

**MASTER PLAN AND ZONING COMMITTEE**  
**City of Novi Planning Commission**  
**September 11, 2019 at 6:00 p.m.**  
**Novi Civic Center – Council Conference Room**  
**45175 W. Ten Mile, Novi, MI 48375**  
**(248) 347-0475**  
**AGENDA**

**Members:** Anthony, Avdoulos, Gronachan

**Staff Support:** Barb McBeth, Sri Ravali Komaragiri, Tom Schultz, Madeleine Kopko

- 1. Roll Call**
- 2. Approval of Agenda**
- 3. Approval of March 13, 2019 Master Plan and Zoning Committee meeting minutes**
- 4. Audience Participation and Correspondence**
- 5. Discussion Items**
  - A. Rezoning request from Office Service Technology(OST) to Multi-family residential (RM-2) using a Planning Rezoning Overlay option  
Review and provide comments on the rezoning request for a 22 acres of property located on the west side of Haggerty Road, north of Twelve Mile Road in Section 12 from Office Service Technology(OST) to Multi-family residential (RM-2) using a Planning Rezoning Overlay option.
- 6. Adjourn**



**MASTER PLAN AND ZONING COMMITTEE**  
**City of Novi Planning Commission**  
**March 13, 2019 at 6:00 p.m.**  
**Novi Civic Center – Council Conference Room**  
**45175 W. Ten Mile, Novi, MI 48375**  
**(248) 347-0475**  
**DRAFT MINUTES**

**CALL TO ORDER**

The meeting was called to order at 6:06 p.m.

**1. Roll Call**

Present: Member Avdoulos, Chair Pehrson  
Not Present: Member Anthony

Staff Present: Barb McBeth, Sri Komaragiri, Tom Schultz, Hannah Smith

**2. Approval of Agenda**

Motion to approve by Member Avdoulos, seconded by Member Pehrson.

**3. Approval of January 23, 2019 Master Plan and Zoning Committee meeting minutes**

Motion to approve made by Member Avdoulos, seconded by Member Pehrson.

**4. Audience Participation and Correspondence**

There was no audience participation or correspondence.

**5. Discussion Items**

**A. Rezoning request from Regional Commercial (RC) to Regional Commercial with a Planned Development 2 Options (PD-2)**

Review and provide comments on the rezoning request for a 1.40 acres of property located at the south east corner of Novi Road and Twelve Oaks Drive (Section 15) from Regional Commercial (RC) to Regional Commercial with a Planned Development 2 Options (PD-2).

Planner Komaragiri explained that the proposed use is well accepted, but this is coming before the Committee to consider the location. The proposed site is a small lot, which comes with challenges. The site is currently zoned RC, Regional Commercial, and a drive-thru is not allowed there, but can be allowed with a PD-2 Option. This was done on the other side of the road.

City Planner McBeth added that a lot of the outlots around the mall have the PD-2 Option in place, this one does not. Planner Komaragiri said all areas along Twelve Mile have it, but this site on Novi Road does not. The Conference District on the opposite side of the road has a PD-2 Option, as well.

Planner Komaragiri explained that this is a small site with very small space to develop. The Denny's that was on this site is considered legal non-conforming because of parking and the building. Chick-Fil-A wants to do a drive-thru on the site but cannot fall within the legal non-conforming use because of the use and the proposed relocation

of the building. The PD-2 Option allows rezoning and site plan to be done as one application, so there is the benefit that when the rezoning request comes in, there is a site plan as well.

Multiple traffic studies were conducted since traffic is a big issue based on the location of this site, including a Trip Generation Study and a Queuing Study since more stacking may be required. The studies reflect that what the applicant is proposing is sufficient but there is a possibility for the overflow of stacking. A Parking Study was also done because the applicant is proposing less than what is required, and our Traffic consultant has suggested that they work with La-Z-Boy for potential cross-access parking in case overflow parking is needed.

There were concerns with not having a bypass lane but the applicant worked with the Fire Marshal to provide ultimate means so that Fire will have access from all sides of the building as needed. This would still require a deviation for lack of bypass lane. They would have a contingency plan for emergency situations in the drive-thru.

The project would need multiple landscape waivers. But the major issues to consider are the use, the potential lack of parking, etc. There are no natural features on the site. Their Façade is in full compliance.

Jason Hill, with Chick-Fil-A, said we chose this site because of the great location and exposure being right at the interchange, it has great access, great synergy with the mall, and the demographics here are perfect. The size of the site is large enough to accommodate our site plan usually, but size and access points together create a challenge. In trying to balance what we need for operations and what is required from the Ordinance, this is the best layout we could fit for the plan.

Because of popularity, our drive-thru is about 60% of our business so that's obviously an important part. Chick-Fil-A is constantly trying to improve how that works, and part of that is having team members outside. So some team members will be outside with iPads so the drive-thru process is faster. There are dedicated areas where team members will be, and we've started doing canopies with heaters and fans to provide protection for our members as well as the cars in the drive-thru. There is also a canopy at the pick-up window with a bypass lane for Fire.

Chair Pehrson asked about site access and egress. Would cars come in by Red Lobster and go to either drive-thru or to parking, is it forced that cars go out to La-Z-Boy? I am concerned with the traffic flow going onto the ring road being forced to turn right there instead of being able to turn left to get back out to Novi Road. The stacking and the egress point are the only concerns I have.

Mr. Hill said I don't know if there are any alternatives to that, we could look into putting up signage.

Member Avdoulos said for the Planning Commission, I would suggest having a larger site plan with a layout showing the ingress and egress and flow of the site. The larger picture like that is the first thing I look at before looking into the details. It would also be helpful to show the canopies so that people can understand the size of those.

Chair Pehrson asked that if this site is similar in size to others, are the parking numbers the same as other locations?

Planner Komaragiri said based on the parking data, there may be a need for overflow parking at peak times.

City Planner McBeth asked in ranking store volumes, where Chick-Fil-A would expect this one to fall?

Mr. Hill said right now, we are expecting it to be about average.

Chair Pehrson said deviations are the natural course of a new use coming into an existing site that is non-conforming, but a lot of deviations can cause opposition at Planning Commission. It would be helpful if you could explain the deviations up front when you go to Planning Commission.

Planner Komaragiri said there are a couple of Landscape deviations so there is less green space, but so that they have more parking.

City Planner McBeth said this is not a PRO, but it's a PD-2 Option. So with that, all deviations can be built into the agreement instead of having to go to the ZBA. It would be a recommendation to City Council.

Chair Pehrson said this site and use would be getting rid of something that's been vacant and putting something in its place that is upscale and trendy. People will want to come to this site and it will bring people to the City to come here. It's just an awkward site. We'd suggest that you approach La-Z-Boy to discuss shared parking if you haven't already.

City Planner McBeth said we were wondering about the Red Lobster for shared parking, as well.

Chair Pehrson said they get very busy there and the parking lot is often filled up.

Chair Pehrson said I don't think we would have a problem recommending approval for this and moving forward with it, as far as this Committee is concerned. There are other properties in the area with the PD-2, so it is not anything new. Traffic just may pose an issue.

Member Avdoulos agreed and said there will be concerns about traffic and circulation. The brand is recognizable and I think the size is ok, but I'd just suggest you bring forward the ingress and egress issues when this goes to the Planning Commission.

Planner Komaragiri said so the biggest issues are the parking deviations, landscaping which they've made progress on with our Landscape Architect, and the ingress and egress issues. Those are things the Planning Commission will look at.

## **6. Adjourn**

Motion to adjourn made by Member Avdoulos, seconded by Member Pehrson.  
Meeting adjourned at 6:50 p.m.

# MEMORANDUM



**TO:** MASTER PLAN AND ZONING COMMITTEE  
**FROM:** SRI RAVALI KOMARAGIRI, PLANNER  
**THRU:** BARBARA MCBETH, *AICP*, CITY PLANNER  
**SUBJECT:** CONSIDERATION OF PRO CONCEPT PLAN FOR NOVAPLEX  
**DATE:** SEPTEMBER 05, 2019

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The petitioner, BC Novaplex LLC, is requesting a Zoning Map amendment for 22 acre property on the west side of Haggerty Road, north of Twelve Mile Road (Section 12) from Office Service Technology (OST) to High-Density Multiple Family (RM-2) with a Planned Rezoning Overlay. The applicant is proposing to develop a 332 unit multiple-family residential development. The development consists of two attached town style buildings and eight apartment style building. All units are three stories tall at its average grade. The development is a private street network with two entrances off of Haggerty Road.

The applicant submitted for a Pre-Application Meeting, which was held on June 10, 2019. The concept plan would provide enough information to determine the viability of the proposed zoning request from office to residential. The applicant has provided the following studies as part of their application packet. All are attached to this memo.

1. Community Impact Statement
2. Market Study
3. Planning Narrative by CIB planning
  - i. Exhibit B-List of Requested Deviations
  - ii. Exhibit A- List of Project Benefits
  - iii. Exhibit C- Project Information
4. Traffic Impact Study
5. Sign Location Plan
6. Soil boring report
7. Wetland boundary determination

The new rezoning category requested by the applicant is currently not supported by the Future Land Use Map. Staff is requesting the Committee to consider the applicant's request, review staff and consultants' review letters and provide input to provide further direction to staff and the applicant. The review letters from the recent submittal of the Concept Plan review are attached to this memo.

The memo also includes staff reviews for Planning, Engineering, Landscape, Traffic, Wetlands, Woodlands, Façade and Fire. **Please note that recommendations in all reviews are left blank on purpose.**

**MAPS**

Location Map

Zoning

Future Land Use

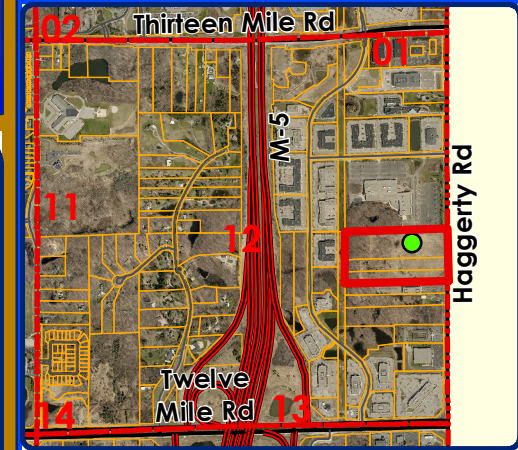
Natural Features

# JZ 19-37 NOVAPLEX

Location

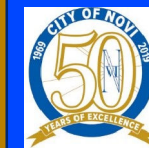


**Subject  
Property**



## LEGEND

 Sections



## City of Novi

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

Map Author: Sri Komaragiri  
Date: 08/23/19  
Version #: 1



1 inch = 287 feet

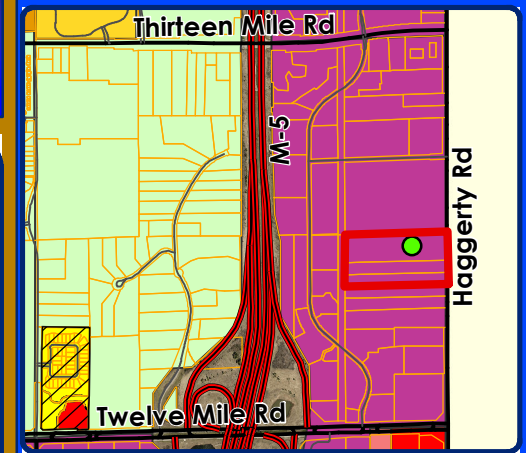
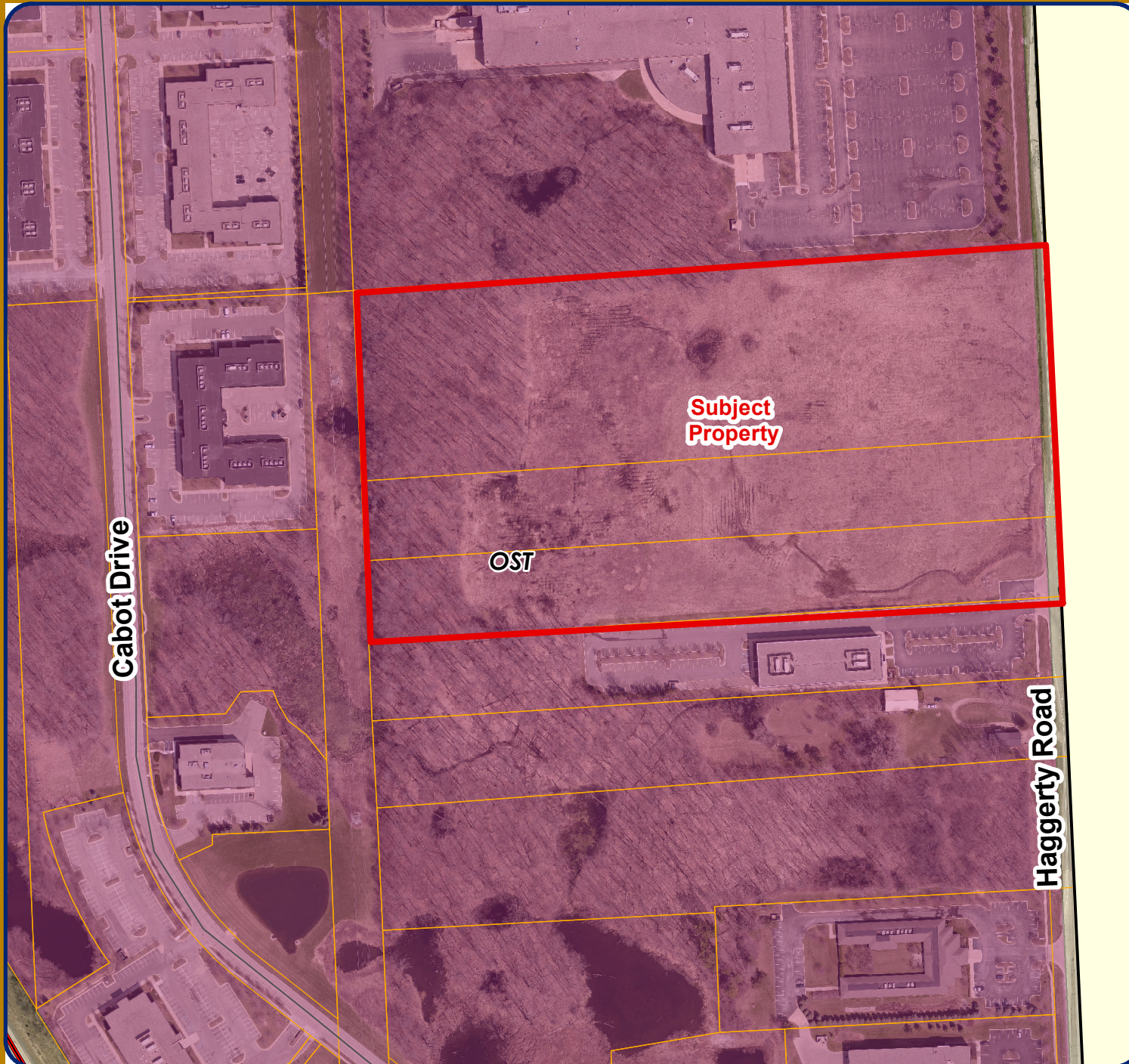


### MAP INTERPRETATION NOTICE

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.

# JZ 19-37 NOVAPLEX









Zoning

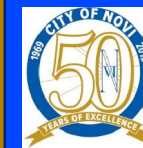


## LEGEND

### Zoning Overlay

#### Overlay Name

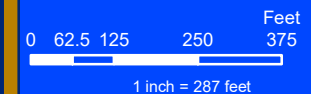
-  Planned Rezoning (PRO)
-  R-A: Residential Acreage
-  R-4: One-Family Residential District
-  RM-1: Low-Density Multiple Family
-  MH: Mobile Home District
-  B-2: Community Business District
-  B-3: General Business District
-  OST: Office Service Technology



## City of Novi

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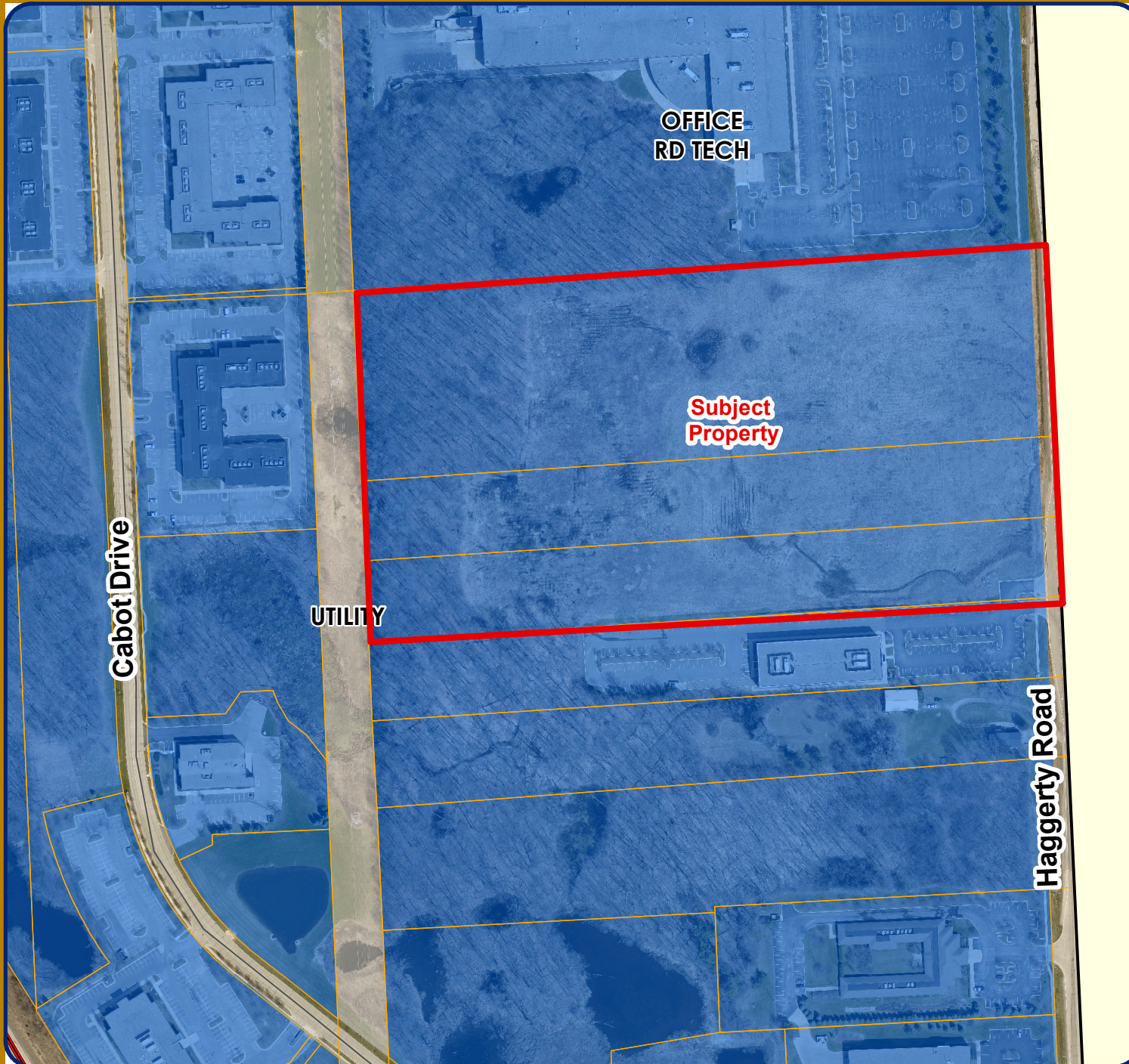
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# JZ 19-37 NOVAPLEX

Future Land Use



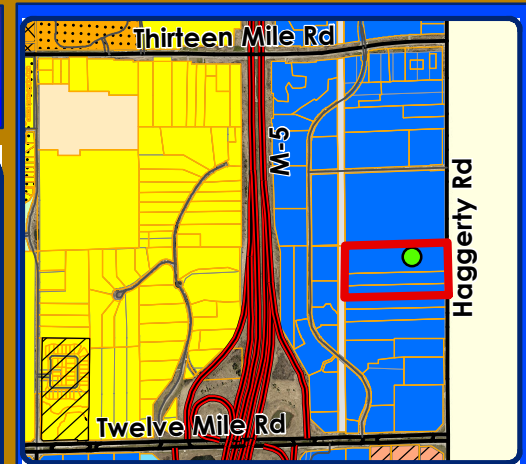
OFFICE  
RD TECH

Subject  
Property

Cabot Drive

UTILITY

Haggerty Road



### LEGEND

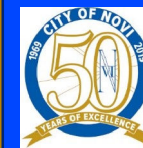
#### Zoning Overlay

##### Overlay Name

Planned Rezoning (PRO)

#### FUTURE LAND USE

- Single Family
- PUD
- PD1
- Mobile Home Park
- Office RD Tech
- Community Commercial
- Educational Facility
- Public
- Private Park
- Utility



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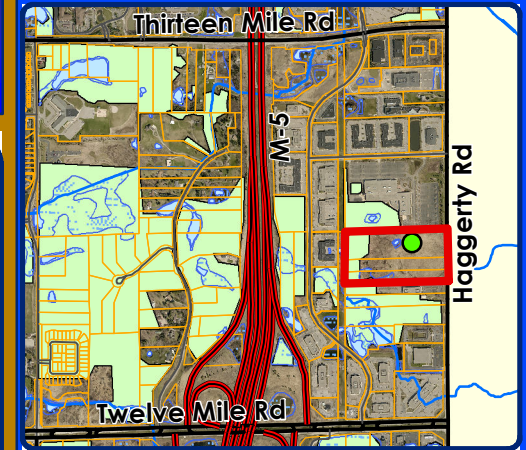


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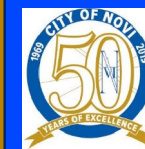
# JZ 19-37 NOVAPLEX

## Natural Features



### LEGEND

-  WETLANDS
-  WOODLANDS



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**PRO CONCEPT PLAN SUBMITTAL**

(Full size drawings available for viewing at Community Development)

## Aerial View of Novaplex from the Southeast



**Please note that not all proposed landscaping is shown. The intent of this plan is to show the massing of the buildings and the relationship between adjacent uses. Please see the Landscape Plan for plant quantities and types**

## **3 Story Townhouse Building #10 - West Facade**



**Building 1 is Similar**

## **3 Story Townhouse Building #10 - East Facade**



**Building 1 is similar**

## PLANNING REVIEW



# PLAN REVIEW CENTER REPORT

## Planning Review

August 27, 2019

### JZ 19-37 NOVAPLEX

Zoning Map Amendment No. 18.733

#### PETITIONER

BC Novaplex LLC

#### REVIEW TYPE

PRO Concept Plan

Rezoning Request from OST Office Service Technology to High-Density Multiple Family RM-2 with a Planned Rezoning Overlay

#### PROPERTY CHARACTERISTICS

<b>Section</b>	12	
<b>Site Location</b>	East side of Haggerty Road, north of Twelve Mile Road	
<b>Site School District</b>	Novi Community School District	
<b>Current Site Zoning</b>	OST, Office Service Technology	
<b>Proposed Site Zoning</b>	RM-2, High-Density Multiple Family	
<b>Adjoining Zoning</b>	North	OST, Office Service Technology
	East	Farmington Hills
	West	OST, Office Service Technology
	South	OST, Office Service Technology
<b>Current Site Use</b>	Vacant	
<b>Adjoining Uses</b>	North	Office
	East	Single family residential development
	West	Office
	South	Medical Office
<b>Site Size</b>	Gross: 22 Acres; Net: 21.04 Acres	
<b>Parcel ID's</b>	50-22-12-400-009, -010, and -011	
<b>Plan Date</b>	July 26, 2019	

#### PROJECT SUMMARY

The subject property is located on the west side of Haggerty Road, north of Twelve Mile Road in Section 12 of the City of Novi. The property totals about 22 acres and contains a significant amount of high-quality regulated woodlands along the western boundary. The applicant is proposing to develop a 332 unit multiple-family residential development. The development consists of two attached town style buildings and eight apartment style building. All units are three stories tall at its average grade. The development is a private street network with two entrances off Haggerty Road. The applicant is requesting to rezone the site from Office Service Technology (OST) to High-Density Multiple Family (RM-2) with a Planned Rezoning Overlay.

#### PROJECT REVIEW HISTORY

A Preliminary Site Plan, also referred to as Novaplex, was initially approved for this subject property on August 16, 2000 for development of office buildings. It was identified by the project number SP 99-32B. Final site plan approval was granted in March 22, 2002. The City held an environmental pre-construction meeting on February 23, 2005, just before the site plan approval expired. In the Spring



of 2005, a majority of regulated woodlands were removed in the western part of the site. At this time, all the previous approvals/extensions for both PRO and the site plan have expired and are no longer valid. The applicant is no longer proposing office development and is requesting to rezone to allow multiple family use.

### PRO OPTION

The PRO option creates a “floating district” with a conceptual plan attached to the rezoning of a parcel. As part of the PRO, the underlying zoning is proposed to be changed (in this case from OST to RM-2) and the applicant enters into a PRO agreement with the City, whereby the applicant submits a conceptual plan for development of the site. The City Council reviews the Concept Plan, and if the plan may be acceptable, it directs for preparation of an agreement between the City and the applicant, which also requires City Council approval. Following final approval of the PRO concept plan and PRO agreement, the applicant will submit for Preliminary and Final Site Plan approval under standard site plan review procedures. The PRO runs with the land, so future owners, successors, or assignees are bound by the terms of the agreement, absent modification by the City of Novi. If the development has not begun within two (2) years, the rezoning and PRO concept plan expires and the agreement becomes void.

### RECOMMENDATION

## **Recommendation left blank on purpose**

### REVIEW CONCERNS

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), Section 7.13 (Amendments to Ordinance) and any other applicable provisions of the Zoning Ordinance. **Please see the attached chart for information pertaining to ordinance requirements.** Items in **bold** below must be addressed and incorporated as part of the next submittal:

1. Supporting Documentation: The applicant has provided the following studies as part of their application packet
  - a. **Community Impact Statement:** The statement concludes that the proposed Rezoning allows for development of an otherwise very difficult parcel to develop. **Staff does not agree with this statement. The parcel has been cleared for development as part of previous plan approvals. The site does not pose any significant challenges for development.** The applicant notes some market challenges that may restrict office development at this time; however, that is not typically a consideration in the development of a property as master-planned.
  - b. The statement also noted that this development would provide a 150 foot wide wildlife corridor across its westerly end for wildlife movement, sheltering and food gathering. It should be noted that the 150 foot corridor is only what would be *remaining* after the additional proposed woodland removals.
  - c. **Traffic Impact Study:** The City’s review of the submitted study notes that the change of use does not create significant impacts despite the flip in peak hour peak direction traffic. Both a right turn deceleration taper and some form of a left turn treatment are warranted along Haggerty Road to address proposed impacts for the site plan.
  - d. **Sign Location Plan:** Please change ‘OST to RM-2’ to ‘OST to RM-2 with a PRO’. Location and other text are acceptable.
  - e. **Soil boring report:** This dates back to 1999. Refer to Engineering review for more details.

- f. **Wetland boundary determination:** The Plan does not include all of the Wetland 'A' area as determined by MDEQ's Wetland Identification Review (letter dated July 5, 2018). Refer to Wetland review for more details.
  - a. **Market Study:** The applicant studied the supply and demand for the multi-family residential development in Novi. It includes information about average rents and vacancy rates. It notes that the demand for multiple-family especially in close proximity to office areas is high. It also studied the demand for office-flex space and noted that office development is not economically feasible. It states that the current average vacancy rate for rental apartment units is at 4 percent.
  - b. **Planning Narrative by CIB planning:** The narrative summarizes findings that support the proposed change of use from Office to Multiple Family Residential using various studies. The narrative also provides a letter of supports from the developer of the neighboring office development, Haggerty Corridor Corporate Park. The narrative includes three exhibits. More comments are provided later in this review.
    - i. Exhibit B-List of Requested Deviations
    - ii. Exhibit A- List of Project Benefits
    - iii. Exhibit C- Project Information
2. **Height of the Buildings:** For RM-2 development, Densities and room count differ based on number of stories for the development. Some of the site data on sheet C 2.0 refers to units as 4 stories. Staff has reviewed the definition for 'story', 'half-story' and 'basement' in Section 2.0 Definitions of the Zoning Ordinance. **After comparing the definitions with the elevations and grade levels shown, the proposed development is considered a three-story development. All requirements for RM-2 development for 'less than four stories' would apply.**
  3. **Deviations:** The current plan would require extensive deviations for the development to work the way it is shown. The PRO ordinance states that *"each Zoning Ordinance provision sought to be deviated would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest, and that approving the deviation would be consistent with the Master Plan and compatible with the surrounding areas."* **The applicant did not provide any sort of reasonable justification to meet the intent of the Ordinance. The plan proposes removal of high quality woodlands that would allow additional density, but does not mitigate the impacts with on-site replacements, or provide sufficient landscape buffers from surrounding developments, or provide usable open space, or offer any other improvements that can be perceived as benefits to the public or to the residents. Please refer to the Deviations section and try to reduce/minimize the extent of impacts. For example, this can be achieved by reducing the density and go taller to reduce the footprint.**
  4. **Secondary access for Infinity Medical:** The current development to the South, Infinity Medical, constructed a driveway stub to the property line. At the time of site plan approval, review for the office development for Novaplex was ongoing simultaneously. The site plans for Infinity Medical and Novaplex were approved with a condition that Infinity Medical will provide a secondary connection through Novaplex site. A location was coordinated with the Novaplex office plan as it was previously submitted. As noted, much of the Novaplex site was cleared, but the construction of Novaplex office was kept on hold indefinitely. Infinity Medical went ahead and completed the stub construction and dedicated a Fire and Emergency access easement to the City. The current Novaplex residential plan does not propose any connection to the stub street. Based on the current design, the Infinity Medical building would not have any secondary or any emergency access. **The applicant needs to revise the plans to provide a connection to the stub street, in order to maintain a secondary point of access for Infinity Medical building. (Closing an existing secondary access could arguably be seen as a public "detriment," as opposed to a benefit.) The applicant could alternatively propose an alternate secondary access point, approvable by City's Fire Marshal, and to Infinity Medical if needed.**

5. Major and Minor Drives: Section 5.20, relating to major and minor driveways in a multiple family residential development would apply to the proposed development. The plan currently does not meet a majority of requirements for this section. Please refer to Plan Review Chart for more details. A significant comment refers to width of Major roads, which are essentially the inner and outer loop driveways, noting that the driveway width is required to be a minimum of 28 feet. The applicant has revised the width of the inner loop to provide 28 feet since the Pre-application review. The proposed outer loop still remains at 24 feet. The current widths still do not meet the standard of the ordinance. **Staff is open to consider supporting a reduction to allow a width to 24 feet, but only if the applicant can provide additional green space and buffer from neighboring properties.**
  
6. Plan Review Chart: **The attached chart provides additional comments on many of the Ordinance review standards. Please refer to it in detail.**
  
7. Other Reviews:
  - a. **Engineering**: The Staff Engineer is currently reviewing the request. The comments are forthcoming.
  - b. **Landscape**: Landscape review identifies multiple deviations from Ordinance standards that could be reduced. Review recommends shortening Building 4 and eliminating Building 5, to avoid the need to remove the large section of quality woodland on the west end of the property. This would result in a significant savings in replacement trees required.
  - c. **Traffic**: Traffic review notes that the applicant would need a number of deviations based on the submitted concept. The applicant should review this letter, and the other review letters, and confirm which ordinance deviations are being requested. Since all the ordinance deviations, should be included as part of the PRO process, it is imperative that all requested clarifications are provided with the revised submittal.
  - d. **Woodlands**: The site measures 22 acres and consisted of 10 acres of regulated woodlands. The applicant previously removed about 9 acres of woodlands, totaling 560 regulated trees at that time, following an environmental Pre-Con in 2005. The plan submitted at this time proposes a total of 163 tree removals requiring an additional 303 Woodland Replacement Credits. 181 replacements are still required from previous removal. Because the woodland removals on this property are already extensive, staff does not support the additional woodland removals.
  - e. **Wetlands**: Wetlands review is unable to complete the review due to missing information about on-site wetlands and proposed mitigation. The plan appears to require wetland mitigation, but does not to show any mitigation areas.
  - f. **Façade**: Façade notes that in general the buildings are well designed, but the deviations listed in Façade review letter can be readily achieved without compromising the overall designs. Carports are also subject to façade review. Please include those elevations or they will be expected to conform at a later time.
  - g. **Fire**: Fire has some additional concerns to be addressed with the next submittal. Revisions to address Traffic comments may or may not require an additional review from Fire.

**LAND USE AND ZONING: FOR SUBJECT PROPERTY AND ADJACENT PROPERTIES**

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

	Existing Zoning	Existing Land Use	Master Plan Land Use Designation
<b>Subject Property</b>	OST: Office Service Technology	Vacant	Office Research Service and Technology (Uses consistent with OST)
<b>Northern Parcels</b>	OST: Office Service Technology	Office	

Eastern Parcels (across Haggerty Road)	Farmington Hills	Single Family Residential	NA
Western Parcels	OST: Office Service Technology	Office	Office Research Service and Technology (Uses consistent with OST)
Southern Parcels	OST: Office Service Technology	Medical Office	

Existing Zoning



Future Land Use

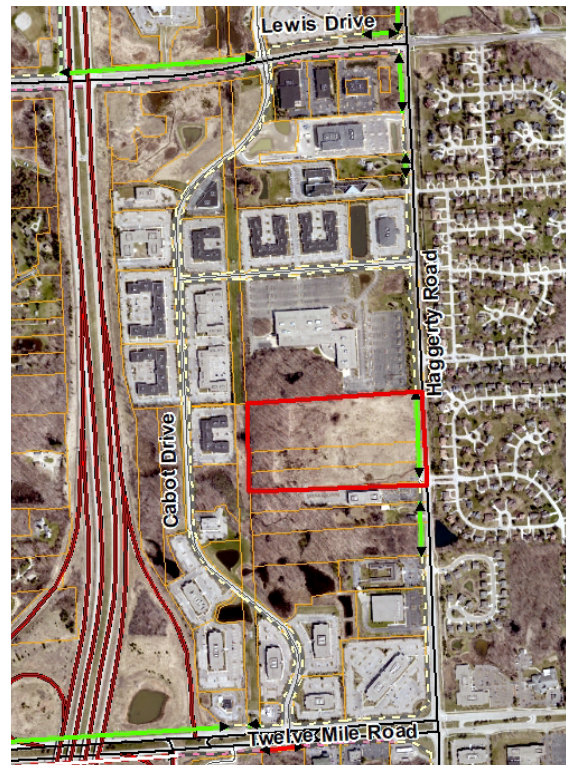


**Compatibility with Surrounding Land Use**

The subject property is located along eastern boundary of the City of Novi, west of Haggerty Road. The City of Farmington Hills is to the east. It is surrounded by existing office development to all sides in Novi with single family residential across Haggerty Road to the East in Farmington Hills. Within Novi, the proposed use is not compatible with the surrounding uses. All surrounding properties are developed and have established office uses. The likelihood of redevelopment is almost none. The proposed use is not consistent with the surrounding existing uses based on current Zoning requirements.

The applicant has initially considered a mixed use (office-residential) development for this property. The Planning narrative, prepared by CIB Planning, states that rental rates for flex office space, are not high enough to support a speculative development.

The Planning narrative notes that the current residential development is a "professional targeted" development which is intended to be walkable, bikeable, and accessible residential community to primarily serve area companies in Haggerty Corridor Park and their employees. They note that the



proximity to the office development is crucial for their development. The applicant states that there is a shortage of land zoned for multiple family developments in Novi and an overage of land zoned for office use. **It should be noted that multiple-family development is not limited to RM-1 and RM-2 zoning. It is also allowed in other districts such as Town Center and Gateway East. Projects like Manchester (172 units) and Huntley Manor (225 units), Emerson Park (125 units) and Woodbridge Park (40 units) are under construction and we have couple other projects such as Flint Street (253 units) under review.**

The planning narrative expands further on the necessity for multiple-family rental development based on current market demand. The compatibility of the proposed rezoning with the zoning and uses on the adjacent properties should be considered by the Planning Commission in making the recommendation to City Council on the rezoning request.

**Comparison of Zoning Districts**

The following table provides a comparison of the current (OST) and proposed (RM-2) zoning classifications. It is not a direct comparison between the two uses, given that the two uses are clearly distinct from each other. It is a change of use from Office to residential. The setbacks, buffering an

	<b>OST (EXISTING)</b>	<b>RM-2 (PROPOSED)</b>
Principal Permitted Uses	See attached copy of Section 3.1.23.B	See attached copy of Section 3.1.8.B Outdoor Storage yards*
Special Land Uses	See attached copy of Section 3.1.23.C	See attached copy of Section 3.1.8.C
Lot Size	Except where otherwise provided in this Ordinance, the minimum lot area and width, and the maximum percent of lot coverage shall be determined on the basis of off-street parking, loading, greenbelt screening, yard setback or usable open space requirements as set forth in this Ordinance.	See Section 3.8.1
Lot Coverage		45%
Building Height	46 ft. or 3 stories, whichever is less	65 ft or 5 stories, whichever is less
Building Setbacks	Front: 50 feet Rear: 50 feet Side: 50 feet Exterior side yard setbacks same as front yard	Front: 75 feet Rear: 75 feet Side: 75 feet Exterior side yard setbacks same as front yard
Parking Setbacks  See 3.6.2. for additional conditions	Front: 20 feet Rear: 20 feet Side: 20 feet Exterior side yard setbacks same as front yard	Subject to 3.8 RM-1 and RM-2 Required Conditions

**DEVELOPMENT POTENTIAL**

The land is currently vacant. Development under current OST zoning could result in significant amount of space. For example, a Preliminary site plan was initially approved for this subject property on August 16, 2000 for development of Office buildings. At that time, the site plan proposed two 68,500 square foot, three-story, multiple tenant buildings along with parking and other improvements. In 2018, the applicant proposed a mixed-use development consisting of seven residential buildings with 242 units and two single story office buildings totaling 70,000 square feet (which was not pursued by the applicant at that time following staff’s initial review).

The current concept plan proposes a development of 332 units with 16 DUA for a high-density multifamily development which is below the maximum density allowed for three bedroom units under RM-2 zoning (458 total number of rooms allowed for 3 story building that would allow lower density, 902 rooms proposed). The master plan designation expects the subject property to be developed as office space for research and technology.

As is evident, the existing, proposed and anticipated uses are much different from each other. The Master Plan for Land Use does not anticipate residential uses of this property, so no density guidelines are provided on the plan. The applicant has included and exhibit 'Comparison of alternate development'. The exhibit notes as below. **Staff does not agree with this statement. It should be noted that the previous approved plans has expired. The applicant has to go through the review process and the previous approved development (80,854 sf) is most likely not approvable. Staff concerns about additional woodland removals still remain.**

*"The additional clearing limits for the previously approved OST use updated for current design standards (80,854 sf) is very larger than the additional clearing limits for the Proposed multifamily use (68,341 sf)"*

The applicant submitted a narrative from CIB planning that assesses and supports the applicant's request for change of use. Staff notes that the market assessment from the current draft update to Master plan indicate that an increasing share of the City's residents and larger market want a different housing pattern. The applicant has provided a market study to support their findings. But while that narrative may provide some reasonable justification for the change of use, staff's concerns about removing yet more high-quality woodlands in order to propose a higher-density development—without sufficient buffering and requiring multiple additional (and significant) ordinance deviations still remain unaddressed.

In this review letter, staff identifies concerns with connectivity, security, architectural compatibility and lack of adequate screening from adjacent uses. **The applicant should consider addressing those comments and revise the drawings accordingly to offset the impacts of the proposed change of use on the surrounding development.**

## **2016 MASTER PLAN FOR LAND USE: GOALS AND OBJECTIVES**

The proposed use is currently not recommended by the 2016 Master Plan for Land Use. The following objectives as listed in the Master Plan are applicable for the proposed development. However, at this time the plan follows only a few. **The applicant should consider revisions to the plan to comply with as many goals as possible. Please refer to staff comments in bold and revisions recommended in bold and underline.**

### **1. General Goal: Quality and Variety of Housing**

- a. Provide residential developments that support healthy lifestyles. Ensure the provision of neighborhood open space within residential developments. **The development proposes internal sidewalk system, a clubhouse and a pool.**
- b. Safe housing and neighborhoods. Enhance the City of Novi's identity as an attractive community in which to live by maintaining structurally safe and attractive housing choices and safe neighborhoods.
- c. Maintain existing housing stock and related infrastructure.
- d. Provide a wide range of housing options. Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly. **The applicant is proposing a rental development with a mix of apartment style units and attached townhouse style units.**

### **2. General Goal: Community Identity**

- a. Maintain quality architecture and design throughout the City. **The current proposed elevations would require a Section 9 waiver, which is not supported. Please refer to the facade review letter for opportunities to maintain quality architecture.**
3. **General Goal: Environmental Stewardship**
- a. Protect and maintain the City's woodlands, wetlands, water features, and open space. The concept plan proposes additional removal of regulated woodlands. **Please refer to the wetlands and woodlands review letter for opportunities to further protect these natural features.**
  - b. Increase recreational opportunities in the City. **The Concept plan proposes recreational opportunities for the residents. They propose to fill two off-site gaps totaling 600 feet as a benefit to the public. This completes the sidewalk loop between Lewis Drive, Cabot Drive Twelve Mile Road and Haggerty Road. The applicant should consider a sidewalk connection from the west side of the property to the Cabot Drive sidewalk through the ITC corridor. This would connect the proposed residential development to the office development, which is supposedly the primary source of residents for this development.**
  - c. Encourage energy-efficient and environmentally sustainable development through raising awareness and standards that support best practices. **The applicant should consider energy-efficient design for building materials and constructions, such as LEED recommended. There is no indication at this time.**
4. **General Goal: Infrastructure**
- a. Provide and maintain adequate water and sewer service for the City's needs. **Please refer to the Engineering memo.**
  - b. Provide and maintain adequate transportation facilities for the City's needs. Address vehicular and non-motorized transportation facilities. **Please refer to comment for item b under General Goal 3. Also, refer to Traffic review for required improvements along Haggerty Road, i.e. left turn lane.**
5. **General Goal: Economic Development / Community Identity**
- a. Ensure compatibility between residential and non-residential developments. **Please refer to comments about compatibility with surrounding development earlier in this review.**

#### **MAJOR CONDITIONS OF PLANNED REZONING OVERLAY AGREEMENT**

The Planned Rezoning Overlay process involves a PRO concept plan and specific PRO conditions in conjunction with a rezoning request. The submittal requirements and the process are codified under the PRO ordinance (Section 7.13.2). Within the process, which is initiated by the applicant, the applicant and City Council can agree on a series of conditions to be included as part of the approval which must be reflected in the Concept Plan and or the PRO agreement.

The PRO conditions must be in material respects, more strict or limiting than the regulations that would apply to the land under the proposed new zoning district. *Development and use of the property shall be subject to the more restrictive requirements shown or specified on the PRO Plan, and/or in the PRO Conditions imposed, and/or in other conditions and provisions set forth in the PRO Agreement.*

The benefits to the public of the rezoning and the extensive deviations are not apparent from the applicant's submission. The applicant should submit a list of PRO Conditions that they are seeking to include with the PRO agreement.

#### **ORDINANCE DEVIATIONS**

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Section 7.13.2.D.i.c(2) permits deviations from the strict interpretation of the Zoning Ordinance within a PRO agreement. These deviations must be accompanied by a finding by City Council that ***“each Zoning Ordinance provision sought to be deviated would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest, and that approving the deviation would be consistent with the Master Plan and compatible with the surrounding areas.”*** Such deviations must be considered by City Council, who will make a finding of whether to include those deviations in a proposed PRO agreement. A proposed PRO agreement would be considered by City Council only after tentative approval of the proposed concept plan and rezoning.

The Concept Plan submitted with an application for a rezoning with a PRO is not required to contain the same level of detail as a preliminary site plan. Staff has reviewed the applicant’s Concept Plan in as much detail as possible to determine what deviations from the Zoning Ordinance are currently shown. The applicant may choose to revise the concept plan to better comply with the standards of the Zoning Ordinance, or may proceed with the plan as submitted with the understanding that those deviations would have to be approved by City Council in a proposed PRO agreement. **The applicant provided a request for certain deviations. However, it is not comprehensive. The applicant should refer to all review letters and identify what deviations they would seek and what they would revise the plan to conform.**

The following are deviations from the Zoning Ordinance and other applicable ordinances shown on the concept plan.

1. **Usable Open Space Area** (Sec 3.1.8.D: For a total of 332 dwelling units, required Open Space: 66,400 SF. The concept plan proposes a clubhouse and pool. The clubhouse, pool and open space in that block appears to be 24,000 SF. **C 3.0 indicates the 3.7 acres of open space, which does not fit with the definition of usable open space.**
2. **Maximum percentage of one bedroom units** (Sec. 3.8.1.A.ii.b): *A maximum of 20% is allowed. 39% is proposed. The applicant notes that it fits the target renters who would be young professionals.*
3. **Total number of rooms** (Sec. 3.8.1.B): In the RM-2 district, total number of rooms dictates the maximum density that can be attained for a specific site. The current ordinance provides clear guidelines if the development contains only one type of bedroom units. This development proposes a mix of 1, 2 and 3 bedroom units. In RM-2 with unit less than four stories, maximum allowable rooms is calculated by taking the area of the parcel in square feet, divided by a factor of 2000. For the subject parcel, the maximum number of rooms allowed for this property is 458 rooms (21.04 acres = 916, 502 sq. ft. / 2000). In this case, the DUA does not define the development as much as the total number of rooms does. The table below lists the Ordinance maximum and proposed.

	Maximum Allowable	Proposed
<b>Dwelling Units Per Acre (DUA)</b>	8 *	16
<b>Total Number of Units</b>	163 *	332 (51% more)
<b>Total Number of Rooms</b>	458	902 (49 % more)
<b>% of 1 Bedroom Units</b>	20	39 (49% more)
* This number is calculated based on the site acreage of 21.04 acres; the percentage of unit mix the applicant is proposing (39% 1 BR units, 51% 2 BR units and 10% 3 BR units). Please note that the total number of units may differ from 163 (and the corresponding density), if the percentage mix is revised.		

4. **Maximum length of the buildings** (Sec. 3.8.2.C): A single building or a group of attached buildings cannot exceed 180 ft. **Building lengths range from 186 to 298 feet. Buildings exceed**



**180 feet, but meet the qualifying criteria for City Council's approval for this deviation per section 3.8.2.C.**

5. **Building Orientation** (Sec. 3.8.2.D): Where any multiple dwelling structure and/ or accessory structure is located along an outer perimeter property line adjacent to another residential or nonresidential district, said structure shall be oriented at a minimum angle of forty-five (45) degrees to said property line. **All buildings are either parallel or perpendicular to property lines abutting non-residential districts.**
6. **Yard setback restrictions** (Sec. 3.8.2.E): Within any front, side or rear yard, off-street parking, maneuvering lanes, service drives or loading areas cannot exceed 30% of yard area. **The parking area is proposed at 41% on all sides.**
7. **Off-Street Parking or related drives** (Sec. 3.8.2.F: Off-street parking and related drives shall be no closer than 25 ft. to any wall of a dwelling structure that contains openings involving living areas. **Buildings with openings?? to living areas are only 20 ft. from parking drives.**
8. **Major Road Width** (Sec. 5.10): All Major drives shall be a minimum of 28 feet wide. **The plan proposes a width of 24 feet and 28 feet.**
9. **Parking along Major Drives** (Sec. 5.10): Angled and perpendicular parking, permitted on minor drive, but not from a major drive; **on-street perpendicular parking is proposed on all Major Drives**
10. **Major Drive Centerline Radius** (Sec. 5.10): A minimum centerline radius of 100 feet is required for Major Drives. **It appears to not meet the minimum requirement.**
11. **Number of Parking Spaces** (Sec.5.2.12.A & B): The current plan proposes unit mix and the clubhouse would require a minimum of 764 spaces. The current plan proposes a total of 586 spread across the site, including attached/detached garages and surface parking. **A 23% reduction is currently proposed.** The applicant refers to additional 154 apron spaces in front of attached garages to count towards the minimum required. Apron spaces may provide additional guest parking for certain units with access to garage parking, but not necessarily required parking for others.
12. **Bicycle Parking Location** (Sec. 5.16): Bicycle parking shall be no farther than 120 ft. from the entrance being served. Bike parking is not clearly labeled on plans. The applicant notes on the plan that they could be farther away in some instances. The applicant should try and place them 120 ft. to at least one of the entryways.
13. **Bicycle Parking Access path** (Sec. 5.16): Bicycle parking shall be shall be accessible via 6 ft. paved sidewalk. **The development proposes 5 feet sidewalks.** Staff can support this deviation to maintain consistent width in sidewalks.
14. **Exterior lighting** Sec. 5.7: A lighting and photometric plan is not provided at this time. **Given the proximity to the adjacent property lines, it is unclear if the light levels can be maintained under Ordinance maximum.**
15. **Façade requirements for Accessory building in excess of 200 sf** Sec. 4.19.1.L: All materials and architecture shall be compatible with the principal structure and they shall have a minimum roof pitch of 3/12 and overhangs of no less than six (6) inches. **Proposed materials for the garages do not comply with the requirements.** Carports elevations are not provided

16. **Maximum number of Accessory buildings.** *Sec. 4.19.1.J: For lots more than 21,780 SF, a maximum of two accessory buildings are allowed. The current plan proposed nine detached garages and 26 free standing carports. Staff can support the deviation if the materials comply with Ordinance requirements*
17. **Section 9 Waiver:** Proposed elevations for residential buildings have an underage of minimum required brick and overage of maximum allowable Vinyl siding. **It is recommended that the percentage of Brick on the front and rear façade be increased to more closely comply with the Ordinance. It is recommended that the percentage of siding be reduced and/or that a compliant type of siding be used in lieu of Vinyl (cement fiber siding is allowed up to 25%).**
18. **Landscape Deviations:**
  - i. Lack of screening berms between the site and the properties on the north, south and west. Not supported by staff for north and south property lines. Is supported for west end of site.
  - ii. Lack of greenbelt berm along Haggerty Road. Not supported by staff.
  - iii. Deficiency in large greenbelt trees provided. Not supported by staff.
  - iv. Lack of parking lot perimeter trees in lots between Buildings 1-2, 5-6, 6-11, 9-10 and 6-11. Not supported by staff.
  - v. Utility lines along Haggerty Road may make planting street trees impossible. This deviation would be supported by staff.
  - vi. Deviation to use sub canopy trees for up to 25% of the required multifamily unit trees. This deviation is supported by staff.
19. **Traffic Deviations:** The applicant would need a number of deviations based on the submitted concept plan. The applicant should review Traffic review letter and confirm which deviations that they are actually seeking.

All deviations from the ordinance requirements shall be identified and included in PRO Agreement. Any deviations identified during later reviews, after Concept Plan approval, will restart the PRO process.

The applicant shall also update narrative addressing *" each Zoning Ordinance provision sought to be deviated would, if the deviation were not granted, prohibit an enhancement of the development that would be in the public interest, and that approving the deviation would be consistent with the Master Plan and compatible with the surrounding areas."*

#### **APPLICANT'S BURDEN UNDER PRO ORDINANCE**

The Planned Rezoning Overlay ordinance (PRO) requires the applicant to demonstrate that certain requirements and standards are met. The applicant should be prepared to discuss these items, especially in number 1 below, where the ordinance suggests that the enhancement under the PRO request would be unlikely to be achieved or would not be assured without utilizing the Planned Rezoning Overlay. Section 7.13.2.D.ii states the following:

1. *(Sec. 7.13.2.D.ii.a) Approval of the application shall accomplish, among other things, and as determined in the discretion of the City Council, the integration of the proposed land development project with the characteristics of the project area, and result in an enhancement of the project area as compared to the existing zoning, and such enhancement would be unlikely to be achieved or would not be assured in the absence of the use of a Planned Rezoning Overlay.*
2. *(Sec. 7.13.2.D.ii.b) Sufficient conditions shall be included on and in the PRO Plan and PRO Agreement on the basis of which the City Council concludes, in its discretion, that, as compared to the existing zoning and considering the site specific land use proposed by the applicant, it would be in the public interest to grant the Rezoning with Planned Rezoning*

*Overlay; provided, in determining whether approval of a proposed application would be in the public interest, the benefits which would reasonably be expected to accrue from the proposal shall be balanced against, and be found to clearly outweigh the reasonably foreseeable detriments thereof, taking into consideration reasonably accepted planning, engineering, environmental and other principles, as presented to the City Council, following recommendation by the Planning Commission, and also taking into consideration the special knowledge and understanding of the City by the City Council and Planning Commission.*

#### **PUBLIC INTEREST/ BENEFITS TO PUBLIC UNDER PRO ORDINANCE**

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Section 7.13.2.D.ii states that the City Council must determine that the proposed PRO rezoning would be in the public interest and the benefits to public of the proposed PRO rezoning would clearly outweigh the detriments. **The applicant provided Exhibit B along with the Planning Narrative which purports to identify the project benefits and the detriments. The list included nine items. Of them, eight appear to describe the prominent characteristics of the development, such as providing rental opportunities and adding to the tax base, etc. While these can be perceived as positive subsequent features of the development, they do not provide any measurable benefits to the public, and are not the sorts of things that the ordinance contemplates when it talks about benefits to the public.**

The one substantive benefit that appears to fit what the ordinance does contemplate is listed below.

*"We will complete the sidewalk connections in the Haggerty Corridor Corporate Park, as shown on the map exhibit, to ensure that the Master Plan goal of providing non-motorized connectivity is met;"*

The Concept plan proposes to fill two off-site gaps totaling 600 feet as a benefit to the public. This completes the sidewalk loop between Lewis Drive, Cabot Drive Twelve Mile Road and Haggerty Road. **The applicant should consider a sidewalk connection from the west side of the property to the Cabot Drive sidewalk through the ITC corridor. This would connect the proposed residential development to the adjacent office development, which was previously indicated as a likely possibility that employees of the adjacent business park would choose to live in the proposed residential development**

**Again, this is a PRO in which the applicant seeks both a rezoning and a significant list of ordinance deviations. The benefits to the City beyond the sort of "tax base" increase/property utilization that any viable development would result in are not clear at this point—particularly given the extensive environmental impacts of such a high-density project.**

#### **NEXT STEP: MASTER PLANNING AND ZONING COMMITTEE MEETING**

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The current request for rezoning is not supported by Master Plan for Land Use. The plan is scheduled for Master Planning and Zoning Committee input on September 11, 2019.

#### **REVISED CONCEPT PLAN SUBMITTAL**

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The current submittal is not ready for Planning Commission's public hearing. There is additional information requested for clarification. Planning, Landscape, Wetland and Woodland reviews are currently not recommending approval. Please provide the following for reconsideration:

1. Site plan revision application
2. Six copies of revised Concept Plan/Preliminary Site Plan addressing Fire, Traffic and Landscape, Planning and Wetland comments. **Please do not include the City standard details.**
3. A response letter addressing all the comments from ALL the reviews.

4. Updated Rezoning narrative addressing deviations, benefits to public, conditions and other items noted in the review letters

If the applicant has any questions concerning the above review or the process in general, do not hesitate to contact me at 248.735.5607 or [skomaragiri@cityofnovi.org](mailto:skomaragiri@cityofnovi.org)



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Sri Ravali Komaragiri – Planner



## PLANNING REVIEW CHART: RM-2

**Review Date:** August 29, 2019  
**Review Type:** PRO Concept Plan  
**Project Name:** **JSP 19-24 NOVAPLEX 2019**  
**Plan Date:** July 26, 2019  
**Prepared by:** Sri Komaragiri, Planner  
**E-mail:** skomaragiri@cityofnovi.org; **Phone:** (248) 735-5607

**Bold** To be addressed before Planning Commission public hearing for PRO Concept  
Underline To be addressed with Preliminary Site Plan submittal  
**Bold and Underline** Possible deviations to be included as part of PRO agreement  
*Italics* Notes to be noted

Item	Required Code	Proposed	Meets Code	Comments
<b>Zoning and Use Requirements</b>				
<b>Master Plan</b> <i>(adopted July 26, 2017)</i>	Office research development and technology	10 residential buildings with 332 units and a clubhouse	No	<ul style="list-style-type: none"> <li>- The proposed rezoning is not supported by the Master Plan. The plan requires Master Planning and Rezoning Committee input.</li> <li>- Planning Commission recommendation &amp; City Council approval PRO Concept Plan</li> <li>- City Council approval</li> <li>- PRO agreement</li> <li>- Site Plan or Plat normal approval process</li> </ul>
<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	RM-2 High-density Multiple Family	No	
<b>Uses Permitted</b> (Sec 3.1.21.B & C)	Office and Service Uses Sec. 3.1.21.B. - Principal Uses Permitted. Sec. 3.1.21.C. – Special Land Uses Permitted.	Sec. 3.1.8. Multi-Family Residential	No	The proposed rezoning category would allow Multi-family uses.
<b>Phasing</b>		Phasing is not proposed Building construction is proposed to be staggered.	NA	<p>The proposed phasing does not indicate a clear timeline. It is an open ended schedule that is directed by the market demand. The residents may have to deal with the construction for an uncertain time period. Please provide further clarification on Phasing with re: timeline, façade, parking etc.</p> <p>The applicant can consider phasing the units and parking improvements to the west to avoid woodland</p>

Item	Required Code	Proposed	Meets Code	Comments
				removals unless needed.  Please refer to woodland review letter for more details/comments about proposed woodland removals. Staff strongly recommends not to propose any impacts to the woodlands or to significantly reduce the proposed impacts.
<b>Planned Rezoning Overlay Document Requirements (SDM link: <i>Site development Manual</i>)</b>				
<b>Written Statement</b> <i>(Site Development Manual)</i>  <i>The statement should describe the following</i>	Potential development under the proposed zoning and current zoning	Provided	Yes	Refer to Planning review letter for related comments
	Identified benefit(s) of the development	Provided	Yes	Refer to Planning review letter for related comments
	Conditions proposed for inclusion in the PRO Agreement (i.e., Zoning Ordinance deviations, limitation on total units, etc)	Conditions are currently not identified in the narrative	Yes?	Staff will work with the applicant to identify the conditions as the review progresses.
<b>Sign Location Plan</b> <i>(Page 23,SDM)</i>	Installed within 15 days prior to public hearing Located along all road frontages	Submitted	Yes	Please change OST to RM-2 to 'OST to RM-2 with a PRO'. Location and other text is acceptable.
<b>Traffic Impact Study</b> <i>(Site development manual)</i>	A Traffic Impact Study as required by the City of Novi Site Plan and Development Manual.	Provided	Yes	Refer to Traffic review letter for related comments
<b>Community Impact Statement</b> <i>(Sec. 2.2)</i>	<ul style="list-style-type: none"> <li>- Over 30 acres for permitted non-residential projects</li> <li>- Over 10 acres in size for a special land use</li> <li>- All residential projects with more than 150 units</li> <li>- A mixed-use development, staff shall determine</li> </ul>	<p>All residential projects with more than 150 units.</p> <p>A Community Impact statement is provided</p>	Yes	Refer to Planning review letter for related comments
<b>Market Study</b>	The applicant submitted a Market study to provide a market demand analysis for the proposed project.	The analysis reviewed multiple family use vs flex office space. The analysis is drawn from existing market conditions and future	Yes?	The current zoning allows for office space. The report summarizes that there is more demand for housing than office space at this location,

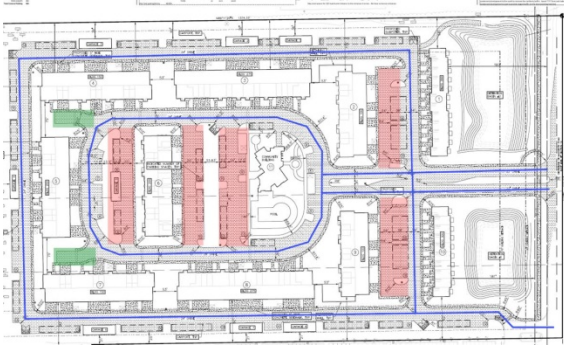
Item	Required Code	Proposed	Meets Code	Comments
		market absorption potential		due to projected growth at Haggerty Corridor Park and other areas zoned for office. <b>Refer to Planning review letter for related comments</b>
<b>Height, bulk, density and area limitations (Sec 3.1.8.D)</b>				
<b>Frontage on a Public Street.</b> <i>(Sec. 5.12)</i>	Frontage on a Public Street is required	The site has frontage and access to Haggerty Road	Yes	
<b>Minimum Zoning Lot Size</b> for each Unit: in Acres <i>(Sec 3.8.1)</i>	RM-1 and RM-2 Required Conditions			
<b>Minimum Zoning Lot Size</b> for each Unit: Width in Feet <i>(Sec 3.8.1)</i>				
<u><a href="#">Usable Open Space Area</a></u> <i>(Sec 3.1.8.D)</i> <i>Article 2: Definitions</i>	200 sf of Minimum usable open space per dwelling unit For a total of 332 dwelling units, <u>required Open Space:66,400 SF</u>  <u>Refer to definitions for Usable Open Space and Open Space</u>	The concept plan proposes a clubhouse and pool. The clubhouse, pool and open space in that block appears to be 24,000 SF  Proposed elevations indicate balconies.	Yes?	<b>C 3.0 indicates the 3.7 acres of open space, which does not fit with the definition of usable open space.</b>  <b>Refer to definition of usable open space. The usable open spaces are supposed to be designed and intended for the private recreational use of residents of the building. They should be directly accessible by means of common passageway.</b>
<b>Maximum % of Lot Area Covered</b> (By All Buildings)	45%	15.81 %	Yes	
<b>Building Height</b> <i>(Sec. 3.20)</i>	65 ft. or 5 stories whichever is less	3 stories and 3.5 stories	Yes	<b>Refer to definition for story, half-story and basement in Section 2.2 for more clarification</b>  <b>Please update the number of stories on Page C2.0 accordingly</b>
<b>Minimum Floor Area per Unit</b> <i>(Sec. 3.1.8.D)</i>	Efficiency	400 sq. ft.	Not proposed	NA
	1 bedroom	500 sq. ft.	720 f	Yes
	2 bedroom	750 sq.	1000 – 1200 sq.ft.	Yes

Item	Required Code		Proposed	Meets Code	Comments
		ft.			
	3 bedroom	900 sq. ft.	1470 to 1670 sq.ft.	Yes	
	4 bedroom	1,000 sq. ft.	Not Proposed	NA	
<b>Maximum Dwelling Unit Density/Net Site Area</b> <i>(Sec. 3.1.8.D)</i> <i>Per Sec. 3.8.2.B, all buildings less than four stories should comply with RM-1 regulations for limits on percent of 1 bedroom units and number of rooms.</i>	Efficiency	Max 10%	Not proposed	No	<b>Densities and room count differ based on number of stories for the development.</b>  <b>Refer to definition for story, half-story and basement in Section 2.2 for more clarification</b>  <b>Even though, 1 BR units are under the maximum density, they exceed the maximum percentage of units.</b>
	1 bedroom	31.1 Max 20 % for buildings less than 4 stories	Proposed 39% 1 Bedroom Units 6.08 DUA		
	2 bedroom	20.7	Proposed 8.08 DUA		
	3+ bedroom	15.8	Proposed 1.62 DUA		
<b>Residential Building Setbacks</b> <i>(Sec 3.1.8.D)</i>					
Front @ Haggerty Road	75 ft. (Sec. 3.6.B)		All building setback 75 feet from all sides	Yes	
Rear West	75 ft.				
Side North	75 ft.				
Side South	75 ft.				
<b>Parking Setback</b> <i>(Sec 3.1.8.D) (Sec 3.1.12.D) Refer to applicable notes in Sec 3.6.2</i>					
Front <i>(3.6.2.B)</i>	75 ft.		A minimum of 20 ft. on all sides.	Yes	<b>Parking is provided on street and a few in garage</b>
Rear <i>(3.6.2.B)</i>	20 ft.			Yes	
Side <i>(3.6.2.B)</i>	20 ft.			Yes	
<b>Note To District Standards</b> <i>(Sec 3.6.2)</i>					
<b>Exterior Side Yard Abutting a Street</b> <i>(Sec 3.6.2.C)</i>	All exterior side yards abutting a street shall be provided with a setback equal to front yard.		No exterior side yards	NA	
<b>Off-Street Parking in Front Yard</b> <i>(Sec 3.6.2.E)</i>	Off-street parking is allowed in front yard		Parking is not proposed in the front yard	NA	
<b>Distance between buildings</b> <i>(Sec 3.6.2.H)</i>	It is governed by sec. 3.8.2 or by the minimum setback requirements, whichever is greater		RM-2 code has additional requirements for distance between buildings.	No	<b>See Comments later in the review</b>
<b>Wetland/Watercourse Setback</b> <i>(Sec 3.6.2.M)</i>	A setback of 25ft from wetlands and from high watermark course shall be maintained		Wetlands exist on south and west side of the site. minimal impacts are proposed		<b>Refer to wetland review letter for more detail</b>



Item	Required Code	Proposed	Meets Code	Comments	
<b>Parking setback screening</b> <i>(Sec 3.6.2.P)</i>	Required parking setback area shall be landscaped per sec 5.5.3.	Screening is provided, but it does not meet the minimum buffer and screening requirements	No	<b>Refer to landscape review for more comments</b>	
<b>Modification of parking setback requirements</b> <i>(Sec 3.6.2.Q)</i>	The Planning Commission may modify parking setback requirements based on its determination according to Sec 3.6.2.Q	None required	NA		
<b>RM-1 and RM-2 Required Conditions</b> <i>(Sec 3.8)&amp; (Sec 3.10)</i>					
<b>Total number of rooms</b> <i>(Sec. 3.8.1.B)</i>	For RM-2 building less than four stories, RM-1 regulations apply; Total No. of rooms < Net site area in SF/2000  For RM-2 buildings, four or more: Total No. of rooms < Net site area in SF/700	After reviewing the definitions for story and basement, staff made a determination that the proposed development contains 3 story buildings.  <b>Total number of rooms Allowed: 458 Proposed: 902</b>	No	<b>Densities, room count and maximum number of Units differ based on number of stories for the development</b>  <b><u>This is considered a deviation.</u></b>	
<b>Public Utilities</b> <i>(Sec. 3.8.1)</i>	All public utilities should be available	All public utilities are available	Yes	<b>Refer to Engineering review for more details</b>	
<b>Maximum Number of Units</b> <i>(Sec. 3.8.1.A.ii)</i>  <i>Applicable for RM-1 building and RM-2 buildings less than four stories</i>	Efficiency < 5 percent of the units	Not Proposed	NA		
	1 bedroom units < 20 percent of the units	<b>39 %</b>	<b>No</b>		
	Balance should be at least 2 bedroom units	Proposed	Yes		
<b>Room Count per Dwelling Unit Size</b> <i>(Sec. 3.8.1.C)</i> <i>*An extra room such as den count towards an extra room</i>	<b>Dwelling Unit Size</b>	<b>Room Count *</b>	No	<b>Floorplans are provided. The plans indicate a large area for both living/dining.</b>	
	Efficiency	1			Not proposed
	1 bedroom	2			2
	2 bedroom	3			3
	3 or more bedrooms	4			4
<i>For the purpose of determining lot area requirements and density in a multiple-family district, a room is a living room, dining room or bedroom, equal to at least eighty (80) square feet in area. A room shall not include the area in kitchen, sanitary facilities, utility provisions, corridors, hallways, and storage. Plans presented showing one (1), two (2), or three (3) bedroom units and including a "den," "library," or other extra room shall count such extra room as a bedroom for the purpose of computing density.</i>					
<b>Setback along natural shore line</b> <i>(Sec. 3.8.2.A)</i>	A minimum of 150 feet along natural shore line is required.	No natural shore line exists within the property	NA		
<b>Structure frontage</b> <i>(Sec. 3.8.2.B)</i>	Each structure in the dwelling group shall front either on a dedicated public street or approved private drive.	Proposed Private Drive	Yes	<b>Subject to City Council approval</b>	

Item	Required Code	Proposed	Meets Code	Comments
<a href="#">Maximum length of the buildings</a> (Sec. 3.8.2.C)	A single building or a group of attached buildings cannot exceed 180 ft.	Most of the buildings exceed 180 ft.	No	<b><u>This is considered a deviation</u></b>
<a href="#">Modification of maximum length</a> (Sec. 3.8.2.C)	Planning Commission may modify the extra length up to 360 ft. if		No	<b>Buildings exceed 180 feet, but meet the qualifying criteria for City Council's approval for this deviation</b>
	Common areas with a minimum capacity of 50 persons for recreation or social purposes	Not applicable		
	Additional setback of 1 ft. for every 3 ft. in excess of 180 ft. from all property lines abutting a residential district or major thoroughfare	Does not abut residential district  187 feet setback from Haggerty Road		
<a href="#">Building Orientation</a> (Sec. 3.8.2.D)	Where any multiple dwelling structure and/ or accessory structure is located <u>along an outer perimeter property line adjacent to another residential or nonresidential district</u> , said structure shall be oriented at a minimum angle of forty-five (45) degrees to said property line.	Buildings and Accessory structures (Carport and Garages) orientation do not meet the minimum requirement for all buildings	No	<b><u>This is considered a deviation</u></b>
<a href="#">Yard setback restrictions</a> (Sec. 3.8.2.E)	Within any front, side or rear yard, <u>off-street parking, maneuvering lanes, service drives or loading areas</u> cannot exceed 30% of yard area	Parking is provided in the required side yards. 41 %	No	<b>Data on Sheet C 2.0 refers to two numbers – 74958 and 75229. Please include the right number</b>
<a href="#">Off-Street Parking or related drives</a> (Sec. 3.8.2.F)  Off-street parking and related drives shall be	No closer than 25 ft. to any wall of a dwelling structure that contains openings involving living areas or	25 ft. minimum is maintained on the side with garage entrances  <b>20 ft. minimum is maintained on the side with building entrances</b>	No	<b>Building with entrances to living doors are only 20 ft. from parking drives.</b>  Drive aprons are not subject to this requirements
	No closer than 8 ft. for other walls or	Appears to comply	Yes	
	No closer than 20 ft. from ROW and property line	Minimum of 20 ft. is maintained	Yes	
<a href="#">Pedestrian Connectivity</a> (Sec. 3.8.2.G)	5 feet sidewalks on both sides of the Private drive are required to permit safe and convenient pedestrian access.	Appears to comply	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	Where feasible sidewalks shall be connected to other pedestrian features abutting the site.	Provides connectivity to Haggerty Road	Yes	
	All sidewalks shall comply with barrier free design standards	Unable to determine	Yes?	<b>Add a note to the plan to verify conformance.</b>
<b>Minimum Distance between the buildings</b> <i>(Sec. 3.8.2.H)</i>	(Total length of building A + total length of building B + 2(height of building + height of building B))/6	Appear to comply	Yes	The applicant calculated distances based on maximum height (which is higher than the average height)
<b>Minimum Distance between the buildings</b> <i>(Sec. 3.8.2.H)</i>	In no instance shall this distance be less than thirty (30) feet unless there is a corner-to-corner relationship in which case the minimum distance shall be fifteen (15) feet.	Buildings are setback by at least 30 ft. from each other	Yes	
<b>5.10 Additional Road Design, Building Setback, And Parking Setback Requirements, Multiple-Family Uses</b>				
<u>Road standards</u> <i>(Sec. 5.10)</i>	A private drive network within a cluster, two-family, multiple-family, or non-residential uses and developments shall be built to City of Novi Design and Construction Standards for local street standards (twenty-eight (28) feet back-to-back width	It appears that the proposed layout does not comply with multiple requirements of this section.  All drives in the development are considered Major Drives	No	
		For the purpose of this review, staff categorized the drives as follows: <ol style="list-style-type: none"> <li>1. Major Drive: Blue line</li> <li>2. Minor Drive: Green shaded areas</li> <li>3. Parking Drives: Red shaded areas</li> </ol>		
<u>Major Drives</u>	- Width: 28 feet -	<b>Outer loop major drive is 24 feet wide</b> Inner loop is 28 feet wide Parking drives are 24 to 25 feet wide	No	<b>Bolded items do not meet the code.</b>
<b>Minor Drive</b>	- Cannot exceed 600 feet - Width: 24 feet with no on-street parking - Width: 28 feet with	Meets the requirements	Yes	

Item	Required Code	Proposed	Meets Code	Comments
	parking on one side - Parking on two sides is not allowed - Needs turn-around if longer than 150 feet			
<a href="#">Parking on Major and Minor Drives</a>	- Angled and perpendicular parking, permitted on minor drive, but not from a major drive; - minimum centerline radius: 100 feet - Adjacent parking and on-street parking shall be limited near curves with less than two-hundred thirty (230) feet of centerline radius	<b>On-street perpendicular parking is proposed on all Major Drives</b>  <b>Minimum centerline radius is not provided</b>	No	<b>Bolded items do not meet the code.</b>
<b>Driveways, Parking, Loading and Dumpster Requirements</b>				
<a href="#">Number of Parking Spaces</a> (Sec.5.2.12.A & B)	For 2 or less bedroom units: 2 spaces each For 3 or more bedroom units: 2 ½ spaces each  For 128-1 BR units: 256 spaces 170-2 BR units: 340 spaces For 34- 3 bedroom units: 85 spaces  <b>Private Clubs</b> One (1) for each four (4) member families: 83 spaces  <b>TOTAL: 764 spaces</b>	Attached Garages: 154 Detached Garages: 48 Carports/Surface: 384  TOTAL PROPOSED (not including Apron spaces): 586  Apron spaces: two spaces in front of garage: 154	Yes?	<b>Apron spaces may provide additional guest parking for certain units with access to garage parking, but not necessarily required parking for others. This would require a deviation</b>
<b>Landbank Parking</b> (Sec.5. 2.14)	Maximum number of Landbank spaces: 25% of required parking	Not proposed	NA	
<b>Parking Space Dimensions and Maneuvering Lanes</b> (Sec. 5.3.2)	- 90° Parking: 9 ft. x 19 ft. - 24 ft. two way drives - 9 ft. x 17 ft. parking spaces allowed along 7 ft. wide interior sidewalks as long as detail indicates a 4" curb at these locations and along landscaping	- 24 ft. two way drives - 9 ft. x 17 ft. parking spaces with buffer or sidewalk as required	Yes?	<b>Refer to Traffic comments on parking depth</b>  <b>The applicant should consider connecting to the westerly stub street on the parcel to the South. Refer to Planning review for more details.</b>

Item	Required Code	Proposed	Meets Code	Comments
<b>Parking stall located adjacent to a parking lot entrance</b> (public or private) <i>(Sec. 5.3.13)</i>	- shall not be located closer than twenty-five (25) feet from the street right-of-way (ROW) line, street easement or sidewalk, whichever is closer	Not applicable	NA	
<b>End Islands</b> <i>(Sec. 5.3.12)</i>	- End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles. - The end islands shall generally be at least 8 feet wide, have an outside radius of 15 feet, and be constructed 3' shorter than the adjacent parking stall as illustrated in the Zoning Ordinance	End Islands are proposed wherever applicable	Yes	<b>Include dimensions on the plan. Refer to Traffic comments.</b> All parking end islands must be three feet shorter than the adjacent parking space.
<b>Barrier Free Spaces</b> <i>Barrier Free Code</i>	To be determined once minimum required spaces for the clubhouse are determined	To be determined once minimum required spaces for the clubhouse are determined	TBD	<b>Refer to Building Code requirements to identify how many ADA accessible units are required and provide necessary Handicap spaces in that location</b>
<b>Barrier Free Space Dimensions</b> <i>Barrier Free Code</i>	- 8' wide with an 8' wide access aisle for van accessible spaces - 5' wide with a 5' wide access aisle for regular accessible spaces	None provided	No	<i>It is important to identify the handicap parking counts and locations as it impacts the deviation for minimum number of parking spaces proposed</i>
<b>Barrier Free Signs</b> <i>Barrier Free Code</i>	One sign for each accessible parking space.	None proposed at this time	No	<u>Provide signage as required</u>
<b>Minimum number of Bicycle Parking</b> <i>(Sec. 5.16.1)</i>	One (1) space for each five (5) dwelling units  For 332 units, 66 bike spaces are required  10% of total parking for clubhouse: 9 spaces	76 spaces required, it appears that the applicant intends to provide them.	Yes	
<b><u>Bicycle Parking General requirements</u></b> <i><u>(Sec. 5.16)</u></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	The bike racks are not shown on the plan, but are noted to be located at 11 different locations including the clubhouse.	No	<b>Two deviations are required:</b> <b>1. To allow 5 feet sidewalk in lieu of 6 feet</b> <b>2. Locations to be farther away than 120</b>

Item	Required Code	Proposed	Meets Code	Comments
	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			
<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	Not provided	No	<a href="#">Provide the bike layout plan as required at the time of final site plan. It should meet the requirements.</a>
<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 yard, - In the ratio of five (5) square feet per front foot of building up to a total area of three-hundred sixty (360) square feet per building.	None proposed	No	<b>The clubhouse should be equipped with a loading and unloading area if it is proposed to be leased for parties.</b>
<a href="#">Exterior lighting</a> <a href="#">Sec. 5.7</a>	Photometric plan and exterior lighting details needed at time of Final Site Plan submittal	A lighting and photometric plan is not provided at this time	No	Given the proximity to the adjacent property lines, it is unclear if the light levels can be maintained under Ordinance maximum.
<b>Accessory Use (Sec. 4.19)</b>				
<b>Accessory Buildings</b> <i>Sec. 2.2. Definitions</i>	Any structure, either temporary or permanent, having a roof supported by columns or walls, and intended for the shelter, or enclosure of persons, animals, chattels, or property of any kind.	Proposed Garages and carports are subject these requirements	Yes?	
<b>Location: Accessory Building</b> <i>Sec. 4.19.1.B</i>	They shall not be erected in any required front yard or in any required exterior side yard.	Proposed in rear yard and interior side yard	Yes	
<b>Setbacks: Detached Accessory Building</b> <i>Sec. 4.19.1.G</i>	- It shall not be located closer than ten (10) feet to any main building - It shall not be located closer than six (6) feet to any interior side lot or rear lot line.	Carports: 40 feet minimum Garages: 36 feet minimum	Yes	<b>The applicant should consider the proposed setbacks as a condition of approval.</b>

Item	Required Code	Proposed	Meets Code	Comments
<b>Height: Detached Accessory Building</b> <i>Sec. 4.19.1.G</i>	The height equal to the maximum permitted height of the district; provided, if the accessory building exceeds one (1) story or fourteen (14) feet in height, the building shall be set back one (1) foot for each foot the building exceeds fourteen (14) feet in height.	Proposed structures comply with this requirement	Yes	
<b><a href="#">Façade requirements for Accessory building in excess of 200 sf</a></b> <i>Sec. 4.19.1.L</i>	<ul style="list-style-type: none"> <li>- materials and architecture shall be compatible with the principal structure,</li> <li>- shall have a minimum roof pitch of 3/12 and overhangs of no less than six (6) inches.</li> </ul>	Garages: Carports: Elevations not provided	No	<p><b>Proposed materials for the garages do not comply with the requirements. Please refer to Façade review for more comments.</b></p> <p>Carport elevations are expected to meet the Ordinance requirement, if relevant information is not provided now.</p>
<b>Maximum Total Floor Area</b> <i>Sec. 4.19.1.C</i>	The total floor area of all accessory buildings shall not occupy more than Twenty-five (25) percent of any required rear yard.	Appears to comply	Yes	
<b><a href="#">Maximum number of Accessory buildings</a></b> <i>Sec. 4.19.1.J</i>	Lots less than 21,780 SF: 1 Lots more than 21,780 SF: 2	Garages: 9 Carports: 26	No	<b>Staff can support the deviation if the materials comply with Ordinance requirements</b>
<b>Dumpster</b> <i>Sec. 4.19.2.F</i>	<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> </ul>	Dumpsters are located at five different locations All are detached Farther than 10 ft.	Yes	<b>Refer to Traffic review for concerns with dumpster truck maneuvering</b>

Item	Required Code	Proposed	Meets Code	Comments
<b>Dumpster Enclosure</b> <i>Sec. 21-145. (c)</i> <i>Chapter 21 of City Code of Ordinances</i>	<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>	Unable to determine.	Yes?	<u>Provide additional information that conforms to the code at the time of Preliminary site plan or provide information now if additional deviations are requested.</u>
<b>Roof top equipment and wall mounted utility equipment</b> <i>Sec. 4.19.2.E.ii</i>	All roof top equipment must be screened and all wall mounted utility equipment must be enclosed and integrated into the design and color of the building	Unable to determine.	Yes?	<u>If information is not provided at this time, it is expected to comply at the time of Preliminary site plan review.</u>
<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.	Unable to determine.	Yes?	<u>If information is not provided at this time, it is expected to comply at the time of Preliminary site plan review.</u>
<b>Accessory Structures</b> <i>(Sec. 4.19.2)</i>	<p>Anything constructed or erected, the use of which requires location on the ground or attachment to something having location on the ground.</p> <p>Flagpoles, solar structures, transformers and utility boxes</p>	The plan does not appear to propose any other accessory structures	NA	<p><u>Contact Planning department for relevant permits if any accessory structures are proposed</u></p> <p><u>Any future proposed structures are expected to comply with the requirements if not approved as part of the PRO plan</u></p>
<b>Sidewalks</b>				
<b>Non-Motorized Plan</b>	Proposed Off-Road Trails and Neighborhood Connector Pathways. No trails proposed in the vicinity	Applicant is proposing to build off-site sidewalks to provide connectivity to Haggerty Corridor Park	Yes	<b>Refer to Plan review letter for more comments</b>
<b>Internal Sidewalks</b> <i>Sec. 3.8.2.G</i>	Five foot sidewalks required on both sides of internal public or private drives	Sidewalk provided on both sides for most part. Unit 2, 6 and 9 doesn't have sidewalks to the west	No	<p><b><u>This could be a deviation</u></b></p> <p><b>There is no buffer/green space proposed between the sidewalks and the driveways. The applicant could consider wider sidewalks for safety and to allow for usable</b></p>



Item	Required Code	Proposed	Meets Code	Comments
				space in case of snow piled on the side of the roads.
<b>Public Sidewalks</b> <i>(Chapter 11, Sec.11-276(b))</i>	A 6 foot sidewalk is required along Haggerty Road	Sidewalk proposed along Haggerty Road	Yes	<b>Label the width of the sidewalk. Potential conflicts with existing utility lines.</b>
<b>Other Requirements</b>				
<b>Residential Entryway lighting</b> <i>Sec. 5.7</i>	One street light is required per entrance.	Not provided at this time	No	
<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).	Additional information is requested in this other review letters to verify conformance	No	<b>Please provide additional information as requested</b>
<b>Economic Impact</b>	- Total cost of the proposed building & site improvements - Number of anticipated jobs created (during construction & after building is occupied, if known)	Community Impact statement provided, which addresses these questions.	Yes	
<b>Other Permits and Approvals</b>				
<b>Development/ Business Sign</b> <i>(City Code Sec 28.3)</i>  <i>Sign permit applications may be reviewed as part of Preliminary Site Plan or separately for Building Office review.</i>	Signage if proposed requires a permit. It can be reviewed at the time of Preliminary site plan or after site plan approval	Signage is not proposed at this time.	Yes?	<u>For sign permit information contact ordinance at 248-735-5678</u>
<b>Development and Street Names</b>	Development and street names must be approved by the Street Naming	The project received Project name approval.	No	<u>For approval of project and street naming contact Planning at 248-</u>

Item	Required Code	Proposed	Meets Code	Comments
	Committee before Preliminary Site Plan approval	It requires street name approval		<u>347-0475</u>
<b>Property Split or Combination</b>	The proposed property split must be submitted to the Assessing Department for approval.	Three parcels are supposed to be combined	NA	The parcel combination should be completed prior to final stamping set approval.
<b>Other Legal Requirements</b>				
<b>PRO Agreement</b> <i>(Sec. 7.13.2.D(3))</i>	A PRO Agreement shall be prepared by the City Attorney and the applicant (or designee) and approved by the City Council, and which shall incorporate the PRO Plan and set forth the PRO Conditions and conditions imposed	Not applicable at this moment	NA	<u>PRO Agreement shall be approved by the City Council after the Concept Plan is tentatively approved</u>
<b>Master Deed/Covenants and Restrictions</b>	Applicant is required to submit this information for review with the Final Site Plan submittal	Not applicable at this moment	NA	<u>If one is proposed, then a Master Deed draft shall be submitted prior to Stamping Set approval.</u>
<b>Conservation easements</b>	Conservation easements may be required for woodland impacts	Not applicable at this moment	NA	<u>The following documents will be required during Site Plan review process after the Concept PRO approval</u>
<b>Lighting and Photometric Plan (Sec. 5.7)</b>				
<b>Intent</b> <i>(Sec. 5.7.1)</i>	Establish appropriate minimum levels, prevent unnecessary glare, reduce spillover onto adjacent properties & reduce unnecessary transmission of light into the night sky	Not provided at this time		<b>A lighting and photometric plan is typically required during site plan review. But given the intensity of the development, we recommend providing one with the Concept Plan submittal</b>
<b>Lighting Plan</b> <i>(Sec. 5.7.A.i)</i>	Site plan showing location of all existing & proposed buildings, landscaping, streets, drives, parking areas & exterior lighting fixtures			
<b>Building Lighting</b> <i>(Sec. 5.7.2.A.iii)</i>	Relevant building elevation drawings showing all fixtures, the portions of the walls to be illuminated, illuminance levels of walls and the aiming points of any remote fixtures.			

