internal sidewalk		
<b>Lighting and Photometric Plan (Sec. 5.7)</b>				
<b>Exterior lighting (Sec. 5.7.2)</b>	Photometric plan and exterior lighting details needed at time of Final Site Plan submittal;	Lighting details and photometric plan provided	Yes	
<b>Lighting Plan (Sec. 5.7.2.A.i)</b>	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures		Yes	<b>Please darken the site plan under the Photometric plan to make it easily read</b>  <b>Please show property line on Photometric Plan</b>  <b>Extend photometric data to property lines and near the building</b>
<b>Lighting Plan (Sec.5.7.A.2)</b>	Specifications for all proposed & existing lighting fixtures		Yes	
	Photometric data		Yes	
	Fixture height		Yes	
	Mounting & design		Yes	



Item	Required Code	Proposed	Meets Code	Comments
	Glare control devices		Yes	
	Type & color rendition of lamps	LED	Yes	
	Hours of operation	Not provided	<b>No</b>	<b>Provide hours of operation</b>
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties	NA	NA	
<b>Required Conditions</b> (Sec. 5.7.3.A)	Height not to exceed maximum height of zoning district (or 25 ft. where adjacent to residential districts or uses	27 ft max shown	Yes	
<b>Required Conditions</b> (Sec. 5.7.3.B)	<ul style="list-style-type: none"> <li>- Electrical service to light fixtures shall be placed underground</li> <li>- Flashing light shall not be permitted</li> <li>- Only necessary lighting for security purposes &amp; limited operations shall be permitted after a sites hours of operation</li> </ul>	Not shown	<b>No</b>	<b>Provide notes on plan</b>
<b>Required Conditions</b> (Sec.5.7.3.E)	Average light level of the surface being lit to the lowest light of the surface being lit shall not exceed 4:1	6.3:1 proposed	<b>No</b>	<b>Adjust ratio to match 4:1 requirement</b>
<b>Required Conditions</b> (Sec. 5.7.3.F)	Use of true color rendering lamps such as metal halide is preferred over high & low pressure sodium lamps	LED	Yes	
<b>Min. Illumination</b> (Sec. 5.7.3.k)	Parking areas: 0.2 min	0.4 min	Yes	<b>Data appears to comply, Please provide minimums in a table on the plans</b>
	Loading & unloading areas: 0.4 min	1.4 min	Yes	
	Walkways: 0.2 min	0.5 min	Yes	
	Building entrances, frequent use: 1.0 min	1.2 min	Yes	
	Building entrances, infrequent use: 0.2 min	1.1 min	Yes	
<b>Max. Illumination adjacent to Non-Residential</b> (Sec. 5.7.3.K)	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle	Not provided	<b>No</b>	<b>Extend photometric data to property line</b>

Item	Required Code	Proposed	Meets Code	Comments
<b>Cut off Angles</b> (Sec. 5.7.3.L)	When adjacent to residential districts: - All cut off angles of fixtures must be 90° - maximum illumination at the property line shall not exceed 0.5 foot candle		NA	<i>Residential district not immediately adjacent</i>
<b>Other Requirements</b>				
<b>Design and Construction Standards Manual</b>	Land description, Sidwell number (metes and bounds for acreage parcel, lot number(s), Liber, and page for subdivisions).	Provided	Yes	
<b>General layout and dimension of proposed physical improvements</b>	Location of all existing and proposed buildings, proposed building heights, building layouts, (floor area in square feet), location of proposed parking and parking layout, streets and drives, and indicate square footage of pavement area (indicate public or private).	Provided	Yes	
<b>Economic Impact Information</b>	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known).	Not provided	No	<b><u>Please provide Economic Impact Statement in response letter for Planning Commission's consideration</u></b>
<b>Development and Street Names</b>	Development and street names must be approved by the Street Naming Committee before Preliminary Site Plan approval	Requires Project Name approval Does not require street name approval	NA	<i>Project Name reapproved by Committee January 17, 2019</i>
<b>Development/ Business Sign</b>	Signage if proposed requires a permit. Can be considered during site plan review process or independently.	None shown	NA	If there will be a sign, please show the location  <u>For sign permit information contact Maureen Underhill 248-735-5602.</u>

Item	Required Code	Proposed	Meets Code	Comments
<p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1. This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.</li> <li>2. The section of the applicable ordinance or standard is indicated in parenthesis. Please refer to those sections in Article 3, 4 and 5 of the zoning ordinance for further details</li> <li>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.</li> </ol>				

# ENGINEERING REVIEW



# PLAN REVIEW CENTER REPORT

February 15, 2019

## Engineering Review

Adams North Technology Centre  
JSP19-0005

---

### Applicant

HCP Land, LLC

### Review Type

Combined Preliminary and Final Site Plan

### Property Characteristics

- Site Location: North of Mackenzie Drive, West of Haggerty Road
- Site Size: 6.70 acres
- Plan Date: 01/22/2019
- Design Engineer: PEA, Inc.

### Project Summary

- Construction of an approximately 56,429 square-foot office building and associated parking. Site access would be provided via Mackenzie Drive which connects to Haggerty Road in the east and Cabot Drive in the south.
- Water service would be provided by an 8-inch loop around the building extending from the existing 24-inch water main along the east side of the property line, and at the intersection of Cabot Drive and Mackenzie Drive. A 2-inch domestic lead and an 8-inch fire lead would be provided to serve the building, along with additional hydrants.
- Sanitary sewer service would be provided by a 6-inch extension from the existing 12-inch sewer directly north of Mackenzie Drive.
- Storm water would be collected by a single storm sewer collection system and discharged to Detention Basin 'E' northeast of this development.

### Recommendation

**Approval of the Preliminary Site Plan is recommended. Approval of the Final Site Plan is NOT recommended.**

**Comments:**

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

**General**

1. Provide sight distance measurements for the Mackenzie Drive entrance in accordance with Figure VIII-E of the Design and Construction Standards.
2. Provide a note with the traffic sign table stating all traffic signage will comply with the current MMUTCD standards.
3. Generally, all proposed trees shall remain outside utility easements. Where proposed trees are required within a utility easement, the trees shall maintain a minimum 5-foot horizontal separation distance from any existing or proposed utility. All utilities shall be shown on the landscape plan, or other appropriate sheet, to confirm the separation distance.
4. Indicate the typical foundation depth for the light poles to verify that no conflicts with utilities will occur. Light poles in a utility easement will require a License Agreement.
5. Provide the City's standard detail sheets for water main (5 sheets-rev. 02/16/2018), sanitary sewer (3 sheets- rev. 02/16/2018), storm sewer (2 sheets-rev. 02/16/2018), paving (2 sheets-rev. 03/05/2018) and pathways (1 sheet-rev. 04/12/2018) at the time of the Stamping Set submittal. These details can be found on the City's website at this location: <http://cityofnovi.org/Government/City-Services/Public-Services/Engineering-Division/Engineering-Standards-and-Construction-Details.aspx>

**Water Main**

6. Change note on sheet C-7.0 to state, "All hydrants to be a minimum of **7 feet** from back of curb". This is according to section 11-68(f) of the City's Code of Ordinances.
7. Provide separate domestic lead and fire service lead from the water main for building with a unique shut-off valve for each. Shut-off valves to be placed within water main easement.
8. Hydrant leads in excess of 25 feet to be minimum 8-inch diameter.
9. Three (3) sealed sets of revised utility plans along with the MDEQ permit application (06/12 rev.) for water main construction and 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**

10. Revise the sanitary sewer basis of design for the development on the utility plan sheet based on 3.2 people per REU and using a peak factor of 4.0 for design population of 500 or less.

11. Provide a note on the Utility Plan and sanitary profile stating the sanitary leads will be buried at least 5 feet deep where under the influence of pavement.

**Storm Sewer**

12. Storm manholes with differences in invert elevations exceeding two feet shall contain a 2-foot deep plunge pool.
13. An easement is required over the storm sewer accepting and conveying off-site drainage.

**Storm Water Management Plan**

14. The Storm Water Management Plan for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the new Engineering Design Manual.
15. 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.
16. Provide manufacturer's details and sizing calculations for the pretreatment structure within the plans. The treated flow rate should be based upon the 1-year storm event intensity (~1.6 In/Hr). Higher flows shall be bypassed.
17. Provide supporting calculations for the runoff coefficient determination in each tributary area.
18. A runoff coefficient of 0.35 shall be used for all turf grass lawns (mowed lawns), and 0.95 for all roofs and paved areas.

**Paving & Grading**

19. Specify the product proposed and provide a detail for the detectable warning surface for barrier free ramps. The product shall be the concrete-embedded detectable warning plates, or equal, and shall be approved by the Engineering Division. Stamped concrete will not be acceptable.
20. Site grading shall be limited to 1V:4H (25-percent), excluding landscaping berms.
21. The grade of the drive approach shall not exceed 2-percent within the first 25 feet of the intersection. Revise grading to meet this requirement, or submit a request for variance from Design and Construction standards.
22. The end islands shall conform to the City standard island design, or variations of the standard design, while still conforming to the standards as outlined in Section 2506 of Appendix A of the Zoning ordinance (i.e. 2' minor radius, 15' major radius, minimum 8' wide, 3' shorter than adjacent 19' stall).
  - a. All end islands must be 3 feet shorter in length than the adjacent parking space.
23. Provide top of curb/walk and pavement/gutter grades to indicate height of curb adjacent to parking stalls or drive areas.

**Soil Erosion and Sediment Control**

24. A SESC permit is required. A full review has not been completed at this time. The review checklist detailing all SESC requirements is attached to this letter.

Please address the comments below and submit a SESC permit application under separate cover. The application can be found on the City's website at <http://cityofnovi.org/Reference/Forms-and-Permits.aspx>.

**Off-Site Easements**

25. Any off-site utility easements anticipated must be executed **prior to final approval of the plans**. If you have not already done so, drafts of the easements and a recent title search shall be submitted to the Community Development Department as soon as possible for review, and shall be approved by the Engineering Division and the City Attorney prior to executing the easements.

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

26. A letter from either the applicant or the applicant's engineer must be submitted with the revised Final Site Plan highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved. **Additionally, a statement must be provided stating that all changes to the plan have been discussed in the applicant's response letter.**

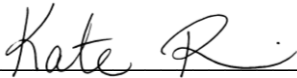
**The following must be addressed prior to construction:**

27. A pre-construction meeting shall be required prior to any site work being started. Please contact Sarah Marchioni in the Community Development Department to setup a meeting (248-347-0430).
28. A City of Novi Grading Permit will be required prior to any grading on the site. This permit will be issued at the pre-construction meeting (no application required). No fee is required for this permit.
29. Material certifications must be submitted to Spalding DeDecker for review prior to the construction of any onsite utilities. Contact Ted Meadows at 248-844-5400 for more information.
30. Construction inspection fees in amount that is to be determined must be paid to the Community Development Department.
31. Legal escrow fees must be deposited with the Community Development Department. All unused escrow will be returned to the payee at the end of the project. This amount includes engineering legal fees only. There may be additional legal fees for planning legal documents.
32. A storm water performance guarantee an amount equal to 120% of the cost required to complete the storm water management facilities, as specified in the Storm Water Management Ordinance, must be posted at the Community Development Department.
33. Water and Sanitary Sewer Fees must be paid prior to the pre-construction meeting. Contact the Water & Sewer Division at 248-347-0498 to determine the amount of these fees.



34. A street sign financial guarantee in the amount of \$400 per traffic control sign proposed must be posted at the Community Development Department. Signs must be installed in accordance with MMUTCD standards.
35. A Soil Erosion Control Permit must be obtained from the City of Novi. Contact Sarah Marchioni in the Community Development Department, Building Division (248-347-0430) for forms and information. The financial guarantee and inspection fees will be determined during the SESC review.
36. An NPDES permit must be obtained from the MDEQ since the site is over 5 acres in size. The MDEQ may require an approved SESC plan to be submitted with the Notice of Coverage.
37. A permit for all proposed work activities within the road right-of-way must be obtained from the City of Novi. This application is available from the City Engineering Division or on the City website and can be filed once the Final Site Plan has been submitted. Please contact the Engineering Division at 248-347-0454 for further information. Please submit the cover sheet, standard details and plan sheets applicable to the permit only.
38. A permit for water main construction must be obtained from the MDEQ. This permit application must be submitted through the Engineering Division after the water main plans have been approved. Please submit the cover sheet, overall utility sheet, standard details and plan/profile sheets applicable to the permit.
39. An inspection permit for the sanitary sewer tap must be obtained from the Oakland County Water Resource Commissioner (OCWRC).
40. Permits for the construction of each retaining wall exceeding 48 inches in height (measured from bottom of the footing to top of the wall) must be obtained from the Community Development Department (248-347-0415).

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



---

Kate Richardson, EIT  
Plan Review Engineer

cc: Lindsay Bell, Community Development  
George Melistas, Engineering  
Darcy Rehtien, PE, 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:	<b>STATUS:</b> <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span>

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

February 4, 2019

## Preliminary/Final Site Plan - Landscaping

### Adams North Technology Centre

#### Review Type

Combined Preliminary/Final Landscape Review

#### Job #

JSP19-0005

#### Property Characteristics

- Site Location: MacKenzie Drive at Cabot
- Site Acreage: 6.7 acres
- Site Zoning: OST
- Adjacent Zoning: OST
- Plan Date: 1/22/2019

#### 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 revised 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 but not for Final Site Plan. There are 3 landscape waivers required for the current plan. Staff supports all 3 waivers. Assuming all waivers are granted by the Planning Commission, the revisions requested below must be addressed on Final Site Plans.**

#### **LANDSCAPE WAIVERS: Please include the impact of the waiver within the waiver request.**

1. Lack of parking lot interior trees within the ITC corridor (4 trees). *Supported by staff.*
2. Lack of parking lot perimeter trees within the ITC corridor (7 trees). *Supported by staff.*
3. Lack of building coverage by foundation landscaping (less than 75% of building has landscaping). *Supported by staff.*
4. Lack of landscape screening around transformers (which are located within paved areas). *Supported by staff.*

**GENERAL LAYOUT NOTE:** Please convert as much as possible of the paved area west of the dumpsters that is not used for parking, loading or vehicle maneuvering to greenspace. There appears to be a large amount of unused paving there.

#### Ordinance Considerations

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

**Please provide in the set.**

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

1. Provided
2. Please indicate if there are any overhead utility lines in the site.

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

There are no existing trees on the site.

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 (Zoning Sec. 5.5.3.B.ii and iii)

The project is not immediately adjacent to rights-of-way.

The site is entirely within an industrial subdivision so those rules should be followed. See below.

Industrial Subdivision Landscaping (LDM 2.b.) – See the landscape chart for a detailed discussion

**MacKenzie Drive (632lf – net of entry, ITC corridor)**

- Based on the frontage, 18 canopy trees (including 5 street trees), 16 subcanopy trees and 32 shrubs, a berm or hedge screening the parking plus 63lf of massing are required.
- 18 canopy trees, 27 subcanopy trees, a 3 foot berm, a hedge along MacKenzie Drive, groups of shrubs at the entry and a mass of plantings at the intersection of Cabot and MacKenzie are provided.
- **A landscape waiver to not provide canopy or subcanopy trees within the ITC corridor should be requested. It will be supported by staff.**

**Future Cabot Drive (134 lf – net of ITC corridor, Sanitary Main easement).**

- Based on the frontage, 4 canopy trees, 3 subcanopy trees and 7 shrubs, a berm or hedge screening the parking plus 63lf of massing are required.
- 6 canopy trees parking lot perimeter trees, 0 subcanopy trees, no berm or hedge screening the parking and a mass of plantings at the intersection of Cabot and MacKenzie are provided.
- **Landscape waivers to not provide canopy or subcanopy trees within the ITC corridor and sanitary main easements should be requested. They will be supported by staff.**
- **Since the site topography will not allow a berm, a continuous hedge should be provided along the west side of the parking lot (facing Cabot Drive).**

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

1. Based on the vehicular use area, 4,356sf of landscape area is required and 15,972sf is provided.
2. A number of interior islands and endcap islands need canopy trees. Please see the detailed discussion of these in the Landscape Chart.
3. **A landscape waiver for the trees that can't be planted within the ITC corridor can be requested. It would be supported by staff.**
4. **Alternate landscaping, such as short shrub masses, should be provided in the spots where trees cannot be planted.**

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

1. Based on the calculations, 51 trees are required, and 51 are provided.
2. Please move some of the perimeter trees to the northeast corner connecting drive.
3. Please see the detailed discussion on the Landscape Chart.
4. **A landscape waiver can be requested for the perimeter trees that can't be planted within the ITC corridor. It would be supported by staff.**

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

1. The loading zones near the building are sufficiently screened by the building and by the berm in the interior island.

2. **Please extend the length of the berm in the screening island to the west to better screen the loading zones.**
3. **Please convert as much of the paved area west of the dumpsters as possible to greenspace.**

Building Foundation Landscape (Zoning Sec 5.5.3.D.)

1. The required amount of building foundation area is provided.
2. **A landscape waiver is required for providing landscaping at less than 75% of the building foundation.** *As the missing areas are not visible from the roads, and the required area is provided, this waiver request is supported by staff.*
3. Greater than 60% of the frontages facing MacKenzie Drive and the future Cabot Drive have foundation landscaping.

Plant List (LDM 4)

1. Provided.
2. 23 of 34 species used (68%) are native to Michigan.
3. The proposed tree diversity meets the requirements of the Landscape Design Manual.

Planting Notations and Details (LDM)

1. Provided.
2. **Please revise the notes and details as noted on the Landscape Chart.**
3. **Please add site prep and maintenance notes for the seeded areas.**

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

1. The site's storm water will be treated by an existing detention basin. If any changes to the basin are required, the disturbed areas shall be landscaped per the ordinance.
2. **Please note if there is any Phragmites on the site. If there is, please add a plan for its complete removal to the plans.**

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.**

Proposed topography. 2' contour minimum (LDM 2.e.(1))

Provided

Snow Deposit (LDM.2.g.)

**Please indicate areas on the plan where snow can be deposited without damaging plantings.**

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 meader [meader@cityofnovi.org](mailto:meader@cityofnovi.org).





## LANDSCAPE REVIEW SUMMARY CHART

**Review Date:** February 14, 2019  
**Project Name:** JSP19 – 0005: ADAMS NORTH TECHNOLOGY CENTRE  
**Plan Date:** January 22, 2019  
**Prepared by:** Rick Meader, Landscape Architect E-mail: [rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org);  
 Phone: (248) 735-5621

Items in **Bold** need to be addressed by the applicant before approval of the revised Final Site Plan.

### LANDSCAPE WAIVERS:

1. Lack of parking lot interior trees within the ITC corridor (4 trees). *Supported by staff.*
2. Lack of parking lot perimeter trees within the ITC corridor (7 trees). *Supported by staff.*
3. Lack of greenbelt trees within the ITC corridor and sanitary main easement (10 trees). *Supported by staff.*
4. Lack of building coverage by foundation landscaping (less than 75% of building has landscaping). *Supported by staff.*
5. Lack of landscape screening around transformers (which are located within paved areas). *Supported by staff.*

**GENERAL LAYOUT NOTE:** Please convert as much as possible of the paved area west of the dumpsters that is not used for parking, loading or vehicle maneuvering to greenspace.

Item	Required	Proposed	Meets Code	Comments
<b>Landscape Plan Requirements (LDM (2))</b>				
<b>Landscape Plan</b> (Zoning Sec 5.5.2, LDM 2.e.)	<ul style="list-style-type: none"> <li>▪ New commercial or residential developments</li> <li>▪ Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less.</li> <li>▪ 1"=20' minimum with proper North. Variations from this scale can be approved by LA</li> <li>▪ Consistent with plans throughout set</li> </ul>	<ul style="list-style-type: none"> <li>▪ Overall Scale 1"=40'</li> <li>▪ Foundation plantings Scale 1"=20'</li> </ul>	Yes	
<b>Project Information</b> (LDM 2.d.)	Name and Address	Yes	Yes	
<b>Owner/Developer Contact Information</b> (LDM 2.a.)	Name, address and telephone number of the owner and developer or association	Yes	Yes	
<b>Landscape Architect contact information</b> (LDM 2.b.)	Name, Address and telephone number of RLA	Yes	Yes	
<b>Sealed by LA.</b> (LDM 2.g.)	Requires original signature	Yes	Yes	<u>Original signature will be needed on printed stamping sets.</u>

Item	Required	Proposed	Meets Code	Comments
<b>Miss Dig Note</b> (800) 482-7171 (LDM.3.a.(8))	Show on all plan sheets	Yes	Yes	
<b>Zoning</b> (LDM 2.f.)	Include all adjacent zoning	Sheet L-1.0 <u>Parcel:</u> OST <u>North, South, East &amp; West:</u> OST	Yes	
<b>Survey information</b> (LDM 2.c.)	<ul style="list-style-type: none"> <li>Legal description or boundary line survey</li> <li>Existing topography</li> </ul>	Sheet C-1.0	Yes	
<b>Existing plant material</b> <b>Existing woodlands or wetlands</b> (LDM 2.e.(2))	<ul style="list-style-type: none"> <li>Show location type and size. Label to be saved or removed.</li> <li>Plan shall state if none exists.</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>A note on the Sheet L-1.0 indicates there are no trees or regulated woodlands on the site.</li> </ul>	Yes	As the site had been cleared as part of the overall site development, no replacements will be required for this project.
<b>Soil types</b> (LDM.2.r.)	<ul style="list-style-type: none"> <li>As determined by Soils survey of Oakland county</li> <li>Show types, boundaries</li> </ul>	No	No	<b>Please include in plan set and refer to location on Landscape Sheet L-1.0 if not included on that sheet.</b>
<b>Existing and proposed improvements</b> (LDM 2.e.(4))	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	Yes	Yes	<b>Please dimension widths of parking lot islands at backs of curbs.</b>
<b>Existing and proposed utilities</b> (LDM 2.e.(4))	Overhead and underground utilities, including hydrants	<ul style="list-style-type: none"> <li>Yes</li> <li>ITC Utility lines limit what can be planted within the corridor.</li> </ul>	Yes	
<b>Proposed grading. 2' contour minimum</b> (LDM 2.e.(1))	Provide proposed contours at 2' interval	Yes	No	No berms along greenbelt are proposed, but as the site is entirely within an industrial subdivision, they are not required as long as hedges to block parking lots are provided.
<b>Snow deposit</b> (LDM.2.q.)	Show snow deposit areas on plan	No	No	<b>Please indicate snow deposit areas that won't harm landscaping.</b>
<b>LANDSCAPING REQUIREMENTS</b>				
<b>Parking Area Landscape Requirements LDM 1.c. &amp; Calculations (LDM 2.o.)</b>				
<b>General requirements</b> (LDM 1.c)	<ul style="list-style-type: none"> <li>Clear sight distance within parking islands</li> <li>No evergreen trees</li> </ul>	Yes No trees or shrubs are planted within	Yes	