Item	Required Code	Proposed	Meets Code	Comments
<b>Lighting Plan</b> (Sec. 5.7.2.A.ii)	Specifications for all proposed & existing lighting fixtures			
	Photometric data			
	Fixture height			
	Mounting & design			
	Glare control devices (Also see Sec. 5.7.3.D)			
	Type & color rendition of lamps			
	Hours of operation			
	Photometric plan illustrating all light sources that impact the subject site, including spill-over information from neighboring properties			
<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)			
<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 site's hours of operation</li> </ul>			
<b>Security Lighting</b> (Sec. 5.7.3.H)  Lighting for security purposes shall be directed only onto the area to be secured.	<ul style="list-style-type: none"> <li>- All fixtures shall be located, shielded and aimed at the areas to be secured.</li> <li>- Fixtures mounted on the building and designed to illuminate the facade are preferred</li> </ul>			
<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			
<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			
<b>Min. Illumination</b> (Sec. 5.7.3.K)	Parking areas: 0.2 min			
	Loading & unloading areas: 0.4 min			

Item	Required Code	Proposed	Meets Code	Comments
	Walkways: 0.2 min			
	Building entrances, frequent use: 1.0 min			
	Building entrances, infrequent use: 0.2 min			
<b>Max. Illumination adjacent to Non-Residential</b> <i>(Sec. 5.7.3.K)</i>	When site abuts a non-residential district, maximum illumination at the property line shall not exceed 1 foot candle			
<b>Cut off Angles</b> <i>(Sec. 5.7.3.L)</i>	when adjacent to residential districts - All cut off angles of fixtures must be 90° - maximum illumination at the property line shall not exceed 0.5 foot candle			

**NOTES:**

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

## ENGINEERING REVIEW



# PLAN REVIEW CENTER REPORT

September 4, 2019

**Engineering Review**  
Novaplex PRO Concept  
JZ19-0037

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## **Applicant**

BC Novaplex LLC

## **Review Type**

PRO Concept Plan

## **Property Characteristics**

- Site Location: West side of Haggerty Road, between Twelve Mile Road and Thirteen Mile Road
- Site Size: 22.00 acres gross
- Plan Date: 07/26/2019
- Design Engineer: PEA, Inc.

## **Project Summary**

- Proposed mixed use development with residential apartments.
- Water service would be provided by looping public water main from the existing 12-inch water main on the neighboring parcels to the north and south.
- Sanitary sewer service would be provided by extension of existing 8-inch sanitary sewer near the southeast corner of the site.
- Storm water would be collected by a single storm sewer collection system and detained in one of two proposed on-site detention basins.

**Recommendation left blank on purpose**

**Comments:**

General

1. The site plan shall be designed in accordance with the Design and Construction Standards (Chapter 11).
2. A right-of-way permit will be required from the City of Novi and Oakland County for work in the Haggerty Road right-of-way.
3. Label the master planned 60-foot half right-of-way width for Haggerty Road. The dedication of the master-planned half width right-of-way of sixty (60) feet in width is requested with this project. Show the additional right-of-way width to be dedicated along Haggerty Road labeled as "**proposed**" right-of-way.
4. 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.
5. Show the locations of all light poles on the utility plan and indicate the typical foundation depth for the pole to verify that no conflicts with utilities will occur. Light poles in a utility easement will require a License Agreement.
6. **Current** soil borings shall be provided for a preliminary review of the constructability of the proposed development (roads, basin, etc.). Borings identifying soil types, and groundwater elevation should be provided at the time of Preliminary Site plan.
7. The Non-domestic User Survey form shall be submitted to the City so it can be forwarded to Oakland County.
8. A letter from either the applicant or the applicant's engineer must be submitted with the Concept Plan submittal highlighting the changes made to the plans addressing each of the comments in this review.

Utilities

9. **The current capacity of the 8-inch sanitary sewer at a 0.40% slope is 0.766 cfs. The peak flow for the development is 0.484 cfs leaving only 0.282 cfs for the properties that are tributary to this sewer (entire 8-inch sewer extending to Cabot Drive). Please provide evidence that the sanitary sewer has sufficient capacity.**
10. Provide a sanitary sewer monitoring manhole, unique to the clubhouse, within a dedicated access easement or within the road right-of-way. If not in the right-of-way, provide a 20-foot wide access easement to the monitoring manhole from the right-of-way (rather than a public sanitary sewer easement).
11. Sanitary leads shall be buried at least 5 feet deep where under the influence of pavement.
12. Revise the sanitary sewer basis of design to show the breakdown of number of bedrooms per apartment. Additionally, the REUs per apartment shall reflect the "Residences: Mobile Home Parks & Multiple Family Residences"

- Usage Type for one, two, or three or more bedrooms on the City of Novi Sewer Unit Factor Chart.
13. Note and show the proposed water main and sanitary sewer easements within the proposed site.
  14. Remove the water main basis of design on the utility sheet. This information is not necessary.
  15. Per Article III, Section 11-68.a.4 of the Code of Ordinances, water mains shall, wherever feasible, be constructed outside of pavement.
  16. Show relocation of the existing fire hydrant near the southeast corner of the development. Currently, it is shown within the proposed pavement area.
  17. Profile view is required for all proposed water mains (8" diameter or larger).
  18. Gate valves shall be arranged so that no single line failure will require more than eight hundred (800) feet of main or thirty (30) multiple units to be out of service.
  19. Provide evidence that the proposed storm outlet connection on Haggerty Road has adequate capacity to take in the additional flow from the proposed site. If it is through the existing ditch, information where the ditch is ultimately draining to and its available capacity must be shown on plan. Coordinate with Oakland County as required.
  20. A minimum cover depth of 3 feet shall be maintained over all storm sewers. Grades shall be elevated and minimum pipe slopes shall be used to maximize the cover depth. In situations where the minimum cover cannot be achieved, Class V pipe must be used with an absolute minimum cover depth of 2 feet. A Design and Construction standards variance application must be submitted under a separate cover where 3-feet of cover cannot be provided.
  21. Provide a four-foot deep sump and an oil/gas separator in the last storm structure prior to discharge to the storm water basin.

#### Paving & Grading

22. Extend the existing stub driveway on the west end of existing site to south.
23. The grade of the drive approach shall not exceed 2-percent within the first 25 feet of the intersection, with a maximum slope of eight (8) percent on the remainder of the drive approach, as described in Section 11-216(d) of the Design and Construction Standards.
24. Provide dimensions of parking stalls abutting a curb or sidewalk to the face of curb or walk. Standard parking space dimensions are 19 feet in length with a 6 inch curb, or 17 feet in length with a 4 inch curb with 2 foot overhang width provided.
25. Label the width of the sidewalk in the Haggerty Road right-of-way.
26. The proposed sidewalk should generally be located such that the outside edge is one (1) foot inside the master planned right-of-way line, as described in Chapter 7.4.2(C) of the Engineering Design Manual. If existing topography



or other constraints interfere with this requirement, a request for variance from the Design and Construction Standards can be submitted.

27. Provide at least 3-foot clearance between the sidewalk and any fixed objects, including hydrants and utility poles. Note on the plan any location where the 3-foot separation cannot be provided.

#### Storm Water Management Plan

28. The SWMP must detail the storm water system design, calculations, details, and maintenance as stated in the ordinance. The SWMP must address the discharge of storm water off-site, and evidence of its adequacy must be provided. This should be done by comparing pre- and post-development discharge rates. The area being used for this off-site discharge should be delineated and the ultimate location of discharge shown.
29. Clarify what is meant by off-site outlet from the adjacent parcel to the south. If runoff from any area on the adjacent parcel discharges onto the subject parcel, an off-site easement will be required for that area.
30. Show how the proposed Haggerty Road widening is to drain.
31. Storm water quality standards can be met with a pre-treatment unit in the last structure prior to discharge into the detention basins or a permanent 3-foot pool depth. Both are not required and a 3-foot pool depth is preferred.
32. A 4-foot wide safety shelf is required one foot below the permanent water surface elevation within the basin, for the purposes of safety and establishing aquatic vegetation. The total area of the shelf should be 25-50% of the permanent water level surface area.
33. An adequate maintenance access route to the basin outlet structure and any other pretreatment structures shall be provided (15 feet wide, maximum slope of 1V:5H, and able to withstand the passage of heavy equipment). Verify the access route does not conflict with proposed landscaping.
34. A 25-foot vegetated buffer shall be provided around the perimeter of each storm water basin. This buffer cannot encroach onto adjacent property. Call out the said buffer on plan. Both basins appear to be lacking the full 25 feet of buffer on all sides above the proposed freeboard elevations of 911.00.

#### Off-Site Easements

35. Any required off-site easements must be executed prior to final approval of the plans. Drafts shall be submitted at the time of the Preliminary/Final Site Plan submittal.

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

36. A letter from either the applicant or the applicant's engineer must be submitted with the Stamping Set highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved.

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

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

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

39. A draft copy of the Storm Drainage Facility Maintenance Easement Agreement (SDFMEA), as outlined in the Storm Water Management Ordinance, must be submitted to the Community Development Department. Once the agreement is approved by the City's Legal Counsel, this agreement will then be sent to City Council for approval/acceptance. The SDFMEA will then be recorded at the office of the Oakland County Register of Deeds. This document is available on our website.
40. A draft copy of the 20-foot wide easement for the water main to be constructed onsite must be submitted to the Community Development Department. This document is available on our website.
41. A draft copy of the 20-foot wide easement for the sanitary sewer to be constructed onsite must be submitted to the Community Development Department. This document is available on our website.
42. A draft copy of the 20-foot wide easement for the sanitary sewer monitoring manhole to be constructed onsite must be submitted to the Community Development Department. This document is available on our website.
43. A draft copy of the warranty deed for the additional proposed right-of-way along Haggerty Road must be submitted for review and acceptance by the City.

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

Please contact Victor Boron at (248) 735-5695 with any questions.

A handwritten signature in black ink, appearing to read "Victor F. Boron", is written over a horizontal line.

Victor Boron  
Civil Engineer

cc: Sri Komaragiri, Community Development  
Kate Richardson, Plan Review Engineer  
Ben Croy, PE, Engineering

# CITY OF NOVI

## Sewer Unit Factor Chart (See Notes Following Table)

Usage Type	Unit Factor	Information Source
<b>Auto Dealers</b>	0.300 per 1000 sq. ft.	D
<b>Barber Shops</b>	1.000 per 1000 sq. ft.	A - C
<b>Bars</b>	0.044 per seat	D
<b>Beauty Shops</b>	0.223 per booth	D
<b>Boarding Houses</b>	0.160 per person	A - C
<b>Boarding Schools</b>	0.270 per person	A - C
<b>Bowling Alleys</b> (no bar, or lunch facilities)	0.160 per alley	D
<b>Car Wash:</b>		
a) Manual, Do-It-Yourself	2.500 per stall	D
b) Semi-Automatic (mechanical without conveyor)	12.500 per lane	D
c) Automatic (with conveyor)	33.000 per lane	D
d) Automatic (with recycling water)	8.400 per lane	D
<b>Churches</b>	0.008 per seat	D
<b>Cleaners:</b>		
a) Pick-up Only	0.048 per employee	D
b) With Pressing Facilities	1.250 per press	D
<b>Clinics:</b>		
a) Medical	1.000 per doctor	D
b) Dental	1.400 per dentist	D
<b>Community Buildings</b>	2.000 per building	D
<b>Convalescent and/or Nursing Homes</b>	0.300 per bed	D
<b>Convents</b>	0.200 per person	D
<b>Country Clubs</b>	0.080 per member	A - C
<b>Day Care</b>	0.012 per student	CITY
<b>Drug Stores:</b>		
a) With Fountain Service	0.080 per seat, plus <b>0.140 per 1000 sq. ft.</b>	D
b) Without Fountain Service	0.140 per 1000 sq. ft.	D

# CITY OF NOVI

## Sewer Unit Factor Chart (See Notes Following Table)

<b>Factories</b> (exclusive of excessive industrial use)	0.500 per 1000 sq. ft.	D
<b>Fraternal Organizations</b> (members only)	1.000 per hall	D
<b>Fraternal Organizations</b> (members and rentals)	2.000 per hall	D
<b>Funeral Home</b> (including one residence)	2.200 per funeral home	D
<del>Grocery Stores &amp; Super Markets</del>	<del>1.100 per 1000 sq. ft.</del>	<del>D</del>
<b>Grocery Stores &amp; Super Markets</b>	0.310 per 1000 sq. ft.	D
<b>Health Clubs:</b>		
a) With Showers and/or Pool	2.300 per 1000 sq. ft.	D
b) Without Showers and/or Pool	0.260 per 1000 sq. ft.	D
<b>Hospitals</b>	1.220 per bed	A - C
<b>Hotels and/or Motels</b> (exclusive of swimming, pools, bars, restaurants, etc.)	0.380 per room	A - C
<b>Laundry</b> (self-serve)	0.540 per washer	D
<b>Office Building</b>	0.400 per 1000 sq. ft.	D
<b>Public Institutes</b> (other than hospitals)	0.320 per employee	A - C
<b>Racquet Clubs</b>	0.820 per court	D
<b>Residences:</b>		
Mobile Home Parks & Multiple Family Residences:		
a) One Bedroom	0.600 per dwelling unit	CITY
b) Two Bedroom	0.750 per dwelling unit	CITY
c) Three or more Bedrooms	1.000 per dwelling unit	CITY
Single Family Residential	1.000 per dwelling	CITY
<b>Restaurants:</b>		
a) Conventional Type (with or without drinks)	0.130 per seat	A - B
1. Seasonal Out-door Eating	0.130 per seat x 5/12	CITY
2. Banquet Section	0.130 per seat x 25%	CITY
b) Quick Service Franchise Type (without dishes, dealing mainly in hamburgers, with or without eating in building. Includes, but not necessarily limited to McDonald's, Burger Chef, Burger King, Red Barn, and Hardees.)	5.600 per restaurant	D
c) All Other Restaurants (Includes, but not limited to, drive-ins, snack bars, carryouts, such as fried chicken, pizzas; could have some eating in building, all without dishes.)	1.800 per restaurant	D

# CITY OF NOVI

## Sewer Unit Factor Chart

(See Notes Following Table)

<b>Rooming Houses</b> (No Meals)	0.130 per person	A - C
<b>Schools:</b>		
a) Elementary	0.012 per student	D
b) Junior or Middle School	0.020 per student	D
c) High School	0.038 per student	D
d) Bus Maintenance Facility	0.165 per 1000 sq. ft.	D
<b>Service Station</b>	0.240 per pump	C - D
<b>Store</b> (other than specifically listed)	0.340 per 1000 sq. ft.	CITY
<b>Summer Camps</b>	0.140 per housing unit	D
<b>Swimming Pool</b> (residential excluded)	3.000 per 1000 sq. ft.	D
<b>Theaters</b> (drive-in)	0.012 per car space	D
<b>Theaters</b> (indoor)	0.008 per seat	D
<b>Warehouses</b>	0.100 per 1000 sq. ft.	D

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### Notes Pursuant to Resolutions Dated April 10, 1991 and June 7, 1999:

- 1) In the computing of unit factors to be charged to industrial and commercial users, each separately operated business entity in a common building shall have a unit factor as set forth above (unless modified by agreement) but in no instance less than 1.00 tap unit for each separately operated business entity.
- 2) When the usage requested is not specifically identified under the "Usage Type" column, an estimated temporary tap unit assignment will be initially assigned by the City, and the USER will enter into a monitoring agreement (Exhibit A) to determine the actual tap unit assignment.

### INFORMATION SOURCE:

- A - Cincinnati Report
- B - Gordon McDougall Report to Wayne County
- C - Manual of Septic Tank Practice Publication No. 526, U.S. Department of Health
- D - Oakland County Department of Public Works Studies

## LANDSCAPE REVIEW



# PLAN REVIEW CENTER REPORT

August 13, 2019

## PRO Concept Plan - Landscaping

Novaplex Multi-family Housing

### Review Type

PRO Concept Plan Landscape Review

### Job #

JZ19-0037

### Property Characteristics

- Site Location: Haggerty Road, south of 13 Mile road
- Site Zoning: OST – proposed re-zoning to RM-2 with Overlay
- Adjacent Zoning: North, West, South: OST, East: Farmington Hills SFR
- Plan Date: 7/26/2019

### Ordinance Considerations

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

## **Recommendation left blank on purpose**

### LANDSCAPE DEVIATIONS NOTED:

- Lack of screening berms between the site and the properties on the north, south and west. *Not supported by staff for north and south property lines. Is supported for west end of site.*
- Lack of greenbelt berm along Haggerty Road. *Not supported by staff.*
- Deficiency in large greenbelt trees provided. *Not supported by staff.*
- Lack of parking lot perimeter trees in lots between Buildings 1-2, 5-6, 6-11, 9-10 and 6-11. *Not supported by staff.*
- Utility lines along Haggerty Road may make planting street trees impossible. *This deviation would be supported by staff.*
- Deviation to use subcanopy trees for up to 25% of the required multifamily unit trees. *This deviation is supported by staff.*

### Ordinance Considerations

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

Provided

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

1. Utility lines and structures are provided.
2. **Please show proposed lighting fixtures on landscape plans.**

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

- Provided
- 163 regulated trees are proposed for removal, with 303 replacements required.



- 158 trees are proposed to be planted as replacements, with 54 of them being evergreen.
- **Please reduce the number of evergreen replacements to 10% or less of the replacement trees provided.**
- **Please consider shortening Building 4 and eliminating Building 5, to avoid having to remove the large section of quality woodland on the west end of the property. This would result in a significant savings in replacement trees required.**

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

1. Property is adjacent to OST-zoned property developed as commercial.
2. 4.5-6' landscaped berms are required but none are provided.
3. **The lack of berms requires a landscape deviation.** *It is not supported by staff without evidence that the proposed substitutions provide similar visible and audible buffering.*
4. *The lack of a berm on the west end is supported by staff because the woods to remain would provide sufficient buffering.*

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

1. The berms along Haggerty Road are not provided. **This is a landscape deviation that requires justification in order to gain support from staff.**
2. Based on the frontage, 17 deciduous canopy or large canopy trees and 24 subcanopy trees are required. 6 large evergreen trees and 32 subcanopy trees are provided. **The deficiency in large greenbelt trees requires a landscape deviation that is not supported by staff.**
3. The number of street trees required between the sidewalk and road is dependent on the width of the RCOC clear vision zone, which was not shown. It is possible that utilities traveling along Haggerty Road provide conflicts such that the required trees can't be planted. **If they can't for this reason, a landscape deviation to not provide some or all of them would be supported by staff.**
4. It is also possible that the RCOC may not allow some or all of the trees that can be planted. If they don't a deviation is not required but the applicant must provide the city a copy of the RCOC decision.

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

1. Based on the vehicular use area, 4,412SF of landscape area is required and 20,021SF is provided. A total of 22 canopy trees are required, and 22 are provided.
2. **Please increase the area of two undersized islands with trees to at least 200sf of contiguous greenspace.** Those islands are the corner islands near the community building.
3. **The two long interior islands in the parking lots between buildings 1-2 and 9-10 must be widened to at least 10ft, measured at the back of curbs.**

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

1. No parking lot perimeter calculations or trees are provided, only interior drive perimeter trees (see Multi-family requirements below).
2. **Please provide calculations for the perimeters of the lots between buildings 1-2, 5-6, 6-11 and 9-10, and the required trees.** I calculated that the perimeters of those lots add up to 1033LF for a total requirement of 30 trees.

Multi-Family Housing Landscaping (Zoning Sec. 5.5.3.F.ii)

1. Unit Landscaping - Based on the 66 units, 198 trees are required and 223 are provided.
2. Interior Roadway
  - a. Based on the interior drives' perimeters (not including parking lot perimeters), 216 deciduous canopy trees are required and 224 are provided.
  - b. **Please distribute them along the drives' perimeters, not in the parking lots.**

- c. **Perimeter trees may not be used in the boulevard islands, but unit landscaping trees may.**
- d. **Please place more of the perimeter trees in spaces between the drives and the buildings. Place them relative to the curb such that they don't block the view of cars backing out of driveways.**
3. Building foundation landscaping.
  - a. All buildings meet or exceed the 35% foundation landscaping requirement.
  - b. Please provide detailed foundation plantings plans on the Preliminary Site Plans.

Woodland Replacement Trees (Sec. 37, LDM Sec 1)

1. **Please provide greater spacing for the large evergreen trees (also in the greenbelt), per the LDM guidelines**
2. **Please use fewer evergreens. The mix of trees used should resemble more closely what is being removed, which in this case is exclusively deciduous canopy trees. A maximum of 10% of the trees provided can be evergreen.**
3. **See Landscape Chart and ECT's letter for more details related to woodland replacements.**

Plant List (LDM 4)

1. Not provided. Please provide on Preliminary Site Plans.
2. When species are assigned, please use species native to Michigan for at least 50% of the species used (not of plant count, but of species)
3. When species are assigned, please follow the tree diversity guidelines in the Landscape Design Manual for all non-woodland replacement trees.

Planting Notations and Details (LDM)

Provided

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

1. Sufficient coverage with large native shrubs is indicated with shaded areas. Please provide species on the Preliminary Site Plan.
2. Please survey the site for Phragmites australis. If it is found, show the locations on the existing conditions plan and add a control plan for its complete eradication. If it is not found, add a note to that effect to the existing conditions plan.

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

Please provide an irrigation system plan or other means of providing sufficient water for plant establishment and long-term survival with Final Site Plans.

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

Provided

Snow Deposit (LDM.2.q.)

Provided

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



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Rick Meader – Landscape Architect

## LANDSCAPE REVIEW SUMMARY CHART

**Review Date:** August 13, 2019  
**Project Name:** JZ19-0037: NOVAPLEX  
**Plan Date:** July 26, 2019  
**Prepared by:** Rick Meader, Landscape Architect E-mail: [rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org);  
 Phone: (248) 735-5621

### LANDSCAPE DEVIATIONS NOTED:

- Lack of screening berms between the site and the properties on the north, south and west. *Not supported by staff for north and south property lines. Is supported for west end of site.*
- Lack of greenbelt berm along Haggerty Road. *Not supported by staff.*
- Deficiency in large greenbelt trees provided. *Not supported by staff.*
- Lack of parking lot perimeter trees in lots between Buildings 1-2, 5-6, 6-11, 9-10 and 6-11. *Not supported by staff.*
- Utility lines along Haggerty Road may make planting street trees impossible. *This deviation would be supported by staff.*
- Deviation to use subcanopy trees for up to 25% of the required multifamily unit trees. *This deviation is supported by staff.*

Items in **Bold** need to be addressed by the applicant before approval of the PRO Concept Plan. Underlined items need to be addressed for Preliminary and/or Final Site Plan.

Item	Required	Proposed	Meets Code	Comments
<b>Landscape Plan Requirements (LDM (2))</b>				
<b>Landscape Plan</b> <i>(Zoning Sec 5.5.2, LDM 2.e.)</i>	<ul style="list-style-type: none"> <li>▪ New commercial or residential developments</li> <li>▪ Addition to existing building greater than 25% increase in overall footage or 400 SF whichever is less.</li> <li>▪ 1"=20' minimum with proper North. Variations from this scale can be approved by LA</li> <li>▪ Consistent with plans throughout set</li> </ul>	Site plan scale is 1"=50'	Yes	<b>Please use a smaller scale (1"=20', minimum) for the detailed foundation and clubhouse planting designs when they are provided.</b>
<b>Project Information</b> <i>(LDM 2.d.)</i>	Name and Address	Provided in title block	Yes	
<b>Owner/Developer Contact Information</b> <i>(LDM 2.a.)</i>	Name, address and telephone number of the owner and developer or association	Provided in title block	Yes	
<b>Landscape Architect contact information</b> <i>(LDM 2.b.)</i>	Name, Address and telephone number of RLA/PLA/LLA	Yes	Yes	
<b>Sealed by LA.</b> <i>(LDM 2.g.)</i>	Requires original signature	No		<u>Need for Final Site Plans</u>

Item	Required	Proposed	Meets Code	Comments
<b>Miss Dig Note</b> (800) 482-7171 (LDM.3.a.(8))	Show on all plan sheets	In Title Block	Yes	
<b>Zoning</b> (LDM 2.f.)	Include all adjacent zoning	<u>Parcel:</u> OST <u>Proposed rezoning:</u> RM-2 <u>North South, West:</u> OST <u>East:</u> Farmington Hills Single Family residential	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>	Description on Cover Sheet, Topo on 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>▪ Tree labels, woodland limits on Sheet C-1.0, T-1.0-T1.2</li> <li>▪ Approximately 2.5 acres of quality woodland on the north side and west end of the property will be lost for this project, in addition to what was already removed for the previous project on this site.</li> <li>▪ Removals indicated on T-1.0-T1.2</li> <li>▪ Replacement calculations provided on T-1.0</li> <li>▪ No replacements are shown within the woodland area to remain</li> </ul>	Yes	<ol style="list-style-type: none"> <li>1. Please see the ECT letters for comprehensive reviews of the woodland and wetland impacts.</li> <li>2. Please do whatever is possible to reduce the amount of woodlands lost. Despite the verbiage in the Impact Statement, a corridor is not being created as much as a good-sized, quality woodland is being decimated and interior woodland is being lost while more unnatural edge is created.</li> <li>3. If Building 4 was shortened by approximately half and Building 5 was either shortened or eliminated, virtually all significant woodland impacts could be eliminated, sharply reducing the negative ecological impacts of the project and significantly reducing the number of</li> </ol>

Item	Required	Proposed	Meets Code	Comments
				replacement trees required and the expense of those trees. Please consider this option.
Soil types (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>	Soil types provided on Sheet L-1.0	Yes	
Existing and proposed improvements (LDM 2.e.(4))	Existing and proposed buildings, easements, parking spaces, vehicular use areas, and R.O.W	Yes	Yes	
Existing and proposed utilities (LDM 2.e.(4))	<ul style="list-style-type: none"> <li>▪ Overhead and underground utilities, including hydrants</li> <li>▪ Proposed light posts</li> </ul>	<ul style="list-style-type: none"> <li>▪ All utilities are shown on Utility Plan and Landscape Plan.</li> <li>▪ No light posts are provided.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Yes</li> <li>▪ No</li> </ul>	<ol style="list-style-type: none"> <li>1. Please show all proposed light posts on landscape plan so light/tree conflicts can be avoided in the field.</li> <li>2. Adjust positions of each and/or enlarge islands as necessary so all required trees can be planted.</li> </ol>
Proposed grading. 2' contour minimum (LDM 2.e.(1))	Provide proposed contours at 2' interval	<ul style="list-style-type: none"> <li>▪ Contours and spot elevations are provided on Sheet C-4.0.</li> <li>▪ Contours are shown on the landscape plan.</li> <li>▪ Existing and proposed walls are shown on the landscape plan.</li> </ul>	Yes	Please highlight the high water line (HWL) on both ponds on the landscape plan and locate the shrubs around that line.
Snow deposit (LDM.2.q.)	Show snow deposit areas on plan	Yes	Yes	
<b>LANDSCAPING REQUIREMENTS</b>				
<b>Parking Area Landscape Requirements LDM 1.c. &amp; Calculations (LDM 2.o.)</b>				
General requirements (LDM 1.c)	<ul style="list-style-type: none"> <li>▪ Clear sight distance within parking islands</li> <li>▪ No evergreen trees</li> </ul>	Only the City of Novi clear vision zones are provided.	No	Please show the RCOC clear vision zone for Haggerty Road entry and City of Novi clear vision zone for all interior intersections. It appears that trees are within the clear vision zone of interior

Item	Required	Proposed	Meets Code	Comments
				intersections. (Their rules are attached to this review).
<b>Name, type and number of ground cover (LDM 1.c.(5))</b>	As proposed on planting islands	Not indicated	No	Please indicate the ground cover for all areas of the site.
<b>General (Zoning Sec 5.5.3.C.ii)</b>				
<b>Parking lot Islands (a, b. i)</b>	<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> <li>▪ Minimum 200sf per tree planted in an island</li> </ul>	<ul style="list-style-type: none"> <li>▪ Islands are provided.</li> <li>▪ Areas are provided for most islands with trees, but not all.</li> </ul>	No	<ol style="list-style-type: none"> <li>1. Please label SF of all individual islands' contiguous unpaved area (should not include sidewalks).</li> <li>2. The long interior islands in the parking areas between Buildings 1 and 2 and 9 and 10 must be widened to at least 10 feet, measured at the back of curb.</li> <li>3. The corner islands near the community building do not appear to be at least 200sf in area, and both need trees. Please label the area of them and increase to at least 200sf if necessary.</li> </ol>
<b>Curbs and Parking stall reduction (c)</b>	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 (j)</b>	Maximum of 15 contiguous spaces	<ul style="list-style-type: none"> <li>▪ 15 is maximum bay length</li> <li>▪ It appears that layout may allow all required endcap trees</li> </ul>	TBD	Please add trees as necessary for all endcap islands and enlarge island planting areas if necessary to accommodate them.
<b>Plantings around Fire Hydrant (d)</b>	<ul style="list-style-type: none"> <li>▪ No plantings with matured height greater than 12' within 10 ft. of fire hydrants</li> <li>▪ Keep trees at least 5 feet from underground utility lines.</li> </ul>	All trees are located at least 10 feet from hydrants.	Yes	
<b>Landscaped area (g)</b>	Areas not dedicated to parking use or driveways exceeding 100 sq. ft.	Yes	Yes	

Item	Required	Proposed	Meets Code	Comments
	shall be landscaped			
<b>Clear Zones (LDM 2.3.(5))</b>	<ul style="list-style-type: none"> <li>Road Commission for Oakland County clear distance zones for Haggerty Road entry.</li> <li>25 ft corner clearance required at internal intersections. Refer to Zoning Section 5.5.9</li> </ul>	<ul style="list-style-type: none"> <li>City of Novi clear zones are provided.</li> <li>Some are not shown completely, such as that for the parking lot between Buildings 1 and 2 – trees in island at drive may block vision</li> </ul>	No	<ol style="list-style-type: none"> <li>Please indicate the clear vision zone per RCOC regulations for Haggerty Road entry (attached) and per Novi rules (Sec 5.9 illustration is below) for all entries to interior roads.</li> <li>Please check clear vision zones and verify that trees won't block views.</li> <li>If RCOC does not allow some or all of the Haggerty Road street trees, the disallowed trees do not need to be planted, but documentation of that ruling must be provided.</li> </ol>
<b>Category 1: For OS-1, OS-2, OSC, OST, B-1, B-2, B-3, NCC, EXPO, FS, TC, TC-1, RC, Special Land Use or non-residential use in any R district (Zoning Sec 5.5.3.C.iii)</b>				
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>(X - 50000) * 1\% = B \text{ sf}</math></li> <li><math>(66209-50000)*1\% = 662 \text{ sf}</math></li> </ul>			
<b>Category 2: For: I-1 and I-2 (Zoning Sec 5.5.3.C.iii)</b>				
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%	$B = 0.5\% * 0 \text{ sf} = B \text{ SF}$	NA		
<b>All Categories</b>				
C = A+B Total square footage of landscaped islands	$A + B = C \text{ SF}$ $3750+662 = 4,412 \text{ sf}$	20,021 sf	Yes	<b>1. Please label all islands with trees with their area in SF.</b>

Item	Required	Proposed	Meets Code	Comments
D = C/200 Number of canopy trees required	C/200 = D Trees 4412/200 = 22 trees	22 trees	Yes	<ol style="list-style-type: none"> <li><b>Please verify that all 22 trees are labeled as parking lot trees</b></li> <li>Multiple family site landscaping trees may be used to meet parking lot landscaping requirements. If this is done, please label them something like MF/PI for Multifamily-Parking lot interior to help verify the counts.</li> </ol>
<b>Parking Lot perimeter trees</b>	1 Canopy tree per 35 lf	<ul style="list-style-type: none"> <li>No calculations are provided.</li> <li>No parking lot perimeter trees are provided.</li> </ul>	No	<ol style="list-style-type: none"> <li><b>Please provide calculations.</b></li> <li><b>Show the line(s) used as the basis of the calculations.</b></li> <li><b>Label trees as parking lot perimeter trees (vs interior drive perimeter trees).</b></li> <li>As noted above, multiple family site landscaping trees may be used to meet some or all of the parking lot landscaping requirements. If they are, please label them as such (eg MF/PP).</li> </ol>
<b>Accessway perimeter</b>	See Multi-family interior drive parking lot requirements below			
<b>Parking land banked</b>	None	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 with 6" of top soil.</li> </ul>				
<b>Residential Adjacent to Non-residential (Sec 5.5.3.A) &amp; (LDM 1.a)</b>				
<b>Berm requirements</b> <i>(Zoning Sec 5.5.A)</i>	Landscaped berm 4.5-6 feet high required around all of project as it borders OST on the	<ul style="list-style-type: none"> <li>None</li> <li>An existing retaining wall with varying</li> </ul>		<ol style="list-style-type: none"> <li><b>Landscape deviations are required for any berms not provided.</b></li> </ol>



Item	Required	Proposed	Meets Code	Comments
	north, west and south	heights above the lower adjacent property exists along approximately 335 feet of the southern property line. <ul style="list-style-type: none"> <li>▪ A mix of dense plantings are provided along the north property line.</li> <li>▪ A line of trees, mostly canopy trees, is provided along the south property line.</li> </ul>		2. <i>The deviation would be supported for the west side, as the woods shouldn't be removed any more than they already would be and the screening should be sufficient.</i> 3. <b>Alternative forms of screening that provide a similar buffer as the landscaped berm must be provided along the north and south property lines.</b> A deviation would still be required, but if the buffering is sufficient, it could be supported by staff. 4. <b>Please provide justification for all berms not provided.</b>
<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>	An undulating berm with a 3 ft minimum height and a 2 ft wide crest is required along the Haggerty Road frontage greenbelt	No berm is provided	No	1. <b>Please provide the required berms.</b> 2. <b>A landscape deviation is required for the lack of the required berms.</b> <i>Without sufficient justification, the deviation is not supported by staff.</i>
<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. 2 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 provide cross section details for any berms provided.</b>
Type of Ground Cover		NA		
Setbacks from Utilities	Overhead utility lines	<ul style="list-style-type: none"> <li>▪ An overhead line</li> </ul>	Yes	

Item	Required	Proposed	Meets Code	Comments
	and 15 ft. setback from edge of utility or 20 ft. setback from closest pole	crosses the site along Haggerty Road, just inside the right-of-way. <ul style="list-style-type: none"> <li>No trees are proposed within 15 feet of the line.</li> </ul>		
<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	Retaining walls are indicated in the site interior in several locations.	TBD	<b>Please indicate tw/bw elevations on grading plan and provide either standard or detailed construction drawings, depending on the height of the walls.</b>
<b>Walls greater than 3 ½ ft. should be designed and sealed by an Engineer</b>		No details are provided	TBD	
<b>ROW Landscape Screening Requirements (Sec 5.5.3.B. ii)</b>				
<b>Greenbelt width (2)(3) (5)</b>	Adjacent to Pkg: 20 ft. Not adj to Pkg: 34 ft	176 ft min	Yes	
Min. berm crest width	2 ft	No berm is provided	No	<ol style="list-style-type: none"> <li>Please provide the required undulating berms.</li> <li>A landscape deviation must be approved for the lack of berms.</li> <li>Justification for the lack of berms must be provided. <i>Currently the deviation is not supported by staff.</i></li> </ol>
Minimum berm height (9)	3 ft	No berm is provided	No	<b>See above</b>
3' wall	(4)(7)	No walls are indicated in the greenbelt	Yes	
<b>Canopy deciduous or large evergreen trees</b> Notes (1) (10)	<ul style="list-style-type: none"> <li>Not adj to pkg: 1 tree per 35 lf</li> <li>(698-74-24)lf/35 = 17 trees</li> </ul>	6 large evergreen trees	No	<ol style="list-style-type: none"> <li>Please revise calculations per RM-2 guidelines.</li> <li>Please provide all required trees within the greenbelt.</li> <li>A landscape deviation is required for the tree shortage. <i>It would not be</i></li> </ol>

Item	Required	Proposed	Meets Code	Comments
				<p><i>supported by staff as there is room for all of the required trees in the greenbelt.</i></p> <p>4. <u>Provide species on Preliminary Site Plans.</u></p>
<p><b>Sub-canopy deciduous trees</b>                      Notes (2)(10)</p>	<ul style="list-style-type: none"> <li>▪ Not adj to pkg: 1 tree per 25 lf</li> <li>▪ (698-74-24)lf/25 = 24 trees</li> </ul>	<p>32 trees</p>	<p>No</p>	<p>1. <b>Please revise calculations per RM-2 guidelines.</b></p> <p>2. <u>Provide species on Preliminary Site Plans.</u></p>
<p><b>Canopy deciduous trees in area between sidewalk and curb</b>  <i>(Novi Street Tree List)</i></p>	<ul style="list-style-type: none"> <li>▪ 1 tree per 35 lf</li> <li>▪ (698- RCOC clear vision zone halfway between sidewalk and curb/edge of pavement:</li> <li>▪ <math>x/35 = x</math> trees</li> </ul>	<p>14 trees</p>	<p>TBD</p>	<p>1. It appears that there are a number of utility lines running along Haggerty Road. If those utilities provide a conflict and some or all of the required trees can't be planted, a landscape deviation can be requested. <i>If proper evidence is provided showing the trees can't be planted, the deviation for the trees that can't be planted would be supported by staff.</i></p> <p>2. <b>Please show RCOC clear vision triangle at Haggerty Road and deduct the width of that, measured at halfway between the sidewalk and curb, from the frontage as the basis for the calculation.</b></p> <p>3. <i>If the RCOC does not allow some or all of the required street trees to be planted, they do not have to be and a deviation would not be required, but a copy of their decision must be provided to staff.</i></p>
<p><b>Multi-family/Attached Dwelling Units (Zoning Sec 5.5.3.E.ii)</b></p>				

Item	Required	Proposed	Meets Code	Comments
Interior Street Trees (Sec 5.5.3.E.ii.B.ii.b(2))	<ul style="list-style-type: none"> <li>• 1 deciduous canopy tree per 35 lf of interior roadway, excluding driveways, parking entry drives and interior roads adjacent to public rights-of-way</li> <li>• <math>x/35 = y</math> trees</li> <li>• <math>7572/35 = 216</math> trees</li> </ul>	224 trees	Yes/No	<ol style="list-style-type: none"> <li>1. Please locate all required perimeter trees along the interior drives' perimeters, within 15 feet of the curb</li> <li>2. Parking lot perimeter trees should be located around the edges of the parking lots between Buildings 1-2, 5-6, 6-11 and 9-10. Please label them differently from interior drive perimeter trees.</li> <li>3. Please plant more perimeter trees along drive in front of all buildings</li> <li>4. Use deciduous canopy trees as interior street trees, not subcanopy trees.</li> <li>5. Perimeter trees should not be used in the large interior islands of the parking lots.</li> </ol>
Site Landscaping (Sec. 5.5.3.E.ii.b.(1))	<ul style="list-style-type: none"> <li>• (3) deciduous canopy trees or large evergreen trees for each dwelling unit on the ground floor.</li> <li>• Evergreens not closer than 20 ft from roadway</li> <li>• <math>66 \text{ units} * 3 = 198</math> trees</li> </ul>	72 large evergreen trees 77 deciduous canopy trees <u>74 subcanopy trees</u> 223 total trees  Note: While 74 subcanopy trees are provided and is more than 25% of the total provided trees, 50 subcanopy trees (25% of the required trees) are allowed with a deviation. If the applicant wants to provide more site landscaping than is required, the surplus	Yes	<ol style="list-style-type: none"> <li>1. Site landscaping trees may be used toward parking lot requirements (interior and parking lot perimeter trees).</li> <li>2. Please clearly label trees used as parking lot trees as multifamily site landscaping trees (eg MF/PI or MF/PP).</li> <li>3. A landscape deviation may be requested to use subcanopy trees for up to 25% of the required site landscaping trees to help provide diversity. <i>The deviation would be</i></li> </ol>

Item	Required	Proposed	Meets Code	Comments
		trees can be subcanopy trees.		<i>supported by staff.</i> 4. Subcanopy trees may not be used for parking lot trees. 5. <b>Some of the unit trees in the greenbelt can be changed to greenbelt trees to fully meet that requirement, and replacement trees can be changed to unit landscaping trees to meet that requirement.</b> 6. <u>Provide species on Preliminary Site Plans.</u>
Building Foundation Landscaping	35% of building frontage facing drives must be landscaped with mix of trees, bushes, perennials, grasses and/or annuals.	All buildings' frontages have at least 35% of their frontages shown as being landscaped.	Yes	<u>Provide detailed foundation planting plans with species on Preliminary Site Plans.</u>
<b>Transformers/Utility boxes</b> <i>(LDM 1.e from 1 through 5)</i>	<ul style="list-style-type: none"> <li>▪ A minimum of 2 ft. separation between box and the plants</li> <li>▪ Ground cover below 4" is allowed up to pad.</li> <li>▪ No plant materials within 8 ft. from the doors</li> </ul>	None proposed	TBD	1. <b>When transformer locations are finalized, screening shrubs per standard detail are required.</b> 2. <b>Please add a note to this effect to the plans.</b>
<b>Detention/Retention Basin Requirements (Sec. 5.5.3.E.iv)</b>				
<b>Planting requirements</b> <i>(Sec. 5.5.3.E.iv)</i>	<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 masses provided appear to meet the requirement.	TBD	1. <b>Please give detention ponds a more natural shape if possible.</b> 2. <u>Provide species on Preliminary Site Plans.</u>
<b>Phragmites Control</b>	<ul style="list-style-type: none"> <li>▪ Survey site for Phragmites australis</li> <li>▪ If any is found, show location(s) on existing conditions plan and provide a control plan for its complete eradication.</li> </ul>	None indicated	TBD	1. <u>Please survey the site and add a control plan if necessary.</u> 2. <u>If none is found, please add a note to that effect to the existing conditions plan.</u>
<b>Woodland Replacement Trees (Sec 37, LDM)</b>				
<b>Species breakdown</b>	▪ Replacement mix must	▪ 104 3" cal.	No	1. <b>Maximum 10% of</b>

Item	Required	Proposed	Meets Code	Comments
	approximate mix of trees removed. ■ No more than 10% evergreen since forest is a deciduous hardwood forest with no evergreens.	Deciduous canopy trees ■ 54 8' evergreen trees		trees provided can be evergreen (16). 2. Sizes can be reduced to 2.5" deciduous canopy and 6' evergreen. 3. Evergreens only count for 0.67 credits. Please revise calculations of credits provided.
<b>Spacing requirements</b> <i>(LDM Table 1.a.(1)(f))</i>	See table for spacing requirements	■ Large evergreen trees – approx. 10 ft ■ Deciduous canopy trees – approx. 20 ft	■ No ■ Yes	1. Please provide greater spacing for evergreen trees than is proposed. 2. Per the LDM, Large evergreen trees must be at least 15 feet from each other and 20 feet from a deciduous canopy tree 3. Deciduous canopy trees must be placed a minimum of 20 feet from each other and from large evergreen trees.
<b>LANDSCAPING NOTES, DETAILS AND GENERAL REQUIREMENTS</b>				
<b>Landscape Notes – Utilize City of Novi Standard Notes</b>				
<b>Installation date</b> <i>(LDM 2.l. &amp; Zoning Sec 5.5.5.B)</i>	Provide intended date	Between Mar 15- Nov 15	Yes	
<b>Maintenance &amp; Statement of intent</b> <i>(LDM 2.m &amp; Zoning Sec 5.5.6)</i>	■ Include statement of intent to install and guarantee all materials for 2 years. ■ Include a minimum one cultivation in June, July and August for the 2-year warranty period.	Yes	Yes	
<b>Plant source</b> <i>(LDM 2.n &amp; LDM 3.a.(2))</i>	Shall be northern nursery grown, No.1 grade.	Yes	Yes	
<b>Irrigation plan</b> <i>(LDM 2.s.)</i>	■ A fully automatic irrigation system or a method of providing sufficient water for plant establishment	None		1. <u>Please add irrigation plan or information as to how plants will be watered sufficiently for</u>

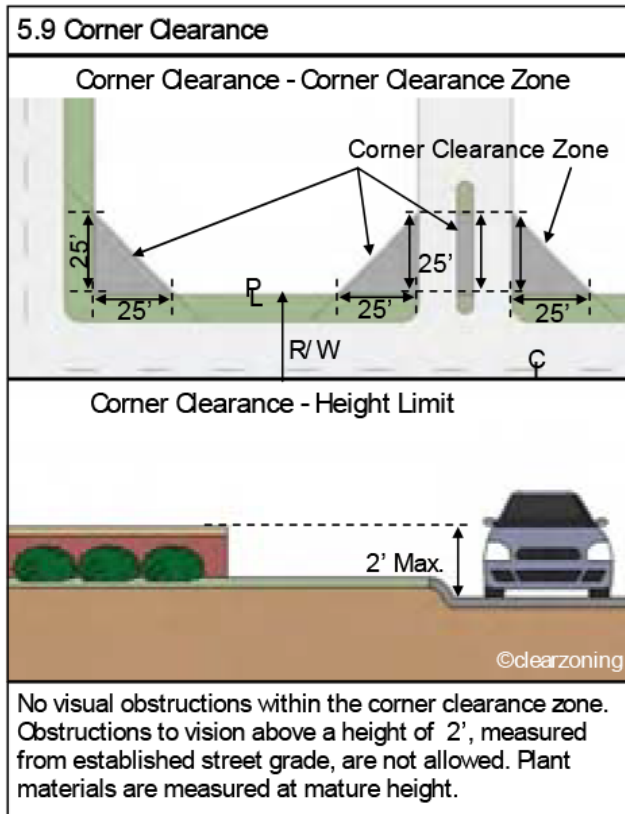
Item	Required	Proposed	Meets Code	Comments
	and survival is required on Final Site Plans. <ul style="list-style-type: none"> <li>An alternative method of providing water for plant establishment and long-term survival can be proposed instead.</li> </ul>			establishment and long-term survival. 2. <u>If xeriscaping is used, please provide information about plantings included.</u>
<b>Other information</b> (LDM 2.u)	Required by Planning Commission	NA		<b>Please follow spacing requirements of LDM Table 1.a.(1)(f) for all trees.</b>
<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.) – Include all cost estimates</b>				
Quantities and sizes	<ul style="list-style-type: none"> <li>Refer to LDM suggested plant list, tree diversity requirements.</li> <li>At least 50% of species used should be native to Michigan.</li> </ul>	No	No	<u>Please add plant list on Preliminary Site Plan</u>
Root type		No	No	<u>See above</u>
Botanical and common names		No	No	<u>See above</u>
Type and amount of lawn		No	No	<u>Please add areas of each in cost table.</u>
Cost estimate (LDM 2.t)	For all new plantings, mulch and sod as listed on the plan	No	No	<u>Please add to final site plan.</u>
<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)	Yes Tree fencing line is shown on T-1.0	Yes	
<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	Yes	Yes	
<b>Plant Materials &amp; Existing Plant Material</b>	Clearly show trees to be removed and trees to	<ul style="list-style-type: none"> <li>Existing tree tags and woodland</li> </ul>	Yes	

Item	Required	Proposed	Meets Code	Comments
<i>(LDM 3.b)</i>	be saved.	line are shown on T-1.0 <ul style="list-style-type: none"> <li>Trees to be removed are shown as lighter than trees to be saved and are indicated on tree chart.</li> </ul>		
<b>Landscape tree credit</b> <i>(LDM3.b.(d))</i>	Substitutions to landscape standards for preserved canopy trees outside woodlands/ wetlands should be approved by LA. Refer to Landscape tree Credit Chart in LDM	None - no trees outside of woodlands/ wetlands are being saved.		
<b>Plant Sizes for ROW, Woodland replacement and others</b> <i>(LDM 9.b.(2)(a)i)</i>	See Landscape Design Manual Table 9.b.(2)(a).i for required sizes	No plant list is provided.	TBD	<u>Please provide plant list with sizes on Preliminary Site Plan.</u>
<b>Plant size credit</b> <i>(LDM 9.b.(2)(a)(ii))</i>	NA	None	TBD	
<b>Prohibited Plants</b> <i>(LDM 9.b)</i>	No plants on City Invasive Species List	No plant list is provided.	TBD	As no plant list is provided, it is assumed that all species will be allowed by the city.
<b>Recommended trees for planting under overhead utilities</b> <i>(LDM 3.e)</i>	Label the distance from the overhead utilities	No trees are proposed beneath the overhead utility line.	Yes	
<b>Nonliving Durable Material: Mulch</b> <i>(LDM 4)</i>	<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>	Shown in planting details	Yes	

**NOTES:**

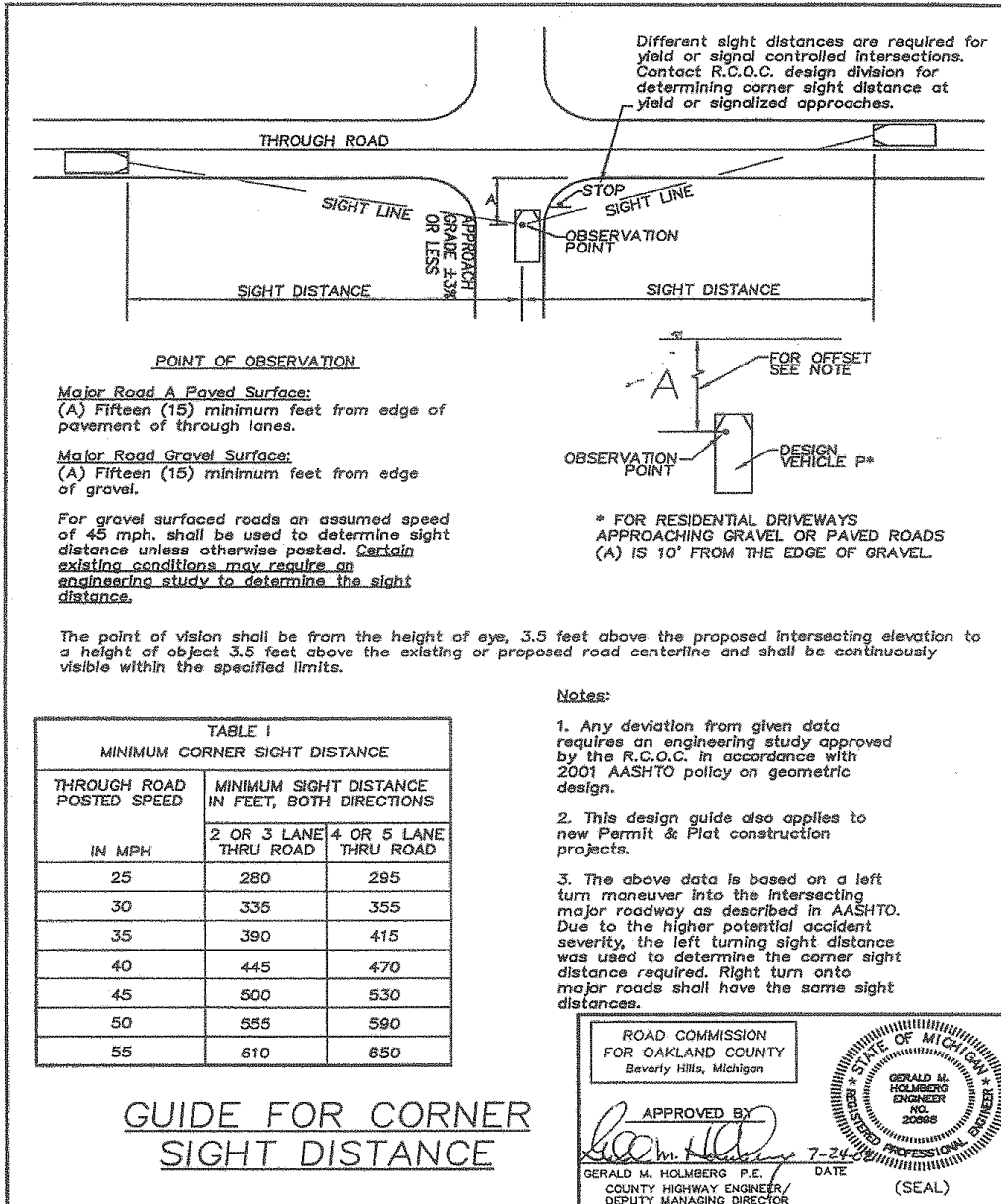
- This table is a working summary chart and not intended to substitute for any Ordinance or City of Novi requirements or standards.
- The section of the applicable ordinance or standard is indicated in parenthesis. For the landscape requirements, please see the Zoning Ordinance landscape section 5.5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





Road Commission for Oakland County Sight Distance Guidelines

FIGURE 6-1



## WETLANDS REVIEW



ECT Project No. 190526-0200

August 26, 2019

Ms. Barbara McBeth  
City Planner  
Community Development Department  
City of Novi  
45175 W. Ten Mile Road  
Novi, Michigan 48375

Re: Novaplex (JZ19-0037)  
Wetland Review of the Revised PRO Concept Plan (PSP19-0129)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Revised Planned Re-Zoning Overlay (PRO) Concept Plan for the proposed Novaplex project prepared by PEA, Inc. dated and stamped "Received" by the City of Novi Community Development Department on July 26, 2019 (Plan). The Plan was reviewed for conformance with the City of Novi Wetland and Watercourse Protection Ordinance and the natural features setback provisions in the Zoning Ordinance. ECT most-recently visited the proposed project site on August 20, 2019 for the purpose of a wetland boundary verification.

**Recommendation left blank on purpose**

The following wetland related items are required for this project:

Item	Required/Not Required/Not Applicable
Wetland Permit (specify Non-Minor or Minor)	Required (Non-Minor)
Wetland Mitigation	Required (Impacts currently > 0.25-acre wetland mitigation threshold)
Wetland Buffer Authorization	Required
EGLE Permit	Required
Wetland Conservation Easement	Required for any areas of proposed on-site wetland mitigation

The proposed project is located north of Twelve Mile Road and west of Haggerty Road (between the vacant Magna building to the north and the Botsford Center Rehabilitation Center to the south). The project site includes Parcel ID's 50-22-12-400-009, -010, and -011. The Plan proposes the construction of ten (10) multi-family residential buildings, a club house, garages, associated parking and utilities and two (2) stormwater detention basins.

An on-site wetland delineation and tree survey have been completed for the site by ECT. In addition, the Michigan Department of Environmental Quality (MDEQ, now the Michigan Department of Environment,

2200 Commonwealth  
Blvd., Suite 300  
Ann Arbor, MI  
48105

(734)  
769-3004

FAX (734)  
769-3164

Great Lakes, and Energy (EGLE)) conducted a Level 3 Wetland Identification Review of approximately 22 acres on the subject site on June 7, 2018. The MDEQ Wetland Identification Report is dated July 5, 2018 (Report). At that time, the MDEQ stated that “based on our site investigation which included a review of plants, hydrology, and soils, the DEQ confirms, in part, the wetland boundary lines flagged by your consultant. The DEQ also reviewed other pertinent information such as aerial imagery, soil survey data, topographic mapping data, and surface hydrology data”. In addition, the Report states:

*Approximately 0.72-acre of wetland was overlooked and omitted by the consultant. The DEQ extended the consultant’s wetland delineation boundary flagging associated with wetlands within the western and northcentral portion of the Wetland Identification Program (WIP) review area and located two other wetlands within the southwest portion of the WIP review area. The wetland areas showed evidence of sustained surface (or near-surface) hydrology occurring during the growing season and were associated with hydrophytic plant species and hydric soil.*

*Modified boundaries were documented on the enclosed site map (Figure 2). The site map of the WIP review area was created by combining information from your consultant and the DEQ. The new map identifies areas containing regulated wetland, unregulated wetland, and non-wetland (upland)”.*

### **Wetland Evaluation**

ECT’s in-office review of available materials included the City of Novi Regulated Wetland and Woodland map, USGS topographic quadrangle map, NRCS soils map, USFWS National Wetland Inventory map, and historical aerial photographs. The site includes areas indicated as City-regulated wetland on the official City of Novi Regulated Wetland and Woodland Map (see Figure 1).

ECT visited the site most recently on August 20, 2019 for the purpose of a wetland boundary verification. The focus of the inspection was to review site conditions in order to determine whether on-site wetlands are considered regulated under the City of Novi’s Wetland and Watercourse Protection Ordinance. Wetland boundary flagging was in place in some areas of the site at the time of our inspection and not present in others. ECT concurs with the seven (7) wetland areas (Wetlands A, B, C, D, E, F, and G) indicated on the MDEQ’s Wetland Identification Detail figure (Figure 2, attached). The current Plan appears to show most of the wetland areas that have been delineated on site by the applicant’s wetland as well as by MDEQ during their June 7, 2018 WIP review.

There is one (1) main discrepancy between the applicant’s Plan and the MDEQ’s Wetland Identification Detail. The Plan does not include all of the Wetland A area as determined by MDEQ. This is part of the area that MDEQ notes as being omitted by the applicant’s consultant in the northcentral portion of the site.

Wetlands A, B, F, and G are all primarily open water/emergent wetlands located in the northcentral, southwest and southeast sections of the subject property, respectively. The eastern section of Wetland A contained standing water at the time of our inspection. In general, these wetland areas appear to contain seasonal standing water. Existing vegetation observed within these wetland areas included common reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), sensitive fern (*Onoclea sensibilis*), cattails (*Typha spp.*) and several other species.

Wetlands C, D, and E are primarily forested/scrub-shrub wetlands located along the western edge of the subject properties. Portions of these wetlands included standing water at the time of our inspection. Existing vegetation observed within these wetland areas included cattail (*Typha spp.*), silver maple (*Acer*

*saccharinum*), silky dogwood (*Cornus amomum*), reed canary grass (*Phalaris arundinacea*), and several other species).

What follows is a summary of the wetland impacts associated with the proposed site design as shown on the current Plan. It should be noted that the current Plan has omitted some of the overall area of existing Wetland A and should be revised as necessary.

**Wetland Impact Review**

The Plan indicates seven (7) areas of existing wetland on the development site. The proposed Plan currently proposes impacts to four (4) of these wetlands (i.e., Wetlands A, B, F, and G). Wetlands C, D, and E are proposed to be preserved. A description of proposed wetland impacts follows. The following table (Table 1) summarizes the existing wetlands and the proposed wetland impacts.

**Table 1. Proposed Wetland Impacts**

Wetland Area	Wetland Area (square feet)	Wetland Area (acre)	City Regulated?	EGLE Regulated?	Impact Area (square feet)	Impact Area (acre)	Impact Volume (cubic yards)
A	3,930*	0.09*	<b>City/Essential</b>	No	3,930*	0.09*	Not Provided
B	17,919	0.41	<b>City/Essential</b>	No	17,919	0.41	Not Provided
C	1,663	0.038	<b>City/Essential</b>	Yes	None	None	None
D	5,866	0.13	<b>City/Essential</b>	No	None	None	None
E	4,679	0.11	<b>City/Essential</b>	No	None	None	None
F	23,309	0.53	<b>City/Essential</b>	Yes	23,309	0.53	Not Provided
G	481	0.01	<b>City/Essential</b>	Yes	481	0.01	Not Provided
<b>TOTAL</b>	<b>57,847</b>	<b>1.33</b>	--	--	<b>45,639</b>	<b>1.05</b>	<b>Not Provided</b>

\*Note: The Plan does not include all of the Wetland A area as determined by MDEQ. This is part of the area that MDEQ notes as being omitted by the applicant’s consultant in the northcentral portion of the site.

As shown in Table 1, the current Plan indicates a permanent wetland impact of 1.05-acre. The associated volume (cubic yards) of fill has not been provided on the Plan. As noted, the Plan does not include all of the Wetland A area as determined by MDEQ. This is part of the area that MDEQ notes as being omitted by the applicant’s consultant in the northcentral portion of the site.

In addition to wetland impacts, the Plan also proposes impacts to the 25-foot natural features setbacks. These impacts have not, however, been indicated or quantified on the Plan.

The applicant shall show the following information on subsequent site plans:

- Area (square feet) of all existing 25-foot wetland buffer areas;
- Area (square feet) of all wetland buffer impacts (both permanent and temporary);

- The proposed impacts to wetlands and 25-foot wetland setbacks shall be indicated on the Plan on the same sheet at the proposed site plan, not just on the existing conditions/demo plan;
- Volume (cubic yards) of all proposed wetland impacts.

The currently proposed wetland impacts do require wetland mitigation as the City's threshold for wetland mitigation is 0.25-acre of wetland impact and the MDEQ's threshold is 0.30-acre. Currently, the Plan proposes impacts to 1.05 acres of City-regulated wetland and to 0.55-acre of EGLE-regulated wetland.

### **City of Novi Wetland Ordinance Requirements**

The City of Novi Wetland and Watercourse Protection Ordinance (City of Novi Code of Ordinances, Part II, Chapter 12, and Article V) describes the regulatory criteria for wetlands and review standards for wetland permit applications.

As stated in the Ordinance, it is the policy of the city to prevent a further net loss of those wetlands that are: (1) contiguous to a lake, pond, river or stream, as defined in Administrative Rule 281.921; (2) two (2) acres in size or greater; or (3) less than two (2) acres in size, but deemed essential to the preservation of the natural resources of the city under the criteria set forth in subsection 12-174(b).

The wetland essentiality criteria as described in the Wetland and Watercourse Protection Ordinance are included below. Wetlands deemed essential by the City of Novi require the approval of a use permit for any proposed impacts to the wetland:

*All noncontiguous wetland areas of less than two (2) acres which appear on the wetlands inventory map, or which are otherwise identified during a field inspection by the city, shall be analyzed for the purpose of determining whether such areas are essential to the preservation of the natural resources of the city....In making the determination, the city shall find that one (1) or more of the following exist at the particular site:*

- (1) *The site supports state or federal endangered or threatened plants, fish or wildlife appearing on a list specified in Section 36505 of the Natural Resources Environmental Protection Act (Act 451 of 1994) [previously section 6 of the endangered species act of 1974, Act No. 203 of the Public Acts of 1974, being section 229.226 of the Michigan Compiled Laws].*
- (2) *The site represents what is identified as a locally rare or unique ecosystem.*
- (3) *The site supports plants or animals of an identified local importance.*
- (4) *The site provides groundwater recharge documented by a public agency.*
- (5) *The site provides flood and storm control by the hydrologic absorption and storage capacity of the wetland.*
- (6) *The site provides wildlife habitat by providing breeding, nesting or feeding grounds or cover for forms of wildlife, waterfowl, including migratory waterfowl, and rare, threatened or endangered wildlife species.*
- (7) *The site provides protection of subsurface water resources and provision of valuable watersheds and recharging groundwater supplies.*
- (8) *The site provides pollution treatment by serving as a biological and chemical oxidation basin.*
- (9) *The site provides erosion control by serving as a sedimentation area and filtering basin, absorbing silt and organic matter.*
- (10) *The site provides sources of nutrients in water food cycles and nursery grounds and sanctuaries for fish.*

*After determining that a wetland less than two (2) acres in size is essential to the preservation of the natural resources of the city, the wetland use permit application shall be reviewed according to the standards in subsection 12-174(a).*

### **Wetland Permits & Regulatory Status**

ECT has evaluated the on-site wetlands and believes that they are all considered to be essential/regulated by the City of Novi as they meet one or more of the essentiality criteria (i.e., functions and values) outlined in the City of Novi Wetland and Watercourse Protection Ordinance. Based on the criteria set forth in The City of Novi Wetlands and Watercourse Protection ordinance (Part II-Code of Ordinances, Ch. 12, Article V.), the on-site wetlands appear to meet the definition of a City-regulated wetland and meet one or more of the essentially criteria (i.e., wildlife habitat, storm water control, etc.). Any proposed use of the wetlands will require a City of Novi *Wetland Use Permit* as well as an *Authorization to Encroach the 25-Foot Natural Features Setback* for any proposed impacts to the 25-foot wetland buffers. It appears as though a City of Novi Non-Minor Use Wetland Permit would be required for the proposed impacts as the total wetland impacts appear to be greater than 10,000 square feet and/or likely greater than 300 cubic yards of impact [i.e., threshold for City of Novi Non-Residential (i.e., non-single family residence) Minor Wetland Permits]. A City of Novi *Authorization to Encroach the 25-Foot Natural Features Setback* would be required for any proposed impacts to on-site 25-foot wetland buffers.

ECT encourages the Applicant to minimize impacts to on-site wetlands and wetland setbacks to the greatest extent practicable. The Applicant should consider modification of the proposed lot boundaries and/or site design in order to preserve wetland and wetland buffer areas. It is ECT's opinion that the preservation of the 25-foot wetland buffer areas is important to the overall health of the wetlands, especially after site development. The existing buffer serves to filter pollutants and nutrients from storm water before entering the wetlands, as well as to provide additional wildlife habitat.

The City regulates wetland buffers/setbacks. Article 24, Schedule of Regulations, of the Zoning Ordinance states that:

*"There shall be maintained in all districts a wetland and watercourse setback, as provided herein, unless and to the extent, it is determined to be in the public interest not to maintain such a setback. The intent of this provision is to require a minimum setback from wetlands and watercourses.*

*Within an established wetland or watercourse setback, unless and only to the extent determined to be in the public interest by the body undertaking plan review, there shall be no deposition of any material, removal of any soils, minerals and/or vegetation, dredging, filling or land balancing, or construction of any temporary or permanent structures.*

*In determining whether proposed activities are in the public interest, the benefit which would reasonably be expected to accrue from the proposal shall be balanced against the reasonably foreseeable detriments of the construction or other activity, taking into consideration the local, state, and national concern for the protection and preservation of the natural feature in question. If, as a result of such a balancing, there remains a debatable question whether the proposal is clearly in the public interest, authorization for the construction or other activity within the setback shall not be granted".*

EGLE generally regulates wetlands that are within 500 feet of a waterbody, regulated stream or are part of wetland system greater than 5 acres in size. As noted, EGLE (formerly MDEQ) conducted a Level 3



Wetland Identification Review and summarized this in a Report dated July 5, 2018. EGLE has regulatory authority over Wetlands C, F, and G. The Applicant should provide a copy of the MDEQ Wetland Use Permit application to the City (and our office) for review and a copy of the approved permit upon issuance. A City of Novi Wetland Permit cannot be issued prior to receiving this information.

It should be noted that in those cases where an activity results in the impact to wetland areas of 0.25-acre or greater that are deemed essential under City of Novi Ordinance subsection 12-174(b) mitigation shall be required. The MDEQ's threshold for the requirement of wetland mitigation is 0.3-acre of wetland impacts. The applicant shall provide information on subsequent plans that clearly indicates all areas of onsite wetlands as well as the area of the 25-foot wetland buffers (i.e., square feet or acres). The plans shall also clearly indicate the area (square feet or acres) of all wetland and wetland buffer impacts (both permanent and temporary, if applicable) and the volume (cubic yards) of all wetland impacts.

### **Wetland Comments**

Please consider the following comments when preparing subsequent site plan submittals:

1. ECT encourages the Applicant to minimize impacts to on-site wetlands and wetland setbacks to the greatest extent practicable. The Applicant should consider modification of the proposed limits of disturbance boundaries and/or site design in order to preserve wetland and wetland buffer areas. It is ECT's opinion that the preservation of the 25-foot wetland buffer areas is important to the overall health of the wetlands, especially after site development. The existing buffer serves to filter pollutants and nutrients from storm water before entering the wetlands, as well as to provide additional wildlife habitat.
2. The Plan does not include all of the Wetland A area as determined by MDEQ's Wetland Identification Review (letter dated July 5, 2018). The plan should be updated to include all areas of existing wetland.
3. Proposed wetland impacts shall be clearly indicated, quantified and labeled on the Plan. All impact areas (square feet or acres) and impact volumes (cubic yards) shall be indicated on the Plan.
4. Subsequent site plans shall clearly indicate, label, and quantify (square feet or acres) the areas of all existing 25-foot wetland setbacks. Areas of proposed impact to 25-foot wetland buffers shall also be indicated, quantified (square feet or acres), and labeled on the Plan.
5. Wetland flag numbers should also be included on the Plan for all wetland areas.
6. Impacts are proposed to EGLE-regulated wetlands F and G. The Applicant should provide a copy of the EGLE Wetland Use Permit application to the City (and our office) for review and a copy of the approved permit upon issuance. A City of Novi Wetland Permit cannot be issued prior to receiving this information.
7. Should temporary impacts to either wetland or wetland setback be required, the applicant shall designate on the Plan a proposed native seed mix to be used in the restoration of these areas. Temporary impacts to wetlands and wetland setbacks shall be restored using a native seed mix; common grass seed or sod is not authorized in these areas. Seed mix details shall be included on the Plan, if applicable. The applicant should review and revise the Plan as necessary.

8. Should wetland mitigation continue to necessary due to proposed wetland impacts exceeding the City of EGLE mitigation thresholds, the applicant shall submit a detailed wetland mitigation plan for approval concurrently with the site development plan. Subsequent Plans should provide detailed information regarding the proposed wetland mitigation area, and specifically contain all of the requirements listed in Section 12-176. – Mitigation of the City of Novi Wetland Ordinance. .

The Plan shall also indicate the wetland Mitigation Ratio required for each area of wetland impact keeping in mind that the minimum requirement for mitigation of emergent and scrub-shrub wetland is 1.5-to-1 and the minimum requirement for mitigation of forested wetland is 2.0-to-1.

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

### **Recommendation left blank on purpose**

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

Respectfully submitted,

**ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.**



Pete Hill, P.E.  
Senior Associate Engineer

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

Attachments: Figure 1 – City of Novi Regulated Wetland and Woodland Map  
Figure 2 – DEQ Wetland Identification Detail  
Site Photos



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

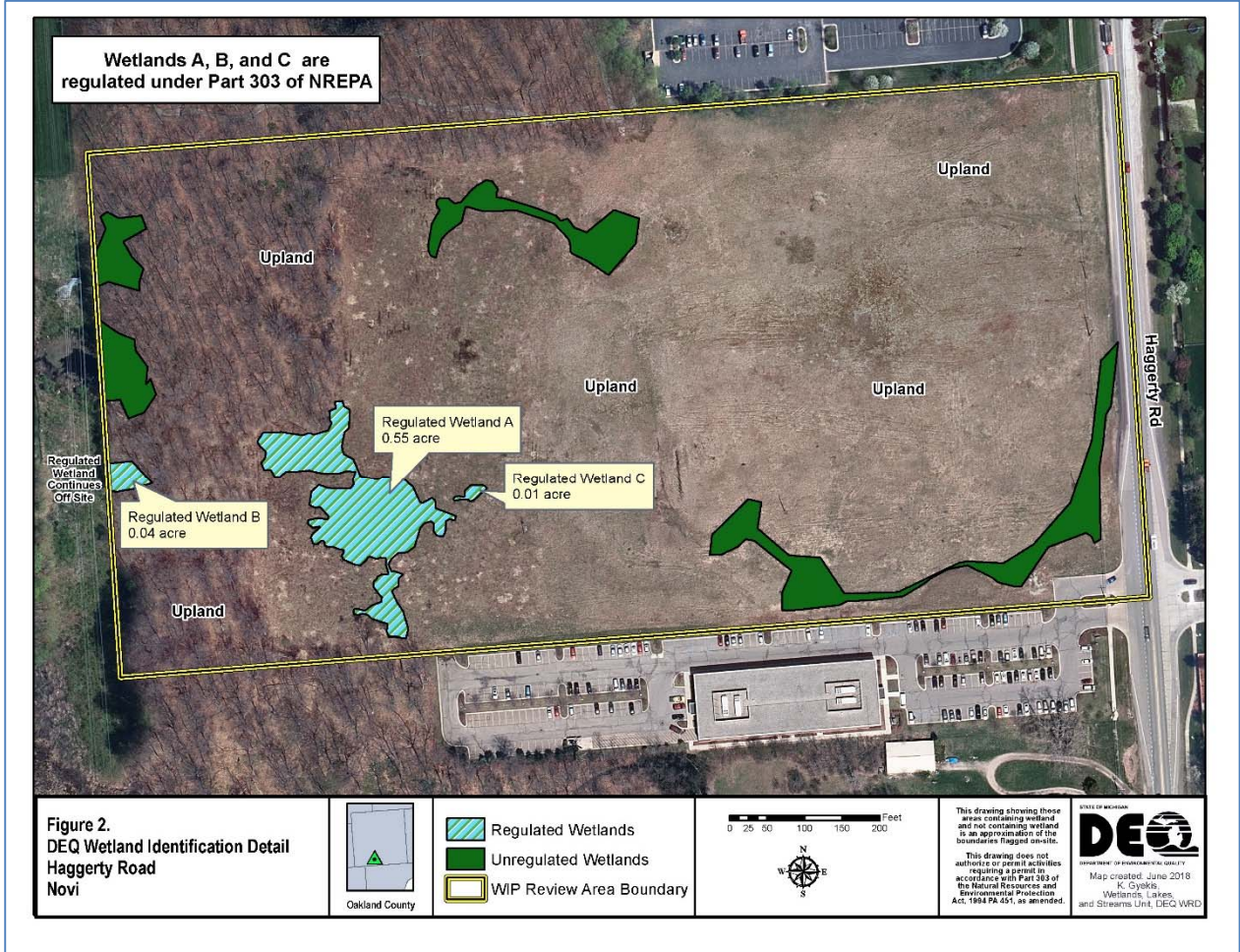


Figure 2. DEQ Wetland Identification Detail.

Site Photos



**Photo 1.** Looking west at Wetland C on the western edge of the project site (ECT, August 20, 2019).



**Photo 2.** Looking east at the northern edge of Wetland F near existing edge of woodlands (ECT, August 20, 2019).



**Photo 3.** Looking south at Wetland A (ECT, August 20, 2019).



**Photo 4.** Looking west at Wetland B on the southern edge of the project site (ECT, August 20, 2019).



**Photo 5.** Looking east at the western extents of Wetland A along the northern section of the project site (ECT, August 20, 2019).

ECT Project No. 170397-0500

January 8, 2017

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

Re: Novaplex (PWT17-0010)  
Wetland Evaluation

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) conducted a wetland evaluation for a property located north of Twelve Mile Road and west of Haggerty Road. It is located south of the currently vacant Magna building located at the southwest corner of Haggerty Road and Lewis Drive, Section 12. The Wetland Boundary Determination Application notes that the gross site acreage is 22 acres. The on-site wetland acreage does not appear to be listed on the plans submitted by the applicant, however it is noted that there are three (3) small pockets of forested wetland along the west property line as well as two (2) emergent wetlands in the open field area in the central and eastern portion of the site.

Based on our review of the application, Novi aerial photos, Novi GIS, the City of Novi Official Wetlands and Woodlands Map (see Figure 1, attached), and our on-site wetland evaluation inspection on November 7, 2017, the overall development site contains City-Regulated Wetlands as well as Woodlands. It should be noted that a significant portion of the development site had been previously cleared for the purpose of constructing a development that was never built. Wetland and Woodland Permits were issued for the previously-proposed impacts. ECT estimates that approximately 17.4 acres of the 22-acre site was previously cleared in preparation for development. Approximately 4.6 acres of the site remains as City Regulated Woodland area.

**City of Novi Wetland Ordinance Requirements**

The City of Novi Wetland and Watercourse Protection Ordinance (City of Novi Code of Ordinances, Part II, Chapter 12, Article V.; Division 2.) describes the regulatory criteria for wetlands and review standards for wetland permit applications.

The wetland essentiality criteria as described in the Wetland and Watercourse Protection Ordinance are included below. Wetlands deemed essential by the City of Novi require the approval of a use permit for any proposed impacts to the wetland.

*All noncontiguous wetland areas of less than two (2) acres which appear on the wetlands inventory map, or which are otherwise identified during a field inspection by the city, shall be analyzed for the purpose of determining whether such areas are essential to the preservation of the natural resources of the city. . . . In making the determination, the city shall find that one (1) or more of the following exist at the particular site:*

- (1) *The site supports state or federal endangered or threatened plants, fish or wildlife appearing on a list specified in Section 36505 of the Natural Resources Environmental Protection Act (Act 451 of*



1994) [previously section 6 of the endangered species act of 1974, Act No. 203 of the Public Acts of 1974, being section 229.226 of the Michigan Compiled Laws].

- (2) The site represents what is identified as a locally rare or unique ecosystem.
- (3) The site supports plants or animals of an identified local importance.
- (4) The site provides groundwater recharge documented by a public agency.
- (5) The site provides flood and storm control by the hydrologic absorption and storage capacity of the wetland.
- (6) The site provides wildlife habitat by providing breeding, nesting or feeding grounds or cover for forms of wildlife, waterfowl, including migratory waterfowl, and rare, threatened or endangered wildlife species.
- (7) The site provides protection of subsurface water resources and provision of valuable watersheds and recharging groundwater supplies.
- (8) The site provides pollution treatment by serving as a biological and chemical oxidation basin.
- (9) The site provides erosion control by serving as a sedimentation area and filtering basin, absorbing silt and organic matter.
- (10) The site provides sources of nutrients in water food cycles and nursery grounds and sanctuaries for fish.

*After determining that a wetland less than two (2) acres in size is essential to the preservation of the natural resources of the city, the wetland use permit application shall be reviewed according to the standards in subsection 12-174(a).*

### **Wetland Evaluation**

ECT's in-office review of available materials included the City of Novi Regulated Wetland and Watercourse map, USGS topographic quadrangle map, NRCS soils map, USFWS National Wetland Inventory map, and historical aerial photographs. The site includes several wetland areas that are indicated as City-regulated on the official City of Novi Regulated Wetland and Watercourse Map (see Figure 1).

The focus of the site inspection was to review site conditions in order to determine whether City-regulated wetlands are found on-site as well as confirm any wetland boundaries delineated by the applicant's wetland consultant. PEA, Inc. performed the on-site wetland delineation. Pink wetland boundary flagging was in place at the time of our site inspection.

The *Topographic Survey* provided by the applicant (Figure 2) indicates a total of five (5) on-site wetlands. The conceptual site plan that was previously submitted by the applicant proposed the filling of two (2) of the five (5) delineated wetlands on the site. As noted in the *Community Impact Statement (CIS)* prepared July 20, 2017 and previously submitted by the applicant, it is noted that about half of the wetlands are forested with the remaining wetlands consisting of emergent wetlands located in the open field areas. The applicant's consultants (PEA and Fleis & Vandenbrink) note that the wetlands are very typical for urban areas and exhibit poor to fair quality and provide minimal plant diversity. Common plants are noted as silver maple, reed canary grass, cattail, red-twig dogwood and black willow.

The CIS continues to state that based on the definition of wetland regulation by the Michigan Department of Environmental Quality (MDEQ) and the City of Novi, it is their opinion that all five (5) flagged wetlands are not regulated by the MDEQ or the City of Novi. Furthermore, based upon that opinion of regulation, the City's 25-foot wetland and watercourse buffer regulation would not apply. Finally, the CIS notes that the "small, unregulated" wetlands within the previously-disturbed area of the proposed development will be filled. The small wetlands within the proposed wildlife corridor along the westerly property line will be preserved.

ECT disagrees with the applicant's assessment that the on-site wetlands are not regulated by the City or by MDEQ (see *Wetland Regulatory Discussion* section for additional information). We have reviewed the wetland flagging and have determined that the wetland boundaries were accurately flagged in the field.

The following is a brief description of each of the on-site wetlands:

Wetland A is an emergent wetland located in the north/central open portion of the site. The dominant vegetation consisted of mainly common reed (*Phragmites australis*); an invasive species of vegetation. This wetland was proposed to be filled on the previously submitted concept plan. It appears as if a portion of this wetland was previously filled as authorized by the City of Novi Wetland and Watercourse Permit (Permit No. 99-32C-Renewal, dated August 24, 2004). Previous plans indicated a somewhat larger wetland in this area of the site (0.41-acre as opposed to the 0.09-acre wetland shown on the current *Topographic Survey Plan*).

Wetland B is an emergent wetland located along the southern and southeastern portion of the site. The dominant vegetation consisted of mainly common reed (*Phragmites australis*); an invasive species of vegetation.

It should be noted that it appears as if the applicant has labeled two (2) separate wetlands as wetland "A". Wetland A is forested wetland located in the western portion of the site. The dominant vegetation consisted of silver maple (*Acer saccharinum*). This wetland is proposed to be preserved on the pre-application site plan.

Wetland D is forested wetland with an open water element located in the western portion of the site. This wetland is proposed to be preserved on the pre-application site plan. The dominant vegetation consisted of silver maple (*Acer saccharinum*), narrow-leaved cattail (*Typha angustifolia*), and reed canary grass (*Phalaris arundinacea*).

Wetland E is forested wetland located in the northwestern portion of the site. The dominant vegetation consisted of silver maple (*Acer saccharinum*). This wetland is proposed to be preserved on the pre-application site plan.

#### **Wetland Regulatory Discussion**

ECT has evaluated the on-site wetlands and believes that they are all considered to be essential/regulated by the City of Novi as they meet one or more of the essentiality criteria (i.e., functions and values) outlined in the City of Novi Wetland and Watercourse Protection Ordinance (listed above). Specifically, the wetlands provide either flood and storm control or wildlife habitat. As noted, the wetlands appear to accurately flagged in the field and appear to be generally indicated accurately on the *Topographic Survey* provided by the applicant (Figure 2, attached). The dominant vegetation within Wetland B consisted of mainly common reed (*Phragmites australis*); an invasive species of vegetation.

The Michigan Department of Environmental Quality (MDEQ) generally regulates wetlands that are within 500 feet of a waterbody, regulated stream or are part of wetland system greater than 5 acres in size. It is the applicant's responsibility to contact MDEQ in order to confirm the regulatory authority with respect to the on-site wetland areas.

Any proposed use of the wetlands will require a City of Novi *Wetland Use Permit* as well as an *Authorization to Encroach the 25-Foot Natural Features Setback* for any proposed impacts to the 25-foot wetland buffers.

The applicant is urged to minimize impacts to on-site wetlands and wetland setbacks to the greatest extent practicable. The City regulates wetland buffers/setbacks. Article 24, Schedule of Regulations, of the Zoning Ordinance states that:

*“There shall be maintained in all districts a wetland and watercourse setback, as provided herein, unless and to the extent, it is determined to be in the public interest not to maintain such a setback. The intent of this provision is to require a minimum setback from wetlands and watercourses?”.*

It should be noted that in those cases where an activity results in the impact to wetland areas of 0.25-acre or greater that are deemed essential under City of Novi Ordinance subsection 12-174(b) mitigation shall be required. The MDEQ’s threshold for the requirement of wetland mitigation is 0.3-acre of wetland impacts. It should be noted that the original site development plan appears to have proposed the filling of approximately 0.41-acre (17,985 square feet) of existing wetland. This impact appears to have been previously-authorized through a City of Novi Wetland Permit. The previous permit does not appear to have included wetland mitigation as a required condition. Although not specified on the current conceptual site plan, the applicant appears to be proposing the filling of Wetland A (3,918 square feet/0.090-acre) and Wetland B (18,267 square feet/0.419-acre) for a total of approximately 22,185 square feet (0.509-acre).

The applicant shall provide information on subsequent plans that clearly indicates the areas of onsite wetlands as well as the area of the 25-foot wetland buffers (i.e., square feet or acres). The plans shall also clearly indicate the area (square feet or acres) of all wetland and wetland buffer impacts (both permanent and temporary, if applicable) and the volume (cubic yards) of all wetland impacts.

**Woodland Observations**

As shown on the *Topographic Survey* (Figure 2), a forested buffer remains along the western edge of this parcel. Sections of this remaining forested area appear to exceed 300 lineal feet in width. The remaining woodland areas consists of a high-quality beech-sugar maple forest that has a dense canopy dominated by beech and sugar maple trees with some ash, basswood, oak, elm, black cherry, and walnut. Ironwood is a dominant understory tree along with beech and sugar maple saplings. Shrubs consist of predominantly spicebush with some witch-hazel, viburnum and common elderberry. Ground cover within this woodland includes creeping strawberry-bush, woodbine, Jack-in-the-pulpit, Solomon’s seal, Christmas fern, bloodroot, beech drops, and mayapple.

A relatively recent concept plan previously submitted by the applicant proposed the removal of **203** remaining regulated trees requiring a total of **382** Woodland Replacement Credits. The current pre-application plan submitted by the applicant proposes the removal of **245** remaining regulated trees requiring a total of **457** Woodland Replacement Credits. This plan proposes a total of **327** on-site Woodland Replacement Credits according to the following:

- 151 3” caliper deciduous trees (1-to-1 replacement ratio) = 151 Credits;
  - 142 8-foot tall evergreens (1.5-to-1 replacement ratio) = 95 Credits;
  - 162 1.5” caliper deciduous tree (2-to-1 replacement ratio) = 81 Credits;
- 327 Credits**

Based on these replacement quantities, **130** Credits would be required to be paid to the City of Novi Tree Fund. In addition, the concept and pre-application plans noted that an additional **181** Woodland Replacement Credits continue to be required for the trees that were previously-cleared from the site. The

previously-submitted development plan required a total of **775** Woodland Replacement Trees; **181** Woodland Replacement Credits were to be planted on-site and **594** Woodland Replacement Credits were to be paid to the City of Novi Tree Fund. The required payment to the City of Novi Tree Fund was **\$193,050** (\$325 per Tree Credit x 594 Credits).

It is ECT's understanding that a Woodland Replacement Performance Financial Guarantee is being held for the on-site replacement of these **181** Woodland Replacement Credits. In addition, it is our understanding that the previously required payment to the City of Novi Tree Fund of **\$193,050** (\$325 per Tree Credit x 594 Credits) was made by the applicant.

The remaining woodland areas on the subject site are of high quality, contain mature high-quality trees, and contain very few invasive plant species located in this area as well. ECT recommends that no additional woodland impacts be authorized for the development of this property.

#### **Wetland/Woodland Comments**

ECT recommends that the Applicant address the items noted below in subsequent site plan submittals:

1. It should be noted that that subsequent site plans shall clearly indicate, label, and quantify the areas of all existing wetlands and 25-foot wetland setbacks. It should also be noted that the applicant's wetland consultant has included two (2) different areas labelled as "Wetland A"; and there is no "Wetland C" on the Plan. The applicant shall label all on-site wetlands and 25-foot wetland setbacks on the Plan. Wetland flag numbers should also be included on the Plan. Specifically, the applicant shall show the following information on subsequent site plans:
  - a. The area of all existing on-site wetland/watercourse areas (square feet or acres);
  - b. The area of all existing 25-foot buffer areas (square feet or acres);
  - c. Area (square feet) and volume (cubic yards) of all wetland/watercourse impacts (both permanent and temporary);
  - d. Area (square feet) of all wetland buffer impacts (both permanent and temporary).
2. In addition, based on the review of historic aerial photos and our site inspection, the previously-authorized clearing, grubbing, grading and tree removal work impacted all existing wetlands within the previously-defined limits of disturbance area that were present at that time. The current pre-application plan does not propose impacts to wetlands outside of the previously approved limits of disturbance area. It should be noted, however, that the applicant did not complete all of the wetland fill authorized by previous permits. Specifically, the current Plan appears to propose the filling of two (2) of the five (5) delineated wetlands on the site (see Figure 2, Topographic Survey Plan). ECT supports the re-authorization of wetland impacts proposed within the previously-proposed limits of disturbance area.

The applicant shall continue to preserve the wetlands and wetland setbacks located along the western edge of the proposed site.

3. It appears as though a City of Novi Non-Minor Use Wetland Permit would be required for the proposed impacts as the total wetland impacts appear to be greater than 10,000 square feet and/or likely greater than 300 cubic yards of impact [i.e., threshold for City of Novi Non-Residential (i.e., non-single family residence) Minor Wetland Permits]. A City of Novi *Authorization to Encroach the*

*25-Foot Natural Features Setback* would be required for any proposed impacts to on-site 25-foot wetland buffers.

4. It should be noted that it is the Applicant's responsibility to confirm the need for a Permit from the MDEQ for any proposed wetland impact. Final determination as to the regulatory status of each of the on-site wetlands shall be made by MDEQ. The on-site wetlands could be regulated by the Michigan Department of Environmental Quality (MDEQ) as MDEQ regulates wetlands that are located within 500-feet of a pond, stream, drain or lake or are greater than 5-acres in size. A permit from this agency may be required for any direct impacts, or potentially for storm water discharge from the proposed detention basin to existing wetlands (if applicable). The Applicant should provide a copy of the MDEQ Wetland Use Permit application to the City (and our office) for review and a copy of the approved permit upon issuance. A City of Novi Wetland Permit cannot be issued prior to receiving this information.
5. The remaining woodland areas on the subject site are of high quality, contain mature high-quality trees, and contain very few invasive plant species located in this area as well. As 79% of the site has been previously cleared for development, ECT recommends that **no additional woodland impacts be authorized** for the development of this property.

As always, please feel free to contact our office if you have any questions.

Sincerely,

**ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.**



Matthew Carmer  
Senior Scientist  
Professional Wetland Scientist #1746



Pete Hill, P.E.  
Senior Associate Engineer

cc: Lindsay Bell, City of Novi Planner ([lbell@cityofnovi.org](mailto:lbell@cityofnovi.org))  
Sri Komaragiri, City of Novi Planner ([skomaragiri@cityofnovi.org](mailto:skomaragiri@cityofnovi.org))  
Rick Meader, City of Novi Landscape Architect ([rmeader@cityofnovi.org](mailto:rmeader@cityofnovi.org))  
Hannah Smith, City of Novi Planning Assistant ([hsmith@cityofnovi.org](mailto:hsmith@cityofnovi.org))

Attachments: Figure 1 – City of Novi Regulated Wetland Boundaries Map  
Figure 2 – Topographic Survey  
Site Photos



**Figure 1. City of Novi Regulated Wetland Boundaries Map.** Regulated wetland boundaries are shown in blue and regulated woodland areas are indicated in green. The approximate property boundary is shown in red.

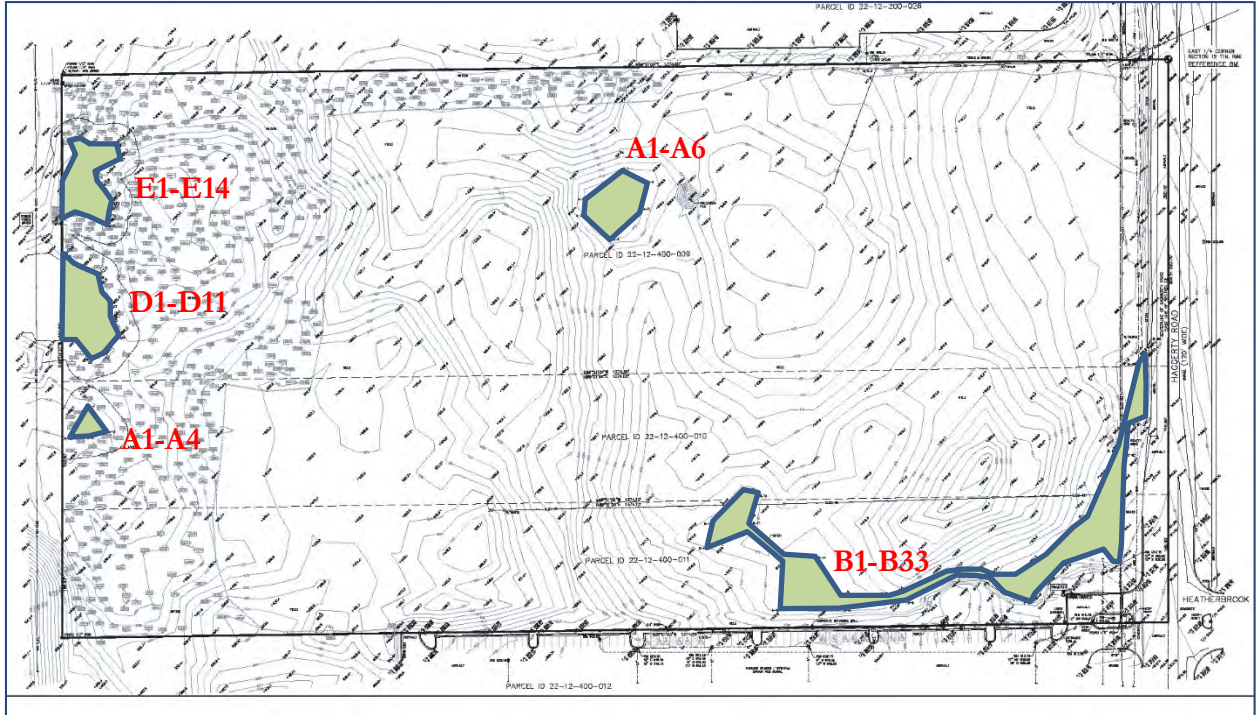


Figure 2. Topographic Survey (provided by PEA, Inc.).

*Site Photos*



**Photo 1.** Looking north at Wetland A located within northcentral section of the site (ECT, November 7, 2017).



**Photo 2.** Looking east at Wetland B in the southern section of the site (ECT, November 7, 2017).





**Photo 3.** Looking northwest at Wetland A in the western section of the site (ECT, November 7, 2017).



**Photo 4.** Looking west at Wetland D in the western section of the site (ECT, November 7, 2017).



**Photo 5.** Looking northwest at Wetland E in the northwestern section of the site (ECT, November 7, 2017).



**Photo 6.** Looking north within the high-quality regulated woodland area located in the western section of the site (ECT, November 7, 2017).

## WOODLANDS REVIEW

ECT Project No.: 190526-0200

August 26, 2019

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

Re: Novaplex (JZ19-0037)  
 Woodland Review of the Revised PRO Concept Plan (PSP19-0129)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Revised Planned Re-Zoning Overlay (PRO) Concept Plan for the proposed Novaplex project prepared by PEA, Inc. dated and stamped “Received” by the City of Novi Community Development Department on July 26, 2019 (Plan). The Plan was reviewed for conformance with the City of Novi Woodland Protection Ordinance Chapter 37. ECT most-recently visited the proposed project site on August 20, 2019 for the purpose of a woodland evaluation.

**Recommendation left blank on purpose**

The following woodland related items are required for this project:

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

The proposed project is located north of Twelve Mile Road and west of Haggerty Road (between the vacant Magna building to the north and the Botsford Center Rehabilitation Center to the south). The project site includes Parcel ID’s 50-22-12-400-009, -010, and -011. The Plan proposes the construction of ten (10) multi-family residential buildings, a club house, garages, associated parking and utilities and two (2) stormwater detention basins.

The purpose of the Woodlands Protection Ordinance is to:

- 1) *Provide for the protection, preservation, replacement, proper maintenance and use of trees and woodlands located in the city in order to minimize disturbance to them and to prevent damage from erosion and siltation, a loss of wildlife and vegetation, and/or from the destruction of the natural habitat. In this regard, it is the intent of this chapter to protect the integrity of woodland areas as a whole, in recognition that woodlands serve as part of an ecosystem, and to*

*place priority on the preservation of woodlands, trees, similar woody vegetation, and related natural resources over development when there are no location alternatives;*

- 2) *Protect the woodlands, including trees and other forms of vegetation, of the city for their economic support of local property values when allowed to remain uncleared and/or unharvested and for their natural beauty, wilderness character of geological, ecological, or historical significance; and*
- 3) *Provide for the paramount public concern for these natural resources in the interest of health, safety and general welfare of the residents of the city.*

What follows is a summary of our findings regarding on-site woodlands associated with the proposed project.

### **On-Site Woodland Evaluation**

ECT has reviewed the City of Novi Official Woodlands Map and completed an onsite Woodland Evaluation on August 20, 2019. ECT's in-office review of available materials included the City of Novi Regulated Woodland map and other available mapping. The subject property does include areas indicated as City-regulated woodland on the official City of Novi Regulated Wetland and Woodland Map (see Figure 1). The majority of the site has been previously cleared of trees, however, as shown on the *Topographic Survey* (Sheet C-1.0), a forested buffer remains along the western portion and a section of the northwester edge of this parcel. Sections of this remaining forested area appear to exceed 300 lineal feet in width. The remaining woodland areas consists of a high-quality beech-sugar maple forest that has a dense canopy dominated by beech and sugar maple trees with some ash, basswood, oak, elm, black cherry, and walnut. Ironwood is a dominant understory tree along with beech and sugar maple saplings. Shrubs consist of predominantly spicebush with some witch-hazel, viburnum and common elderberry. Ground cover within this woodland includes creeping strawberry-bush, woodbine, Jack-in-the-pulpit, Solomon's seal, Christmas fern, bloodroot, beech drops, and mayapple.

The *Community Impact Statement (CIS)* submitted with the Plan notes that the property is a historically disturbed and vacant site. There is regulated woodland along the west property line, with the remainder of the site an open, tilled field. Some of the woodland is located within forested wetlands (i.e., along the western side of the site) with the remainder being an upland mix of trees. The CIS states that overall, the woodlot is in fair to good condition. It is stated that the proposed development will impact from 50-feet on the southerly edge of the existing tree line on the west side of the project site, to 200 feet on the northerly end of this existing tree line. The CIS states that the disturbance is necessary for the physical construction of the proposed improvements. The applicant states that as the site plan continues to be refined, efforts will be made to reduce the proposed number of tree removals. The CIS notes that all regulated trees removed will be replaced per the City of Novi Woodland Ordinance requirements.

An existing tree survey and tree list has been provided. The Plan includes a surveyed tree list (*Prelim. Tree List*, Sheet T-1.1) that identifies tree tag numbers, diameter-at-breast-height (DBH), common/botanical name, condition, and required replacement credit quantities for all surveyed trees. The *Prelim Landscape Calculation* plan (Sheet L-1.1) includes a *Tree Replacement* Summary that lists the total woodland replacements credits that are required for the proposed tree removals.

The surveyed trees have been marked with aluminum tree tags allowing ECT to compare the tree diameters reported on the Plan to the existing tree diameters in the field. ECT found that the Plan appears to

accurately depict the location, species composition and the size of the existing trees. ECT took a sample of diameter-at-breast-height (DBH) measurements and found that the data provided on the Plan was consistent with the field measurements.

The City of Novi regulates all trees 8-inches diameter-at-breast-height (DBH) and greater that are located within the areas delineated as regulated woodlands on the City-Regulated Woodlands Map. The City also regulates any individual tree greater than or equal to 36-inches DBH, irrespective of whether such tree is within a regulated woodland. Proposed woodland impacts will require a Woodland Permit and the regulated trees shall be relocated or replaced by the permit grantee.

It should be noted that the *Prelim. Tree List* includes a total of eighteen (18) trees listed as “poor” condition and have been exempted from replacement. The City’s Woodland Ordinance does not define/describe “poor” trees but does define “dead” and “diseased” trees:

***Dead tree*** means a tree having no more than zero (0) to fifteen (15) percent of the canopy with leaves. This determination shall be made during the regular growing season.

***Diseased tree*** means a tree that has been determined to have a terminal disease such as, but not limited to, Dutch Elm disease or Oak Wilt. Said disease must be confirmed by the Michigan State Cooperative Extension Service Plant and Pest Diagnostic Clinic at Michigan State University or an equivalent laboratory.

During ECT’s onsite woodland evaluation we reviewed the condition of the following eighteen (18) trees. ECT evaluated the tree for the condition value of the trunk, growth rate, structure, signs of insects or disease, crown development, and life expectancy. Based on these rankings it was determined if the tree is above or below a 50% health/condition ranking:

- Tree #3385, 10” basswood (<50% health condition);
- Tree #3485, 15” basswood;
- Tree #3653, 30” sugar maple;
- Tree #3663, 8” basswood;
- Tree #3678, 8” red oak;
- Tree #3680, 8” sugar maple (<50% health/condition);
- Tree #3690, 11” basswood;
- Tree #3702, 8” basswood (<50% health/condition);
- Tree #3822, 18” sugar maple (<50% health/condition);
- Tree #3833, 20” American beech (<50% health/condition);
- Tree #3837, 23” American beech;
- Tree #3861, 15” sugar maple;
- Tree #3961, 17” sugar maple;
- Tree #3972, 8” basswood;
- Tree #3977, 8” basswood (<50% health/condition);
- Tree #3991, 9” basswood;
- Tree #3996, 18” sugar maple;
- Tree #3999, 8” sugar maple (<50% health/condition).

As such, ECT agrees with the exclusion of seven (7) of these eighteen (18) trees from replacement. The trees that appear to be <50% health/condition are Trees #3385, #3680, #3702, #3822, #3833, #3977, and #3999. The applicant shall review the information related to tree removals and replacements on the Plan and make revisions as necessary.

**Proposed Woodland Impacts and Replacements**

A *Woodland Summary* Table has been included on Sheet L-1.1 (*Prelim Landscape Calculations*). The Applicant has noted the following woodland impacts associated with the Plan:

- Stems to be Removed 8” to 11”: 50 x 1 replacement (Requiring 50 Replacements)
- Stems to be Removed 11” to 20”: 86 x 2 replacements (Requiring 172 Replacements)
- Stems to be Removed 20” to 30”: 27 x 3 replacements (Requiring 81 Replacements)
- Subtotal Replacements Required: 303 Replacements
- Replacement Required for Trees Previously Cleared from Site and Not Replaced: 181 Replacements
  
- Total Replacements Required: 484 Replacements

In summary, 163 regulated trees are proposed for removal on the current Plan requiring 303 Woodland Replacement Credits. The Plan appears to indicate that 140 Woodland Replacement Credits will be planted on-site and the remainder (343) shall be paid into the City of Novi Tree Fund. Sheet L-1.1 (*Prelim Landscape Calculations*) and Sheet L-1.0 (*Preliminary Landscape Plan*) contain some discrepancies. The *Preliminary Landscape Plan* appears to indicate a total of 104 deciduous replacement trees (104 Credits at 1-to-1 replacement ratio) and 54 evergreens (36 Credits at 1.5-to-1 replacement ratio) are to be planted. The information regarding replacements provided on the *Prelim Landscape Calculations* sheet differs slightly. Please review and revise the landscaping sheets to ensure that the woodland removal and proposed replacement information is consistent.

**City of Novi Woodland Review Standards and Permit Requirements**

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

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

In addition,

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

The City of Novi regulates all trees 8-inches diameter-at-breast-height (DBH) and greater that are located within the areas delineated as regulated woodlands on the City-Regulated Woodlands Map. The City also regulates any individual tree greater than or equal to 36-inches DBH, irrespective of whether such tree is within a regulated woodland. Proposed woodland impacts will require a Woodland Permit and the regulated trees shall be relocated or replaced by the permit grantee.

**Woodland Comments**

Please consider the following comments when submitting future site development plan submittals:

1. The majority of the site has previously been cleared of trees. The Plan notes that an additional 181 Woodland Replacement Credits are required for the trees that were to be planted on-site for the clearing that was associated with the previous development that was not built. The current Plan proposes the removal of an additional 163 trees requiring 303 Woodland Replacement Credits.

The remaining woodland areas on the subject site are of high quality, contain mature high-quality trees, and contain very few invasive plant species located in this area as well. As approximately 79% of the site has been previously cleared for development, ECT recommends that **no additional woodland impacts be authorized** for the development of this property.

2. It should be noted that the Plan proposes a total of 163 tree removals requiring an additional 303 Woodland Replacement Credits. Of these trees to be removed, the applicant notes that eighteen (18) of these trees (11%) should be treated as exempt because the tree's condition. ECT evaluated these trees for the condition value of the trunk, growth rate, structure, signs of insects or disease, crown development, and life expectancy. Based on these rankings it was determined if the tree is above or below a 50% health/condition ranking. ECT agrees with the exclusion of seven (7) of these eighteen (18) trees from replacement. The trees that appear to be <50% health/condition are Trees #3385, #3680, #3702, #3822, #3833, #3977, and #3999. The applicant shall review the information related to tree removals and replacements on the Plan and make revisions as necessary.
3. A Woodland Permit from the City of Novi would be required for proposed impacts to any trees 8-inch DBH or greater located within the regulated woodland boundaries or any tree greater than 36-inches DBH. Such trees shall be relocated or replaced by the permit grantee either through approved on-site replacement trees or through a payment to the City of Novi Tree Fund. All deciduous replacement trees shall be two and one-half (2 ½) inches caliper or greater and will be counted at a 1:1 replacement ratio. All proposed coniferous replacement trees shall be 6-feet in height (minimum) and will be counted at a 1.5:1 replacement ratio. See the attached City of Novi Woodland Replacement Chart for acceptable woodland replacement species.
4. A Woodland Replacement Performance financial guarantee for the planting of replacement trees will be required. This financial guarantee will be based on the number of on-site woodland replacement trees (credits) being provided at a per tree value of \$400.
5. The Applicant will be required to pay the City of Novi Tree Fund at a value of \$400/credit for any Woodland Replacement tree credits that cannot be placed on site.
6. It should be noted that the *Preliminary Landscape Plan* (Sheet L-1.0) indicates that woodland replacement trees are to be planted within the regulated woodland areas remaining on the west side of the project site. The Plan also notes that replacement planting numbers and locations within the woodland will be jointly determined by the applicant's landscape architect and the City of Novi's Landscape architect. Any trees that cannot be planted without bringing harm to the existing woods will be replaced by a contribution to the City of Novi Tree Fund.



It is ECT's opinion that because the quality of the remaining woodland area is so high, no Woodland Replacement Trees shall be authorized within the existing Regulated Woodland area.

7. The Plan appears to indicate that 140 Woodland Replacement Credits will be planted on-site and the remainder (343) shall be paid into the City of Novi Tree Fund. Sheet L-1.1 (*Prelim Landscape Calculations*) and Sheet L-1.0 (*Preliminary Landscape Plan*) contain some discrepancies. The *Preliminary Landscape Plan* appears to indicate a total of 104 deciduous replacement trees (104 Credits at 1-to-1 replacement ratio) and 54 evergreens (36 Credits at 1.5-to-1 replacement ratio) are to be planted. The information regarding replacements provided on the *Prelim Landscape Calculations* sheet differs slightly. Please review and revise the landscaping sheets to ensure that the woodland removal and proposed replacement information is consistent.
8. Based on a successful inspection of the installed on-site Woodland Replacement trees (if applicable), the Woodland Replacement Performance Guarantee shall be returned to the Applicant. A Woodland Maintenance and Guarantee bond equal to twenty-five percent (25%) of the value of the original Woodland Replacement material will then be kept for a period of 2-years after the successful inspection of the tree replacement installation.
9. The Applicant shall provide preservation/conservation easements as directed by the City of Novi Community Development Department for any areas of woodland replacement trees. The applicant shall demonstrate that the all proposed woodland replacement trees will be guaranteed to be preserved as planted with a conservation easement or landscape easement to be granted to the city. This language shall be submitted to the City Attorney for review. The executed easement must be returned to the City Attorney within 60 days of the issuance of the City of Novi Woodland permit. Any associated easement boundaries shall be indicated on the Plan.
10. Replacement material should not be located 1) within 10' of built structures or the edges of utility easements and 2) over underground structures/utilities or within their associated easements. In addition, replacement tree spacing should follow the *Plant Material Spacing Relationship Chart for Landscape Purposes* found in the City of Novi *Landscape Design Manual*.

Novaplex (JZ19-0037)  
Woodland Review of the Revised PRO Concept Plan (PSP19-0129)  
August 26, 2019  
Page 7 of 10

## **Recommendation left blank on purpose**

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

Respectfully submitted,

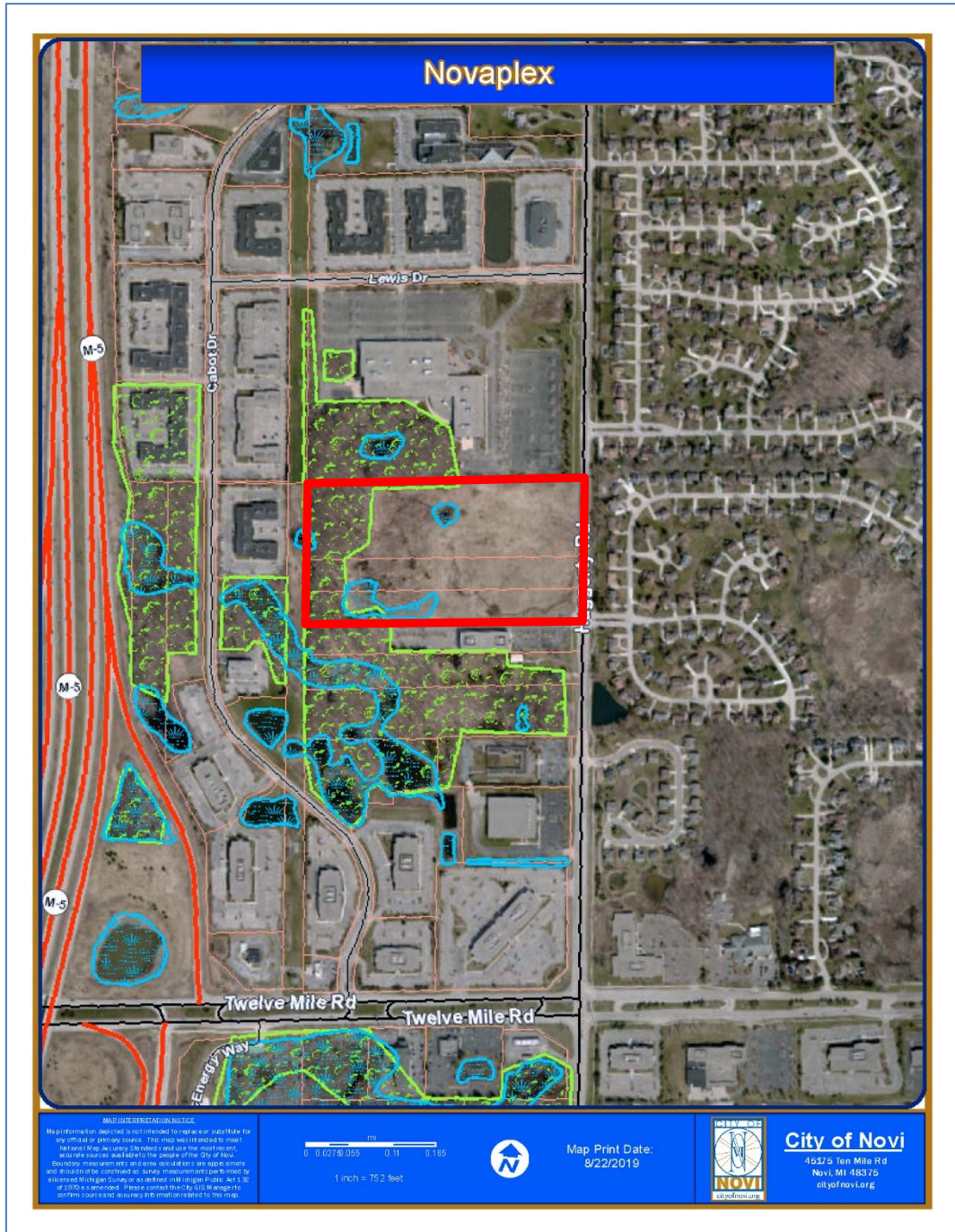
**ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.**



Pete Hill, P.E.  
Senior Associate Engineer

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

Attachments: Figure 1 – City of Novi Regulated Wetland and Woodland Map  
Site Photos



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

***Site Photos***



**Photo 2.** Looking east along the existing regulated woodland area located on the northern portion of the site (ECT, August 20, 2019).



**Photo 3.** Looking west from the southeast portion of the site towards the regulated woodland area located on the western portion of the site (ECT, August 20, 2019).



**Photo 4.** Tree No. 3833 (20-inch diameter beech tree). ECT concurs with the applicant's assessment that this tree is exempt from replacement due to condition (i.e. poor condition of the trunk, overall structure, crown development, and low life expectancy). (ECT, August 20, 2019).

## TRAFFIC REVIEW



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

**Project name:**  
 JSP19-0024 Novaplex Residential PRO Concept  
 Traffic Review

**From:**  
 AECOM

**Date:**  
 August 30, 2019

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

**CC:**  
 Sri Komaragiri, Lindsay Bell, Kate Richardson,  
 Madeleine Kopko

# Memo

**Subject:** JSP19-0024 Novaplex Residential PRO Concept Traffic Review

**Recommendation left blank on purpose**

## GENERAL COMMENTS

1. The applicant, BC Novaplex LLC, is proposing an apartment complex, consisting of 10 buildings containing 340 units, garages, clubhouse, and outdoor areas on the west side of Haggerty Road, between Twelve and Thirteen Mile Roads.
2. Haggerty Road is under the jurisdiction of Oakland County.
3. The parcel is zoned OST. The applicant is proposing rezoning the area to RM-2 with a PRO.
4. The applicant would need a number of deviations based on the submitted concept. They should review this letter and confirm which deviations that they are actually seeking.

## 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: 221 Multi-Family housing (Mid-Rise)  
 Development-specific Quantity: 340  
 Zoning Change: As indicated above for PRO

Trip Generation Summary				
	Estimated Trips	Estimated Peak-Direction Trips	City of Novi Threshold	Above Threshold?
AM Peak-Hour Trips	114	84	100	No
PM Peak-Hour Trips	143	87	100	No

<b>Daily (One-Directional) Trips</b>	1,851	N/A	750	Yes
--------------------------------------	-------	-----	-----	-----

- The number of trips exceeds the City's threshold of more than 750 trips per day or 100 trips per either the AM or PM peak hour. AECOM recommends performing the following traffic impact studies in accordance with the City's requirements. This study was provided during the Pre-App phase and was revised for this submittal.

Trip Impact Study Recommendation	
Type of Study:	Justification
<b>Rezoning Traffic Impact Study</b>	The applicant is proposing rezoning the parcels and so a rezoning traffic study comparing the trips possible under the current and proposed zoning, as well as the proposed land use, is required. A RTIS was submitted by the applicant and reviewed by AECOM in a separate letter.
<b>Traffic Impact Study</b>	The proposed developments exceed the City of Novi thresholds for requiring a Traffic Impact Study. This study was provided during the Pre-App phase and was revised for this submittal.

## EXTERNAL SITE ACCESS AND OPERATIONS

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

- The applicant is proposing two (2) points of access to the development, as follows:
  - One (1) divided driveway off of Haggerty Road.
    - The dimensions of the divided entrance are generally within the ranges provided in Figure IX.3 of the City's Code of Ordinances. The applicant could consider modifying the proposed dimensions to meet the standards. The nose offset, island width, and island length dimensions are not within the ranges in the figure.
  - One (1) tie in to existing access point for adjacent parcel on Haggerty Road.
- The applicant is proposing a right turn lane and taper along Haggerty Road. The applicant should review Figure IX.11 of the City's Code of Ordinances. The exit lane is proposed to tie into the existing right turn lane taper for the property to the south. The applicant should submit proposed Haggerty Road revisions to the Road Commission for Oakland County for their review and approval.
- The applicant should add a left turn passing lane that ties into the existing exit lane for the property to the south, as shown in the pre-application plan set. The applicant should submit proposed Haggerty Road revisions to the Road Commission for Oakland County for their review and approval.
- The applicant should confirm that the proposed driveways meet the same side spacing requirements as indicated in Section 11-216(d)(1)(d) and Figure IX.12 of the City's Code of Ordinances and dimension the spacing on the plans. It needs to be clearly shown.
- The applicant should include sight distance measurements for the driveways along Haggerty Road. Refer to Figure VIII-E of the City's Code of Ordinances for more information.
- The applicant is proposing a sidewalk along Haggerty Road, and continuing the sidewalk along the adjacent parcel to connect to the existing sidewalk.
  - The applicant should provide proposed sidewalk and ramp details and include the latest Michigan Department of Transportation (MDOT) sidewalk ramp detail.

## INTERNAL SITE OPERATIONS

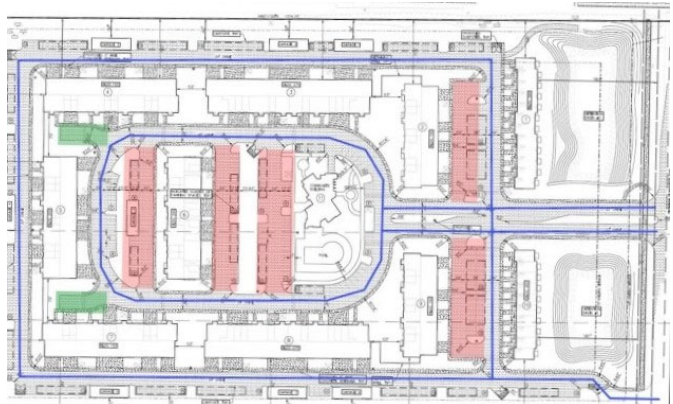
The following comments relate to the on-site design and traffic flow operations.

- General Traffic Flow



- a. The site generally appears to be accessible to passenger vehicles.
- b. The applicant has provided fire truck turning paths to ensure accessibility.
- c. The majority of the drives in the

development (see blue lines on the image shown here) are considered major drives as per the City's Zoning Ordinance, Section 5.10.1.B. Major drives shall have a width of 28' and angled and perpendicular parking spaces are not permitted (5.10.1.B.v.d). **The applicant should revise the proposed drives to comply with the ordinance or seek a deviation.**



- d. The applicant should provide width dimensions for the end island areas throughout the development to ensure compliance with Figure 5.3.12 in the City's Zoning Ordinance.
  - i. The applicant should indicate the end islands are to be 3' shorter than the adjacent parking stall.
- e. The applicant should indicate curb heights throughout the development. Note that 6" curbs are required along all landscape areas, except when in front of a 17' parking space where a 4" curb is permitted.
- f. The applicant has not provided more than 15 consecutive parking spaces, which is in compliance with the City's Zoning Ordinance, Section 5.5.3.C.ii.i.
- g. The applicant has proposed five (5) trash receptacles in the development. The locations of some of the proposed facilities is such that, when in active use, the collection vehicle will diminish access to the maneuvering aisle and/or parking spaces. **The applicant should review the placement of the receptacles and consider alternate locations that would not diminish access, if possible, in order to be in compliance with Section 5.4.4 of the Zoning Ordinance. Specifically the location just south of building #10. That trash receptacle should be straitened out and aligned with the drive that is perpendicular to the outer ring drive.**
  - i. The applicant should confirm that the trash receptacles are accessible by trash collection vehicles via turning movement paths.

## 2. Parking Facilities

- a. The applicant should reference the Planning Review letter for information regarding required off-street parking quantities. **The applicant has indicated they are requesting a deviation for the number of parking spaces required on the site.**
  - i. The applicant is proposing a mix of surface lot and garage spaces.
  - ii. The applicant should indicate the number of parking spaces provided in the 63' x 20' garages located along the edges of the property.
- b. As stated in Section 1.c of this letter, perpendicular parking is not allowed on major drives.
- c. The proposed parking lot parking space dimensions are generally in compliance with City standards; however, curb heights should be provided to confirm space length dimensions are appropriate. The applicant should reference Section 5.5.3.C.ii for additional information about required curb heights in relation to parking space length.
  - i. Spaces 19' in length require a 6" curb height. Alternatively, the length of the parking spaces could be reduced to 17' abutting the 4" curb.
- d. The applicant should indicate parking space widths.
- e. The applicant should indicate any accessible parking spaces.
  - i. **The applicant is required to provide accessible spaces based on 2% (12 spaces) of the total spaces provided (586 spaces).**
- f. The applicant has generally indicated 24 aisles (one is 25"). Please refer with Section 5.3.2 of the City's Zoning Ordinance. Many of these aisles are major drives and would need a deviation.

- g. The applicant is required to provide 68 bicycle parking spaces, one (1) space for each five (5) dwelling units.
  - i. **The applicant should indicate the locations where the bicycle parking is proposed and whether it is covered parking or not.**
  - ii. The Zoning Ordinance, Section 5.16.1.F suggests providing spaces in multiple locations in increments of two (2) when more than four (4) spaces are required. Given the range of buildings to be served by the bicycle parking in this development, the applicant should provide the bicycle parking throughout the development, no more than 120 feet from the building entrances being served (Section 5.16.1.E).
  - iii. The Zoning Ordinance, Section 5.16.4 provides the following covered bicycle parking space requirement: *Unless waived or modified as provided in subsection 5E, when twenty (20) or more bicycle parking spaces are required, twenty-five (25) percent of the bicycle parking spaces shall be covered bicycle parking spaces.*
    - 1. Under this section, the applicant is required to provide 17 (25%) of the 68 bicycle parking spaces as covered parking.
  - iv. The applicant should provide the design of proposed bicycle racks.
  - v. The applicant should provide the proposed bicycle parking layout and distances from the entrances of the proposed buildings to review compliance with Section 5.16.
- 3. Sidewalk Requirements
  - a. The applicant has generally proposed a 5' sidewalk width details throughout the site. The sidewalks adjacent to parking spaces at the Community Building have been dimensioned as 7'.
  - b. The applicant should indicate locations of and details for all proposed sidewalk ramps throughout the site and include the latest MDOT sidewalk ramp detail.
  - c. **It should be noted that all bicycle parking facilities shall be accessible from adjacent street(s) and pathway(s) via a paved route that has a minimum width of 6'. The applicant should revise the plans or seek a deviation.**

## SIGNING AND STRIPING

- 1. All on-site signing and pavement markings shall be in compliance with the Michigan Manual on Uniform Traffic Control Devices (MMUTCD). The following is a discussion of the proposed signing and striping.
  - a. The applicant should provide proposed signing locations along with a signing quantities table and additional details (MMUTCD designation and proposed size) in future submittals.
  - b. The stop sign detail shown on sheet C-8.0 shows a size of 30". The minimum size of the stop sign should be 30".
- 2. The applicant should provide the following notes and details related to the proposed signing.
  - a. Single signs with nominal dimensions of 12" x 18" or smaller in size shall be mounted on a galvanized 2 lb. U-channel post. Multiple signs and/or signs with nominal dimension greater than 12" x 18" shall be mounted on a galvanized 3 lb. or greater U-channel post as dictated by the weight of the proposed signs.
  - b. The applicant should indicate a bottom height of 7' from final grade for all signs installed.
  - c. The applicant should indicate that all signing shall be placed 2' from the face of the curb or edge of the nearest sidewalk to the near edge of the sign.
  - d. Traffic control signs shall use the FHWA Standard Alphabet series.
  - e. Traffic control signs shall have High Intensity Prismatic (HIP) sheeting to meet FHWA retroreflectivity requirements.
- 3. The applicant has included parking space striping notes to indicate that:
  - a. The standard parking spaces shall be striped with four (4) inch white stripes.
  - b. The accessible parking space and associated aisle should be striped with four (4) inch blue stripes.
  - c. Where a standard space is adjacent to an accessible space, abutting blue and white stripes shall be installed.

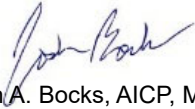
Memo

4. The applicant should provide a detail for the proposed international symbol for accessibility pavement markings that may be placed in the accessible parking space. The symbol shall be white or white with a blue background and white border with rounded corners.
5. The applicant should provide a detail for the proposed crosswalk markings.
6. The applicant should indicate any proposed pavement markings along Haggerty Road.
7. The applicant should include maintenance of traffic plans for the work along Haggerty Road in future submittals.

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

Sincerely,

**AECOM**



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



Patricia Thompson, EIT  
Traffic Engineer

## TRAFFIC STUDY REVIEW



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

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

**Project name:**  
JZ19-37 Novaplex Traffic Impact Study Review  
Letter

**From:**  
AECOM

**Date:**  
August 29, 2019

**CC:**  
Sri Komaragiri, Lindsay Bell, Kate Richardson,  
Madeleine Kopko, Kale Richardson

# Memo

**Subject:** JZ19-37 Novaplex Traffic Impact Study Review Letter

## Recommendation left blank on purpose

## GENERAL COMMENTS

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

## PROJECT OVERVIEW

1. The project is proposed on the west side of Haggerty Road, between 12 Mile road and 13 Mile Road.
2. The development is proposed to consist of 350 multi-family residential units.
3. The TIS examines the traffic conditions at the intersection of Haggerty Road and Heatherbrook Drive/Infinity Medical Drive.

## DATA COLLECTION

1. The study intersections are Haggerty Road and Heatherbrook Drive/Infinity Medical Drive along with Haggerty Road and the proposed Site Driveway.
2. The preparer provided the historical AADT values for Haggerty Road to show a growth rate of less than 2% annually from 2000 to 2012. However, the text states volumes decreased from 2013 to 2018, and that 2017 values were used. The AADT for any of these years is not available in the appendix, with the exception of the 2017 AADT that was added to the turn lane/taper warrants. The 2017 AADT is listed as 16,230. 4 hour counts are the only 2017 data present in the appendix. The preparer should include the data for 2013-2018 as referenced, or update the reference to the provided data.
3. A lane use and traffic control inventory was conducted as well.

## BASELINE CONDITIONS

### Existing Conditions (2019)

1. The delay, Level of Service (LOS), average queue length, and 95<sup>th</sup> percentile queue lengths were calculated for the existing conditions. The intersection of Haggerty Road and Heatherbrook Drive/Invinity Medical Drive is a two way stop controlled intersection.
2. During the AM peak, the westbound left turning movement experiences the worst delay, at LOS E. The eastbound left turning movement operates at LOS D. The narrative describes the eastbound turning movement as operating at either an LOS E or F and should be revised.
3. During the PM peak, both the eastbound and westbound left turning movements operate at LOS F, with motorists waiting, on average, more than a minute to complete their turns.
4. A signal warrant analysis was done for the intersection. The existing volumes did not meet any of the warrant thresholds. A signal is not warranted at this location for existing conditions.

### Background Conditions (No Build 2022)

1. A 1% annual growth rate was applied to the 2019 volumes to arrive at the 2022 No Build values.
2. Eastbound and Westbound left turns operate at LOS E or F for both AM and PM peak periods under the background conditions.
3. Queue lengths remain insignificant, with a maximum of 2 to 3 vehicles.

## SITE TRIP GENERATION AND DISTRIBUTION

1. ITE Code 221, for Multi-Family Homes (Mid-Rise) was used to generate trips.
2. 1,906 vpd is the AADT for the site, with 117 trips during AM peak and 147 trips during PM peak
3. Existing peak hour traffic patterns, along with the site plans and ITE methodologies, were used to assign the trips to the study road network.

## FUTURE CONDITITONS (With Development 2022)

1. With the addition of the site traffic, the eastbound and westbound left turn approaches remain operating at LOS E or F. However, the delay increases for the westbound left turn movement by nearly 20 seconds in the AM peak and 25 seconds in the PM peak. The eastbound left turn movement has a delay increase of about 23 seconds during the PM peak under the build conditions.
2. Despite significant delay values, of nearly 2 minutes (103 seconds) for the east- and westbound left turns, the queue lengths indicate a queue of approximately 3 vehicles (63 feet).
3. The preparer should revise the narrative to match the max queue length present in the table and the synchro outputs.

### Future Signal Warrant Analysis / Access Management

1. The warrant analysis examined 3 warrants and dfound a signal was not warranted at the intersection of Haggerty Road and Heatherbrook Drive/Invinity Medical Drive with the development traffic conditions.
2. Driveway spacing is indicated to be consistent with the requirements set forth in the city ordinances.
3. The site driveway warrants a right turn taper and a left turn treatment, according to RCOC's guidelines.

## REZONING TRAFFIC COMPARISON

1. The applicant compared the previously approved site plan for this development with the multi-family .
2. Total trips proposed are lower than the previously approved site plan. However, the number of trips out-bound during the AM peak and in-bound during the PM peak exceed the previous site plan. This is a flip of the peak direction during peak hours.

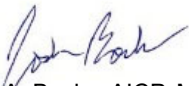
## CONCLUSIONS AND RECOMMENDATIONS

1. No signals are warranted for the intersections studied for either current or future traffic conditions.
2. The STOP controlled left turn movements at the intersection of Haggerty Road and Heatherbrook Drive/Infinity Medical Drive will operate at LOS E or F during both peak periods, with delays of over a minute and a half. However, due to small amounts of vehicular traffic, queue length is not expected to cause major issues.
3. Both a right turn deceleration taper and some form of a left turn treatment are warranted for the site driveway.
4. The change of use does not create significant impacts despite the flip in peak hour peak direction traffic.

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

Sincerely,

**AECOM**



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



Patricia A. Thompson, EIT  
Traffic Engineer

## FAÇADE REVIEW





August 27, 2019

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

**Recommendation left blank on purpose**

Re: **FACADE ORDINANCE REVIEW**  
**Novaplex, JZ19-37**  
 Façade Region: 1, Zoning District: OST, Rezoned to RM-2

Dear Ms. McBeth;

The following is the Façade Review for the above referenced project, based on the drawings prepared by Alexander Bogaerts Architects, dated 7/24/19. The proposed percentages of materials on each elevation are shown in the table below. The maximum percentage allowed by the Ordinance is shown in the right hand column. All building in a RM-2 District are considered to be Façade Region 1. A sample board as required by Section 5.15.4.D was not available at the time of this review.

<b>Building 100</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	23%	20%	29%	29%	100% (30% Minimum)
Vinyl Siding, Vertical	18%	10%	34%	34%	0%
Vinyl Siding, Horizontal	37%	43%	25%	25%	0%
Asphalt Shingles	19%	22%	9%	9%	50%
Flat Metal	3%	5%	3%	3%	50%

<b>Building 150</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	20%	20%	28%	28%	100% (30% Minimum)
Vinyl Siding, Vertical	18%	10%	36%	36%	0%
Vinyl Siding, Horizontal	38%	43%	25%	25%	0%
Asphalt Shingles	21%	22%	8%	8%	50%
Flat Metal	3%	5%	3%	3%	50%

<b>Building 200</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	18%	20%	28%	28%	100% (30% Minimum)
Vinyl Siding, Vertical	19%	11%	35%	35%	0%
Vinyl Siding, Horizontal	39%	43%	25%	25%	0%
Asphalt Shingles	21%	22%	9%	9%	50%
Flat Metal	3%	4%	3%	3%	50%

<b>Building 250</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	18%	22%	28%	28%	100% (30% Minimum)
Vinyl Siding, Vertical	19%	11%	36%	36%	0%
Vinyl Siding, Horizontal	39%	40%	25%	25%	0%
Asphalt Shingles	21%	21%	8%	8%	50%
Flat Metal	3%	6%	3%	3%	50%

<b>Building 275</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	18%	23%	28%	28%	100% (30% Minimum)
Vinyl Siding, Vertical	11%	10%	36%	36%	0%
Vinyl Siding, Horizontal	45%	40%	25%	25%	0%
Asphalt Shingles	23%	22%	8%	8%	50%
Flat Metal	3%	5%	3%	3%	50%

The Ordinance requires 30% minimum Brick on all buildings in Façade Region 1. As shown above, the minimum percentage of Brick is not provided on all facades. We believe that the deviation in Brick on the front and rear façades ( $\pm 10\%$ ) can be reduced without detrimental effect on the overall design. It is recommended that the percentage of Brick on the front and rear façade be increased to more closely comply with the Ordinance. In the case of the underage of Brick on the side facades the deviation is not significant ( $\leq 2\%$ ), and would qualify for a Section 9 Waiver. The applicant has indicated that both horizontal and vertical siding will be 0.046 gage vinyl, unless otherwise noted. Vinyl Siding is not permitted by the Façade Ordinance in Façade Region 1. It is recommended that the percentage of siding be reduced and/or that a compliant type of siding be used in lieu of Vinyl (cement fiber siding is allowed up to 25%). For the reasons stated above we are unable to recommend a Section 9 Waiver for the aforementioned deviations.

<b>Community Building</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	<b>20%</b>	49%	44%	34%	100% (30% Minimum)
Smooth Block (12" x 24", similar to Limestone)	45%	18%	30%	17%	50%
Fiber Cement Siding, horizontal	18%	10%	21%	20%	25%
Cement Panels (Similar To EIFS)	5%	0%	0%	25%	25%
Asphalt Shingles (non-residential building)	12%	23%	5%	4%	25%

Community Building - As shown above the percentage of Brick on the front façade is below the minimum amount required by the Ordinance (30% minimum required, 20% provided). It is recommended that the Brick be increased to more closely comply with the Ordinance.

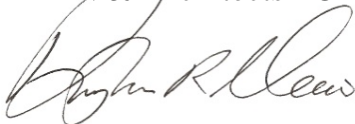
<b>Garage Buildings</b>	<b>Front</b>	<b>Rear</b>	<b>Left Side</b>	<b>Right Side</b>	Façade Ordinance Section 5.15 Maximum
Brick	<b>15%</b>	34%	58%	58%	100% (30% Minimum)
Vinyl Siding, Horizontal	<b>43%</b>	<b>35%</b>	<b>27%</b>	<b>27%</b>	0%
Asphalt Shingles (residential style building)	42%	31%	15%	15%	50%

Garage Buildings - As shown above the percentage of Brick on the front façade is below the minimum amount required by the Ordinance (30% minimum required, 15% provided) and the percentage of Vinyl Siding exceeds the maximum amount allowed by the Ordinance by a significant amount. It is recommended that the Brick be increased to more closely comply with the Ordinance and that a compliant type of siding be used in lieu of Vinyl Siding.

Summary – In general the buildings are well designed with interesting overall composition and high attention to detail. We believe the deviations listed above can be readily achieved without compromising the overall designs. A façade material sample board as required by Section 5.15.4.D of the Ordinance should be provided to more clearly illustrate the proposed types, colors and textures of all façade materials.

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

Sincerely,  
DRN & Architects PC



Douglas R. Necci, AIA

## FIRE REVIEW



August 9, 2019

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

**CITY COUNCIL**

**Mayor**  
Bob Gatt

**Mayor Pro Tem**  
Dave Staudt

Andrew Mutch

Laura Marie Casey

Kelly Breen

Ramesh Verma

Doreen Poupard

**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: Novaplex Residential

**PSP # 19-0129**

PSP# 19-0090

PSP# 17-0181

**Project Description:**

**Build a 11 building Multi-tenant Community off of Haggerty Rd north of Twelve Mile Rd.**

**Comments:**

- All fire hydrants **MUST** in installed and operational prior to any building construction begins.
- **CORRECTED 8/9/19KSP**-All water mains and fire hydrants **MUST** be put on plans for review.
- **CORRECTED 8/9/19 KSP**-In front of building #7, the drive is > 150'. **MUST** put hammerhead turn around, or shorten the drive to < 150' or connect the drive to the drive to the west. **(IFC 503.2.5)**
- Fire Hydrant spacing is 300' from hydrant to hydrant (as the hose comes off the fire truck driving). **Novi City Ordinance 11-68(F)(1)c.**
- All FDC's **MUST** be within 100' from a fire hydrant. **(IFC 912.2.3)**

**Recommendation left blank on purpose**

Sincerely,

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

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

cc: file

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

cityofnovi.org

**PRO CONCEPT PLAN SUBMITTAL**

(Full size drawings available for viewing at Community Development)

PLANNED RE-ZONING OVERLAY (PRO) PLAN FOR

# NOVAPLEX

PART OF THE SE 1/4 OF SECTION 12, T. 01N., R. 08E.,  
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

**OWNER/APPLICANT/DEVELOPER:**

BEZTAK COMPANIES  
31731 NORTHWESTERN HWY, SUITE 250W  
FARMINGTON HILLS, MI 48334  
CONTACT: MARK HIGHLEN  
EMAIL: MHIGHLEN@BEZTAK.COM  
PHONE: 248.737.6175

**ARCHITECT:**

ALEXANDER V. BOGAERTS & ASSOCIATES, PC  
2445 FRANKLIN ROAD  
BLOOMFIELD HILLS, MI 48302  
CONTACT: MARK ABANATHA  
EMAIL: MABANATHA@BOGAERTS.US  
PHONE: 248.334.5000 EXT. 223

**CIVIL ENGINEER:**

PEA, INC.  
2430 ROCHESTER CT, SUITE 100  
TROY, MI 48063  
CONTACT: JOHN B. THOMPSON, PE  
PHONE: 248.689.9090 EXT. 109  
FAX: 248.689.1044  
EMAIL: JTHOMPSON@PEAINC.COM

**LANDSCAPE ARCHITECT**

PEA, INC.  
7927 NEMCO WAY, SUITE 115  
BRIGHTON, MI 48116  
CONTACT: JEFF SMITH, RLA  
PHONE: (517) 546-8583  
FAX: (517) 546-8973



LOCATION MAP  
NO SCALE

**LEGAL DESCRIPTION:**

(Per Professional Engineering Associates)  
The North 22 acres of the Northeast 1/4 of the Southeast 1/4 of Section 12, Town 1 North, Range 8 East, Township of Novi, Oakland County, Michigan being more particularly described as: Beginning at the East 1/4 Corner of said Section 12; thence SOUTH, 697.70 feet along the East line of Section 12; thence S89°11'20"W, 1373.45 feet; thence N0°04'21"W, 697.69 feet to the East-West 1/4 line of said section; thence along said line N89°11'20"E, 1374.33 feet to the East line of said Section 12 and the Point of Beginning. Containing 22.003 acres of land more or less and subject to the rights of the public over the easterly 33 feet known as Haggerty Road.

**INDEX OF DRAWINGS:**

- C-1.0 COVER SHEET
- C-2.0 TOPOGRAPHIC SURVEY
- C-3.0 PRELIMINARY SITE PLAN
- C-4.0 OPEN SPACE PLAN
- C-4.0 PRELIMINARY GRADING PLAN
- C-5.0 PRELIMINARY UTILITY PLAN
- C-6.0 STORM WATER MANAGEMENT PLAN
- C-7.0 FIRE TRUCK ROUTE
- C-8.0 STANDARD DETAIL SHEET
- L-1.0 PRELIMINARY LANDSCAPE PLAN
- L-1.1 PRELIMINARY LANDSCAPE CALCULATIONS
- L-1.2 LANDSCAPE DETAILS
- T-1.0 PRELIMINARY TREE PRESERVATION PLAN
- T-1.1 PRELIMINARY TREE LIST
- T-1.2 PRELIMINARY TREE LIST
- A1 BLDG. 100 & 150 PLANS (APARTMENT)
- A2 BLDG. 100 & 150 ELEVATIONS (APARTMENT)
- A3 BLDG. 200 & 250 PLANS (APARTMENT)
- A4 BLDG. 275 PLANS AND 1/8" SCALE TYPICAL UNITS (APARTMENT)
- A5 BLDG. 200 & 250 ELEVATIONS (APARTMENT)
- A6 BLDG. 275 ELEVATIONS (APARTMENT)
- A7 BLDG. 300 10-UNIT & 12-UNIT PLANS AND 1/8" SCALE UNITS (TOWNHOUSE)
- A8 BLDG 300 10-UNIT ELEVATION (12-UNIT SIMILAR) (TOWNHOUSE)
- A9 COMMUNITY BUILDING PLAN
- A10 COMMUNITY BUILDING ELEVATION
- A11 COMMUNITY BUILDING ELEVATION
- A12 COMMUNITY BUILDING ELEVATION
- A13 DETACHED GARAGES FLOOR PLANS
- A14 DETACHED GARAGES TYPICAL ELEVATION

**NOTE:**  
ALL WORK SHALL CONFORM TO THE CURRENT CITY  
OF NOVI STANDARDS AND SPECIFICATIONS

NOT FOR CONSTRUCTION

REF: S:\PROJECTS\2019\20190726\NOV\11038-TOPOGRAPHIC.DWG  
REF: S:\PROJECTS\2019\20190726\NOV\11038-UTILITY.DWG  
REF: S:\PROJECTS\2019\20190726\NOV\11038-COVER.DWG

NO.	DATE	DESCRIPTION	BY	CHKD.	DATE

REVISIONS

**CAUTION!**  
This drawing was prepared by a professional engineer or architect under the supervision of a professional engineer or architect. It is not to be used for any other purpose without the written consent of the professional engineer or architect. The professional engineer or architect is not responsible for any errors or omissions in this drawing.

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.org

**PEA, Inc.**  
2430 Rochester Ct., Ste. 100  
Troy, MI 48063-1972  
T: 248.689.9090  
F: 248.689.1044  
www.peainc.com

**BEZTAK COMPANIES**  
31731 NORTHWESTERN HWY., SUITE 250W  
FARMINGTON HILLS, MI 48334

**COVER SHEET**  
**NOVAPLEX**  
PART OF THE SE 1/4 OF SECTION 12,  
T. 01N., R. 08E.,  
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

DES: DSK DN: DSK SUR: RR  
BY: M. J. SMITH

ORIGINAL ISSUE DATE:  
JULY 26, 2019  
PEA JOB NO. 2019-298  
SCALE: N.T.S.  
DRAWING NUMBER:  
**COVER**

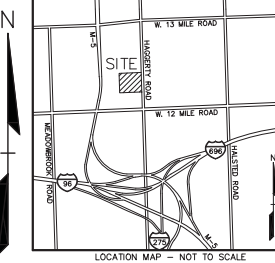
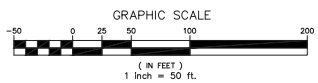
**FLOODPLAIN NOTE:**  
 BY GRAPHICAL PLOTTING, THIS SITE IS WITHIN ZONE "X", AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBERS 26125C0489F & 26125C0493F, DATED SEPTEMBER 29, 2006.

**LEGAL DESCRIPTION**  
 PARCEL ID 55-22-12-400-000  
 1/4 N. R. SEC. 12 N. 22 ACRES OF NE 1/4 OF SE 1/4, EXC. BEG. AT PT. DIST. S. 380.10 FT. FROM E 1/4 COR., TH. S. 317.60 FT., TH. S. 86-51-00 W. 1374.20 FT., TH. N00-02-00 E. 317.60 FT., TH. N 88-51-00 E. 1374 FT. TO BEG. 11.88 AC.  
 PARCEL ID 55-22-12-400-010  
 1/4 N. R. SEC. 12 PART OF SE 1/4 BEG. AT PT. DIST. S. 380.10 FT. FROM E 1/4 COR., TH. S. 158.80 FT., TH. S08-51-00W 1374.10 FT., TH. N00-02-00 E. 158.80 FT., TH. N88-51-00E 1374 FT. TO BEG. 5.01AC.  
 PARCEL ID 55-22-12-400-011  
 1/4 N. R. SEC. 12 PART OF SE 1/4 BEG. AT PT. DIST. S. 538.90 FT. FROM E 1/4 COR., TH. S. 158.80 FT., TH. S08-51-00W 1374.20 FT., TH. N00-02-00 E. 158.80 FT., TH. N88-51-00E 1374.10 FT. TO BEG. 5.01AC.

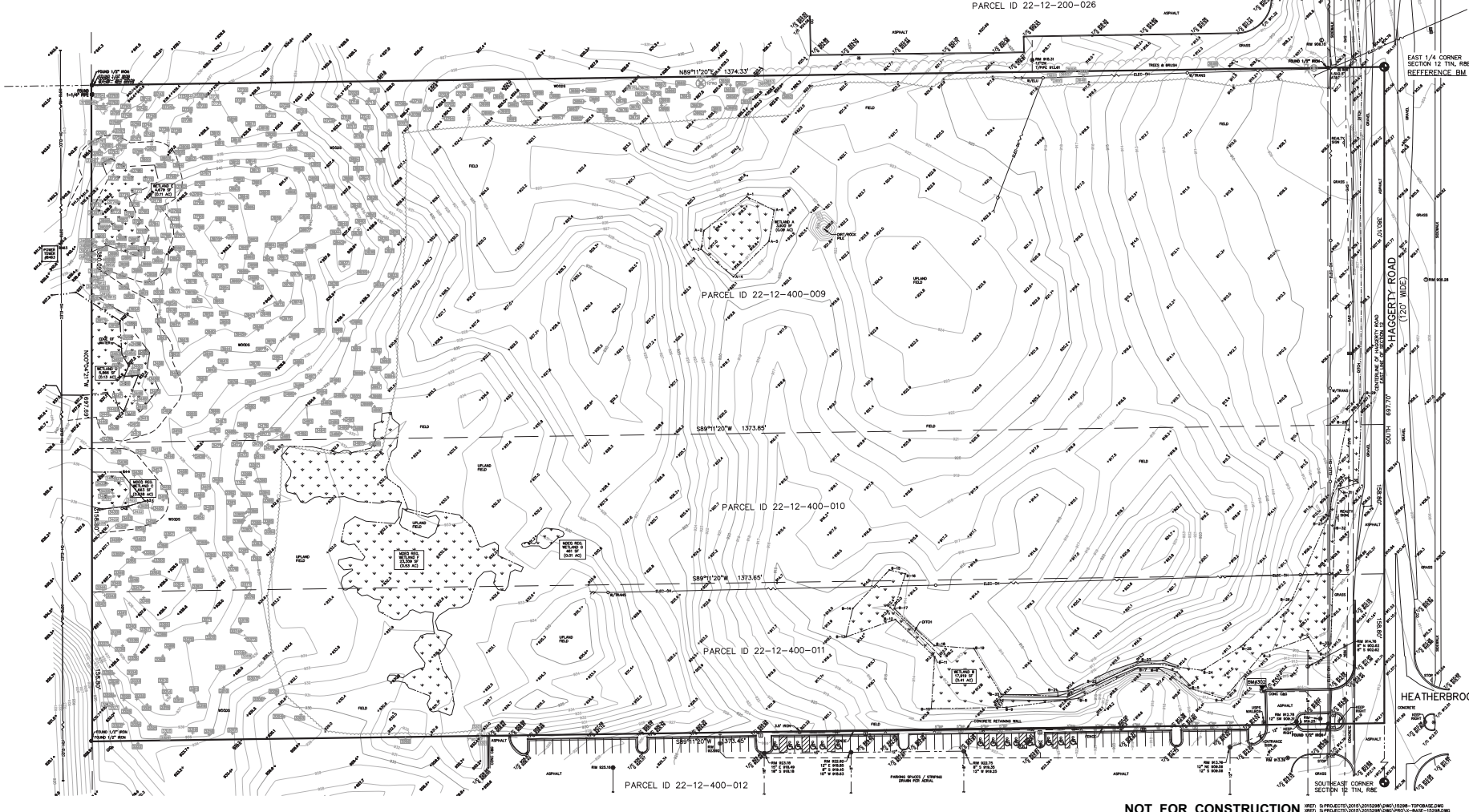
**REFERENCE BENCHMARKS**  
 CITY OF NOVI BM #12-14  
 NORTH RIM OF SOUTHERLY MON. BOX  
 ELEV. = 906.13  
 BM#302  
 PUNCH MARK IN ARROW ON A HYDRANT LOCATED ON THE WEST SIDE OF HAGGERTY RD., OPPOSITE OF HEATHERBROOK DR.  
 ELEV. = 916.06

**LEGAL DESCRIPTIONS**  
 (Per Professional Engineering Associates)  
 The North 22 acres of the Northeast 1/4 of the Southeast 1/4 of Section 12, Town 1 North, Range 8 East, Township of Novi, Oakland County, Michigan being more particularly described as: Beginning at the East 1/4 Corner of said Section 12; thence SOUTH, 697.70 feet along the East line of Section 12; thence S89°11'20"W, 1373.45 feet; thence N0°24'27"W, 697.69 feet to the East-West 1/4 line of said section; thence along said line N89°11'20"E, 1374.33 feet to the East line of said Section 12 and the Point of Beginning, Containing 22.003 acres of land more or less and subject to the rights of the public over the easterly 33 feet known as Haggerty Road.

- LEGEND**
- IRON FOUND
  - ⊗ IRON SET
  - ⊕ NAIL FOUND
  - ⊕ NAIL & CAP SET
  - BRASS FLAG SET
  - ⊕ MONUMENT FOUND
  - ⊕ MONUMENT SET
  - RECORDED
  - ⊕ MEASURED
  - CALCULATED
- EXISTING**
- OH-ELEC—V—C—: ELEC. FROM OR CABLE TV OIL LINE, POLE & SIX WIRE
  - OH-ELEC—: UNDERGROUND CABLE TV ONLY PROTECTA
  - S—P—: TELEPHONE OR CABLE, FIBER, & MARIAGE
  - S—P—: ELECTRIC GAS LINE, MARIAGE, WATER & MARIAGE
  - S—P—: GAS MAIN, VALVE & GAS LINE MARIAGE
  - S—P—: WATER MAIN, VALVE, SIZE VALVE, WATER SLEEVE & MARIAGE
  - S—P—: SANITARY SEWER, CLEANOUT & MARIAGE
  - S—P—: STORM SEWER, CLEANOUT & MARIAGE
  - S—P—: CROWNED SEWER & MARIAGE
  - S—P—: SEWER, ROAD & MARIAGE CATCH BASIN
  - S—P—: WELLS AND BORE
  - S—P—: POST INDICATOR VALVE
  - S—P—: WATER VALVE (REGULATORY VALVE, SOL. SERVICE SHUTOFF)
  - S—P—: MARIAGE, TRANSFORMER, MARIAGE CONTROL VALVE
- CONCRETE**
- : FENCE
  - : STREET LIGHT
  - : SIGN
  - : CONCRETE
  - : ASPHALT
  - : DRIVEWAY SHOULDER
  - : BELAND
  - : BELAND FLAG NUMBER



NO.	BY	DATE	DESCRIPTION



**CAUTION!**  
 This drawing is a technical drawing and is not to be used for construction purposes without the approval of the engineer of record. It is the responsibility of the user to verify the accuracy of the information shown on this drawing. The engineer of record is not responsible for any errors or omissions in this drawing. The user is advised to consult the engineer of record for any questions or concerns regarding this drawing.

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**BEZAK COMPANIES**  
 5107 PARKINGTON HILLS MI 48318  
**TOPOGRAPHIC SURVEY**  
**NOVAPLEX**  
 PART OF THE SE 1/4 OF SECTION 12, T. 01 N., R. 08 E.,  
 CITY OF NOVI, OAKLAND COUNTY, MICHIGAN  
 (PROJECT) (JOB) (DATE) (SCALE) (SHEET) (TOTAL SHEETS)

ORIGINAL ISSUE DATE:  
 JULY 26, 2019  
 PEA JOB NO. 2015-296  
 SCALE: N.T.S.  
 DRAWING NUMBER:  
**C-1.0**



**LOT AREA / DENSITY**

Lot Area	22.90	99000 sq ft
Front	140'	200' x 200' sq ft
Side	8.00'	40000 sq ft
Back	21.00'	90000 sq ft

**REAR YARD (R.Y.)**

Front	140'	200' x 200' sq ft
Side	8.00'	40000 sq ft
Back	21.00'	90000 sq ft

**REAR YARD (R.Y.)**

Front	140'	200' x 200' sq ft
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Front	140'	200' x 200' sq ft
Side	8.00'	40000 sq ft
Back	21.00'	90000 sq ft

**EXISTING STRUCTURE SUMMARY**

Building	Year	Area	Height	Notes
BLDG 150	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 270	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 300	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 100	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 200	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 250	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 350	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 400	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 450	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 500	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 550	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 600	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 650	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 700	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 750	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 800	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 850	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 900	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 950	1980	10000	10'	As per 1980 permit. To be demolished.
BLDG 1000	1980	10000	10'	As per 1980 permit. To be demolished.