Item	Required	Proposed	Meets Code	Comments
		the clear zones.		
<b>Name, type and number of ground cover</b> (LDM 1.c.(5))	As proposed on planting islands	Sod is indicated on islands and perimeter of parking.	Yes	
<b>General</b> (Zoning Sec 5.5.3.C.ii)				
<b>Parking lot Islands</b> (a, b. i)	<ul style="list-style-type: none"> <li>▪ A minimum of 200 SF to qualify</li> <li>▪ A minimum of 200sf unpaved area per tree planted in an island</li> <li>▪ 6" curbs</li> <li>▪ Islands minimum width 10' BOC to BOC</li> </ul>	Inset on Sheet L-1.1 show island areas.	TBD	<ol style="list-style-type: none"> <li>1. <b>Please dimension widths of islands.</b></li> <li>2. <b>Please add trees in all interior and endcap islands, except within the ITC corridor.</b></li> <li>3. <b>A landscape waiver will be required to not provide interior deciduous canopy trees within the ITC Corridor. This waiver will be supported by staff.</b></li> <li>4. <b>Please increase area of islands as necessary.</b></li> </ol>
<b>Curbs and Parking stall reduction</b> (c)	Parking stall can be reduced to 17' and the curb to 4" adjacent to a sidewalk of minimum 7 ft.	Yes	Yes	
<b>Contiguous space limit</b> (i)	Maximum of 15 contiguous spaces	15 is maximum bay length	Yes	<ol style="list-style-type: none"> <li>1. Endcap islands and islands used to break up bays must be landscaped with a deciduous canopy tree.</li> <li>2. <b>Please add trees as necessary and enlarge island planting area if necessary to accommodate them.</b></li> <li>3. <b>The island in the northern bay without a tree, the 2 islands immediately south of the building that do not have the sanitary easement (that are used to break up bays into less than 15</b></li> </ol>

Item	Required	Proposed	Meets Code	Comments
				<b>spaces), the island in the bay west of the entry and all endcap islands outside of the ITC corridor need to have deciduous canopy trees planted in them, and have at least 200sf of contiguous greenspace for that tree. Please add those trees.</b>
<b>Plantings around Fire Hydrant (d)</b>	No plantings with matured height greater than 12' within 10 ft. of fire hydrants	No	Yes	<ol style="list-style-type: none"> <li>1. No new or existing plantings are shown closer than 10 feet from hydrants or utility structures.</li> <li>2. The tree in the island at the east end of the building with the hydrant needs to be at least 3' behind the curb, 4' away from the sidewalk and 10' away from the hydrant. <b>Please widen the island if necessary to achieve that spacing.</b></li> </ol>
<b>Landscaped area (g)</b>	Areas not dedicated to parking use or driveways exceeding 100 sq. ft. shall be landscaped	Yes	Yes	
<b>Clear Zones (LDM 2.3.(5))</b>	25 ft corner clearance required. Refer to Zoning Section 5.5.9	Provided	Yes	
<b>Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, NCC, EXPO, FS, TC, TC-1, RC, Special Land Use or non-residential use in any R district (Zoning Sec 5.5.3.C.iii)</b>				
A = Total square footage of vehicular use areas up to 50,000sf x 7.5%	<ul style="list-style-type: none"> <li>• <math>A = x \text{ sf} * 7.5\% = A \text{ sf}</math></li> <li>• <math>50,000 * 7.5\% = 3750 \text{ sf}</math></li> </ul>			
B = Total square footage of additional paved vehicular use areas (not including A or B) over 50,000 SF) x 1 %	<ul style="list-style-type: none"> <li>• <math>B = x \text{ sf} * 1\% = B \text{ sf}</math></li> <li>• <math>(110559 - 50000) * 1\% = 606 \text{ sf}</math></li> </ul>			
<b>Category 2: For: I-1 and I-2 (Zoning Sec 5.5.3.C.iii)</b>				

Item	Required	Proposed	Meets Code	Comments
A. = Total square footage of vehicular use area up to 50,000 sf x 5%	$A = x \text{ sf} * 5\% = A \text{ sf}$	NA		
B = Total square footage of additional paved vehicular use areas over 50,000 SF x 0.5%	$B = 0.5\% \times 0 \text{ sf} = B \text{ SF}$	NA		
<b>All Categories</b>				
C = A+B Total square footage of landscaped islands	$3750 + 606 = 4356 \text{ SF}$	15,972 sf	Yes	
D = C/200 Number of canopy trees required	$4356/200 = 22 \text{ Trees}$	22 trees	Yes	<ol style="list-style-type: none"> <li><b>Please add deciduous canopy trees to all interior islands used to break up bays of more than 15 spaces, and endcaps where they aren't currently proposed.</b></li> <li><b>A landscape waiver can be requested for the endcaps and interior islands within the ITC corridor that can't have trees.</b>  <i>That waiver request would be supported by staff, but other landscaping that meets the ITC requirements should be planted there to improve the islands' appearance, as was done in Daifuku and Magna Seating.</i> </li> </ol>
<b>Perimeter Green space</b>	<ul style="list-style-type: none"> <li>1 Canopy tree per 35 lf</li> <li><math>(1829-60)/51 \text{ trees}</math></li> </ul>	51 provided	Yes	<ol style="list-style-type: none"> <li>A landscape waiver can be requested for the perimeter trees that can't be planted within the ITC corridor (<math>260\text{lf}/35 = 7 \text{ trees}</math>). <i>It would be supported by staff.</i></li> <li><b>Please add perimeter trees around the northeast bend.</b> The</li> </ol>

Item	Required	Proposed	Meets Code	Comments
				trees can be planted within 15 feet of the back of curb to qualify, even if they are beyond the wall.
<b>Accessway perimeter</b>	<ul style="list-style-type: none"> <li>▪ 1 canopy tree per 35 lf on each side of road, less widths of access drives (less area in clear vision zone).</li> <li>▪ 140/35= 4 trees on each side.</li> </ul>	7 canopy trees + 2 subcanopy trees	No	<b>1. Please provide the calculation for the access drive leading to the property to the east.</b> <b>2. Please provide required trees.</b>
<b>Parking land banked</b>	▪ NA	None		
<b>Berms, Walls and ROW Planting Requirements</b>				
<b>Berms</b>				
<ul style="list-style-type: none"> <li>▪ All berms shall have a maximum slope of 33%. Gradual slopes are encouraged. Show 1ft. contours</li> <li>▪ Berm should be located on lot line except in conflict with utilities.</li> <li>▪ Berms should be constructed of loam with 6" top layer of top soil.</li> </ul>				
<b>Residential Adjacent to Non-residential (Sec 5.5.3.A) &amp; (LDM 1.a)</b>				
<b>Berm requirements (Zoning Sec 5.5.A)</b>	No berm is required as property is not adjacent to residential.	None	Yes	
<b>Planting requirements (LDM 1.a.)</b>	LDM Novi Street Tree List	NA		
<b>Adjacent to Public Rights-of-Way (Sec 5.5.B) and (LDM 1.b)</b>				
<b>Berm requirements (Zoning Sec 5.5.3.A.(5))</b>	<ul style="list-style-type: none"> <li>▪ Project is not adjacent to a public right-of-way so no berm is required</li> <li>▪ See Industrial Subdivision requirements for frontage landscaping</li> </ul>	<ul style="list-style-type: none"> <li>▪ 3 foot tall berm is provided along most of frontage of MacKenzie Drive</li> <li>▪ No berm is provided along Future Cabot Drive frontage due to site topography.</li> </ul>	Yes	<b>Please show anticipated centerline grades for future Cabot Drive.</b>
<b>Cross-Section of Berms (LDM 2.j)</b>				
Slope, height and width	<ul style="list-style-type: none"> <li>▪ Label contour lines</li> <li>▪ Maximum 33%</li> <li>▪ Min. 3 feet flat horizontal area</li> <li>▪ Minimum 3 feet high</li> <li>▪ Constructed of loam with 6' top layer of topsoil.</li> </ul>	No		<b>Please add notes to the detail showing its construction of loam with 6" top layer of topsoil.</b>
Type of Ground Cover		NA		
Setbacks from Utilities	Overhead utility lines	NA		<b>Please clearly indicate</b>

Item	Required	Proposed	Meets Code	Comments
	and 15 ft. setback from edge of utility or 20 ft. setback from closest pole			any overhead lines.
<b>Walls (LDM 2.k &amp; Zoning Sec 5.5.3.vi)</b>				
<b>Material, height and type of construction footing</b>	Freestanding walls should have brick or stone exterior with masonry or concrete interior		TBD	<b>Please indicate wall elevations and provide construction details.</b>
<b>Walls greater than 3 ½ ft. should be designed and sealed by an Engineer</b>		No details provided		
<b>ROW Landscape Screening Requirements (Sec 5.5.3.B. ii)</b>				
<b>Greenbelt width (2)(3) (5)</b>	Adj. to Parking: 20 ft Not adj to Parking: 25 ft	<ul style="list-style-type: none"> <li>▪ MacKenzie Dr: 22-28 ft</li> <li>▪ Cabot Dr: 42-85 ft</li> </ul>	Mostly	
Min. berm crest width	Greenbelt berms are not required in industrial subdivisions.	<ul style="list-style-type: none"> <li>▪ Mackenzie: 3 ft</li> <li>▪ Cabot: 0 ft</li> </ul>	Yes	
Minimum berm height (9)	NA	<ul style="list-style-type: none"> <li>▪ MacKenzie: 3 ft</li> <li>▪ Cabot: 0 ft</li> </ul>	Yes	
3' wall	(4)(7)	No		
<b>Canopy deciduous or large evergreen trees</b> Notes (1) (10)	Use Industrial Subdivision calculations for both frontages (Landscape Design Manual Sec 2.b.)		TBD	
<b>Sub-canopy deciduous trees</b> Notes (2)(10)	Use Industrial Subdivision calculations for both frontages (Landscape Design Manual Sec 2.b.)		TBD	
<b>Canopy deciduous trees in area between sidewalk and curb</b> (Novi Street Tree List)	Use Industrial Subdivision calculations for both frontages (Landscape Design Manual Sec 2.b.)		TBD	
<b>Non-Residential Zoning Sec 5.5.3.E.iii &amp; LDM 1.d (2)</b>				
Refer to Planting in ROW, building foundation landscape, parking lot landscaping and LDM				
<b>Interior Street to Industrial subdivision</b> (LDM 1.d.(2))	<ul style="list-style-type: none"> <li>▪ 1 canopy deciduous or 1 large evergreen per 35 l.f. linear frontage less access drive width (at least 1 per 50 lf must be planted as street tree within 15 of street curb).</li> <li>▪ 1 sub canopy tree per 40 l.f. of linear frontage</li> </ul>	<u>MacKenzie Drive</u> <ul style="list-style-type: none"> <li>▪ 18 canopy trees</li> <li>▪ 27 subcanopy trees</li> <li>▪ 123 shrubs in hedge along Mackenzie Drive</li> <li>▪ 3 foot tall berm</li> <li>▪ Significant combination of shrubs, grasses,</li> </ul>		<ol style="list-style-type: none"> <li>1. <b>Please use the Industrial Subdivision calculations and provide the required landscaping.</b></li> <li>2. If the parking lot perimeter canopy trees west of the entry are centered between the parking lot and Mackenzie</li> </ol>

Item	Required	Proposed	Meets Code	Comments
	<p>less access drive width</p> <ul style="list-style-type: none"> <li>▪ 2 shrubs per 40 l.f. of linear frontage less access drive width</li> <li>▪ Plant massing for 10% of ROW</li> <li>▪ Evergreen hedge or berm to screen parking lot</li> </ul> <p><b>Mackenzie Drive:</b> 767lf-30lf= 737lf</p> <ul style="list-style-type: none"> <li>▪ Trees: 21 trees</li> <li>▪ Street Trees: 13 trees</li> <li>▪ Subcanopy trees: 18 trees</li> <li>▪ Shrubs: 37 shrubs</li> <li>▪ Hedge or berm along parking lot frontage</li> <li>▪ Plant massing: 74lf</li> </ul> <p><b>Future Cabot Drive:</b> 536lf--25lf = 511lf</p> <ul style="list-style-type: none"> <li>▪ Total Trees: 15 trees</li> <li>▪ Street trees: 10 trees</li> <li>▪ Subcanopy trees: 13 trees</li> <li>▪ Shrubs: 26 shrubs</li> <li>▪ Hedge or berm along parking lot frontage</li> <li>▪ Plant massing: 51lf</li> </ul>	<p>perennials at intersection of Mackenzie and Cabot</p> <p><u>Cabot Drive</u></p> <ul style="list-style-type: none"> <li>▪ Required landscaping along Cabot Drive is limited by ITC Corridor and sanitary force main.</li> <li>▪ No trees or shrubs are proposed along Cabot drive except at intersection</li> <li>▪ 6 canopy parking lot perimeter trees</li> <li>▪ 0 subcanopy trees</li> <li>▪ 0 shrubs except at intersection</li> <li>▪ No berm due to topography</li> </ul>		<p>Drive, they can be double-counted as street trees and perimeter trees. The parking lot perimeter trees east of the entry can be double-counted in their existing positions (not the access drive perimeter trees).</p> <p><b>3. Please locate the 5 street trees along MacKenzie behind the sidewalk where they will have a better chance of survival.</b></p> <p><b>4. When Cabot Drive is built, the required street should be installed where possible (there should be at least 3 street trees outside of the utility corridor and easements).</b></p> <p>5. A landscape waiver may be requested for the frontages within the ITC corridor (105lf/2 trees for MacKenzie Drive and 182lf/4 street trees for the future Cabot Drive) and within the sanitary force main easement (200lf/4 street trees). <i>This would be supported by staff.</i></p> <p>6. Deciduous canopy greenbelt trees within 15 feet of parking can be double-counted as parking lot perimeter.</p> <p><b>7. Please add a continuous 3' tall evergreen hedge along the entire</b></p>



Item	Required	Proposed	Meets Code	Comments
				<p><b>parking lot edge facing the future Cabot Drive.</b></p> <p>8. <b>Please propose alternative landscaping along the road within the ITC easement to improve the appearance of the road in that area.</b></p> <p>9. While any landscaping along the Cabot Drive extension won't be planted at this time, except at the corner of Cabot and MacKenzie, all required plants should be included on the plan for this project, and the future Cabot Road extension shall include those plantings.</p>
<p><b>Screening of outdoor storage, loading/unloading</b>                      (Zoning Sec. 3.14, 3.15, 4.55, 4.56, 5.5)</p>		<ul style="list-style-type: none"> <li>• Loading zones are within the "courtyard" of the building</li> <li>• They are completely screened from Cabot and MacKenzie by the building.</li> <li>• They are mostly screened from view from the north by the central island.</li> </ul>	<p>Yes</p>	
<p><b>Transformers/Utility boxes</b>                      (LDM 1.e from 1 through 5)</p>	<ul style="list-style-type: none"> <li>▪ A minimum of 2ft. separation between box and the plants</li> <li>▪ Ground cover below 4" is allowed up to pad.</li> <li>▪ No plant materials within 8 ft. from the doors</li> </ul>	<p>Transformers are located within paved area, protected by bollards.</p>	<p>No</p>	<ul style="list-style-type: none"> <li>▪ The current locations of the transformers within the paved area, without screening, require a landscape waiver. <i>This is supported by staff as they are mostly screened from</i></li> </ul>

Item	Required	Proposed	Meets Code	Comments
				<p>view by the landscaped berm.</p> <ul style="list-style-type: none"> <li>▪ If the transformers are moved or added to other locations, screening shrubs per standard detail are required.</li> <li>▪ Please add detail to plans if transformers are located in greenspace.</li> </ul>
<b>Building Foundation Landscape Requirements (Sec 5.5.3.D)</b>				
<b>Interior site landscaping SF</b>	<ul style="list-style-type: none"> <li>▪ Equals to entire perimeter of the building x 8 with a minimum width of 4 ft.</li> <li>▪ Minimum of 75% coverage</li> <li>▪ A: <math>1707 \text{ lf} \times 75\% \times 8\text{ft} = 10,242 \text{ SF}</math></li> </ul>	A: 10,255 sf	Yes/No	<ol style="list-style-type: none"> <li>1. A landscape waiver is required as less than 75% of the building foundation is landscaped due to the large loading area. <i>This waiver request would be supported by staff as much of the loading area is screened by the large central landscape area, and the required area is provided at the building.</i></li> <li>2. <b>Please extend the berm in the island near the loading area to the west to screen more of the loading areas.</b></li> </ol>
<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	Well over 60% of the building frontages facing MacKenzie and Cabot will be landscaped.	Yes	
<b>Detention/Retention Basin Requirements (Sec. 5.5.3.E.iv)</b>				
<b>Planting requirements (Sec. 5.5.3.E.iv)</b>	<ul style="list-style-type: none"> <li>▪ Clusters of large native shrubs shall cover 70-75% of the basin rim area</li> <li>▪ 10" to 14" tall grass along sides of basin</li> <li>▪ Refer to wetland for basin mix</li> </ul>	The site's storm water will be treated by an existing detention pond so no detention pond landscaping is proposed.	Yes	If any changes to the pond are required, the modified portions of the pond shall be landscaped per the ordinance.
<b>Phragmites Control</b>	▪ Any and all	None indicated	TBD	<b>1. Please survey the</b>

Item	Required	Proposed	Meets Code	Comments
(Sec 5.5.6.C)	<p>populations of <i>Phragmites australis</i> on site shall be included on tree survey.</p> <ul style="list-style-type: none"> <li>Treat populations per MDEQ guidelines and requirements to eradicate the weed from the site.</li> </ul>			<p>pond for any populations of <i>Phragmites australis</i> and submit plans for its removal.</p> <p>2. If none is found, please indicate that on the survey.</p>
<b>LANDSCAPING NOTES, DETAILS AND GENERAL REQUIREMENTS</b>				
<b>Landscape Notes – Utilize City of Novi Standard Notes</b>				
<b>Installation date</b> (LDM 2.l. & Zoning Sec 5.5.5.B)	Provide intended date	Between Mar 15 and Nov 15.	Yes	
<b>Maintenance &amp; Statement of intent</b> (LDM 2.m & Zoning Sec 5.5.6)	<ul style="list-style-type: none"> <li>Include statement of intent to install and guarantee all materials for 2 years.</li> <li>Include a minimum one cultivation in June, July and August for the 2-year warranty period.</li> </ul>	Yes	Yes	<b>Please add the cultivation note.</b>
<b>Plant source</b> (LDM 2.n & LDM 3.a.(2))	Shall be northern nursery grown, No.1 grade.	Yes	Yes	
<b>Irrigation plan</b> (LDM 2.s.)	A fully automatic irrigation system or a method of providing sufficient water for plant establishment and survival is required on Final Site Plans.	No	No	<p>1. <b>Please add an irrigation plan or information as to how plants will be watered sufficiently for establishment and long- term survival.</b></p> <p>2. <b>If xeriscaping is used, please provide information about plantings included.</b></p>
<b>Other information</b> (LDM 2.u)	Required by Planning Commission	NA		
<b>Establishment period</b> (Zoning Sec 5.5.6.B)	<b>2 yr. Guarantee</b>	Yes	Yes	
<b>Approval of substitutions.</b> (Zoning Sec 5.5.5.E)	City must approve any substitutions in writing prior to installation.	Yes	Yes	
<b>Plant List (LDM 2.h., LDM 4) – Include all cost estimates</b>				
Quantities and sizes	Refer to LDM suggested plant list	Yes	Yes	
Root type		Yes	Yes	
Botanical and common names		Yes	Yes	1. 23 of 34 species used (68%) are native to

Item	Required	Proposed	Meets Code	Comments
				Michigan. 2. The tree diversity meets the standards of Landscape Design Manual Section 4.
Type and amount of lawn		Yes	Yes	1. <b>Please add site prep and maintenance notes for the areas to be seeded with the slope stabilization mix.</b> 2. Good instructions can be found on the websites of Michigan Wildflower Farm, Native Connections or Cardno.
Cost estimate (LDM 2.f)	For all new plantings, mulch and sod as listed on the plan	Yes	Yes	
<b>Planting Details/Info (LDM 2.i) – Utilize City of Novi Standard Details</b>				
Canopy Deciduous Tree	Refer to LDM for detail drawings	Yes	Yes	
Evergreen Tree		Yes	Yes	
Multi-stem Tree		Yes	Yes	
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)	NA – no trees exist on the site		
<b>Other Plant Material Requirements (LDM 3)</b>				
<b>General Conditions</b> (LDM 3.a)	Plant materials shall not be planted within 4 ft. of property line	Note is provided on Sheet L-1.0	Yes	
<b>Plant Materials &amp; Existing Plant Material</b> (LDM 3.b)	Clearly show trees to be removed and trees to be saved.	NA – no trees exist on the site		
<b>Landscape tree credit</b> (LDM3.b.(d))	<ul style="list-style-type: none"> <li>Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA.</li> <li>Refer to Landscape</li> </ul>	None		

Item	Required	Proposed	Meets Code	Comments
	tree Credit Chart in LDM			
<b>Plant Sizes for ROW, Woodland replacement and others</b> (LDM 3.c)	2.5" canopy trees 6' evergreen trees			
<b>Plant size credit</b> (LDM3.c.(2))	NA	None taken		
<b>Prohibited Plants</b> (LDM 3.d)	No plants on City Invasive Species List	None are proposed.	Yes	
<b>Recommended trees for planting under overhead utilities</b> (LDM 3.e)	Label the distance from the overhead utilities	The only overhead lines are the ITC lines. They are shown.	Yes	
<b>Collected or Transplanted trees</b> (LDM 3.f)		No		
<b>Nonliving Durable Material: Mulch</b> (LDM 4)	<ul style="list-style-type: none"> <li>▪ Trees shall be mulched to 3" depth and shrubs, groundcovers to 2" depth</li> <li>▪ Specify natural color, finely shredded hardwood bark mulch. Include in cost estimate.</li> <li>▪ Refer to section for additional information</li> </ul>	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.

## TRAFFIC REVIEW



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

**Project name:**  
 JSP19-05 Adams North Technology Centre  
 Preliminary and Final Site Plan Traffic Review

**From:**  
 AECOM

**Date:**  
 February 20, 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:** JSP19-05 Adams North Technology Centre Preliminary and Final Site Plan Traffic Review

The preliminary and final site plan was reviewed to the level of detail provided and AECOM **recommends preliminary site plan approval and final site plan denial** 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, HCP Land, LLC, is proposing a 56,429 SF mixed use building, including office space and lab space, located on the north side of Mackenzie Road, west of Haggerty Road.
2. Mackenzie Road is under the jurisdiction of the City of Novi.
3. The parcel is currently zoned OST, Office Service Technology.
4. Summary of traffic-related waivers/variances:
  - a. There are not any traffic-related waivers or variances required by the applicant at this time.

## TRAFFIC IMPACTS

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

ITE Code: 760 (Research and Development Center)  
 Development-specific Quantity: 56.43 thousand square feet  
 Zoning Change: None

Trip Generation Summary				
	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
<b>AM Peak-Hour Trips</b>	24	18	100	No
<b>PM Peak-Hour Trips</b>	43	37	100	No

<b>Daily (One-Directional) Trips</b>	782	N/A	750	YES
--------------------------------------	-----	-----	-----	-----

2. The number of trips exceeds the City's threshold of more than 750 trips per day. AECOM recommends performing a traffic impact study in accordance with the City's requirements. If an updated trip generation study is provided by the applicant for justification, AECOM would be in support of the waiver of an additional traffic study being done for the project.