**REAR YARD (R.Y.)**

Front	140'	200' x 200' sq ft
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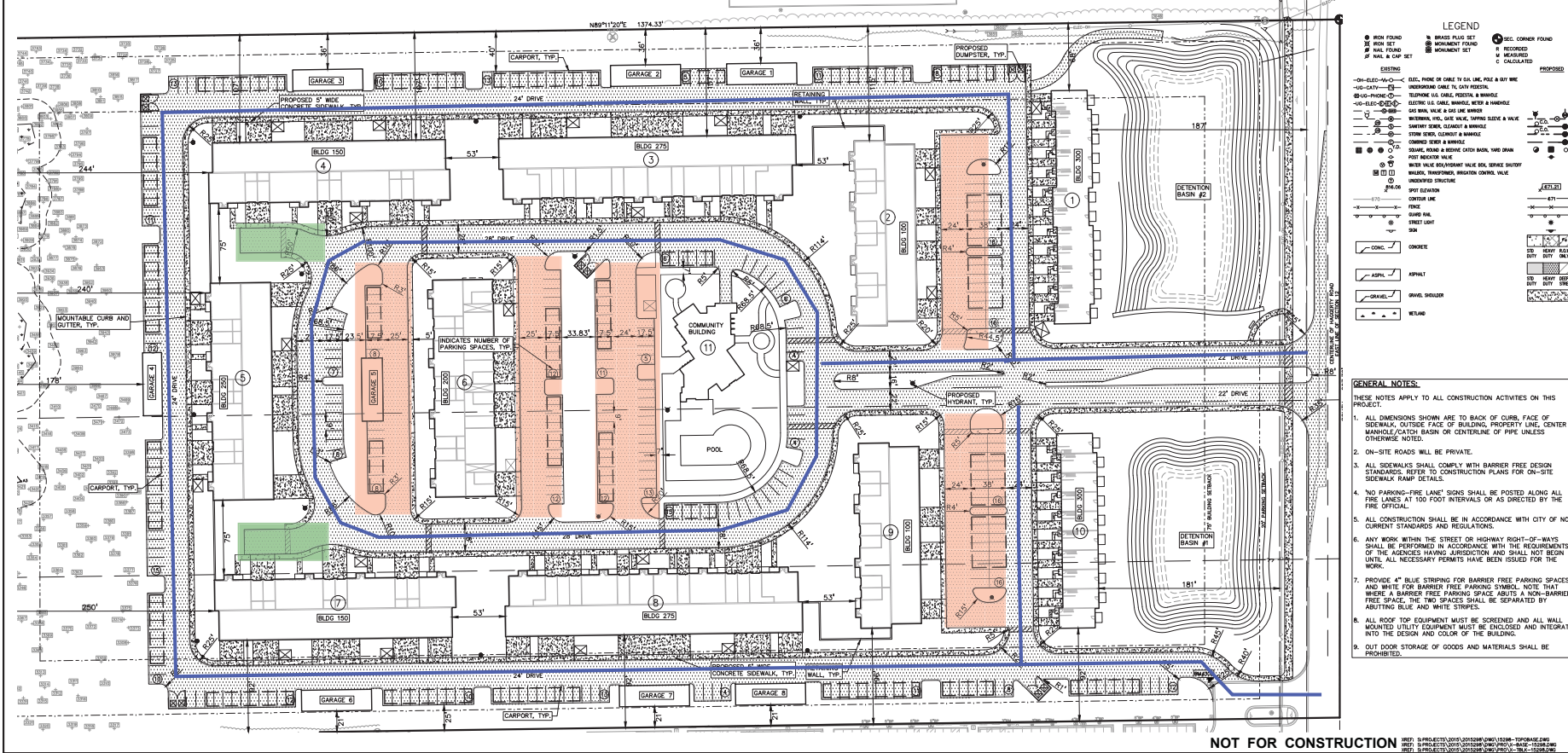
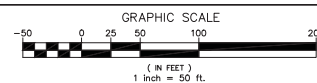
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Back	21.00'	90000 sq ft

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Front	140'	200' x 200' sq ft
Side	8.00'	40000 sq ft
Back	21.00'	90000 sq ft



**REVISIONS**

NO.	BY	DATE	DESCRIPTION

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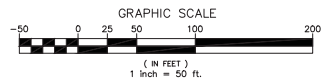
3100 PARKWAY DRIVE, SUITE 200  
PARKWAY CENTER, MI 48364

**PRELIMINARY SITE PLAN NOVAPLEX**

PART OF THE SE 1/4 OF SECTION 12, T. 0 N., R. 6 E.,  
CITY OF NOWI, CRAWFORD COUNTY, MICHIGAN

ORIGINAL ISSUE DATE: JULY 26, 2019  
PEA JOB NO. 2015-296  
SCALE: 1" = 50'  
DRAWING NUMBER: C-2.0

**NOT FOR CONSTRUCTION**



**LEGEND**

● HIGH FOUND	● BRICK PLUM SET	● REC. CORNER FOUND
■ WOOD SET	● MONUMENT FOUND	■ RECORDED
■ WALK FOUND	■ MONUMENT SET	■ MEASURED
■ NAIL & CAP SET		■ CALCULATED

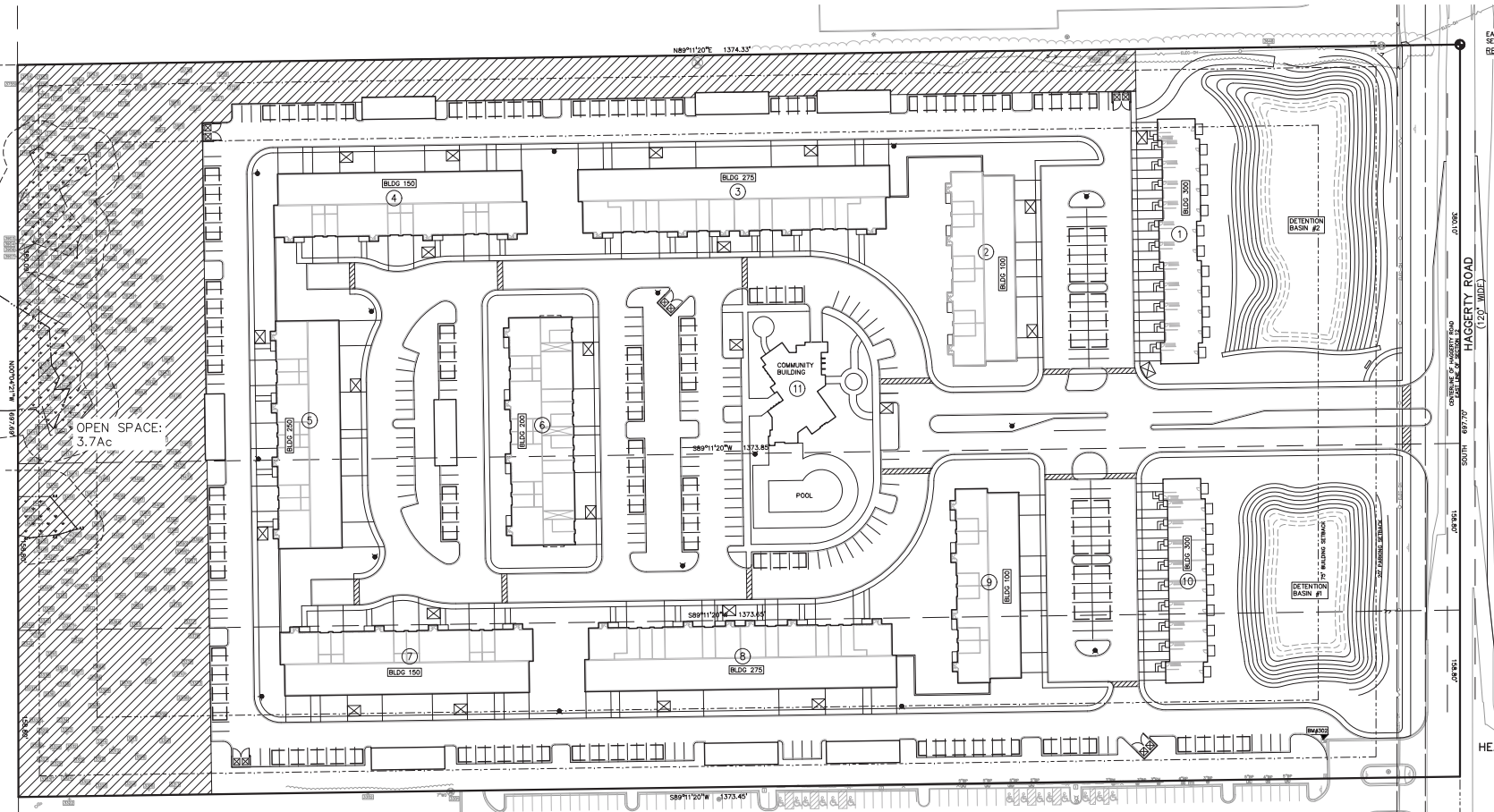
  

—ELEC.—	—ELEC. FRINGE OR CABLE TV OR LINE, FIBER & OPT. WIRE	—PROPOSED
—CITY	UNDERGROUND CABLE TV, CABLE FEEDLINE	
—PHONE	TELEPHONE U.S. CABLE, FEEDLINE & BRANCH	
—ELEC.	ELECTRIC GAS, CABLE, WIRELESS, WIRE & WIRELESS	
—ELEC.	GAS MAIN, VALVE & GAS LINE BRANCH	
—ELEC.	WATER MAIN, VALVE, FIRE MAIN, SPRING, SLEEVE & WIRE	
—ELEC.	SEWER MAIN, CLEANOUT & BRANCH	
—ELEC.	STORM SEWER, CLEANOUT & BRANCH	
—ELEC.	CORNER SEWER & BRANCH	
—ELEC.	STEAM, RADIUM & REFRIG. CATCH BASIN, VENT DRAIN	
—ELEC.	FOOT RESTRAINING WALK	
—ELEC.	WATER MAIN, ROY/STORMY VALVE, STOP, SERVICE, SHUTOFF	
—ELEC.	MARKING, TRANSFORMER, REINFORCED CONCRETE, VALVE	
—ELEC.	UNIDENTIFIED STRUCTURE	

—ELEV.	SPOT ELEVATION	—ELEV.	SPOT ELEVATION
—ELEV.	CONCRETE WALK	—ELEV.	SPOT ELEVATION
—ELEV.	FINISH	—ELEV.	SPOT ELEVATION
—ELEV.	GRADE WALK	—ELEV.	SPOT ELEVATION
—ELEV.	STREET LIGHT	—ELEV.	SPOT ELEVATION
—ELEV.	SUN	—ELEV.	SPOT ELEVATION
—ELEV.	CONCRETE	—ELEV.	SPOT ELEVATION
—ELEV.	ASPHALT	—ELEV.	SPOT ELEVATION
—ELEV.	GRAVEL	—ELEV.	SPOT ELEVATION
—ELEV.	GRAVEL WALKER	—ELEV.	SPOT ELEVATION
—ELEV.	WELAND	—ELEV.	SPOT ELEVATION

OPEN SPACE



NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION	DATE

**CAUTION!**  
 Construction of this project is subject to the approval of the local health department. The contractor shall be responsible for obtaining all necessary permits and approvals. The contractor shall be responsible for the safety of all workers and the public. The contractor shall be responsible for the protection of all existing utilities and structures. The contractor shall be responsible for the removal of all debris and the restoration of the site to its original condition. The contractor shall be responsible for the payment of all taxes and fees. The contractor shall be responsible for the completion of the project within the specified time frame. The contractor shall be responsible for the maintenance of the project until it is accepted by the local health department. The contractor shall be responsible for the payment of all insurance and bonds. The contractor shall be responsible for the payment of all other costs associated with the project. The contractor shall be responsible for the payment of all other costs associated with the project. The contractor shall be responsible for the payment of all other costs associated with the project.

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**OPEN SPACE PLAN NOVAPLEX**  
 PART OF THE SE 1/4 OF SECTION 12, T. 0 N., R. 6 E.,  
 CITY OF NOVAPLEX, CRAWFORD COUNTY, MICHIGAN

DATE: 07/26/2019  
 TIME: 11:58 AM  
 P. 31

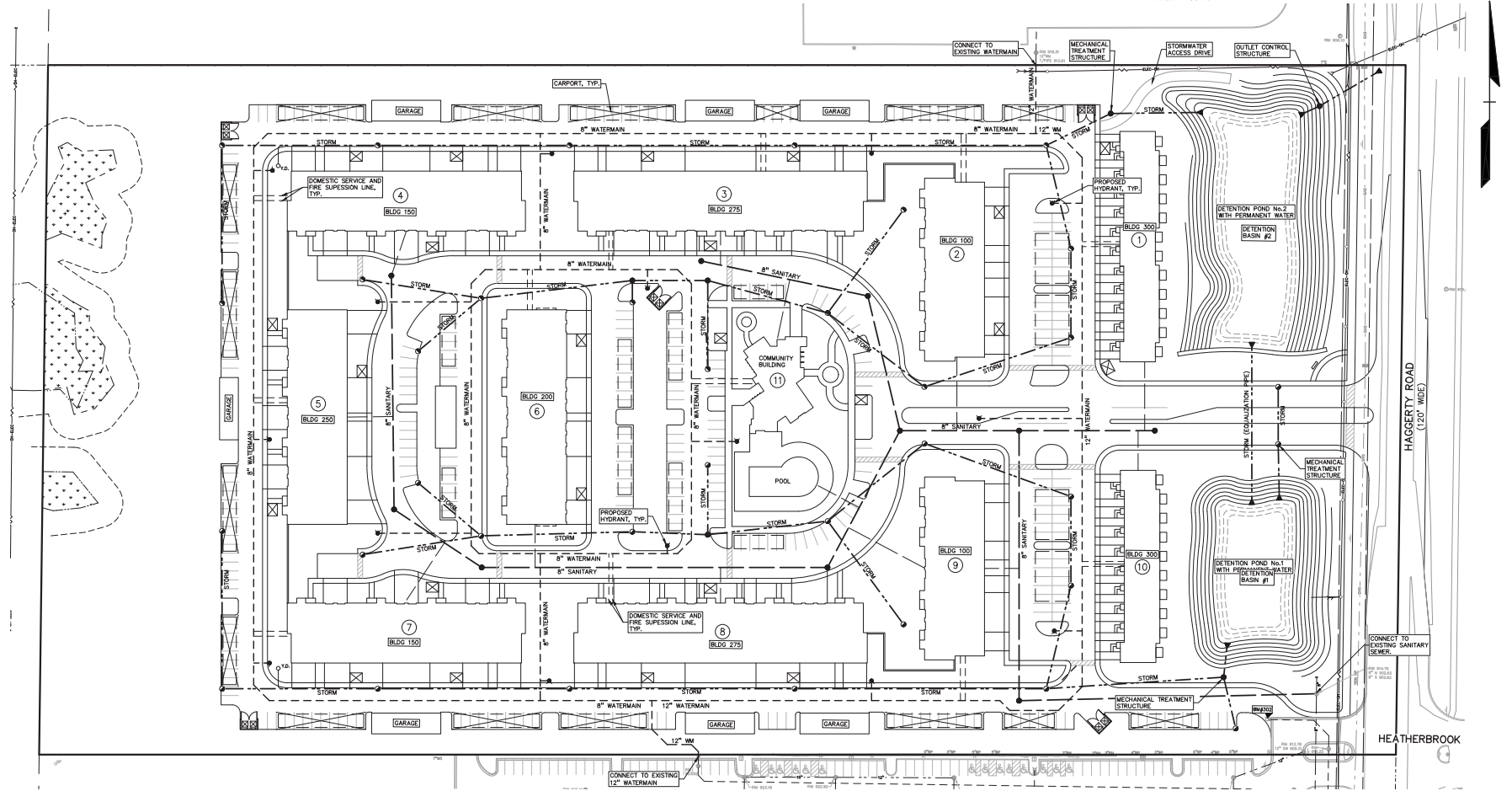
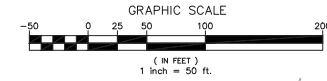
ORIGINAL ISSUE DATE:  
 JULY 26, 2019

PEA JOB NO. 2015-296

SCALE: 1" = 50'

DRAWING NUMBER:  
**C-3.0**





- GENERAL UTILITY NOTES:**
- ALL UTILITY LINES, STRUCTURES AND TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF THE CITY OF NOVA.
  - 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" #20R MODEL #250 PER CITY OF NOVA STANDARDS.
  - ALL HYDRANTS TO BE A MINIMUM OF 5' FROM BACK OF CURB OR PROVIDE BOLLARD PROTECTION.
  - 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 NOVA.
  - THE WATER MAIN CONTRACTOR SHALL NOTIFY THE INSPECTION SECTION OF THE DETROIT WATER AND SEWER DEPARTMENT AT (313) 833-4662 AT LEAST THREE WORKING DAYS IN ADVANCE OF STARTING CONSTRUCTION.

- ALL SANITARY SEWER 8" OR LARGER SHALL BE POLYVINYL CHLORIDE (PVC) SDR 26 PIPE AND FITTINGS. ALL JOINTS TO BE 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, UNLESS OTHERWISE NOTED.
- SANITARY LEADS SHALL BE AT LEAST 5 FEET DEEP WHERE UNDER THE INFLUENCE OF PAVEMENT.
- ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE REINFORCED CONCRETE PIPE (RCP C-75) 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 SECTION UNLESS NOTED OTHERWISE.
- THE CITY OF NOVA STANDARD DETAIL SHEETS ARE INCORPORATED INTO AND MADE A PART OF THESE PLANS. CONTRACTOR TO REFER TO THE CITY OF NOVA STANDARD DETAIL SHEETS FOR ALL STRUCTURE, PIPE MATERIALS, BEDDING, TESTING, ETC. NOTES AND DETAILS.

**SANITARY SEWER BASIS OF DESIGN:**  
(Unit Factors Based on Oakland County Unit Assignment Factors)

Multi-Family Residence	332	REU
Unit Factor	0.6 / Apt.	
REU	199.2	
Clubhouse (Swimming Pool)	4,500 x 1	REU
Unit Factor	3.0 / 1000 sf	
REU	13.5	
<b>TOTAL</b>		<b>212.7</b>
Population (P) (2.44 PEOPLE/REU)		519 People
Average Flow (150 GPCPD)		51,900 G.P.D.
		0.080 C.F.S.
		0.519 M.G.D.
Peaking Factor (PF)		3.97
PF = (18+sqrt(P)) / (14+sqrt(P))		
Peak Flow (0.01 P)		206,827 G.P.D.
Peak Flow (C.F.S.)		0.318 C.F.S.
8" Pipe at 0.60% Capacity Provided =		1.61 C.F.S.

**WATER MAIN BASIS OF DESIGN:**  
(Unit Factors Based on Oakland County Unit Assignment Factors)

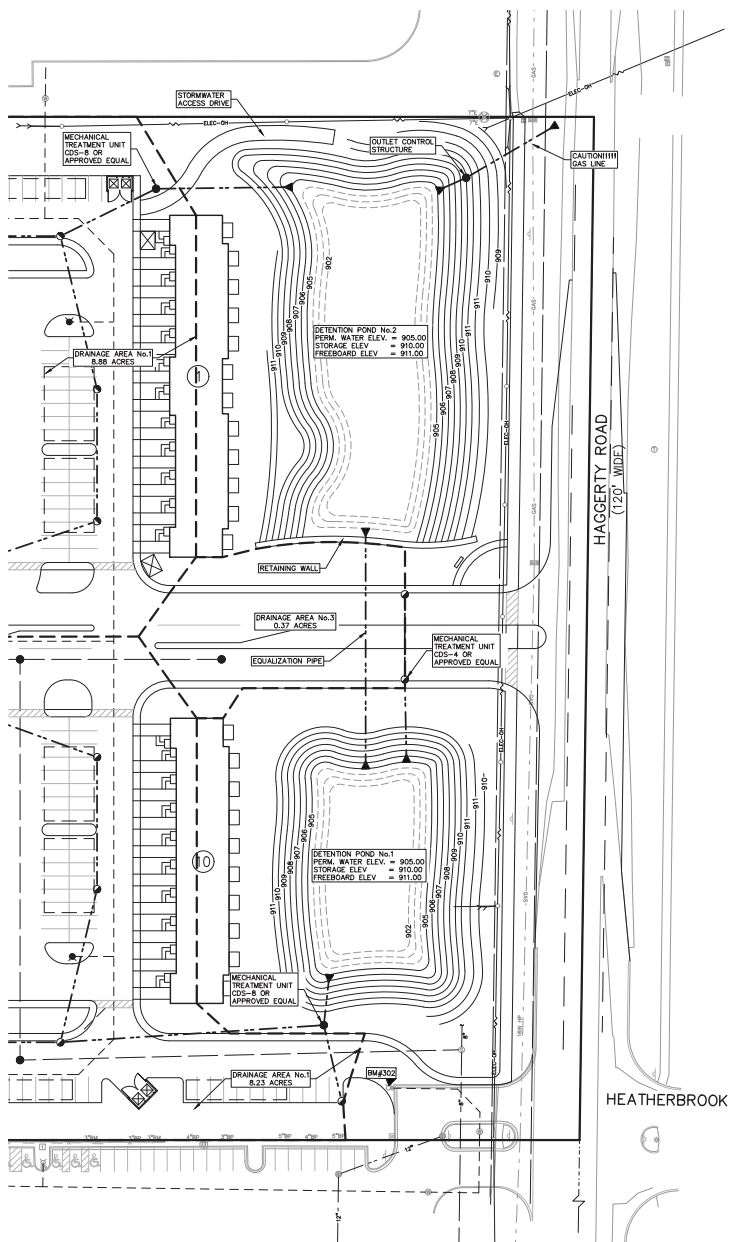
Multi-Family Residence	332	REU
Unit Factor	0.6 / Apt.	
REU	199.2	
Office Buildings	4,500 x 1	REU
Unit Factor	3.0 / 1000 sf	
REU	13.5	
<b>TOTAL</b>		<b>212.7</b>
Population (P) (2.44 PEOPLE/REU)		519 People
Average Flow (150 GPCPD)		77,850 G.P.D.
		0.120 C.F.S.
		0.979 M.G.D.
Design Max. Flow = (2*avg)		155,700 G.P.D.
		0.241 C.F.S.
		0.158 M.G.D.

**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.T. CLASS # 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.

NO. OF SHEETS	DATE
NO. OF SHEETS DESCRIBED	REVISIONS
<p><b>CAUTION!</b> This drawing is the property of the City of Novi and is not to be used for any other project without the written consent of the City of Novi. Any reproduction or use of this drawing without the written consent of the City of Novi is strictly prohibited. The City of Novi is not responsible for any errors or omissions in this drawing. The contractor shall verify all dimensions and conditions before construction. The City of Novi is not responsible for any damage to existing utilities or structures during construction. The contractor shall be responsible for obtaining all necessary permits and easements. The contractor shall be responsible for the safety of all workers and the public during construction. The contractor shall be responsible for the cleanup and restoration of the site after construction is complete. The contractor shall be responsible for the maintenance and repair of the utilities and structures during the warranty period. The contractor shall be responsible for the payment of all taxes and fees associated with this project. The contractor shall be responsible for the payment of all insurance and bonding requirements. The contractor shall be responsible for the payment of all other costs associated with this project. The contractor shall be responsible for the completion of this project within the specified time frame. The contractor shall be responsible for the satisfaction of the City of Novi and the public. The contractor shall be responsible for the overall success of this project.</p>	
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<p><b>PEA, Inc.</b> 2430 Rochester Ct., Ste. 100 Troy, MI 48063-1872 T: 248-689-9000 F: 248-689-1044 www.peainc.com</p>	
<p><b>BETAK COMPANIES</b> 3705 WASHINGTON BLVD., SUITE 200 TROY, MI 48063-1872</p> <p><b>PRELIMINARY UTILITY PLAN</b> <b>NOVAPLEX</b> PART OF THE SE 1/4 OF SECTION 12, T. 0 N., R. 6 E., CITY OF NOVI, OAKLAND COUNTY, MICHIGAN</p> <p>DATE: 07/26/2019 SCALE: 1" = 50' DRAWING NUMBER: C-5.0</p>	

NOT FOR CONSTRUCTION



**100 YEAR STORM DETENTION DESIGN**  
(PER OAKLAND COUNTY DESIGN METHOD)

**Site Drainage Data**

Contributing Area (A)	21.04 acre
Allowable Discharge (Ca)	3.16 cfs (0.15% impervious)
Impervious Area (Ai)	482,375 sq ft
Rainfall Intensity (I)	4.36 in/hr
Runoff Coefficient (C)	0.35
Permissible Peak Discharge (Qd)	37,268 cfs
Proposed Coefficient of Runoff (Cr)	0.89

**100-yr Design Storm Calculations**

Q<sub>d</sub> = (C<sub>r</sub>A<sub>i</sub>I) / (60) = 0.22 cfs/acre impervious  
 T = 25 + (10/31.5) (5.0/0.35) = 191.51 minutes  
 V<sub>s</sub> = (180000(T/60) - 25) / (400)(I) = 12,600 cfs-sec impervious  
 V<sub>t</sub> = (V<sub>s</sub> / A<sub>i</sub>) (C<sub>r</sub>) = 187,775 cf

**Detention Basin No. 1**

Elev. (ft)	Area (sf)	Vol. (sf)	No. 1 Vol. (sf)
900	11,375	0	0
906	13,167	12,241	12,241
907	15,000	14,130	26,371
908	17,117	16,105	42,476
909	19,240	18,179	60,655
910	21,465	20,353	81,007
911	23,790	22,628	103,635

**Detention Basin No. 2**

Elev. (ft)	Area (sf)	Vol. (sf)	No. 2 Vol. (sf)	Total Vol. (sf)	Storage Elev.
900	19,523	0	0		
906	22,437	21,195	21,195	33,436	
907	25,019	23,725	44,920	71,291	
908	27,683	26,346	71,266	113,544	
909	30,482	29,068	100,334	160,880	
910	33,328	31,840	132,174	213,163	908.51

**Storage Elevation: 910.00**  
Freeboard Elevation: 911.00

**STORMWATER PRETREATMENT**  
(GRAPHICAL PEAK DISCHARGE  
(PER OAKLAND COUNTY DESIGN METHOD))

**Drainage Area No. 1 (A1)**

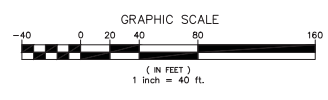
Impervious Area (A1)	8.23 acres
Permissible Area (A2)	0.913 sq. mi.
Permissible Area (A3)	5.80 acres
Runoff Curve Number (CN)	2.63
Runoff Curve Number (CN)	86
Permissible CN	86
Permissible CN	71
Time of Concentration (Tc)	34 min
Fund & Swamp Areas	0.00 acres
Frequency	0.00%
Runoff, 24-yr (P)	2.2 yr
Initial Abstraction (Ia)	0.247 in
Composite (Ia / F)	0.11
Unit Peak Discharge (Qd)	600 cavin
Runoff (Ro)	0.90 in
Fund & Swamp Adjustment Factor (F <sub>1</sub> )	1.00
Peak Discharge (Qp)	8.8 cfs
Qp = Q <sub>1</sub> x A x R <sub>1</sub> x F <sub>1</sub>	

**Drainage Area No. 2 (A2)**

Impervious Area (A2)	8.88 acres
Permissible Area (A3)	0.913 sq. mi.
Runoff Curve Number (CN)	5.60 acres
Runoff Curve Number (CN)	3.28 acres
Permissible CN	86
Permissible CN	71
Time of Concentration (Tc)	24 min
Fund & Swamp Areas	0.40 acres
Frequency	0.00%
Runoff, 24-yr (P)	2.2 yr
Initial Abstraction (Ia)	0.273 in
Composite (Ia / F)	0.12
Unit Peak Discharge (Qd)	580 cavin
Runoff (Ro)	0.90 in
Fund & Swamp Adjustment Factor (F <sub>1</sub> )	1.00
Peak Discharge (Qp)	7.2 cfs
Qp = Q <sub>1</sub> x A x R <sub>1</sub> x F <sub>1</sub>	

**Drainage Area No. 3 (A3)**

Impervious Area (A3)	0.37 acres
Permissible Area (A4)	0.27 acres
Runoff Curve Number (CN)	0.10 acres
Runoff Curve Number (CN)	91
Permissible CN	86
Permissible CN	71
Time of Concentration (Tc)	25 min
Fund & Swamp Areas	0.00 acres
Frequency	0.00%
Runoff, 24-yr (P)	2.2 yr
Initial Abstraction (Ia)	0.186 in
Composite (Ia / F)	0.09
Unit Peak Discharge (Qd)	680 cavin
Runoff (Ro)	0.80 in
Fund & Swamp Adjustment Factor (F <sub>1</sub> )	1.00
Peak Discharge (Qp)	0.4 cfs
Qp = Q <sub>1</sub> x A x R <sub>1</sub> x F <sub>1</sub>	



HAGGERTY ROAD  
(120' WIDE)

HEATHERBROOK

REVISIONS

NO.	DATE	DESCRIPTION

**CAUTION!**

This drawing is not to be used for construction of any structure without the written consent of the engineer. The engineer's responsibility is limited to the design and construction of the structure shown on this drawing. The contractor is responsible for all other aspects of the construction, including but not limited to, the safety of the construction, the quality of the materials, and the compliance with all applicable laws and regulations. The engineer does not warrant the accuracy of the information provided in this drawing, and the user of this drawing does so at their own risk.

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**BETAK COMPANIES**  
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FARMINGTON HILLS, MI 48334

**STORM WATER MANAGEMENT PLAN**  
PART OF THE 80' x 140' OF SECTION 12, T. 0 N., R. 6 E.,  
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN  
PROJECT NO. 2015-298

ORIGINAL ISSUE DATE: JULY 26, 2019  
PEA JOB NO. 2015-298  
SCALE: 1" = 40'  
DRAWING NUMBER: C-6.0

**CDS4045-B-C DESIGN NOTES**

CDS4045-B-C RATED TREATMENT CAPACITY IS 0.5 CFS/SQ YD OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 36 CFS/900 SQ. YD. IF THE SITE CONDITIONS EXCEED 36 CFS/900 SQ. YD, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STRUCTURAL DESIGN AND CONSTRUCTION OF SUCH STRUCTURES, CONNECTIONS AND DETAILS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE CHANGED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION	NOTES
GRAVEL INLET ONLY (NO INLET PIPE)	INLET PIPE INLET ONLY (NO INLET PIPE)
GRAVEL INLET ONLY (NO INLET PIPE)	INLET PIPE INLET ONLY (NO INLET PIPE)
CURB INLET WITH RAIL (TYP) OR PIPES	SEPARATE TO RAIL/SAMPLE INLET PIPE (REQUIRED FOR THIS CONFIGURATION)
SEPARATE TO RAIL/SAMPLE INLET PIPE (REQUIRED FOR THIS CONFIGURATION)	SEPARATE TO RAIL/SAMPLE INLET PIPE (REQUIRED FOR THIS CONFIGURATION)

**GENERAL NOTES**

- CONTRACTOR TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS SHOWN WITHIN ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS AND DETAILS STRUCTURE DIMENSIONS AND HEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEER.
- IF YOU HAVE A SLOPE BREAK IN THE STRUCTURE, A BREAK IS REQUIRED.
- FOR WATER QUALITY STRUCTURES, THE CONTRACTOR SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THE DRAWINGS.
- STRUCTURE SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS AND SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS AND SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS.
- FOR STRUCTURE WITH INLET PIPE, THE CONTRACTOR SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS AND SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS.
- FOR STRUCTURE WITH INLET PIPE, THE CONTRACTOR SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS AND SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS.
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**INSTALLATION NOTES**

- AND SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS AND SHALL BE BUILT TO WITHSTAND THE DESIGN LOADS.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
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- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.

**CONTECH ENGINEERING SOLUTIONS, LLC**

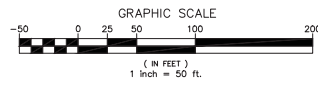
2800 Center Pointe, Suite 100, Troy, MI 48068  
(248) 689-1872

CDS4045-B-C  
INLINE CDS  
STANDARD DETAIL

NOT FOR CONSTRUCTION REF: S PROJECT\2015\20150706\000\0001\000B\CAD REF: S PROJECT\2015\20150706\000\0001\000B\CAD REF: S PROJECT\2015\20150706\000\0001\000B\CAD

**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.
4. ALL FIRE APPARATUS ACCESS ROADS (PUBLIC AND PRIVATE) WITH A DEAD-END DRIVE IN EXCESS OF ONE HUNDRED FIFTY (150) FEET SHALL BE DESIGNED WITH A TURN-AROUND DESIGNED IN ACCORDANCE WITH FIGURE 901 OR A CUL-DE-SAC DESIGNED IN ACCORDANCE WITH FIGURE 901-F. (D.C.S. SEC 11-149 (a)(2)(D))
5. 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)(3))
6. APPROVED FIRE APPARATUS ACCESS ROADS SHALL BE PROVIDED FOR EVERY FACILITY, BUILDING OR PORTION OF A BUILDING CONSTRUCTED OR MOVED INTO OR WITHIN THE JURISDICTION. THE FIRE APPARATUS ACCESS ROAD SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION AND SHALL EXTEND TO WITHIN 150 FEET OF ALL PORTIONS OF THE EXTERIOR WALL OF THE FIRST STORY OF THE BUILDING. (INTERNATIONAL FIRE CODE)
7. 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 (PIV) OR BY VALVE IN WELL AND SHALL BE PROVIDED WITHIN A PUBLIC WATER MAIN EXEMPTION. (D.C.S. SEC 11-68 (a)(9))
8. NO PART OF A COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL AREA SHALL BE MORE THAN 300 FEET FROM A HYDRANT. (D.C.S. SEC 11-38 (f)(1)(a)-1)
9. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED ON THE STREET SIDE OF BUILDINGS, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS OF AS OTHERWISE APPROVED BY THE CODE OFFICIAL. (INTERNATIONAL FIRE CODE)
10. WITH RESPECT TO HYDRANTS, DRIVEWAYS, BUILDINGS AND LANDSCAPING, FIRE DEPARTMENT CONNECTIONS SHALL BE SO LOCATED THAT FIRE APPARATUS AND HOSE CONNECTED TO SUPPLY THE SYSTEM WILL NOT OBSTRUCT ACCESS TO THE BUILDING FOR OTHER FIRES APPARATUS. THE LOCATION OF FIRE DEPARTMENT CONNECTIONS SHALL BE APPROVED. (INTERNATIONAL FIRE CODE)
11. PROXIMITY TO HYDRANT: IN ANY BUILDING OR STRUCTURE REQUIRED TO BE EQUIPPED WITH A FIRE DEPARTMENT CONNECTION, THE CONNECTION SHALL BE LOCATED WITHIN ONE HUNDRED (100) FEET OF A FIRE HYDRANT. (FIRE PREVENTION ORD. SEC. 15-17)
12. ALL NEW MULTI-RESIDENTIAL BUILDINGS SHALL BE NUMBERED. EACH NUMBER SHALL BE A MINIMUM 10 INCHES HIGH, 1 INCH WIDE AND BE POSTED AT LEAST 15 FEET ABOVE THE GROUND ON THE BUILDING WHERE READILY VISIBLE FROM THE STREET. (FIRE PREVENTION ORD.)
13. ENTRANCES TO PUBLIC AND PRIVATE ROADWAYS SHALL NOT HAVE LOCATED GATES, CABLES OR BARRICADES THAT WOULD IMPED FIRE APPARATUS RESPONSE. (FIRE PREVENTION ORD.)



**LEGEND**

**EXISTING**

- IRON FOUND
- ⊗ IRON SET
- ⊕ MAIL FOUND
- ⊕ MAIL & CAP SET

**PROPOSED**

- (H)-DEE-W-C- C. GEE, HOLE OR GORE TO GAS LINE, FLEECE & GRT WIRE
- (H)-CIVTY--- C. UNDERGROUND CABLE TO GRT FLOOR
- (H)-PHONE--- C. TELEPHONE GAS, CABLE, FIBERGLASS & WIRELESS
- (H)-CIG-CIG--- C. ELECTRIC GAS, CABLE, FIBERGLASS, WIRE & WIRELESS
- (H)-GAS--- C. GAS MAIN, VALVE & GAS LINE NUMBER
- (H)-WATER--- C. WATERMAIN, FTY, GRT. HOLE, TAPPING, SLEEVE & VALVE
- (H)-SEWER--- C. SEWER MAIN, CLEANOUT & MANHOLE
- (H)-STORM--- C. STORM SEWER, CLEANOUT & MANHOLE
- (H)-CATCH--- C. COMING SEWER & MANHOLE
- (H)-SQUARE--- C. SQUARE, FRAME & RETRICE CATCH BASIN, TRAP DRAIN
- (H)-POST--- C. POST INDICATOR VALVE
- (H)-WATER--- C. WATER VALVE, SHUTOFF VALVE, SOL, SERVIC, SHUTOFF
- (H)-MISC.--- C. MISC., TRANSFORMER, PROTECTION CONTROL VALVE
- (H)-UNIDENTIFIED--- C. UNIDENTIFIED STRUCTURE

**FINISH**

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

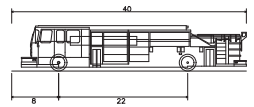
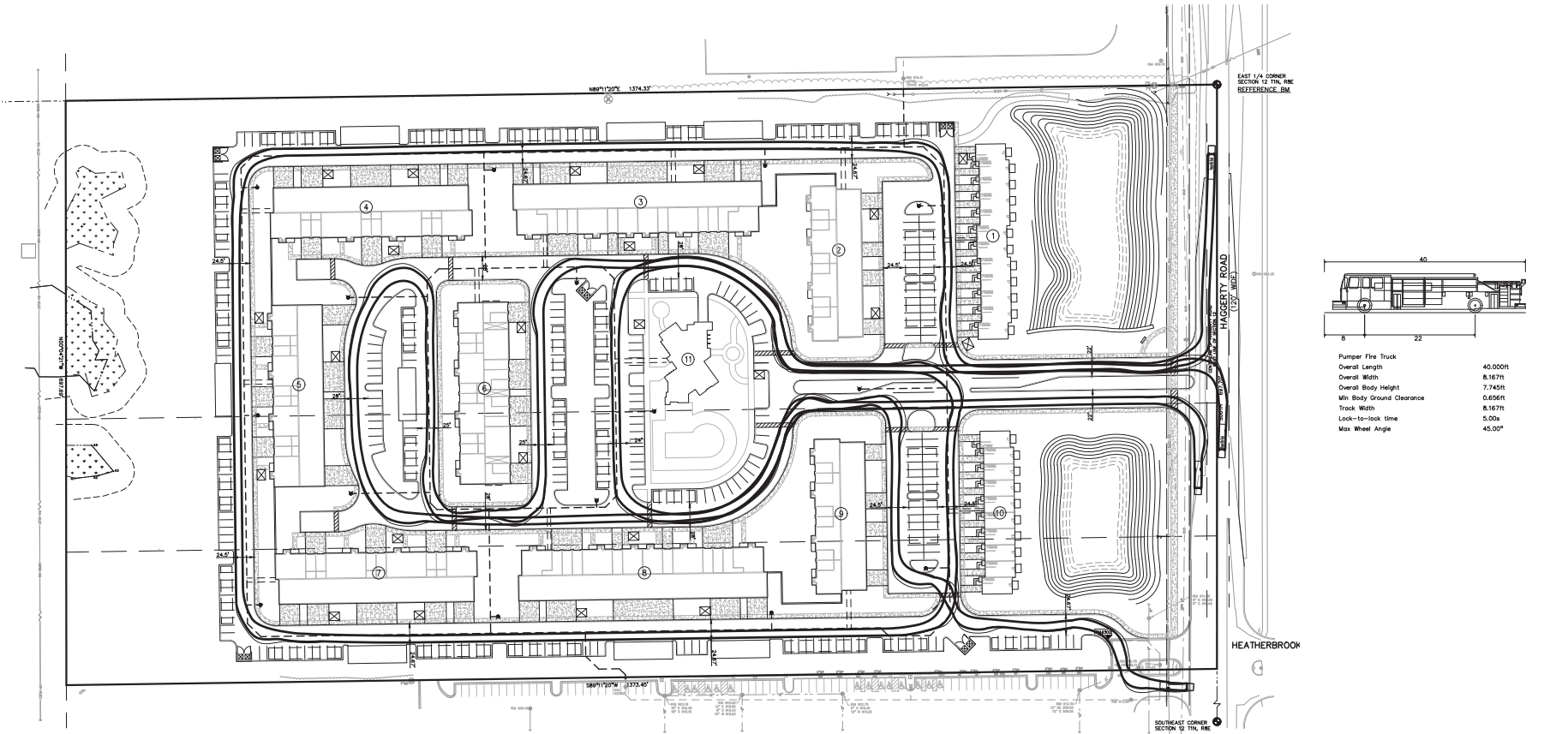
**OTHER**

- SPOT ELEVATION
- COVER LINE
- FINES
- GRADE PALE
- STREET LIGHT
- SUN

**SYMBOLS**

- 811 MISSISSIPPI SYSTEM, INC.
- NEW YORK CITY
- NEW YORK STATE
- NEW YORK STATE
- NEW YORK STATE
- NEW YORK STATE
- NEW YORK STATE
- NEW YORK STATE

NO.	DATE	DESCRIPTION	REVISIONS



**CAUTION!**

Know what's below  
Call before you dig

811  
MISSISSIPPI SYSTEM, INC.

1-800-482-7171 www.missdig.org

**PEA, Inc.**

2430 Rochester Ct., Ste. 100  
Troy, MI 48063-1872  
T: 248-689-9090  
F: 248-585-1044  
www.peainc.com

**BESTAK COMPANIES**  
3175 PARKWAY DRIVE, SUITE 200  
FARMINGTON HILLS, MI 48334

**FIRE TRUCK ROUTE NOVAPLEX**

PART OF THE SE 1/4 OF SECTION 12, T. 0 N., R. 0 E.,  
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

DATE: 07/26/2019  
SCALE: 1" = 50'  
DRAWING NUMBER: C-7.0

**NOT FOR CONSTRUCTION**

**KEEP RIGHT SIGN DETAIL**  
NOT TO SCALE

1/2" x 1/2" x 1/2" ALUMINUM SIGN  
MOUNTED ON 1" DIA. STEEL PIPE  
2" DIA. STANDARD STEEL PIPE  
FILLED WITH CONCRETE  
1/2" DIA. STANDARD STEEL PIPE  
FILLED WITH CONCRETE

NOTE: ALL SIGNS WILL COMPLY WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

**NO PARKING FIRE LANE**  
NOT TO SCALE

12" x 18" RED ON WHITE REFLECTORIZED 2 1/2" MOUNTING HEIGHT

**NO PARKING LOADING ZONE**  
NOT TO SCALE

12" x 18" RED ON WHITE REFLECTORIZED 2 1/2" MOUNTING HEIGHT

**STOP SIGN DETAIL**  
NOT TO SCALE

24" x 24" RED REFLECTORIZED 2 1/2" MOUNTING HEIGHT

**RESERVED PARKING ONLY**  
NOT TO SCALE

12" x 18" GREEN BORDER AND TEXT REFLECTORIZED 2 1/2" MOUNTING HEIGHT

**VAN ACCESSIBLE SIGN DETAIL**  
NOT TO SCALE

12" x 18" GREEN BORDER AND TEXT REFLECTORIZED 2 1/2" MOUNTING HEIGHT

**CONCRETE SIDEWALK ADJACENT TO CURB**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**HEAVY DUTY ASPHALT DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**STANDARD DUTY ASPHALT DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**SIGN AND POST INSTALLATION IN PAVED AREAS**  
NOT TO SCALE

12" x 18" ALUMINUM SIGN  
MOUNTED ON 1" DIA. STEEL PIPE  
2" DIA. STANDARD STEEL PIPE  
FILLED WITH CONCRETE  
1/2" DIA. STANDARD STEEL PIPE  
FILLED WITH CONCRETE

**SIGN AND POST INSTALLATION IN LANDSCAPED AREAS**  
NOT TO SCALE

12" x 18" ALUMINUM SIGN  
MOUNTED ON 1" DIA. STEEL PIPE  
2" DIA. STANDARD STEEL PIPE  
FILLED WITH CONCRETE

**BARRIER FREE PARKING SYMBOL DETAIL (INTERNATIONAL SYMBOL OF ACCESSIBILITY)**  
NOT TO SCALE

4" WIDE BLUE PARKING STRIPE  
2" WIDE WHITE BORDER  
WHITE SYMBOL OF ACCESSIBILITY WITH BLUE BACKGROUND

**18" CONCRETE CURB AND GUTTER DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**4" MOUNTABLE CURB AND GUTTER DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**STANDARD DUTY CONCRETE DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**RETAINING WALL DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**M.D.O.T. CURB DETAIL "B-2" (MODIFIED)**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**HEAVY DUTY CONCRETE PAD DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**6" DIA. GUARD POST DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**PLAN VIEW**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**24" WIDE CONCRETE GUTTER PAN DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**DUMPSTER ENCLOSURE WALL CROSS SECTION**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**TRASH ENCLOSURE GATE DETAIL**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

**TRASH ENCLOSURE DETAILS**  
NOT TO SCALE

1" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE  
BOND COAT  
10" M.D.O.T. #1100-220A OF 1/2" BRITANNIA LEVING COURSE

REVISIONS

3 FULL WORKING DAYS BEFORE YOU DIG CALL 811

Know what's below Call before you dig

MISSISSIPPI System, Inc. 1-800-462-7171 www.mississippsys.com

PEA, Inc. 2430 ROCHESTER CT. Ste. 100 Troy, MI 48063-1872 T: 248.688.9090 F: 248.688.1044 www.peainc.com

BEZTAK COMPANIES 31731 NORTHWESTERN HWY. SUITE 200W FARMINGTON HILLS, MI 48334

STANDARD DETAIL SHEET PART OF THE NOVAPLEX PLAN SET CITY OF NOVA, CALHOUN COUNTY, ALABAMA

DESIGN: [ ] DRAWN: [ ] CHECKED: [ ] SURVEY: [ ] DATE: [ ]

ORIGINAL ISSUE DATE: JULY 26, 2019

PEA JOB NO. 2015-298

SCALE: NONE

DRAWING NUMBER: **C-8.0**

NOT FOR CONSTRUCTION

SOIL MAP



**NOTES**

SEE SHEET L-1.1 FOR LANDSCAPE CALCULATIONS AND LANDSCAPE CALCULATION AREA PLAN.

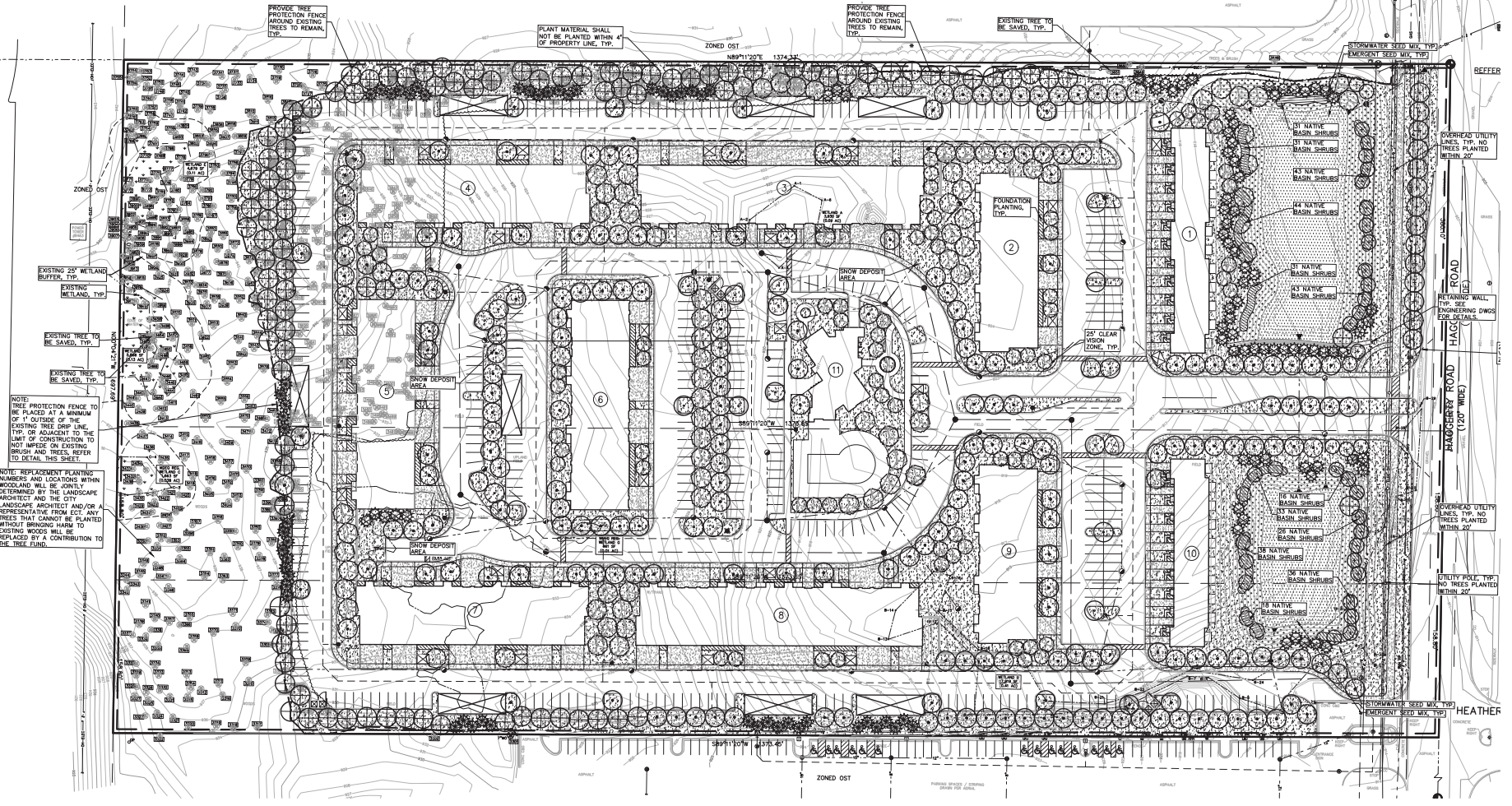
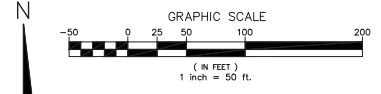
PLANT MATERIAL SHALL BE PLANTED A MINIMUM OF 4' OFF OF PROPERTY LINES.

ALL TREES ARE TO BE A MINIMUM OF 10' FROM HYDRANTS AND UTILITY STRUCTURES.

\$400/CREDIT WILL BE PAID INTO THE TREE FUND FOR EACH TREE CREDIT THAT CANNOT BE REPLACED ON SITE.

KEY

- INTERIOR PARKING LOT TREES
- INTERIOR ROADWAY TREES
- ROW TREES
- MULTI-FAMILY LANDSCAPE TREES
- REPLACEMENT TREES
- EXISTING TREES TO BE REMOVED
- TREE PROTECTION FENCING
- EXISTING TREES TO REMAIN
- FOUNDATION AND BASIN SHRUBS
- STORMWATER SEED MIX & STAKED EROSION MAT BY CAROLINA NATIVE PLANT NURSERY PHONE: 574.588.2412
- EMERGENT SEED MIX & STAKED EROSION MAT BY CAROLINA NATIVE PLANT NURSERY PHONE: 574.588.2412
- IRRIGATED BEED LAWN
- FOUNDATION SHRUBS



EXISTING 20' WETLAND BUFFER, TYP.

EXISTING WETLAND, TYP.

EXISTING TREE TO BE SAVED, TYP.

EXISTING TREE TO BE SAVED, TYP.

NOTE: TREE PROTECTION FENCE TO BE PLACED AT A MINIMUM OF 1' OUTSIDE OF THE EXISTING TREE CRIP LINE, TYP. OR ADJACENT TO THE LIMIT OF CONSTRUCTION TO NOT IMPERE ON EXISTING BRUSH AND TREES, REFER TO DETAIL THIS SHEET.

NOTE: REPLACEMENT PLANTING NUMBERS AND LOCATIONS WITHIN WOODLAND WILL BE JOINTLY DETERMINED BY THE LANDSCAPE ARCHITECT AND THE CITY LANDSCAPE ARCHITECT AND/OR A REPRESENTATIVE FROM CCT. ANY TREES THAT CANNOT BE PLANTED WITHOUT BRINGING HARM TO EXISTING WOODS WILL BE REPLACED BY A CONTRIBUTION TO THE TREE FUND.

REVISIONS

NO.	DATE	DESCRIPTION
1	08/18/2017	ISSUE FOR PERMITS

**CAUTION!**

THE INFORMATION CONTAINED HEREIN IS FOR THE EXCLUSIVE USE OF THE CLIENT AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER. THE ENGINEER'S LIABILITY IS LIMITED TO THE PROFESSIONAL SERVICES PROVIDED HEREIN AND DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGES. THE CLIENT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

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F: 248.689.1044  
www.peainc.com

**BEZTAK COMPANIES**  
31731 NORTHWESTERN HWY., SUITE 200W  
TROY, MI 48063-1872

**PRELIMINARY LANDSCAPE PLAN**

PART OF THE **NOVAPLEX** PROJECT  
CITY OF NOVAPLEX, OAKLAND COUNTY, MICHIGAN

DES. LAW. EN. SUR. ARCH. P. M. JTS  
LAWSON, J. J. JONES, J. J. JONES, J. J. JONES, J. J. JONES

ORIGINAL ISSUE DATE:  
AUGUST 18, 2017

PEA JOB NO. 2015-296

SCALE: 1" = 50'

DRAWING NUMBER:  
**L-1.0**

NOT FOR CONSTRUCTION



NO.	DATE	DESCRIPTION
1	10/18/17	ISSUED FOR PERMITS
2	10/18/17	ISSUED FOR PERMITS
3	10/18/17	ISSUED FOR PERMITS
4	10/18/17	ISSUED FOR PERMITS
5	10/18/17	ISSUED FOR PERMITS
6	10/18/17	ISSUED FOR PERMITS
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63	10/18/17	ISSUED FOR PERMITS
64	10/18/17	ISSUED FOR PERMITS
65	10/18/17	ISSUED FOR PERMITS
66	10/18/17	ISSUED FOR PERMITS
67	10/18/17	ISSUED FOR PERMITS
68	10/18/17	ISSUED FOR PERMITS
69	10/18/17	ISSUED FOR PERMITS
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74	10/18/17	ISSUED FOR PERMITS
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97	10/18/17	ISSUED FOR PERMITS
98	10/18/17	ISSUED FOR PERMITS
99	10/18/17	ISSUED FOR PERMITS
100	10/18/17	ISSUED FOR PERMITS

**PRELIMINARY LANDSCAPE CALCULATION - ENTIRE SITE:**  
 PER CITY OF NOVA ZONING ORDINANCE (AMENDED 6.22.17) - ENTIRE SITE  
 SEZTAL NOH: 2015-298

**INTERIOR PARKING LOT LANDSCAPE REQUIRED:**  
 A. SF OF PAVED AREA UNDER 50,000 SF = 50,000 SF ÷ 7.5M = 3,750 SF  
 B. SF OF ADD. PAVED AREA OVER 50,000 SF = 16,209 SF ÷ 1% = 662 SF  
 A+B = 3,750 + 662 = 4,412 SF OF ISLANDS REQUIRED  
 E. C/200 4,412 / 200 = 22 CANOPY TREES REQUIRED

PARKING LOT A 14,306  
 PARKING LOT B 20,366  
 PARKING LOT C 15,629  
 PARKING LOT D 15,708  
 66,209 SF PAVED INTERIOR PARKING LOT

PROVIDED: 20,021 SF OF INTERIOR LANDSCAPE ISLAND AREA  
 22, 3" CAL. DEC. TREES

**INTERIOR ROADWAY / PERIMETER PARKING LOT TREES**  
 REQUIRED: 1 DECIDUOUS TREE PER 35 LF  
 7,824 LF / 35 = 224 TREES  
 PROVIDED: 224 TREES

**RIGHT OF WAY NOT ADJACENT TO PARKING**  
 REQUIRED: 25' WIDE GREENBELT, 1 DECIDUOUS TREE OR LARGE EVERGREEN PER 80 LF, 1 SUBCANOPY TREE PER 20 LF, 1 DECIDUOUS TREE PER 35 LF BETWEEN SIDEWALK AND CURB  
 325 + 315 = 638 LF  
 638 LF / 80 = 8 DECIDUOUS OR LARGE EVERGREEN  
 638 LF / 20 = 32 SUB CANOPY TREES  
 638 LF / 35 = 18 DECIDUOUS TREES BETWEEN SIDEWALK & CURB

PROVIDED: 18 LARGE EVERGREEN TREES, 32 SUBCANOPY TREES, 14 DECIDUOUS TREES BETWEEN SIDEWALK & CURB, INADEQUATE SPACE FOR REMAINING TREES DUE TO OVERHEAD AND UNDERGROUND UTILITIES.

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

BLDG 1: 233 X .35 = 82 LF  
 BLDG 2: 177 X .35 = 62 LF  
 BLDG 3: 586 X .35 = 205 LF  
 BLDG 4: 474 X .35 = 166 LF  
 BLDG 5: 434 X .35 = 152 LF  
 BLDG 6: 217 X .35 = 76 LF  
 BLDG 7: 474 X .35 = 166 LF  
 BLDG 8: 586 X .35 = 205 LF  
 BLDG 9: 177 X .35 = 62 LF  
 BLDG 10: 194 X .35 = 68 LF

PROVIDED:  
 BLDG 1: 101 LF  
 BLDG 2: 95 LF  
 BLDG 3: 234 LF  
 BLDG 4: 176 LF  
 BLDG 5: 222 LF  
 BLDG 6: 96 LF  
 BLDG 7: 176 LF  
 BLDG 8: 234 LF  
 BLDG 9: 95 LF  
 BLDG 10: 83 LF

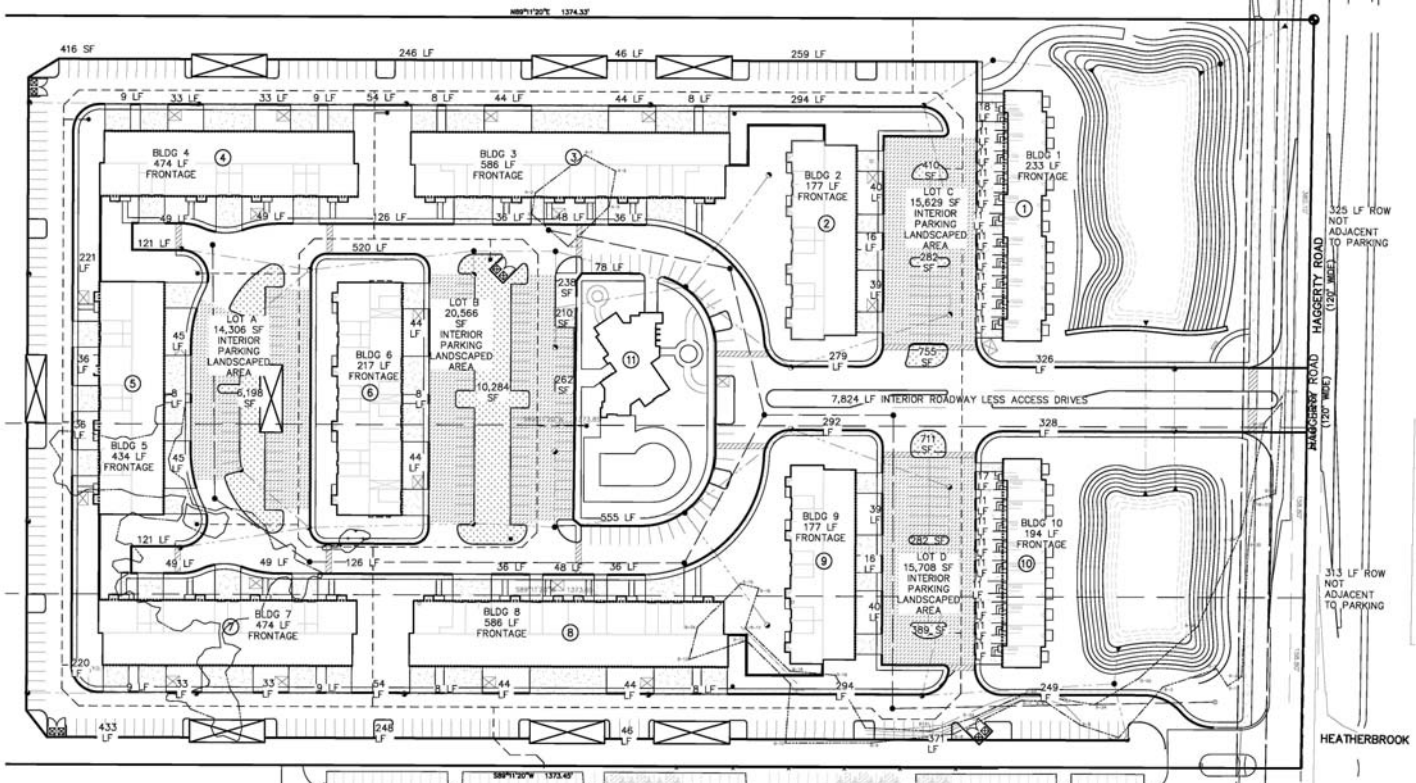
**MULTI-FAMILY LANDSCAPE TREES**  
 REQUIRED: 3 DECIDUOUS TREES OR LARGE EVERGREENS PER EACH DWELLING UNIT ON THE FIRST FLOOR, 60 FIRST FLOOR UNITS X 3 = 198 TREES  
 PROVIDED: 72 LARGE EVERGREEN, 77 DECIDUOUS TREES AND 74 SUBCANOPY TREES AT 1.5:1 RATIO TO PROMOTE DIVERSITY

**DETENTION BASIN**  
 REQUIRED: 70-75% OF RIM COVERED IN CLUSTERS OF LARGE NATIVE SHRUBS ABOVE HIGH WATER LINE, BOTTOM AND SIDES OF BASIN PLANTED WITH A MIX OF NATIVE GRASSES, SEDGES AND WILDFLOWERS.  
 PROVIDED:  
 BASIN A: 223 NATIVE SHRUBS  
 BASIN B: 167 NATIVE SHRUBS

**TREE REPLACEMENT:**  
 REQUIRED: 1 REPLACEMENT : 8" < 11" = 50 TREES (50 REPLACEMENT REQ.)  
 2 REPLACEMENT : 11" < 20" = 86 TREES (172 REPLACEMENT REQ.)  
 3 REPLACEMENT : >20" < 29" = 27 TREES (81 REPLACEMENT REQ.)  
 TOTAL REQUIRED REPLACEMENT TREES = 303 + 181 TREES REQUIRED TO REPLACE FROM PREVIOUS SITE PLAN NOT BUILT = 484

(EXISTING TREES THAT ARE LESS THAN 8" D.B.H., DEAD/VERY POOR, OR POOR CONDITION, ARE EXEMPT FROM REPLACEMENT) CITY'S ARBORIST REQUIRED TO ASSESS/VERIFY CONDITION OF TREES CONSIDERED POOR/VERY POOR PRIOR TO CONSTRUCTION.

PROVIDED:  
 104 = 3" CAL. DECIDUOUS AND 82 LARGE EVERGREEN TREES AT 1.5:1 RATIO  
 TOTAL PROVIDED = 105 + 43 (54 TREES AT 1.5:1 RATIO) = 148 TREES PROVIDED  
 THE REMAINING 336 TREES (484 - 148 = 336 TREES) ARE NOT PROVIDED ON SITE DUE TO INADEQUATE SPACE FOR REPLACEMENT TREES.  
 THE REMAINING 336 TREE REPLACEMENT WILL BE DONE VIA CONTRIBUTION TO THE CITY OF NOVA TREE REPLACEMENT FUND.



PRELIMINARY LANDSCAPE CALCULATION PLAN  
 NOT FOR CONSTRUCTION

**CAUTION!**  
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**PRELIM LANDSCAPE CALCULATIONS**  
 PART OF THE NOVAPEX PROJECT  
 CITY OF NOVA, OAKLAND COUNTY, MICHIGAN

DIST. LAW. DN. LAW. SUR. RS. P. M. JTS  
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ORIGINAL ISSUE DATE:  
 AUGUST 18, 2017

PEA JOB NO. 2015-298

SCALE: N/A

DRAWING NUMBER:  
**L-1.1**

REF: S:\PROJECTS\2015\20150824\NOVA\1508-2015-298.DWG  
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NO.	DATE	BY	DESCRIPTION
1	10/18/17	JTS	ISSUE FOR CONSTRUCTION
2	10/18/17	JTS	ISSUE FOR CONSTRUCTION
3	10/18/17	JTS	ISSUE FOR CONSTRUCTION

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**LANDSCAPE DETAILS**  
 PART OF THE **NOVAPLEX**  
 CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

DWG. NO. 1015-298

DWG. NO. 1015-298

ORIGINAL ISSUE DATE:  
 AUGUST 18, 2017

PEA JOB NO. 2015-298

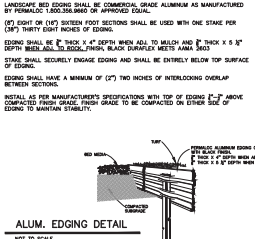
SCALE: N/A

DRAWING NUMBER:  
**L-1.2**

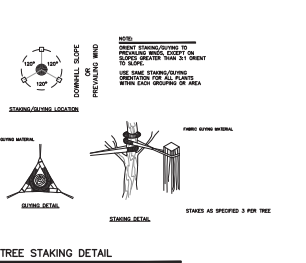
**GENERAL PLANTING NOTES PER CITY OF NOVI:**

- LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING SITE CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK. IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, PLAN SHALL GOVERN QUANTITIES. CONTACT LANDSCAPE ARCHITECT WITH ANY CONCERNS.
- CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HIS/HER PHASE OF WORK. ELECTRIC, GAS, TELEPHONE, CABLE, TELEVISION, AND OTHER SERVICES SHALL BE IDENTIFIED BY CALLING MISC. DIG 1-800-482-7171. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF CONTRACTOR. CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES ON THE JOB AND SHALL REMOVE ANY UNACCEPTABLE JOB CONDITIONS TO OWNER'S REPRESENTATIVE PRIOR TO COMMENCING.
- ALL PLANT MATERIALS ARE TO BE NORTHERN NURSERY GROWN NO. 1 AND INSTALLED ACCORDING TO ACCEPTED PLANTING PROCEDURES. ALL PLANT MATERIAL SHALL CONFORM TO THE CURRENT (AAS) STANDARD FOR NURSERY STOCK. THEY SHALL BE PLANTED ACCORDING TO THE CITY OF NOVI PLANTING AND SPECIFICATIONS. THE CITY SHALL HAVE THE RIGHT TO INSPECT THE PLANT MATERIAL PRIOR TO PLANTING AND TO REJECT ANY PLANT MATERIALS DEEMED NOT TO MEET THE STANDARDS OF THE ZONING ORDINANCE.
- ALL TREES SHALL HAVE A CENTRAL LEADER AND A RADIAL BRANCHING STRUCTURE. PARK GRADE TREES ARE NOT ACCEPTABLE. ALL TREES SHALL BE BALLED AND BURLAPPED (BBM). ANY DECIDUOUS CANOPY TREE WITH BRANCHES THAT MIGHT TEND TO DEVELOP INTO "Y" CROTCHES SHALL BE SUBORDINATED SO AS NOT TO BECOME DOMINANT BRANCHES.
- ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE-SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.
- ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE, AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.
- NO MACHINERY IS TO BE USED WITHIN THE DRIP LINE OF EXISTING TREES; HAND GRAZE ALL LAINN AREAS WITHIN THE DRIP LINE OF EXISTING TREES.
- MULCH SHALL BE NATURAL COLOR, FINELY SHREDED HARDWOOD BARK FOR ALL PLANTINGS. 3" THICK FOR TREES IN 4-FOOT DIAMETER CIRCLES WITH 3" FILLED AWAY FROM TRUNK; 2" FOR SHRUBS AND SHRUB BEDS AND 2" THICK BARK MULCH FOR PERENNIALS.
- ALL LAINN AREAS SHALL RECEIVE 4" COMPACTED TOPSOIL.
- ALL PLANT MATERIAL SHALL BE MAINTAINED IN A HEALTHY GROWING CONDITION, INCLUDING WATERING, CULTIVATION, WEED CONTROL, AND SOIL ENRICHMENTS AS MAY BE NECESSARY.
- ALL PLANT MATERIALS ARE TO BE INSTALLED IN A SOUND, WORKMAN-LIKE MANNER AND IN ACCORDANCE WITH THE CURRENT CITY OF NOVI PLANTING REQUIREMENTS.
- ALL PLANT MATERIAL SHALL BE INSTALLED BETWEEN MARCH 15TH AND NOVEMBER 15TH.
- ALL PLANT MATERIAL SHALL BE WARRANTED FOR TWO(2) FULL YEARS AFTER DATE OF ACCEPTANCE BY THE CITY OF NOVI. ALL UNHEALTHY AND DEAD MATERIAL SHALL BE REPLACED WITHIN THREE (3) MONTHS OR THE NEXT APPROPRIATE PLANTING PERIOD WHICH EVER COMES FIRST.
- A MINIMUM OF ONE WEED CONTROL CULTIVATION PER MONTH OCCURRING IN JUNE, JULY AND AUGUST SHALL BE PERFORMED DURING THE TWO-YEAR ESTABLISHMENT PERIOD.
- ANY SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED IN WRITING BY THE CITY OF NOVI PRIOR TO INSTALLATION.
- ALL TREE WRAP, STAKES, AND GUYS MUST BE REMOVED BY JULY 1ST, FOLLOWING THE FIRST WINTER SEASON AFTER INSTALLATION.
- ALL LANDSCAPE AREAS ARE TO BE MAINTAINED IN A HEALTHY GROWING CONDITION FREE OF DEBRIS AND REFUSE AND IN CONFORMANCE WITH THE APPROVED LANDSCAPE PLAN.
- ALL LANDSCAPE AREAS ARE TO BE WATERED BY A FULLY AUTOMATIC IRRIGATION SYSTEM.
- CONTRACTOR TO REMOVE ALL CONSTRUCTION DEBRIS AND EXCESS MATERIALS FROM THE SITE PRIOR TO FINAL ACCEPTANCE.
- PLANT MATERIALS, EXCEPT SOIL, GROUND COVER, AND CREEPING VINE TYPE PLANTINGS, SHALL NOT BE LOCATED WITHIN FOUR(4) FEET OF THE PROPERTY LINE.
- ALL TRANSFORMERS ARE TO BE SCREENED ON THREE SIDES (MIN.) IN ACCORDANCE WITH THE CITY OF NOVI ORDINANCE AND SO AS TO NOT CONFLICT WITH D.T.E. RESTRICTIONS. (DETAIL THIS SHEET)
- THE OWNER IS RESPONSIBLE FOR REQUEST OF FINAL INSPECTION AND ACCEPTANCE OF THE LANDSCAPE AT THE END OF THE 2-YEAR GUARANTEE PERIOD.
- THE PROVIDER OF THE FINANCIAL GUARANTEE FOR THE LANDSCAPE INSTALLATION SHALL BE FULLY RESPONSIBLE FOR COMPLETION OF THE LANDSCAPE INSTALLATION AND MAINTENANCE PER THE APPROVED LANDSCAPE PLAN AND APPLICABLE CITY ORDINANCES.

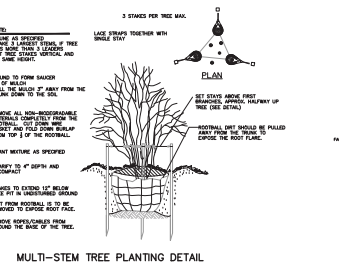
**SELECTION FOR LANDSCAPE MULCHING**



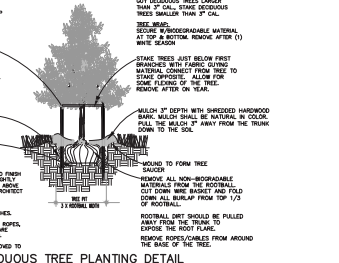
**ALUM. EDGING DETAIL**  
 NOT TO SCALE



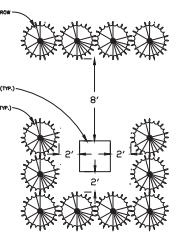
**TREE STAKING DETAIL**  
 NOT TO SCALE



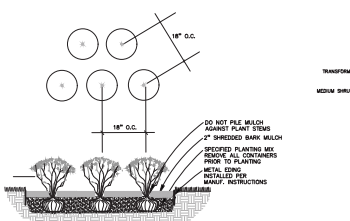
**MULTI-STEM TREE PLANTING DETAIL**  
 NOT TO SCALE



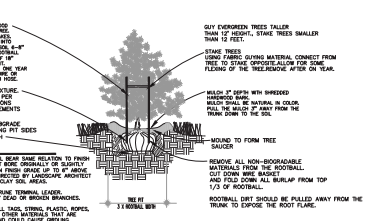
**DECIDUOUS TREE PLANTING DETAIL**  
 NOT TO SCALE



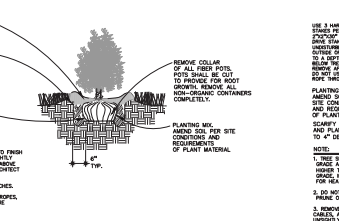
**TRANSFORMER SCREENING DETAIL**  
 NOT TO SCALE



**PERENNIAL PLANTING DETAIL**  
 NOT TO SCALE



**EVERGREEN TREE PLANTING DETAIL**  
 NOT TO SCALE



**SHRUB PLANTING DETAIL**  
 NOT TO SCALE

**NOT FOR CONSTRUCTION**

REF: 8 PROJECTS 10/18/17 1015-298 1015-298 1015-298  
 REF: 8 PROJECTS 10/18/17 1015-298 1015-298 1015-298  
 REF: 8 PROJECTS 10/18/17 1015-298 1015-298 1015-298

TREE PROTECTION WILL BE ERECTED PRIOR TO START OF CONSTRUCTION ACTIVITIES AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.

NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN, INCLUDING BUT NOT LIMITED TO PLACING SOLVENTS, BUILDING MATERIAL, CONSTRUCTION EQUIPMENT OR SOIL DEPOSITS WITHIN DRIP LINES.

GRADE CHANGES MAY NOT OCCUR WITHIN THE DRIP LINE OF PROTECTED TREES.

DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY DEVICE OR WIRE TO ANY REMAINING TREE.

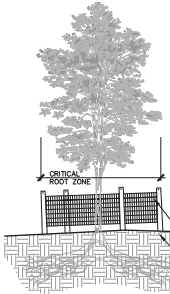
ALL UTILITY SERVICE REQUESTS MUST INCLUDE NOTIFICATION TO THE INSTALLER THAT PROTECTED TREES MUST BE AVOIDED. ALL TRENCHING SHALL OCCUR OUTSIDE OF THE PROTECTIVE FENCING.

TREES LOCATED ON ADJACENT PROPERTY THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.

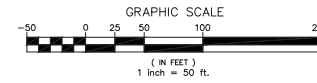
TREES TO BE PRESERVED SHALL BE IDENTIFIED WITH FLAGGING PRIOR TO TREE CLEARING OPERATIONS.

PROVIDE FENCE AROUND CRITICAL ROOT ZONE OF TREE.

FENCE SHALL BE PLACED IN A CIRCLE WITH A MINIMUM RADIUS OF 1" PER 1" DIAMETER OF THE TREE MEASURED AT 4.5' ABOVE GROUND.



1 TREE PROTECTION DETAIL  
SCALE: 1" = 5'-0"



TREE REPLACEMENT CALCULATIONS

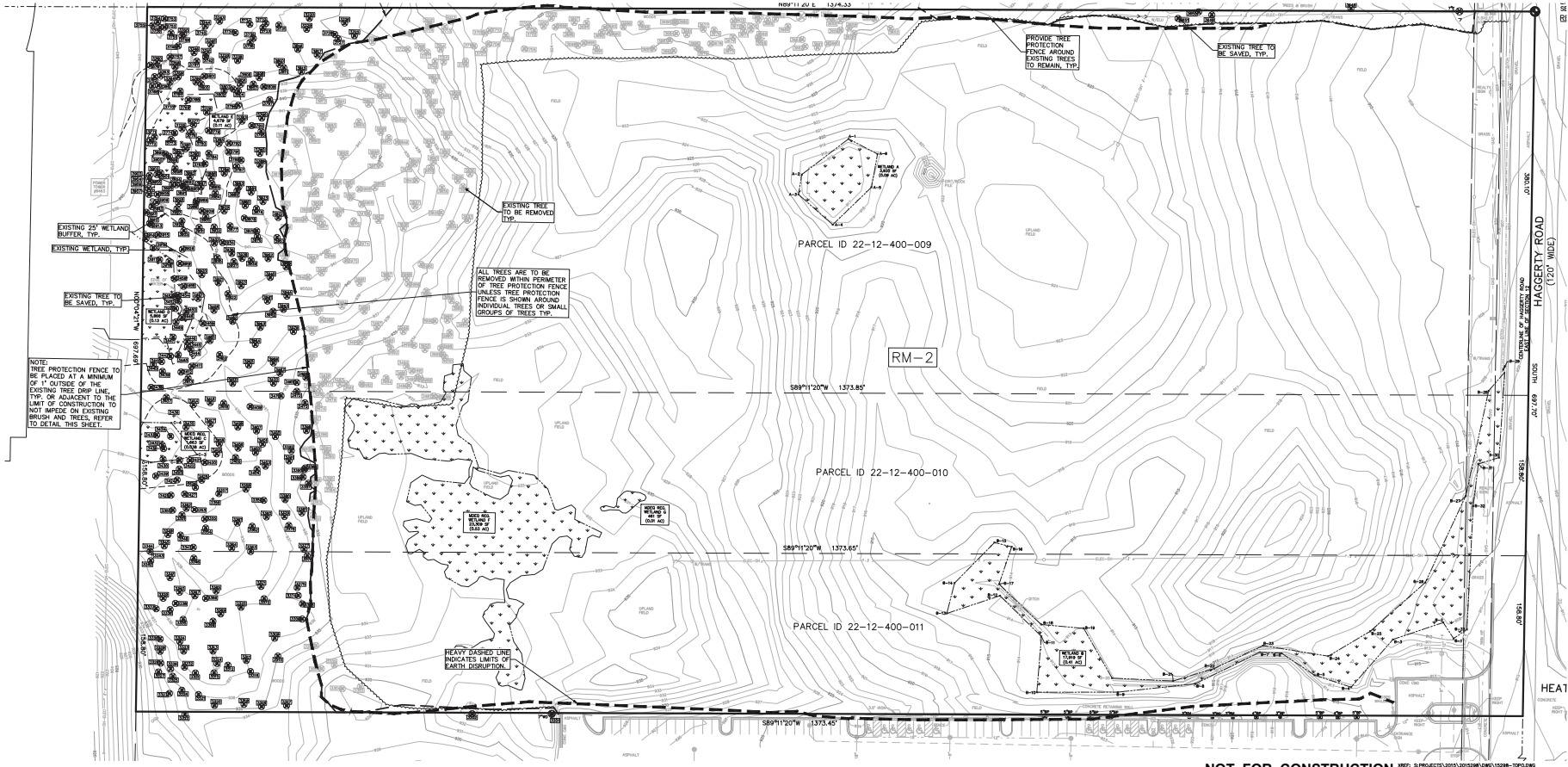
REQUIRED 1 REPLACEMENT 8" DBH	90	90 REPLACEMENT TREES REQUIRED
2 REPLACEMENT 12" DBH	86	172 REPLACEMENT TREES REQUIRED
3 REPLACEMENT 24" DBH	27	81 REPLACEMENT TREES REQUIRED
TOTAL REQUIRED REPLACEMENT TREES	303	

PROVIDED: 104 3" CAL. DECIDUOUS TREES & 54 6" EVERGREENS. SEE SHEET L-1.0

(EXISTING TREES THAT ARE DEAD, VERY POOR OR POOR CONDITION, ARE EXEMPT FROM REPLACEMENT)

PROVIDED: IF THERE IS NOT ADEQUATE SPACE FOR REPLACEMENT TREES ON SITE, TREE REPLACEMENT WILL BE DONE VIA CONTRIBUTION TO THE CITY OF NOV. TREE REPLACEMENT FUND AT \$400 PER TREE. CREDIT NOT MET.

SEE SHEET T-1.2 & T-1.3 FOR EXISTING TREE LIST. SEE SHEET L-1.0 FOR REPLACEMENT TREES.



NO.	DATE	DESCRIPTION	BY	CHKD.
1		ISSUED FOR CONSTRUCTION		

REVISIONS

CAUTION!  
This plan was prepared by an engineer and is intended to be used in accordance with the provisions of the Michigan Professional Engineers Act. It is the responsibility of the user to verify that the information on this plan is accurate and that it is used for the intended purpose. The user shall be responsible for any errors or omissions on this plan.

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**PRELIM. TREE PRESERVATION PLAN**  
PART OF THE **NOVAPLEX** PROJECT  
CITY OF NOV. LAWN AND COUNTY MICHIGAN

DES. LAW. DN. LAW. E. SUR. KR. P.M. JBT

ORIGINAL ISSUE DATE:  
AUGUST 18, 2017

PEA JOB NO. 2015-298

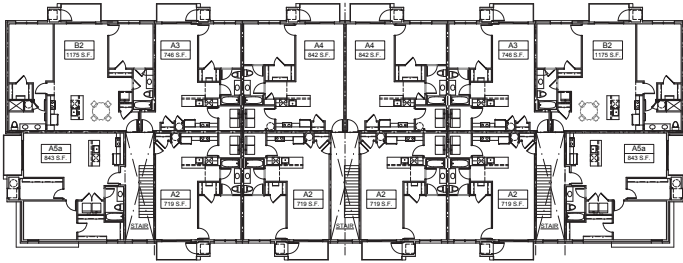
SCALE: 1" = 50'

DRAWING NUMBER:  
**T-1.1**

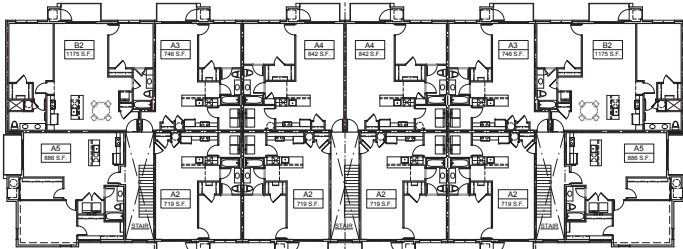
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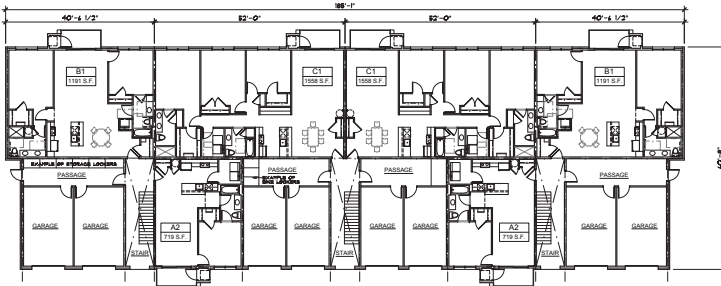




THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

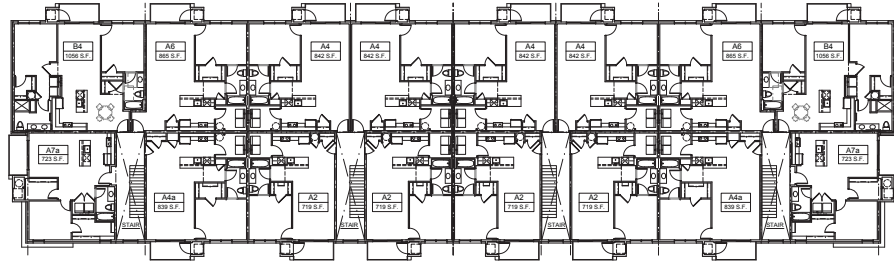
OVERALL UNIT MIX - BUILDING 100				
LOWER LEVEL	1-BDRM	2-BDRM	3-BDRM	TOTAL
1ST FLOOR	2	2	2	4
2ND FLOOR	10	2	-	12
3RD FLOOR	10	2	-	12
TOTAL	22 (73%)	6 (20%)	2 (7%)	30

(2) BUILDING 100 • ON-SITE

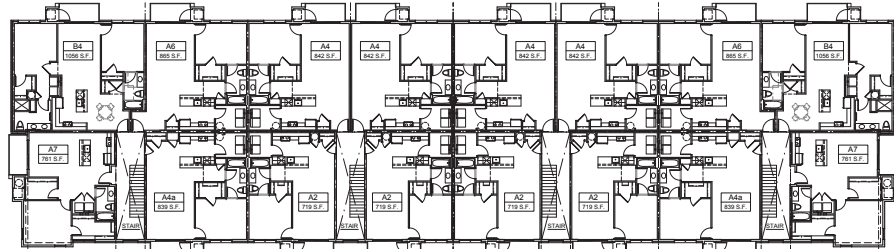
GARAGES	
1ST FLOOR	8
2ND FLOOR	8
3RD FLOOR	8

BUILDING 100

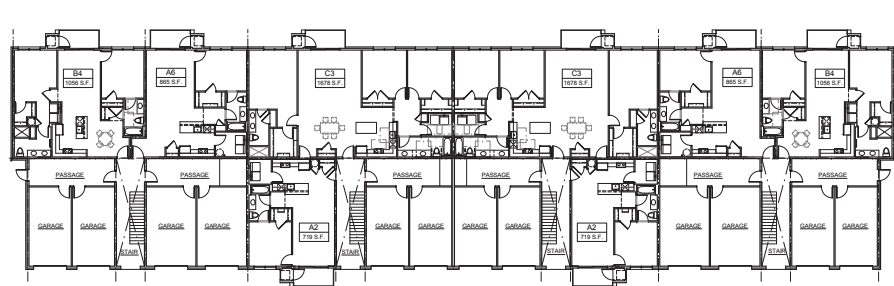
SCALE: 1/16" = 1'-0"



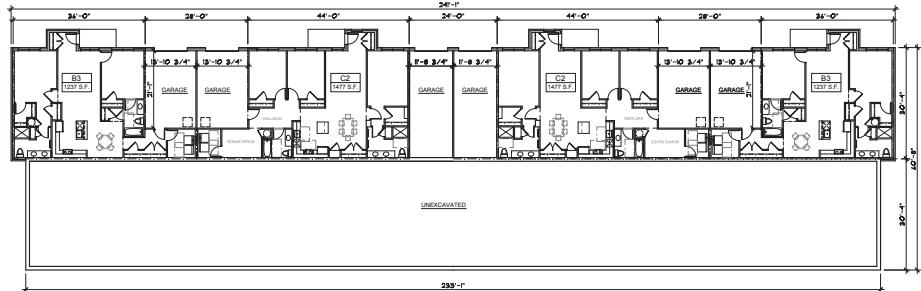
THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN



WALK-OUT LEVEL PLAN

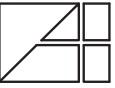
OVERALL UNIT MIX - BUILDING 150				
LOWER LEVEL	1-BDRM	2-BDRM	3-BDRM	TOTAL
1ST FLOOR	4	2	2	8
2ND FLOOR	14	2	-	16
3RD FLOOR	14	2	-	16
TOTAL	32 (73%)	6 (18%)	4 (9%)	44

(2) BUILDING 150 • ON-SITE

GARAGES	
1ST FLOOR	12
2ND FLOOR	-
3RD FLOOR	-

BUILDING 150

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



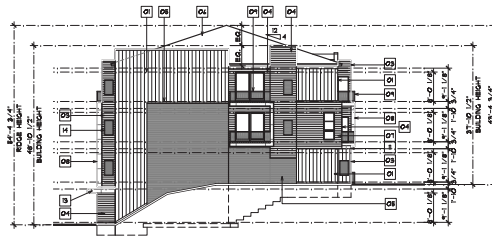
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Bloomfield Hills, MI 48302  
248-334-5000

PROJECT: BLDG. 100/150 PLANS

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BEZTAK PROPERTIES  
NOV., MICHIGAN

DATE: FEBRUARY 07-24-19  
DRAWN BY: ABM  
CHECKED BY: BEZTAK-NOV...  
REVISIONS:

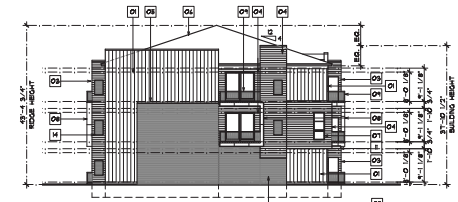
DATE: 1909  
SHEET NUMBER: A1



**LEFT SIDE ELEVATION BLDG 150**  
RIGHT SIDE SIM. SCALE: 1/16" = 1'-0"

**COLOR AND MATERIAL KEYNOTES**

- 1 VERTICAL BRICK - BROWN ULLIANS 80 120" HIGH REFLECTIVE WHITE
- 2 HORIZONTAL BRICK - BROWN ULLIANS 80 4248 "JABLES"
- 3 HORIZONTAL BRICK - BROWN ULLIANS 80 120" HIGH REFLECTIVE WHITE
- 4 BRICK - GENERAL BRICK BOURBONSTON "DESERT" PAIGE VELVET
- 5 ASPHALT SHINGLES - CERTAINTEED LANDMARK GEORGETOWN GREY
- 6 WINDOW DOOR FRAMES - BLACK
- 7 METAL-FACED GABLETYPED BALCONY FRAMES - BROWN ULLIANS 80 120" HIGH REFLECTIVE WHITE
- 8 METAL RAILING - BLACK
- 9 GARAGE DOOR - BROWN ULLIANS 80 120" HIGH REFLECTIVE WHITE
- 10 METAL-FACED GABLETYPED ENTRY CANOPY - BROWN ULLIANS 80 120" HIGH REFLECTIVE WHITE
- 11 OPEN METAL GRILLE AT STAIR - BLACK
- 12 METAL-FACED ROOF OVERHANG AT VESTIBULE - BROWN ULLIANS 80 120" HIGH REFLECTIVE WHITE
- 13 MECHANICAL VENT



**LEFT SIDE ELEVATION BLDG 100**  
RIGHT SIDE SIM. SCALE: 1/16" = 1'-0"



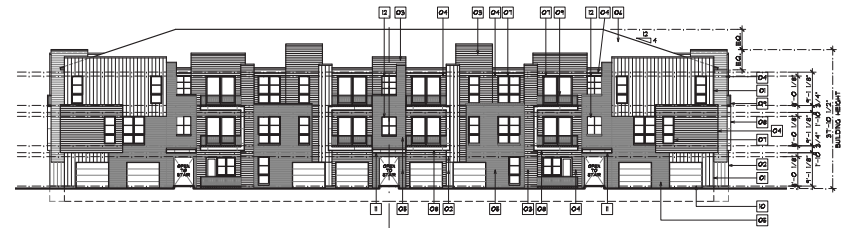
**REAR ELEVATION BUILDING 150**  
SCALE: 1/16" = 1'-0"



**REAR ELEVATION BUILDING 100**  
SCALE: 1/16" = 1'-0"



**FRONT ELEVATION BUILDING 150**  
SCALE: 1/16" = 1'-0"



**FRONT ELEVATION BUILDING 100**  
SCALE: 1/16" = 1'-0"

REAR		1 SIDE		FRONT		BLDG 150	
12632	TOTAL FACADE	27191	TOTAL FACADE	10038	TOTAL FACADE		
-3822	OPENINGS	-231	OPENINGS	-2184	OPENINGS		
8810	TOTAL MATL SURFACE	2540	TOTAL MATL SURFACE	7852	TOTAL MATL SURFACE		
1122	ASPHALT ROOF	205	ASPHALT ROOF	1544	ASPHALT ROOF		
4714	SIDING	1540	SIDING	4072	SIDING		
1882	BRICK	101	BRICK	1390	BRICK		
+492	METAL	+ 88	METAL	+244	METAL		
8810	TOTAL MATL SURFACE	2540	TOTAL MATL SURFACE	7852	TOTAL MATL SURFACE		

REAR		1 SIDE		FRONT		BLDG 100	
7440	TOTAL FACADE	2420	TOTAL FACADE	7810	TOTAL FACADE		
-2190	OPENINGS	-295	OPENINGS	-1944	OPENINGS		
5410	TOTAL MATL SURFACE	2325	TOTAL MATL SURFACE	5864	TOTAL MATL SURFACE		
1230	ASPHALT ROOF	205	ASPHALT ROOF	1138	ASPHALT ROOF		
2874	SIDING	1380	SIDING	3220	SIDING		
1103	BRICK	410	BRICK	1320	BRICK		
+210	METAL	+ 10	METAL	+ 114	METAL		
5410	TOTAL MATL SURFACE	2325	TOTAL MATL SURFACE	5864	TOTAL MATL SURFACE		



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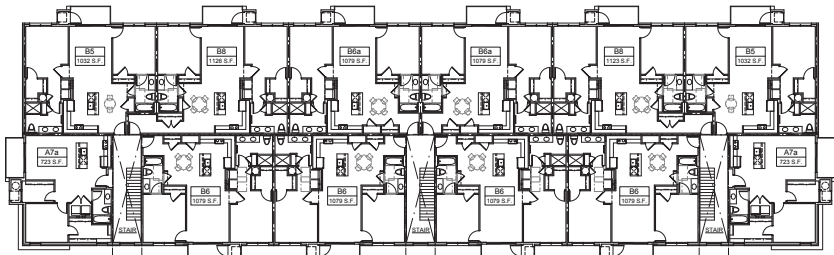
ELEVATION

NOVAPLEX  
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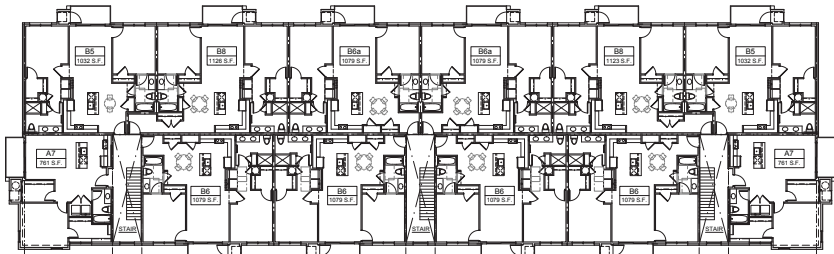
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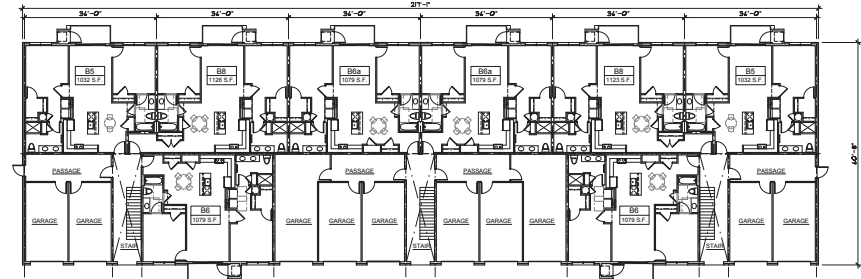
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 CAD FILENAME: BEZTAK-NOV...  
 CHECKED BY:  
 DATE: 1/30/19  
 SHEET NUMBER:



THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

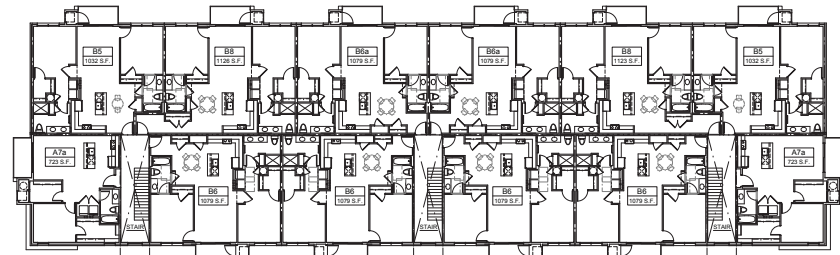
OVERALL UNIT MIX - BUILDING 200				
LOWER LEVEL	1-BDRM	2-BDRM	3-BDRM	TOTAL
1ST FLOOR	-	6	-	6
2ND FLOOR	2	10	-	12
3RD FLOOR	2	10	-	12
TOTAL	4 (33%)	26 (81%)	0 (0%)	30

GARAGES	
1ST FLOOR	14
2ND FLOOR	12
3RD FLOOR	12
TOTAL	38

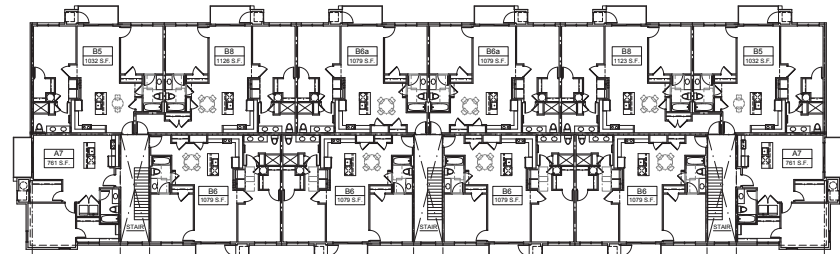
**BUILDING 200**

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

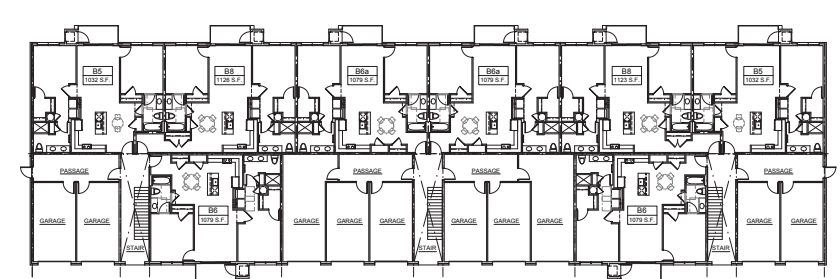
(1) BUILDING 200 ON-SITE



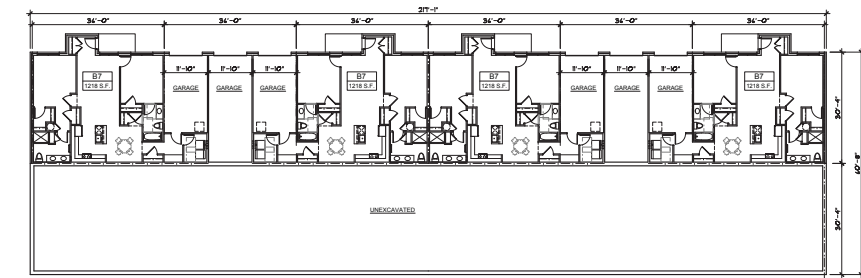
THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN



WALK-OUT LEVEL PLAN

OVERALL UNIT MIX - BUILDING 250				
LOWER LEVEL	1-BDRM	2-BDRM	3-BDRM	TOTAL
1ST FLOOR	-	8	-	8
2ND FLOOR	2	10	-	12
3RD FLOOR	2	10	-	12
TOTAL	4 (16%)	32 (84%)	0 (0%)	36

GARAGES	
1ST FLOOR	10
2ND FLOOR	12
3RD FLOOR	12
TOTAL	34

**BUILDING 250**

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

(1) BUILDING 250 ON-SITE



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BUILDG. 200/250 PLANS

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**UNIT MATRIX** 332 TOTAL UNITS  
BEZTAK | APARTMENTS | NOVI

BLDG TYPE	REQ'D MIX	UNITS BLDG	% TOTAL	OVER ENTIRE SITE
100	2	30	60	
non w/o				
150	2	44	88	
w/o				
200	1	30	30	
non w/o				
250	1	36	36	
w/o				
275	2	48	96	
w/o				
300	1	10	10	
10-unit townhouse				
300	1	12	12	
12-unit townhouse				
<b>TOTAL UNITS ON SITE</b>		<b>332</b>		<b>332 UNITS</b>

**SUMMARY**

BEZTAK | APARTMENTS | NOVI

**SUMMARY OF TOTAL UNITS OVER ENTIRE SITE :**

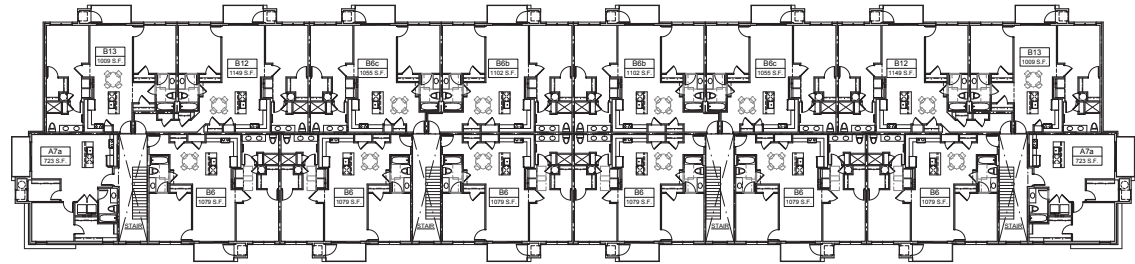
1 BEDROOM	128	39%
2 BEDROOM	170	51%
3 BEDROOM	34	10%
<b>TOTAL</b>	<b>332</b>	

**ATTACHED GARAGES:**

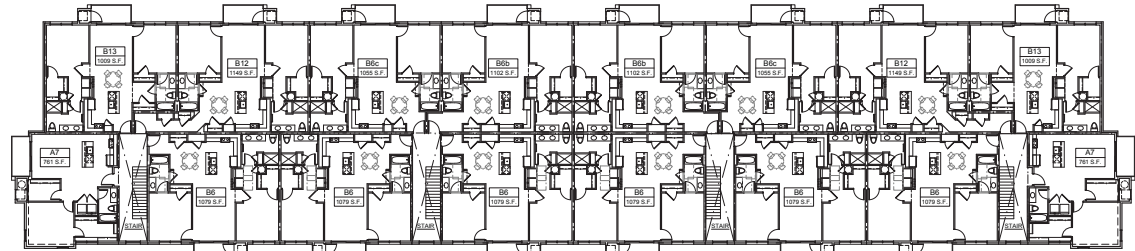
BLDG 100	8 x	2 =	16
BLDG 150	18 x	2 =	36
BLDG 200	16 x	1 =	16
BLDG 250	16 x	1 =	16
BLDG 275	34 x	3 =	48
BLDG 300	10 x	1 =	10
BLDG 300	12 x	1 =	12
<b>TOTAL GARAGES</b>			<b>154</b>
<b>TOTAL APRONS</b>			<b>154</b>

**TOTAL DETACHED GARAGES**

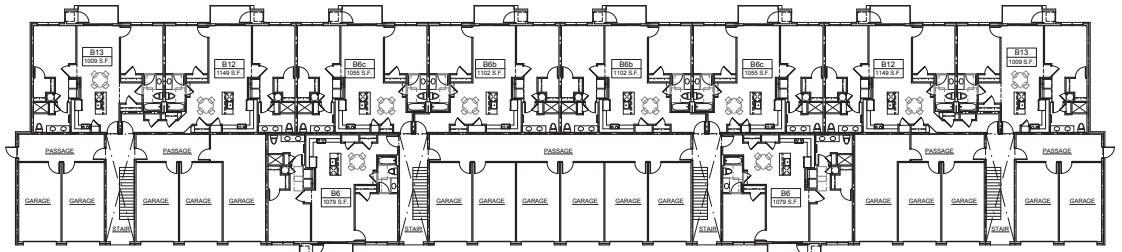
(B) BUILDINGS w/ (B) SPACES EACH 48 SPACES



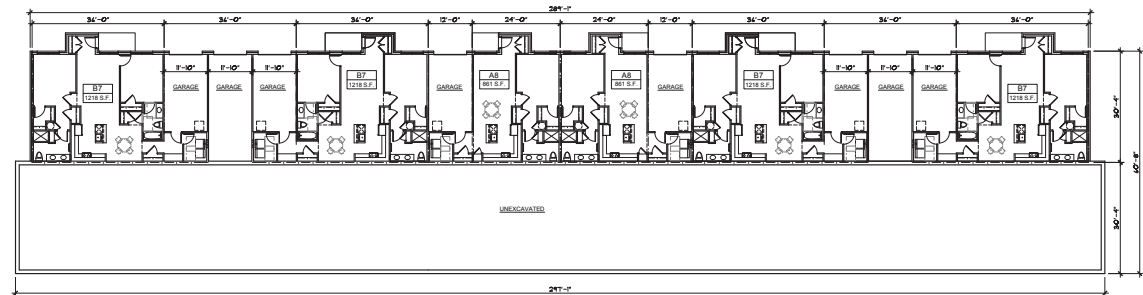
SECOND / THIRD FLOOR PLAN



SECOND / THIRD FLOOR PLAN



FIRST FLOOR PLAN

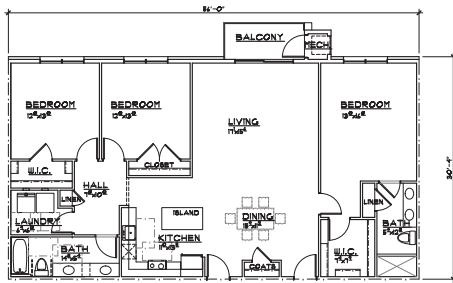


WALK-OUT LEVEL PLAN

OVERALL UNIT MIX - BUILDING 275					GARAGES	
	1-BDRM	2-BDRM	3-BDRM	TOTAL		
LOWER LEVEL	2	4	-	6	8	
1ST FLOOR	-	10	-	10	14	
2ND FLOOR	2	4	-	6	14	
3RD FLOOR	2	14	-	16	14	
<b>TOTAL</b>	<b>6 (18%)</b>	<b>42 (88%)</b>	<b>0 (0%)</b>	<b>48</b>	<b>24</b>	

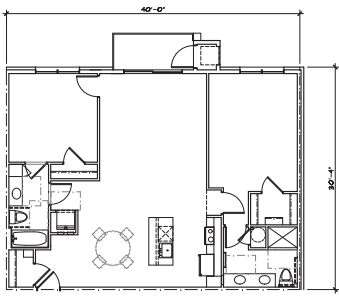
BUILDING 275

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



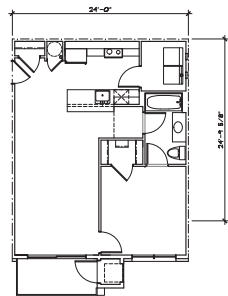
'C3' 3-BEDROOM UNIT

1678 S.F.  
SCALE: 1/8" = 1'-0"



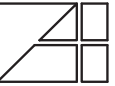
'B1' 2-BEDROOM UNIT

1198 S.F.  
SCALE: 1/8" = 1'-0"



'A2' 1-BEDROOM UNIT

719 S.F.  
SCALE: 1/8" = 1'-0"



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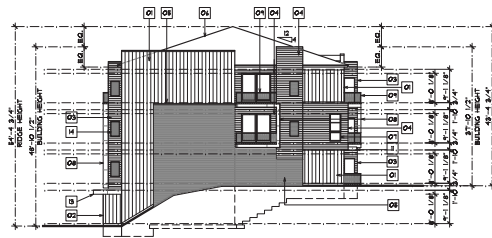
BLDG. 275 PLANS

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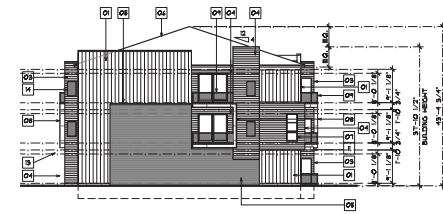
A4



**LEFT SIDE ELEVATION BLDG 250**  
RIGHT SIDE SIM. SCALE: 1/16" = 1'-0"

**COLOR AND MATERIAL KEYNOTES**

- 1 VERTICAL SIDING - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 2 HORIZONTAL SIDING - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 3 HORIZONTAL SIDING - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 4 BRICK - GENERAL BRICK BOURKESTON DESERT PADE VELVET
- 5 ASPHALT SIDING
- 6 CERTAINTEED LANDMARK GEOMETRIC GREY
- 7 WINDOW DOOR FRAMES - BLACK
- 8 METAL FACED GABLE SIDING - BALCONY FRAMES - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 9 METAL RAILING - BLACK
- 10 GARAGE DOOR - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 11 METAL FACED GABLE SIDING - ENTRY CANOPY - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 12 OPEN METAL GRILLE AT STAIR - BLACK
- 13 METAL FACED ROOF OVERHANG AT VESTIBULE - BRICKEN ULLIANS 8 1/2" HIGH REFLECTIVE WHITE
- 14 MECHANICAL VENT



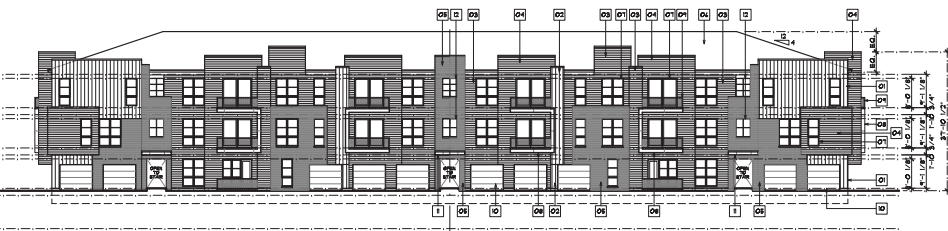
**LEFT SIDE ELEVATION BLDG 200**  
RIGHT SIDE SIM. SCALE: 1/16" = 1'-0"



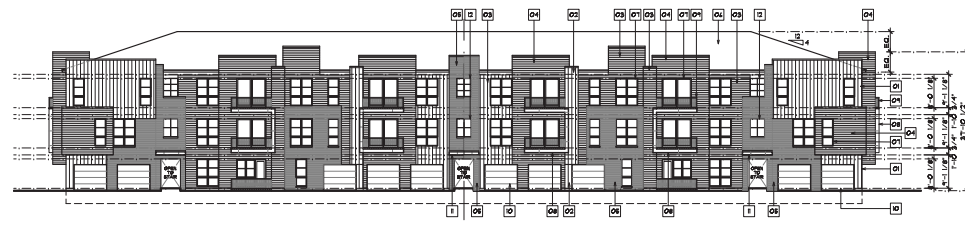
**REAR ELEVATION BUILDING 250**  
SCALE: 1/16" = 1'-0"



**REAR ELEVATION BUILDING 200**  
SCALE: 1/16" = 1'-0"



**FRONT ELEVATION BUILDING 250**  
SCALE: 1/16" = 1'-0"



**FRONT ELEVATION BUILDING 200**  
SCALE: 1/16" = 1'-0"

REAR		1 SIDE		FRONT		BLDG 250	
1402	TOTAL FACADE	2191	TOTAL FACADE	1424	TOTAL FACADE		
-244	OPENINGS	-231	OPENINGS	-2538	OPENINGS		
1158	TOTAL MATL SURFACE	2520	TOTAL MATL SURFACE	4888	TOTAL MATL SURFACE		
1470	ASPHALT ROOF	205	ASPHALT ROOF	1454	ASPHALT ROOF		
4084	SIDING	150	SIDING	4004	SIDING		
1758	BRICK	701	BRICK	123	BRICK		
+442	METAL	+88	METAL	+114	METAL		
1158	TOTAL MATL SURFACE	2520	TOTAL MATL SURFACE	4888	TOTAL MATL SURFACE		

REAR		1 SIDE		FRONT		BLDG 200	
1440	TOTAL FACADE	2410	TOTAL FACADE	1414	TOTAL FACADE		
-2474	OPENINGS	-245	OPENINGS	-2522	OPENINGS		
4834	TOTAL MATL SURFACE	2365	TOTAL MATL SURFACE	4892	TOTAL MATL SURFACE		
1518	ASPHALT ROOF	205	ASPHALT ROOF	1454	ASPHALT ROOF		
3140	SIDING	1420	SIDING	4010	SIDING		
1398	BRICK	648	BRICK	123	BRICK		
+180	METAL	+112	METAL	+114	METAL		
4834	TOTAL MATL SURFACE	2365	TOTAL MATL SURFACE	4892	TOTAL MATL SURFACE		

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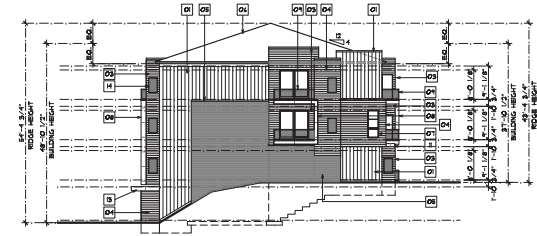
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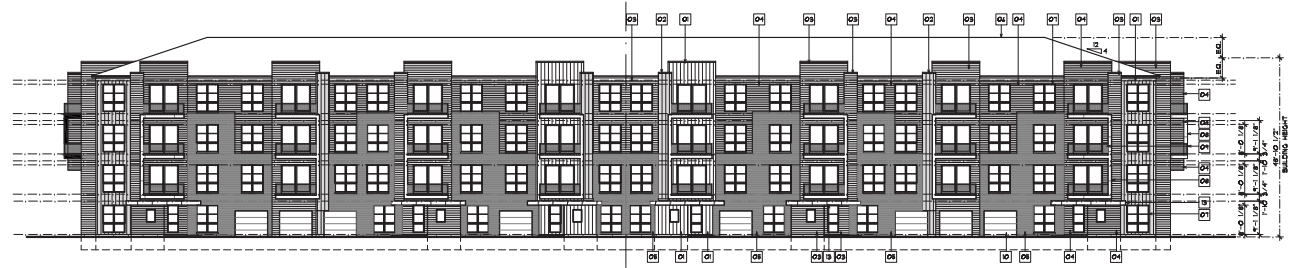
ELEVATION

COLOR AND MATERIAL KEYNOTES

- 01 VERTICAL SIDING - SHERRIN WILLIAMS BU 1181 "HIGH REFLECTIVE WHITE"
- 02 VERTICAL SIDING - SHERRIN WILLIAMS BU 1248 "JUBILEE"
- 03 HORIZONTAL SIDING - SHERRIN WILLIAMS BU 1181 "HIGH REFLECTIVE WHITE"
- 04 HORIZONTAL SIDING - SHERRIN WILLIAMS BU 1248 "JUBILEE"
- 05 BRICK - GENERAL SHALE ROBERTSON "DESERT SAUCY VELVET"
- 06 ASPHALT SHINGLES - CRYSTALINE LANDMARK "GEORGETOWN GREY"
- 07 WINDOW/DOOR FRAMES - BLACK
- 08 METAL-FACED CANTILEVERED BALCONY FRAMES - SHERRIN WILLIAMS BU 1181 "HIGH REFLECTIVE WHITE"
- 09 METAL PAINTING - BLACK
- 10 GARAGE DOOR - SHERRIN WILLIAMS BU 1181 "HIGH REFLECTIVE WHITE"
- 11 METAL-FACED CANTILEVERED ENTRY CANOPY - SHERRIN WILLIAMS BU 1181 "HIGH REFLECTIVE WHITE"
- 12 OPEN METAL GRILLE AT STAIR - BLACK
- 13 METAL-FACED ROOF OVERHANG AT VESTIBULE - SHERRIN WILLIAMS BU 1181 "HIGH REFLECTIVE WHITE"
- 14 MECHANICAL VENT



**LEFT SIDE ELEVATION BLDG 275**  
RIGHT SIDE SIM. SCALE: 1/16" = 1'-0"



**REAR ELEVATION**

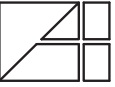
**BUILDING 275**  
SCALE: 1/16" = 1'-0"



**FRONT ELEVATION**

**BUILDING 275**  
SCALE: 1/16" = 1'-0"

REAR		1 SIDE		FRONT		BLDG 275
TOTAL FACADE	TOTAL MATL SURFACE	TOTAL FACADE	TOTAL MATL SURFACE	TOTAL FACADE	TOTAL MATL SURFACE	
15898	1004	2191	2560	12142	9088	
-4892		-231		-3474		
OPENINGS		OPENINGS		OPENINGS		
2380	22%	205	8%	2014	23%	
5548	50%	1560	41%	518	54%	
2493	23%	701	28%	1650	18%	
+5%	5%	+ 88	3%	+244	3%	
1004	TOTAL MATL SURFACE	2560	TOTAL MATL SURFACE	9088	TOTAL MATL SURFACE	



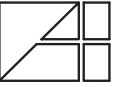
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INTERIOR  
ELEVATION

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PROJECT: TOWNHOUSE PLANS

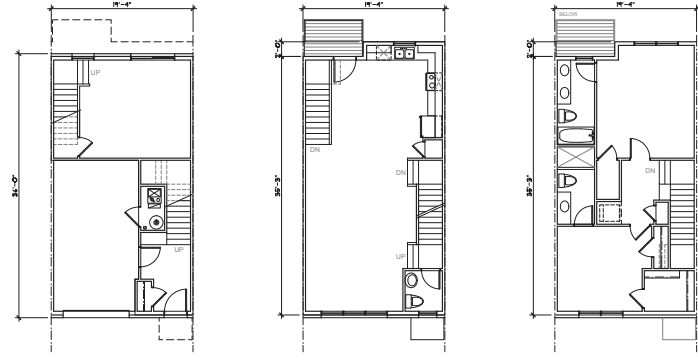
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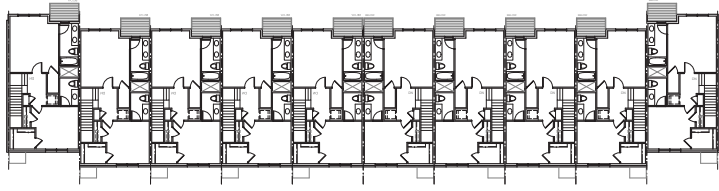
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REVISIONS

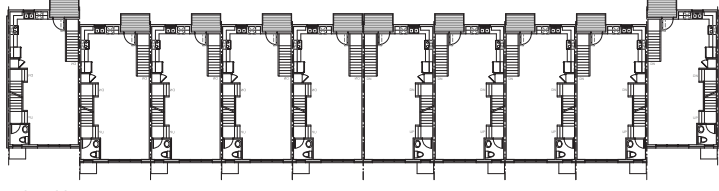
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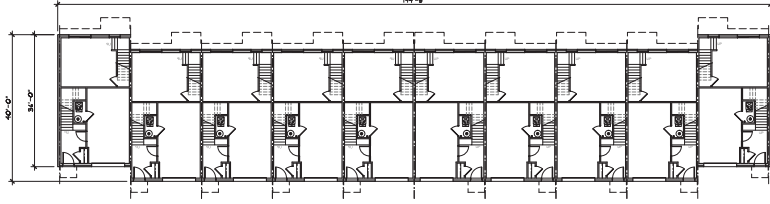
433 S.F. LOWER LEVEL PLAN  
 704 S.F. FIRST FLOOR PLAN  
 704 S.F. SECOND FLOOR PLAN  
 TOWNHOUSE UNIT PLANS  
 1841 S.F.  
 SCALE: 1/8" = 1'-0"



SECOND FLOOR PLAN



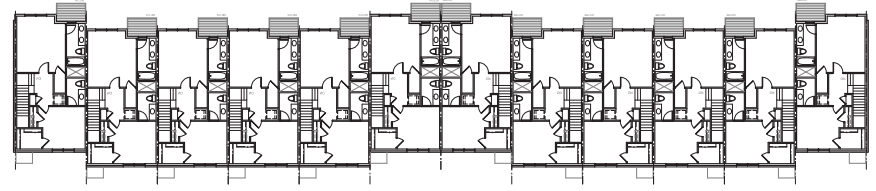
FIRST FLOOR PLAN



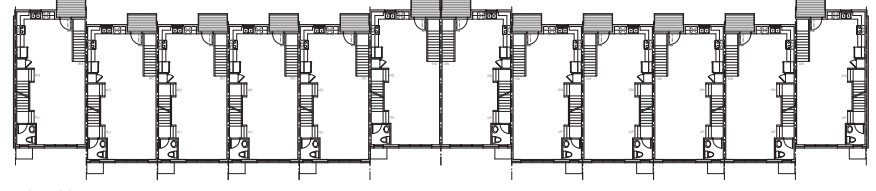
LOWER LEVEL PLAN

10-UNIT TOWNHOUSE

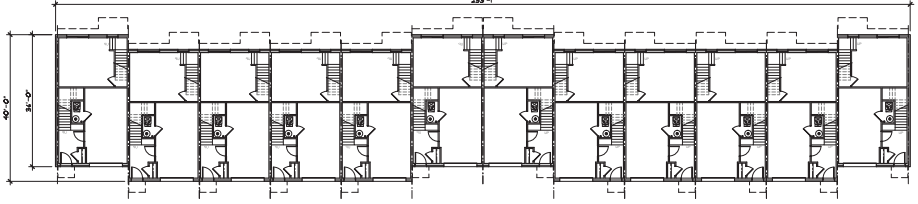
SCALE: 1/16" = 1'-0"



SECOND FLOOR PLAN



FIRST FLOOR PLAN



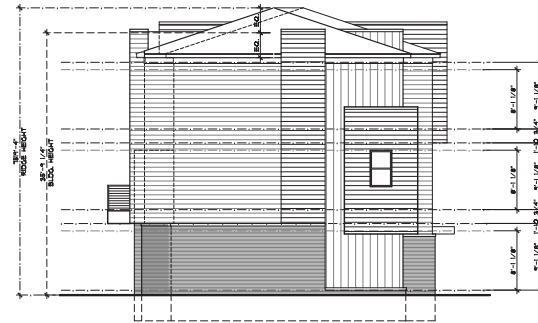
LOWER LEVEL PLAN

12-UNIT TOWNHOUSE

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

COLOR AND MATERIAL KEYNOTES

- 1) VERTICAL SIDING - SHERWIN WILLIAMS 86 1317 "HIGH REFLECTIVE WHITE"
- 2) VERTICAL SIDING - SHERWIN WILLIAMS 86 4246 "JUNBLEE"
- 3) HORIZONTAL SIDING - SHERWIN WILLIAMS 86 1317 "HIGH REFLECTIVE WHITE"
- 4) HORIZONTAL SIDING - SHERWIN WILLIAMS 86 4246 "JUNBLEE"
- 5) BRICK - GENERAL SHALE ROBERTSON "CREAM TONE YELLOW"
- 6) ASPHALT SHINGLES - CERTAINTELD LANDMARK GEORGETOWN GRAY
- 7) WINDOW/DOOR FRAMES - BLACK
- 8) METAL-FACED CANTILEVERED BALCONY FRAMES - SHERWIN WILLIAMS 86 1317 "HIGH REFLECTIVE WHITE"
- 9) METAL RAILING - BLACK
- 10) GARAGE DOOR - SHERWIN WILLIAMS 86 1317 "HIGH REFLECTIVE WHITE"
- 11) METAL-FACED CANTILEVERED ENTRY CANOPY - SHERWIN WILLIAMS 86 1317 "HIGH REFLECTIVE WHITE"
- 12) OPEN METAL GRILLE AT STAIR - BLACK
- 13) METAL-FACED ROOF OVERHANG AT ENTRY - SHERWIN WILLIAMS 86 1317 "HIGH REFLECTIVE WHITE"
- 14) MECHANICAL VENT



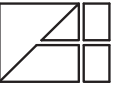
**SIDE ELEVATION BUILDING 300**  
SCALE: 1/8" = 1'-0"



**REAR ELEVATION BUILDING 300**  
SCALE: 1/8" = 1'-0"



**FRONT ELEVATION BUILDING 300**  
SCALE: 1/8" = 1'-0"



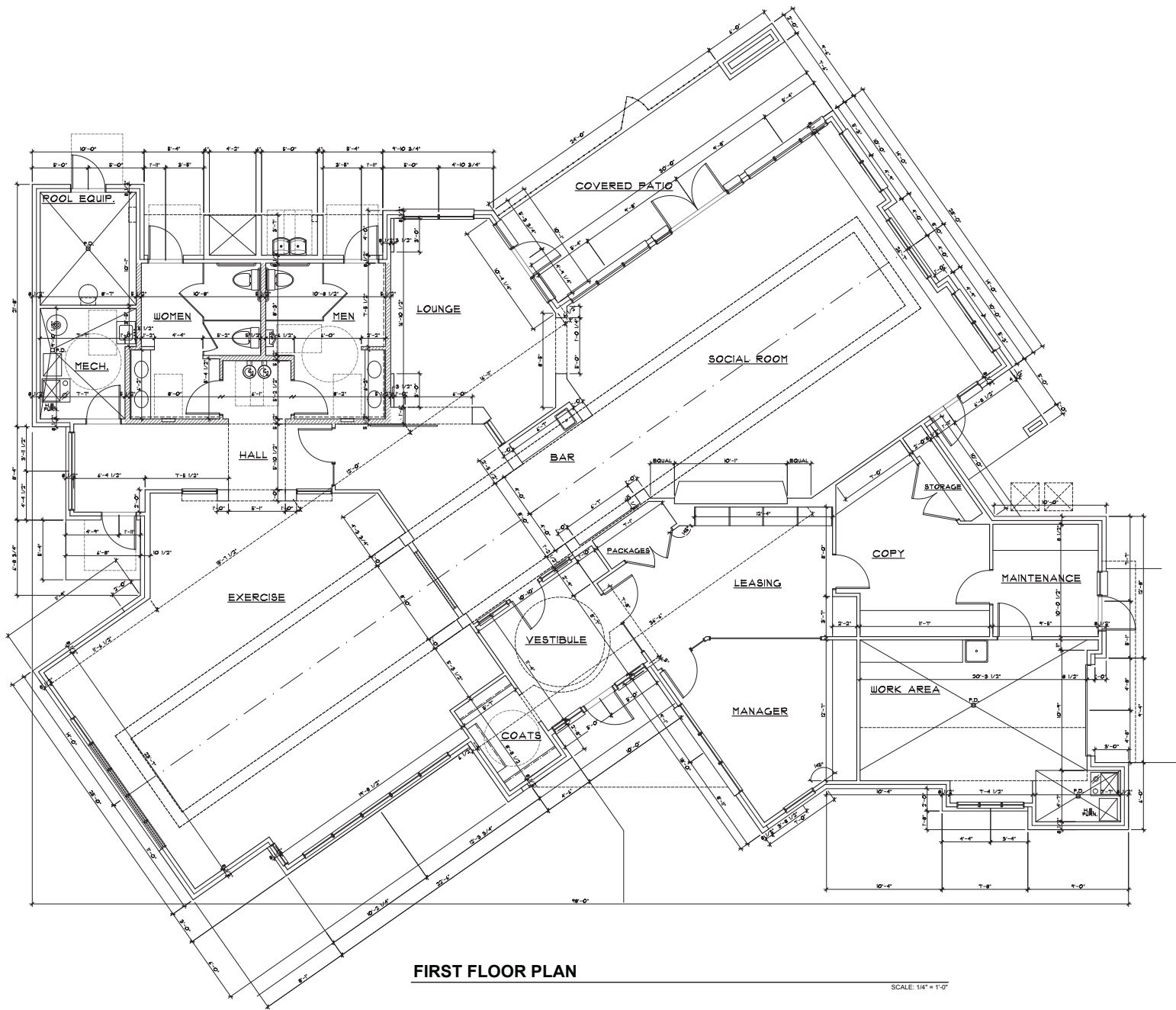
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Bloomfield Hills, MI 48302  
248-334-5000

NOVAPLEX  
ELEVATIONS - BLDG. 300  
TOWNHOUSES

NOVAPLEX  
BEZTAK PROPERTIES  
NOVI, MICHIGAN

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<input type="checkbox"/> BIDS <input type="checkbox"/> PERMITS <input type="checkbox"/> CONSTRUCTION	REVISIONS

DRAWN BY: J. ABM CAD FILENAME: BEZTAK-NOV... CHECKED BY:	DATE: 1909
SHEET NUMBER: AB	SHEET NUMBER:



**FIRST FLOOR PLAN**

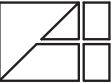
SCALE: 1/4" = 1'-0"

ALL INTERIOR PARTITION DIMENSIONS ARE  
2 1/2" UNLESS NOTED OTHERWISE.

BEFORE CONSTRUCTION OBTAIN WINDOW  
DOOR ROUGH OPENING SIZES FROM  
INDOOR/DOOR SUPPLIER.

DO NOT SCALE THESE DRAWINGS. USE  
CALCULATED DIMENSIONS. IF VARIATIONS  
OCCUR CONTACT ARCHITECT.

ALL METAL THRESHOLDS TO BE ADA  
COMPLIANT.



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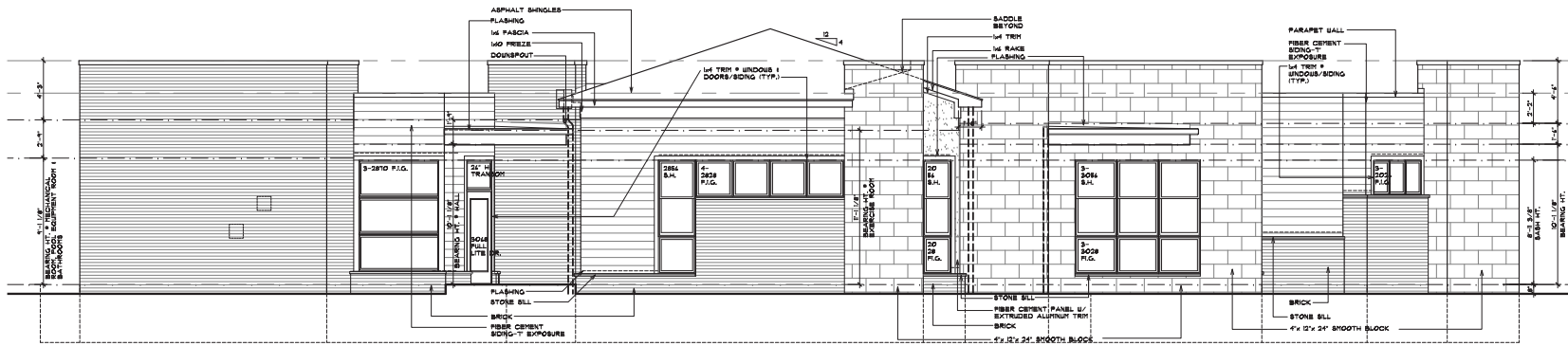
FIRST FLOOR PLAN  
PRELIMINARY

NOVAPLEX  
BEZTAK PROPERTIES  
COMMUNITY BUILDING  
NOVI, MICHIGAN

DATE: 07-24-19  
REVISIONS:

DRAWN BY: ARM  
CAD FILENAME:  
CHECKED BY:  
DATE: 1909  
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AG

NOTE TO BUILDING OFFICIAL: THIS DRAWING IS NOT VALID UNLESS THE SIGNATURE AND SEAL ARE IN BLUE INK.



503 LEFT SIDE ELEVATION

**OVERHANGS/DRAINAGE**  
 PROVIDE GUTTERS & DOWNSPOUTS FOR OVERHANGS OF ROOF & REAR DOWNSPOUTS ARE TO BE CONNECTED TO THE STORM WATER SYSTEM.  
 UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE 6" FROM FINISH. RAKE DIMENSIONS ARE 4".

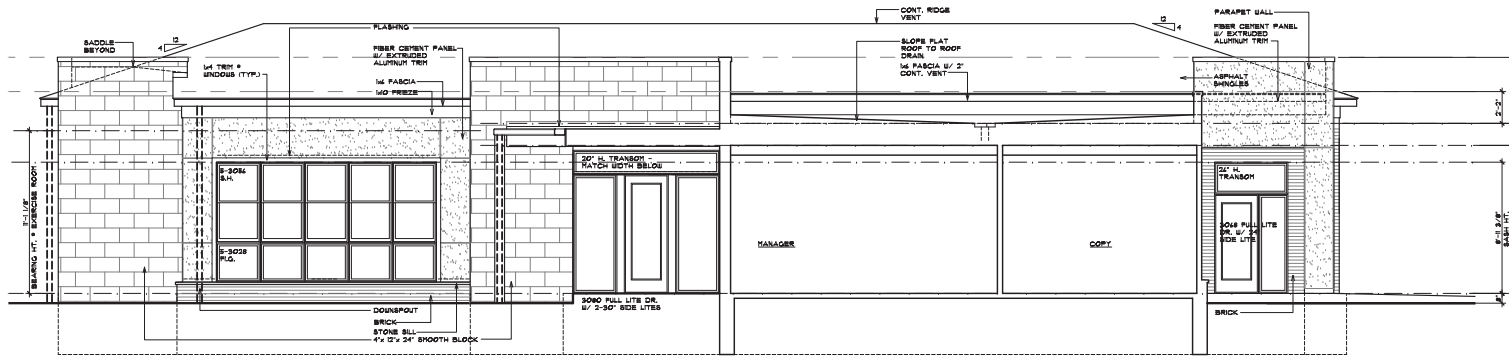
**WINDOW DESIGNATION**  
 GENERAL REFERENCE FOR WINDOW COORDINATION: SEE ARCHITECT'S SPECIFICATIONS FOR WINDOW COORDINATION, FINISHES & REQUIREMENTS.

ALL INTERIOR PARTITION DIMENSIONS ARE 3/4" UNLESS NOTED OTHERWISE.

BEFORE CONSTRUCTION OBTAIN ENDS OF DOOR ROUGH OPENING SIZES FROM ENDS/DOOR SUPPLIER.

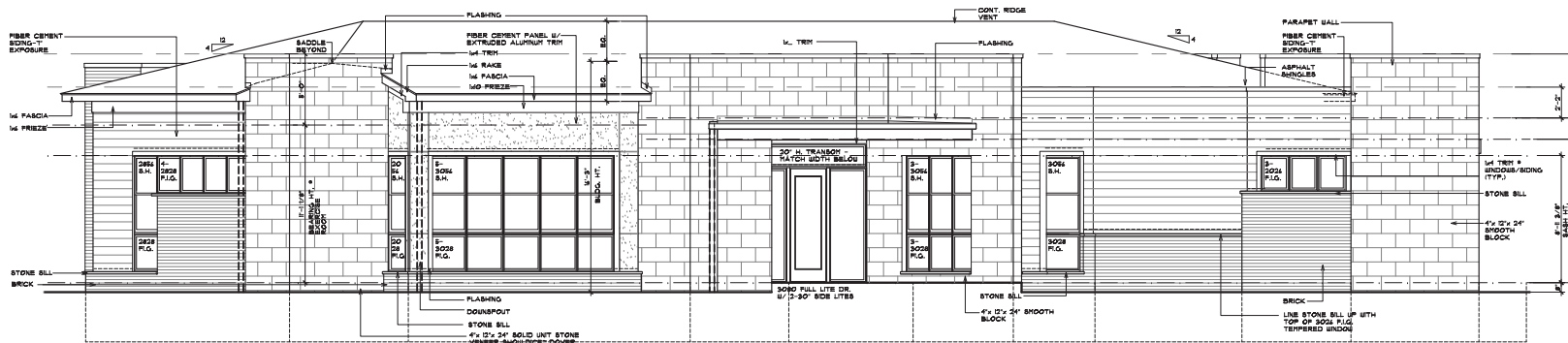
DO NOT SCALE THESE DRAWINGS. USE CALCULATED DIMENSIONS. IF VARIATIONS OCCUR CONTACT ARCHITECT.

ALL FIG. AT FLOOR LEVELS WILL BE TIPPED SAFETY GLASS.



502 FRONT ELEVATION

SCALE: 1/4" = 1'-0"



501 FRONT ELEVATION

SCALE: 1/4" = 1'-0"

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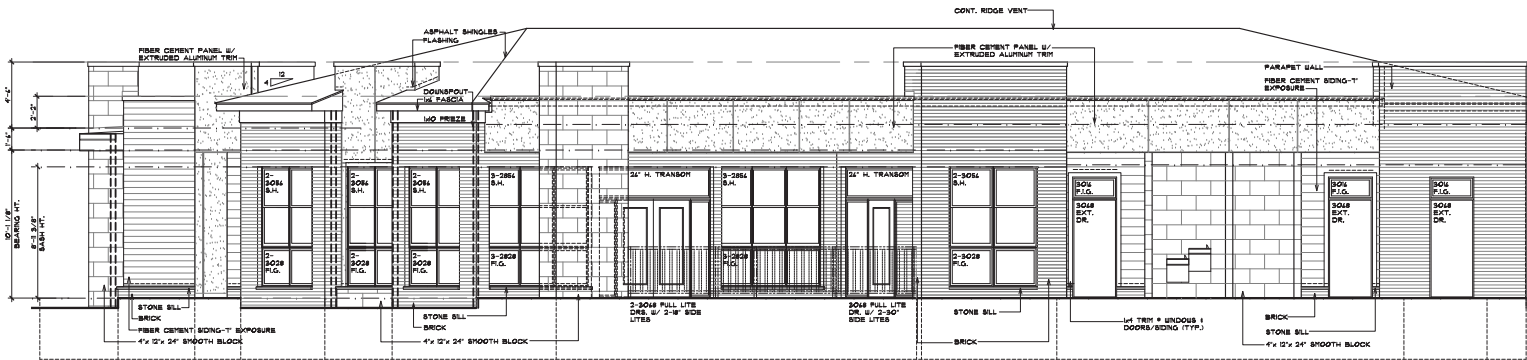
NOVAPLEX BEZTAK PROPERTIES COMMUNITY BUILDING NOV., MICHIGAN  
 ELEVATIONS  
 PRELIMINARY

NOVAPLEX BEZTAK PROPERTIES COMMUNITY BUILDING NOV., MICHIGAN

DATE: 07-24-19  
 PRELIMINARY  
 BEGS  
 PERMITS  
 CONSTRUCTION

REVISIONS

DRAWN BY: ARM  
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 A10



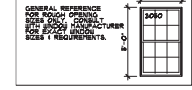
603 REAR ELEVATION

SCALE: 1/4" = 1'-0"

**OVERHANGS/DRAINAGE**

PROVIDE GUTTERS & DOWNSPOUTS FOR DRAINAGE OF ROOF. THE DOWNSPOUTS ARE TO BE CONNECTED TO THE STORM WATER SYSTEM.  
UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE 6" FROM FINISH. MAKE OVERHANGS ARE 4".

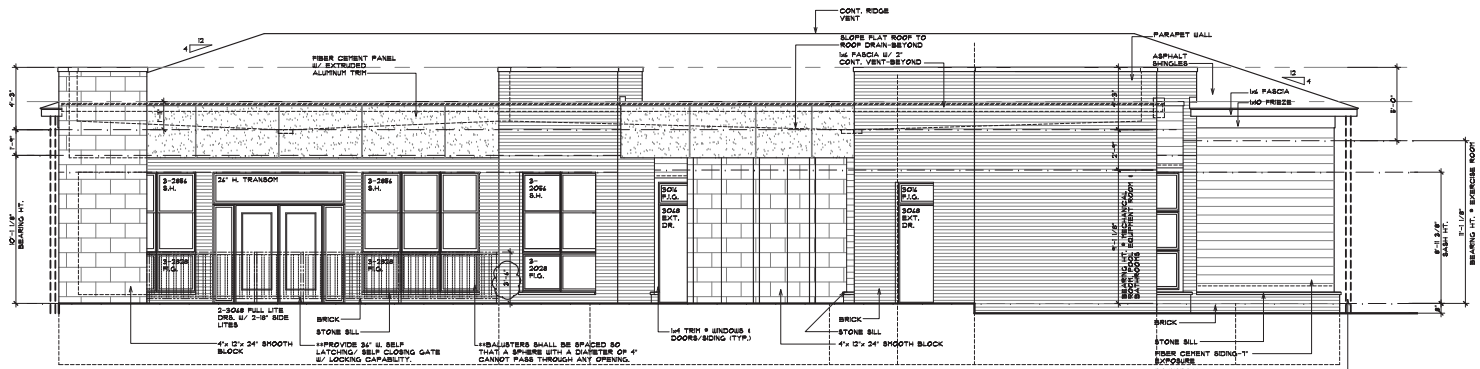
**WINDOW DESIGNATION**



GENERAL REFERENCE FOR WINDOW CONSTRUCTION SHALL BE THE WINDOW SCHEDULE IN THE SPECIFICATIONS FOR CONSTRUCTION. REFER TO THE SPECIFICATIONS FOR WINDOW CONSTRUCTION FOR ALL REQUIREMENTS.  
ALL INTERIOR PARTITION DIMENSIONS ARE 3/4" UNLESS NOTED OTHERWISE.  
BEFORE CONSTRUCTION, OBTAIN ENDS OF DOOR ROUGH OPENING SIZES FROM ENDORS/DOOR SUPPLIER.

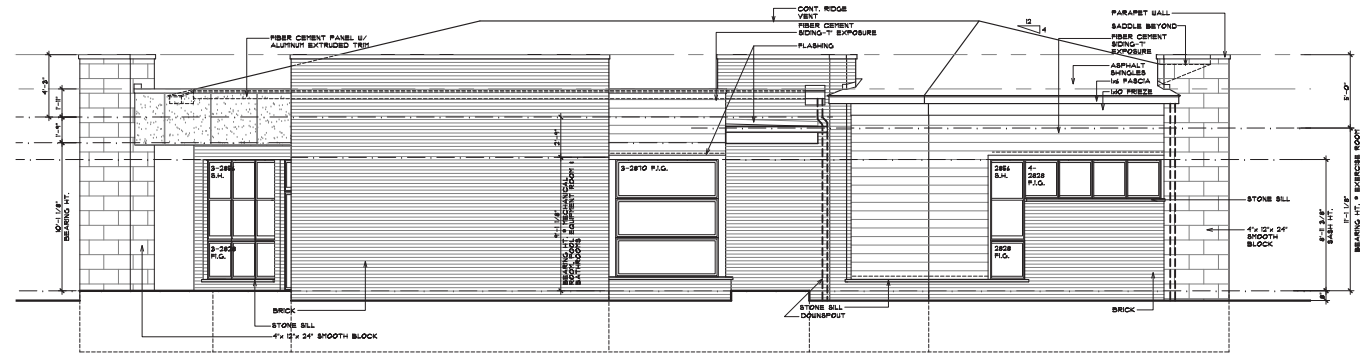
DO NOT SCALE THESE DRAWINGS. USE CALCULATED DIMENSIONS. IF VARIATIONS OCCUR CONTACT ARCHITECT.

ALL FLOOR AT FLOOR LEVELS WILL BE TYPED SAFETY GLASS.



602 REAR ELEVATION

SCALE: 1/4" = 1'-0"



601 LEFT SIDE ELEVATION

SCALE: 1/4" = 1'-0"

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 NOVAPLEX BEZTAK PROPERTIES COMMUNITY BUILDING NOV., MICHIGAN  
 ELEVATIONS PRELIMINARY  
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 □ PERMITS  
 □ CONSTRUCTION  
 REVISIONS:  
 DRAWN BY: AVM  
 CAD FILENAME:  
 CHECKED BY:  
 DATE: 1909  
 SHEET NUMBER: A11





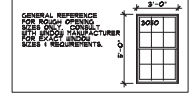
703 BUILDING SECTION

SCALE: 1/4" = 1'-0"

OVERHANGS/DRAINAGE

PROVIDE CUTTERS & DOWNSPOUTS FOR OVERHANGS OF ROOF. ALL DOWNSPOUTS ARE TO BE CONNECTED TO THE STORM DRAINAGE SYSTEM.  
UNLESS NOTED OTHERWISE OVERHANG DIMENSIONS ARE # FROM FINISH. BASE DIMENSIONS ARE 1/2"

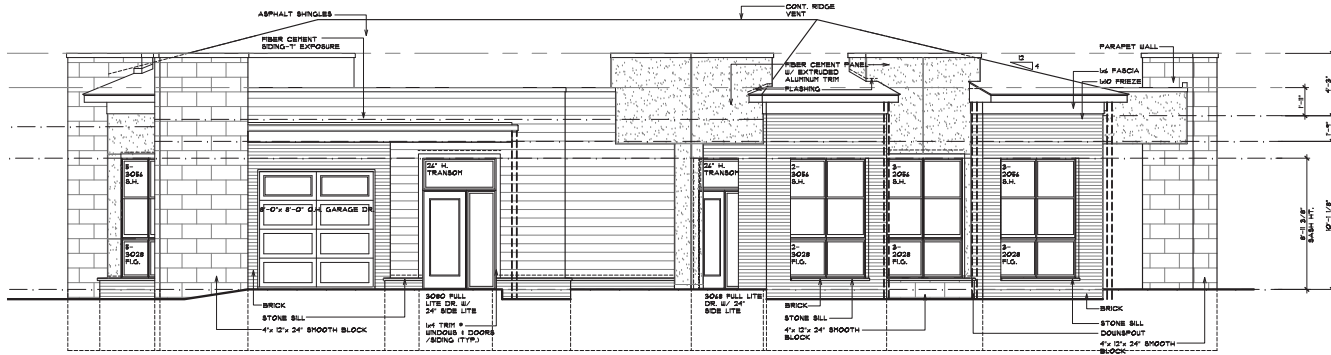
WINDOW DESIGNATION



ALL INTERIOR PARTITION DIMENSIONS ARE 3/4" UNLESS NOTED OTHERWISE.

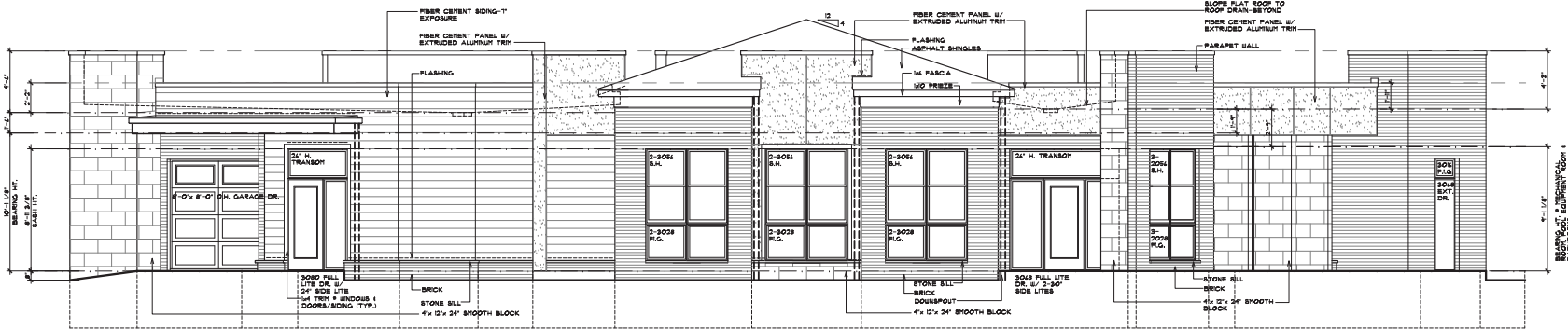
BEFORE CONSTRUCTION OBTAIN SIZES FROM WINDOW/DOOR SUPPLIER.  
DO NOT SCALE THESE DRAWINGS. USE CALCULATED DIMENSIONS. IF VARIATIONS OCCUR CONTACT ARCHITECT.

ALL FIG. AT FLOOR LEVEL UNLESS NOTED OTHERWISE.  
ALL FIG. AT FLOOR LEVEL WILL BE TYPED SAFETY GLASS.



702 RIGHT SIDE ELEVATION

SCALE: 1/4" = 1'-0"

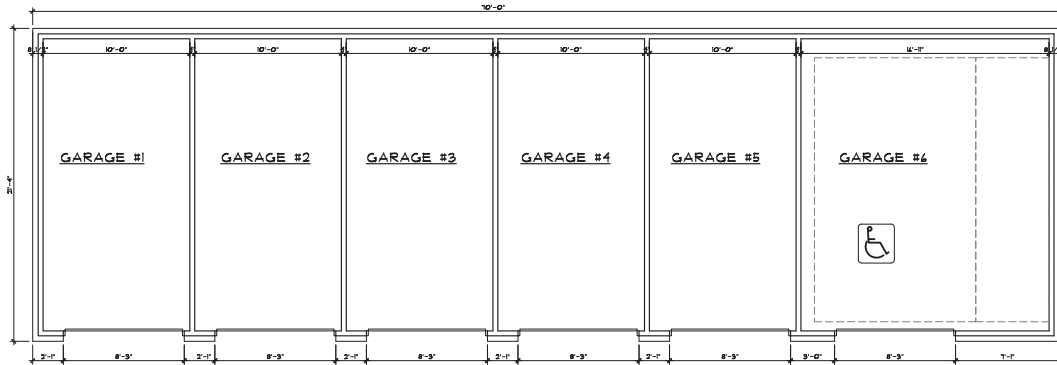


701 RIGHT SIDE ELEVATION

SCALE: 1/4" = 1'-0"

NOTE TO BUILDING OFFICIAL: THIS DRAWING IS NOT VALID UNLESS THE SIGNATURE AND SEAL ARE IN BLUE INK.

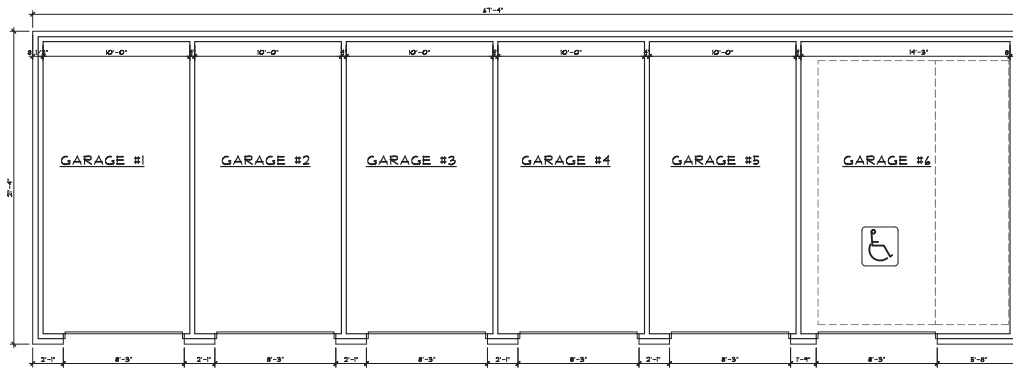
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 2445 Franklin Road  
 Bloomfield Hills, MI 48302  
 248 • 334 • 5000  
 NOVAPLEX BEZTAK PROPERTIES COMMUNITY BUILDING  
 NOV., MICHIGAN  
 PRELIMINARY  
 NOVEMBER 2019  
 ARCHITECT: ALEXANDER V. BOGAERTS  
 PROJECT: NOVAPLEX BEZTAK PROPERTIES COMMUNITY BUILDING  
 SHEET: 701, 702, 703  
 DATE: 11/20/19  
 SCALE: AS SHOWN  
 DRAWN BY: AVM  
 CHECKED BY: AVM  
 DATE: 11/20/19  
 SHEET NUMBER: 701, 702, 703  
 A10



**FIRST FLOOR PLAN**

(1) GARAGE BUILDING WITH (1) VAN ACCESSIBLE SPACE

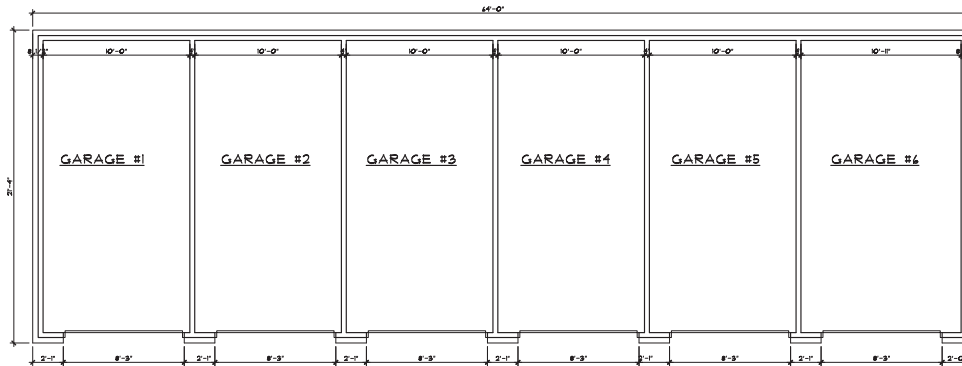
SCALE: 1/4" = 1'-0"



**FIRST FLOOR PLAN**

(2) GARAGE BUILDINGS WITH (1) ACCESSIBLE SPACE

SCALE: 1/4" = 1'-0"



**FIRST FLOOR PLAN**

SCALE: 1/4" = 1'-0"

NOTE TO BUILDING OFFICIAL: THIS DRAWING IS NOT VALID UNLESS THE SIGNATURE AND SEAL ARE IN BLUE INK.

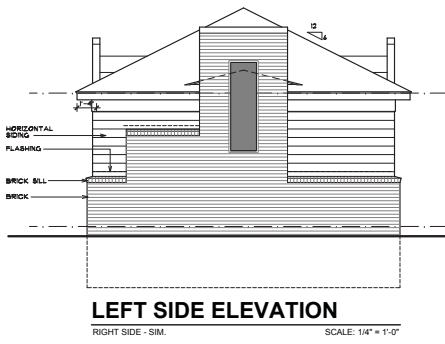
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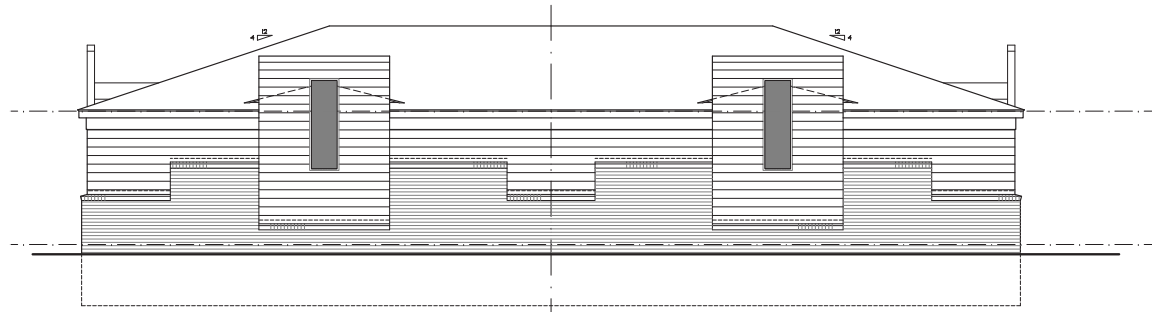
NOVAPLEX BEZTAK PROPERTIES DETACHED GARAGES NOV, MICHIGAN

FLOOR PLANS PRELIMINARY

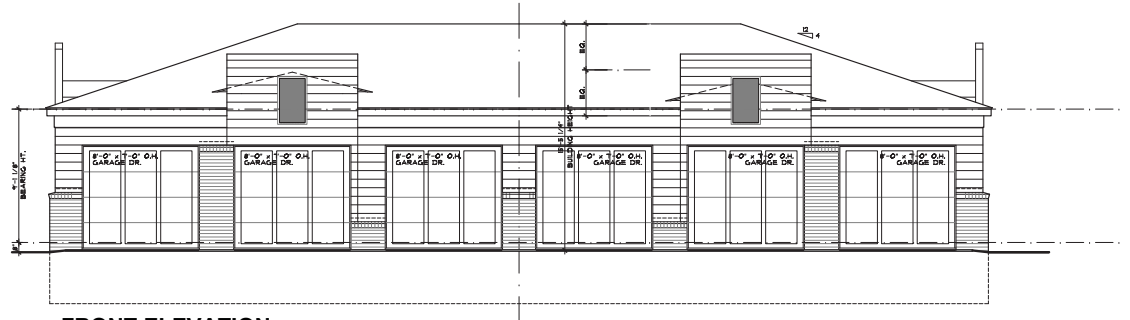
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PRELIMINARY  
07-24-19  
DESIGNED BY  
DATE  
1909  
SHEET NUMBER  
**A13**



**LEFT SIDE ELEVATION**  
RIGHT SIDE - SIM. SCALE: 1/4" = 1'-0"



**REAR ELEVATION** SCALE: 1/4" = 1'-0"



**FRONT ELEVATION** SCALE: 1/4" = 1'-0"



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PROJECT TITLE  
**ELEVATIONS**  
STANDARD 4-CAR GARAGE  
PRELIMINARY

CLIENT PROJECT  
**NOVAPLEX  
BEZTAK PROPERTIES  
DETACHED GARAGES**  
NOVI, MICHIGAN

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DATE  
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DATE  
SHEET NUMBER  
**A14**

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**COMMUNITY IMPACT STATEMENT**

LAW OFFICES  
**LANDRY, MAZZEO & DEMBINSKI, P.C.**  
37000 GRAND RIVER AVENUE SUITE 200  
FARMINGTON HILLS, MICHIGAN 48335  
[www.lmdlaw.com](http://www.lmdlaw.com)

TELEPHONE  
(248) 476-6900

FACSIMILE  
(248) 476-6564

D.B. LANDRY  
[dlandry@lmdlaw.com](mailto:dlandry@lmdlaw.com)

July 25, 2019

Ms. Barb McBeth, AICP, City Planner  
City of Novi  
47175 Ten Mile Rd.  
Novi, MI 48375

Re: Application for Rezoning With Planned Rezoning Overlay Agreement  
JSP 17-509 NOVAPLEX PRO

Dear Ms. McBeth:

Attached is an Application for Rezoning With Planned Rezoning Overlay Agreement, a Concept Plan and a detailed narrative by Carmine Avantini, AICP. The narrative provides a detailed explanation of the rezoning request regarding this property which has remained vacant for over two decades despite active efforts by Beztak to market the property as zoned.