Trip Impact Study Recommendation	
Type of Study:	Justification
TIS	Exceeds daily trips threshold

## 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 is proposing two driveways to access the site, a shared access drive with the adjacent parcel and one new driveway on Mackenzie Drive.
  - a. The applicant should indicate that the owner of the adjacent parcel is granting access.
  - b. The proposed driveway width and radii are in compliance with Figure IX.1 of the City's Code of Ordinances.
    - i. The radius of 30', while within the range allowed, is larger than the standard of 20'. The applicant could consider reducing the radius to match the standard.
  - c. Sight distances and driveway spacing should be provided to ensure compliance with Figure XIII-E and Section 11-216.d.1.d of the City's standards.
2. The applicant is proposing a 6' sidewalk along the property that connects to the existing sidewalk at the property to the east of the site.

## INTERNAL SITE OPERATIONS

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

1. General Traffic Flow
  - a. The applicant is proposing two loading zones that total 900 SF and fulfill the requirement of 360 SF per building as set forth in the Zoning Ordinance.
  - b. The applicant is proposing two trash receptacles in the rear of the building.
    - i. Truck turning movement patterns should be provided to show that the trash receptacle locations do not interfere with the use of the adjacent parking spaces.
2. Parking Facilities
  - a. The applicant is proposing 234 parking spaces and should refer to the planning review letter for parking quantity requirements.
  - b. The applicant has indicated eight (8) barrier free parking spaces, four (4) of which are van accessible, which meets the requirement of seven (7) with two (2) being van accessible.
  - c. The applicant has indicated 17.5' parking spaces with 2' overhang and 4" curbs. The parking space length should be adjusted to match the 17' standard for 4" curbs per Section 5.3.2 of the City's Zoning Ordinance.
  - d. The applicant has no more than 15 parking spaces in a bay without an island.
    - i. The end islands are required to have an outside radius of 15' and an inside radius of 2' as well as a minimum width of 10'. The applicant should provide dimensions where necessary and ensure that the islands meet the requirements.



- ii. Note that all end islands adjacent to a travel way shall be constructed three (3) feet shorter than the adjacent parking space. This should be indicated on the plans as it appears that the end island lengths are not in compliance with Section 5.3.12 of the City's Zoning Ordinance.
- e. The proposed aisle widths are in compliance with City standards.
- f. The applicant has provided 12 bicycle parking spaces. A layout of the proposed spaces as well as dimensions have been included that are in compliance with City standards. The applicant should provide the height of the bicycle rack on the detail shown on sheet L-1.2 to ensure it meets the 36" minimum height requirement.
  - i. Per Section 5.16.5.B of the City's Zoning Ordinance, all bicycle parking facilities shall be accessible from adjacent street and pathway via a paved route that as a minimum width of six (6) feet. The proposed sidewalk from of the bicycle parking is 5' in width and should be widened to 6' to ensure compliance.
  - ii. Section 5.16.1.E of the City's Zoning Ordinance requires that the bicycle parking be no more than 120 feet from the entrance being served or the parking space nearest that entrance. The applicant should ensure that the bicycle parking location meets this requirement.
  - iii. Section 5.16.1.F of the City's Zoning Ordinance suggests providing bicycle parking at multiple entrances when more than four (4) parking spaces are required. The applicant could consider providing 4 spaces at each entrance to the facility.
- 3. Sidewalk Requirements
  - a. The applicant has indicated 7' sidewalks where the sidewalk is adjacent to parking spaces with a 4" curb, as is required.

## 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).
  - a. The applicant has provided a signing quantities table.
  - b. The R1-1 stop sign size should be increased from 24" to 30".
- 2. The applicant should indicate any proposed signing on site and provide 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. Traffic control signs shall use the FHWA Standard Alphabet series.
  - c. Traffic control signs shall have High Intensity Prismatic (HIP) sheeting to meet FHWA retroreflectivity requirements.
- 3. The applicant has included the applicable pavement marking notes and details.

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

Memo

A handwritten signature in cursive script that reads "Patricia A. Thompson".

Patricia Thompson, EIT  
Traffic Engineer

## FAÇADE REVIEW



February 7, 2019

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

**Façade Review Status; Approved,  
 Section 9 Waiver Recommended**

**Re: FACADE ORDINANCE – Preliminary & Final Site Plan**  
**Adams North Technology Centre, JSP19-05**  
 Façade Region: 1, Zoning District: OST

Dear Ms. McBeth;

The following is the Façade Review for Final Site Plan Approval of the above referenced project based on the drawings prepared by Faudie Architecture, dated 1/18/19. The percentages of materials proposed for each façade are as shown on the table below. The maximum percentages allowed by the Schedule Regulating Façade Materials (AKA Façade Chart) of Ordinance Section 5.15 are shown in the right hand column. Materials in non-compliance with the Façade Chart, if any, are highlighted in bold. A sample board as required by Section 5.15.4.D of the Ordinance was not provided at the time of this review.

	South (Front)	North	West	East	Ordinance Maximum (Minimum)
Brick	46%	95%	<b>24%</b>	87%	100% (30% Min.)
Flat Metal Panel (Types 7, 8, 9 & 21, single color)	40%	5%	27%	13%	50%
Flat Metal Panel (Types 11, Roof Screens)	7%	0%	6%	0%	50%
Combined Flat Metal Panels	<b>47%</b>	5%	33%	13%	50%
Vertical Metal Panel (Type 10, multi color)	2%	0%	38%	0%	25% (Sim. to Standing Seam)
Spanderal Glass	5%	0%	5%	0%	50%

As shown above the minimum percentage of Brick is not provided on the west façade and the combined percentage of various types of Flat Metal exceeds the maximum amount allowed by the Ordinance Panels on the south facade. A Section 9 Waiver would be required for these deviations. The renderings provided by the applicant indicate a well designed building with interesting massing and harmonious colors. The main entrance is defined by a 2-story lobby with canopy and multi-colored vertical element.

Multiple types and colors of metal panels are used on the south and west facades. The architect has indicated that these materials are representative of the product manufactured by the building's occupant. We believe that said materials have been creatively integrated into the facades and enhance the overall design of the building.

**Recommendation** – For the reasons stated above, it is our recommendation that the overall design is consistent with the intent and purpose of the Façade Ordinance and that a Section 9 Waiver be granted for the underage of Brick on the west façade and the overage of Flat Metal Panels on the south façade. The detail provided for the dumpster enclosure indicates brick veneer. The notations should be revised to clarify that the brick veneer will match the primary building.

**Notes to the Applicant:**

1. Façade Ordinance requires inspection(s) for all projects. Materials displayed on the approved sample board will be compared to materials delivered to the site. It is the applicant's responsibility to request the inspection of each façade material at the appropriate time. 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>.

If you have any questions regarding this project please do not hesitate to call.

Sincerely,  
DRN & Associates, Architects PC



Douglas R. Necci, AIA



Proposed Exterior Rendering for:

**Adams North Technology Center**



**FAUDIE ARCHITECTURE**

Design to Inspire

## FIRE REVIEW



January 24, 2019

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

**CITY COUNCIL**

**Mayor**  
Bob Gatt

**Mayor Pro Tem**  
Dave Staudt

Andrew Mutch

Laura Marie Casey

Gwen Markham

Kelly Breen

Ramesh Verma

**City Manager**  
Peter E. Auger

**Director of Public Safety  
Chief of Police**  
David E. Molloy

**Director of EMS/Fire Operations**  
Jeffery R. Johnson

**Assistant Chief of Police**  
Erick W. Zinser

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

RE: Adams North Technology Centre

PSP# 19-0014

**Project Description:**

**Build a 56,429 S.Q.F.T. structure on the north east corner of Cabot Dr and Mackenzie Dr.**

**Comments:**

- **All** fire hydrants **MUST** in installed and operational prior to any building construction begins.
- 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))**
- For interior fire protection systems a separate fire protection line shall be provided in addition to a domestic service for each building. Individual shutoff valves for interior fire protection shall be by post indicator valve (P.I.V.) or by valve in well and shall be provided within a public water main easement. **(D.C.S. Sec.11-68(a)(9))**
- On the east side of the structure, hydrants shall be spaced approximately three hundred (300) feet apart on line in commercial, industrial, and multiple-residential areas. In cases where the buildings within developments are fully fire suppressed, hydrants shall be no more than five hundred (500) feet apart. **(D.C.S. Sec. 11-68 (f)(1)c) (MUST BE APPROVED BY THE FIRE CHIEF TO INCREASE TO 500')**
- 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.

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

cityofnovi.org



**Recommendation:**  
**NOT APPROVED**

Sincerely,

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

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

cc: file

**APPLICANT RESPONSE LETTERS**



February 22, 2019  
PEA Project No: 2014-016  
City of Novi Project No: JSP19-05

Hannah Smith, Planning Assistant  
City of Novi  
45175 West 10 Mile Road  
Novi, MI, 48375

## **RE: Adams North Technology Centre – Review I**

Dear Ms. Smith:

In response to the review letters received from various City departments dated February 20, 2019, we offer the following responses. Due to the short time frame given to provide written responses to the review comments, we have only provided written responses to those comments that require change or clarification.

### Planning Review (dated February 20, 2109)

#### Plan Review Center Report:

1. Property Combination/Split: The proposed parcel is to be split from the parent parcel for purposes of creating an individual parcel of land associated with the Adams North Technology Centre that meets all required setbacks and City requirements. The parcels north of 13 Mile Road are not part of a condominium and do not have a Master Deed.
2. Future Road Development: The location of the Cabot Drive extension or whether there will be an extension has yet to be finalized. The applicant will work with the City to assure plantings and sidewalk are provided should the road be extended in the future.
3. An Economic Impact Statement has been provided by Northern Equities Group under separate cover.
4. End Islands: **A waiver will be requested** for the end island radii and a turning template will be provided when the plans are resubmitted.
5. The applicant would prefer to leave the bicycle parking spaces at the rear of the building. It is their experience that tenants prefer the bicycle spaces in the rear, as bicycle parking spaces are underutilized and tenants prefer the bike racks to be located away from their main public entrances.
6. Photometric Plans – Refer to the photometric plan responses provided under separate cover by Faudie Architecture.
7. Additional Comments: Comment noted.
8. Other Reviews:
  - a. Landscape Review: Please refer to landscape plan responses provided.
  - b. Traffic Review: Please refer to the responses to the Traffic Review.
  - c. Engineering Review: Please refer to the responses to the Engineering Review
  - d. Façade Review: Please refer to the responses to the Façade Review
  - e. Fire Review: Please refer to the responses to the Fire Review.

#### Planning Review Chart (dated February 7, 2019):

- Parking Setback, Side (East): The parking is located 49.31' from the east property line. A dimension will be added to the revised plans.
- Outdoor Storage: A note shall be added regarding the no outdoor storage.

- End Islands: **A waiver will be requested for the parking lot island in the southwest portion** of the site as the 8' radii provided together with the ample pavement adjacent to that radii provides sufficient maneuvering space for a personal vehicle to travel. The end islands on the north side of the building adjacent to the loading areas that have a 10' radii, will be modified to provide a 15' radii.
- Parking Space Dimensions: PEA plans are dimensioned to back of curb. Parking spaces adjacent to a concrete curb and gutter are shown to be 17.5' long to back of curb in order to provide a minimum 17' clear distance (to face of curb). Similarly, the end spaces are shown to be 9.5' wide to provide a minimum 9' clear distance. If you'd prefer that the spaces are shown 17' to back of curb, or show only an 18" vehicle overhang, the plans can be adjusted.
- Bicycle Parking General Requirements: The applicant would prefer to keep the bicycle parking spaces at the current location. Refer to responses under the Traffic Review comments for additional items or concerns.
- Bicycle Parking Lot Layout: The note referencing the bicycle parking detail will be updated.
- Dumpster: A truck will be able access the dumpster enclosures without encroaching on the adjacent parking spaces. A truck turning plan will be added to the revised plan set.
- Lighting Plan: Refer to responses under separate cover from Faudie Architecture.
- An Economic Impact Statement has been provided by Northern Equities Group under separate cover.
- Development/Business Sign: The approximate location of a proposed monument sign will be shown on the revised plan set.

#### Engineering Review (dated February 15, 2019):

##### General:

1. A sight distance diagram will be added to the revised plan set.
2. A note will be added to the sign table stating all signs will meet MMUTCD. This note is provided on the sign details.
3. All proposed utility lines and easements are shown on the landscape plan. To our knowledge no trees are proposed within an easement.
4. A foundation detail for light poles will be provided on the revised plans. No light poles are proposed within existing or proposed water main, sanitary sewer or storm sewer utility easements. The existing sanitary sewer easement that currently bisects the site will be vacated prior to construction.
5. City standard details will be provided for stamping sets.

##### Water Main:

6. Section 11-68(f) of the Design and Construction ordinance requires hydrants to be located 7' from a curb in single-family residential areas. It is not clear this requirement applies to this project.
7. After discussion with the Fire Marshal, the proposed domestic service and fire service leads will be separated from the water main loop to the building, each with individual shut-off valves. A revised sheet C-7.0 was emailed to the Fire Marshal to document our intent. These changes will be incorporated into the Stamping Set submittal.
8. All hydrant leads that exceed 25' in length are 8" diameter.
9. Plans and an MDEQ permit application for public water main will be provided once the City approves the water main layout.

##### Sanitary Sewer:

10. The sanitary sewer basis of design will be updated on the revised plan set.
11. Notes will be added stating that sanitary sewer leads will have 5' minimum cover. As shown on the plans the lead has 8.5' of cover.

Storm Sewer:

12. There are no proposed manholes with more than 24” of vertical separation between inverts that do not have sumps/plunge pools.
13. An easement will be provided over the storm sewer if needed. This item will be discussed with the engineering department prior to issuing the revised plan set.

Storm Water Management Plan:

14. The stormwater management system for the Haggerty Corridor Corporate Park was approved and installed per the 2009 plans. In all previous developments within this park the detention calculations have been shown to meet the originally approved design. The existing detention basins located throughout the park were designed and installed prior to the City’s latest storm water ordinance.
15. The site is tributary to an existing detention basin. Calculations on sheet C-10.0 show that the tributary area of this development is well within the storage capacity of existing Detention Basin C.
16. There are no pre-treatment structures for this development. The storm sewer discharges to an existing detention basin with sedimentation forebay.
17. The average runoff coefficient is provided for each separate tributary area of the proposed storm sewer system (sheet C-10.0). These were calculated using 0.95 for roof areas and pavement, and 0.25 for lawn areas as has previously been approved by the City of Novi for projects within this park.
18. The original park design plans and parcel development plans approved prior to the City’s new stormwater ordinance used runoff coefficients of 0.90 for roofs, 0.80 for pavement and 0.20 for lawn areas. As most new developments within this park connect to storm sewer stubs provided by earlier projects, using higher runoff coefficients than the original design was approved for, lead to confusion over the capacity of the existing storm sewer network. A compromise reached with previous City reviews resulted in new developments using 0.95 for pavement and roof areas and 0.25 for lawn areas. It is hoped this can be continued so as to avoid any existing portions of the pipe network appearing to be ‘under-capacity’.

Paving and Grading:

19. Sheets C-3.1 and C-3.2 have notes detailing the types of detectable warning plates that will be specified on this project.
20. All proposed greenbelt areas are proposed with a maximum slope of 1:4, except the landscape berm along Mackenzie Drive which is shown with 1:3 side-slopes.
21. We were unable to find the section of the City’s Design and Construction ordinance that states that private drives have to be sloped at a maximum of 2% for 25’ from the public ROW/intersection. If the reviewer could provide that reference, the potential need for a **waiver** can be assessed. For reference, the drive approach was steepened to between 3% and 5% to reduce the cross-slope of the drive aisle that runs around the perimeter of the building. It was thought that reduced cross-slopes in this drive (where there is likely to be greater concentrations of pedestrian traffic) was more critical than the slope of the drive aisle out to Mackenzie Drive. We could likely reduce the drive slope to Mackenzie Drive should the engineering department require it, but it would be preferred to keep the perimeter drive cross-slope as currently designed.
22. Refer to responses under Traffic Review for a response to end island dimensions.
23. There are adequate proposed elevations provided on the plans in order for the project to be constructed as shown. The height of all curb and gutter, and sidewalk curbs are noted on the dimension plans and grading plans. Providing top of curb elevations in addition to top of pavement and/or gutter elevation and curb heights seems redundant. Based on a conversation with the engineering department, this would be acceptable.

Soil Erosion and Sediment Control:

24. A soil erosion permit application was submitted as part of the original submittal to the City on January 22, 2019. Review comments for soil erosion were received on February 11, 2019 from the City’s soil erosion reviewer. Minor revisions were requested to be made to the plans as part of that review. The plans will be updated as part of the resubmittal for Final Site Plan approval.

#### Other Comments or Notes

Items #25 through #40 have been noted and will be provided as needed throughout final site plan approval, stamping set submittal and pre-construction meetings.

#### Landscaping Review (dated February 4, 2019)

Landscape Waivers: **Waivers will be requested with an explanation of each impact on the revised plan set.**

General Layout Note: The paved area west of the dumpsters is required for the potential truck turning movements to access the adjacent overhead door to the building. The area will be reviewed again to verify that additional landscape area can not be provided.

Existing Soils: Existing soils information will be provided on the revised plan set.

Existing Overhead Utility Lines: All existing overhead utility lines are shown on the plans (within the ITC easement).

#### Parking Lot Landscaping:

1. Comment noted
2. Comment noted
3. **A waiver will be requested for plantings within the ITC corridor.**
4. Short shrub masses will be added to areas where trees cannot be planted.

#### Parking Lot Perimeter Canopy Trees:

1. Comment noted.
2. Trees will be moved to the northeast area of the property if possible. Trees cannot be planted in close proximity to the retaining wall due to potential issues with roots interacting with the wall and the necessary tiebacks on the west side of the wall.
3. Comment noted.
4. **A waiver will be requested for plantings within the ITC corridor.**

#### Loading Zone Screening:

1. Comment noted.
2. The small berm adjacent to the dumpster enclosures will be extended toward the west.
3. Refer to General Layout Note response above.

#### Building Foundation Landscape:

1. Comment noted.
2. **A waiver will be requested for providing less than 75% of the building foundation with foundation plantings.**
3. Comment noted.

#### Planting Notations and Details:

1. Comment noted.
2. Notes and details will be revised as noted in the landscape chart comments
3. Site prep and maintenance notes will be added to the revised plan set.

#### Storm Basin Landscape:

1. Comment noted. No disturbance of the existing basin is anticipated.
2. The presence of phragmites will be investigated.

Irrigation:

1. All areas are proposed to be irrigated.
2. An irrigation plan will be part of the revised plan set.

Snow Deposit: Snow storage areas will be noted on the revised plan set.

Landscape Review Summary Chart:

- Soil Types: Will be provided on revised plan set
- Existing and Proposed Improvements: Island widths can be provided on the revised plan set.
- Snow Deposit: Snow storage areas will be shown on the revised plan set.
- Parking Lot Islands: Landscape island widths will be dimensioned. Landscape islands of insufficient area will be enlarged and trees will be added as required by ordinance. **A waiver will be requested to not plant trees within the ITC easement**
- Contiguous Space Limit: Islands will be widened and trees added as necessary to meet ordinance requirements. Per discussions with Rick Meader, the plans will updated to meet his requirements.
- Plantings around Fire Hydrant: Island will be widened to add tree as required
- Canopy Trees: Trees will be added to interior islands and end cap islands as needed to meet ordinance requirements.
- Perimeter Green Space: Trees will be added where feasible around the northeast portion of the site near the retaining wall. Proposed tree roots cannot interfere with the wall foundations (low side of wall) and trees cannot be planted directly behind the wall due to the tiebacks (high side of wall).
- Accessway Perimeter: Trees will be added as required by ordinance.
- Berm Requirements: The future alignment layout and grading of the Cabot Drive extension has not yet been designed.
- Cross-Section of Berms: A note will be added regarding 6" of topsoil on the revised plan set.
- Setback from Utilities: There are no overhead utilities on this property except the ITC lines on the west side of the site. A note can be added to the plans if needed.
- Walls: As noted on the plans, the retaining wall will be a masonry unit wall similar to the many other retaining walls within the Park. Fully detailed and engineered plans for the wall are to be provided by the contractor (to be approved by the City) prior to construction of the wall.
- Interior Street to Industrial Subdivision:
  - Parking lot perimeter canopy trees west of entry will be centered and double counted as perimeter and parking lot trees, along with the ones to the east of the entry.
  - The five trees along Mackenzie Drive cannot be located to the other side of the sidewalk due to the presence of an existing road/utility easement and a sanitary sewer easement.
  - The extension of Cabot Drive has not been designed, and may not be, as there is no longer the need to extend the roadway to 14 Mile Road. If Cabot Drive is extended in the future, the required construction would require the removal of all trees planted in proximity to the ROW. The applicant would prefer to add any required Cabot Drive ROW plantings once an extension is designed, reviewed and approved for construction.
  - It is not clear that a 3' high hedge along the west side of the parking lot would create any screening as the elevations west of the property line are 7' to 15' above the parking lot grade. While Cabot Drive has not been designed, the future road grades are not likely to be within 4-5 feet of the parking lot elevations.
- Transformers: **A waiver will be requested for transformer screenings as they are located in pavement areas.**
- Building Foundation Landscape Requirements:
  - **A waiver will be requested for foundation plantings as previously mentioned in this response letter.**
  - The small berm adjacent to the dumpster enclosures will be extended toward the west.

- Phragmite Control: The presence of phragmites on site will be investigated.
- Maintenance and Statement of Intent: A cultivation note will be added.
- Irrigation Plan: An irrigation plan will be included in the revised plan set.
- Type and Amount of Lawn: Site prep and maintenance notes will be added to the revised plans.

Traffic Review (dated February 20, 2019):

Traffic Impacts:

1. Comment noted.
2. Comment noted. A recent traffic study was conducted on June 16, 2017 for a related 200,000 s.f. spec building for a nearby site in the Haggerty Corridor Corporate Park (JSP-17-30). We refer to this study as justification for removing the need for a new study. If it is still necessary, a **waiver** is requested for this stipulation.

External Site Access and Operations:

1. Driveway Access to the Site
  - a. An existing cross-access easement is shown on the adjacent parcel (L.45548, P.820) and both parcels are owned by a related entity.
  - b. A 30' radius is provided at the main entrance to facilitate the access of large trucks. As reviewers have asked for truck turning diagrams elsewhere, a truck turning plan will be added as part of the revised plan set.
  - c. Sight distance diagrams will be added to the revised plan set.
2. Comment noted.