The attached narrative discusses in detail the site constraints which make this property uniquely unmarketable as zoned and more appropriate for the proposed RM-2 rezoning with PRO. The benefits with the proposed use are detailed along with market studies and testimonials from adjacent OST landowner/occupant substantiating those benefits.

The applicant requests rezoning to RM-2 with a PRO. The proposed use and concept plan guarantees the City that many of the principal permitted uses of the RM-2 District would be eliminated i.e. congregate facilities, elderly housing, farm and green houses, outdoor recreation facilities, cemeteries, home occupations, keeping of horses and family daycare homes. The proposed use of the property, rezoned with PRO, would be limited to the high-density residential use.

The key to understanding the benefit of the proposed use, as opposed to the other principal permitted uses of the RM-2 District, is that the limited proposed use in fact *integrates* this property with the surrounding OST uses. The proposed use is in fact *consistent* with and *enhances* the adjacent OST uses, in contrast the other principal permitted uses in the RM-2 area cannot integrate with the surrounding OST uses.

The accompanying narrative includes great support from Mr. Matt Sosin of the Haggerty Corridor Corporate Park and Mr. E. Brook Matthews of Harmon Company. This

July 26, 2019

Page 2

OST owner/manager and tenant testify that the availability of residential apartments that are walkable and bikeable to the Haggerty Corridor Corporate Park enhances the success of the Corporate Park and the business tenants by allowing those tenants to recruit highly trained employees that want to walk and bicycle to work.

Indeed, the City of Novi's Master Plan For Land Use includes the following Objectives:

- Provide a wide range of housing options
- Encourages housing in walkable proximity to employment centers
- Continue to strive towards making the City of Novi 'bikeable' and a more 'walkable' community
- Encourage developments that reduce the number of vehicle trips on local thoroughfares.

The proposed rezoning achieves the above objectives. In reviewing the City of Novi's Zoning Map it becomes readily apparent that in the area surrounding the Haggerty Corridor Corporate Park, East of M-5 between 14 Mile Road to the North and I-696 to the South, there are no residential areas zoned. The proposed project fulfills that need.

The applicant has presented a Concept Plan that is not only integrated with the adjacent uses but provides a residential use which is well under the maximum density requirement. Thus, the concept plan achieves the City's goals in the most efficient manner.

In keeping within the Michigan Zoning Enabling Act, MCL 125.3405 and the City of Novi Zoning Ordinance the applicant is voluntarily offering to fill in missing "gaps" with sidewalk along Haggerty Road as a special public benefit consistent with the City's Master Plan Objectives to create housing within walkable and bikeable distances to nearby high-tech employment centers.

In the end, this project not only enhances the parcel of property on which it sits (which has been vacant for over 20 years) but more importantly, this project enhances the continual success of the nearby OST properties by enabling those employers to attract top quality employees. The City of Novi has been very proud of its OST developments and the City has always taken measures to attempt to secure the continued success of every OST business it has attracted to Novi. Indeed, the City desires long term business residents. The proposed rezoning with PRO Overlay is one way for the City to take another step toward ensuring the future success of nearby OST properties.

**LANDRY, MAZZEO & DEMBINSKI, P.C.**

July 26, 2019

Page 3

We look forward to progressing through the rezoning process with the City Administration, the Planning Commission and the City Council.

Very truly yours,

/s/ David B. Landry

David B. Landry

DBL/ek

BC Novaplex L.L.C.  
31731 Northwestern Highway, Suite 250W  
Farmington Hills, MI 48334  
(248) 855-5400

July 25, 2019

City of Novi Community Development Dept.  
City of Novi Planning Division  
45175 W. 10 Mile Rd.  
Novi, MI 48375

***RE: Application for Site Plan and Land Use Approval***

Dear Sir/Madam:

Please be advised that Mark Highlen is authorized to submit and sign any related documents for the application for site plan and land use approval for the above referenced entity regarding Novaplex.

Very truly yours,

BC Novaplex L.L.C.

By: Oakland Management Corp.  
Its: Manager

By: 

Samuel Beznos, President

(248) 737-6110  
sbeznos@beztak.com

SB:bmc



# **Community Impacts and Project Benefits for the proposed Novaplex Residential Development**

Prepared July 10, 2019 for the  
Planning Commission and City Council  
of the City of Novi

## **Index of Information**

1. Community Impact Topics
  - Employment / Housing
  - Environmental Features, Impacts and Mitigation
  - Utility Impacts
  - Public Safety
  - Social Impacts
2. Summary of Project Benefits
3. Conclusion

# 1. Community Impact Topics

## **Providing housing in the OST District will benefit employees, businesses and the City**

(Text in blue are excerpts copied from the cited source)

Many companies are looking at more than just financial and logistical concerns when considering where to expand or relocate their offices. An article titled “6 Things Leaders Should Consider When Relocating Their Firm’s Offices”, published January 19, 2017 By Lauren Dixon, Associate Editor *for* Talent Economy notes that “... Many companies in recent years have opted to relocate their headquarters back into the city, as more workers express interest in urban living. In 2014, Nielsen’s data shows that U.S. city growth outpaced other areas for the first time since the 1920s” and goes on the state “Increasingly, labor and considerations around talent are really what’s driving real estate decisions these days for all types of different operations,” said Mark Seeley, senior vice president of the labor analytics team at CBRE Group Inc., a commercial real estate company based in Los Angeles. Companies are being much more thoughtful than in the past about locations and how that can enable their ability to acquire talent. “Market conditions are forcing companies to be much more strategic,” Seeley said. “They can’t just assume that if they’re a large company with a great brand, they can just plop a building anywhere and they’re going to be able to get the applicant pools that they need.”

Of the 6 considerations for leaders when relocating, 2 speak directly to idea that companies can benefit when they consider conveniences for their employees.

4. Examine trends around the employee lifecycle. “...There’s an entire lifecycle of workforce that people need to be thinking about as they’re being strategic about where they locate”. Although younger generations tend to move to major cities, they might migrate to the suburbs if they chose to start families later on. Seeley advised leaders to think more holistically about all generations in the talent pool.

5. Convenience is a differentiator. Employees in some competitive sectors have the ability to be picky when choosing employers, Seeley said. And for some, their choice isn’t only about the amount on their paycheck; it’s more about the company’s environment and location. Amenities available in and around the office building — cafes, gyms, etc. — are part of this consideration.

In an article titled “Facebook’s Employee Community Solves Relocation Housing Issues” posted by Mike Armstrong on Oct 9, 2013, Mr. Armstrong notes “One of the trickiest parts of moving to a new city for work is finding a home. It’s hard enough moving to an area that you’re familiar with...”. “A large number of transferees and new employees end up searching for housing options in places they’ve never even been, and a blind relocation is stressful and often results in housing that leaves something to be desired. Facebook recently announced a plan that could alleviate the issue altogether. Facebook is planning a housing community ...which will be strictly used by their employees. This is a definite perk in many ways for Facebook’s employees. The idea is to free up employee time and add convenience to their lives, which usually translates to more productivity.”

There are many more articles and studies that reach the same conclusion: The benefits of housing very near work are many. A 25 minute one-way commute (average per SEMCOG) = 208 hrs/person/ year.

- The time saved could go towards more important things like family, hobbies or sleep.
- Living close to work makes an active commute (biking/walking) possible most days.
- Employees can go home during their lunch break to take care of chores, let the dog out, or visit their young kids.

Fewer long-distance commuters means fewer miles driven

- Less wear-and-tear on roadways
- Less gasoline used
- Less pollution

Shorter commutes result in less stress and more worker productivity

Many companies recognize the impacts of commutes on employees and productivity, and they have programs or stipends to encourage living near work. Facebook and Harley Davidson are a couple of the better-known ones. Compuware, Marketing Associates and Strategic Staffing Solutions are local companies that offer incentives for employees to live near their offices in Downtown Detroit. Even without employer participation, employees recognize the benefits of living near work. When we broke ground on our apartment project Five Points of Auburn Hills, one of our first calls was from a professor working across the street at Oakland University.

By allowing certain service-related uses in the OST district, Novi has already taken a significant step towards attracting new companies and retaining current ones, recognizing that employee convenience is of growing importance to businesses. Allowing for well-designed multi-family housing within appropriate areas of the OST District will help further promote Novi's reputation as a business-friendly community that cares for residents and employees, and allows for growth in an environmentally responsible manner.

### **Employment - Construction**

**OST** – Calculating the number of construction jobs needed to complete a OST project like this is difficult because so many factors can impact the number of workers employed. It is our best estimate that developing the site plus approximately 4 padsites and buildings over the course of about 3 - 5 years (if market demand increases substantially) will generate maybe 250 to 300 hundred construction jobs.

**Apartments** – It is also difficult to calculating the number of construction jobs needed to complete a Residential project like this, but it is safe to say that 1) the entire project will be completed is a shorter timeframe, and 2) there is much more work that goes into apartment construction (more walls, more doors, more bathrooms/plumbing, more cabinets, etc.). It is our best estimate that developing 10 apartment buildings and a clubhouse over the course of about 2 years will generate a maybe 350 – 450 construction jobs.

### **Employment – Daytime Operational**

**OST** – In our experience, the research/office buildings could be home for between 4 and 15 companies, with 100 to 150 permanent employees.

**Apartments** - Once completed, the apartments will employ approximately 10 permanent operations and maintenance staff, plus weekly work for a grounds/landscape maintenance company and monthly apartment refurbishing work (cleaning, paint and carpet) once the tenant turnover cycle begins.

## **Permanent Population**

**Apartments** - From an infrastructure design standpoint, the estimated apartment population would be 3.2 persons per unit x 336 units x 0.6 apartment (residential equivalency unit) = 645 residents. In our experience, the apartments will be home for anywhere from 460 to 590 residents.

**OST** – With the exception of a potential multi-shift business or security guards, we do not anticipate a significant nighttime population

## **Opportunity Cost**

### **Increase in Residential Use -**

We anticipate 336 residential units will be developed on this 22 acre site (21.03 ac. net). People spend where they live. Providing opportunities for business growth/jobs is good, but without nearby housing opportunities, employees leave the area with their salaries. People tend to spend where they live. More housing in Novi helps keep the income in the city.

### **Decrease in OST Use -**

This site is 22 acres (21.03 ac. net). There is about 900 acres of OST land, with about 590 acres of vacant / underdeveloped OST parcels in addition to this site. It could take several decades to fully develop the remaining vacant / underdeveloped OST land. The proposed change to a multi-family use represents less than 4% of the remaining developable acreage.

It is better to approve a zoning change that allows development of a complimentary Use on this single piece of OST land, and also supports the existing and future OST property in the area. Why lose tax dollars from a developed property plus the benefits of new Novi Residents and their wages, to hold to the “potential” of this single piece of land for years or decades.

## **Environmental Features, Impacts and Mitigation**

**Topography** - The site slopes upward 35' along the n'ly property line, from an elevation of 907 at the Haggerty Road r.o.w. to 942 at the northwest property corner; and it slopes upward 24' along the s'ly property line, from an elevation of 914 at the Haggerty Road r.o.w. to 938 at near the southwest property corner. The slope of the property makes it difficult to develop large-footprint buildings. Smaller building footprints allow for more grading flexibility, but small building footprints don't work well for demisable research office buildings. By using apartment buildings with smaller footprints, there is much more opportunity for grading flexibility, resulting in less total earthwork.

**Woodlands** - The property is a historically disturbed, but vacant site. There is a regulated woodland along the west property line, with the remainder of the site an open field. Some of the woodland has small pockets of wetland with the remainder being an upland mix of trees. Overall, the woodlot is in fair to good condition. Adjacent properties also contain regulated woodlands contiguous with the woodland on the Novaplex property. The proposed development will impact the easterly edge of the woodland anywhere from 50' on the southerly edge of the westerly treeline to 200 feet on the northerly end of the westerly treeline. The limit of disturbance for tree removal will be approximately 20 feet from the edge of proposed buildings and approximately 10 feet from paved surfaces. This disturbance is necessary for the physical construction of the proposed improvements. As the site plan is further refined, efforts

will be made to try and reduce the number of tree removals. All regulated trees which are removed for development will be replaced per the City's tree replacement ordinance. In the event that one or more trees cannot be replaced onsite, the appropriate fee will be paid into the City's Tree Fund. A tree mitigation plan will be prepared to demonstrate which trees are tagged for removal and the replacement location, amount and type. These mitigation trees will not count towards other landscaping requirements according to Section 2509.

**Habitat** – A Wildlife Corridor will be designated onsite and protected for the benefit of the community. Wildlife Corridors (definition adopted from State of Florida) “are tracts of land or habitat that are linked and allow wildlife to travel from one location to another to find food, shelter, a mate, ...”. Based upon this definition, Novaplex will provide a minimum 150 foot wide wildlife corridor across its westerly end for wildlife movement, sheltering and food gathering. In conjunction with the ITC corridor adjacent to the west, the resulting wildlife corridor will be approximately 250 feet wide. This corridor will continue to serve as habitat and provide the link to the woodlands north and south of the property. It must be noted that although this woodland serves as a wildlife corridor for the micro/ local community, a larger macro view shows that M-5, Twelve Mile and Thirteen Mile Roads, Cabot Drive, Lewis Drive, Geneva Drive plus numerous existing developments impede on connecting this isolated piece of property from a larger framework.

**Wetlands** - Based upon PEA's wetland delineation and site observations on April 11 and May 11, 2017, wetlands exist on the subject property. A total of 5 wetlands were flagged on the site. About half the wetlands are forested with the remaining wetlands occurring in the open field/emergent. The wetlands are very typical for urban areas. They exhibit poor to fair quality and provide minimal plant diversity. Common plants include silver maple, reed canary grass, cattail, redtwig dogwood and black willow. These 5 small pockets of wetland do not provide any significant amount of storm water storage. They do not provide any notable wildlife habitat and do not recharge any aquifers. One of them exists because a neighboring development discharges their concentrated storm water runoff onto this site, and the road ditch that ultimately accepts the runoff is very poorly drained. These small pockets of wetland are not essential to the preservation of the natural resources of the city. These 5 small pockets of wetland are regulated only because they are within 500' of an inland lake, pond, river, or stream, as defined by in the Wetlands Protection Act. The small wetlands in the woodlot/wildlife corridor will be preserved.

## Utility Impacts

**Water Main** - Based on previous surveys and conversations with the City Engineering Department, there is Public Water Main available to this site, located within the Haggerty Road right-of-way at the southeast corner of the site and in the adjacent Magna property to the north. The public water system is designed considering the development of this area, and it has sufficient capacity for the proposed uses with no impact to the surrounding developments. (see the attached dimensional site plan for utility demand calculations)

**Sanitary Sewer** – Based on previous surveys and conversations with the City Engineering Department, there is Public Sanitary Sewer available to this site, located within the Haggerty Road right-of-way. The public sanitary system is designed considering the development of this area, and it has sufficient capacity for the proposed uses with no impact to the surrounding developments. (see the attached dimensional site plan for utility demand calculations)

**Storm Water Management** - The storm water management system for this site will conform to City requirements to detain a 100-year storm event onsite. Storm water management will be provided by constructing vegetated swales where possible, plus sedimentation and detention ponds which discharge into the Haggerty Road right-of-way ditch at the northeast corner of the site. The adjacent medical building development to the south currently outlets its storm runoff onto this site. Novaplex will include this offsite runoff in its storm water management system design and maintain the flow as pass-through drainage.

## Public Safety

Novi's population is around 59,395 per the Census Update page on the City's website. The proposed 336 apartments will likely add up to 590 residents to the population. That is a 0.99% increase.

**Fire / EMS Responses** (yearly) – This development will add about 590 residents to the population of Novi. These new residents will add a small amount to the number of Fire/EMS calls. In 2016, the Fire Department received 4426 service and medical emergency calls. For this development we would calculate an additional 42 calls per year, or under a 1 service/EMS call per week average. Because we expect the adult average age in this new development will skew younger than the adult average age in the City, we anticipate even fewer calls than calculated.

**Police Responses** (yearly) – This development will add approximately 590 residents to the population of Novi. These new residents will add an equally small amount to the number of Police calls. In 2016, the Police Department responded to 2146 calls for criminal activity. Our 322 apartment units would result in about 22 additional calls per year, or just under 2 calls per month. Given the type of residents likely to live here, we would anticipate fewer calls than that. Our research also showed that Farmington Hills Police responded to 54 calls from our nearby Citation Club Apartments (northeast corner of Haggerty and 13 Mile Roads). Citation Club contains 600 apartments and would likely have a similar demographic to this proposed development.  $54 \text{ calls} / 600 \text{ units} = 0.09 \text{ calls/unit/year}$ , which translate to about 29 police calls per year for a 322 unit complex, or 0.55 calls per week, or 2.2 calls per month.

## Social Impacts

Lights –

- Lighting levels will meet or be less than allowed by ordinance
- Building lighting is architecturally integrated with the building style, material, and color.
- Building- and pole-mounted lighting will be shielded and directed downward.
- Light poles and fixtures for the apartment will be residential in scale

Noise -

- The adjacent properties are businesses with less sensitivity to noise.
- Apartments are occupied primarily from evening through early morning, and businesses from morning to early evening, so the uses generally won't disturb each other.
- Apartments generally generate less loud noises than office/research, and each use generates the majority of their noise during different hours.

### Safety -

- Apartment Staff will be onsite during normal office hours 7 days a week
- A staff member will be on-call for emergencies during off-hours
- Residents must pass a rigorous review including criminal and civil background checks
- Our residents expect a safe environment and don't generally tolerate troublemakers.

### Traffic –

- Site is near the intersection of Haggerty and 12 Mile Road, with quick access to M-5, I-275 and I-96/I-696.
- This is one of the best locations in the City to handle and disperse the traffic
- Office/Industrial developments generally have larger volumes of traffic
- Providing a residential Use in the area spreads traffic out, reducing the peak-time traffic.
- See attached Traffic Impact Study for traffic counts and recommended improvements.

### Schools -

- The general estimate is 0.15 to 0.18 children/unit in Apartments
- Our residents could include approx. 50-66 school-aged children for 336 units.
- Because of our target resident demographics, our properties usually have about 25% fewer children than the general estimate.
- New children are beneficial as school districts will experience shrinking enrollment and competition from private and charter schools.

**Many Impacts from this development are positive, and the other impacts are minimal and reasonably mitigated.**

## 2. Summary of Project Benefits

- Puts workers potentially closer to employment
  - Opportunity for corporate housing
  - Pedestrians = reduction in local traffic
  - Shorter drive to work may spread out peak traffic
- Provides residential density where its impacts are best mitigated
  - Near major roadway/freeway intersections to help disperse traffic.
  - Near employment to help minimize traffic
  - Impacts on roadways are lessened
  - Impacts from exhaust are lessened
- Provides potential students for local schools
- Provides high-quality residents for the City
- Minimal impacts on infrastructure
- Different hours of use/occupation
  - People at work when not at home
    - Offices provide some security when apartments empty
    - Apartments provide some security when offices empty.
  - Different times for peak infrastructure use so less concerns about capacity.
    - Water / Sanitary, Traffic, Electric
- Providing opportunities for business growth/jobs is good, but without nearby housing opportunities, employees leave the area with their salaries. More housing helps keep the income in the city.

- Many corporations seek out and relocate or expand into areas convenient for employees. They look for “everything in one area” for convenience of employees. These apartments will be a great complement to the area businesses, support high-income employment in the area and make a more productive, less disruptive use out of land.
  - Nearby shopping & services makes daily errands easier
  - Nearby housing reduces travel time
- Filling in a 430’ safety path gap south of the site and another 166’ gap north of the site, as well as constructing the safety path on the Novaplex site greatly improves walkability along Haggerty Road. Along with a small gap being completed by the development at the corner of 13 Mile Road, it completes the looped pathway system along Haggerty from 12 Mile to 13 Mile, and back south through the corporate park.
- Provides pedestrians/cyclists a pocket park seating area along the Haggerty Road safety path, about halfway between 12 Mile Road & 13 Mile Road
- Preserves a wildlife corridor between existing woodlots on adjacent sites
- Allows for existing businesses to thrive and expand, for new businesses to relocate to the area, and allow for some employees to relocate closer to work
- This project conforms to the Goals of the Master Plan

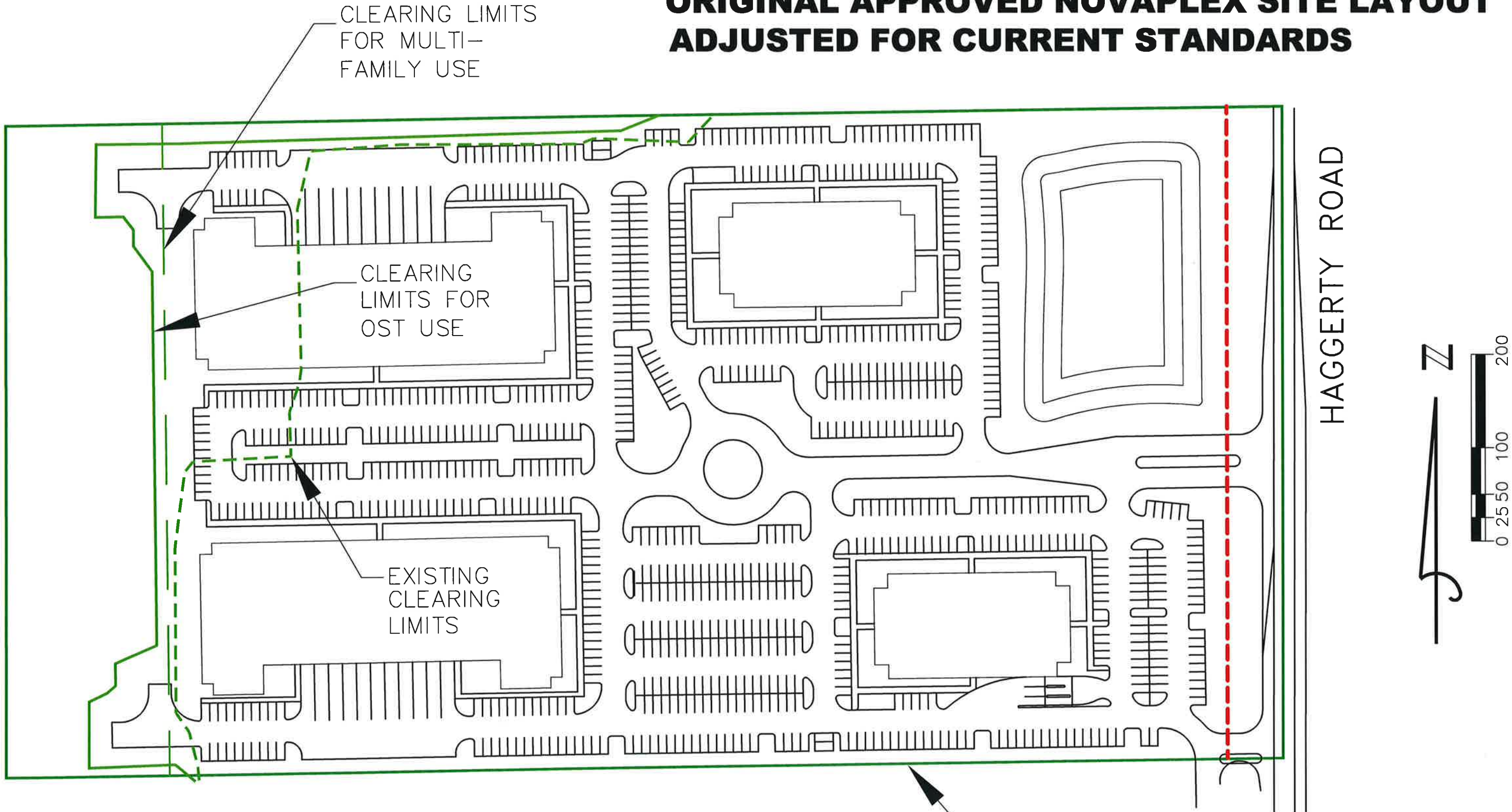
### **3. Conclusion**

This proposed Rezoning allows for development of an otherwise very difficult parcel to develop; Does not prevent future significant development of OST businesses on numerous other sites; Supports and enhances viability of existing and vacant OST parcels; Satisfies the Market Demand for multi-family residences in the area; Brings new residents and their income to the City; Supports schools and local businesses; Improves and Promotes walkability in the area; Reduced potential impacts on infrastructure; Protects a portion of existing woodlot for a wildlife corridor; and Meets the Goals of the Master Plan.

This proposed Rezoning with a PRO will greatly enhance the area to the benefit of neighbors, the local community and the City as a whole.



# COMPARISON OF NECESSARY DISRUPTION AREA ORIGINAL APPROVED NOVAPLEX SITE LAYOUT ADJUSTED FOR CURRENT STANDARDS



THE ADDITIONAL CLEARING LIMITS FOR THE PREVIOUSLY APPROVED OST USE UPDATED FOR CURRENT DESIGN STANDARDS (80,854 SF) IS VERY LARGER THAN THE ADDITIONAL CLEARING LIMITS FOR THE PROPOSD MULTI-FAMILY USE (68,341 SF)

PLEASE NOTE THAT THIS LAYOUT SHOW THE SAME 3 STORY OFFICE BUILDINGS NEAR THE FRONT OF THE SITE. NEWER TECH BUILDINGS TEND TO BE ON A SINGLE FLOOR, WHICH WOULD MEAN LARGER BUILDING FOOTPRINTS AND EVEN MORE SITE DISRUPTION

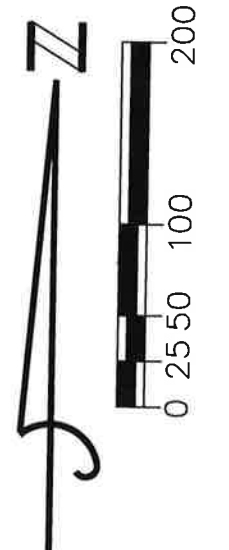
PROPERTY LINE

HAGGERTY ROAD

**BC NOVAPLEX LLC**  
 31731 NORTHWESTERN HWY., STE. 250W  
 FARMINGTON HILLS, MI 48334  
 CONTACT: MARK HIGHLEN  
 PH. 248-737-6175 / MHIGHLEN@BEZTAK.COM

# COMPARISON OF NECESSARY DISRUPTION AREA ORIGINAL APPROVED NOVAPLEX SITE LAYOUT

## FOR REFERENCE ONLY



1. ALL JOINTS ON 8" WATER MAIN AND 4" WATER MAIN SHALL BE RESTRAINING JOINTS PER CITY OF NOVI STANDARD DETAILS.
2. MINIMUM COVER ON WATER MAIN IS AS FOLLOWS:
  - A. 5'-6" INCLUDING CROSSINGS THROUGH DITCH SECTIONS. WHEN INSTALLED PARALLEL TO A DITCH, MAINS SHALL HAVE 5'-6" OF COVER MINIMUM, AS MEASURED FROM THE NEAREST POINT IN THE DITCH CROSS SECTION.
  - B. 6'-0" UNDER STREETS, ROADS, ALLEYS AND OTHER PAVED OR TRAVELED AREAS.

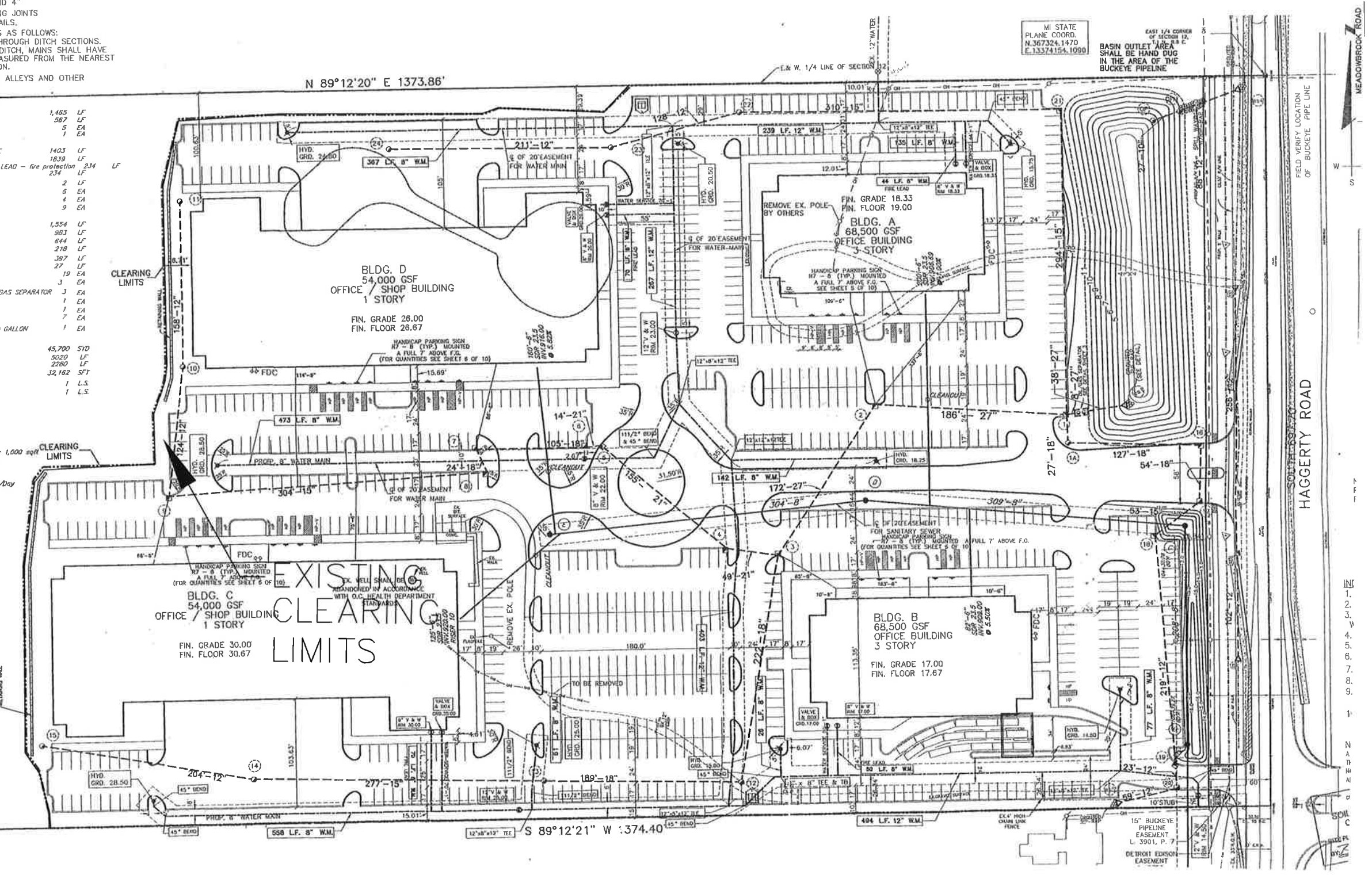
**ESTIMATED QUANTITIES -**

SANITARY SEWER		
8" ABS TRUSS PIPE	1,455 LF	
6" PVC, SDR 23.5 PIPE	287 LF	
MANHOLE CONNECTION TO EX.	5 EA	
WATER MAIN		
12" CL 54 DUCTILE IRON PIPE	1403 LF	
8" CL 54 DUCTILE IRON PIPE	1839 LF	
8" CL 54 DUCTILE IRON PIPE LEAD - fire protection	234 LF	
WATER MAIN SERVICE 1"	234 LF	
12"x12" V & W	2 LF	
8"x8" V & W	6 EA	
VALVE & BOX	4 EA	
HYDRANT ASSEMBLY	9 EA	
STORM SEWER		
12" C76 IV	1,554 LF	
15" C76 IV	983 LF	
18" C76 IV	644 LF	
21" C76 IV	218 LF	
27" C76 IV	397 LF	
8" PVC	27 LF	
4" DIA. W/LET	3 EA	
4" DIA. WITH 4" SUMP & OIL/GAS SEPARATOR	3 EA	
OUTLET FILTER	1 EA	
OVER FLOW NH	1 EA	
EXISTING WETLAND END SECTION	7 EA	
OIL/GAS SEPARATOR 1000 GALLON	1 EA	
PAVING (ON SITE)		
BITUMINOUS PAVEMENT	45,700 SYD	
4" CURB & GUTTER	5020 LF	
6" CURB & GUTTER (F2)	2280 LF	
CONCRETE SIDEWALK	32,182 SFT	
GRADING (ESTIMATED)	1 L.S.	
SOIL EROSION CONTROL	1 L.S.	

**SANITARY SEWER DESIGN**

Building A	69500	sqft
Building B	53500	sqft
Building C	54000	sqft
Building D	54000	sqft
Building space	245,000.00	sqft
Calculate number of units:	0.40 units per 1,000 sqft	
NUMBER OF UNITS	245.00	units
PERSONS/UNIT	3.5	
TOTAL POPULATION	857.50	People
AVG. DAILY FLOW	100 Gal/Pop/Day	
AVERAGE FLOW	0.133CFS	
PEAK FACTOR	3.842	
PEAK FLOW	0.510CFS	
Minimum Pipe Size =	8 inches	
Minimum Pipe Slope =	0.40%	
Area =	0.35	
Hydraulic Radius =	0.17	
q =	0.78CFS	

WOODLAND 4.61 ACRES



INT. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

## MARKET STUDY

PRINCIPALS

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Andrew J. Exline, MAI, SRA, MRICS  
James R. Green, MAI  
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Susan P. Shipman, MAI

DESIGNATED STAFF

Joseph R. Calvanese, MAI  
Andrea M. Kujala, MAI  
Stephen S. Wagner, MAI, SRA, AI-GRS

FOUNDERS

Raymond V. Bologna - Retired  
Frederick C. Terzo - Retired

March 18, 2019

Mr. Zachary Weiss  
Manager, Development and Acquisitions  
Beztak Corporation  
31731 Northwestern Highway, Suite 250 W  
Farmington Hills, MI 48334

RE: Beztak Market Study  
WS of Haggerty Road between 12 and 13 Mile Roads  
Novi, MI 48377

Dear Mr. Weiss:

Pursuant to your request, we have conducted the necessary research to provide a market analysis for the proposed subject development. The effective date of the analysis is February 25, 2019. The analysis provides a detailed market demand analysis for primary use as a multifamily residential site. The analysis will also discuss general market conditions related to the allowable uses under the current zoning.

The market conclusions are predicated upon the conditions and limitations stated in Section 2 of this report. Following is the body of the pertinent issues, analyses, and conclusions. We trust you will find them self-sufficient but please feel free to call us with any questions you may have.

Sincerely,



**Andrea M. Kujala**  
Certified General Appraiser – Michigan #1201006294  
for Terzo & Bologna, Inc.

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### ANNEX

INTRODUCTION TO TERZO & BOLOGNA, INC.  
QUALIFICATIONS OF THE CONSULTANT

## IDENTIFICATION AND BRIEF DESCRIPTION OF PROPERTY

Vacant Land, 3 Contiguous Parcels  
WS of Haggerty Road between 12 and 13 Mile Roads  
Novi, MI



Source: Oakland County Gateway, date unknown

The site contains approximately 22 acres of vacant land along the west side of Haggerty Road between 12 and 13 Mile Roads in the city of Novi, Michigan. It is essentially rectangular in shape with 897.7 feet of frontage on Haggerty Road and 1,374.33 feet along the northern boundary of the site. Topography is generally level and there are no known environmental issues or wetlands on the property. Additionally, there are no known easements or encroachments that would adversely affect value.

The site is well located with respect to proximity near major employment centers as well local and regional retail uses. Access to major highway linkages is excellent with major north/south and east/west freeway interchanges located within approximately one mile of the site. Uses in the immediate neighborhood include office – both traditional and flex - to the north, west and south and single family to the east.

### DATE OF ANALYSIS

All conclusions are based on an analysis date of February 25, 2019.

## **INTENDED USER AND INTENDED USE**

The report is intended for use only by Beztak Corporation as client. There are no other intended users. The report is to be used by the client to formulate internal business decisions as to the potential development of the site. It is not intended for any other use.

## **ASSUMPTIONS & LIMITING CONDITIONS**

**This report has been made with the following general assumptions:**

1. No responsibility is assumed for the legal description, legal matters, or title considerations. Title to the property is assumed to be clear and marketable, and it is assumed that there are no recorded or unrecorded matters or exceptions to title that would adversely affect marketability or market value.
2. Unless otherwise stated, no consideration is given to liens or encumbrances against the property.
3. The information furnished by others is assumed to be reliable. However, no warranty is given for its accuracy.
4. It is assumed that there are no hidden or unapparent conditions of the land or of the improvements that render the property more or less valuable. No responsibility is assumed for such conditions or for arranging any engineering studies that may be required to discover them.
5. Except as noted, no evidence of hazardous material, which may or may not be present on the property, has been relayed to the analysts. Except as noted, Terzo & Bologna, Inc., has no knowledge of the existence of such materials on or in the property and it is assumed that the property is free of such materials. Terzo & Bologna, Inc., however, is not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, or other potentially hazardous materials may affect the value of the property. No responsibility is assumed for any such conditions, or for any expertise or engineering knowledge required to discover them. The client (or any reader of this report who is contemplating some financial commitment to the property) is urged to retain an expert in this field, if desired.
6. No survey of the boundaries of the property was undertaken. It is assumed that the utilization of the land and improvements will be within the boundaries or property lines of the property described and that there will be no encroachment or trespass.
7. The presence of flood plain or wetland areas could affect the value of the property. It is assumed that wetland areas are not present or are minimal

unless otherwise stated. Terzo & Bologna, Inc. is not qualified to detect such areas.

**The report has been made with the following general limiting conditions:**

1. Without the express written consent of Terzo & Bologna, Inc., neither the name of the appraiser, nor the report, nor any material contained in the report may be included in any prospectus or used in private offering memoranda, or representations in connection with the sale of securities or participation interests to the public. Terzo & Bologna, Inc. reserves the right to deny such consent.
2. Without the express written consent of Terzo & Bologna, Inc., neither the report nor any part of it may be submitted to the Securities and Exchange Commission or to any state securities regulatory agency. Terzo & Bologna, Inc. reserves the right to deny such consent.
3. Neither all nor any part of the contents of this report, especially any conclusions as to market conclusions, the identity of Terzo & Bologna, Inc., any of its staff, or any reference to the Appraisal Institute or the MAI designation, shall be quoted or disseminated to the public through advertising, public relations media, news media, sales media, or other public means of communication without the prior written consent and approval of Terzo & Bologna, Inc., which consent Terzo & Bologna, Inc. reserves the right to deny. Further, neither the consultants, nor Terzo & Bologna, Inc., assumes obligation, liability or accountability to any third party.
4. This report shall be considered only in its entirety. No part of this report shall be used separately or taken out of context.
5. Possession of this report, or a copy thereof, does not carry with it the right of publication.
6. Terzo & Bologna, Inc. or any of its staff, by reason of this report, is not required to give further consultation, testimony, or be in attendance in court or other hearing with reference to the property unless written contractual arrangements have been made relative to such additional employment.
7. The forecasts and projections contained herein are based upon current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These market conditions and forecasts are subject to material changes because of unusual or unforeseen circumstances. The estimates and opinions within the report are not, therefore, predictions or assurances as to the achievement of a particular income or profit, or that particular events will occur or that a particular price will be offered or accepted.



8. Acceptance and/or use of this report constitutes full acceptance of the General Assumptions and Limiting Conditions as well as the Special Assumptions set forth in this report. Neither Terzo & Bologna, Inc. nor its staff assumes responsibility for any situation arising from the client's failure to become familiar with and understand these assumptions and limiting conditions.

## **PROBLEM TO BE CONSIDERED**

The site is currently zoned OST, Office Service Technology District. The district is intended to for development of high tech, multi-use office/ laboratory/ production use. As of May 2017, the owner of the property envisioned a site plan that included a mixture of flex office and multifamily, with an approximate 50/50 distribution of land use. As of a current date, the owner envisions a site plan that would include only multifamily use. Multifamily development is not consistent with the current zoning of the site but is a viable alternative, particularly given soft market conditions with respect to office/ flex office uses.

This analysis will provide a detailed market study showing demand indicators relative to multifamily use. In addition, a discussion of barriers to entry with respect to office/ flex office will be discussed.

## **SCOPE OF WORK**

The scope of work for the market analysis comprised a comprehensive data gathering and analytical process that incorporated but was not necessarily limited to the following.

- Obtain property data from the client, contact sources, and governmental representatives.
- Obtain market and transaction data from brokers, property owners and/or property managers, other appraisers, secondary data sources, and in-house files. Data sources utilized for this report are assumed to be reliable and are accepted as such in the analysis. When possible or deemed appropriate or necessary, first-hand verification of data for accuracy was conducted.

Specifically, the scope of work addresses the following:

### **Multi-family Apartment Market Study**

- Analyze demographic factors that serve as demand drivers for rental demand to quantify the depth of the market.
- Identify who the potential tenants would be and the likely range of income levels.
- Provide an analysis of existing supply.
- Research pipeline inventory.
- Provide an overview of recently completed projects and competitive projects including absorption and rental rate statistics.
- Provide analysis of feasibility rent.

**Office/Flex Analysis**

- Analyze historic occupancy, absorption, and leasing activity.
- Analyze historic rental rates.
- Analyze potential new supply.
- Provide analysis of feasibility rent.

The foregoing list represents an overview of the major items that constitute the scope of work of this market analysis. Additional items that are relevant to the scope of work will be found in other portions of the text, where they reference specific procedures or market analysis issues.

**MULTI-FAMILY APARTMENT MARKET STUDY****OVERVIEW**

The owner is seeking to improve the entire subject site with residential apartments. There currently is a rough plan to develop the site with 325 to 375 units under the RM-2 High Density Multiple-Family zoning designation. The indicated density is about 14.7 to 17 units per acre. The proposed unit mix the unit would be proposed to be as follows.

One Bedroom	120 to 139 units	(37%)
Two Bedroom	172 to 198 units	(53%)
Three Bedroom	33 to 38 units	(10%)

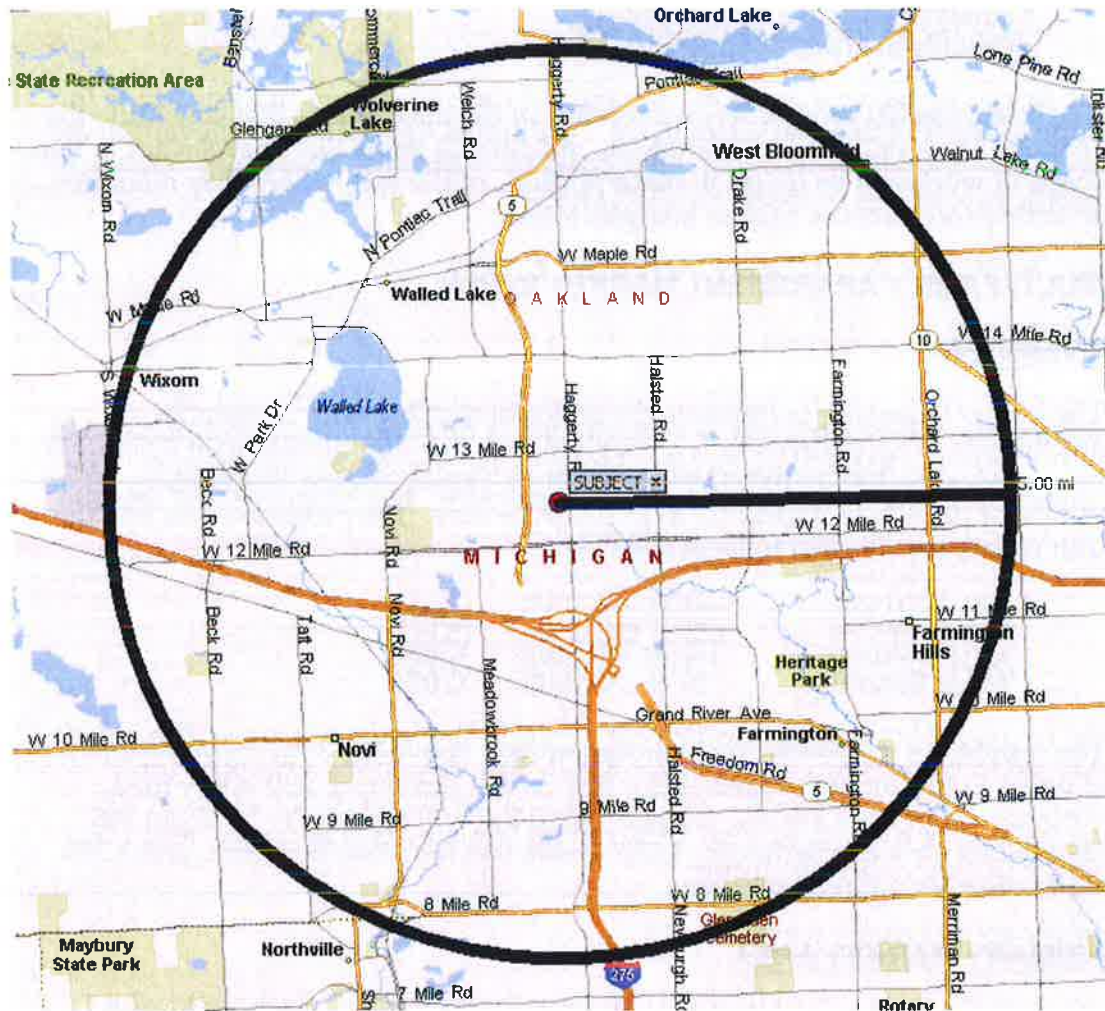
The number of proposed one bedroom units is above the 33 percent threshold allowed in the zoning ordinance for RM-2. The developer will apply for a variance. Unit sizes are still undetermined but will reportedly be about 800 square feet for a one bedroom, 1,150 square feet for a two bedroom, and 1,350 square feet for a three bedroom.

**PRIMARY MARKET AREA**

The primary market area (PMA) is the geographic area in which units with similar characteristics are in equal competition. The subject is located in the city of Novi, which is in the west central portion of Oakland County near excellent highway linkages of M-5, I-96, I-275, and I-696. A prospective resident at the subject would work in the regional market and would consider other multiple-family developments in Novi as well as surrounding communities including Walled Lake, West Bloomfield, Farmington Hills, Wolverine Lake, and Commerce.

The primary market area (PMA) is identified as a five mile radius around the subject. The PMA was defined primarily after consideration of the location of existing and competing supply, but also with consideration given to the drawing power created by the location near major freeway interchanges, proximity to regional medical services, and identification of major employment centers within central Oakland County. The defined PMA incorporates a full range of convenience services that would be expected by a typical resident in a property

such as the subject. The following map identifies the geographic boundaries of the subject's PMA.



### ANTICIPATED TARGET MARKET

The anticipated tenant profile would most likely include single or two-tenant households and, to a lesser extent, small families. Household income levels would typically need to be above \$50,000 to afford a luxury apartment unit. Within the PMA, more than 70 percent of households have income of \$50,000 or above and the median household is almost \$95,000.

ANALYSIS OF HOUSEHOLDS BY ANNUAL INCOME								
Household Income	PERCENT AND NUMBER OF HOUSEHOLDS							
			2010		2018		2023	
0 to \$14,999			6.9%	5,037	5.3%	4,079	4.2%	3,354
\$15,000 to \$24,999			7.7%	5,620	4.9%	3,761	3.5%	2,771
\$25,000 to \$34,999			8.0%	5,878	6.2%	4,746	5.5%	4,407
\$35,000 to \$49,999			11.5%	8,419	8.9%	6,850	7.6%	6,063
\$50,000 to \$74,999			17.2%	12,623	14.3%	10,972	12.0%	9,604
\$75,000 to \$99,999			13.8%	10,138	13.2%	10,148	12.6%	10,066
\$100,000 to \$124,999			9.5%	6,975	11.7%	8,986	12.9%	10,319
\$125,000 to \$149,999			7.0%	5,112	8.3%	6,371	9.7%	7,761
\$150,000 to \$199,999			8.8%	6,446	9.9%	7,618	10.4%	8,338
\$200,000 and over			9.6%	7,059	17.2%	13,153	21.5%	17,130
<b>TOTAL</b>				<b>73,307</b>		<b>76,684</b>		<b>79,813</b>

Source: EASIdemographics.com

Based on demographic profile of newer apartment projects in the area, tenants in the subject should include a wide array of occupations but almost all would be white-collar professionals employed in the regional market. Employment in the PMA is growing and includes a good percentage of white collar professions, including finance and insurance, real estate, scientific and technical services.

PMA EMPLOYMENT TRENDS AND PROJECTIONS					
Industry	2010	2018	Annual Change	2023	Annual Change
Agriculture, Forestry, Mining	60	72	2.3%	76	1.1%
Construction	2,469	2,548	0.4%	2,620	0.6%
Manufacturing	14,767	16,474	1.4%	17,434	1.1%
Wholesale Trade	2,647	2,467	-0.9%	2,434	-0.3%
Retail Trade	10,217	10,226	0.0%	10,415	0.4%
Transportation/Warehouse/Utilities	2,364	2,506	0.7%	2,594	0.7%
Information	1,972	1,964	-0.1%	1,991	0.3%
F. I. R. E.	7,465	7,663	0.3%	7,905	0.6%
Professional/Scientific/Mgmt/Admin	11,635	12,553	1.0%	13,133	0.9%
Education/Health/Social	17,402	18,269	0.6%	18,943	0.7%
Arts/Entertnmt/Accomod/Food Service	6,614	7,397	1.4%	7,810	1.1%
Other Services	3,128	3,078	-0.2%	3,126	0.3%
Public Administration	2,239	2,495	1.4%	2,642	1.2%
<b>Total Civilian Employment</b>	<b>82,979</b>	<b>87,712</b>	<b>0.7%</b>	<b>91,123</b>	<b>0.8%</b>
Government Employment	7,357	7,008	-0.6%	7,017	0.0%
Private Sector Employment	75,622	80,704	0.8%	84,106	0.8%

Source: EASIdemographics.com

It is expected that a good portion of the leasing will come from the younger professional, under 30 and single or recently married and the older demographic that tend to be empty nesters and choose to rent as opposed to own. Population by age projections are supportive of a younger demographic with healthy increases shown in the 25-34 range. A large increase is projected in the empty nester age range of 55-64 years.

ANALYSIS OF POPOULATION BY AGE								
Age			PERCENT AND NUMBER IN AGE STRATIFICATION					
			2010		2018		2023	
0	to	17	22.4%	39,129	21.4%	38,755	20.7%	38,713
18	to	24	7.0%	12,221	6.6%	11,878	6.4%	11,967
25	to	34	12.5%	21,873	13.2%	23,915	13.7%	25,539
35	to	44	13.9%	24,308	13.3%	24,189	13.0%	24,214
45	to	54	16.2%	28,258	14.4%	26,064	13.2%	24,651
55	to	64	12.8%	22,395	13.9%	25,196	14.3%	26,765
65	and	over	15.1%	26,403	17.3%	31,309	18.7%	34,872
Population, Median Age			40.8		41.7		42.1	

Source: EASIdemographics.com

Overall, the target market is well represented within the current and projected demographic profile for the PMA.

### **OVERVIEW OF MARKET DEMAND ANALYSIS PROCESS**

The sections that follow will first identify current market conditions in the PMA, as represented by the five-mile radius. Vacancy and rental rates among the existing rental stock will be studied and recent trends analyzed. Additionally, recent absorption data on newly completed projects as well as projects currently in lease-up will be presented.

Once current market conditions in the PMA have been presented, the analysis will focus on a demand analysis that measures potential demand from the primary housing market area. New demand for multi-family development can be measured based on population and household growth and the ensuing demand for new housing in the market. One approach to the forecast of future growth in housing demand is based on a traditional analysis of population projections, variations in household size, and tenure characteristics. There are numerous demographic models in these areas that are usually called upon to estimate demand. In this instance, estimates by Easy Analytic Software, Inc. (EASI) will be relied upon, which forecasts current demographics based on trending models that utilize 2010 Census data.

### **EXISTING SUPPLY**

The subject will compete with the upper end of the supply base – newer, modern units with full amenity packages. The bulk of the supply in the PMA is older and the focus for competing supply is focused on newer construction. A summary of the subject's primary competitors, as well as a location map, is presented in detail in the following pages.

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #1 Survey Date 2/19

Huntley Manor  
41745 Midtown Circle  
SS of Grand River, W of Meadowbrook  
Novi, Oakland County, MI  
Contact: Ebony 248-946-4742  
203 Units Built in 2018-2020



<u>Total</u>	<u>#</u>	<u>#</u>		<u>Base</u>		
<u>Rms</u>	<u>Br</u>	<u>Ba</u>	<u>Type</u>	<u>Rent</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>
5	2	2	APT	\$2,178	1,503	\$1.45
5	2	2	APT	\$2,224	1,536	\$1.45
5	2	2	APT	\$2,361	1,475	\$1.60
5	2	2	APT	\$2,363	1,698	\$1.39
5	2	2	APT	\$2,394	1,498	\$1.60
4	2	2	APT	\$2,055	1,353	\$1.52
5	2	2	APT	\$2,281	1,420	\$1.61
6	3	2	Apt	\$2,675	1,820	\$1.47

Rent Concessions: None

Vacancy: In lease up

T&B # 8481

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #1 Survey Date 2/19

<u>Utilities Included in Rent</u>	<u>Unit Amenities</u>	<u>Common Area Amenities</u>
	Electric Stove	Garage
	Frost-Free Refrigerator	Clubhouse
	Central Air	Fitness Room
	Disposal	Pool
	Dishwasher	
	Microwave	
	In-Unit Laundry	
	Full Size	
	Patio or Balcony	
	Window Treatments	

Comments

Two buildings with 24 units came online February 15. Four units are available.

Assuming three month pre-leasing period, indicated absorption is about 6.7 units per month.

Tenant responsible for all utilities except trash

Each unit has a two-car attached garage and all but one type have an additional "flex" room. Upscale finishes to include crown molding, recessed lighting, stainless steel appliances, kitchen island and granite countertops.

Gated community with clubhouse featuring fitness and business centers; outdoor patio with fireplace, and walking trails.

T&B # 8481

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**  
**COMPARABLE #2**

Survey Date 2/19

Central Park Estates  
 47305 Central Park Boulevard  
 ES Beck, S of Grand River  
 Novi, Oakland County, MI  
 Contact: Terry (248) 449-5270  
 254 Units Built in 2002-2004



<u>#</u> <u>Units</u>	<u>Total</u> <u>Rms</u>	<u>#</u> <u>Br</u>	<u>#</u> <u>Ba</u>	<u>Type</u>	<u>Base</u> <u>Rent</u>	<u>Square Feet</u>	<u>\$/Square Foot</u>
30	3	1	1	APT	\$1,345	1,065	\$1.26
10	4	2	2	APT	\$1,445	1,080 - 1,085	\$1.34 - \$1.33
41	4	2	2	APT	\$1,545	1,190	\$1.30
41	4	2	2	TH	\$1,545	1,250	\$1.24
34	4	2	2	TH	\$1,575	1,460	\$1.08
11	4	2	2.5	TH	\$1,845	1,385 - 1,455	\$1.33 - \$1.27
64	5	3	2.5	TH	\$1,795	1,425	\$1.26
6	5	3	3	TH	\$1,795	1,425	\$1.26
11	5	3	2.5	TH	\$1,900	1,590	\$1.19
6	6	3	2.5	TH	\$1,975	1,700	\$1.16

Rent Concessions: Currently are not being offered.

Vacancy: Reportedly 95% occupied. Vacants are primarily in two bedroom unit styles.

T&B # 8475



**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE # 2 Survey Date 2/19

<u>Utilities Included in Rent</u>	<u>Unit Amenities</u>	<u>Common Area Amenities</u>
	Electric Stove	Garage
	Frost-Free Refrigerator	Clubhouse
	Central Air	Fitness Room
	Disposal	Sauna
	Dishwasher	Jacuzzi
	Microwave	Pool
	In-Unit Laundry Full Size	Tennis Court
	Patio or Balcony	
	Window Treatments	
	Cathedral Ceilings	
	Fireplace	

Comments

12 different floor plans (one 1BR, six 2BR, five 3BR).

Tenant is responsible for all utilities including trash

1 car attached direct access garage, private driveway, and private entrance.

All units have fireplaces.

Select units can have upgrades of granite countertops for a premium of \$100 per month, stainless steel appliances for a premium of \$100 per month, or both for a total premium of \$200 per month.

Tanning, indoor and outdoor Jacuzzi, massage center, elaborate clubhouse with second level banquet area, and a business center.

T&B # 8475

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**  
**COMPARABLE #3**

Survey Date 2/19

Brownstones  
 42330 Joyce Lane  
 SS 13 Mile, W of Meadowbrook  
 Novi, Oakland County, MI  
 Contact: Carly (248) 926-1909  
 260 Units Built in 2000-2001



<u>#</u> <u>Units</u>	<u>Total</u> <u>Rms</u>	<u>#</u> <u>Br</u>	<u>#</u> <u>Ba</u>	<u>Type</u>	<u>Base</u> <u>Rent</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>	<u>#</u> <u>Vacant</u>
32	3	1	1	APT	\$1,418	1,140	\$1.24	
22	4	1	1	APT	\$1,300	1,253	\$1.04	
84	4	2	2	TH	\$1,335	1,196	\$1.12	
8	4	2	2	APT	\$1,499	1,281	\$1.17	
16	4	2	2	APT	\$1,520	1,288	\$1.18	
32	4	2	2	TH	\$1,462	1,491	\$0.98	3
16	4	2	2.5	TH	\$1,474	1,277	\$1.15	
8	4	2	2.5	TH	\$1,372	1,300	\$1.06	
42	5	3	2	TH	\$1,488	1,554	\$0.96	2

Rent Concessions: No concessions are being offered at this time.

Vacancy: Leasing agent would not disclose vacancy. Web site shows 5 units available  
 - 97.5 percent occupancy.

T&amp;B # 8476

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #3

Survey Date 2/19

Utilities Included in RentUnit AmenitiesCommon Area Amenities

Electric Stove  
 Self-Cleaning Oven  
 Frost-Free Refrigerator  
 Central Air  
 Disposal  
 Dishwasher  
 Microwave  
 In-Unit Laundry  
 Full Size  
 Patio or Balcony  
 Window Treatments

Clubhouse  
 Fitness Room  
 Pool

Comments

Management reports rents change daily based on availability; daily rates are only available units (either now or in near future). Rents shown are for up to 18 month leases. Undefined premiums are charged for shorter lease lengths.

Tenant responsible for all utilities.

Select units have fireplaces and cathedral ceilings. All units have one car attached garages, some shared in two car garage format. Base rents are shown - 1BR rents range from \$1,300 to \$1,794; 2BR from \$1,344 to \$2,154; 3BR from \$1,488 to \$2,406.

Other amenities include children's play area, 24/7 maintenance.

T&amp;B # 8476

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**  
**COMPARABLE #4** **Survey Date 2/19**

Main Street Village I and II  
 25300 Constitution  
 SS Grand River, E of Novi Road  
 Novi, Oakland County, MI  
 Contact: (248) 349-8400

389 Units Built in 1996-98 Phase I and 2003-2004 Phase II



<u>Total</u>	<u>#</u>	<u>#</u>		<u>Base</u>			<u>#</u>
<u>Rms</u>	<u>Br</u>	<u>Ba</u>	<u>Type</u>	<u>Rent</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>	<u>Vacant</u>
3	1	1	APT	\$1,450	906	\$1.60	1
4	2	1	APT		1,087	\$0.00	
2	2	2	APT	\$1,595	1,204	\$1.32	
5	3	2.5	TH	\$2,254	1,697	\$1.33	

Rent Concessions: Currently no concessions are being offered.

Vacancy: Leasing agent would not disclose vacancy, company web site indicates 99% occupied with one 1BR avail, and one 4BR avail (unit details not shown).

T&B # 8477

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #4

Survey Date 2/19

Utilities Included in RentUnit AmenitiesCommon Area Amenities

Self-Cleaning Oven  
 Frost-Free Refrigerator  
 Central Air  
 Disposal  
 Dishwasher  
 Microwave  
 In-Unit Laundry  
 Full Size  
 Patio or Balcony  
 Window Treatments

Garage  
 Clubhouse  
 Fitness Room  
 Sauna  
 Pool  
 Tennis Court

Comments

Only 2 true townhouse unit floor plans, remaining are townhouse style apartments. Basic sample of 26 different floor plans. Leasing agent reports rents change daily based on availability; daily rates are only available for vacant units. Undefined premiums are charged for shorter lease lengths. Most units come with one car attached garage. The 3BR Th comes with a two-car garage. Base rents are shown - 1BR rents range from \$1,450 to \$1,750; 2BR from \$1,595 to \$2,372; 3BR from \$2,074 to \$2,656.

T&amp;B # 8477

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

**COMPARABLE #5** **Survey Date 2/19**

Shearwater Apartments  
 2063 Shearwater Circle  
 SEC Corner of Maple and Beck  
 Commerce Township, Oakland County, MI  
 Contact: Sara 248-579-8893  
 203 Units Built in 2017-2018



<u>Total</u>	<u>#</u>	<u>#</u>	<u>Type</u>	<u>Base</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>
<u>Rms</u>	<u>Br</u>	<u>Ba</u>		<u>Rent</u>		
4	2	2	APT	\$1,899	1,295	\$1.47
4	2	2	APT	\$1,939	1,328	\$1.46
4	2	2	APT	\$1,799	1,336	\$1.35
4	2	2	APT	\$1,699	1,425	\$1.19
4	2	2	APT	\$2,299	1,485	\$1.55
5	2	2	APT	\$1,799	1,558	\$1.15
5	3	2	APT	\$1,999	1,669	\$1.20

Rent Concessions: None

Vacancy: Property is reportedly close to full occupancy.

T&B # 8474

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

**COMPARABLE #5**

**Survey Date 2/19**

Utilities Included in Rent

Unit Amenities

Common Area Amenities

Electric Stove  
 Frost-Free Refrigerator  
 Central Air  
 Disposal  
 Dishwasher  
 Microwave  
 In-Unit Laundry  
     Full Size  
 Patio or Balcony  
 Window Treatments

Garage  
 Clubhouse  
 Fitness Room  
 Pool

Comments

Leasing began February 2017 and recently reached stabilization. Indicated absorption is about 8.5 units per month.

Tenant responsible for all utilities including trash

Each unit has a two-car attached garage. Upscale finishes to include crown molding, recessed lighting, stainless steel appliances, kitchen island and granite countertops.

Clubhouse with fitness and business centers; outdoor patio with fireplace

T&B # 8474

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

**COMPARABLE #6**

**Survey Date 2/19**

Redwood Commerce Twp (aka Four Seasons)  
 2720 Union Lake Road  
 WS, N of Commerce Road  
 Commerce Township, Oakland County, MI  
 Contact: 248-462-0330  
 98 Units Built in 2014



<u>Total</u>	<u>#</u>	<u>#</u>		<u>Base</u>		
<u>Rms</u>	<u>Br</u>	<u>Ba</u>	<u>Type</u>	<u>Rent</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>
5	2	2	Den	\$1,559	1,294	\$1.20

Rent Concessions: Waived security deposit  
 Vacancy: Unavailable

T&B # 8472



**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #6

Survey Date 2/19

Utilities Included in Rent

Unit Amenities

Common Area Amenities

Self-Cleaning Oven  
 Frost-Free Refrigerator  
 Central Air  
 Disposal  
 Dishwasher  
 Laundry Hook-Ups  
 Patio or Balcony  
 Window Treatments

Garage

Comments

The first buildings opened in February of 2014 and the final building was completed in November 2014. Pre-leasing began November 15, 2013 and there were reportedly only four units available at the time of completion. Indicated absorption is 7.83 units per month.

Tenants responsible for all unit utilities including trash

All units are equipped with a den as an additional room. Other unit amenities include eat-in kitchen with breakfast bar, vaulted ceilings, walk-in closets, and walk-in kitchen pantry.

All units equipped with a direct access two-car attached garage. End units have a \$100 premium. There is one building that has superior view characteristics and premiums of \$100 per month are applied to this building.

On-site leasing office - no other common area amenities.

T&B # 8472

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**  
**COMPARABLE #7** **Survey Date 2/19**

Briarcliff Village  
 140 Crestview Boulevard  
 N of 14 Mile Road, W of Welch Road  
 Commerce Township, Oakland County, MI  
 Contact: Ashley (248) 669-5900  
 180 Units Built in 1997-1998



<u>Total</u>	<u>#</u>	<u>#</u>	<u>Type</u>	<u>Base</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>
<u>Rms</u>	<u>Br</u>	<u>Ba</u>		<u>Rent</u>		
3	1	1	APT	\$1,145	910	\$1.26
4	2	2	APT	\$1,357	1,178	\$1.15
4	2	2	APT	\$1,407	1,180	\$1.19
4	2	2	APT		1,271	\$0.00
4	2	2	APT		1,241	\$0.00
5	3	2	APT	\$1,676	1,483	\$1.13

Rent Concessions: No concessions are currently being offered.

Vacancy: Agent report four units available - 97.8 percent occupancy

T&B # 8473

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #7

Survey Date 2/19

Utilities Included in Rent

Unit Amenities

Common Area Amenities

Electric Stove  
 Frost-Free Refrigerator  
 Central Air  
 Disposal  
 Dishwasher  
 Microwave  
 In-Unit Laundry  
     Full Size  
 Patio or Balcony  
 Window Treatments  
 Cathedral Ceilings

Garage (\$0-200)  
 Clubhouse  
 Fitness Room  
 Jacuzzi  
 Pool

Comments

Management reports rents change daily based on availability; daily rates are only available units (either now or in near future). Rents for fully occupied floor plans are thus not shown.

Tenant responsible for all utilities including trash

Cathedral ceiling with ceiling fans in upper level units.

All 1,241 SF units, all 1,483 SF units, and five of the 1,271 Sf units include attached 2-car garages. All other units have attached 1-car garages.

Base rents are shown - 1BR rents range from \$1,145 to \$1,720; 2BR from \$1,356 to \$1,852; 3BR from \$1,683 to \$2,095.

T&B # 8473

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**  
**COMPARABLE #8** **Survey Date 2/19**

Brandywine  
 7950 Brandywine Blvd.  
 South of West Maple, East of Haggerty Road  
 West Bloomfield, Oakland County, MI  
 Contact: Steve (248) 313-8001  
 119 Units Built in 2003



<u>Total</u>	<u>#</u>	<u>#</u>		<u>Base</u>			<u>#</u>
<u>Rms</u>	<u>Br</u>	<u>Ba</u>	<u>Type</u>	<u>Rent</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>	<u>Vacant</u>
5	3	2	APT	\$2,070	1,738	\$1.19	
6	3	2	APT		1,781	\$0.00	
5	3	3	APT	\$1,928	1,794	\$1.07	
5	3	3	APT		1,940	\$0.00	
5	3	2	APT		1,979	\$0.00	
5	3	2	APT	\$2,155	2,049	\$1.05	1
5	2	2.5	APT	\$2,602	2,227	\$1.17	
6	3	2.5	APT	\$2,635	2,262	\$1.16	1

Rent Concessions: No concessions are currently being offered.

Vacancy: Agent reported two units vacant - 98.3 percent occupancy

T&B # 8479

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE # 8

Survey Date 2/19

Utilities Included in RentUnit AmenitiesCommon Area Amenities

Electric Stove	Garage
Self-Cleaning Oven	Clubhouse
Frost-Free Refrigerator	Fitness Room
Central Air	Sauna
Disposal	Jacuzzi
Compactor	Pool
Dishwasher	
Microwave	
In-Unit Laundry	
Full Size	
Patio or Balcony	
Window Treatments	
Cathedral Ceilings	
Fireplace	

Comments

Management reports rents change daily based on availability; daily rates are only available units (either now or in near future). Rents for fully occupied floor plans are thus not shown. Rents shown are for up to 18 month leases. Undefined premiums are charged for shorter lease lengths.

Tenants are responsible for separately metered hot and cold water, gas and electricity.

The 2,262sf units as well as the 2,227sf units contain finished walkout lower levels.

The 2,262sf and 1,979sf units contain a computer room. The 1,738sf units contain a den/studio.

Most units have 2 car attached garage except the 1,794 sf 3BR/3BA unit and the 2,227 sf 2BR/2.5BA units, which have 3 car attached garage options. Some second floor units have cathedral ceiling and/or a fireplace at no extra charge.

Clubhouse has business center which includes use of the Internet, fax and copy machines; and game library.

T&amp;B # 8479

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**  
**COMPARABLE #9** **Survey Date 2/19**

Redwood Wolverine Lake (aka Beechcrest)  
 3025 S. Commerce Road  
 WS, S of Oakley Park Road  
 Wolverine Lake Village, Oakland County, MI  
 Contact: Bree 248-893-9280  
 176 Units Built in 2015-2018



<u>Total</u>	<u>#</u>	<u>#</u>	<u>Base</u>	<u>Sq Ft</u>	<u>\$/Sq Ft</u>
<u>Rms</u>	<u>Br</u>	<u>Ba</u>	<u>Rent</u>		
5	2	2	\$1,449	1,294	\$1.12
5	2	2	\$1,574	1,327	\$1.19
5	2	2	\$1,574	1,343	\$1.17
5	2	2	\$1,699	1,427	\$1.19
5	2	2	\$1,774	1,500	\$1.18
5	2	2	\$1,874	1,538	\$1.22

Rent Concessions: None

Vacancy: Agent reported three units available - 98.3 percent occupancy

T&B # 8478

**TERZO & BOLOGNA, INC. SUMMARY OF COMPARABLE RENTALS**

COMPARABLE #9

Survey Date 2/19

Utilities Included in Rent

Unit Amenities

Common Area Amenities

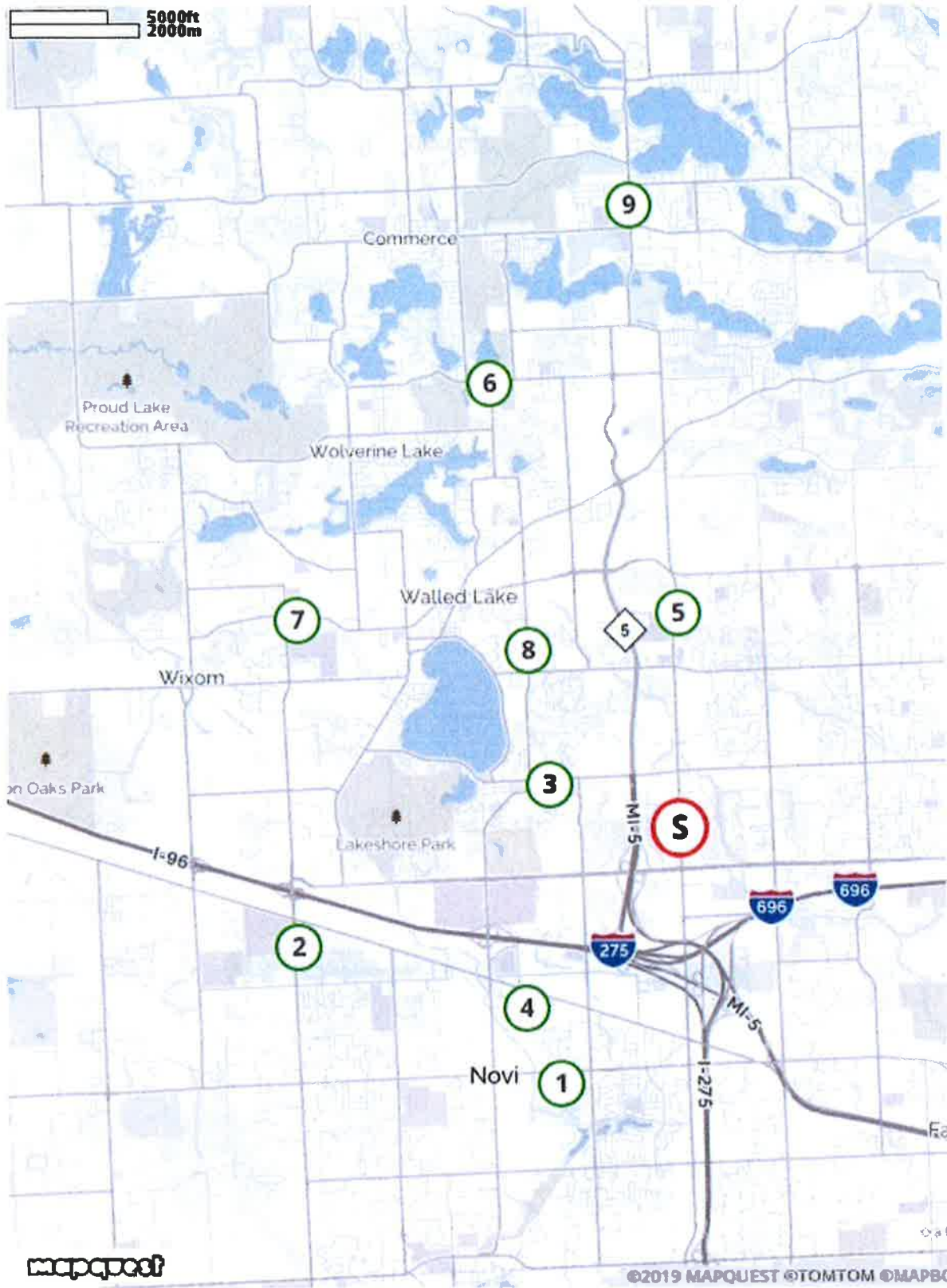
Self-Cleaning Oven  
 Frost-Free Refrigerator  
 Central Air  
 Disposal  
 Dishwasher  
 Microwave  
 Laundry Hook-Ups  
 Patio or Balcony  
 Window Treatments  
 Cathedral Ceilings

Garage

Comments

Tenants responsible for all unit utilities, including trash removal.  
 All units are equipped with a den as an additional room. Two largest units have garden level den with patio. Other unit amenities include eat-in kitchen with breakfast bar, vaulted ceilings, walk-in closets, and walk-in kitchen pantry. Countertops in kitchen and baths are granite. Largest units in Phase II will have a finished walk-out level with about 340 square feet (included in NRSF).

T&B # 8478





All of the competitive properties provide extensive unit and site amenities, which will subsequently be discussed. General observations from within the competitive rent comparison set are as follows:

- One bedroom units: Four of the nine properties offer one bedroom unit styles in a range from about 900 to 1,200 square feet, with the majority between about 900 and 1,000 square feet. Rental rates range from \$1,145 to \$1,750 per month, with an emphasis between about \$1,300 and \$1,450 per month.
- Two bedroom units: All properties offer a two bedroom unit style. Unit sizes range from about 1,080 to 1,880 square feet with a predominate range from about 1,100 to 1,500 square feet. Rental rates range from \$1,356 to \$2,394 per month with an emphasis between about \$1,400 and \$1,900 per month.
- Three bedroom units: All properties offer a three bedroom unit style. Unit sizes range from about 1,241 to 2,800 square feet with a predominate range from about 1,500 to 1,700 square feet. Rental rates range from \$1,449 to \$2,349 per month with an emphasis between about \$1,700 and \$2,200 per month.

### Vacancy Analysis

The properties that revealed vacancy data all reported occupancy levels above 95 percent. In addition, the subject owner manages more than 3,300 units in the five-mile radius, which currently have a 3.5 percent vacancy rate. According to CoStar, a national provider of real estate statistics, there are 21,762 existing rental units in the five-mile radius with a current vacancy rate of 4.1 percent.

Hendricks-Berkadia, a national brokerage firm specializing in multifamily residential properties, publishes a quarterly vacancy report for the metro Detroit region. The following exhibit summarizes vacancy trends as reported by Hendricks-Berkadia.

Multifamily Vacancy Trends	
Period	Metro Detroit
4th Quarter 2014	3.0%
4th Quarter 2015	4.6%
4th Quarter 2016	3.5%
4th Quarter 2017	4.0%
4th Quarter 2018	3.6%

Source: Hendricks-Berkadia

The secondary data provided provides strong support for the primary data from current rent surveys and it is reasonable to conclude that market vacancies are currently between about 3.5 to 4.5 percent. Overall, there is not enough vacancy

in the Class A market to support healthy movement, especially when considering the substantial growth in renter households anticipated for the PMA. Pent up demand is therefore present.

### Density (Units per Acre)

The rough plans for the subject result in a density of about 14.7 to 17.0 units per acre. Density statistics for existing and proposed supply in the market are as follows.

DEVELOPMENT DENSITY ANALYSIS				
Property	Location	Acres	Units	Density (Unis/Acre)
<b>Proposed/Under Construction</b>				
Barrington	Commerce	51.55	308	6.0
Beechcrest Phase I & II	Wolverine Lake	26.7	176	6.6
Shearwater	Commerce	28.0	203	7.3
Huntley Manor	Novi	27.0	210	7.8
Encore at Manchester	Novi	19.3	172	8.9
<b>Subject, Proposed</b>	<b>Novi</b>	<b>22.0</b>	<b>325-375</b>	<b>14.7-17.0</b>
The Bond	Novi	7.74	253	32.7
Town Court	West Bloomfield	4.8	192	40.0
<b>Existing Developments</b>				
Central Park Estates	Novi	41.4	254	6.1
Main Street Village	Novi	25.7	241	9.4
Brownstones at the Vistas	Novi	15.9	260	16.4

Proposed developments show densities in a range from 5.4 to 40 units per acre. The Bond and Town Court apartments set the upper end and are least similar to the subject with respect to overall location and drawing power. The subject's location is generally less residential oriented as compared to the remaining properties that showing a range from 5.4 to 8.9 units per acre and would support a higher density.

The existing but newer developments show densities in a range from 6.1 and 16.4 units per acre. A density of 14.7 to 17.0 units per acre would be at the high end of the market norm but within development regulations for the RM-2 Family zoning designation.

### Unit Mix

Unit mix statistics for properties proposed and existing properties constructed since 2000 in Oakland County are on the following page. The list is not

exhaustive but provides a good representation for newer properties in the county.

**Supply Statistics by Unit Type**  
Proposed Projects and Newer Construction - Oakland County

Property Name/Location	Location	Studio	1BR	2BR	3BR	4BR+	Total
Central Park Estates	Novi	0	30	137	87	0	254
Main Street Village, Phase I	Novi	0	24	168	8	41	241
Brownstones	Novi	0	54	164	42	0	260
Encore at Manchester	Novi	0	0	103	69	0	172
Huntley Manor	Novi	0	0	182	21	0	203
The Bond	Novi	0	146	92	15	0	253
Auburn Square	Auburn Hills	41	39	17	0	0	97
Residences at Thirty-Two Fifty	Auburn Hills	0	36	12	0	0	48
Barrington Apartments	Commerce Twp	0	0	308	0	0	308
Redwood Living (fka Four Seasons)	Commerce Twp	0	0	92	0	0	92
409 on Nine	Ferndale	6	90	33	0	0	129
River Place at Mill Town	Rochester	0	0	96	35	0	131
City Apartments	Rochester Hills	0	24	28	0	0	52
Amber Crossing	Royal Oak	8	19	15	0	0	42
Amber Corners	Royal Oak	10	8	15	0	0	33
Amber Landing Townhomes & Lofts	Royal Oak	1	11	11	1	0	24
South Main Lofts	Royal Oak	0	16	32	0	0	48
Harper on Main	Royal Oak	0	2	8	2	0	12
The Harrison Residences	Royal Oak	0	35	15	25	0	75
Eight 55 South Main Apartments	Royal Oak	0	24	24	0	0	48
Amber on 11 Studios & Lofts	Royal Oak	36	0	0	0	0	36
Amber Landing Townhomes	Royal Oak	0	0	11	0	0	11
Harrison Lofts	Royal Oak	0	28	44	0	0	72
Midtown Pointe	Royal Oak	0	8	124	54	0	186
42 West	Southfield	0	33	79	2	0	114
Arbor Lofts	Southfield	6	9	6	16	24	61
Amber Town Center	Troy	1	22	21	2	0	46
Amber Studios & Lofts	Troy	35	0	0	0	0	35
Town Court	West Bloomfield	0	77	100	15	0	192
Redwood Living (fka Beechcrest)	Wolverine Lake	0	0	176	0	0	176
Market Averages		144	735	2,113	394	65	3,451
Subject's Proposal		0	120-139	172-198	33-38	0	325-375
		0.0%	37.0%	53.0%	10.0%	0.0%	0.0%

**UNIT MIX**

The rough plans for the subject include about 37 percent one bedroom units, which is above the norm for recently constructed and proposed developments. A variance would need to be granted if the site is developed under the RM-2 High Density Multiple-Family zoning designation. However, given the target market, a higher percentage of one bedroom units than what has been recently introduced in the five-mile radius would be warranted.

### **Unit Layout and Features**

New and proposed developments typically provide a full, modern amenity package, including:

- 9' ceilings
- Hardwood flooring (or equivalent)
- Oak or maple cabinetry
- Good quality, brushed nickel fixtures
- Granite countertops (or equivalent)
- Stainless steel appliances to include dishwasher, range with built in microwave, and refrigerator
- In unit washer and dryer
- One bathroom per bedroom
- Direct access one or two-car garages
- One or two level floor plans

With respect to size, one bedroom units typically range from about 900 and 1,000 square feet, two bedroom units from 1,100 to 1,500 square feet and three bedroom units from 1,500 to 1,700 square feet. The rough plan for the subject includes 800 square feet for a one bedroom unit, 1,100 square feet for a two bedroom unit, and 1,350 square feet for a three bedroom unit. These sizes would be at the lower end of the market but within reason. The one bedroom unit at 800 square feet is below the competitive properties used herein but within market norms.

New developments also typically provide upscale site amenities to include a clubhouse with gathering areas, fitness room, and pool.

### **Market Absorption**

The following represents the list of known completed suburban projects for which absorption information has been made available.

## RECENT METRO DETROIT ABSORPTION STATISTICS

Property	Location	Built	Units	Absorption/Mo.
Stoney Brook Village	Brownstown Twp	2016-2018	70	3.8
Redwood Commerce Twp	Commerce Township	2014	98	5.6
Redwood Wolverine Lake - Phase I	Wolverine Lake	2015-2016	108	5.7
Harvard Square	Rochester Hills	2016	168	6.0
Parkways of Auburn Hills	Auburn Hills	2016-2017	118	6.7
Huntley Manor*	Novi	2018-2020	24	6.7
Heron Springs	Orion Township	2014	162	6.8
Waterstone @ Village Square	Orion Township	2013	77	7.7
Peninsula Ridge	Brownstown Twp	2017	92	8.0
Shearwater Apartments	Commerce Township	2017-2018	203	8.5
Kirkway III Part I	Washington Township	2014	18	9.0
Ashford Apartments	Shelby Township	2012	108	10.0
Starkweather Lofts	Plymouth	2017	93	10.1
Shelby Woods North	Shelby Township	2014	105	10.7
Enclave at Brownstone	Canton	2016	83	11.6
Five Points Apartments	Auburn Hills	2017-2018	178	12.0
Eight 55 South Main Apts.	Royal Oak	2016	48	12.0
Auburn Square	Auburn Hills	2014	97	12.1
River Birch Bend	Shelby Township	2016	88	13.0
618 S. Main	Ann Arbor	2015	164	15.0
Preserves Phase V	Sterling Heights	2016	52	17.0
Oakcliff Apartments	Ann Arbor	2016	217	19.7
The Harrison Phase I	Royal Oak	2016	75	25.0

\*Lease-up still in process

The properties at the low end of the range shown here were slowed down by construction timing. Based upon the preceding and all things considered – location, competition, etc. – absorption of around ten to 12 units per month could be expected.

This indicator must be viewed in light of demand, which is expected to be strong due to growing population and households. In this light, potential new supply and demand are considered.

### Projects Under Construction or in Planning

Based on interviews with local government units, there are several proposed rental communities within the PMA, which are described below.

**Encore at Manchester – 172 Units**

*Source: City of Novi Planning Department*

Under construction, this property has a clubhouse and 23 residential buildings housing 103 two bedroom and 69 three bedroom units all with two-car attached garages. Site amenities include clubhouse, fitness center, and outdoor pool. Interior finish level is upscale with nine-foot ceilings, granite countertops, stainless steel appliances, brushed nickel hardware, and in unit washer/dryer.

Two bedroom units are currently marketed in a range from \$1,795 to \$2,175 per month, with size between 1,195 and 1,542 square feet. Three bedroom units are currently marketed in a range from \$2,195 to \$2,495 per month, with sizes between 1,599 and 1,899 square feet. Initial delivery is expected Spring of 2019.

**Huntley Manor – 203 units**

Source: [www.huntleymanor.com](http://www.huntleymanor.com)

Under construction, this property is gated with a residential clubhouse and 24 residential buildings housing 182 two bedroom and 21 three bedroom units all with two-car attached garages. Two buildings with 24 units were brought online February 15, 2019 and 20 units are leased. Indicated absorption is 6.7 units per month, presuming a three month pre-leasing period.

All units will have upscale finishes to include nine-foot ceilings, crown moldings, wood-style plank flooring, granite countertops, premium stainless steel



appliances, full-size washer and dryer and patio or balcony. Site amenities include fitness room, outdoor pool, outdoor lanai with fireplace, and walking trails. Two bedrooms range in size from 1,353 to 1,698 square feet with rents from \$2,055 to \$2,394 per month. Three bedrooms are 1,820 square feet with rents at \$2,675 per month.

### ***Barrington Apartments – 308 units***



*Source: Commerce Township Planning Department*

This property is being developed as part of the Commerce Towne Place mixed use development along Martin Parkway. The site is 51.55 net acres and will have 42 buildings with 308 two bedroom with den units. Indicated density is 6.0 units per acre. There will be 16, one-story ranch-style buildings and 26 two-story stacked ranch buildings. The developer of this property also developed Shearwater Apartments (comp #7) and Huntley Manor (comp #1) and units are expected to have finishes commensurate with these properties. Site amenities will include a clubhouse with fitness room and pool. There will also be walking trails and two parks. As of the report date, infrastructure is almost complete and construction of the clubhouse is expected to begin soon. Initial delivery of the apartment units is expected for Fall of 2019.

***Town Court Apartments (fka Audette Apartments) – 192 Units***

*Source: [www.towncourt.com](http://www.towncourt.com)*

This property will consist of one residential building over ground level parking garage. Unit mix will consist of 77 one bedroom, 100 two bedroom, and 15 three bedroom units. The site is 4.8 acres resulting in a density of 40 units per acre.

On site amenities will include gathering rooms, fitness center, and pool. Interior finish level will be modern with nine-foot ceilings, wood-like plank flooring in living areas, granite countertops, and full appliance package including washer/dryer. Ground recently broke and delivery is expected to be in Spring 2020.

## The Bond



Source: Humphreys and Partners Architects LP

The complex is conditionally approved and will consist of two, 4-story apartment buildings with a combined 253 units ranging from 800 to 1,200 square-feet. There will be 146 one bedroom, 92 two bedrooms units and 15 three bedroom units. Other amenities include a two-level parking structure, swimming pool, exercise facility, landscaped courtyards and a 5,578 square-foot commercial building. Rent will reportedly range from about \$1,300 to \$2,200 per month. Project completion will come in three phases including:

Phase 1 (Building 1): 127 units, swimming pool, two-story parking garage, on-street parking

Phase 2 (Building 2): 126 units, two-story parking garage

There is the potential for a Phase 3 component with a commercial building and associated parking. This, however, is not definitive. The site size is 7.74 acres, resulting in a development density of 32.7 units per acre. Construction is expected to begin in April 2019 with project completion in late 2020.

### ***Five & Main Residential***



According to Commerce Township, the multifamily residential portion of this development is mostly conceptual at this point. Following is a summary of the proposed uses.

- Entertainment – 26%
- Restaurants – 20%
- Specialty food and beverages – 9%
- Fashion – 24%
- Wellness & Beauty – 9%
- Home furnishings – 10%
- Residential – 300 apartments
- First Phase: 42 acres
- Possible second phase: 14 acres

The project is moving forward but exact timing is unknown. Given the scale of the development, delivery will likely be at least a few years out. For analysis, it is assumed that this property would be delivered in 2021 and 2022.

### ***Railyard Lofts***

This development has been in the planning stages for an extended period and there are no details other than 200 units are proposed in a mixed-used development. The City of Novi Planner indicated that there is currently no

activity related to the project and it appears to be “dead”. This property is therefore excluded from the potential pipeline analysis.

Based on the preceding, there is the potential for 1,778 known units over the next five years, with 350 potential units imputed for the subject to be delivered in 2020 and 2021. The proposed supply, along with estimated timing, is summarized below, followed by a map showing the location of each.

SUMMARY OF PROPOSED UNITS BY YEAR OF ANTICIPATED DELIVERY						
Development	2019	2020	2021	2022	2023	TOTALS
(Subject)		175	175			350
Encore at Manchester	172					172
Huntley Manor	203					203
Barrington	154	154				308
Town Court (fka Audette Apts)		192				192
The Bond		253				253
Five & Main			150	150		300
						0
<b>Totals</b>	<b>529</b>	<b>774</b>	<b>325</b>	<b>150</b>	<b>0</b>	<b>1,778</b>



**ESTIMATE OF CURRENT DEMAND**

According to CoStar, a national provider of multifamily statistics, there are 21,762 existing rental units within the PMA. The overall vacancy in the PMA is estimated at about four percent based on primary and secondary sources, indicating there are 20,846 occupied units in the PMA. A market with too little vacancy does not allow for movement within itself or movement in and out resulting in an environment of pent up demand. In contrast, a market with too much vacancy is oversupplied, generally having a negative impact on the market’s fundamentals. The point of equilibrium where vacancy is adequate to support movement and maintain or improve upon a market’s fundamentals is referred to as the frictional vacancy level. In this case, frictional vacancy is estimated at five percent. Utilizing the preceding information, an estimate of the subject PMA’s current excess demand (or pent up demand) is shown in the following chart.

<b>PMA Estimate of Current Demand</b>	
Existing Supply of Rental Units	21,762
Vacant Rental Units	916
Total Occupied Rental Units	20,846
Gross Up for Frictional Vacancy	5%
Stabilized Demand for Rental Units	21,943
Existing Supply of Rental Units	21,762
Excess (Pent Up) Demand	181

The above illustrates that the PMA as a whole is undersupplied by an estimated 181 units. This represents an estimate of pent up demand for rental units in the PMA.

### **ESTIMATE OF ANTICIPATED CHANGES IN DEMAND**

One approach to the forecast of housing demand is based on analyses of population projections, variations in household size, and tenure characteristics. There are numerous demographic models in these areas that are usually called upon to estimate demand. In this instance, forecasts have been made available by EASI Demographics, utilizing 2010 U.S. Census data with projections for 2018 and 2023. The projections are representative of the subject's PMA, previously defined as a five mile radius.

#### **Quantified Demand Calculation**

The current 2018 population in the area is estimated to be 181,306. This is an increase of 0.47 percent per year since 2010. Furthermore, data indicate that the population is anticipated to increase by 0.59 percent per year, on average, through 2023. The population in the PMA is therefore projected to grow in a manner slightly higher than recent trends.

Although housing demand can arise from population growth, it is also important to note trends in household formations. Average household size in the area is projected to decrease slightly. Persons per household were 2.36 in 2010 and 2.35 in 2018 with 2.32 projected for 2023.

Household growth is projected to account for approximately 626 new households per year between 2018 and 2023. This represents a forecast rate of growth of 0.80 percent annually.

It is clear, therefore, that the PMA population is increasing, which in turn is resulting in a projected increase in households. This will create additional demand for rental housing in the immediate future. These demographic trends are illustrated in the following exhibit.

HISTORIC AND PROJECTED POPULATION AND HOUSEHOLDS FIVE-MILE RADIUS						
	2010 CENSUS		2018 Est		2023 Est	
Population	174,587		181,306		186,721	
Households (HH)	73,307		76,684		79,813	
Household Size *	2.36		2.35		2.32	
Renter Households	26,168	35.7%	29,048	37.9%	30,870	38.7%
Owner Households	47,139	64.3%	47,636	62.1%	48,943	61.3%

\* HH size is average excluding population in institutions or group quarters

Source: EASIdemographics.com

"Households" are defined as occupied housing units

The changes shown by the preceding demographic data are summarized in the chart that follows, showing total and annual change, as well as percentage change and total change. It also stratifies household growth between owner households and renter households.

ANALYSIS OF HISTORIC AND PROJECTED POPULATION AND HOUSEHOLD GROWTH								
	2010 to 2018				2018 to 2023			
	Total Change/Period		Avg. Ann'l Change		Total Change/Period		Avg. Ann'l Change	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Change in Pop.	6,719	3.85%	840	0.47%	5,415	2.99%	1,083	0.59%
Change in HH	3,377	4.61%	422	0.56%	3,129	4.08%	626	0.80%

HISTORIC AND PROJECTED GROWTH BY HOUSEHOLD TYPE				
	2010 to 2018		2018 to 2023	
	Total Change/Period	Avg. Ann'l Change	Total Change/Period	Avg. Ann'l Change
	Number	Percent	Number	Percent
Change in HH	3,377		3,129	
Renter HH Change	2,880		1,822	
Owner HH Change	497		1,307	

The preceding charts show the forecast changes in households by tenure. Every market needs frictional vacancy (empty units) in order to accommodate the movement of households. The numbers are thus adjusted to reflect current and projected changes with vacancies at stabilized levels of five percent.



PROJECTED DEMAND FOR NEW HOUSING UNITS		
	Renter	
Households (Occupied)	2018	29,048
Estimated Market Vacancy	5.0%	1,529
Total Housing Units		30,577
<b>2023</b>		
Households (Occupied)	2023	30,870
Stable Market Vacancy	5.0%	1,625
Total Housing Unit Demand		32,495
Less Current Housing Units		30,577
Total Change in Housing Unit Demand		1,918
Annual Change in Housing Unit Demand		384

Based on the preceding, total new demand of 384 renter household per year over is projected over the next five years.

### **PROJECTED IMPACT OF NEW SUPPLY IN LIGHT OF CURRENT DEMAND**

Including an estimated 350 units applicable to the subject, there are 1,778 new rental units proposed to come on line over the next four years. Based on projected deliveries, the market could experience a slight, short-term increase in vacancies; however, this would be short-lived. The following chart illustrates that existing and new demand is sufficient to support all of the proposed supply in the long-term with conditions tightening into 2023 if no new supply is proposed.

PROJECTED IMPACT OF NEW SUPPLY ON PMA VACANCY					
Estimated Current Supply	21,762				
Estimated Current Vacancy	4.1%				
Estimated Current Vacant Units	916				
	2019	2020	2021	2022	2023
New Units Added	529	774	325	300	0
New Estimated Supply	22,291	23,065	23,390	23,365	23,390
Vacancy					
Existing Vacant Units	916	880	1,270	1,211	1,211
Plus New Deliveries	529	774	325	300	0
Less Pent Up Demand	(181)				
Less New Renter Household Demand	(384)	(384)	(384)	(384)	(384)
Total Estimated Residual Vacant Units	880	1,270	1,211	1,127	827
Estimated Market Vacancy	3.9%	5.5%	5.2%	4.8%	3.5%

## **FINDINGS AND CONCLUSIONS**

The market is exhibiting strong fundamentals. The following general observations are made:

- The primary market area is relatively affluent with median household income of almost \$95,000. This is well above the minimum of \$50,000 typically needed to afford a luxury apartment.
- Employment is growing and there is good proportion of white collar jobs
- Population in the age ranges between 24-34 and 54-64 is growing both in total numbers and as a percentage of population
- The supply analysis illustrates the following facts:
  - Current market vacancy is estimated to be about four percent
  - Existing and newly approved development densities generally range from about six to 16 units per acre.
  - Average unit mix for newer and proposed construction is about 22 percent for one bedroom units, 58 percent two bedroom units, and with 13 percent three bedroom units. The remainder is allocable to studio and 4+ bedroom units.
  - Extensive unit and site amenities are expected in newly constructed properties, including high end finishes and direct access garages.
  - Direct competitors that have a full amenity package including direct access garages show the following:
    - One bedroom units typically range from about 800 and 1,000 square feet with typical asking rents between \$1,300 and \$1,450 per month.
    - Two bedroom units range from about 1,100 to 1,500 square feet with typical asking between about \$1,400 and \$1,900 per month.
    - Three bedroom units typically range from about 1,500 to 1,700 square feet with typical rental rates between about \$1,700 and \$2,200 per month.
- There are 1,778 known units in seven properties that could potentially come on-line in the next four years.
- There currently are 181 estimated units in pent up demand
- Demand for new renter households of 384 units per year over the next five years is projected.
- Existing and new demand is sufficient to support existing and proposed supply, with vacancy in year 2023 shown to be insufficient to support frictional movement in the market.

Specifically in relation to the subject, the following observations are made:

- The target market is expected to consist of single or two-tenant households and, to a lesser extent, small families.
- Almost all tenants would likely be white-collar professionals employed in the regional market.

- Tenant profile would consist of the younger professional, under 30 and single or recently married and the older demographic that tend to be empty nesters.
- The rough concept plan tends to vary from market norms in the following areas:
  - Proposed density for the subject is about 14.7 to 17 units, which is at the high end based on current existing and approved site plans in the immediate market area.
  - The proposed unit sizes are on the small side, particularly for the one bedroom unit style.

The following chart summarizes the potential rent level that would be needed to support new construction. The calculation is based on numerous market-supported assumptions and considers a subject development containing 350 apartments. An approximate average land value of \$13,000 per unit is imputed. The average market rent applied is based on \$1,300 per month for a one bedroom, \$1,700 per month for a two bedroom, and \$2,000 per month for a three bedroom. A small allocation is also considered for other income. A market-support expense factor of 35 percent is applied.

<b>Calculation of Feasibility Rent and Development Feasibility</b>	
<b>Assumptions and Underlying Factual Data</b>	
1. Site Size	22 acres
2. Site Value	\$4,550,000
3. Anticipated Density at Highest and Best Use (Units/ Acre)	15.9
4. Number of Units at Highest and Best Use	350
5. Hard Cost of Building Improvements/ Unit	\$120,000
6. Hard Site Improvement Costs as % of Building Costs	15%
7. Soft Costs	7%
8. Entrepreneurial Incentive	10%
9. Current Market Rent/Unit	\$19,200
10. Applicable Vacancy for New Project	5.00%
11. Owner's Expenses/ Unit	\$6,720
12. New Project Overall Rate	6.25%
<b>Calculation of Feasibility Rent</b>	
Hard Cost of Building/Unit	\$120,000
Plus Site Improvement Hard Costs	\$18,000
<hr/> Total Hard Costs/Unit	<hr/> \$138,000
Plus Soft Costs	\$9,660
<hr/> Hard and Soft Cost of Building/Unit	<hr/> \$147,660
Plus Entrepreneurial Incentive	\$14,766
<hr/> Total Cost of Improvements/Unit	<hr/> \$162,426
Plus Land Value/Unit (Line2 ÷ Line 4)	\$13,000
<hr/> Total Project Cost/Unit	<hr/> \$175,426
x Overall Rate	6.25%
<hr/> Feasibility NOI/Unit	<hr/> \$10,964
Plus Landlord Incurred Expenses/Unit	\$6,720
<hr/> Feasibility Effective Gross Income/Unit	<hr/> \$17,684
Adjustment for Vacancy & Collection Loss ÷ (1-Line 10)	95.0%
<hr/> Feasibility Rent/Unit @ Market Terms	<hr/> \$18,615
VS.	
Current Market Rent/Unit, Annual	\$19,200

The feasibility rent shown is supportive of new construction. Overall, the market is strong and, assuming the subject is developed with a product that is reasonably consistent with market expectations in the PMA, it should be well received and able to capture its fair share of demand.

## OFFICE/FLEX OFFICE ANALYSIS

The zoning for the site allows for general or flex office use and the owner of the property originally created a site plan that included 70,000 square feet of flex office space. Terzo & Bologna, Inc. provided an in depth market study effective May 2017 that ultimately concluded that a flex development, rather than general office, would in fact be most logical. General market conditions as of a current

date remain largely unchanged for general and flex office since the prior report and this conclusion still stands. Moreover, most of the construction in the general vicinity is more of a flex-style development, albeit of good quality, rather than office. The focus of this discussion will thus be on the merits of the flex office market as opposed to multifamily.

Overall, the flex office market is showing signs of slow growth with positive space absorption and increasing rental rates. The following chart summarizes market conditions as of a current date and, for reference, shows the market as of the 1<sup>st</sup> quarter 2017 when the previous report was provided.

CoStar Summary of Flex Space Market Activity										
Quarter	Inventory		Vacancy Statistics				Occupancy	Change from Prior	Rent	
	Bldgs	Sq. Ft.	Direct	Total w Sublease	% Direct	% w Sublease	Sq. Ft.	Sq. Ft.	NNN Rent - Direct	
2019 Q1	187	6,216,591	452,306	479,683	7.3%	7.7%	5,736,908	-132	\$10.78	
2018 Q4	187	6,216,591	396,763	396,763	6.4%	6.4%	5,819,828	238,642	\$10.30	
2017 Q4	187	6,216,591	618,107	635,405	9.9%	10.2%	5,581,186	-155,854	\$10.13	
2017 Q1	187	6,216,591	592,681	592,681	9.5%	9.5%	5,623,910	976	\$9.75	
2016 Q4	186	6,136,591	399,551	399,551	6.5%	6.5%	5,737,040	114,106	\$9.42	
2015 Q4	186	6,136,591	504,207	513,657	8.2%	8.4%	5,622,934	131,826	\$9.11	
2014 Q4	186	6,136,591	630,242	645,483	10.3%	10.5%	5,491,108	204,315	\$8.98	
2013 Q4	186	6,136,591	849,798	849,798	13.8%	13.8%	5,286,793	145,778	\$8.79	
2013-2019 Q1 Sq.Ft.		204,802	Added							\$2.40
2013-2019 Q1 Sq.Ft.		450,115	Absorbed							
Avg annual change in space delivered				0.2%						
Avg annual change in space absorbed				1.6%						
Avg annual change in asking rents				4.0%						

Rental rates show a range between about \$8.00 and \$14.00 per square foot, NNN. Rates vary widely based on varying factors, including age and percentage of office. Average annual increase in asking rents has been four percent annually over the past five years.

Obviously, the market is improving. However, new construction has been minimal and only one new flex building has come online in the past five years. The most recent addition consists of the 80,000 square foot Autoneum headquarters that was built-to-suit and was near completion at the time of the previous report.

Currently, a 150,000 square foot facility is under construction, consisting of the new A123 headquarters. This tenant will vacate their 291,000 square foot facility that is located in the just south of the submarket and will therefore create significant vacancy in the overall market. After being in planning for over five years, one other speculative 67,000 square foot building is under construction. There is a large amount of supply shown to be proposed (about 800,000 square feet); however, it is likely that new deliveries will be limited into the foreseeable future. According to the City of Novi Planning Department, there are several

approved developments; however, the consultant's confidence in these projects moving forward in the immediate future is low. As a point of reference, as of the May 2017 report date, about 500,000 square feet of flex space was proposed. The previously mentioned 150,000 square feet A123 site is one of two substantial developments to have come to fruition and this tenant will actually create a significant surplus of vacant space in the overall market after vacating its current building. The second was in planning for more than five years.

Considering current rental rates for flex office buildings, rent levels generally are not high enough to support new speculative construction. The following chart summarizes the potential rent level that would be needed to support new construction. The calculation is based on numerous market-supported assumptions and considers a subject development containing 140,000 square feet of flex office space, with 50 percent office ratio. An approximate average land value of \$5.00 per square foot is imputed.

<b>Calculation of Feasibility Rent and Development Feasibility</b>	
<b>Assumptions and Underlying Factual Data</b>	
1. Site Size	22 acres
2. Site Value	\$4,792,000
3. Anticipated Land-to Building Ratio at Highest and Best Use	6.845 :1
4. Square Feet of Building at Highest and Best Use	140,000
5. Hard Cost of Building Improvements/Sq. Ft.*	\$106.00
6. Hard Site Improvement Costs as % of Building Costs	20%
7. Soft Costs	7%
8. Entrepreneurial Incentive	10%
9. Current Market Rent/Sq. Ft.*	\$13-\$14
10. Applicable Vacancy for New Project	7.5%
11. Owner's Expenses/ Sq. Ft.	\$1.00
12. New Project Overall Rate	7.50%
<b>Calculation of Feasibility Rent</b>	
Hard Cost of Building/Sq.Ft.	\$106.00
Plus Site Improvement Hard Costs	\$21.20
Total Hard Costs/Sq.Ft.	\$127.20
Plus Soft Costs	\$8.90
Hard and Soft Cost of Building/Sq.Ft.	\$136.10
Plus Entrepreneurial Incentive	\$13.61
Total Cost of Improvements/Sq. Ft.	\$149.71
Plus Land Value/Sq. Ft. of Building (Line2 ÷ Line 4)	\$34.23
Total Project Cost/Sq. Ft. of Building	\$183.94
x Overall Rate	7.50%
Feasibility NOI/Sq. Ft.	\$13.80
Plus Landlord Incurred Expenses/Sq.Ft.	\$1.00
Feasibility Effective Gross Income/Sq. Ft.	\$14.80
Adjustment for Vacancy & Collection Loss ÷ (1-Line 10)	92.5%
Feasibility Rent/Sq. Ft. @ Market Terms	\$16.00
VS.	
Current Market Rent/ Sq. Ft.	\$13-\$14

\*Presumes 75% office buildout

The feasible rent is based on a myriad of assumptions; nonetheless, achievable rents are likely somewhere around ten to 20 percent below the economic rent levels needed to support new construction. The fact that there has been very little speculative construction for an extended period supports this conclusion.

Considering the fact that the market has continually shown improvement with respect to occupancy and increasing market rents, it is likely that new construction will be financially feasible at some point. Market forces as of a current date, however, do not support such a conclusion. An unknown holding

period would thus be associated with a site plan that includes any amount of flex office space.

## **FINAL COMMENTARY**

The preceding analysis provides strong support for multifamily use in the market. While the flex office market is experiencing improved fundamentals, the economics associated with such a use are less stable as compared to multifamily. Essentially, it is not clear when a financially feasible flex office plan could be implemented. On the other hand market fundamentals for multifamily uses support new development in the immediate future.

It is recognized that the site is surrounded on three sides by flex or general office use; however, the location of the single family subdivision across Haggerty to the east helps to enhance the appeal of the site for residential use. Further, given the commercial nature of these surrounding sites, strong opposition to a multifamily use is unlikely. It is also noted that the city of Novi has few multifamily sites remaining, which is in contrast to healthy projections for increased population and households, specifically renter households.

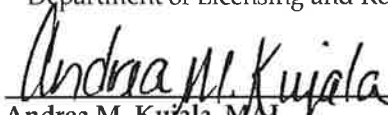
The owner of the site is an experienced multifamily developer/operator and would undoubtedly be able to develop a site plan that is readily accepted by the market. Based on this, along with market fundamentals and favorable locational factors, it is the consultant's opinion that the site should be allowed to be improved with a multifamily use.



## CERTIFICATION OF THE CONSULTANT

I certify that, to the best of my knowledge and belief:

- the statements of fact contained in this report are true and correct.
- the reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- my engagement in this assignment was not contingent upon developing or reporting predetermined results.
- my compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- my analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the *Uniform Standards of Professional Appraisal Practice*.
- I have not made a personal inspection of the property that is the subject of this report.
- Raymond V. Bologna and Andrea M. Kujala were instrumental in providing the research, doing the analysis, and writing the enclosed report.
- The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.
- the use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives, and is subject to review by governing State agencies.
- as of the date of this report, I have completed the continuing education program for Designated Members of the Appraisal Institute.
- to the best of my knowledge, neither I, nor Terzo & Bologna, Inc., has performed any services as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
- in Michigan, appraisers are required to be licensed and are regulated by the Michigan Department of Licensing and Regulatory Affairs, P.O. Box 30018, Lansing, Michigan 48909.



Andrea M. Kujala, MAI  
Certified General Appraiser - Michigan #12010006294

**ANNEX**

INTRODUCTION TO TERZO & BOLOGNA, INC.  
QUALIFICATIONS OF THE CONSULTANT

- **INTRODUCTION TO TERZO & BOLOGNA, INC.**

Terzo & Bologna, Inc., is a real estate consulting group with offices in Indiana and Michigan that specializes in analysis of commercial properties throughout the Midwest. The firm has a well-established reputation and is recognized for its ability to resolve complex valuation issues in an objective and impartial manner.

The primary goal of Terzo & Bologna, Inc., is to build long-term relationships by providing high quality real estate analysis that is timely and of value to its clients.

- **PROBLEM SOLVING IS OUR STRENGTH**

The success of any real estate analysis rests on knowledge of local markets.

No two properties are alike. Each presents its own unique challenge to analysis. Similarly, client objectives are not all alike. Some clients require analysis leading to property valuation; others require analysis directed to specific investment or disposition strategy.

The firm considers the uniqueness of each property and assignment in providing services that are responsive to the specific needs of the client. No matter how intricate the real estate problem, Terzo & Bologna, Inc., has the experience to solve it.

• **STAFF APPRAISERS AND COUNSELORS**

Well-educated and experienced professionals form the backbone of the firm. Staff appraisers and counselors have established backgrounds in a wide range of real estate related fields such as finance, mortgage banking, city planning, brokerage, construction management and property management. Each is involved in a continuing education program. The multiple perspectives provided by this professional diversity enhance the quality of the analysis that is provided to each client.

Services are provided in accordance with the ethics and standards established by the Appraisal Institute. Services are unbiased, knowledgeable and confidential. Professional affiliations held by individual members of the staff include:

- \* Appraisal Institute
- \* Royal Institution of Chartered Surveyors

Staff members of Terzo & Bologna, Inc., are currently licensed in the following states.

Indiana  
Michigan  
Ohio  
Kentucky  
Illinois

Licensure in other states can be obtained at the client's request.

## QUALIFICATIONS OF THE CONSULTANT

### ANDREA M. KUJALA

Andrea M. Kujala is a senior appraiser with Terzo & Bologna, Inc. and has provided real estate appraisal and consulting services with the firm since 1997. She graduated from the University of Central Florida with a Bachelor of Science degree in Business Administration with a concentration in marketing.

Her professional work encompasses market research, analysis, and appraisal assignments for multi-family, subdivision, industrial, general commercial, and general office. In addition to work for typical real estate properties, Ms. Kujala has extensive experience with going-concern valuation of special use properties, including ice skating arenas and health clubs.

Although experienced in a vast array of commercial product types, she specializes in multi-family housing. She is part of the multi-family division of Terzo & Bologna, Inc. and has provided comprehensive multi-family counseling and appraisal services. Her many years of multi-family experience have provided proficiency in every imaginable arena of this sector, including existing and proposed market-rate housing, subsidized and LIHTC properties, student housing, and senior independent living facilities. Her extensive experience makes her highly qualified to handle multi-family analyses in all forms whether Fannie Mae, Freddie Mac, HUD, institutional or traditional reporting methods are required.

Ms. Kujala has served local, national, institutional, and governmental clients and her extensive professional services include appraisal services for special assets/foreclosure, financing, estate purposes, ad valorem taxation, condemnation, bankruptcy, and asset management, as well as counseling services for acquisition/disposition and market and feasibility studies. In addition, she has provided counseling to assist in determining property rent potential, and has assisted developers with strategies to maximize development schemes and unit mix on proposed developments.

Ms. Kujala has been licensed as a Certified General Real Estate Appraiser in Michigan (#1201006294) since 2000. She is also affiliated with the Appraisal Institute from which she holds the MAI designation.

**PLANNING NARRATIVE BY CIB PLANNING**

EXHIBIT A- LIST OF PROJECT BENEFITS

EXHIBIT B-LIST OF REQUESTED DEVIATIONS

EXHIBIT C- PROJECT INFORMATION



## CIB PLANNING

Community Image Builders

July 25, 2019

Ms. Barb McBeth, AICP, City Planner  
City of Novi Development Department  
47175 10 Mile Road  
Novi, MI 48375

**Subject: Project Narrative and Planner's Report Supporting the Rezoning Request for a site located on the west side of Haggerty Road, north of 12 Mile Road and south of Lewis Drive, (parcel #22-12-400-009, 010, & 011), from OST, Office Service Technology to RM-2, Multiple-Family with a Planned Rezoning Overlay (PRO).**

Dear Ms. McBeth:

Please accept this project narrative and planner's report for consideration by the City to re-zone the above referenced parcel of land from OST, Office Service Technology to RM-2, Multiple-Family with a Planned Rezoning Overlay (PRO). The project entails construction of a high-quality, multiple-family residential community focused on providing "professional-targeted" housing to an area that is developed with office, research and development, light industrial, and single-family residential uses. The goal is to create a lively, walkable, bikeable, and accessible residential community to primarily serve area companies and their employees---most of which will be professionals desiring to live in close proximity to their places of employment.

### ***Project Narrative***

Proposed is the construction of a high-quality multiple-family residential complex on a property that has remained vacant for over two decades while most of the surrounding properties have developed for a variety of uses, including single-family residential to the east in Farmington Hills. Site constraints have made this property unattractive to users under the current OST, Office Service Technology zoning. The site exists with numerous attributes that make development difficult, including limited road frontage; sole access from heavily travelled Haggerty Road; a long and narrow property configuration; significant elevation changes from the back of the property to the front; and the presence of woodlands, wetlands and high voltage transmission lines at the rear of the site. The natural grade of the site also necessitates that stormwater detention be at the front of the site. Combined with the narrowness of the property, this lessens the visibility of buildings, which is far more critical for office development than for a multi-family residential development.

To effectively use the site and address these existing and natural challenges, we will need deviations from some of the dimensional requirements of the ordinance, similar to the practical difficulty standards of dimensional variances. We did not create the site constraints but instead are proposing a development that will overcome those obstacles. It is important to note, though, that we are presenting a project that meets the health safety ordinances of the City and still creating an

attractive, inviting environment for our residents. This project will also come in under the maximum density requirements of the ordinance and can still be built with these accommodations.

### ***Existing Conditions***

The parcel of land is located on the west side of Haggerty Road, north of 12 Mile Road and south of Lewis Drive. It is abutted by a medical office building to the south; an automotive supply company (Hanon Systems) to the north; single-family residential to the east (Farmington Hills); and the Haggerty Corridor Corporate Park to the west. It is located in close, walkable and bikeable distance to companies in the Haggerty Corridor Corporate Park as well as those south of 12 Mile Road, east of Haggerty Road. As mentioned above, there are significant grade changes on the site along with an existing wooded area and ITC overhead power transmission lines located at the back of the site. A multiple-family residential development provides a better opportunity to preserve the natural features, since the buildings have footprints smaller than the types of buildings permitted in the OST district and can better work with grade changes. There will also be fewer and smaller parking areas than would have been needed for a flex office building.

### ***Market Demand***

The property is currently vacant and has been marketed under the OST, Office Service Technology zoning designation for over 20 years with no development success. Part of this is due to the narrowness of the site, with limited frontage visibility, and primary access on Haggerty Road, as opposed to the interior roads of the abutting Haggerty Corridor Corporate Park. The March 1, 2019 market study prepared by Terzo and Bologna for Beztak reviews the market demand for uses allowed in the current zoning district. This report indicates that while both office and flex office space are the primary permitted uses, most of the construction and demand in the area is for the flex office space.

The study further illustrates that although the market is improving for this type of flex office space, only one new building has come on-line in the past five years. It concludes by indicating that rental rates for flex office space, are not high enough to support speculative development. At the current rent rates of between \$8.00 and \$14.00 per square foot triple net, per the report, there is not a high enough economic benefit to successfully develop new speculative product in the market. It is important to note that rents on the higher range require large Tenant Improvement allowances. The cost of development is further impacted on this site by significant grade changes where larger, flat land area is typically needed for flex office space buildings and drives.

The Planning Department had requested an addendum to the Market Study to include two proposed apartment projects currently in the planning stages. Beztak will not provide an update to the market study to include the two proposed projects that Planning has identified. According to the firm that completed the market study, the developments in question are not on the Novi website for upcoming projects, and when the report was completed in Spring 2019, the firm asked the Planning Department if there were any upcoming projects that were not officially listed with the City, and the answer was that there were none. As a result, Beztak does not feel the need to alter the findings of the market study to account for projects in the preliminary stage.

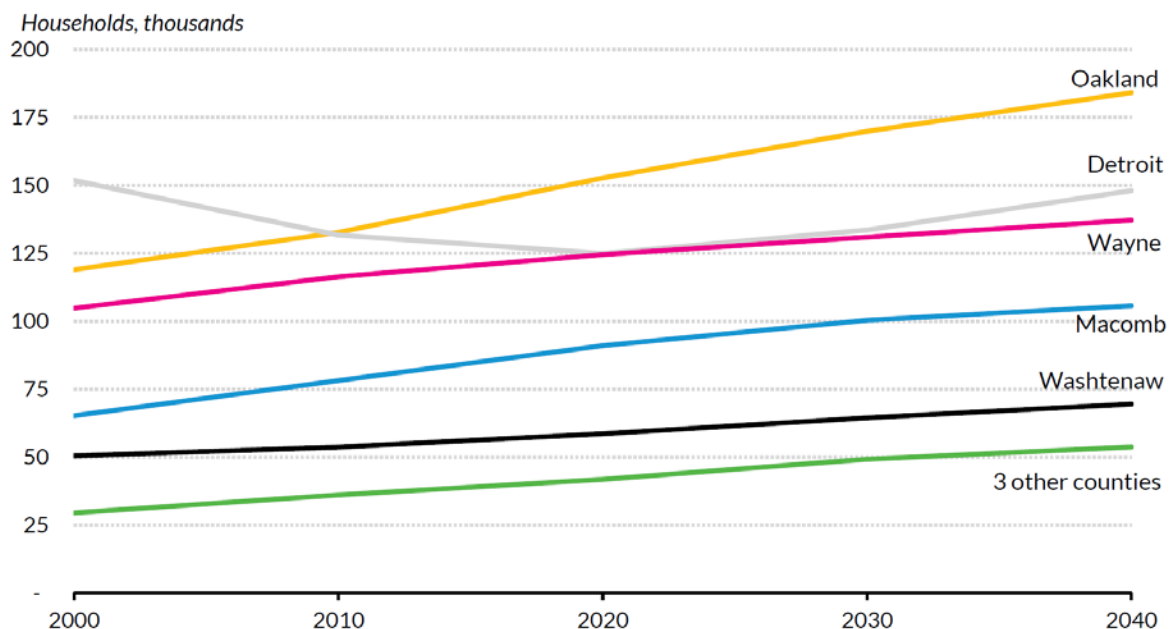


It is our assertion that a high quality residential development in this location, surrounded by several employers that have shown a need for new housing for their employees and have expressed enthusiasm for such endeavors, would be a substantial benefit for this community, relative to any future developments dictated by the current zoning. We will show that recommending a PRO overlay at this site would bring benefits to the community that would outweigh the potential drawbacks.

We also expect the demand for multi-family housing to continue for many years to come. In a recent study entitled "Southeast Michigan Housing Futures: A Converging Story for the Detroit Metropolitan Area" by the Urban Institute, July 2017, it indicates that the Detroit region is expected to gain approximately 380,000 households between 2010 and 2040. While a substantial portion of the new growth will be in the City of Detroit, the suburbs will also be impacted. Much of the growth in housing demand will come from the younger millennials and the aging baby boomers. The millennials have shown a tendency to rent, rather than own, and remain flexible. On the other end of the age spectrum, the baby boomers are either down-sizing from larger homes or looking for senior living arrangements as they continue to age. This project is focused more on the younger, working professionals as well as those downsizing but still in the workforce. Although some may question how long the high demand for rental housing will last, research indicates that it will be present for at least two more decades. In 2016, the Department of Housing and Urban Development released a market demand report showing a need for an additional 4,450 new rental units by 2019. At the time of the report, only 1,125 units were being planned or under construction for Oakland County (<https://www.huduser.gov/portal/publications/pdf/DetroitMI-comp-16.pdf>)

Additionally, the graph below from an Urban Institute study indicates the highest growing demand for rental housing in Oakland County through 2040.

**Renter Demand Expected to Increase across the Region**



**Source:** US Census 2000 and 2010, STF2 and SF2; Urban Institute projections based on MDOT projections of population and Urban Institute projections of age- and race-specific headship and homeownership rates.

**Note:** Wayne County here is the remainder of the county outside of Detroit.

### ***Why Multi-Family Residential?***

It is very difficult for local companies to employ and retain talent and to operate efficiently in areas where housing vacancies are virtually non-existent. In addition, non-single-family residential construction is not keeping pace with demand, especially for higher-quality developments. Either the amount of available land zoned for multiple-family development is limited or surrounding communities are opposed to such new construction. The employment-related housing shortage is actually a state-wide problem and is limiting the ability for communities to attract new companies. We work in communities across the state and hear the same message from economic developers: that the lack of available housing is making it difficult to attract new companies and jobs because the employees have nowhere to live. In fact, many Michigan economic developers are focusing on the creation of new housing development opportunities for this reason.

This proposed residential development will not only utilize a challenging site that has remained vacant while others around it have developed, but also add value to the neighboring uses in the Haggerty Corridor Corporate Park. Introducing a highly attractive residential development next to a substantial number of office, research and development (R&D), and light industrial uses will make those companies more attractive to future and existing employees. This approach is endorsed by Matthew S. Sosin, President of Northern Equities, the developer of the Haggerty Corridor Corporate Park (HCCP) which abuts the subject site to the north and west. He indicates in his support letter that:

“Since its inception in the 1999, the Haggerty Corridor Corporate Park has become the premier office park in the Detroit Metropolitan Area. It has consistently garnered higher rents than the surrounding area. The main reason companies are willing to pay a premium to be in our Park is the value placed on recruiting new talent. As the economy has evolved, the City and Northern Equities Group have modified the zoning to include new uses. First, the zoning was changed to add schools and the dorms associated with those schools. Then, five years ago, we brought Starbucks to the Park. At least three leases were signed where having a Starbucks within walking distance was crucial to their final decision.”

Mr. Sosin also states that:

“The next modification to zoning districts needs to be the ability to add more uses to the office and office/research districts. More specifically, we need the ability to add multifamily, for-rent apartments that are walkable to our buildings. While it is true that Millennials and Generation Z still crave home ownership, the bedrock of the City of Novi, the simple fact is that many of the new entrants to the labor force cannot afford to purchase a home Novi. However, we still need to provide ways for that cohort to stay in Novi, close to the Fortune 500 companies we all want to locate here. The best way to do that is to build multifamily apartments within and adjacent to the Park.”

The need to provide multi-family residential options is further endorsed by E. Brooke Matthews, Facilities and Fleet Services Manager for the Harmon Company, which abuts the subject site to the north. In his letter of support, he states “we feel that having apartments connected to the HCCP Park in walkable and bike-able distance to our buildings would be beneficial to our company for recruiting and retaining employees. Recruiting and retaining employees is a large component of our

human resources budget and any amenity that decreases those costs provides a community benefit for all of our stakeholders.”

It is clear from the above endorsements that the introduction of high-quality rental housing at this site is not only appropriate at this location but would also enhance the existing companies and their ability to attract new companies and employees.

### ***Horizontal Mixed-Use Developments***

Due to the limited external impacts of modern light industrial/R&D uses, we are seeing successful examples of horizontal, mixed-use developments where apartments and townhouses are located next to retail, office, flex office and research & development uses; providing residents the ability to walk or bike to work and avoid driving on already congested road networks. This is especially true where companies are bringing executives in for a year or two from countries where mass transit and walkability is the norm. One local example is in the Harrison Ave. area of Royal Oak where new and rehabilitated apartment buildings are located next to light industrial buildings. These uses tend to be closer to one another than this project proposes but the integration of residential and light industrial uses is evident. This is a relatively new zoning concept and directly relates to advances in manufacturing technology that limit external impacts of industrial uses.

### ***PRO Rezoning Criteria***

Per *Section 713, Amendments to Ordinance, Subsection 2(D)(ii)*, “The applicant shall have the burden of demonstrating that the following requirements and standards are met by the PRO Plan, Conditions, and PRO Agreement:”

***a. Approval of the application shall accomplish, among other things, and as determined in the discretion of the City Council, the integration of the proposed land development project with the characteristics of the project area, and result in an enhancement of the project area as compared to the existing zoning, and such enhancement would be unlikely to be achieved or would not be assured in the absence of the use of a PRO.***

The project not only is a natural extension of the adjacent uses to the east, but it also blends and unifies the surrounding area as a whole, which include single-family residential uses, office uses, and corporate park. In addition, the PRO Plan allows for the preservation of a wooded area to the rear of the property, as well as a proposal to fill in the gaps to complete the area sidewalk network. Employees at the Corporate Park can either use these connections to walk/bike home or incorporate it into their walk or run. A variety of building types will be built along with high-quality architecture that is different from most complexes in Novi. Given the change in grade from the front of the site to the back, a variety of roof elevations will be visible and add to the unique character of the development.

Many units will have garages and detention will be handled through the creation of attractive, well-landscaped ponds at the front of the site, along Haggerty Road. In addition to the grand entryway from Haggerty Road, the front (not the rear of the buildings) will face the road. A total of 740 parking spaces will be needed for the project with 202 in garages (attached, detached and

dedicated), 154 in apron areas and 384 open surface spaces. The 384 open surface spaces, some containing carports, will be spread throughout the project and not have the same visual impact that the large lots for flex office space will from Haggerty Road.

This proposed project breaks from traditional Euclidian zoning calling for the separation and transition of uses. High impact industrial uses that created excessive amounts of smoke, odor, noise, vibration, etc. are virtually obsolete in today's industrial uses. Instead, modern companies use high tech processes and robotics, virtually eliminating exterior impacts and the need to provide transitional separation from residential uses. A review of the neighboring developments along Haggerty Road and to the rear, along Cabot Drive, indicate a mixture of office, research and development, and high-tech manufacturing operations with little or no external impacts like noise, odor or vibration.

The City of Novi has further recognized the change in these "New Economy Uses" as a Best Practice through its participation in the MEDC Redevelopment Ready Communities (RRC) Program, potentially leading ultimately to certification as a Redevelopment Ready Community. RRC Best Practice 2 encourages the mixing of land uses to create more vibrant and sustainable districts that benefit from improvements in technology. This concept can apply not only to the service and retail-oriented Town Center area, but also to the Industrial-Research-Office district. It is therefore not necessary, or even desired, to separate these land uses and require employees to drive to work instead of walking or riding a bike.

Although the Future Land Use designation for this site is Office Research Development and Technology, the Goals of the Master Plan would certainly support creating high-quality rental housing options that also encourage walking and biking. One of the Objectives in the City's Master Plan is to "Provide a wide range of housing options. Attract new residents to the City by providing a full range of quality housing opportunities that meet the housing needs of all demographic groups including but not limited to singles, couples, first time home buyers, families and the elderly." The Master Plan also encourages housing in walkable proximity to *employment centers* along with shopping, entertainment, recreation, etc.

Regarding existing zoning versus use of the PRO option, without new areas designated for future multiple-family use, it is unlikely that new multiple-family can be accommodated without the PRO option. There is currently an extremely low (approximately 4%) vacancy rate for existing multiple-family units throughout the city. The resulting high-demand for units is putting pressure on the housing market, as well as developers, to identify additional areas within the city for multi-family housing that can accommodate workers currently residing outside of the city due to the housing shortage.

Furthermore, according to our analysis, all of the sites but one (Society Hill) that are zoned for multiple-family residential use have been developed. We do recognize that there may be new residential uses introduced in and around the Town Center and City West areas in the future. Currently, however, most of the land in Novi that is either existing or planned for multiple-family residential is located south of I-96 and west of M-5, away from major employment areas of the city. Lastly, there are a number of areas remaining within the city that are currently planned for future

OST as well as zoned for existing OST zoning. Several of these areas still have an ample amount of vacant land for the development of new OST uses. Our research indicates that approximately 917 acres of land in Novi are zoned OST and 502 acres remain undeveloped. Alternately, 64.52 acres of land are zoned RM-2, Multiple-family and only 10 acres are undeveloped. Similarly, 1,215.77 acres are zoned RM-1, Multiple-family and approximately 40 acres are undeveloped. Utilizing the subject property as an RM-2/PRO residential development will in no way limit the city's ability to attract new OST uses, since appropriately zoned land is available.

***b. Sufficient conditions shall be included on and in the PRO Plan and PRO Agreement on the basis of which the City Council concludes, in its discretion, that, as compared to the existing zoning and considering the site specific land use proposed by the applicant, it would be in the public interest to grant the rezoning with PRO; provided, in determining whether approval of a proposed application would be in the public interest, the benefits which would reasonably be expected to accrue from the proposal shall be balanced against, and be found to clearly outweigh the reasonably foreseeable detriments thereof, taking into consideration reasonably accepted planning, engineering, environmental and other principles, as presented to the City Council, following recommendation by the Planning Commission, and also taking into consideration the special knowledge and understanding of the City by the City Council and Planning Commission.***

As noted above, this development is unlike any other proposed in the city and surrounding areas. With such a high demand for professional housing and new multi-family, this project will meet a significant need and benefit to the community. As such, this development will be thoughtfully designed to ensure its context, interspersing housing with industry will provide positive impacts both to residents and the surrounding businesses. This will be demonstrated to the city by way of the PRO Plan and PRO agreement, ensuring the benefits to the community outweigh any perceived detriments. A summary of the Key Benefits of the project are presented in Exhibit A and weighed against the reasonably foreseeable detriments.

***c. In the discretion of the City Council, it shall be determined that there is compliance with all of the General Standards for the approval of uses subject to special approval are met, as enumerated in Section 6.1.2.C.***

The proposed uses are all identified as Permitted under the RM-2, Multiple Family District, with the PRO, Planned Rezoning Overlay to ensure compliance with ordinance standards and City Council approval. Should conditions change during the planning process or if there is a determination that variances may be needed for the completion of the development, the PRO Plan as well as the PRO Agreement will be revisited with the city to ensure compliance with the ordinances. In addition, no phasing of the property is proposed at this time. However, building permits will be pulled either sequentially or in sub-phases. We do not anticipate a material delay between the construction of buildings, nor do we wish to wait for future demand in order to construct the westerly-most buildings.

### **Conclusion**

In conclusion, the City of Novi Planning Commission and City Council should approve the requested rezoning to RM-2, Multiple-Family District with a Planned Rezoning Overlay (PRO). This is the best

option in the ordinance to implement this innovative use of a challenging property, while adding value to the surrounding uses. The proposed project will save more natural features on the site than if developed only with OST uses; enhance the pedestrian pathway system in the area; provide high-quality rental housing options for companies in the Haggerty Corridor Corporate Park and nearby; create a visually appealing development not found elsewhere in the area; and create a higher quality appearance than permitted in a flex office building with associated large parking areas, while at the same time blending in with the overall character and appearance of the area through design and connectivity. Rezoning the property is just the first step in this unique development. Beztak understands that site plan approval will be needed and is ready to work cooperatively with the City to implement a successful, iconic project.

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

Sincerely,

**CIB PLANNING**

A handwritten signature in cursive script, reading "Carmine P. Avantini", enclosed in a thin black rectangular border.

Carmine P. Avantini, AICP  
President

## ***Appendix A: Summary of Key Project Benefits***

Below are the Key Project Benefits supporting the PRO rezoning request:

- ✓ The project helps meet the demand for professional housing for Novi companies looking to hire and relocate professionals into the area;
- ✓ Another option is provided for Novi residents looking to downsize from their single-family home yet stay in the City of Novi;
- ✓ It creates a walkable and bikeable residential community for employees of neighboring companies that wish to live close to work;
- ✓ We will complete the sidewalk connections in the Haggerty Corridor Corporate Park, as shown on Map #\_\_\_\_, to ensure that the Master Plan goal of providing nonmotorized connectivity is met;
- ✓ High-quality building facades are provided that are unlike other developments in the City of Novi and match the character of the Haggerty Corridor Corporate Park, as opposed to the mostly traditional design elsewhere;
- ✓ It better utilizes the natural features on the site, namely significant grade changes, without using extensive retaining wall systems, while at the same time avoiding the large paved parking areas and large footprints that are indicative of a typical OST development;
- ✓ The proposed project utilizes a physically challenging site in a positive fashion that adds to the tax base of the City;
- ✓ The mixture of uses adds value to, and is supported by the developer of, the Haggerty Corridor Corporate Park, Northern Equities, as well as the Harmon Company to the north of the site;
- ✓ This project provides an appropriate transition between the technology park uses to the west and single-family residential neighborhood to the east.

Below are the Reasonable Foreseeable Detriments associated with the PRO rezoning request:

- ✓ **Tree Clearing:** The plan will result in additional tree clearing beyond what was previously approved. It is important to note that Beztak and its consultants have worked with the City to further reduce the level of clearing proposed. The submitted plan actually includes a 29 ft. improvement in the tree line over what was previously presented to staff. The remainder of the woodlands not affected will be protected under a conservation easement.
- ✓ **Loss of Contiguous Office / Flex Area:** The proposed development will introduce a mix of uses to a previously monolithic planning area. The introduction of residential uses will add value to the existing surrounding office development as the presence of local professionally-targeted housing is

one of the greatest needs of local business owners. It will also visually improve the district by introducing fresh, modern architecture to a district that currently has limited building forms.

- ✓ Increase in Use of Local Infrastructure: The resulting development will add users to the local traffic and infrastructure network. However, we believe that a residential development will add less stress on local infrastructure networks than will an OST development. Please refer to the revised Traffic Impact Study that shows that our proposed development will have a smaller impact on local traffic patterns than would a hypothetical OST development.



## ***Appendix B: Summary of Requested Deviations***

Below are the deviations (in red) being requested under the PRO Rezoning application to allow reasonable and appropriate development, given the unique characteristics of the site:

### **BUILDING SPECIFICATIONS**

#### Maximum Building Length

Building	Maximum Length	length, ft
1	180	241
2	180	186
3	180	298
4	180	242
5	180	218
6	180	218
7	180	242
8	180	298
9	180	186
10	180	195

Given the narrow configuration of the site, longer buildings are needed to obtain the number of units that allow the project to be feasible. Ordinance requirements are intended to apply to all developments while this particular property has unique physical characteristics that necessitate fewer, longer buildings.

#### Maximum Number of One Bedroom Units

Total Units	332					Note: all units meet or exceed the	
% of total	38.55%	1's	51.20%	2's	10.24%	3's	minimum required sq. ft.

The ordinance requires that a maximum of 20% of the units be one-bedroom but current market and project demands indicate the need for a greater percentage. This is especially true with professional-targeted housing, based upon the experience of Beztak, which owns and manages a nearby apartment complex and others across the state and country.

We are requesting a waiver to increase the percentage of 1BR units to approximately 40% in order to better fit the demand of our target market, which includes young, professional workers employed in the nearby businesses as well as corporate transfers who may not need the larger spaces provided by 2-3 BR units. More 1BR units will allow more educated, well-compensated workers to stay in Novi and patronize local businesses until the time that they are ready to buy a home. High-quality, entry-level housing will attract more people to Novi and provide a better pathway to local Novi home ownership. The higher level of 1BR units is also supported by proposed density below the maximums, both in terms of numbers of rooms allowed as well as developable units per acre.

Planning had requested further discussion on how the requirements for the total number of rooms shall be met, given the mix of 3-story and 4-story buildings. Since the proposed development

contains a mix of 3-story and 4-story buildings, the requirement for the maximum number of rooms was calculated based on a weighted average of the RM-2 requirements for 3-story and 4-story buildings of 1 room per 2,000 SF of site area and 1 room per 700 SF of site area, respectively. Approximately 66% of the units are located in 4-story buildings and 34% are located in 3-story buildings. Apportioning the site area based on the 66%/34% split, there would be a limit of 1,020 rooms allowed based on a blended basis. Using the calculations Planning has outlined, the proposed development will produce a total of 890 rooms on a blended basis, well below the limit.

**BUILDING SETBACKS & ALIGNMENT**

Building	Front Req.	Front	Side Req.	Side	Rear Req.	Rear	Angle Req.	Angle to Property Line
1	75	187	75	68	75	n/a	45	90
2	75	n/a	75	115	75	n/a	45	90
3	75	n/a	75	116	75	n/a	45	0
4	75	n/a	75	116	75	215	45	0
5	75	n/a	75	n/a	75	215	45	90
6	75	n/a	75	n/a	75	n/a	45	90
7	75	n/a	75	92	75	215	45	0
8	75	n/a	75	92	75	n/a	45	0
9	75	n/a	75	92	75	n/a	45	90
10	75	181	75	92	75	n/a	45	90
Club	75	n/a	75	n/a	75	n/a	45	90

The size and width of the site make it impractical and inefficient to develop with all perimeter buildings at a 45-degree angle to the property lines. Given the narrow shape of the site, more tree clearing would be required to achieve a feasible development better meeting this requirement. It is also our goal to make the multi-family use fit in with the surrounding developments. We are considering this development as an Accessory Use to the overall OST District. As such, we want this development to visually fit into the context of the district. Conforming to the RM layout requirements would most certainly prevent this site from fitting into the context of the district.

**PARKING & DRIVES**

Side Yard Coverage

Only 30% side yard can be used for parking & drives	
Property Depth	1374 ft
Front & rear yard Setback	75 ft
Property Depth remainder	1224 ft
side yard Setback	75 ft
Side Yard Area	183600 sf
Side Yard parking/drives	40.83%

Once again, due to the narrow configuration of the site, additional side yard coverage is needed to provide adequate parking and drives for the complex. Failure to provide these items will negatively impact other requirements that can be considered health, safety related.

Required Parking Spaces

Parking Required

1 bed	128	2.0	256
2 bed	170	2.0	332
3 bed	34	2.5	85
Club	332	4.0	83
		<b>Total</b>	<b>764</b>

Parking Provided

Garages, att.			154
Garages, det.			48
Aprons			154
Carports			
Surface			384
		<b>Total</b>	<b>(2.23 spaces per unit) 740</b>

Parking Justification

1 bed	128	1.5	192
2 bed	170	2.0	340
3 bed	34	2.25	76.5
guest	332	0.2	66.4
Club (Staff + Visitors)		20	20
		<b>Total</b>	<b>695</b>

Additional parking can be provided, but in our extensive experience it is not needed. Installing only the parking needed reduces impervious area and minimizes disruption (grading & trees) Most 1-bedroom units will have only 1 resident. Many, but not all, 2-bedroom units will have 2 residents, and not all 2-resident units will have 2 cars. Almost all 3-bedroom units will only have 2 residents. The 3rd room is usually an office or storage

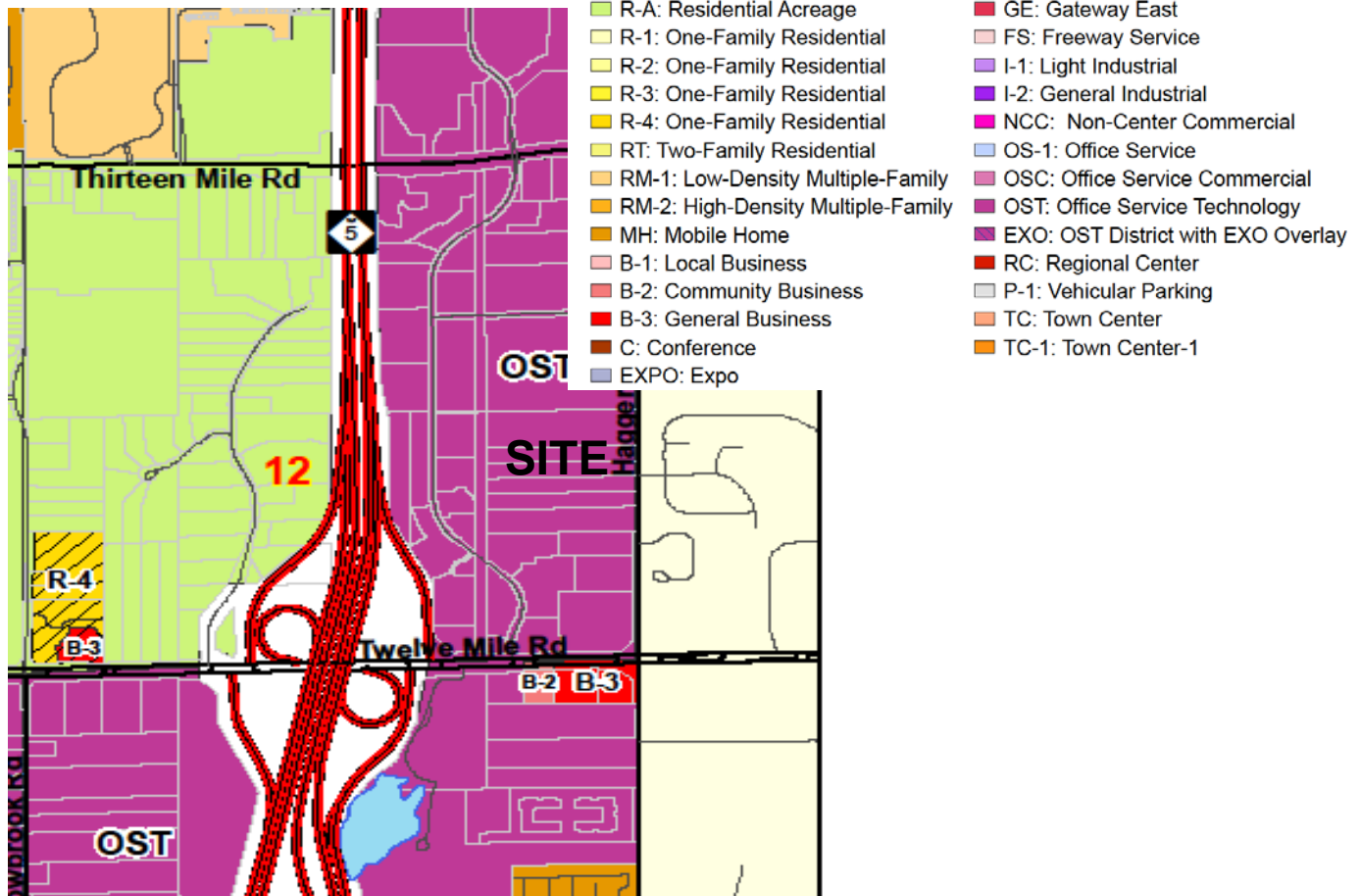
Most residents don't get visitors frequently, and especially not on weekdays (think of your own number of visitors). Residents using the clubhouse will very likely walk. There will be about 5 Staff, and usually 4-5 visitors at most at any time. In addition, 83 parking spaces are not needed for the clubhouse. The farthest apartment is roughly 825' from the clubhouse, the closest is 80', and the majority are less than 500' away (for reference: walking across a Meijer store is about 530').

Beztak manages two nearby apartment complexes, Saddle Creek in Novi and Citation Club in Farmington Hills. Saddle Creek has a parking ratio of 2.03 spaces per unit and 1.14 spaces per bedroom. Citation Club has a parking ratio of 2.00 spaces per unit and 1.26 spaces per bedroom. Neither have experienced any parking issues. Beztak is proposing 2.23 spaces per unit and 1.30 spaces per bedroom, which is above both of the Beztak comps. For this reason, we deem our proposal acceptable.

## Exhibit C

### Project Information - Novaplex Residential Development

#### Site & Project Information



Location / Zoning Map (excerpt)

#### Site Information, Zoning & Land Use –

Sidwell No. 22-12-400-009, 22-12-400-010 & 22-12-400-011  
 Location: West side of Haggerty Road, 1/2 mile north of 12 Mile Road  
 Acres/Frontage: 22.00 acres, 21.03 ac. net, with 697.7' frontage on Haggerty Road  
 Zoning / Use: Office Service Technology (OST) / Vacant  
 Adjacent Uses: north is the 1 story Hanon office/industrial building  
 west is the ITC corridor and then office/industrial buildings along Cabot Dr.  
 south is the 3 story Medical Office building  
 east is Haggerty Road and a single family residential neighborhood.

#### Existing Conditions

- Marketed the Novaplex site as office/R&D/light-industry through several brokers since 2000
  - A few mildly interested contacts.
  - Not enough demand for speculative construction of office/R&D/LI space
- Market Demand – Rents in the traditional office market are slowly increasing, but are still too low to support new speculative construction. Rents in the flex sector, which typically consist

of 1 story buildings, support some limited new non-speculative construction. The market for flexible office/research space is a little healthier than traditional office space.

- The market doesn't support a lot of new growth for research/office flex space.
- There is about 598 acres of undeveloped / underdeveloped OST land in the City
  - The flex office market absorbs approximately 147,000 SF of space per year
  - The maximum coverage in OST is a function of setbacks, parking and landscaping requirements. We'll conservatively estimate 35% for this exercise.
  - Even if 30% of the land is wetland, that leaves  
 $((598 \text{ ac} \times 43560 \text{ sf}) \times 0.70 \text{ upland}) \times 35\% = 6,381,975 \text{ sf}$  of building or approximately 40 years of inventory, depending on your needs.
- Market studies show about 500,000 sf of office/flex space in various stages of planning, and feasible rent rates lower than the rates needed to justify new development.
- Research shows approx. 590 acres of vacant or underdeveloped OST land in the City.
- Costar reports for various types of available office/R&D/Light industrial space reveals ample inventory for a decade or more depending on your needs.
- There are few Class A apartment developments in the market area, north of I-96/I-696. With an average vacancy rate around 4%, all are nearly full. Our own Citation Club, 1/2 mile north on the corner of Haggerty and 13 mile roads, is 600 units and is 95% full.

#### **Reasoning for Residential Development – This 22 acre site is ideal for upscale apartments**

- Many current Haggerty Corridor Corporate Park tenants have younger staff
  - Lots of bikes at their existing area buildings
  - Demand for more walk/bike opportunity
- The market we have identified for this area
  - Class A apartments to serve “walkability” demands of area businesses
  - Apartments are a growing segment of the housing market, especially popular with millennials and retirees.
- New Residential density is proposed by City for the Downtown area
  - There is a clear benefit from having people live in the Downtown area
- No new residential density is proposed near the primary OST employment district
  - There is a clear benefit from having people live near employment centers
  - There is a need for apartments in this area. We have the 95%+ occupied Citation Club apartments 1/2 mile away, but the multifamily market is strong enough that we are not concerned about competing with ourselves.
- Many businesses require “everything” in one area for convenience of employees. The apartments will be a great complement to the area businesses, support high-income employment in the area and make a more productive, less disruptive use out of land with challenging topography and dimensions.
- The total apartment supply in the pipeline is only about 3 years, and there is a much higher likelihood that the apartment space is leased than flex office space, all things being equal.
- The topography of this site is not suited for large, single floor grade industrial buildings
- The topography of this site is better suited for numerous smaller buildings
- The site within a business and employment center
- The opposite side of Haggerty is residential, so this site serves as a transition area.
- Residential density is best near major thoroughfares, retail/services. (M-5, I-696/I-96, 12 Mile, Haggerty)
- Treelines/wooded area will help screen residential use on west half of site.

- According to our tenant selection requirements, the minimum household income needed to qualify at the average rent is \$52,750 (3x the monthly rent in income). Per the market study, more than 70% of the households have an income of \$50,000 or above, with a median household income of \$85,000. The concentration of households with a \$50,000+ income has grown from 66% in 2010 to 72% in 2016 and is expected to reach 74% by 2021. More housing options for this growing population will be needed.

### **Design Considerations –**

There are some design considerations that affect the general site layout

- Small building components, varied roofline, and facade articulation to reduce massing.
- Preserve a large portion of the existing wooded area as a wildlife corridor.
- Provide walk connections to improve “walkability” in the area.
- Residential buildings shall fit the context of the area office/light industrial buildings

### **Site Improvements**

The proposed development will have:

- 10 Residential buildings, 3 to 4 stories, with 332 apartment units
- 154 attached and 48 detached garages, 262 carports, and driveway aprons and surface parking
- A clubhouse for the residents, with fitness room & pool, social space, & outdoor recreation
- Amenities and accessory uses (drives and parking, utilities, landscaping, pathways, etc.)
- A pathway connection through the ITC corridor to access the businesses on Cabot Drive.

Buildings will be conventional wood frame construction on the upper floors. Masonry, cementitious and stone veneers, siding and complimentary materials for various architectural details and features will cover the building. The building shall have high-quality interior and exterior finishes.

**Phasing** - No phasing is proposed, however, building construction will be staggered so that 2 or 3 buildings start, then the next 2 or 3 start after the first buildings are under way, and so on.

**Residential Unit Types** – The 332 residential units shall consist of:

128 (39%) 1 bedroom units, 720sf - 960sf with a base monthly rent starting near \$1350.

170 (51%) 2 bedroom units, 1000sf – 1200sf with a base monthly rent starting near \$1625.

34 (10%) 3 bedroom units, 1470sf – 1670sf with a base monthly rent starting near \$1850.

Units will be unfurnished, with carpeted bedrooms and with resilient flooring in the living room, dining area, hallway, bathrooms and kitchen. All units will have color-coordinated high-end appliances (stove, refrigerator w/ ice maker, garbage disposal, dishwasher, and full-sized washer and dryer). All will have individually controlled heat and air conditioning.

**Residential Target Market** - We anticipate our apartments residents will primarily be:

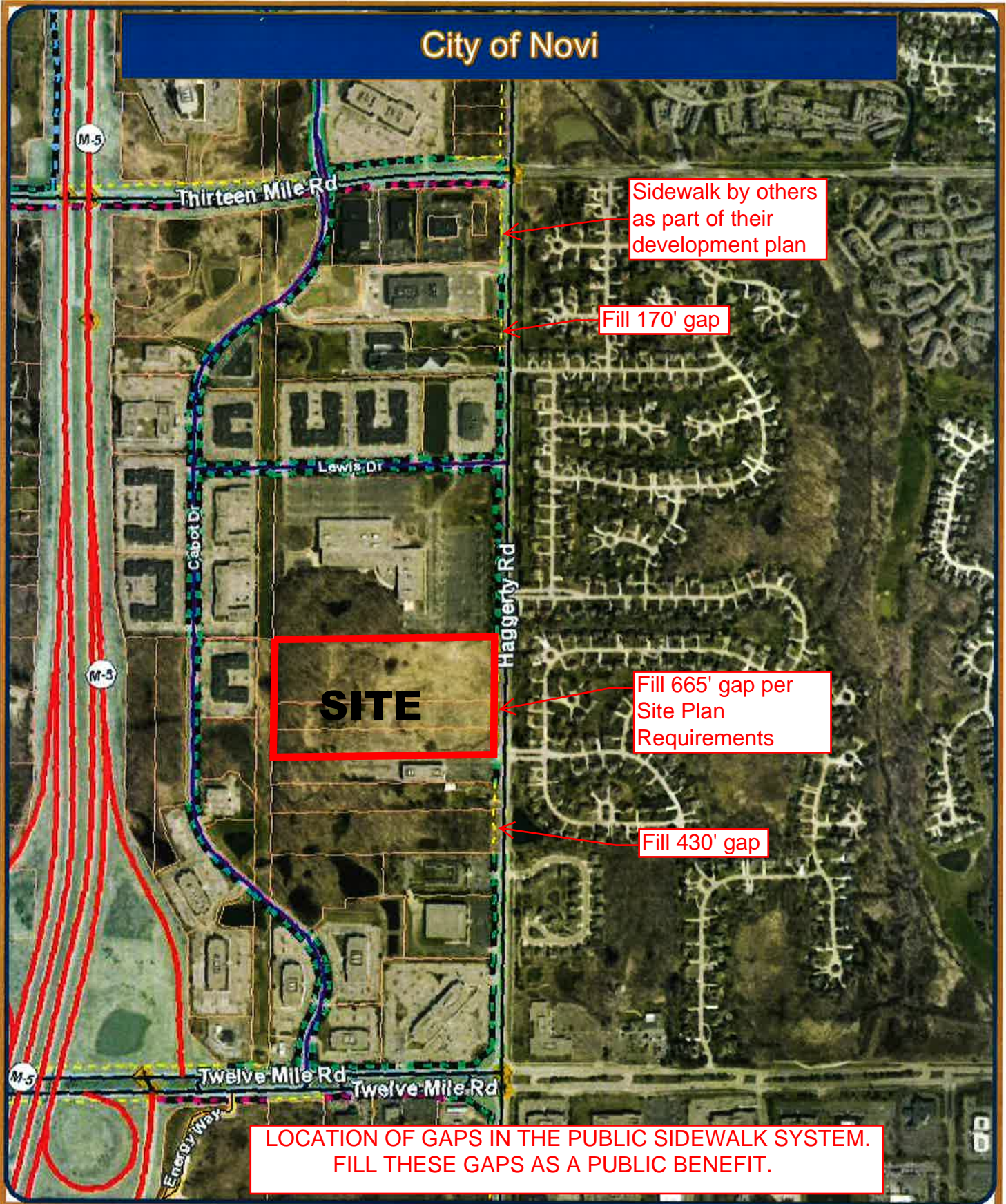
- Professionals, Couples and some young Families;
- Corporate executives of nearby companies & Corporate transfers new to the area
- Highly-skilled employees of nearby OST businesses.

Our residents want to live in a secure setting with covered parking and want to be close to work, but don't want to buy a home yet. Many residents want the opportunity to walk or bike to work.

### **Operations & Ownership**

The site will be developed by an entity related to the Beztak Companies. This would include mass grading, storm water detention basins and storm sewers, the sanitary sewer and water mains, the buildings, private driveways and landscaping. The Site will be owned, operated, and maintained by an entity related to the Beztak Companies.

# City of Novi



Sidewalk by others  
as part of their  
development plan

Fill 170' gap

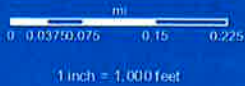
Fill 665' gap per  
Site Plan  
Requirements

Fill 430' gap

**SITE**

**LOCATION OF GAPS IN THE PUBLIC SIDEWALK SYSTEM.  
FILL THESE GAPS AS A PUBLIC BENEFIT.**

**MAP IDENTIFICATION NOTE:**  
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 available source data. It is for the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements per se. It is a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to obtain source and accuracy information related to this map.



Map Print Date:  
6/10/2019



**City of Novi**  
45175 Ten Mile Rd  
Novi, MI 48375  
cityofnovi.org

VIA ELECTRONIC MAIL

June 18, 2019

Mr. Charles Boulard  
Community Development Director  
City of Novi Community Development  
45175 10 Mile Road  
Novi, MI 48375



Re: Haggerty Road Apartments

Dear Mr. Boulard,


As the owner of over twenty office and office/research buildings and almost four hundred acres of land zoned Office, Service Technology in the City of Novi, we have an unparalleled insight into the needs, wants and desires of some of the largest and most well-known tenant's in the City. Walk through any building in the Haggerty Corridor Corporate Park and you will see professional young men and women, well-educated and highly skilled. They are the key the future success of not only our economy in general, but the continued popularity of Novi as a destination for great companies.

Since its inception in the 1999, the Haggerty Corridor Corporate Park has become the premier office park in the Detroit Metropolitan Area. It has consistently garnered higher rents than the surrounding area. The main reason companies are willing to pay a premium to be in our Park is the value placed on recruiting new talent. As the economy has evolved, the City and Northern Equities Group have modified the zoning to include new uses. First, the zoning was changed to add schools and the dorms associated with those schools. Then, five years ago, we brought Starbucks to the Park. At least three leases were signed where having a Starbucks within walking distance was crucial to their final decision. Now, as millennials are entering the labor market, we need to add other tools to the zoning code to attract talent to Novi and the Park.

The next modification to zoning districts needs to be the ability to add more uses to the office and office/research districts. More specifically, we need the ability to add multifamily, for-rent apartments that are walkable to our buildings. While it is true that Millennials and Generation Z still crave home ownership, the bedrock of the City of Novi, the simple fact is that many of the new entrants to the labor force cannot afford to purchase a home Novi. However, we still need to provide ways for that cohort to stay in Novi, close to the Fortune 500 companies we all want to locate here. The best way to do that is to build multifamily apartments within and adjacent to the Park. The site on Haggerty Road owned by Beztak is the perfect location to provide the density and quality we believe is necessary to augment our development goals for the Park.

We firmly believe that the addition of apartments on Haggerty Road near 12 Mile will be a huge asset to the Park, the City, and all of our efforts to build on the success of the past few years.

Sincerely,

  
Matthew S. Sosin  
President

REAL ESTATE DEVELOPMENT,  
CONSTRUCTION AND INVESTMENT



**HARMAN**

30001 Cabot Drive  
Novi, MI 48377 USA

+1.248.254.7700

+1.203.724.2169

brooke.matthews@harman.com



April 10, 2018

Mr. Charles Boulard  
City of Novi  
Community Development Director  
45175 W. 10 Mile Road  
Novi, MI 48375

Re: Apartment Development on Haggerty Road south of Lewis Drive

Dear Mr. Boulard:

In regards to the subject matter, we feel that having apartments connected to the HCCP Park in walkable and bike-able distance to our buildings would be beneficial to our company for recruiting and retaining employees. Recruiting and retaining employees is a large component of our human resources budget and any amenity that decreases those costs provides a community benefit for all of our stakeholders.

Please call me to discuss further, or if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "E. Brooke Matthews". The signature is fluid and cursive, with a large loop at the end.

E. Brooke Matthews  
Facilities / Fleet Services Manager

## TRAFFIC IMPACT STUDY

# Memo

VIA EMAIL

**To:** Mr. Mark Highlen  
Beztak Companies

**From:** Julie Kroll, PE, PTOE  
Jacob Swanson, EIT  
Fleis & VandenBrink

**Date:** June 19, 2019

**Re:** Novaplex Residential Development  
City of Novi, Michigan  
Trip Generation Analysis

This memorandum presents the results of a Trip Generation Analysis for the proposed Novaplex Residential development in Novi, Michigan. The purpose of this evaluation is to provide a comparison of the trips generated by the previously approved development plan for this site and the currently proposed development plan.