Internal Site Operations:

1. General Traffic Flow
  - a. Comment noted
  - b. Truck access to the dumpster enclosures does not affect adjacent parking spaces. A truck turning plan will be provided as part of the revised plan submittal.
2. Parking Facilities
  - a. Comment noted.
  - b. Comment noted.
  - c. PEA dimensions to back of curb as noted on the Dimension Plans. We have provided 17.5' long spaces in order to ensure that a 17' clear distance is provided from the rear of the space to the face of the concrete curb. If the City would prefer the spaces be drawn 17' long to back of curb, or whether the overhang is shown at 1.5' in lieu of 2', the plans can be updated if necessary.
  - d. End Islands:
    - i. Additional dimensions showing island widths can be provided on the revised plan set
    - ii. Islands will be reduced in size to provide the required 3' minimum length reduction
  - e. Comment noted.
  - f. An updated detail on the bike rack can be provided showing it meets the 36" minimum height requirement.
    - i. The sidewalk running perpendicular to the bicycle parking spaces will be widened to 6 feet on the revised plan set.
    - ii. Bicycle parking spaces are within 120 feet of rear building entry doors.
    - iii. The applicant would prefer to leave the bicycle parking spaces at the rear of the building. It is their experience that tenant's prefer the bicycle spaces in the rear, as bicycle parking spaces are underutilized and that tenants prefer the bike racks to be located away from their main public entrances.
3. Comment noted.



**Signing and Striping:**

1. Comment noted
  - a. Comment noted
  - b. The stop signs will be noted as 30" on the revised plan set
2. All proposed traffic signing is shown on the plans
  - a. Notes will be added to the sign details regarding mounting post dimensions
  - b. FHWA standard alphabet series will be noted on the revised plans
  - c. HIP sheeting will be noted on the revised plans
3. Comment noted.

**Facade Review (dated February 7, 2019):**

Refer to responses under separate cover from Faudie Architecture.

**Fire Department Review (dated January 24, 2019):**

1. Comment noted.
2. After discussion with the Fire Marshal, the proposed domestic service and fire service leads will be separated from the water main loop to the building, each with individual shut-off valves. A revised sheet C-7.0 was emailed to the Fire Marshal to document our intent. These changes will be incorporated into the Stamping Set submittal.
3. After discussion with the Fire Marshal, the hydrant spacing will be revised to provide 300' spacing along the main. A revised sheet C-7.0 was emailed to the Fire Marshal to document our intent. These changes will be incorporated into the Stamping Set submittal.
4. Novelis, the first tenant in the building will provide a Hazardous Materials Survey upon completion of the plans for their research centre. This is a move/expansion of the existing facility at 39550 Thirteen Mile Road, Novi, MI, 48377. Attached is the survey for the shell building, which indicates no hazardous materials present.

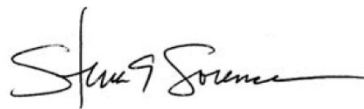
If there are any further questions, please contact this office.

Sincerely,

**PEA, Inc.**



Paul Bater  
Senior Project Engineer



Steven A. Sorensen  
Director of Engineering

**SANITARY SEWER BASIS OF DESIGN:**

THE FOLLOWING DESIGN CALCULATIONS UTILIZE THE UNIT FACTOR METHOD, WHERE 1 RESIDENTIAL EQUIVALENT UNIT (R.E.U.) IS EQUAL TO 3.5 PEOPLE AT 100 GALLONS PER PERSON PER DAY OR 350 GPD. UNIT ASSIGNMENTS USED FROM OAKLAND COUNTY SCHEDULE OF UNIT ASSIGNMENT FACTORS:

OFFICE BUILDING = 0.40 UNITS PER 1000 SQ.FT.  
 TOTAL NUMBER OF R.E.U.s = 56,429/1000 x 0.40 = 22.57 REU  
 AVERAGE DAILY FLOW = 22.57 REU x 350 GPD = 7900 GPD

PEAKING FACTOR =  $(18 + (P)^{0.5}) / (4 + (P)^{0.5}) = 18.281 / 4.281 = 4.27$   
 PEAK FLOW = 4.27 x 7900 GPD x 0.1337 C.F. PER GALLON/86400 SECONDS PER DAY = 0.052 CFS  
 CAPACITY OF 8" PVC PIPE @ 5.00% SLOPE = 1.61 CFS

NOTE: 'P' = POPULATION IN THOUSANDS.

**WATER MAIN BASIS OF DESIGN:**

THE FOLLOWING DESIGN CALCULATIONS UTILIZE THE UNIT FACTOR METHOD, WHERE 1 RESIDENTIAL EQUIVALENT UNIT (R.E.U.) IS EQUAL TO 3.5 PEOPLE AT 150 GALLONS PER PERSON PER DAY OR 525 GPD. UNIT ASSIGNMENTS USED FROM OAKLAND COUNTY SCHEDULE OF UNIT ASSIGNMENT FACTORS:

OFFICE BUILDING = 0.40 UNITS PER 1000 SQ.FT.  
 TOTAL NUMBER OF R.E.U.s = 56,429/1000 x 0.40 = 22.57 R.E.U.  
 AVERAGE DAILY FLOW = 22.57 REU x 525 GPD = 11,849 GPD = 0.01185 MGD

MAXIMUM DAILY FLOW = 2 x AVERAGE DAILY FLOW = 2 x 11,849 GPD = 23,698 GPD = 0.02370 MGD

**SANITARY SEWER QUANTITIES:**

6" PVC SDR 23.5 PIPE 100 LF  
 4" DIA. MONITORING MANHOLE 1 EA.  
 CONNECT TO EX. WYE/LEAD 1 EA.

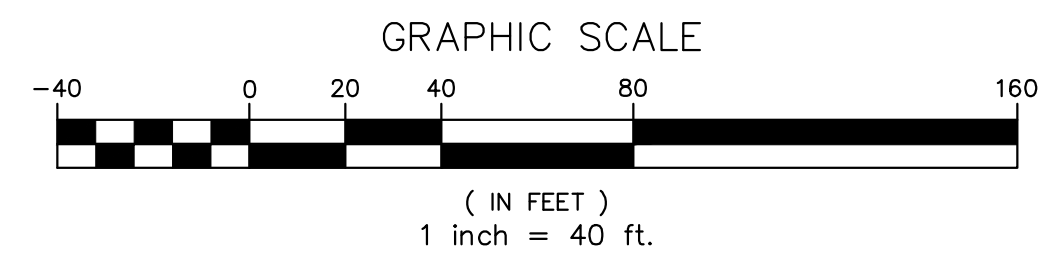
**WATER MAIN QUANTITIES:**

2" COPPER 'K' WATER LEAD 20 LF  
 6" D.I.W.M. CLASS 54 85 LF  
 2031 SF  
 24" D.I.W.M. CLASS 54 50 LF  
 2" VALVE AND BOX 1 EA.  
 8" GATE VALVE AND WELL 5 EA.  
 5" DIA. OIL/GAS SEPARATOR CB 1 EA.  
 8"x8" T.S.V. AND WELL 1 EA.  
 HYDRANT ASSEMBLY 6 EA.

**STORM SEWER QUANTITIES:**

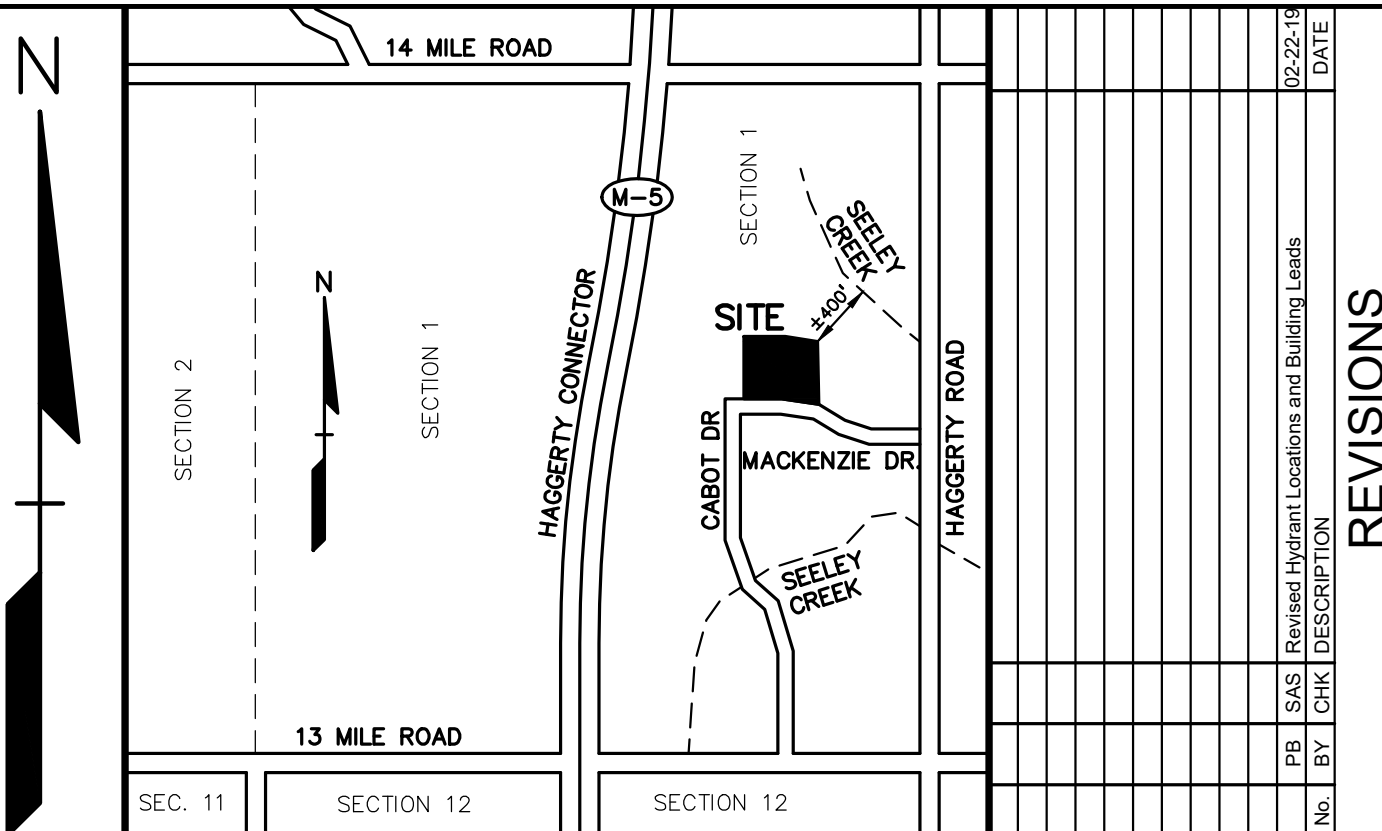
4" HDPE RADIAL UNDERDRAIN 19 EA.  
 4" HDPE UNDERDRAIN BEHIND CURB 1,208 LF  
 6" PVC SDR 26 PIPE 229 LF  
 8" PVC SDR 26 PIPE 89 LF  
 12" RCP CL-IV PIPE 758 LF  
 15" RCP CL-IV PIPE 322 LF  
 18" RCP CL-IV PIPE 633 LF  
 20" DUCTILE IRON CL-54 PIPE 37 LF  
 24" RCP CL-IV PIPE 241 LF  
 CLEANOUT AND BOX 7 EA.  
 4" DIA. CATCH BASIN 17 EA.  
 4" DIA. MANHOLE 3 EA.  
 5" DIA. CATCH BASIN 2 EA.  
 5" DIA. OIL/GAS SEPARATOR CB 2 EA.  
 CONNECT TO EXISTING STUB 2 EA.

**NOTE:**  
 CONTRACTOR TO VERIFY ALL QUANTITIES. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF PROFESSIONAL ENGINEERING ASSOCIATES, INC. FOR VERIFICATION, PRIOR TO BIDDING.



**GENERAL UTILITY NOTES:**

- ALL UTILITY LINES, STRUCTURES AND TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE CITY OF NOVI.
- NO PHYSICAL CONNECTION TO THE EXISTING WATER MAIN CAN BE MADE UNTIL ALL NEW WATER MAIN PASSES PRESSURE AND BACTERIOLOGICAL TESTS TO THE SATISFACTION OF THE CITY.
- ALL WATER MAIN AND FITTINGS (3" DIAMETER AND LARGER) SHALL BE DUCTILE IRON, CLASS 54.
- WATER MAIN SERVICE LEADS SHALL BE TYPE 'K' ANNEALED SEAMLESS COPPER WITH FLARED FITTINGS, UNLESS OTHERWISE NOTED.
- ALL WATER MAIN SHALL BE PROVIDED WITH 6' OF COVER UNLESS OTHERWISE NOTED.
- ALL FIRE HYDRANTS SHALL BE E.I.W. "WATERMASTER" #5BR MODEL #250 PER CITY OF NOVI STANDARDS.
- ALL HYDRANTS TO BE A MINIMUM OF 5' FROM BACK OF CURB, TYP.
- ALL NECESSARY FITTINGS, THRUST BLOCKS, RESTRAINING GLANDS, BLOW OFFS, ETC. FOR WATER MAIN ARE CONSIDERED INCIDENTAL TO THIS PROJECT. THE CONTRACTOR SHALL INSTALL THESE ITEMS AS NECESSARY AND AS REQUIRED BY THE CITY OF NOVI.
- ALL SANITARY SEWER 8" OR LARGER SHALL BE P.V.C. TRUSS PIPE (ASTM D2680) AND FITTINGS, WITH ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
- ALL SANITARY SEWER LEADS SHALL BE POLYVINYL CHLORIDE (PVC) SDR 23.5 PIPE AND FITTINGS. ALL JOINTS TO BE ELASTOMERIC GASKET JOINTS PER ASTM D3212 UNLESS OTHERWISE NOTED.
- SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS EVERY 100 FEET AND AT EVERY BEND AS SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH E.I.W. #1565 BOX OR EQUAL.
- ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE REINFORCED CONCRETE PIPE (RCP C-76) CLASS IV WITH MODIFIED TONGUE AND GROOVE JOINT WITH RUBBER GASKETS.
- ALL STORM SEWER LEADS SHALL BE PVC SDR 26 WITH PUSH-ON JOINTS UNLESS OTHERWISE NOTED.
- PIPE LENGTHS ARE GIVEN FROM CENTER OF STRUCTURE AND TO END OF FLARED END UNLESS NOTED OTHERWISE.
- THE CITY OF NOVI STANDARD DETAIL SHEETS ARE INCORPORATED INTO AND MADE A PART OF THESE PLANS. CONTRACTOR TO REFER TO THE CITY OF NOVI STANDARD DETAIL SHEETS FOR ALL STRUCTURE, PIPE MATERIALS, BEDDING, TESTING, ETC. NOTES AND DETAILS.
- THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS, INVERTS AND GRADES PRIOR TO THE START OF ANY WORK, PER CITY OF NOVI REQUIREMENTS.
- TWO (2) COPIES OF AS-BUILT PLANS SHALL BE SUBMITTED TO THE CITY ENGINEER WITHIN THIRTY (30) DAYS OF THE COMPLETION OF THE UTILITY INSTALLATION AS PER CITY OF NOVI ORDINANCE SECTION 31-7(c).



**LEGEND**

● IRON FOUND	⊗ BRASS PLUG SET	⊙ SEC. CORNER FOUND
⊗ IRON SET	⊙ MONUMENT FOUND	⊙ RECORDED
⊗ NAIL FOUND	⊙ MONUMENT SET	⊙ MEASURED
⊗ NAIL & CAP SET		⊙ CALCULATED

**EXISTING**

- OH-ELEC-W-O: ELEC. PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UG-CATV: UNDERGROUND CABLE TV, CATV FEEDSTAB
- TELEPHONE U.G. CABLE, FEEDSTAB & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MARK, VALVE & GAS LINE MARKER
- WATERMAIN, HYD. GATE VALVE, TAPPING SLAVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER MANHOLE
- CATCH BASIN, INLET, YARD DRAIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MALBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIEN
- CONC.: CONCRETE
- ASPH.: ASPHALT
- GRAVEL: GRAVEL SHOULDER

**PROPOSED**

- 8" SDR 26 PVC SDR 26
- 12" RCP C-76
- 24" RCP C-76
- 6" D.I.W.M. CLASS 54
- 2" COPPER 'K' WATER LEAD
- 4" DIA. MONITORING MANHOLE
- 5" DIA. CATCH BASIN
- 8" GATE VALVE AND WELL
- 5" DIA. OIL/GAS SEPARATOR CB
- 8"x8" T.S.V. AND WELL
- HYDRANT ASSEMBLY
- CONCRETE
- ASPHALT
- GRAVEL SHOULDER

**REFERENCE DRAWINGS**

- WATER MAIN SANITARY SEWER: HAGERSTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- STORM SEWER: HAGERSTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- ELECTRIC: HAGERSTY CORPORATE PARK PHASE II DESIGN PLANS, AR DECKER, SEPT. 10, 2007
- DTE OUTSIDE SALES MAP 238-372, DATED MARCH 12, 2013
- MI&T FACILITIES SKETCH RECEIVED APRIL 24, 2013
- CONSUMERS ENERGY OUTSIDE SALES MAP 01-58-01-4, DATED AUG. 28, 2008
- NO FACILITIES IN THIS AREA
- BRIGHTHOUSE NETWORK SERVICE MAP RECEIVED MARCH 6, 2013
- FLOOD PLAN: ZONE 'X' FEMA FIRM PANEL 26125C0493F, DATED SEPT. 29, 2006
- OTHER: MACKENZIE NORTH PLANS BY AR DECKER AND ASSOCIATES, INC. DATED 12/09/08
- ADAMS TECHNOLOGY CENTER PLANS BY P.E.A. INC. DATED 07/03/13

**CAUTION!**  
 THE LOCATION AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

THIS DRAWING AND DESIGN ARE THE PROPERTY OF PROFESSIONAL ENGINEERING ASSOCIATES, INC. THEY ARE NOT TO BE USED, REPRODUCED OR COPIED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF PROFESSIONAL ENGINEERING ASSOCIATES, INC. COMMON LAW RIGHTS OF COPYRIGHT AND OTHERWISE ARE HEREBY SPECIFICALLY RESERVED. © 2014 PROFESSIONAL ENGINEERING ASSOCIATES, INC.

CONTRACTOR CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR SHALL BE REQUIRED TO MAINTAIN SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONSTRUCTION DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY THAT THIS REQUIREMENT SHALL BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO SERVE, INDEMNIFY AND HOLD DESIGN PROFESSIONAL PERSONNEL FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT EXCEPT LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

**3 FULL WORKING DAYS BEFORE YOU DIG CALL**

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

MISSISSIPPI SYSTEM, INC.  
 1-800-482-7171 www.missdig.net

**TOPOGRAPHIC AND BOUNDARY SURVEY DISCLAIMER:**  
 TOPOGRAPHIC AND BOUNDARY SURVEY, INCLUDING PROPERTY LINES, EXISTING UTILITIES, EXISTING ELEVATIONS, EXISTING PHYSICAL FEATURES AND STRUCTURES WAS PROVIDED BY MICKALICH ENGINEERING, INC. P.E.A., INC. WILL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THE SURVEY OR FOR DESIGN ERRORS/OMISSIONS RESULTING FROM SURVEY INACCURACIES.

**FLOODPLAIN NOTE:**  
 SITE IS WITHIN ZONE 'X', AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBER 26125C0493F DATED SEPT. 29, 2006.

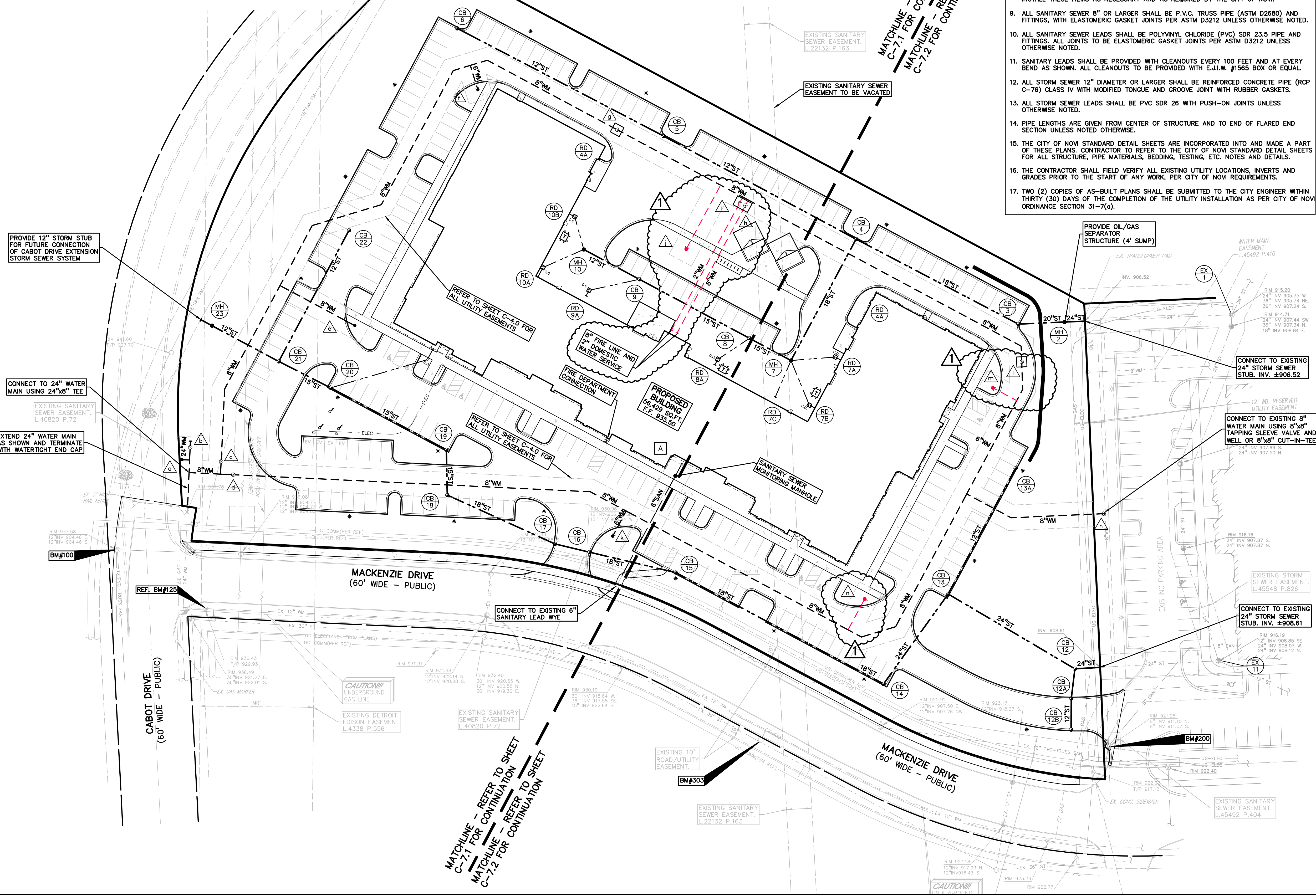
**BENCHMARKS (NAVD88 DATUM)**

- BM #100 WEST SIDE OF SANITARY MANHOLE AT THE NORTHWEST CORNER OF CABOT DRIVE AND MACKENZIE DRIVE ELEV. 937.58
- BM #200 WEST OF SANITARY MANHOLE ON THE NORTH SIDE OF MACKENZIE DRIVE AT THE WEST ENTRANCE TO 39500 MACKENZIE ELEV. 921.28
- BM #303 ARROW ON HYDRANT ON SOUTH SIDE OF MACKENZIE DRIVE ±500 FEET EAST OF CABOT ELEV. 930.24

**CITY OF NOVI REF. BENCHMARK #125**  
 'X' ON NORTH RIM OF GATE WELL, LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CABOT DRIVE AND MACKENZIE DRIVE, 3 FEET FROM BACK OF CURB. CITY REF. ELEV. = 936.58  
 PEA FIELD VERIFIED ELEVATION = 936.48

**SAND BACKFILL NOTE:**  
 ALL UTILITIES UNDER PAVEMENT OR WITHIN 3' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE M.D.O.T. CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557).

**PUBLIC UTILITY EASEMENTS:**  
 ALL SANITARY SEWERS 8" AND LARGER IN DIAMETER ARE TO BE PUBLIC AND SHALL BE LOCATED IN A 20' WIDE EASEMENT. ALL WATER MAIN SHALL BE LOCATED IN A 20' WIDE EASEMENT.



**PEA, Inc.**  
 2430 Rochester Ct., Ste. 100  
 Troy, MI 48063-1872  
 T: 248.689.9090  
 F: 248.689.1044  
 www.peainc.com

**NORTHERN EQUITIES GROUP**  
 39000 COUNTRY CLUB DRIVE  
 FARMINGTON HILLS, MICHIGAN 48331

**OVERALL UTILITY PLAN**  
 ADAMS NORTH TECHNOLOGY CENTRE  
 SECTION 1 - CITY OF NOVI, OAKLAND COUNTY, MICHIGAN 48377

DES. PB DN LGD SUR M.E.I. P.M. SAS

ORIGINAL ISSUE DATE: JANUARY 22, 2019  
 PEA JOB NO. 2019-016  
 SCALE: 1" = 40'  
 DRAWING NUMBER: C-7.0

XREF: S:\PROJECTS\2014\2014016\DWG\TOPBASE-14016.DWG  
 XREF: S:\PROJECTS\2014\2014016\DWG\CONSTRUCTION-2019\CBASE-14016.DWG  
 XREF: S:\PROJECTS\2014\2014016\DWG\CONSTRUCTION-2019\14016.DWG

# FAUDIE ARCHITECTURE

Design to Inspire

February 22, 2019

**Mrs. Hannah Smith**  
Planning Assistant  
City of Novi Planning Department  
45175 W. Ten Mile Road  
Novi, MI 48375-3024

**RE: Adams North Technology Centre**  
Mackenzie Drive  
Novi, Michigan 48375  
Our Project No. 18068  
Novi Project No. JSP19-05

**Dear Hannah:**

This is in response to your **Site Plan Review Comments** letter, dated February 20, 2019 that we received for the proposed Adams North Technology Centre Mackenzie Drive, in Novi. The following items were noted as requiring additional information or further explanation, and have been revised or clarified as follows:

## **Ordinance Requirements:**

### **8.) OTHER REVIEWS – FAÇADE REVIEW:**

d. "Façade Review: Section 9 waiver should be requested for the underage of Brick on the west façade and the overage of flat metal panels on the south façade. Façade supports the waiver and recommends approval"

- **We acknowledge that the submitted Preliminary Elevations, PE-4A, dated 1-18-19, does require a Section 9 waiver for the underage of brick on the west facade. The proposed metal panels that are called out on the elevations will be flat metal panels.**
- **Please let this serve as our request for the waiver as supported by City of Novi Façade review consultant.**

## **Zoning and Use Requirements:**

### **Lighting Plan: (Sec.5.7.2.A.i)**

"Please darken the site plan under the photometric plan to make it easily read"

- **Noted. Revised photometric plan will have darken site back ground as requested.**

# FAUDIE ARCHITECTURE

Design to Inspire

"Please show property line on photometric plan"

- **Noted. Property lines will be added to the photometric plans.**

"Extend photometric data to property lines and near the building"

- **Noted. Revised photometric plan will show data extending to property lines.**

## Lighting Plan (Sec.5.7.A.2)

"Hours of Operation"

- **Proposed building to be made up of mainly business offices open between 7:00 a.m. and 6:00 p.m. With the site lighting on dawn to dusk photo cells.**

## Required Condition (Sec.5.7.3. E)

"Adjust ratio to match 4:1 requirement"

- **Noted. Ratios will be adjusted to meet the 4:1 requirement.**

## Min. Illumination (Sec.5.7.3. K)

"Data appears to comply, please provide minimums in a table on the plans."

- **Tables will be added to the revised drawings showing that the minimums do comply.**

## Max. Illumination adjacent to non-residential (SEC.5.7.3. K)

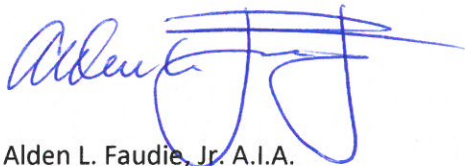
"Extend photometric data to property line"

- **Revised photometric plan will show data extended to property lines.**

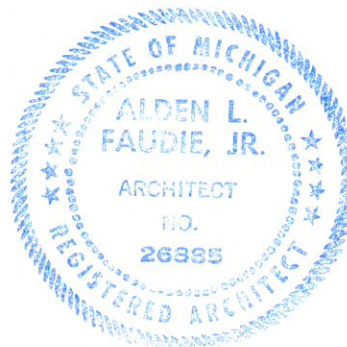
We hope this response will satisfy your concerns so that approval will be granted and a building permit may be obtained. Please feel free to contact me if you have any additional questions.

Sincerely,

FAUDIE ARCHITECTURE, INC.



Alden L. Faudie, Jr. A.I.A.  
President



Cc: Joe Drolshagen, Northern Equities Group

February 22, 2019

PEA Project No: 2014-016  
City of Novi Project No: JSP19-05

Ms. Hannah Smith, Planning Assistant  
City of Novi  
45175 West 10 Mile Road  
Novi, MI, 48375

Re: Adams North Technology Centre Development  
Statement of Economic Impact

Dear Hannah:

The Adams North Technology Centre will create temporary full-time construction work for approximately 115 construction workers to build the shell, with another approximately 30 workers that would be working on the finishes for the Tenant Improvements, for 145 construction related jobs in total. In addition there will be numerous consultants, engineers, architects, and construction managers working on the project. Total job impact is estimated to be 170 jobs.

Novelis is the first tenant in the facility. This is a relocation and an expansion of their existing facility on 13 Mile Road in Novi. The total number of full-time jobs that Novelis will be providing is approximately 100 persons in jobs related to engineering and sales. The remaining space that is available will likely be leased to a company or companies that have a similar profile to the others in the surrounding buildings in the Haggerty Corridor Corporate Park. We can estimate that 65 to 70 new full-time jobs will be created for the 16,000 s.f. of non-Novelis space in the building.

The Total Cost of the project including all costs related to permitting and approvals, Site Development, Shell and Tenant Improvements (excluding land and soft costs) is estimated to be \$7,004,000.

With best regards,



Joseph M. Drolshagen  
Senior Vice President



**NORTHERN  
EQUITIES  
GROUP**

39000 COUNTRY CLUB DRIVE  
FARMINGTON HILLS, MI 48331  
(248) 848-6400 FAX (248) 848-6700  
[www.noreq.com](http://www.noreq.com)

**TRAFFIC IMPACT ANALYSIS FOR  
OFFICE-RESEARCH TECHNOLOGY PARK  
CITY OF NOVI, MICHIGAN**

Prepared For:  
Northern Equities Group, Inc.

Prepared By:  
Parsons Transportation Group, Inc. of Michigan  
Detroit, Michigan

July, 1999

Parsons Transportation Group, Inc.  
Joseph Marson, P.E., PTOE  
26777 Central Park Blvd, Ste 275  
Southfield, MI 48076  
Ph: (248) 262-0013  
Fax: (248) 262-0988

## Office-Research Technology Park Traffic Impact Study

---

### CONTENTS

#### List of Figures and Tables, iii

1.		
SUMMARY OF FINDINGS AND RECOMMENDATIONS		1
Summary of Findings		1
Summary of Recommendations		4
2.		
INTRODUCTION		7
Site Development Plans		7
Area Road Network		9
Study Methodology		9
3.		
ANALYSIS		12
Existing Peak Hour Turning Movement Counts		12
Analysis of Opening of M-5 Impact on Intersection Volumes		12
Capacity Analysis - Base Traffic Conditions		14
Background Traffic		20
Capacity Analysis - Background Conditions		22
Trip Generation - Proposed Development		27
Trip Distribution		28
Capacity Analysis - Future Traffic		29
Site Access		35
4.		
CONCLUSIONS		39
APPENDIX I	- Existing Peak Hour Turning Movement Counts	
APPENDIX II	- Traffic Model Plots	
APPENDIX III	- Base Traffic Capacity Analysis	
APPENDIX IV	- Background Capacity Analysis	
APPENDIX V	- Future Capacity Analysis	

**LIST OF FIGURES AND TABLES**

**Figures**

1.	Site Location Map	8
2.	Existing Weekday Peak Hour Volumes	13
3.	Base Weekday Peak Hour Volumes	15
4.	Background Weekday Peak Hour Volumes	23
5.	Site Generated Traffic Volumes	30
6.	Total Future Traffic Volumes	31

**Tables**

1.	Level of Service Criteria for Signalized Intersections	17
2.	Level of Service Criteria for Unsignalized Intersections	17
3.	Level of Service Analysis - Base Traffic Conditions	18
4.	Trip Generation - Developments for Background Traffic	21
5.	Traffic Volume Growth Rate Analysis	22
6.	Level of Service Analysis - Background Conditions - Mitigated	24
7.	Trip Generation for Proposed OST Development	28
8.	Level of Service Analysis - Future Conditions - Mitigated	32
9.	Level of Service Analysis - Collector Streets	35



## Office-Research Technology Park Traffic Impact Study

---

### **1.** **Summary of Findings and Recommendations**

---

#### **Summary of Findings**

1. The development of an office services technology park consisting of approximately 300 acres of land is proposed to be constructed on the west side of Haggerty Road, between 12 Mile Road and 14 Mile Road. About 254 acres is considered developable.
2. Access for the development is proposed via an internal street system that will provide connections to 12 Mile, 13 Mile, 14 Mile and Haggerty Roads. Site access for the individual parcels to be developed will be primarily from the internal collector street system.
3. Existing weekday morning and afternoon peak hour traffic counts indicate the peak hour occurs from 7:45 to 8:45 A.M. and 4:45 to 5:45 P.M.
4. An extension of the M-5 connector is currently under construction from 12 Mile Road to 14 Mile Road and is expected to be opened in August, 1999. The continuation from 14 Mile Road to Pontiac Trail is expected to be completed by the year 2001.
5. Analysis of the conditions expected at the study intersections after completion of the M-5 Connector indicate the intersection of 12 Mile and Haggerty will operate at Level of Service (LOS) "C" for the morning and afternoon peak hours. Analysis of 13 Mile and Haggerty show the intersection will operate at LOS "C" and "D", for the A.M. and P.M. peak hours, respectively. The 14 Mile and Haggerty intersection will operate at

## Office-Research Technology Park Traffic Impact Study

LOS "D" for both peak hours. The intersection of 12 Mile Road and the M-5 off-ramp will operate at LOS "C" during the morning peak hour and LOS "D" during the afternoon peak hour. The eastbound-to-westbound crossover on Twelve Mile Road, east of Haggerty, will operate at LOS "B" during the A.M. peak hour and LOS "D" during the P.M. peak hour. The westbound-to-eastbound crossover on Twelve Mile Road, west of Haggerty, will operate at LOS "B" during both peak hours.

6. There are numerous development projects that are planned in the area and are described in detail in the background traffic conditions section. These approved developments are expected to generate about 2,900 A.M. and 3,880 P.M. peak hour trips based on a trip generation analysis using information available from impact studies for those projects and rates contained in the latest edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE).
7. Under background conditions, without the site developed, and mitigation measures in place as described under the recommendations section, the intersection of 12 Mile and Haggerty will operate at LOS "C" for the A.M. peak hour and LOS "D" for the P.M. peak hour. Analysis of 13 Mile and Haggerty show the intersection will operate at LOS "C" and "D", for the A.M. and P.M. peak hours, respectively. The 14 Mile and Haggerty intersection will operate at LOS "C" for the A.M. peak hour and LOS "D" for the P.M. peak hour. The intersection of 12 Mile Road and the M-5 off-ramp will operate at LOS "C" during both peak hours. The eastbound-to-westbound crossover on Twelve Mile Road, east of Haggerty, will operate at LOS "B" during the A.M. peak hour and LOS "C" during the P.M. peak hour. The westbound-to-eastbound crossover on Twelve Mile Road, west of Haggerty, will operate at LOS "B" during both peak hours.
8. The site under study is expected to generate about 3,590 A.M., 3,160 P.M. peak hour and 28,050 daily vehicle trips at buildout.
9. A directional distribution analysis completed based on regional population data and an analysis of employee zip codes for a major employer in the area, indicates traffic is expected to approach and depart the site in the following manner:

## Office-Research Technology Park Traffic Impact Study

To/from the south on M-5 (south of 12 Mile)	80%
To/from the north on M-5 (north of 14 Mile)	2%
To/from the south on Haggerty (south of 12 Mile)	5%
To/from the north on Haggerty (north of 14 Mile)	2%
To/from the east on 12 Mile (east of Haggerty)	3%
To/from the west on 12 Mile (west of M-5)	2%
To/from the east on 13 Mile (east of Haggerty)	2%
To/from the west on 13 Mile (west of M-5)	2%
To/from the east on 14 Mile (east of Haggerty)	1%
To/from the west on 14 Mile (west of M-5)	<u>1%</u>
Total	100%

11. Under future conditions, with the site developed, and mitigation measures in place, the intersection of 12 Mile and Haggerty will operate at LOS "C" for the A.M. peak hour and LOS "D" for the P.M. peak hour. The intersection of 13 Mile and Haggerty will operate at LOS "C" for both the A.M. and P.M. peak hours. The 14 Mile and Haggerty intersection will operate at LOS "C" for the A.M. peak hour and LOS "D" for the P.M. peak hour. The intersection of 12 Mile Road and the M-5 off-ramp will operate at LOS "D" during the A.M. peak hour and LOS "E" during the P.M. peak hour. The eastbound-to-westbound crossover on Twelve Mile Road, east of Haggerty, will operate at LOS "B" during the A.M. peak hour and LOS "C" during the P.M. peak hour. The westbound-to-eastbound crossover on Twelve Mile Road, west of Haggerty, will operate at LOS "C" during both peak hours.
12. Under future conditions, at the site collector streets, and mitigation measures in place, the intersection of 12 Mile and the site collector street will operate at LOS "C" for the A.M. peak hour and LOS "D" for the P.M. peak hour. The intersection of 13 Mile and the site collector will operate at LOS "C" for both the A.M. and P.M. peak hours. The Haggerty Road intersection with the north collector and the Haggerty Road intersection with the south collector will both operate at LOS "A" for the A.M. peak hour and LOS "B" for the P.M. peak hour. The intersection of 14 Mile Road and the site collector will operate at LOS "C" during the A.M. peak hour and LOS "E" during the P.M. peak hour.

## Office-Research Technology Park Traffic Impact Study

---

### Summary of Recommendations

In order to accommodate the background conditions (without the site developed), the following road improvements should be implemented:

At the intersection of *12 Mile Road and Haggerty Road*:

- North Approach: A second southbound right turn lane and a second southbound through lane.
- South Approach: A second northbound right turn lane.
- East Approach: A fourth westbound through lane.
- West Approach: The outer eastbound through lane changed to a shared through/right turn lane.

At the intersection of *13 Mile Road and Haggerty Road*:

- North Approach: A second southbound through lane
- South Approach: A second northbound through lane.

At the intersection of *14 Mile Road and Haggerty Road*:

- North Approach: A second southbound through lane
- South Approach: A second northbound through lane.

At the intersection of *12 Mile Road and the M-5 Off-Ramp*:

- East Approach: A fourth westbound through lane.

At the intersection of *12 Mile Road and the eastbound-to-westbound crossover, east of Haggerty Road*:

- East Approach: A fourth through lane.
- West Approach: A second eastbound left turn lane (for the crossover)

At the intersection of *12 Mile Road and the westbound-to-eastbound crossover, west of Haggerty Road*:

- East Approach: A fourth westbound through lane.

In order to accommodate the proposed development under future conditions, the following improvements should be implemented:

## Office-Research Technology Park Traffic Impact Study

---

At the intersection of *13 Mile Road and Haggerty Road*:

- East Approach: A westbound right-turn lane.

At the intersection of *14 Mile Road and Haggerty Road*:

- South Approach: A northbound right-turn lane.

At the intersection of *12 Mile Road and the M-5 Off-Ramp*:

- South Approach: A third northbound right turn lane and a third northbound left turn lane (or alternatively, completion of the loop ramp in the northeast quadrant).

In order to accommodate the site traffic at the collector road intersections with the arterial streets, the following improvements will need to be implemented at each intersection:

At the *12 Mile Road Access* intersection:

- North Approach: Dual southbound right turn lanes (400-450 feet long).
- West Approach: A second left turn lane at crossover (375-400 feet long).

*13 Mile Road Access*

- North Approach: A southbound right turn lane, a shared through/right lane, and a left turn lane.
- South Approach: A northbound left turn lane and a northbound shared through/right lane.
- East Approach: A westbound left turn lane and a second westbound through lane.
- West Approach: An eastbound left turn lane and an eastbound right turn lane.

*Haggerty Road Access Between 13 and 14 Mile Road*

- North Approach: A second southbound through lane.
- South Approach: A northbound left turn lane and a second northbound through lane.
- West Approach: An eastbound left turn lane and an eastbound right turn lane.

The outbound left turn lane should be 100 feet and the outbound right turn lane should be 150 feet. The northbound left turn lane should be 100 feet.

*Haggerty Road Access Between 12 and 13 Mile Road*

- North Approach: A second southbound through lane.
- South Approach: A northbound left turn lane and a second northbound through lane.
- West Approach: An eastbound left turn lane and an eastbound right turn lane.

## Office-Research Technology Park Traffic Impact Study

---

The outbound left turn lane should be 100 feet and the outbound right turn lane should be 150 feet. The northbound left turn lane should be 100 feet.

### *14 Mile Road Access*

- South Approach: A northbound left-turn lane and a northbound right-turn lane.

## Office-Research Technology Park Traffic Impact Study

---

### **2. Introduction**

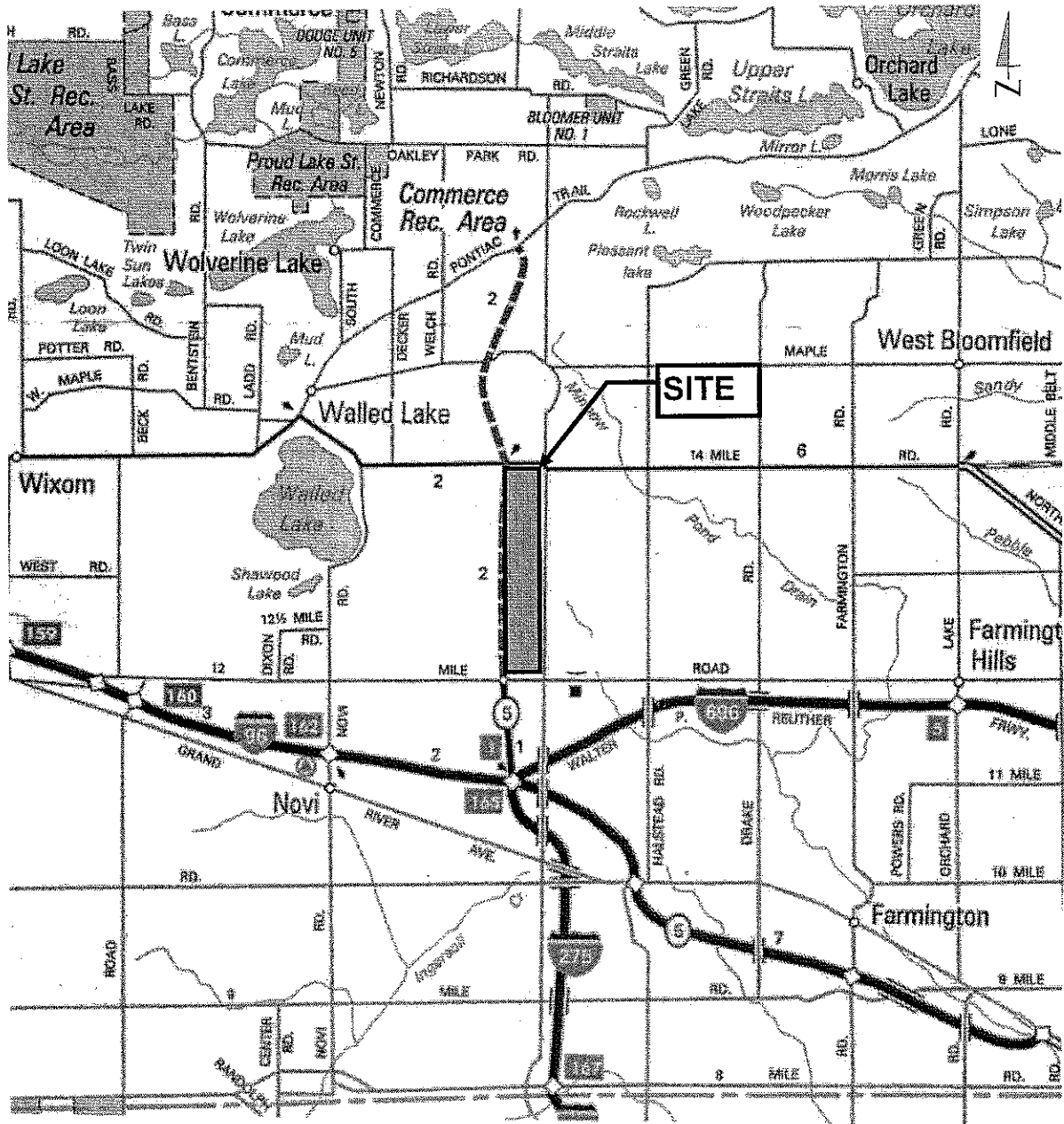
---

#### **Site Development Plans**

The Parsons Transportation Group (PTG) was retained to conduct a traffic impact study for a proposed office-research technology park in the City of Novi, Michigan. The project includes approximately 300 acres bounded by Haggerty Road on the east, 12 Mile Road on the south, M-5 on the west, and 14 Mile Road on the north (see Figure 1). About 254 acres is developable. The property is currently zoned as Office Service Technology. Although no firm schedule for development can be made, for purposes of the traffic impact study it is anticipated the project will be built-out in a seven year time frame.

It is estimated the development will have approximately 1,205,400 square feet of building area north of 13 Mile Road and 1,335,500 square feet of building area south of 13 Mile Road.

The development will have an internal collector street system providing access to all the properties, thus minimizing the number of intersections with the major street system. As currently planned, the collector street system will have one intersection at each of the following locations: (1) on 12 Mile Road about mid-way between Haggerty and M-5 directly across from an eastbound-to-westbound directional crossover, (2) on 13 Mile Road about mid-way between Haggerty and M-5, (3) on Haggerty Road between 12 and 13 Mile Roads, and (5) on Haggerty Road between 13 and 14 Mile Roads. At the north end of the project the internal street will connect to 14 Mile Road via a continuation of the road as part of another development.



## SITE LOCATION



## Office-Research Technology Park Traffic Impact Study

---

The purpose of this study was to determine the road improvements that would be needed to mitigate the impact of this development on the adjacent road system.

### Area Road Network

From a regional standpoint, the site will be served primarily from M-5 (also known as the Haggerty Connector). M-5 is a new boulevard roadway providing a connection between the interstate system (I-96/I-696/I-275) and Pontiac Trail, with access limited to the major mile roads. The M-5 Connector is currently open north to 12 Mile Road, where it is grade-separated. It is projected to be open from 12 Mile Road to 14 Mile Road in August, 1999, resulting in shifts in traffic from the Haggerty Road corridor to the M-5 corridor. The remainder of the M-5 connector, from 14 Mile to Pontiac Trail, is expected to be completed in the year 2001. Directional crossovers will serve the left turn movements at all major roadway intersections.

*Twelve Mile Road* is a six-lane boulevard in the vicinity of the site with an average daily traffic volume (ADT) of 40,550 west of Haggerty Road. Twelve Mile Road is under the jurisdiction of the Road Commission for Oakland County (RCOC). It is signalized at its intersections with the M-5 northbound off-ramp, Haggerty Road, and the westbound-to-eastbound crossover west of Haggerty. Twelve Mile has a posted speed of 45 mph in the immediate area.

*Thirteen Mile Road* is a paved two-lane road adjacent to the site and is posted for 40 mph. Thirteen Mile Road widens to four lanes in the vicinity of M-5, where it will be an at-grade intersection. Thirteen Mile Road is under the jurisdiction of the City of Novi.

*Fourteen Mile Road* is a paved two-lane road east of Haggerty Road and a three-lane roadway west of Haggerty Road, through to M-5 and is posted for 45 mph. Fourteen Mile Road will be an at-grade intersection at M-5. Fourteen Mile Road is under the jurisdiction of the RCOC.

*Haggerty Road* is a paved two-lane road with widening at the major intersections. It has a posted speed limit of 45 mph and is under the jurisdiction of RCOC.

### Study Methodology

The following outlines the data gathering and analysis methodology used in this study:

## Office-Research Technology Park Traffic Impact Study

---

1. Existing weekday morning and afternoon peak period turning movement counts were collected at the intersections of 12 Mile Road with: (1) the northbound M-5 ramp, (2) Haggerty Road, and (3) the directional crossovers immediately east and west of Haggerty. Counts were also made on Haggerty Road at both 13 and 14 Mile Roads.
2. The opening of M-5 to Pontiac Trail will change travel patterns in the area, most significantly on Haggerty Road. An estimate of the changes in travel demand was made based on the regional traffic model to create a base traffic condition. A level of service analysis of the study intersections under the base conditions was completed using methodologies published in the Highway Capacity Manual (Transportation Research Board, Special Report 209, 1998).
3. Approved developments in the area not yet constructed or completed were identified and a trip generation analysis was performed for these developments using information contained in Trip Generation (Institute of Transportation Engineers, Sixth Edition).
4. In order to account for other traffic volume increases that can be expected to occur upon buildout of the site (a seven year buildout was used as a basis), a growth factor was applied to area roadways. The growth factor was determined by reviewing regional traffic projections.
5. The forecast traffic volumes for the approved developments and other traffic volume increases were added to the base traffic to provide a "background traffic" scenario.
6. A level of service analysis was performed for background conditions.
7. A trip generation analysis was performed for the proposed site using the procedure cited in item 3 above. Weekday A.M. and P.M. peak hour trips were estimated.
8. A direction of approach analysis using regional population information, coupled with employment information for a major employer in the area, was used as a basis for trip distribution.
9. The forecast traffic volumes for the proposed development were assigned to the roadways adjacent to the site based on the trip distribution and proposed access locations.

## **Office-Research Technology Park Traffic Impact Study**

---

10. The site generated traffic volumes were added to the "background traffic" volumes to arrive at a "future traffic" scenario.
11. A level of service analysis was performed for future conditions.
12. The traffic impact and associated mitigation measures were identified based on the results obtained from step eleven.

**3.**

**Analysis**

---

**Existing Peak Hour Turning Movement Counts**

Existing weekday morning and afternoon peak period turning movement counts were conducted at the major intersections in the study area. On Wednesday, February 24, 1999 counts were made at the intersections of 12 Mile Road with Haggerty Road, 12 Mile Road with the M-5 northbound off-ramp, and 14 Mile Road with Haggerty Road. On Tuesday, March 16, 1999 counts were made on 12 Mile Road at the eastbound-to-westbound crossover east of Haggerty and at the westbound-to-eastbound crossover west of Haggerty. On Thursday, March 25, 1999 counts were made at the intersection of Haggerty and 13 Mile Road.

The A.M. peak hour was found to be 7:45 to 8:45 A.M. and the P.M. peak hour was found to be 4:45 to 5:45 P.M. The existing peak hour traffic volumes are included in Appendix I and are illustrated on Figure 2.

**Analysis of Opening of M-5 Impact on Intersection Volumes**

The completion of M-5 from 12 Mile Road to Pontiac Trail is expected to occur by the year 2001. This roadway will have a substantial impact on the traffic volumes along the Haggerty Road corridor. Since the M-5 highway will be completed prior to buildout of the subject development, it was necessary to estimate the shift in existing traffic that can be anticipated with the opening of the highway.

In order to assess these changes, the regional transportation model developed by the Southeast Michigan Council of Governments (SEMCOG) was used. The model forecasts traffic volumes

## Office-Research Technology Park Traffic Impact Study

---

figure 2

## **Office-Research Technology Park Traffic Impact Study**

---

for major corridors in the metropolitan Detroit area based on population and employment projections for the region. PTG made two computer model runs as follows: (1) using the base 1995 street network and traffic volumes, and (2) using the base 1995 volumes with the street network modified to include the M-5 connector from 12 Mile Road to Pontiac Trail. Due to the large zone structure in the model, changes to individual turning movements at intersections cannot be ascertained from the model. The resulting plots of the two computer model runs are shown in the Appendix II.

Upon reviewing and analyzing the plots, certain conclusions were drawn, and anticipated changes to traffic volumes were determined. These are described below:

1. The north-south volumes on Haggerty Road are expected to reduce by a range of 30 to 50 percent. This is consistent with the environmental impact study prepared by MDOT for the M-5 Highway. The average reduction on Haggerty Road from 12 Mile Road to Maple Road was found to be 39.4 percent. Consequently, the existing through traffic volume movements were reduced by that amount.
2. Most east-west roads (13 Mile, 14 Mile and Maple) show very little change in volumes. Twelve Mile Road shows a reduction in volume west of Haggerty, but not east of Haggerty; this is due to traffic that would have traveled 12 Mile between M-5 and Haggerty will go to or from points north on Haggerty by remaining on M-5.
3. At the intersections of Haggerty at both 13 Mile and 14 Mile Roads, it is expected the east-west turning movements will decrease with corresponding increases in the through movements leading directly to M-5. Since shifts in traffic from a turn movement to a through movement will increase the capacity of an intersection, and since it was not possible to accurately predict individual movement changes with the model, the east-west volumes were not reassigned; this will provide a conservative analysis.

The resulting changes to the existing traffic volumes are illustrated on Figure 3, which represents the base traffic conditions.

### **Capacity Analysis - Base Traffic Conditions**

The base traffic conditions at the intersections were analyzed according to the methodologies published in the most recent edition of the Highway Capacity Manual. The analysis determined the "Level of Service" of these intersections; "Level of Service" is based on factors

**Office-Research Technology Park Traffic Impact Study**

---

figure 3

## **Office-Research Technology Park Traffic Impact Study**

such as number of lanes, intersection traffic control (signalized versus unsignalized), traffic volumes, lane width, and signal timing. Levels of service are expressed in a range from "A" through "F," with "A" being the highest level of service, and "F" representing the lowest level of service. Level of Service "D" is typically considered the minimum acceptable level in an urban environment.

Table 1 shows the thresholds for Levels of Service "A" through "F" for signalized intersections; Table 2 shows the thresholds for unsignalized intersections. Shown in Table 3 are the results of the analysis of base traffic conditions; the capacity analysis worksheets can be found in Appendix III.



## Office-Research Technology Park Traffic Impact Study

Table 1

### LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY/VEHICLE (SECONDS)	DESCRIPTION
A	$\leq 10$	Most vehicles do not stop at all.
B	$>10$ and $\leq 20$	More vehicles stop than for LOS A.
C	$>20$ and $\leq 35$	The number of vehicles stopping is significant, although many pass through without stopping.
D	$>35$ and $\leq 55$	Many vehicles stop. Individual cycle failures are noticeable.
E	$>55$ and $\leq 80$	Considered to be the limit of acceptable delay. Individual cycle failures are frequent.
F	$> 80$	Unacceptable delay.

SOURCE: Transportation Research Board, Highway Capacity Manual, Special Report 209, 1998.

Table 2

### LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DELAY/VEHICLE (SECONDS)	DESCRIPTION
A	$\leq 10$	Little or no delay, very low main street traffic.
B	$>10$ and $\leq 15$	Short traffic delays, many acceptable gaps.
C	$>15$ and $\leq 25$	Average traffic delays, frequent gaps still occur.
D	$>25$ and $\leq 35$	Long Traffic delays, limited number of acceptable gaps.
E	$>35$ and $\leq 50$	Very long traffic delays, very small number of acceptable gaps.
F	$> 50$	Extreme traffic delays, virtually no acceptable gaps in traffic.

SOURCE: Transportation Research Board, Highway Capacity Manual, Special Report 209, 1998

## Office-Research Technology Park Traffic Impact Study

Table 3

### LEVEL OF SERVICE ANALYSIS - BASE TRAFFIC CONDITIONS

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
12 Mile/Haggerty	<b>Overall</b>	<b>26.0</b>	<b>C</b>	<b>25.6</b>	<b>C</b>
	SB Right	25.9	C	20.4	C
	SB Thru	37.9	D	22.1	C
	NB Right	17.4	B	33.0	C
	NB Through	16.2	B	19.8	B
	WB Right	16.6	B	19.0	B
	WB Through	18.6	B	32.2	C
	EB Right	38.8	D	18.2	B
	EB Thru	22.8	C	20.7	C
13 Mile/Haggerty	<b>Overall</b>	<b>34.9</b>	<b>C</b>	<b>43.4</b>	<b>D</b>
	SB Through/Right	34.1	C	32.7	C
	SB Left	16.0	B	41.4	D
	NB Through/Right	20.4	C	54.9	D
	NB Left	28.9	C	38.1	D
	WB Through/Right	36.3	D	54.9	D
	WB Left	52.0	D	23.4	C
	EB Right	42.3	D	26.4	C
	EB Through	46.2	D	27.8	C
EB Left	25.7	C	35.7	D	

(Cont'd)

## Office-Research Technology Park Traffic Impact Study

Table 3 (Cont'd)

### LEVEL OF SERVICE ANALYSIS - BASE TRAFFIC CONDITIONS

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
14 Mile/Haggerty	<b>Overall</b>	<b>36.8</b>	<b>D</b>	<b>51.9</b>	<b>D</b>
	SB Through/Right	33.4	C	23.0	C
	SB Left	44.8	D	51.1	D
	NB Through/Right	41.3	D	74.6	E
	NB Left	36.0	D	33.0	C
	WB Right	25.8	C	39.2	D
	WB Through	26.4	C	76.5	E
	WB Left	35.7	D	34.3	C
	EB Right	28.8	C	37.1	D
	EB Through	43.4	D	41.3	D
	EB Left	18.6	B	41.8	D
12 Mile/M-5 Off-Ramp	<b>Overall</b>	<b>21.7</b>	<b>C</b>	<b>23.6</b>	<b>D</b>
	Northbound Right	19.8	B	28.4	C
	Northbound Left	17.0	B	25.5	C
	Westbound Through	27.4	C	23.5	C
	Eastbound Through	23.3	C	13.2	B
12 Mile/Crossover	<b>Overall</b>	<b>19.9</b>	<b>B</b>	<b>47.6</b>	<b>D</b>
East of Haggerty (E.B. to W.B.)	Westbound Through	20.2	C	46.8	D
	Eastbound Left	19.4	B	50.8	D
12 Mile/Crossover	<b>Overall</b>	<b>17.2</b>	<b>B</b>	<b>19.1</b>	<b>B</b>
West of Haggerty (W.B. to E.B.)	Eastbound Through	26.9	C	23.2	C
	Westbound Left	16.3	B	18.4	B

LOS - Level of Service

Delay - is average stopped delay per vehicle in seconds

It may be seen from Table 3 that the intersection of *12 Mile Road and Haggerty Road*, will operate at an overall Level of Service "C" (LOS "C") for both peak hours. All individual movements will operate at LOS "D" or better during both peak hours.

## **Office-Research Technology Park Traffic Impact Study**

---

The intersection of *13 Mile Road and Haggerty Road* will operate at an overall LOS "C" during the A.M. peak hour and LOS "D" during the P.M. peak hour. All individual movements will operate at LOS "D" or better during both peak hours.

The intersection of *14 Mile Road and Haggerty Road* will operate at an overall LOS "D" during both peak hours. The northbound through/right movement and the westbound through movement will operate at LOS "E" during the P.M. peak hour. All other individual movements will operate at LOS "D" or better during both peak hours.

The intersection of *12 Mile Road and the M-5 Off-Ramp* will operate at an overall LOS "C" during both peak hours. All individual movements will operate at LOS "C" or better during both peak hours.

The intersection of *12 Mile Road and the eastbound-to-westbound crossover, east of Haggerty Road* will operate at an overall LOS "B" during the A.M. peak hour and LOS "D" during the P.M. peak hour. All individual movements will operate at LOS "D" or better during both peak hours.

The intersection of *12 Mile Road and the westbound-to-eastbound crossover, west of Haggerty Road* will operate at an overall LOS "B" during both peak hours. All individual movements will operate at LOS "C" or better during both peak hours.

### **Background Traffic**

Background traffic is that additional traffic on the surrounding roadway system that will be generated by developments in the area up to the time of buildout of the site. The proposed OST development is anticipated to take seven years to completely build out; thus, a buildout year of 2006 was used. In this analysis, background traffic was estimated to be that which would result from known projects in the area, and, since there would be other traffic generated by developments which are unknown at this time, a growth factor was applied to area roadways to account for this other traffic.

Background projects in the area were obtained from the City of Novi. The peak-hour traffic volumes for these background developments were estimated based upon the trip generation data contained in the 6th edition of the Institute of Transportation Engineers (ITE) report titled Trip Generation for those developments for which no impact studies were completed. Table 4

## Office-Research Technology Park Traffic Impact Study

summarizes the resulting trips associated with these developments.

Table 4

### TRIP GENERATION - DEVELOPMENTS FOR BACKGROUND TRAFFIC

Development	Size	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Brightmore Tabernacle	School-60,000 S.F. Church-80,000 S.F.	150	110	260	80	160	240
Vistas of Novi	Single Family Homes - 498 Townhomes - 257 Commercial - 100,000 SF	205	495	700	690	500	1,190
Novi Research Park	228,007 SF	235	48	283	40	224	264
St. Joseph Mercy Health System	Office: 154,000 SF Outpatient: 150,000 SF Medical Office: 150,000 SF Future Devel: 75,000 SF	707	165	872	235	797	1,032
Waltonwood	240 Units	10	5	15	20	20	40
Maplesplace	44,207 SF Retail 6,000 SF Restaurant 4,000 SF Bank 24,900 SF Office	140	65	205	245	305	550
Maplesplace Congregate Care	119 Units	5	5	10	10	10	20
O.S.T. (Meadowbrook - South of 12 Mile)	260,150 SF	260	55	315	45	250	295
Regency Industrial Park	235,000 GSF	202	39	241	48	200	248
	Total	1914	987	2901	1413	2466	3,879

The forecast traffic volumes for the approved developments (for which traffic studies were not available) were assigned to the roadway system based on a direction of approach (DOA) analysis developed from evaluating other traffic study DOA's completed in nearby areas, the DOA described later in this report, and knowledge of the area.

In addition, since it can be expected additional traffic will occur in the area due to other unknown development in the vicinity within the seven year buildout, a growth factor was applied to the area roadways. The growth factor was determined by analyzing projected traffic

## Office-Research Technology Park Traffic Impact Study

---

volumes in the area contained in the environmental impact study for the M-5 connector.<sup>1</sup> The analysis yielded the results shown in Table 5.

Table 5

### **TRAFFIC VOLUME GROWTH RATE ANALYSIS**

<b>Street</b>	<b>1995 Daily Volume</b>	<b>2010 Daily Volume</b>	<b>Percent Growth</b>
M-5 Connector	39,800	62,000	3.00
Haggerty	13,300	27,000	4.84
12 Mile	28,700	44,800	3.00
13 Mile	8,400	13,100	3.00
14 Mile	17,200	26,600	2.95

Since the study project is one of the major components of increases in Haggerty Road and wouldn't be counted as background traffic, a three percent per year would be appropriate for all streets under study, and thus was used in this study. The results of the forecast traffic volumes for background conditions are illustrated on Figure 4.

### **Capacity Analysis - Background Conditions**

Capacity analyses were completed at all study intersections for the background condition. In cases where intersections were found to operate at unacceptable levels of service, necessary improvements, such as additional lanes and signal timing/phasing modifications were determined and included in the capacity analyses. Table 6 presents the results of the capacity analyses for the mitigated background condition; the capacity analysis worksheets can be found in Appendix IV.

---

<sup>1</sup> "Environmental Impact Statement for the Haggerty Road Connector", MDOT/FHWA, 1989.

**Office-Research Technology Park Traffic Impact Study**

---

Figure 4

## Office-Research Technology Park Traffic Impact Study

Table 6  
**Level of Service Analysis - Background Conditions - Mitigated**

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
12 Mile/Haggerty	<b>Overall</b>	<b>23.9</b>	<b>C</b>	<b>35.5</b>	<b>D</b>
	SB Right	28.7	C	22.7	C
	SB Thru	31.2	C	23.4	C
	NB Right	23.6	C	50.1	D
	NB Through	22.9	C	27.4	C
	WB Through	13.6	B	47.8	D
	EB Right	24.2	C	20.1	C
	EB Thru	25.8	C	20.0	C
13 Mile/Haggerty	<b>Overall</b>	<b>31.4</b>	<b>C</b>	<b>38.4</b>	<b>D</b>
	SB Through/Right	31.1	C	32.0	C
	SB Left	20.0	B	38.0	D
	NB Through/Right	24.5	C	46.5	D
	NB Left	30.5	C	52.8	D
	WB Through/Right	29.3	C	46.4	D
	WB Left	45.7	D	26.6	C
	EB Right	32.1	C	23.6	C
	EB Through	36.0	D	25.0	C
EB Left	20.5	C	35.0	C	

(Cont'd)



## Office-Research Technology Park Traffic Impact Study

Table 6 (Cont'd)  
Level of Service Analysis - Background Conditions - Mitigated

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
14 Mile/Haggerty	<b>Overall</b>	<b>33.8</b>	<b>C</b>	<b>41.4</b>	<b>D</b>
	SB Through/Right	35.7	D	26.8	C
	SB Left	48.4	D	41.3	D
	NB Through/Right	38.6	D	50.4	D
	NB Left	42.7	D	53.9	D
	WB Right	19.3	B	28.2	C
	WB Through	19.9	B	51.1	D
	WB Left	32.0	C	27.0	C
	EB Right	21.3	C	27.9	C
	EB Through	32.4	C	32.1	C
	EB Left	13.8	B	41.4	D
12 Mile/M-5 Off-Ramp	<b>Overall</b>	<b>32.0</b>	<b>C</b>	<b>27.8</b>	<b>C</b>
	Northbound Right	33.5	C	28.1	C
	Northbound Left	28.4	C	29.5	C
	Westbound Through	34.8	C	29.5	C
	Eastbound Through	32.3	C	18.9	B
12 Mile/Crossover	<b>Overall</b>	<b>17.4</b>	<b>B</b>	<b>31.0</b>	<b>C</b>
East of Haggerty (E.B. to W.B.)	Westbound Through	15.5	B	29.7	C
	Eastbound Left	21.2	C	34.3	C
12 Mile/Crossover	<b>Overall</b>	<b>18.7</b>	<b>B</b>	<b>19.8</b>	<b>B</b>
West of Haggerty (W.B. to E.B.)	Eastbound Through	29.5	C	33.2	C
	Westbound Left	17.1	B	18.6	B

LOS - Level of Service

Delay - is average stopped delay per vehicle in seconds

Due to the large increase in traffic volume through the study intersections as a result of the background developments and growth, several improvements will be necessary to enable the intersections to operate at acceptable levels of service. These improvements are discussed

## Office-Research Technology Park Traffic Impact Study

---

below.

At the intersection of *12 Mile Road and Haggerty Road* the following improvements will be needed:

- North Approach: A second southbound right turn lane and a second southbound through lane.
- South Approach: A second northbound right turn lane.
- East Approach: A fourth westbound through lane. Since an additional westbound through lane will be needed at M-5 and at two crossovers (as discussed later), this lane should extend from east of the eastbound-to-westbound crossover east of Haggerty Road, through M-5.
- West Approach: The outer eastbound through lane changed to a shared through/right turn lane.

These improvements will allow the intersection to operate at an overall LOS "C" for the A.M. peak hour and LOS "D" for the P.M. peak hour. All individual movements will operate at LOS "D" or better during both peak hours.

At the intersection of *13 Mile Road and Haggerty Road* the following improvements will be needed:

- North Approach: A second southbound through lane
- South Approach: A second northbound through lane.

These improvements will enable the intersection to operate at an overall LOS "C" during the A.M. peak hour and LOS "D" during the P.M. peak hour. All individual movements will operate at LOS "D" or better during both peak hours.

At the intersection of *14 Mile Road and Haggerty Road* the following improvements will be needed:

- North Approach: A second southbound through lane
- South Approach: A second northbound through lane.

These improvements will allow the intersection to operate at an overall LOS "C" during the A.M. peak hour and LOS "D" during the P.M. peak hour. All individual movements will

## Office-Research Technology Park Traffic Impact Study

---

operate at LOS "D" or better during both peak hours.

At the intersection of *12 Mile Road and the M-5 Off-Ramp* the following improvements will be needed:

- East Approach: A fourth westbound through lane (see earlier discussion regarding 12 Mile/Haggerty intersection).

This improvement will enable the intersection to operate at an overall LOS "C" during both peak hours. All individual movements operate at LOS "D" or better during both peak hours.

At the intersection of *12 Mile Road and the eastbound-to-westbound crossover, east of Haggerty Road*, the following improvements will be needed:

- East Approach: A fourth through lane (see earlier discussion regarding 12 Mile/Haggerty intersection).
- West Approach: A second eastbound left turn lane (for crossover)

These improvements will allow the intersection to operate at an overall LOS "B" during the A.M. peak hour and LOS "C" during the P.M. peak hour. All individual movements operate at LOS "C" or better during both peak hours.

At the intersection of *12 Mile Road and the westbound-to-eastbound crossover, west of Haggerty Road*, the following improvements will be necessary:

- East Approach: A fourth westbound through lane.

This improvement will enable the intersection to operate at an overall LOS "B" during both peak hours. All individual movements operate at LOS "C" or better during both peak hours.

### Trip Generation - Proposed Development

The number of trips generated by the development was estimated based upon the trip generation data contained in the 6th edition of the Institute of Transportation Engineers (ITE) report titled *Trip Generation*. The site is zoned Office Service Technology (OST); the uses allowed in an OST district include uses that are comparable to two uses contained in *Trip Generation*, specifically, Office Park (Land Use 750) and Business Park (Land Use 770).

## Office-Research Technology Park Traffic Impact Study

Table 7 presents the resulting trip generation for the two uses as well as the average. The average was used for this analysis. The trip generation was segregated by the portion north of 13 Mile and south of 13 Mile Road.

**TABLE 7  
TRIP GENERATION FOR PROPOSED OST DEVELOPMENT**

DEVELOPMENT	SIZE	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
<u>North of 13 Mile</u>							
Office Park	1,205,400 SF	1560	195	1755	220	1350	1570
Business Park	1,205,400 SF	1400	265	1665	330	1110	1440
	Average	1480	230	1710	275	1230	1505
<u>South of 13 Mile</u>							
Office Park	1,335,500 SF	1705	210	1915	240	1485	1725
Business Park	1,335,500 SF	1545	295	1840	365	1220	1585
	Average	1625	250	1875	300	1355	1655
Total (of average)		3105	480	3585	575	2585	3160

It is estimated the entire site will generate 28,050 daily trips.

### Trip Distribution

The direction from which traffic will approach and depart the site was based on an analysis of population data available for the region from the Southeast Michigan Council of Governments (SEMCOG). The analysis showed that about ninety percent of the trips during peak hours would come via the freeway system, and, therefore, M-5. The remaining twenty percent of the trips would be via other arterial streets, such as 12 Mile or Haggerty Roads. The direction of approach/departure for the Magna International development, which will be located on Haggerty between 12 and 13 Mile Roads, was based on the current Magna's employee distribution in the region; that analysis yielded approximately seventy-four percent of traffic to/from the freeway system.

Since the SEMCOG regional data considers a much larger region than that in which people would likely locate for this development, it is expected the actual distribution for this

## Office-Research Technology Park Traffic Impact Study

---

development will be between the range of seventy-four and ninety percent to and from the freeway system. Thus, it was decided to use a distribution of eighty percent to/from the freeway, with the remaining distributed on the local street system.

That analysis resulted in the following directions of approach:

To/from the south on M-5 (south of 12 Mile)	80%
To/from the north on M-5 (north of 14 Mile)	2%
To/from the south on Haggerty (south of 12 Mile)	5%
To/from the north on Haggerty (north of 14 Mile)	2%
To/from the east on 12 Mile (east of Haggerty)	3%
To/from the west on 12 Mile (west of M-5)	2%
To/from the east on 13 Mile (east of Haggerty)	2%
To/from the west on 13 Mile (west of M-5)	2%
To/from the east on 14 Mile (east of Haggerty)	1%
To/from the west on 14 Mile (west of M-5)	1%
Total	100%

The site-generated traffic volumes were assigned to the road network using the above trip distribution; the results of the assignment are illustrated on Figure 5. The site-generated traffic volumes were added to the background traffic volumes to obtain total future traffic volumes. These volumes are illustrated on Figure 6.

### Capacity Analysis - Future Traffic

A capacity analysis was completed for the future conditions for this development in order to determine the additional roadway needs that cannot be accommodated with the background improvements recommended above. Similar to the background capacity analyses, to obtain acceptable levels of service at the major study intersections as well as the site access points, various lane and traffic control configurations were tested. The results of the level of service analysis with the necessary improvements are shown in Table 8; the capacity analysis worksheets can be found in Appendix V.

**Office-Research Technology Park Traffic Impact Study**

---

figure 5

**Office-Research Technology Park Traffic Impact Study**

---

figure 6

## Office-Research Technology Park Traffic Impact Study

Table 8  
**LEVEL OF SERVICE ANALYSIS - FUTURE CONDITIONS - MITIGATED**

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
12 Mile/Haggerty	<b>Overall</b>	<b>25.1</b>	<b>C</b>	<b>37.0</b>	<b>D</b>
	SB Right	29.9	C	24.7	C
	SB Thru	32.5	C	24.8	C
	NB Right	24.1	C	52.5	D
	NB Through	24.5	C	28.3	C
	WB Through	14.1	B	51.3	D
	EB Right	25.8	C	19.9	B
	EB Thru	28.1	C	19.9	B
13 Mile/Haggerty	<b>Overall</b>	<b>33.5</b>	<b>C</b>	<b>33.3</b>	<b>C</b>
	SB Through/Right	34.5	C	29.4	C
	SB Left	22.1	C	34.7	C
	NB Through/Right	25.6	C	34.7	C
	NB Left	39.9	D	48.5	D
	WB Right	27.8	C	28.0	C
	WB Through	29.9	C	38.5	D
	WB Left	46.3	D	26.0	C
	EB Right	35.4	D	27.2	C
	EB Through	39.8	D	28.1	C
	EB Left	21.3	C	34.4	C

(Cont'd)



## Office-Research Technology Park Traffic Impact Study

Table 8 (Cont'd)

### LEVEL OF SERVICE ANALYSIS - FUTURE CONDITIONS - MITIGATED

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
14 Mile/Haggerty	<b>Overall</b>	<b>32.5</b>	<b>C</b>	<b>41.3</b>	<b>D</b>
	SB Through/Right	38.5	D	28.5	C
	SB Left	36.0	D	38.5	D
	NB Right	31.8	C	24.7	C
	NB Through	32.5	C	51.2	D
	NB Left	48.3	D	53.3	D
	WB Right	19.3	B	28.1	C
	WB Through	19.9	B	51.9	D
	WB Left	33.4	C	27.6	C
	EB Right	21.2	C	27.8	C
	EB Through	32.2	C	32.6	C
	EB Left	13.9	B	41.6	D
12 Mile/M-5 Off-Ramp	<b>Overall</b>	<b>45.6</b>	<b>D</b>	<b>73.6</b>	<b>E</b>
	Northbound Right	53.7	D	41.1	D
	Northbound Left	27.4	C	105.4	F
	Westbound Through	59.8	E	85.9	F
	Eastbound Through	33.5	C	14.0	B
12 Mile/Crossover East of Haggerty (E.B. to W.B.)	<b>Overall</b>	<b>18.2</b>	<b>B</b>	<b>33.6</b>	<b>C</b>
	Westbound Through	15.9	B	33.6	C
	Eastbound Left	22.2	C	33.6	C
12 Mile/Crossover West of Haggerty (W.B. to E.B.)	<b>Overall</b>	<b>22.2</b>	<b>C</b>	<b>21.1</b>	<b>C</b>
	Eastbound Through	33.7	C	30.1	C
	Westbound Left	21.1	C	19.5	B

LOS - Level of Service

Delay - is average stopped delay per vehicle in seconds

At the intersection of *12 Mile Road and Haggerty Road* no improvements will be needed. As shown in Table 8, the intersection will operate at an overall LOS "C" for the A.M. peak hour

## Office-Research Technology Park Traffic Impact Study

---

and LOS "D" for the P.M. peak hour. All individual movements will operate at LOS "D" or better during both peak hours.

At the intersection of *13 Mile Road and Haggerty Road* the following improvement will be needed:

- East Approach: A westbound right-turn lane.

This improvement will enable the intersection to operate at an overall LOS "C" during both peak hours. All individual movements will operate at LOS "D" or better during both peak hours.

At the intersection of *14 Mile Road and Haggerty Road* the following improvement will be needed:

- South Approach: A northbound right-turn lane.

These improvements will allow the intersection to operate at an overall LOS "C" during the A.M. peak hour and LOS "D" during the P.M. peak hour. All individual movements will operate at LOS "D" or better during both peak hours.

At the intersection of *12 Mile Road and the M-5 Off-Ramp* a third northbound right turn lane will be needed on the south approach to accommodate the high volume of right turns in the morning peak hour. A third left turn lane would be needed to accommodate the afternoon peak hour volumes; alternatively, completion of the loop ramp in the northeast quadrant would eliminate the need for a triple left turn.

The third northbound right turn lane will enable the intersection to operate at an overall LOS "D" during the A.M. peak hour and an overall LOS "E" during the P.M. peak hour.

At the intersection of *12 Mile Road and the eastbound-to-westbound crossover, east of Haggerty Road*, no improvement will be needed. The intersection will operate at an overall LOS "B" during the A.M. peak hour and LOS "C" during the P.M. peak hour. All individual movements operate at LOS "C" or better during both peak hours.

At the intersection of *12 Mile Road and the westbound-to-eastbound crossover, west of Haggerty Road*, no improvements will be necessary. The intersection will operate at an

## Office-Research Technology Park Traffic Impact Study

overall LOS "C" during both peak hours. All individual movements operate at LOS "C" or better during both peak hours.

### Site Access

Signalization was assumed at all site collector road intersections with the major streets except the collector road on 14 Mile Road. The results of the level of service analysis for the collector street intersections with the arterial street system can be found in Table 9; the capacity analysis worksheets can be found in Appendix V.

Table 9

### LEVEL OF SERVICE ANALYSIS - COLLECTOR STREETS

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
12 Mile/Collector	<b>Overall</b>	<b>21.2</b>	<b>C</b>	<b>35.8</b>	<b>D</b>
	SB Right	16.3	B	46.7	D
	WB Through/Right	20.8	C	33.2	C
	EB Left	22.8	C	19.1	B
13 Mile/Collector	<b>Overall</b>	<b>33.4</b>	<b>C</b>	<b>31.7</b>	<b>C</b>
	SB Right	2.9	A	10.6	B
	SB Through	53.8	D	23.8	C
	SB Left	41.4	D	13.5	B
	NB Through/Right	40.8	D	13.0	B
	NB Left	43.0	D	40.3	D
	WB Through/Right	53.7	D	43.4	D
	WB Left	49.4	D	27.3	C
	EB Right	6.9	A	28.1	C
	EB Through	8.9	A	37.9	D
	EB Left	51.0	D	51.2	D

(Cont'd)

## Office-Research Technology Park Traffic Impact Study

Table 9 (Cont'd)

### LEVEL OF SERVICE ANALYSIS - SITE COLLECTOR STREETS

Location	Movement	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
Haggerty/North Collector	<b>Overall</b>	<b>7.6</b>	<b>A</b>	<b>13.5</b>	<b>B</b>
	SB Through/Right	7.4	A	11.6	B
	NB Through	6.0	A	13.3	B
	NB Left	12.5	B	9.3	A
	EB Right	31.2	C	25.8	C
	EB Left	31.1	C	23.9	C
Haggerty/South Collector	<b>Overall</b>	<b>3.8</b>	<b>A</b>	<b>14.2</b>	<b>B</b>
	SB Through Right	2.5	A	12.8	B
	NB Through	1.7	A	13.9	B
	NB Left	16.6	B	9.8	A
	EB Right	46.6	D	26.6	C
	EB Left	44.5	D	24.2	C
14 Mile/Collector (Unsignalized)	<b>Overall</b>	<b>26.4</b>	<b>C</b>	<b>40.2</b>	<b>E</b>
	WB Left	9.8	A	9.2	A
	NB Left	26.4	D	50.7	F
	NB Right	26.4	D	13.9	B

LOS - Level of Service

Delay - is average stopped delay per vehicle in seconds

#### 12 Mile Road Access

The following lane configuration is necessary to enable the intersection to operate at acceptable levels of service:

- North Approach: Dual southbound right turn lanes.
- West Approach: A second left turn lane (at crossover).

## Office-Research Technology Park Traffic Impact Study

The capacity analysis results, as presented in Table 9, show the intersection will operate at overall LOS "C" during the A.M. peak hour and overall LOS "D" during the P.M. peak hour. All individual movements will operate at LOS "D" or better for both peak hours.

This analysis also yields the maximum queue length anticipated for each approach. Based on this analysis, the dual southbound right turn lanes onto 12 Mile Road will need to be about 400 to 450 feet long. The existing eastbound-to-westbound 12 Mile Road crossover that will serve the site will need to be two lanes wide with a length in the range of 375 to 400 feet. The westbound right turns projected into the site are very low, and thus, the right turn lane will only need to be 100 feet long.

### *13 Mile Road Access*

The following lane configuration on each approach is needed to enable the intersection to operate adequately:

- North Approach: A southbound right turn lane, a shared through/right lane, and a left turn lane.
- South Approach: A northbound left turn lane and a northbound shared through/right lane.
- East Approach: A westbound left turn lane and a second westbound through lane.
- West Approach: An eastbound left turn lane and an eastbound right turn lane.

The capacity analysis results show that the intersection will operate at LOS "C" with all individual movements at LOS "D" or better, for both peak hours.

### *Haggerty Road Access Between 13 and 14 Mile Road*

The following lane configuration will be needed to allow the intersection to operate adequately:

- North Approach: A second southbound through lane.
- South Approach: A northbound left turn lane and a second northbound through lane.
- West Approach: An eastbound left turn lane and an eastbound right turn lane.

The capacity analysis results show that the intersection will operate at LOS "A" during the A.M. peak hour and LOS "B" during the P.M. peak hour, with all individual movements at LOS "C" or better, for both peak hours.

## **Office-Research Technology Park Traffic Impact Study**

The outbound left turn lane should be 100 feet and the outbound right turn lane should be 150 feet. The northbound left turn lane should be 100 feet.

### *Haggerty Road Access Between 12 and 13 Mile Road*

The following lane configuration will be needed to allow the intersection to operate adequately:

- North Approach: A second southbound through lane.
- South Approach: A northbound left turn lane and a second northbound through lane.
- West Approach: An eastbound left turn lane and an eastbound right turn lane.

The capacity analysis results show that the intersection will operate at LOS "A" during the A.M. peak hour and LOS "B" during the P.M. peak hour, with all individual movements at LOS "D" or better, for both peak hours.

The outbound left turn lane should be 100 feet and the outbound right turn lane should be 150 feet. The northbound left turn lane should be 100 feet.

### *14 Mile Road Access*

The intersection was analyzed as unsignalized. The following lane configuration will be required:

- South Approach: A northbound left-turn lane and a northbound right-turn lane.

The capacity analysis results show that the intersection will operate at LOS "C" during the A.M. peak hour and LOS "E" during the P.M. peak hour. The northbound left turn in the P.M. peak hour will operate at LOS "F". Although this is a low level of service, the outbound afternoon left turn volume is very low (25 vehicles). At a later time, as the remaining property that is not part of this project is developed, signalization may be required at this location.

## **Office-Research Technology Park Traffic Impact Study**

---

### **4. Conclusions**

---

The results of this study have indicated that the proposed development can be accommodated by the road network surrounding the site. Certain road improvements will be needed to support the development as outlined in the previous section. Since most site traffic will have access to the nearby freeway system via the new M-5 limited access road, the impact on nearby arterial streets will be minimal. Implementing the road improvements as outlined in this report will safely and adequately accommodate the proposed office-service technology park.

# Memo



VIA EMAIL

To: **Mr. Matthew S. Sosin**  
**Northern Equities Group**

From: **Julie M. Kroll, PE, PTOE**  
**Steven J. Russo, PE**  
**Fleis & VandenBrink**

Date: **June 16, 2017**

Re: **HCCP NEG SPEC BUILDING JSP 17-30**  
**Novi, Michigan**  
**Trip Generation & Traffic Volume Analysis**

## Introduction

This memorandum presents an evaluation of traffic generation for the 300 acre Haggerty Corridor Corporate Park (HCCP) development project. The property is located in an area bound by Haggerty Road on the east, 12 Mile Road on the south, M-5 on the west, and ¼ mile south of 14 Mile Road on the north in Novi, Michigan. A Traffic Impact Study (TIS) was previously completed for the development by Parsons Transportation Group Inc. of Michigan dated July, 1999. The TIS completed by Parsons included the evaluation of 2,540,900 square feet (SF) of building area for an office-research technology park. To date, 1,687,860 SF of building area has been constructed within HCCP with another 200,000 SF general office building currently proposed. This study has been completed upon the request of the City and their traffic consultant (AECOM) to provide a comparison of the 1999 study to the current land uses trip generation, and existing and projected traffic volumes based on existing (2017) standards and available data.

## Trip Generation Comparison

A trip generation comparison between the existing / proposed land uses within HCCP and those previously evaluated in the 1999 study was completed. The number of peak hour and daily vehicle trips were generated for the existing and proposed land uses using the equations published by the Institute of Transportation Engineers (ITE) in Trip Generation, 9th Edition. In order to calculate the site trip generation for the HCCP, the existing / proposed uses must be matched to the land use categories described by ITE. Review of the ITE land use descriptions indicates that the Office Park (#750) use best matches the existing / proposed uses of HCCP. The trip generation was segregated by the portion south and north of 13 Mile Road and the site trip generation comparison is summarized in Table 1.

**Table 1: Site Trip Generation Comparison**

Land Use	ITE Code	Amount	Units	Average Daily Traffic	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
<b>1999 Traffic Study</b>										
Office / Business Park		2,540,900	SF	28,050	3,105	480	3,585	575	2,585	3,160
<b>2022 Projected Site-Generated Traffic Volumes</b>										
<b>North of 13 Mile Road</b>										
Office Park	750	1,525,835	SF	16,308	1,971	244	2,215	274	1,683	1,957
<b>South of 13 Mile Road</b>										
Office Park	750	997,025	SF	10,798	1,326	164	1,490	184	1,128	1,312
<b>TOTAL</b>										
Office Park	750	2,522,860	SF	27,106	3,297	408	3,705	458	2,811	3,269
<b>DIFFERENCE</b>										
<b>TOTAL</b>				-944	192	-72	120	-117	226	109

27725 Stansbury Boulevard, Suite 150  
Farmington Hills, MI 48334  
P: 248.536.0080  
F: 248.536.0079  
www.fveng.com



The results of the trip generation comparison indicate that the existing / proposed uses within the HCCP would result in a minor (~3%) increase in overall AM and PM peak hour trips as compared to the traffic projections from the 1999 TIS.

**Traffic Volume Comparisons**

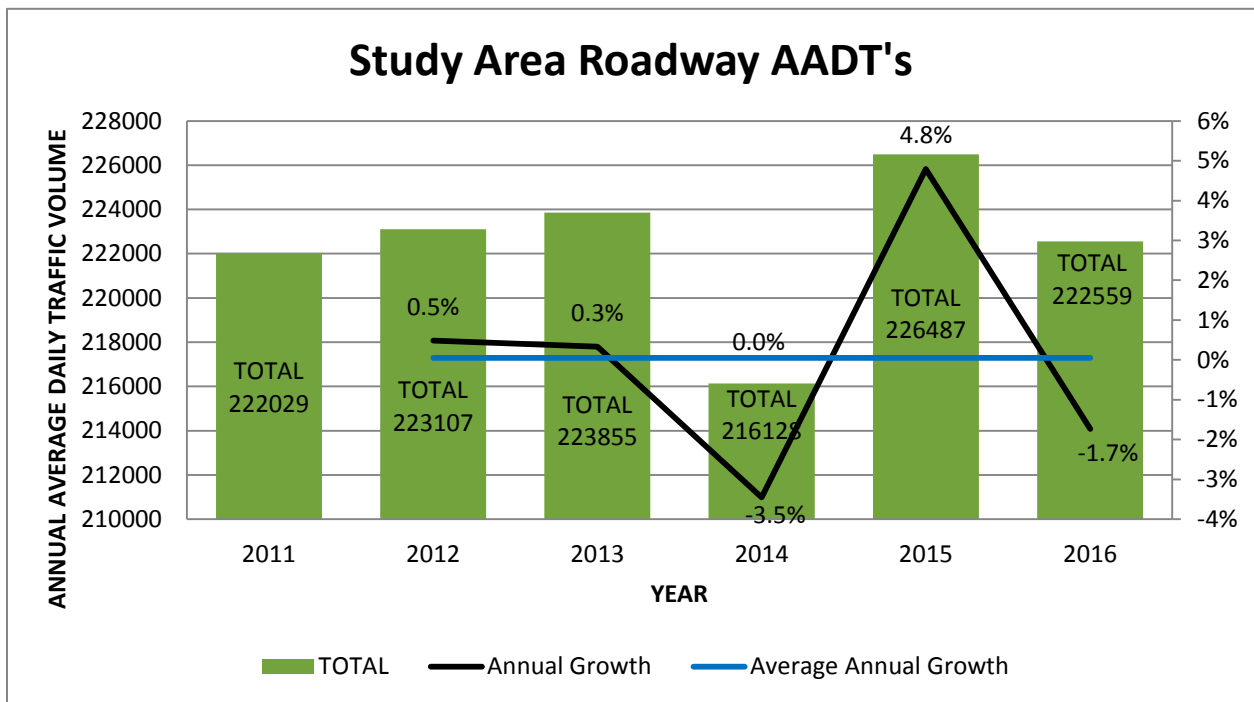
An AM and PM peak hour traffic volume comparison was also completed for the following study intersections included in the 1999 TIS. These intersections were selected based on the availability of recent turning movement count data collected within the previous three years.

- 13 Mile Road & Haggerty Road,
- 13 Mile Road & Cabot Drive,
- Haggerty Road & Lewis Drive, and
- 14 Mile Road & Haggerty Road (PM Only)

Background Traffic

In order to calculate an applicable background growth rate for the existing traffic volumes to the project build-out year of 2022, historical traffic volumes from the Southeast Michigan Council of Government (SEMCOG) on area roadways adjacent to the HCCP were reviewed. The results of this analysis are summarized in Exhibit 1 and indicate that overall no growth occurred over the five year analysis period; however, some of the years showed growth ranging from 0.3% to 4.8%. Therefore, an annual growth rate of 1.0% per year was utilized for this analysis and applied to the 2016 traffic volumes to project future 2022 traffic volumes.

**Exhibit 1: Background Traffic Growth**



In addition to background traffic growth, it is important to account for traffic that will be generated by developments within the vicinity of the study area that have yet to be constructed or were currently under construction at the time of the data collection. The following background developments were identified in or near the project area:

- Autoneum Office / Warehouse
- Magna Seating Headquarters

The vehicle trips that would be generated by the background developments were assigned to the study intersections based on the traffic study completed by Parsons for the Autoneum development dated March, 2016.

Site-Generated Traffic

The number of vehicle trips that would be generated by the remaining undeveloped parcels within the HCCP was forecast based on the percentage of overall building area yet to be constructed. Based on information provided by Northern Equities Group, approximately 50% and 8% of the HCCP property north and south of 13 Mile Road respectively, remains unbuilt. The site-trip generation forecast for the remaining vacant property is summarized in Table 2.

**Table 2: HCCP Vacant Parcels Site Trip Generation**

Land Use	ITE Code	Amount	Units	Average Daily Traffic	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
<b>North of 13 Mile Road</b>										
Office Park	750	755,000	SF	8,154	986	122	1,108	137	842	979
<b>South of 13 Mile Road</b>										
Office Park	750	80,000	SF	864	106	13	119	15	90	105
<b>TOTAL</b>										
Office Park	750	835,000	SF	9,018	1,092	135	1,227	152	932	1,084

The peak hour site generated trips shown in Table 2 were assigned to the adjacent road network based on existing traffic patterns for the HCCP. These patterns indicate the site trip distribution summarized in Table 3. The site generated trips were added to the background traffic volumes to calculate the future 2022 peak hour traffic volumes.

**Table 3: Site Trip Distribution**

South Parcel			North Parcel		
To / From	Via	%	To / From	Via	%
North	Haggerty Road	6%	North	Haggerty Road	14%
	Cabot Drive	3%		South	Cabot Drive
South	Haggerty Road	9%	South		Haggerty Road
East	12 Mile Road	9%	East	13 Mile Road	15%
	13 Mile Road	10%	West	13 Mile Road	53%
West	12 Mile Road	33%			
	13 Mile Road	30%			

Turning Movement Count Comparison

The future projected traffic volumes in the 1999 Parsons TIS were compared to the projected future 2022 traffic volumes based on full buildout of the HCCP. The results of this comparison are summarized in Table 4 and indicate that overall the projected 2022 traffic volumes at the study intersections are substantially less than the 1999 Parsons study, with the exception of the 13 Mile Road intersections with Cabot Drive and Haggerty Road. At the intersection of 13 Mile Road & Haggerty Road, future 2022 traffic volumes are significantly less during the AM peak hour and similar during the PM peak hour. At the intersection of 13 Mile Road & Cabot Drive, future 2022 traffic volumes are slightly higher during the AM peak hour and similar during the PM peak hour.

However, recent improvements have been constructed for this intersection including the installation of a traffic signal and addition of left-turn phasing for all approaches. Additionally, the increase in traffic volumes during the AM peak hour are mostly attributed to the EB and WB right-turn movements at the intersection. Based on the 13 Mile & Cabot Signal phasing study completed by AECOM dated July, 2016, there is excess capacity available for these movements during the PM peak hour. Therefore, the intersection can accommodate the projected increase in traffic demand as compared to the 1999 Parsons study.

**Table 4: Traffic Volume Comparison**

Intersection	Approach	Movement	AM Peak Hour			PM Peak Hour		
			1999	2022	% Change	1999	2022	% Change
14 Mile Road & Haggerty Road	EB	Left				125	112	-10%
		Thru				370	442	19%
		Right				219	122	-44%
	WB	Left				125	111	-11%
		Thru				370	438	18%
		Right				219	219	0%
	NB	Left				341	171	-50%
		Thru				1003	533	-47%
		Right				106	104	-2%
	SB	Left				170	238	40%
Thru					551	483	-12%	
Right					37	95	157%	
<b>Total</b>						<b>3636</b>	<b>3068</b>	<b>-16%</b>
13 Mile Road & Haggerty Road	EB	Left	146	36	-75%	111	205	85%
		Thru	345	287	-17%	203	448	121%
		Right	249	101	-59%	136	106	-22%
	WB	Left	146	169	16%	111	99	-11%
		Thru	345	378	10%	203	291	43%
		Right	249	130	-48%	136	157	15%
	NB	Left	133	113	-15%	241	212	-12%
		Thru	506	275	-46%	814	662	-19%
		Right	79	36	-54%	134	116	-13%
	SB	Left	60	134	123%	100	183	83%
		Thru	881	591	-33%	677	391	-42%
		Right	70	164	134%	123	120	-2%
<b>Total</b>			<b>3209</b>	<b>2414</b>	<b>-25%</b>	<b>2989</b>	<b>2990</b>	<b>0%</b>
13 Mile Road & Cabot Drive	EB	Left	1165	930	-20%	210	87	-59%
		Thru	705	666	-6%	330	417	26%
		Right	410	610	49%	75	30	-60%
	WB	Left	35	66	89%	5	29	480%
		Thru	240	265	10%	629	660	5%
		Right	95	175	84%	125	33	-74%
	NB	Left	35	25	-29%	185	274	48%
		Thru	10	52	420%	10	46	360%
		Right	10	15	50%	40	147	268%
	SB	Left	25	25	0%	80	217	171%
		Thru	10	66	560%	10	42	320%
		Right	18	86	378%	975	698	-28%
<b>Total</b>			<b>2758</b>	<b>2981</b>	<b>8%</b>	<b>2674</b>	<b>2680</b>	<b>0%</b>
Haggerty Road & Lewis Drive	EB	Left	5	10	100%	30	41	37%
		Right	25	24	-4%	140	108	-23%
	NB	Left	150	120	-20%	30	18	-40%
		Thru	713	437	-39%	1159	843	-27%
	SB	Thru	1384	693	-50%	1003	605	-40%
<b>Total</b>			<b>2317</b>	<b>1396</b>	<b>-40%</b>	<b>2372</b>	<b>1628</b>	<b>-31%</b>

Additionally, any minor increases in traffic volumes from the recent data and additional site generated traffic are not expected to generate any additional mitigation measures that are not previously recommended in the Parsons 1999 report. Therefore, it is recommended that this memorandum serve as an addendum to the previous traffic study to reflect projected trip generation and future traffic volumes within the study area.

### **Conclusions**

The conclusions of this Trip generation & Traffic Volume Comparison are as follows:

1. The existing / proposed uses within the HCCP would result in a minor (~3%) increase in overall AM and PM peak hour trips as compared to the traffic projections from the 1999 TIS.
2. Overall the projected 2022 traffic volumes at the study intersections are substantially less than the 1999 Parsons study with the exception of the 13 Mile Road intersections with Cabot Drive and Haggerty Road.
3. Additional capacity is available for the EB and WB right-turn movements at 13 Mile Road & Cabot Drive to accommodate the projected increase in demand for these movements.
4. Any minor increases in traffic volumes from the recent data and additional site generated traffic are not expected to generate any additional mitigation measures that are not previously recommended in the Parsons 1999 report. Therefore, it is recommended that this memorandum serve as an addendum to the previous traffic study to reflect projected trip generation and future traffic volumes within the study area.

Any questions related to this memorandum, study, analysis, and results should be addressed to Fleis & VandenBrink.

**Attached:** Traffic Volume Data

SJR:jmk

Table 1. Peak-Hour Turning Movements

Intersection Approach	Turning Movement	AM Peak Hour Volume	Off-Peak Hour Volume	PM Peak Hour Volume
Eastbound	Left	387	71	13
	Thru	634	241	397
	Right	519	105	17
Westbound	Left	52	29	26
	Thru	252	260	628
	Right	35	29	13
Northbound	Left	15	105	200
	Thru	20	31	26
	Right	13	54	131
Southbound	Left	8	39	94
	Thru	47	37	14
	Right	20	83	240

As shown in Table 1, the turning movement counts show a large amount of traffic entering Cabot Drive from eastbound 13 Mile Road during the morning peak hour. Conversely, there is a large amount of traffic exiting Cabot drive onto westbound 13 Mile Road during the afternoon peak hour, which is reflected in the northbound left-turn and southbound right-turn movements.

Historical traffic volume data was obtained from past studies near the M-5/13 Mile Road and Haggerty Road/13 Mile Road intersections. In addition, existing signal timing permits were provided by the Road Commission for Oakland County (RCOC) for the 13 Mile Road signals at M-5, Cabot Drive, and Haggerty Road.

**Crash Data**

AECOM gathered crash data at the 13 Mile Road/Cabot Drive intersection for time periods before and after the traffic signal installation. Crash data was obtained from the Traffic Improvement Association’s (TIA) Traffic Crash Analysis Tool (TCAT). Data was collected for the “before signal” period from January 1, 2010 through May 31, 2014, and the “after signal” period from September 1, 2014 through December 31, 2015. Data was collected for crashes occurring within 150-feet of the intersection center.

The crash data showed that seven crashes occurred during the “before signal” period when the intersection was under two-way stop control. Two of these collisions were angle crashes – both occurring when a northbound Cabot Drive vehicle failed to yield to a westbound 13 Mile Road vehicle.

Two crashes occurred at this intersection during the “after signal” period. One of the two collisions was a rear-end crash that occurred along eastbound 13 Mile Road when a vehicle failed to stop at a red light.

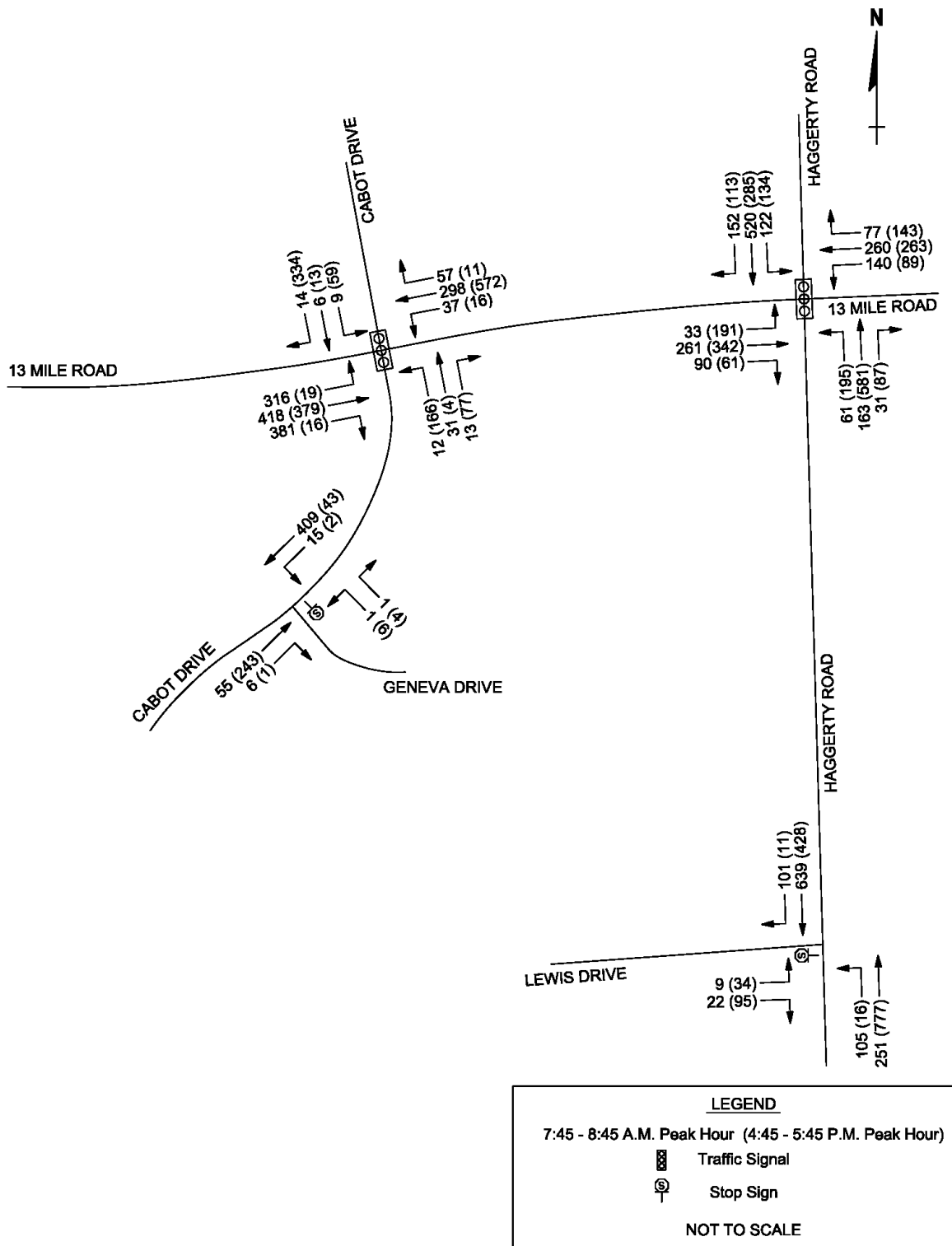


Figure 2 - Existing (2016) Peak Hour Traffic Volumes

**Traffic Study Performed For:  
 FLEIS & VANDENBRINK**

**Project: Commerce Twp. Kroger Study**  
**Location: Haggerty Rd. & 14 Mile Rd.**  
**Weather: Lt. Rain, Temp. 40's**  
**Miovision Video VCU: SCU3EP**

**File Name : TMC3\_Haggerty\_14Mile**  
**Site Code : TMC\_3**  
**Start Date : 12/16/2014**  
**Page No : 1**

**Groups Printed- Pass Cars - Single Units - Heavy Trucks - Ped**

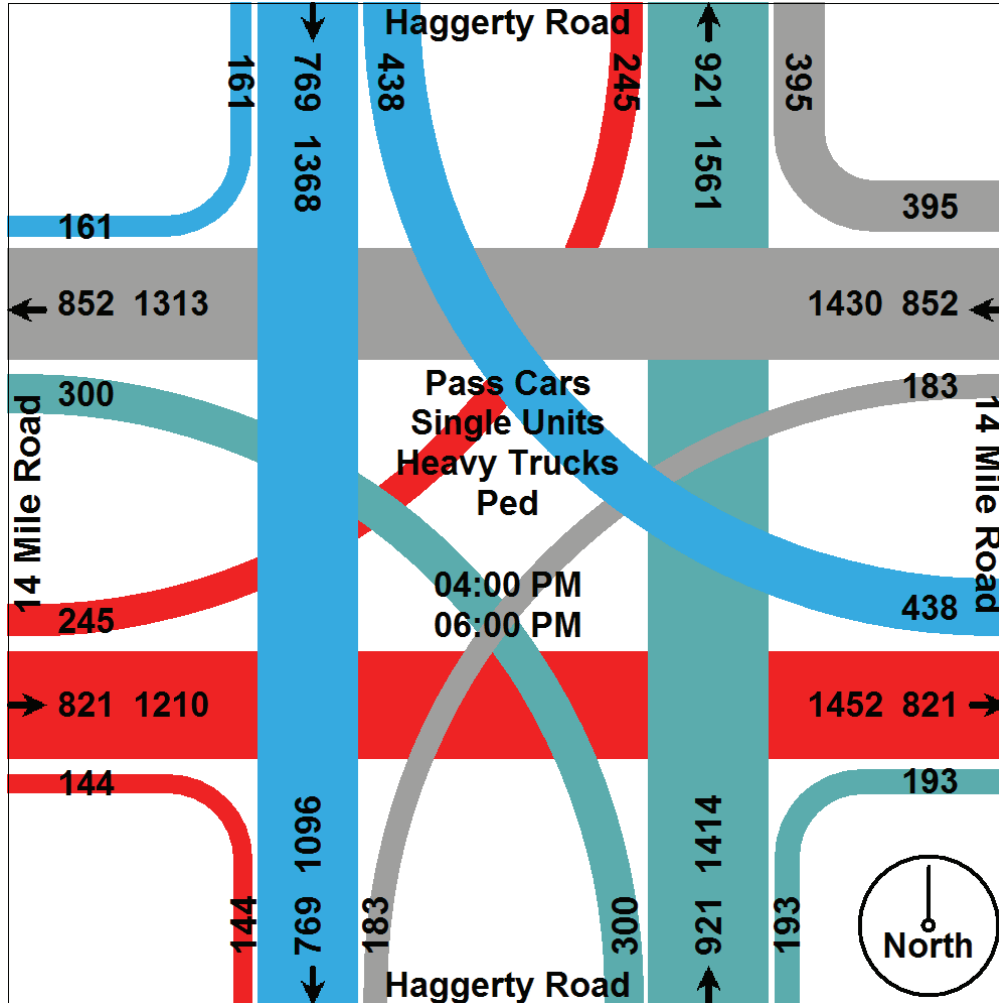
Start Time	Haggerty Road Southbound					14 Mile Road Westbound					Haggerty Road Northbound					14 Mile Road Eastbound					Int. Total
	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	
04:00 PM	19	77	44	0	140	44	114	18	0	176	24	104	27	0	155	14	94	36	0	144	615
04:15 PM	22	87	52	1	162	62	102	20	0	184	26	130	41	0	197	15	103	34	0	152	695
04:30 PM	15	102	59	0	176	44	105	24	1	174	27	111	37	0	175	19	99	30	0	148	673
04:45 PM	21	97	60	0	178	56	106	25	0	187	17	119	45	0	181	19	104	32	0	155	701
<b>Total</b>	<b>77</b>	<b>363</b>	<b>215</b>	<b>1</b>	<b>656</b>	<b>206</b>	<b>427</b>	<b>87</b>	<b>1</b>	<b>721</b>	<b>94</b>	<b>464</b>	<b>150</b>	<b>0</b>	<b>708</b>	<b>67</b>	<b>400</b>	<b>132</b>	<b>0</b>	<b>599</b>	<b>2684</b>
05:00 PM	26	110	66	0	202	54	101	24	0	179	24	121	37	0	182	24	100	23	2	149	712
05:15 PM	20	94	49	0	163	47	102	24	0	173	29	134	30	0	193	19	106	29	0	154	683
05:30 PM	23	111	51	0	185	51	108	23	0	182	25	110	34	0	169	17	111	23	0	151	687
05:45 PM	15	90	57	0	162	37	114	25	0	176	21	92	49	0	162	17	104	38	0	159	659
<b>Total</b>	<b>84</b>	<b>405</b>	<b>223</b>	<b>0</b>	<b>712</b>	<b>189</b>	<b>425</b>	<b>96</b>	<b>0</b>	<b>710</b>	<b>99</b>	<b>457</b>	<b>150</b>	<b>0</b>	<b>706</b>	<b>77</b>	<b>421</b>	<b>113</b>	<b>2</b>	<b>613</b>	<b>2741</b>
06:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Grand Total</b>	<b>161</b>	<b>769</b>	<b>438</b>	<b>1</b>	<b>1369</b>	<b>395</b>	<b>852</b>	<b>183</b>	<b>1</b>	<b>1431</b>	<b>193</b>	<b>921</b>	<b>300</b>	<b>0</b>	<b>1414</b>	<b>144</b>	<b>821</b>	<b>245</b>	<b>2</b>	<b>1212</b>	<b>5426</b>
<b>Apprch %</b>	<b>11.8</b>	<b>56.2</b>	<b>32</b>	<b>0.1</b>		<b>27.6</b>	<b>59.5</b>	<b>12.8</b>	<b>0.1</b>		<b>13.6</b>	<b>65.1</b>	<b>21.2</b>	<b>0</b>		<b>11.9</b>	<b>67.7</b>	<b>20.2</b>	<b>0.2</b>		
<b>Total %</b>	<b>3</b>	<b>14.2</b>	<b>8.1</b>	<b>0</b>	<b>25.2</b>	<b>7.3</b>	<b>15.7</b>	<b>3.4</b>	<b>0</b>	<b>26.4</b>	<b>3.6</b>	<b>17</b>	<b>5.5</b>	<b>0</b>	<b>26.1</b>	<b>2.7</b>	<b>15.1</b>	<b>4.5</b>	<b>0</b>	<b>22.3</b>	
<b>Pass Cars</b>	<b>161</b>	<b>764</b>	<b>436</b>	<b>0</b>	<b>1361</b>	<b>393</b>	<b>844</b>	<b>183</b>	<b>0</b>	<b>1420</b>	<b>190</b>	<b>918</b>	<b>299</b>	<b>0</b>	<b>1407</b>	<b>144</b>	<b>819</b>	<b>244</b>	<b>0</b>	<b>1207</b>	<b>5395</b>
<b>% Pass Cars</b>	<b>100</b>	<b>99.3</b>	<b>99.5</b>	<b>0</b>	<b>99.4</b>	<b>99.5</b>	<b>99.1</b>	<b>100</b>	<b>0</b>	<b>99.2</b>	<b>98.4</b>	<b>99.7</b>	<b>99.7</b>	<b>0</b>	<b>99.5</b>	<b>100</b>	<b>99.8</b>	<b>99.6</b>	<b>0</b>	<b>99.6</b>	<b>99.4</b>
<b>Single Units</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>2</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>25</b>
<b>% Single Units</b>	<b>0</b>	<b>0.5</b>	<b>0.5</b>	<b>0</b>	<b>0.4</b>	<b>0.5</b>	<b>0.9</b>	<b>0</b>	<b>0</b>	<b>0.7</b>	<b>1.6</b>	<b>0.3</b>	<b>0.3</b>	<b>0</b>	<b>0.5</b>	<b>0</b>	<b>0.2</b>	<b>0</b>	<b>0</b>	<b>0.2</b>	<b>0.5</b>
<b>Heavy Trucks</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>
<b>% Heavy Trucks</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.4</b>	<b>0</b>	<b>0.1</b>	<b>0</b>
<b>Ped</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>
<b>% Ped</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0.2</b>	<b>0.1</b>

Comments: Traffic study conducted during atypical weekday (Tuesday) from 4:00-6:00 PM afternoon peak hours & while school was in session. SCATS controlled signalized intersection with push button ped. signals all quadrants.

**Traffic Study Performed For:  
 FLEIS & VANDENBRINK**

Project: Commerce Twp. Kroger Study  
 Location: Haggerty Rd. & 14 Mile Rd.  
 Weather: Lt. Rain, Temp. 40's  
 Miovision Video VCU: SCU3EP

File Name : TMC3\_Haggerty\_14Mile  
 Site Code : TMC\_3  
 Start Date : 12/16/2014  
 Page No : 2





**Traffic Study Performed For:  
 FLEIS & VANDENBRINK**

**Project: Commerce Twp. Kroger Study**  
**Location: Haggerty Rd. & 14 Mile Rd.**  
**Weather: Lt. Rain, Temp. 40's**  
**Miovision Video VCU: SCU3EP**

**File Name : TMC3\_Haggerty\_14Mile**  
**Site Code : TMC\_3**  
**Start Date : 12/16/2014**  
**Page No : 3**

Start Time	Haggerty Road Southbound				14 Mile Road Westbound				Haggerty Road Northbound				14 Mile Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 06:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	21	97	60	178	56	106	25	187	17	119	45	181	19	104	32	155	701
05:00 PM	26	110	66	202	54	101	24	179	24	121	37	182	24	100	23	147	710
05:15 PM	20	94	49	163	47	102	24	173	29	134	30	193	19	106	29	154	683
05:30 PM	23	111	51	185	51	108	23	182	25	110	34	169	17	111	23	151	687
Total Volume	90	412	226	728	208	417	96	721	95	484	146	725	79	421	107	607	2781
% App. Total	12.4	56.6	31		28.8	57.8	13.3		13.1	66.8	20.1		13	69.4	17.6		
PHF	.865	.928	.856	.901	.929	.965	.960	.964	.819	.903	.811	.939	.823	.948	.836	.979	.979
Pass Cars	90	411	226	727	207	414	96	717	94	483	145	722	79	420	106	605	2771
% Pass Cars	100	99.8	100	99.9	99.5	99.3	100	99.4	98.9	99.8	99.3	99.6	100	99.8	99.1	99.7	99.6
Single Units	0	1	0	1	1	3	0	4	1	1	1	3	0	1	0	1	9
% Single Units	0	0.2	0	0.1	0.5	0.7	0	0.6	1.1	0.2	0.7	0.4	0	0.2	0	0.2	0.3
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0.2	0.0
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