A trip generation analysis was performed for both site plans in order to evaluate the potential change in trip generation as a result of the proposed development. The number of weekday, AM and PM peak hour vehicle trips were generated for the proposed development in accordance with the methodologies and equations published by the Institute of Transportation Engineers (ITE) in *Trip Generation, 10<sup>th</sup> Edition*.

The previously approved site plan for this development included OST land uses that consisted of Light Industrial, Research & Development, and General Office. The current site plan is proposed to include 350 multi-family units. The trip generation comparison is summarized in **Table 1**.

**Table 1: Trip Generation Comparison**

Analysis Scenario	Land Use	ITE Code	Amount	Units	Average Daily Traffic	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
Previously Approved Site Plan	General Light Industrial	110	27,000	SF	160	15	2	17	2	13	15
	Research & Development Center	760	81,000	SF	1,033	26	8	34	7	42	49
	General Office	710	137,000	SF	1,440	133	22	155	25	129	154
	<i>Total</i>		<i>245,000</i>	<i>SF</i>	<i>2,633</i>	<i>174</i>	<i>32</i>	<i>206</i>	<i>34</i>	<i>184</i>	<i>218</i>
Proposed Site Plan	Multi-Family Home (Mid-Rise)	221	350	D.U.	1,906	30	87	117	90	57	147
<b>Difference</b>					<b>-727</b>	<b>-144</b>	<b>55</b>	<b>-89</b>	<b>56</b>	<b>-127</b>	<b>-71</b>

The results of the trip generation analysis shows that on a daily basis and during the AM and PM peak hours the trips generated by the proposed development plan will have less impact than the previously approved site plan. The overall impact of the proposed development on the adjacent roadway network will be less than would have been experienced by the previously approved development plan.

Any questions related to this memorandum should be addressed to Fleis & VandenBrink Engineering.

JJS2:jmk

# MEMO

VIA EMAIL

---

**To:** Mr. Mark Highlen  
Beztak Companies

---

**From:** Julie Kroll, PE, PTOE  
Jacob Swanson, EIT  
Fleis & VandenBrink

---

**Date:** May 10, 2019

---

**Re:** Novaplex Residential Development  
City of Novi, Michigan  
Traffic Impact Study

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## INTRODUCTION

This memorandum presents the results of a Traffic Impact Study (TIS) completed for the proposed Novaplex multi-family residential development in the City of Novi, Michigan. The proposed development includes up to 350 multi-family residential units. The project site is located on the west side of Haggerty Road, approximately ½ mile north of 12 Mile Road. Site access is proposed via one new site driveway to Haggerty Road and a shared access connection with the existing Infinity Medical Building Driveway aligned with Heatherbrook Drive. Per the City of Novi Community Development Department's *Site Plan and Development Manual (Section 1)*, a TIS is required for the project.

Haggerty Road is under the jurisdiction of the Road Commission for Oakland County (RCOC). This TIS has been completed to identify the impacts (if any) of the proposed development traffic on the intersection of Haggerty Road & Heatherbrook Drive / Infinity Medical Drive, as well as the proposed site driveways.

The scope of the study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practice, and methodologies published by the Institute of Transportation Engineers (ITE). Additionally, F&V solicited input regarding the scope of work from RCOC and the City of Novi traffic engineering consultant, AECOM.

## DATA COLLECTION

The existing weekday turning movement traffic volume data were collected by F&V subconsultant Traffic Data Collection, Inc. (TDC) on Tuesday, February 14, 2017. Intersection turning movement counts were collected during the weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak periods at the intersection of Haggerty Road & Heatherbrook Drive / Infinity Medical Drive.

Per the City of Novi Community Development Department's *Site Plan and Development Manual (Section 1, pg 48)*, "the City may permit counts up to three years old to be increased by a factor supported by documentation or a finding that traffic has increased at a rate less than two percent annually in the past three to five years". F&V reviewed the historical traffic volume data for Haggerty Road which indicates that traffic volumes decreased between 2013 and 2018. Therefore, it was determined that the 2017 traffic volumes were acceptable for use in the study. The historical traffic volumes are attached.

Since the historical traffic volumes showed a decrease in growth, the SEMCOG community profile for the City of Novi was reviewed to calculate a background growth rate. The SEMCOG data showed a projected marginal increase in population and employment from 2010 to 2040. The SEMCOG community profile data is attached.

Therefore, a conservative background traffic growth of 1% per year was assumed in this study to calculate the existing 2019 traffic volumes. This data was used as a baseline to establish existing traffic conditions without the proposed development. Additionally, F&V collected an inventory of existing lane use and traffic controls.

**EXISTING CONDITIONS (2019)**

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (Version 10) traffic analysis software. This analysis was based on the existing lane use and traffic control shown on the attached **Figure 1**, the existing peak hour traffic volumes shown on the attached **Figure 2**, and the methodologies presented in the *Highway Capacity Manual 6<sup>th</sup> Edition* (HCM). Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. Additionally, SimTraffic network simulations were reviewed to evaluate network operations and vehicle queues. The existing conditions results are attached and summarized in **Table 1**.

**Table 1: Existing Intersection Operations and Vehicle Queue Lengths**

Intersection	Control	Approach	Existing Conditions			
			AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS
1 Haggerty Road & Heatherbrook Drive / Infinity Medical Drive	Stop (Minor)	EBL	34.9	D	64.9	F
		EBR	15.5	C	13.5	B
		WBL	47.4	E	69.3	F
		WBR	10.8	B	16.1	C
		NBL	9.8	A	8.9	A
		SBL	8.2	A	9.9	A
Intersection	Control	Approach	Average (ft)	95 % (ft)	Average (ft)	95 % (ft)
1 Haggerty Road & Heatherbrook Drive / Infinity Medical Drive	Stop (Minor)	EBL	5	22	10	36
		EBR	13	37	17	45
		WBL	17	48	16	50
		WBR	9	33	8	31
		NBL	10	31	0	5
		SBL	1	8	3	15

The results of the existing conditions analysis show that the STOP controlled left turn movements from Heatherbrook Drive and the Infinity Medical Office driveway currently operate at a LOS E or F during both peak periods. The vehicle simulations were further reviewed which show that significant vehicle queuing is not present during the peak periods for the STOP controlled approaches. The 95<sup>th</sup> percentile vehicle queue lengths for these approaches are calculated to be 50 feet (2 vehicles) or less during both peak periods, which is not significant.

**Existing Signal Warrant Analysis**

A signal warrant analysis was performed at the study intersection of Haggerty Road & Heatherbrook Drive / Infinity Medical Drive. The *Michigan Manual on Uniform Traffic Control Devices (MMUTCD)* documents eight warrants by which traffic signal control may or should be considered. This study evaluated the volume warrants: Warrant 1 (8-Hour), Warrant 2 (4-Hour), and Warrant 3 (Peak-Hour). The results of the signal warrant analysis indicate that the existing volumes **do not meet** the thresholds to satisfy any signal warrants evaluated. The existing signal warrant analysis worksheets are attached.

**BACKGROUND CONDITIONS (NO BUILD 2022)**

The 1% annual growth rate was applied to the existing 2019 traffic volumes to calculate the projected 2022 background traffic volumes with the addition of the proposed development. In addition to background growth, it is important to account for traffic that is expected to be generated by approved developments within the vicinity of the study area that have yet to be constructed or are currently under construction. No background

developments were identified near the study area that are expected to be completed prior to the site buildout of the proposed development.

**Background Operations**

Background peak hour vehicle delays and LOS were calculated based on the existing lane use and traffic control shown on the attached **Figure 1**, the background traffic volumes shown on the attached **Figure 3**, and the methodologies presented in the HCM. The results of the background conditions assessment are attached and summarized in **Table 2**.

**Table 2: Background Intersection Operations and Vehicle Queue Lengths**

Intersection	Control	Approach	Existing Conditions				Background Conditions				Difference			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1 Haggerty Road & Heatherbrook Drive / Infinity Medical Drive	Stop (Minor)	EBL	34.9	D	64.9	F	37.0	E	72.7	F	2.1	D > E	7.8	-
		EBR	15.5	C	13.5	B	15.9	C	13.8	B	0.4	-	0.3	-
		WBL	47.4	E	69.3	F	52.5	F	78.2	F	5.1	E > F	8.9	-
		WBR	10.8	B	16.1	C	10.9	B	16.6	C	0.1	-	0.5	-
		NBL	9.8	A	8.9	A	9.9	A	8.9	A	0.1	-	0.0	-
		SBL	8.2	A	9.9	A	8.2	A	10.0	B	0.0	-	0.1	A > B
Intersection	Control	Approach	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)
1 Haggerty Road & Heatherbrook Drive / Infinity Medical Drive	Stop (Minor)	EBL	5	22	10	36	4	22	9	33	-1	0	-1	-3
		EBR	13	37	17	45	11	34	17	44	-2	-3	0	-1
		WBL	17	48	16	50	18	48	11	40	1	0	-5	-10
		WBR	9	33	8	31	12	37	8	31	3	4	0	0
		NBL	10	31	0	5	9	29	1	6	-1	-2	1	1
		SBL	1	8	3	15	1	7	3	15	0	-1	0	0

The results of the background conditions analysis show that all study intersection approaches and movements are expected to continue to operate in a manner similar to existing conditions during both the AM and PM peak hours, with the exception of the left-turn movements during the AM peak period. The eastbound left-turn and westbound left-turn movement will decrease to a LOS E and LOS F, respectively. Review of network simulations also indicates traffic operations will be similar to existing conditions, with the 95<sup>th</sup> percentile vehicle queue lengths on Heatherbrook Drive and Infinity Medical Drive at 50 feet (2 vehicles) or less during both peak periods, which is not significant.

**SITE TRIP GENERATION**

The number of AM and PM peak hour vehicle trips that would be generated by the proposed development was forecast based on data published by ITE in the *Trip Generation Manual, 10<sup>th</sup> Edition*. The site trip generation forecast for the proposed development is summarized in **Table 3**.

**Table 3: Site Trip Generation**

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)			PM Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Multi-Family Homes (Mid-Rise)	221	350	D.U.	1,906	30	87	117	90	57	147

**SITE TRIP DISTRIBUTION**

The vehicle trips that would be generated by the proposed development were assigned to the study road network based on existing peak hour traffic patterns, the proposed site plan, and the methodologies published by ITE. This methodology indicates that new trips will return to their direction of origin. The site trip distributions used in the analysis are summarized in **Table 4**.



**Table 4: Site Trip Distribution**

To/From	Via	AM	PM
North	Haggerty Road	34%	43%
South	Haggerty Road	66%	57%
Total		100%	100%

The site-generated vehicle trips were assigned to the study road network based on these trip distribution patterns and are shown on the attached **Figure 4**. The site-generated trips were added to the background traffic volumes to calculate the future peak hour traffic volumes shown on the attached **Figure 5**.

**FUTURE CONDITIONS (WITH DEVELOPMENT 2022)**

Future peak hour vehicle delays and LOS *with the proposed development* were calculated based on the existing lane use and traffic control, the future traffic volumes, the proposed site access plan, and the methodologies presented in the HCM. Additionally, SimTraffic simulations were reviewed to evaluate network operations and vehicle queues. The results of the future conditions analysis are attached and are summarized in **Table 5**.

**Table 5: Future Intersection Operations and Vehicle Queue Lengths**

Intersection	Control	Approach	Background Conditions				Future Conditions				Difference			
			AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1 Haggerty Road & Heatherbrook Drive / Infinity Medical Drive	Stop (Minor)	EBL	37.0	E	72.7	F	44.4	E	95.6	F	7.4	-	22.9	-
		EBR	15.9	C	13.8	B	17.6	C	14.5	B	1.7	-	0.7	-
		WBL	52.5	F	78.2	F	72.2	F	103.3	F	19.7	-	25.1	-
		WBR	10.9	B	16.6	C	11.1	B	17.3	C	0.2	-	0.7	-
		NBL	9.9	A	8.9	A	10.2	B	9.1	A	0.3	A > B	0.2	-
		SBL	8.2	A	10.0	B	8.3	A	10.2	B	0.1	-	0.2	-
2 Haggerty Road & Proposed Site Drive	Stop (Minor)	EBL	N/A				33.6	D	65.1	F	N/A			
		EBR	N/A				17.4	C	13.9	B	N/A			
		NB LT	N/A				9.9	A	9.3	A	N/A			
		SB	N/A				Free		Free		N/A			
Intersection	Control	Approach	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)	Avg. (ft)	95 % (ft)
1 Haggerty Road & Heatherbrook Drive / Infinity Medical Drive	Stop (Minor)	EBL	4	22	9	33	6	25	15	44	2	3	6	11
		EBR	11	34	17	44	18	43	23	51	7	9	6	7
		WBL	18	48	11	40	25	63	16	48	7	15	5	8
		WBR	12	37	8	31	10	33	9	32	-2	-4	1	1
		NBL	9	29	1	6	11	32	7	23	2	3	6	17
		SBL	1	7	3	15	1	10	5	21	0	3	2	6
2 Haggerty Road & Proposed Site Drive	Stop (Minor)	EBL	N/A				20	48	18	48	N/A			
		EBR	N/A				27	53	20	46	N/A			
		NB LT	N/A				13	55	36	123	N/A			
		SB	N/A				Free		Free		N/A			

The results show that all STOP controlled left turn movements from Heatherbrook Drive, Infinity Medical Office Drive, and proposed site driveway will operate at a LOS E or F during both peak periods. However, review of network simulations indicates acceptable traffic operations and significant vehicle queues are not observed. On all STOP controlled approaches, 95<sup>th</sup> percentile vehicle queues are calculated to be 53 feet (2 - 3 vehicles) or less during both peak periods, which is not significant.

### Future Signal Warrant Analysis

A signal warrant analysis was performed at the study intersection of Haggerty Road & Heatherbrook Drive / Infinity Medical Drive. The analysis evaluated the volume warrants: Warrant 1 (8-Hour), Warrant 2 (4-Hour), and Warrant 3 (Peak-Hour) with the addition of the site generated traffic volumes. The results of the signal warrant analysis indicate that the future volumes **do not meet** the thresholds to satisfy any signal warrants evaluated. The future signal warrant analysis worksheets are attached.

### Access Management

The offset distance at the proposed site driveway to Haggerty Road was evaluated according to the commercial driveway spacing requirements outlined in the City Ordinance *Section 11-216*. These requirements indicate that the proposed site driveway requires a minimum offset of 200 feet from Glenbrook Drive, on the opposite side of the street and 300 feet from Heatherbrook Drive, on the same side of the street. The proposed site drive on Haggerty Road meets these driveway spacing requirements, as summarized in **Table 6** below.

**Table 6: City of Novi - Driveway Spacing**

Adjacent Driveway	City Requirement	Proposed	Met?
North (Glenbrook)	200 ft	500 ft	Yes
South (Heatherbrook)	300 ft	300 ft	Yes

The existing shared site access driveway at Heatherbrook Dr. currently provides left-turn passing flares/right-turn lanes on the north and south approaches. Therefore, this analysis evaluated the RCOC warrants for right and left turns at the proposed site access drive to Haggerty Road. The results of this analysis indicates that a right-turn deceleration taper and a left turn treatment are recommended at the proposed Site Drive. Any proposed geometric improvements on Haggerty Road should be reviewed by RCOC and designed in accordance with RCOC requirements.

### CONCLUSIONS

*The conclusions of this Traffic Impact Study are as follows:*

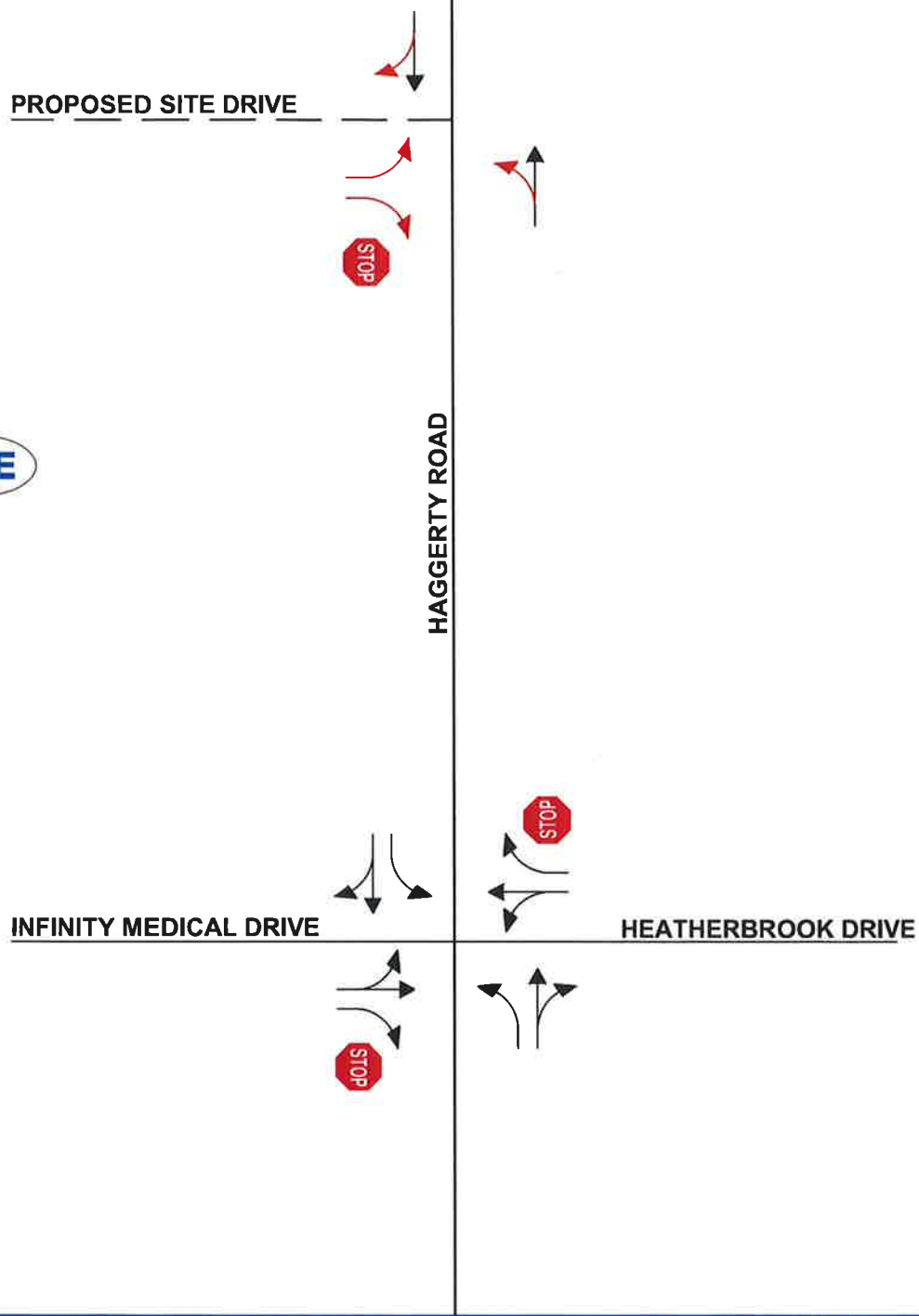
1. The results of the existing conditions analysis show that the STOP controlled left turn movements from Heatherbrook Drive and the Infinity Medical Office driveway currently operate at a LOS E or F during both peak periods; however the 95<sup>th</sup> percentile vehicle queue lengths for these approaches are calculated to be 50 feet (2 vehicles) or less during both peak periods, which is not significant.
2. The analysis of background conditions **without the proposed development** show operations similar to existing conditions and any increases in delay would not be discernable.
3. The analysis of future conditions **with the proposed development** show that all STOP controlled left turn movements from Heatherbrook Drive, Infinity Medical Office Drive, and the proposed site driveway will operate at a LOS E or F during both peak periods. However, review of network simulations indicates acceptable traffic operations and significant vehicle queues are not observed. On all STOP controlled approaches, 95<sup>th</sup> percentile vehicle queues are calculated to be 53 feet (2 - 3 vehicles) or less during both peak periods, which is not significant.
4. A traffic signal is not warranted or recommended at the intersection of Haggerty Road & Heatherbrook Drive / Infinity Medical Drive with the existing or future traffic volumes.
5. The proposed site driveway on Haggerty Road meets the City of Novi driveway spacing requirements.
6. A right turn deceleration taper and left turn treatment is recommended at the proposed site access drive on Haggerty Road. Any proposed geometric improvements should be reviewed by RCOC and designed in accordance with RCOC requirements.

**Attached:** Figures 1-5  
Traffic Volume Data  
SEMCOG Data  
Synchro / SimTraffic Results  
Signal Warrants  
RCOC Auxiliary Lane Warrants

JJS2:jmk





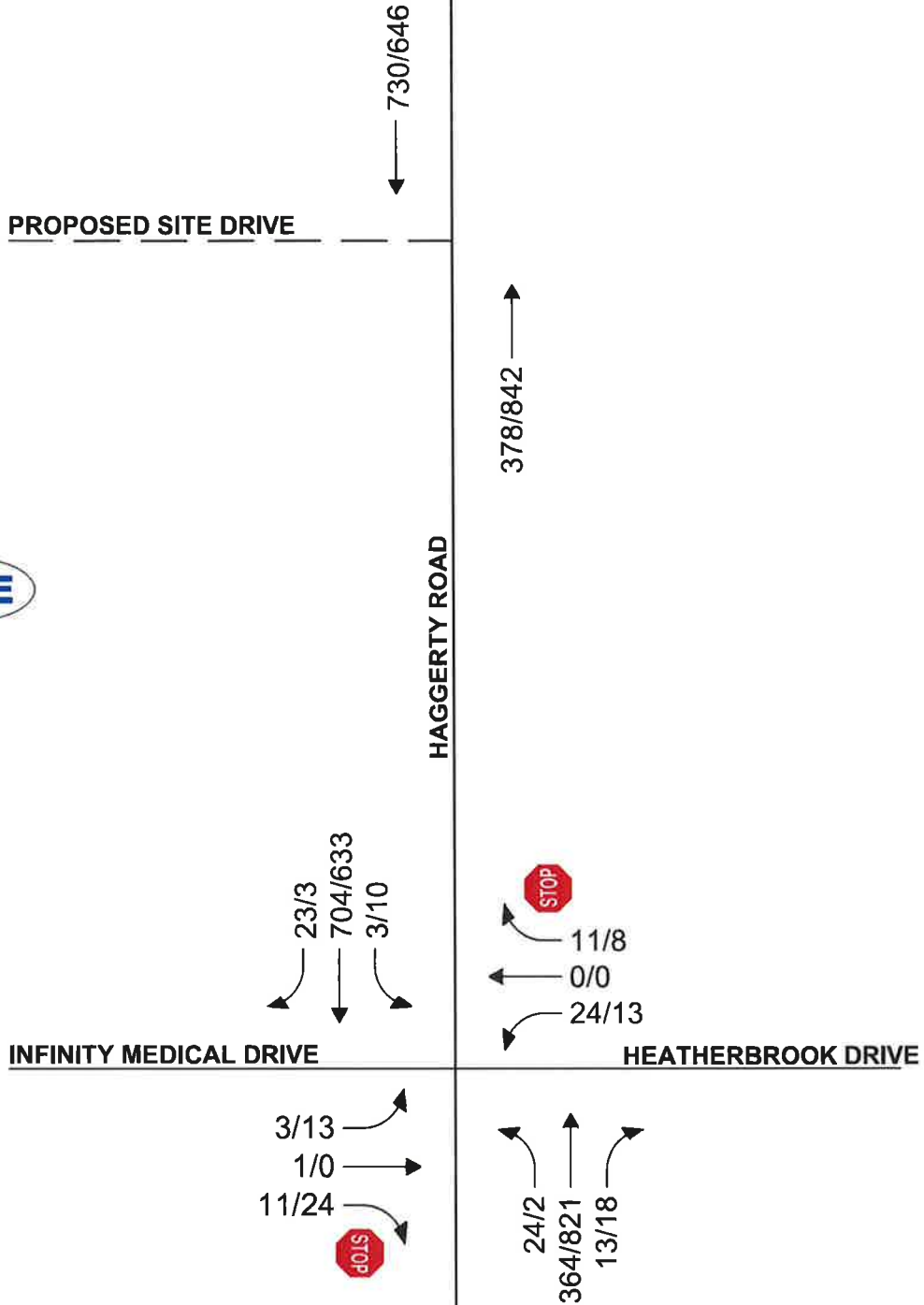


NORTH  
SCALE: NOT TO SCALE



**FIGURE 1**  
**LANE USE AND TRAFFIC CONTROL**  
NOVAPLEX TIS - CITY OF NOVI, MI

LEGEND	
	ROADS
	LANE USE
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION



NORTH  
SCALE: NOT TO SCALE

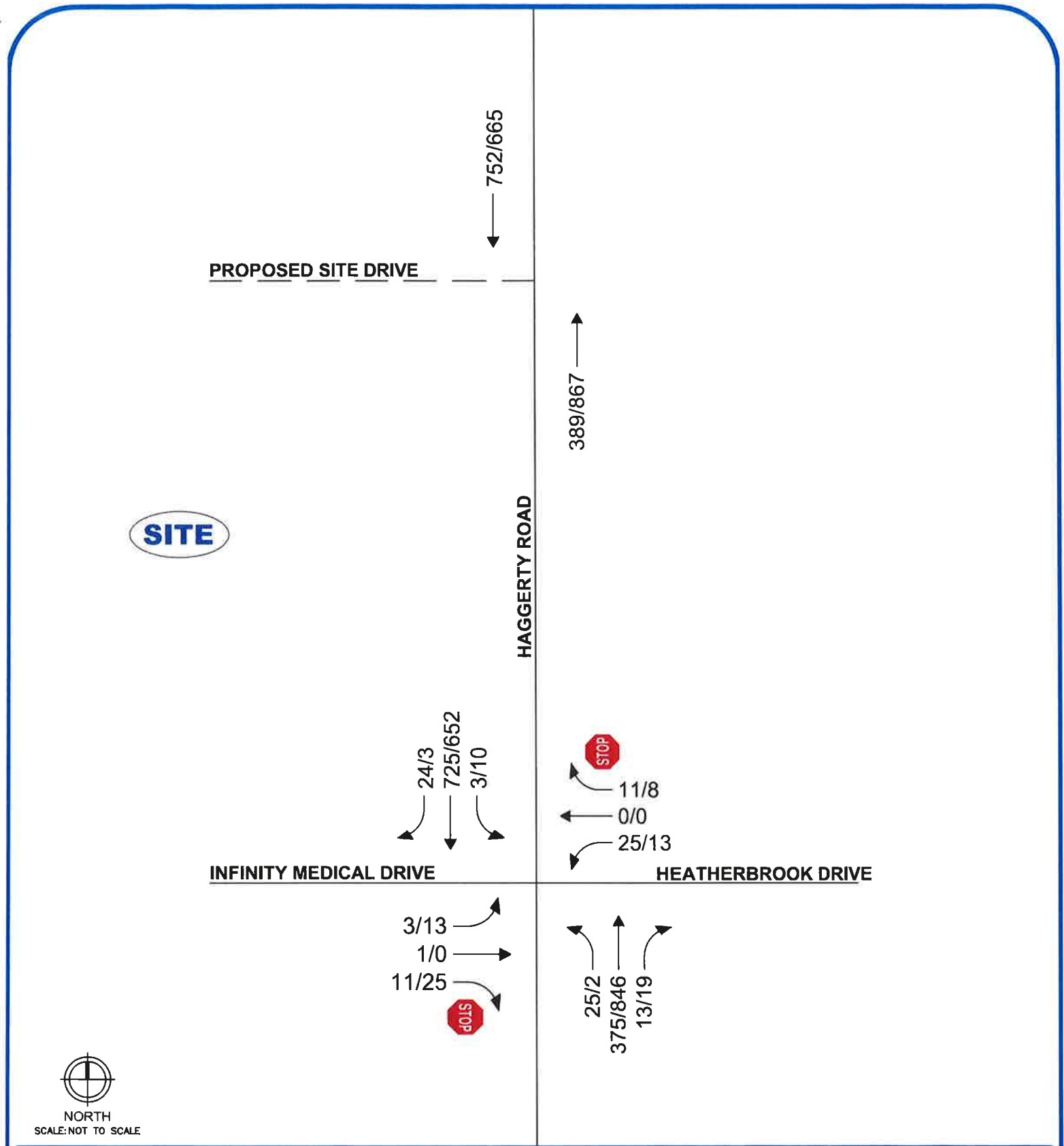


## FIGURE 2 EXISTING TRAFFIC VOLUMES

NOVAPLEX TIS - CITY OF NOVI, MI

### LEGEND

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALED INTERSECTION







NORTH  
SCALE: NOT TO SCALE

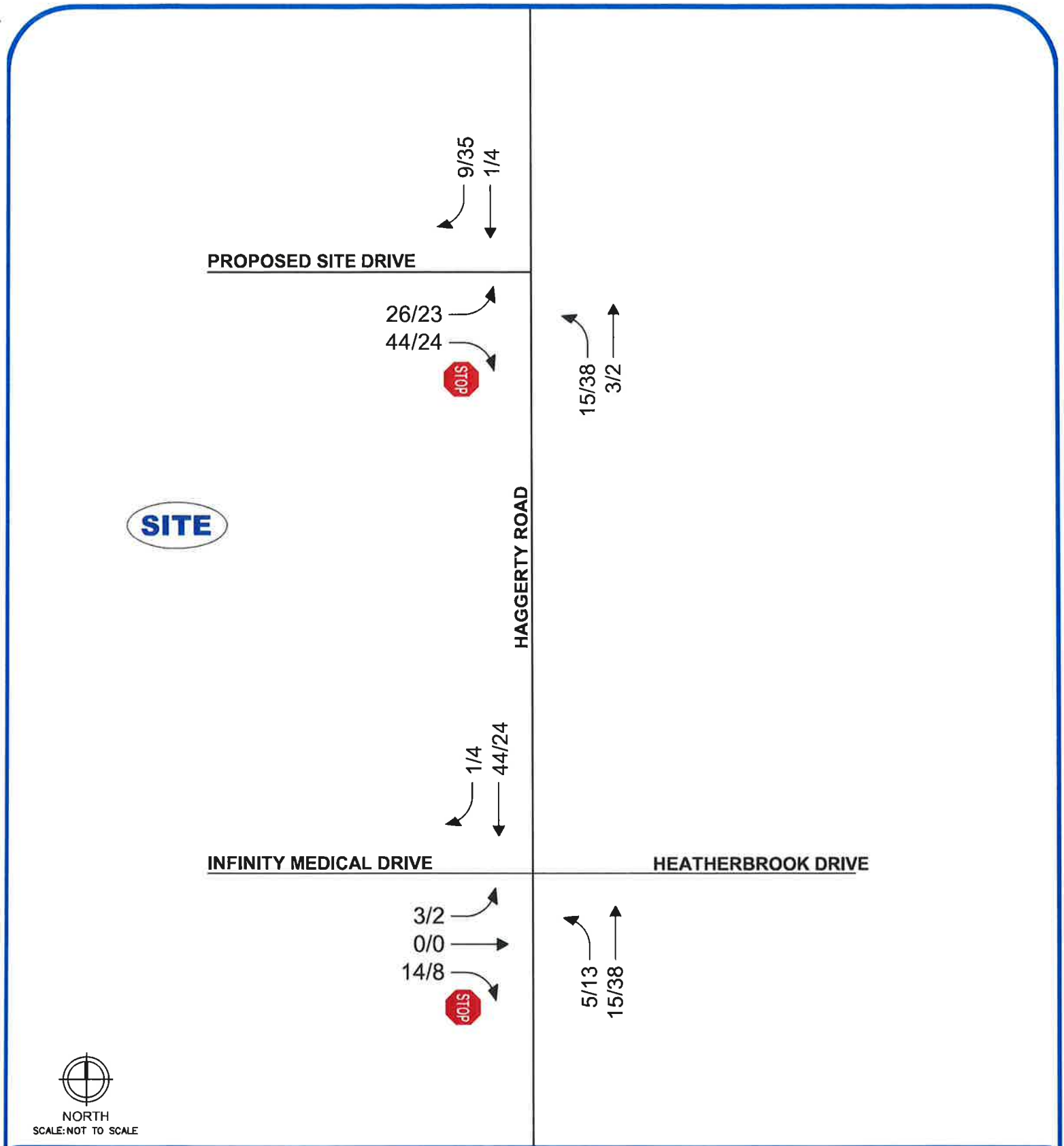


# FIGURE 3 BACKGROUND TRAFFIC VOLUMES

NOVAPLEX TIS - CITY OF NOVI, MI

## LEGEND

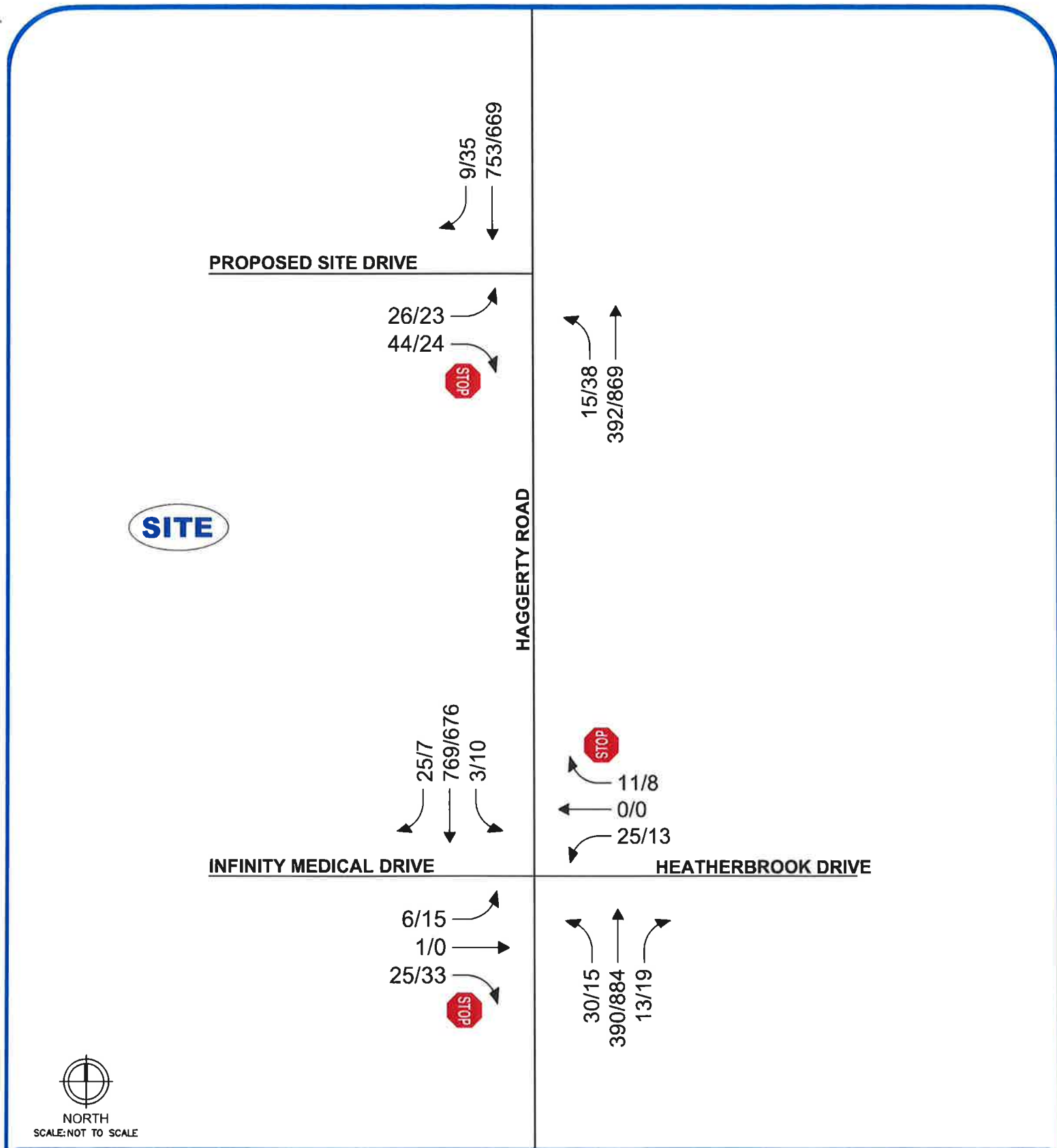
-  ROADS
-  TRAFFIC VOLUMES (AM/PM)
-  SIGNALIZED INTERSECTION
-  UNSIGNALIZED INTERSECTION



**FIGURE 4**  
**SITE-GENERATED**  
**TRAFFIC VOLUMES**  
 NOVAPLEX TIS - CITY OF NOVI, MI

**LEGEND**

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION



NORTH  
SCALE: NOT TO SCALE



# FIGURE 5 FUTURE TRAFFIC VOLUMES

NOVAPLEX TIS - CITY OF NOVI, MI

## LEGEND

- ROADS
- TRAFFIC VOLUMES (AM/PM)
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

# Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

**Fleis & VandenBrink**



Project: City of Novi Traffic Study  
 Type: 4 Hour Video TMC  
 Weather: Sunny, Dry 40 Degs  
 Count By: Miovision Video SCU 34N

File Name : TMC\_1 Haggerty & Heatherbrooke\_2-14-17  
 Site Code : TMC\_1  
 Start Date : 2/14/2017  
 Page No : 1

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

Start Time	Haggery Road Southbound					Heatherbrook Drive Westbound					Haggery Road Northbound					Medical Center Driveway 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	
07:00 AM	3	115	0	0	118	5	0	5	4	14	0	40	8	0	48	1	0	0	0	1	181
07:15 AM	4	150	2	0	156	2	0	3	0	5	0	57	8	0	65	0	0	0	0	0	226
07:30 AM	3	151	0	0	154	5	0	14	1	20	1	68	7	0	76	0	0	1	0	1	251
07:45 AM	13	186	2	0	201	3	0	9	0	12	0	67	8	0	75	0	0	0	0	0	288
Total	23	602	4	0	629	15	0	31	5	51	1	232	31	0	264	1	0	1	0	2	946
08:00 AM	10	151	1	0	162	1	0	7	0	8	4	71	6	0	81	2	0	0	0	2	253
08:15 AM	3	209	0	0	212	3	0	4	0	7	2	86	5	0	93	2	0	0	0	2	314
08:30 AM	4	149	1	0	154	3	0	5	0	8	1	98	8	0	107	2	0	2	0	4	273
08:45 AM	6	181	1	0	188	4	0	8	0	12	6	102	5	0	113	5	1	1	0	7	320
Total	23	690	3	0	716	11	0	24	0	35	13	357	24	0	394	11	1	3	0	15	1160
**** BREAK ****																					
04:00 PM	2	111	0	0	113	2	1	3	0	6	3	185	0	0	188	14	0	5	0	19	326
04:15 PM	0	95	2	0	97	0	0	0	0	0	6	208	1	0	215	7	0	5	0	12	324
04:30 PM	1	111	3	0	115	0	0	3	0	3	4	221	0	0	225	12	0	3	0	15	358
04:45 PM	2	115	8	0	125	3	0	0	1	4	2	180	0	0	182	7	0	5	0	12	323
Total	5	432	13	0	450	5	1	6	1	13	15	794	1	0	810	40	0	18	0	58	1331
05:00 PM	0	162	4	0	166	2	0	3	1	6	4	222	0	0	226	12	0	4	0	16	414
05:15 PM	2	142	2	0	146	0	0	5	0	5	6	213	0	0	219	6	0	3	0	9	379
05:30 PM	1	165	1	0	167	1	0	2	0	3	2	195	1	0	198	4	0	1	0	5	373
05:45 PM	0	152	3	0	155	5	0	3	0	8	6	175	1	0	182	2	0	5	0	7	352
Total	3	621	10	0	634	8	0	13	1	22	18	805	2	0	825	24	0	13	0	37	1518
Grand Total	54	2345	30	0	2429	39	1	74	7	121	47	2188	58	0	2293	76	1	35	0	112	4955
Apprch %	2.2	96.5	1.2	0		32.2	0.8	61.2	5.8		2	95.4	2.5	0		67.9	0.9	31.2	0		
Total %	1.1	47.3	0.6	0	49	0.8	0	1.5	0.1	2.4	0.9	44.2	1.2	0	46.3	1.5	0	0.7	0	2.3	
Pass Cars	54	2323	28	0	2405	39	1	74	0	114	45	2162	58	0	2265	75	1	35	0	111	4895
% Pass Cars	100	99.1	93.3	0	99	100	100	100	0	94.2	95.7	98.8	100	0	98.8	98.7	100	100	0	99.1	98.8
Single Units	0	20	2	0	22	0	0	0	0	0	2	25	0	0	27	1	0	0	0	1	50
% Single Units	0	0.9	6.7	0	0.9	0	0	0	0	0	4.3	1.1	0	0	1.2	1.3	0	0	0	0.9	1
Heavy Trucks	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% Heavy Trucks	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Ped	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	7
% Ped	0	0	0	0	0	0	0	0	100	5.8	0	0	0	0	0	0	0	0	0	0	0.1

Comments: 4 hour traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized intersection. Video SCU camera located with SW intersection quadrant.

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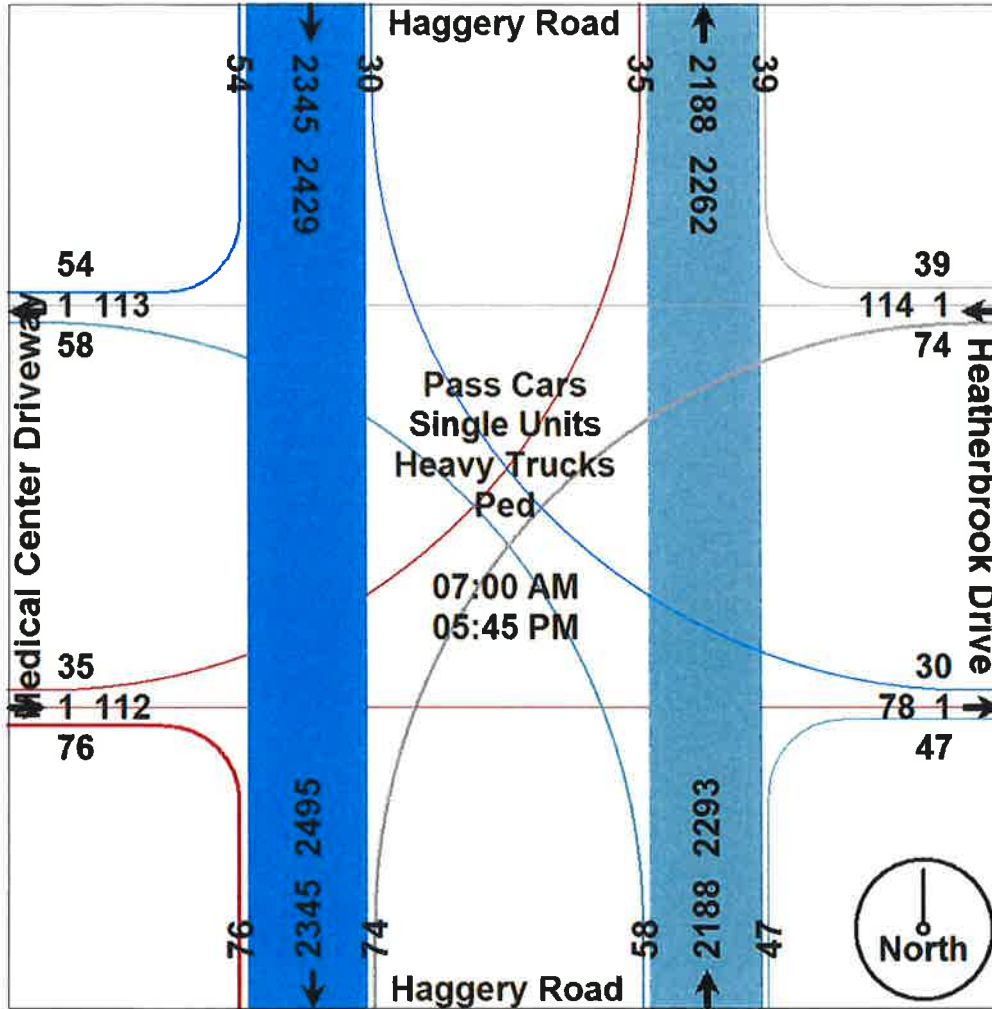
Traffic Study Performed For:

**Fleis & VandenBrink**



Project: City of Novi Traffic Study  
Type: 4 Hour Video TMC  
Weather: Sunny, Dry 40 Degs  
Count By: Miovision Video SCU 34N

File Name : TMC\_1 Haggerty & Heatherbrooke\_2-14-17  
Site Code : TMC\_1  
Start Date : 2/14/2017  
Page No : 2



# Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

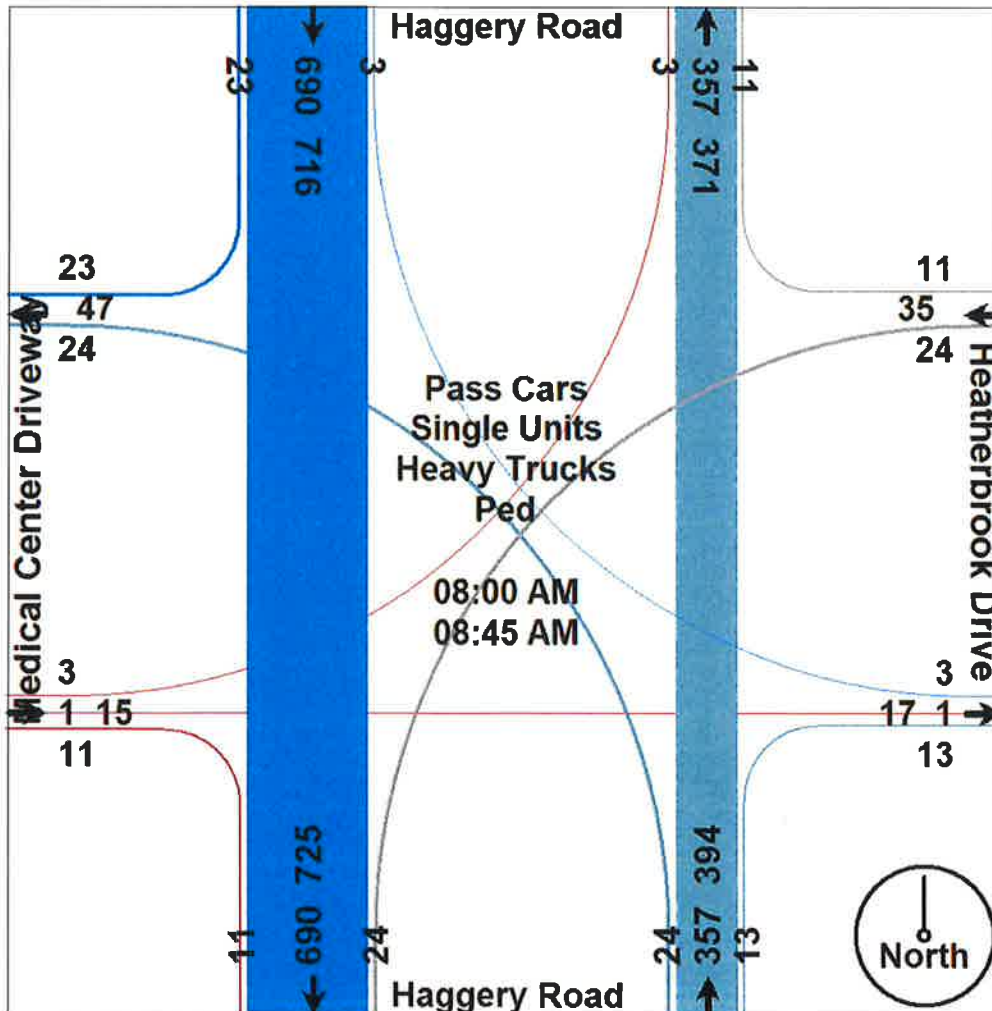
**Fleis & VandenBrink**



Project: City of Novi Traffic Study  
 Type: 4 Hour Video TMC  
 Weather: Sunny, Dry 40 Degs  
 Count By: Miovision Video SCU 34N

File Name : TMC\_1 Haggerty & Heatherbrooke\_2-14-17  
 Site Code : TMC\_1  
 Start Date : 2/14/2017  
 Page No : 3

Start Time	Haggery Road Southbound				Heatherbrook Drive Westbound				Haggery Road Northbound				Medical Center Driveway 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 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	10	151	1	162	1	0	7	8	4	71	6	81	2	0	0	2	253
08:15 AM	3	209	0	212	3	0	4	7	2	86	5	93	2	0	0	2	314
08:30 AM	4	149	1	154	3	0	5	8	1	98	8	107	2	0	2	4	273
08:45 AM	6	181	1	188	4	0	8	12	6	102	5	113	5	1	1	7	320
Total Volume	23	690	3	716	11	0	24	35	13	357	24	394	11	1	3	15	1160
% App. Total	3.2	96.4	0.4		31.4	0	68.6		3.3	90.6	6.1		73.3	6.7	20		
PHF	.575	.825	.750	.844	.688	.000	.750	.729	.542	.875	.750	.872	.550	.250	.375	.536	.906
Pass Cars	23	683	2	708	11	0	24	35	12	347	24	383	11	1	3	15	1141
% Pass Cars	100	99.0	66.7	98.9	100	0	100	100	92.3	97.2	100	97.2	100	100	100	100	98.4
Single Units	0	6	1	7	0	0	0	0	1	9	0	10	0	0	0	0	17
% Single Units	0	0.9	33.3	1.0	0	0	0	0	7.7	2.5	0	2.5	0	0	0	0	1.5
Heavy Trucks	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% Heavy Trucks	0	0.1	0	0.1	0	0	0	0	0	0.3	0	0.3	0	0	0	0	0.2
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





# Traffic Data Collection, LLC

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

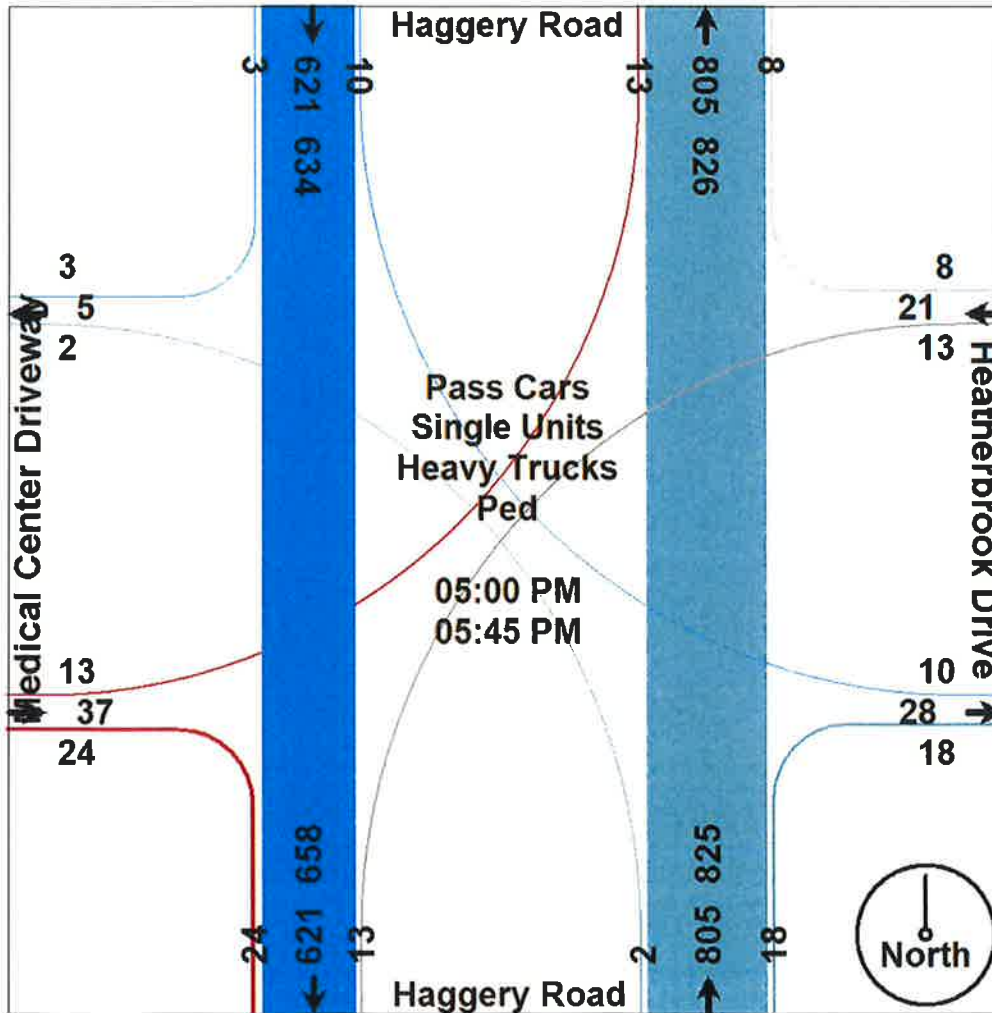
**Fleis & VandenBrink**



Project: City of Novi Traffic Study  
 Type: 4 Hour Video TMC  
 Weather: Sunny, Dry 40 Degs  
 Count By: Miovision Video SCU 34N

File Name : TMC\_1 Haggerty & Heatherbrooke\_2-14-17  
 Site Code : TMC\_1  
 Start Date : 2/14/2017  
 Page No : 4

Start Time	Haggery Road Southbound				Heatherbrook Drive Westbound				Haggery Road Northbound				Medical Center Driveway 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 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	162	4	166	2	0	3	5	4	222	0	226	12	0	4	16	413
05:15 PM	2	142	2	146	0	0	5	5	6	213	0	219	6	0	3	9	379
05:30 PM	1	165	1	167	1	0	2	3	2	195	1	198	4	0	1	5	373
05:45 PM	0	152	3	155	5	0	3	8	6	175	1	182	2	0	5	7	352
Total Volume	3	621	10	634	8	0	13	21	18	805	2	825	24	0	13	37	1517
% App. Total	0.5	97.9	1.6		38.1	0	61.9		2.2	97.6	0.2		64.9	0	35.1		
PHF	.375	.941	.625	.949	.400	.000	.650	.656	.750	.907	.500	.913	.500	.000	.650	.578	.918
Pass Cars	3	615	10	628	8	0	13	21	18	804	2	824	24	0	13	37	1510
% Pass Cars	100	99.0	100	99.1	100	0	100	100	100	99.9	100	99.9	100	0	100	100	99.5
Single Units	0	6	0	6	0	0	0	0	0	1	0	1	0	0	0	0	7
% Single Units	0	1.0	0	0.9	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0.5
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	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
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



## Road Commission for Oakland County

### 1563 Weekly Volume Report - Mon 04/23/2012 - Sun 04/29/2012

<b>Location ID:</b>	1563
<b>Located On:</b>	HAGGERTY
<b>From Road:</b>	TWELVE MILE
<b>Direction:</b>	2-WAY
<b>Community:</b>	Farmington Hills
<b>AADT:</b>	13279

<b>Type:</b>	LINK
<b>To Road:</b>	THIRTEEN MILE
<b>Period:</b>	Mon 04/23/2012 - Sun 04/29/2012

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg
12:00 AM				63				63
1:00 AM				32				32
2:00 AM				17				17
3:00 AM				22				22
4:00 AM				22				22
5:00 AM				95				95
6:00 AM				321				321
7:00 AM				843				843
8:00 AM				967				967
9:00 AM			811					811
10:00 AM			771					771
11:00 AM			1032					1032
12:00 PM			1130					1130
1:00 PM			1048					1048
2:00 PM			963					963
3:00 PM			1007					1007
4:00 PM			1266					1266
5:00 PM			1300					1300
6:00 PM			953					953
7:00 PM			700					700
8:00 PM			518					518
9:00 PM			370					370
10:00 PM			240					240
11:00 PM			105					105
<b>Total</b>	<b>0</b>	<b>0</b>	<b>12214</b>	<b>2382</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>24HrTotal</b>				14596				14596
<b>AM Pk Hr</b>								
<b>AM Peak</b>								0
<b>PM Pk Hr</b>								
<b>PM Peak</b>								0
<b>% Peak Hr</b>								
<b>% Peak Hr</b>				8.91%				8.91%

List View All DIRs

Record of 1 Goto Record

Location ID	1563	MPO ID	9677				
Type	LINK	HPMS ID					
On NHS		On HPMS					
LRS ID		LRS Loc Pt.					
SF Group	01	Route Type					
AF Group		Route					
GF Group							
Class Dist Grp							
WIM Group							
Funct'l Class	-	Milepost					
Located On	HAGGERTY						
Loc On Alias							
From Road	TWELVE MILE						
To Road	THIRTEEN MILE						
From PR	From MP	To PR	To MP	Bgn PT	End PT	Length	
639005	4.05	639005	5.049	63059738	63056726		

More Detail

STATION DATA

Directions:

AAADT

Year	AAADT	DHV-30	K %	D %	PA	BC	Src
2012	13,279						
2010	13,490						
2008	15,410						
2005	15,690						
2002	14,340						

1-5 of 9

Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
	Date	Int	Total
	Wed 4/25/2012	60	14,596
	Mon 4/12/2010	60	14,050
	Mon 5/19/2008	60	15,380
	Mon 5/2/2005	60	16,063
	Wed 11/20/2002	60	14,494
	Mon 8/12/2002	60	16,412
	Thu 4/13/2000	60	17,876
	Tue 3/7/2000	60	16,620
	Mon 11/8/1999	60	17,481
	Mon 10/12/1998	60	32,305

1-10 of 11  
mm / dd / yyyy To Date

VOLUME TREND	
Year	Annual Growth
2012	-1%
2010	-6%
2008	-1%
2005	3%
2002	-6%
2000	-4%
1999	-45%
1998	8%

## Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Exhibit 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	$\leq 10$
B	$> 10$ and $\leq 15$
C	$> 15$ and $\leq 25$
D	$> 25$ and $\leq 35$
E	$> 35$ and $\leq 50$
F	$> 50$

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

## Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the  $v/c$  ratio for the lane group in question.

**LOS A** describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

**LOS B** describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$
C	$> 20.0$ and $\leq 35.0$
D	$> 35.0$ and $\leq 55.0$
E	$> 55.0$ and $\leq 80.0$
F	$> 80.0$

**LOS C** describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

**LOS D** describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high  $v/c$  ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

**LOS E** describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high  $v/c$  ratios. Individual cycle failures are frequent occurrences.

**LOS F** describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high  $v/c$  ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: [Highway Capacity Manual, 2010](#). Transportation Research Board, National Research Council

HCM 6th TWSC  
 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Existing Conditions  
 AM Peak Hour

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	3	1	11	24	0	11	24	364	13	3	704	23
Future Vol, veh/h	3	1	11	24	0	11	24	364	13	3	704	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	40	-	0	-	-	125	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	73	73	73	87	87	87	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	1	1	1
Mvmt Flow	5	2	18	33	0	15	28	418	15	4	838	27

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1349	1349	852	1352	1355	426	865	0	0	433	0	0
Stage 1	860	860	-	482	482	-	-	-	-	-	-	-
Stage 2	489	489	-	870	873	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.227	-	-	2.209	-	-
Pot Cap-1 Maneuver	129	152	362	128	151	633	774	-	-	1132	-	-
Stage 1	353	376	-	569	557	-	-	-	-	-	-	-
Stage 2	564	553	-	349	370	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	122	146	362	117	145	633	774	-	-	1132	-	-
Mov Cap-2 Maneuver	122	146	-	117	145	-	-	-	-	-	-	-
Stage 1	340	374	-	549	537	-	-	-	-	-	-	-
Stage 2	531	533	-	329	369	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.7	35.9	0.6	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	774	-	-	127	362	117	633	1132	-	-
HCM Lane V/C Ratio	0.036	-	-	0.052	0.051	0.281	0.024	0.003	-	-
HCM Control Delay (s)	9.8	-	-	34.9	15.5	47.4	10.8	8.2	-	-
HCM Lane LOS	A	-	-	D	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	1.1	0.1	0	-	-

HCM 6th TWSC  
 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Existing Conditions  
 PM Peak Hour

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↔		↔	↔	
Traffic Vol, veh/h	13	0	24	13	0	8	2	821	18	10	633	3
Future Vol, veh/h	13	0	24	13	0	8	2	821	18	10	633	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	40	-	0	-	-	125	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	66	66	66	91	91	91	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	1	1
Mvmt Flow	22	0	40	20	0	12	2	902	20	11	666	3

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1612	1616	668	1626	1607	912	669	0	0	922	0	0
Stage 1	690	690	-	916	916	-	-	-	-	-	-	-
Stage 2	922	926	-	710	691	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.209	-	-
Pot Cap-1 Maneuver	85	105	462	83	106	335	931	-	-	745	-	-
Stage 1	439	449	-	329	354	-	-	-	-	-	-	-
Stage 2	327	350	-	428	449	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	81	103	462	75	104	335	931	-	-	745	-	-
Mov Cap-2 Maneuver	81	103	-	75	104	-	-	-	-	-	-	-
Stage 1	438	442	-	328	353	-	-	-	-	-	-	-
Stage 2	314	349	-	385	442	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.6	49	0	0.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	81	462	75	335	745	-	-
HCM Lane V/C Ratio	0.002	-	-	0.267	0.087	0.263	0.036	0.014	-	-
HCM Control Delay (s)	8.9	-	-	64.9	13.5	69.3	16.1	9.9	-	-
HCM Lane LOS	A	-	-	F	B	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0.3	0.9	0.1	0	-	-

Intersection: 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	R	LT	R	L	L	TR
Maximum Queue (ft)	33	31	65	31	42	18	2
Average Queue (ft)	5	13	17	9	10	1	0
95th Queue (ft)	22	37	48	33	31	8	3
Link Distance (ft)		357	367				326
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	40			125	75	75	
Storage Blk Time (%)	0	1			0		
Queuing Penalty (veh)	0	0			0		

Zone Summary

Zone wide Queuing Penalty: 0



Intersection: 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	L	L
Maximum Queue (ft)	45	58	73	36	8	26
Average Queue (ft)	10	17	16	8	0	3
95th Queue (ft)	36	45	50	31	5	15
Link Distance (ft)		357	366			
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	40			125	75	75
Storage Blk Time (%)	1	1	0			
Queuing Penalty (veh)	0	0	0			

Zone Summary

Zone wide Queuing Penalty: 1

## Summary of Warrants

<b>Summary of Warrants</b>			
Spot Number:	0		
Major Street:	Haggerty Road	Minor Street:	Heatherbrook Drive
Intersection:	Haggerty Road at Heatherbrook Drive		
City/Twp:	Novi, MI		
Date Performed:	2/20/2017	Performed By:	F&V
Date Volumes Collected:	2/14/2017		
<b>Warrant</b>			
		<b>Condition</b>	<b>Is Warrant Met</b>
Data Has Been Validated			YES
<b>WARRANT 1: Eight-Hour Vehicular Volume</b>			NO
		Condition A	NO
		Condition B	NO
		Condition A&B	N/A
<b>WARRANT 2: Four-Hour Vehicular Volume</b>		(70%)	NO
<b>WARRANT 3: Peak-Hour Vehicular Volume</b>		(70%)	#N/A
		Condition A	#N/A
		Condition B	NO
<b>WARRANT 4: Pedestrian Volume</b>		(70%)	NO
		Four Hour	N/A
		Peak Hour	N/A
	(Threshold)	HAWK	NO
	(Threshold)	RRFB	NO
<b>WARRANT 5: School Crossing</b>			NO
<b>WARRANT 6: Coordinated Signal System</b>			NO
<b>WARRANT 7: Crash Experience</b>			NO
		Condition A	NO
		Condition B	NO
<b>WARRANT 8: Roadway Network</b>			NO
<b>WARRANT 9: Intersection Near a Grade Crossing</b>			#N/A
<b>Issue to Be Addressed by Signalization:</b>			
0			

**Michigan Manual of Uniform Traffic Control Devices  
Worksheet for Signal Warrants (Section 4C)  
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	0
Intersection:	Haggerty Road @ Heatherbrook Drive
Date	2/20/2017 by F&V

2	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
45	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?

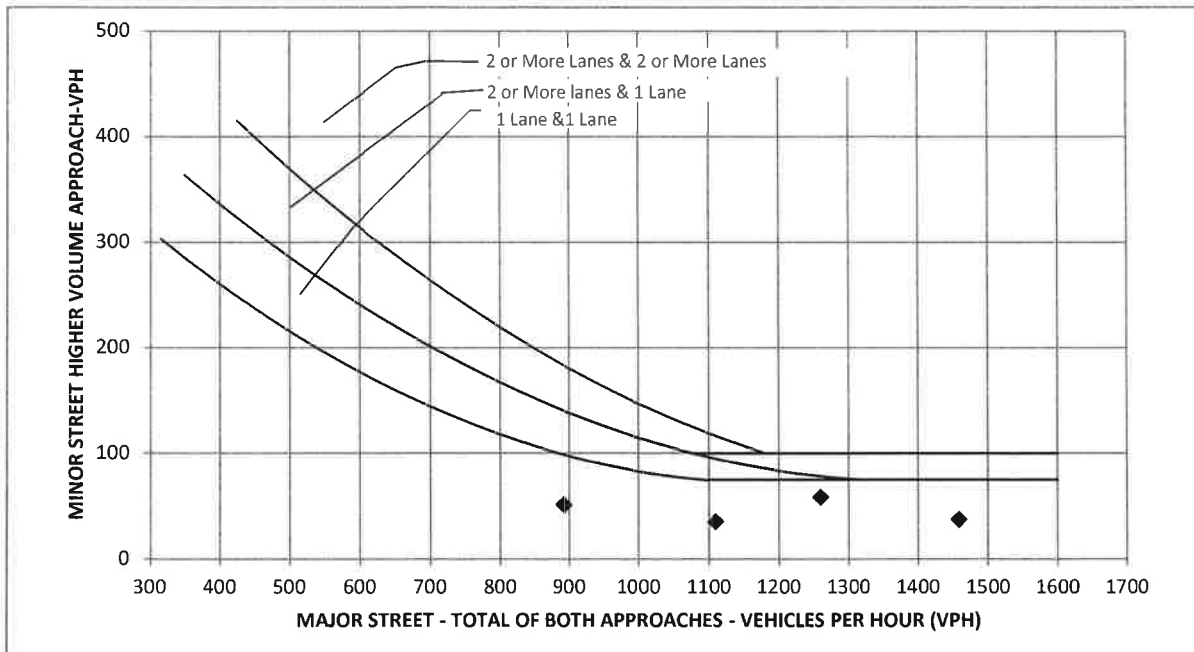


<b>How Many Hours Are Met</b>	<b>0</b>
<b>Is Warrant (70%) Met?</b>	<b>NO</b>

**Michigan Manual of Uniform Traffic Control Devices  
Worksheet for Signal Warrants (Section 4C)  
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	0
Intersection:	Haggerty Road @ Heatherbrook Drive
Date	2/20/2017 by F&V

2	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
45	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



**How Many Hours Are Met**

**0**

**Is Warrant (70%) Met?**

**NO**

HCM 6th TWSC  
1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Background Conditions  
AM Peak Hour

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Vol, veh/h	3	1	11	25	0	11	25	375	13	3	725	24
Future Vol, veh/h	3	1	11	25	0	11	25	375	13	3	725	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	40	-	0	-	-	125	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	73	73	73	87	87	87	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	1	1	1
Mvmt Flow	5	2	18	34	0	15	29	431	15	4	863	29

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1390	1390	878	1393	1397	439	892	0	0	446	0	0
Stage 1	886	886	-	497	497	-	-	-	-	-	-	-
Stage 2	504	504	-	896	900	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.13	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.227	-	-	2.209	-	-
Pot Cap-1 Maneuver	121	144	350	120	142	622	756	-	-	1120	-	-
Stage 1	342	365	-	559	548	-	-	-	-	-	-	-
Stage 2	554	544	-	338	360	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	114	138	350	109	136	622	756	-	-	1120	-	-
Mov Cap-2 Maneuver	114	138	-	109	136	-	-	-	-	-	-	-
Stage 1	329	364	-	538	527	-	-	-	-	-	-	-
Stage 2	520	523	-	318	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.5	39.8	0.6	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	756	-	-	119	350	109	622	1120	-	-
HCM Lane V/C Ratio	0.038	-	-	0.056	0.052	0.314	0.024	0.003	-	-
HCM Control Delay (s)	9.9	-	-	37	15.9	52.5	10.9	8.2	-	-
HCM Lane LOS	A	-	-	E	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	1.2	0.1	0	-	-

HCM 6th TWSC  
 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Background Conditions  
 PM Peak Hour

Intersection

Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Vol, veh/h	13	0	25	13	0	8	2	846	19	10	652	3
Future Vol, veh/h	13	0	25	13	0	8	2	846	19	10	652	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	40	-	0	-	-	125	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	66	66	66	91	91	91	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	1	1
Mvmt Flow	22	0	42	20	0	12	2	930	21	11	686	3

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	1661	1665	688	1676	1656	941	689	0	0	951	0	0
Stage 1	710	710	-	945	945	-	-	-	-	-	-	-
Stage 2	951	955	-	731	711	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.209	-	-
Pot Cap-1 Maneuver	78	98	450	76	99	322	915	-	-	726	-	-
Stage 1	428	440	-	317	343	-	-	-	-	-	-	-
Stage 2	315	339	-	416	439	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	74	96	450	68	97	322	915	-	-	726	-	-
Mov Cap-2 Maneuver	74	96	-	68	97	-	-	-	-	-	-	-
Stage 1	427	433	-	316	342	-	-	-	-	-	-	-
Stage 2	302	338	-	372	432	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34	54.7	0	0.2
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	915	-	-	74	450	68	322	726	-	-
HCM Lane V/C Ratio	0.002	-	-	0.293	0.093	0.29	0.038	0.014	-	-
HCM Control Delay (s)	8.9	-	-	72.7	13.8	78.2	16.6	10	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	0.3	1	0.1	0	-	-

Intersection: 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	L	L
Maximum Queue (ft)	34	31	55	31	37	13
Average Queue (ft)	4	11	18	12	9	1
95th Queue (ft)	22	34	48	37	29	7
Link Distance (ft)		357	367			
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	40			125	75	75
Storage Blk Time (%)	0	1			0	
Queuing Penalty (veh)	0	0			0	

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	L	L
Maximum Queue (ft)	38	48	56	40	12	22
Average Queue (ft)	9	17	11	8	1	3
95th Queue (ft)	33	44	40	31	6	15
Link Distance (ft)		357	366			
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	40			125	75	75
Storage Blk Time (%)	1	1				
Queuing Penalty (veh)	0	0				

Zone Summary

Zone wide Queuing Penalty: 1



HCM 6th TWSC  
1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Future Conditions  
AM Peak Hour

**Intersection**

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	6	1	25	25	0	11	30	390	13	3	769	25
Future Vol, veh/h	6	1	25	25	0	11	30	390	13	3	769	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	40	-	0	-	-	125	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	73	73	73	87	87	87	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	3	3	3	1	1	1
Mvmt Flow	10	2	42	34	0	15	34	448	15	4	915	30

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	1469	1469	930	1484
Stage 1	938	938	-	524
Stage 2	531	531	-	960
Critical Hdwy	7.1	6.5	6.2	7.1
Critical Hdwy Stg 1	6.1	5.5	-	6.1
Critical Hdwy Stg 2	6.1	5.5	-	6.1
Follow-up Hdwy	3.5	4	3.3	3.5
Pot Cap-1 Maneuver	107	129	327	104
Stage 1	320	346	-	540
Stage 2	536	529	-	311
Platoon blocked, %				
Mov Cap-1 Maneuver	100	122	327	86
Mov Cap-2 Maneuver	100	122	-	86
Stage 1	305	345	-	515
Stage 2	498	504	-	269

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.5	53.5	0.7	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	722	-	-	103	327	86	609	1104	-	-
HCM Lane V/C Ratio	0.048	-	-	0.113	0.127	0.398	0.025	0.003	-	-
HCM Control Delay (s)	10.2	-	-	44.4	17.6	72.2	11.1	8.3	-	-
HCM Lane LOS	B	-	-	E	C	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.4	1.6	0.1	0	-	-

HCM 6th TWSC  
2: Haggerty Road & Site Drive

Future Conditions  
AM Peak Hour

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗		↖	↗	
Traffic Vol, veh/h	26	44	15	392	753	9
Future Vol, veh/h	26	44	15	392	753	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	87	87	84	84
Heavy Vehicles, %	0	0	3	3	1	1
Mvmt Flow	28	48	17	451	896	11

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1387	902	907	0	0
Stage 1	902	-	-	-	-
Stage 2	485	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-
Pot Cap-1 Maneuver	159	339	746	-	-
Stage 1	399	-	-	-	-
Stage 2	623	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	154	339	746	-	-
Mov Cap-2 Maneuver	154	-	-	-	-
Stage 1	387	-	-	-	-
Stage 2	623	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.4	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	746	-	154	339	-	-
HCM Lane V/C Ratio	0.023	-	0.184	0.141	-	-
HCM Control Delay (s)	9.9	0	33.6	17.4	-	-
HCM Lane LOS	A	A	D	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.5	-	-

HCM 6th TWSC  
1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive

Future Conditions  
PM Peak Hour

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕		↕	↕	
Traffic Vol, veh/h	15	0	33	13	0	8	15	884	19	10	676	7
Future Vol, veh/h	15	0	33	13	0	8	15	884	19	10	676	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	40	-	0	-	-	125	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	60	60	60	66	66	66	91	91	91	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	1	1	1
Mvmt Flow	25	0	55	20	0	12	16	971	21	11	712	7

Major/Minor	Minor2		Minor1		Major1		Major2				
Conflicting Flow All	1758	1762	716	1779	1755	982	719	0	992	0	0
Stage 1	738	738	-	1014	1014	-	-	-	-	-	-
Stage 2	1020	1024	-	765	741	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.11	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.209	-
Pot Cap-1 Maneuver	67	85	434	65	86	305	892	-	-	701	-
Stage 1	413	427	-	290	319	-	-	-	-	-	-
Stage 2	288	315	-	399	426	-	-	-	-	-	-
Platoon blocked, %											
Mov Cap-1 Maneuver	63	82	434	55	83	305	892	-	-	701	-
Mov Cap-2 Maneuver	63	82	-	55	83	-	-	-	-	-	-
Stage 1	406	420	-	285	313	-	-	-	-	-	-
Stage 2	272	309	-	343	419	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.8	70.5	0.1	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	892	-	-	63	434	55	305	701	-	-
HCM Lane V/C Ratio	0.018	-	-	0.397	0.127	0.358	0.04	0.015	-	-
HCM Control Delay (s)	9.1	-	-	95.6	14.5	103.3	17.3	10.2	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.4	1.3	0.1	0	-	-

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	24	38	869	669	35
Future Vol, veh/h	23	24	38	869	669	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	91	91	95	95
Heavy Vehicles, %	0	0	0	0	1	1
Mvmt Flow	25	26	42	955	704	37

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1762	723	741	0	-	0
Stage 1	723	-	-	-	-	-
Stage 2	1039	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	94	430	875	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	84	430	875	-	-	-
Mov Cap-2 Maneuver	84	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	344	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	39	0.4	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	875	-	84	430	-	-
HCM Lane V/C Ratio	0.048	-	0.298	0.061	-	-
HCM Control Delay (s)	9.3	0	65.1	13.9	-	-
HCM Lane LOS	A	A	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	0.2	-	-

**Intersection: 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive**

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	R	LT	R	L	L	TR
Maximum Queue (ft)	38	36	77	31	46	21	2
Average Queue (ft)	6	18	25	10	11	1	0
95th Queue (ft)	25	43	63	33	32	10	0
Link Distance (ft)		357	367				326
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	40			125	75	75	
Storage Blk Time (%)	0	1	0		0		
Queuing Penalty (veh)	0	0	0		0		

**Intersection: 2: Haggerty Road & Site Drive**

Movement	EB	EB	NB
Directions Served	L	R	LT
Maximum Queue (ft)	49	57	104
Average Queue (ft)	20	27	13
95th Queue (ft)	48	53	55
Link Distance (ft)	363		326
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Zone Summary**

Zone wide Queuing Penalty: 0

**Intersection: 1: Haggerty Road & Infinity Medical Drive/Heatherbrook Drive**

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	R	LT	R	L	L	TR
Maximum Queue (ft)	50	56	60	35	28	29	25
Average Queue (ft)	15	23	16	9	7	5	1
95th Queue (ft)	44	51	48	32	23	21	16
Link Distance (ft)		357	366				376
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	40			125	75	75	
Storage Blk Time (%)	5	2					0
Queuing Penalty (veh)	2	0					0

**Intersection: 2: Haggerty Road & Site Drive**

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	TR
Maximum Queue (ft)	53	44	179	9
Average Queue (ft)	18	20	36	0
95th Queue (ft)	48	46	123	5
Link Distance (ft)	351		376	681
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Zone Summary**

Zone wide Queuing Penalty: 2

# Summary of Warrants

Spot Number:	Future Conditions		
Major Street:	Haggerty Road	Minor Street:	Heatherbrook Drive
Intersection:	Haggerty Road at Heatherbrook Drive		
City/Twp:	Novi, MI		
Date Performed:	2/20/2017	Performed By:	F&V
Date Volumes Collected:	2/14/2017		

Warrant	Condition	Is Warrant Met
<b>Data Has Been Validated</b>		<b>YES</b>
<b>WARRANT 1: Eight-Hour Vehicular Volume</b>		<b>NO</b>
	Condition A	<b>NO</b>
	Condition B	<b>NO</b>
	Condition A&B	N/A
<b>WARRANT 2: Four-Hour Vehicular Volume</b>	(70%)	<b>NO</b>
<b>WARRANT 3: Peak-Hour Vehicular Volume</b>	(70%)	<b>#N/A</b>
	Condition A	<b>#N/A</b>
	Condition B	<b>NO</b>
<b>WARRANT 4: Pedestrian Volume</b>	(70%)	<b>NO</b>
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold) <b>HAWK</b>	<b>NO</b>
	(Threshold) <b>RRFB</b>	<b>NO</b>
<b>WARRANT 5: School Crossing</b>		<b>NO</b>
<b>WARRANT 6: Coordinated Signal System</b>		<b>NO</b>
<b>WARRANT 7: Crash Experience</b>		<b>NO</b>
	Condition A	<b>NO</b>
	Condition B	<b>NO</b>
<b>WARRANT 8: Roadway Network</b>		<b>NO</b>
<b>WARRANT 9: Intersection Near a Grade Crossing</b>		<b>#N/A</b>

**Issue to Be Addressed by Signalization:**

# Michigan Manual of Uniform Traffic Control Devices

## Worksheet for Signal Warrants (Section 4C)

### WARRANT 2: Four-Hour Vehicular Volume

Spot Number:	Future Conditions	
Intersection:	Haggerty Road @ Heatherbrook Drive	
Date	2/20/2017	by F&V

2	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
45	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



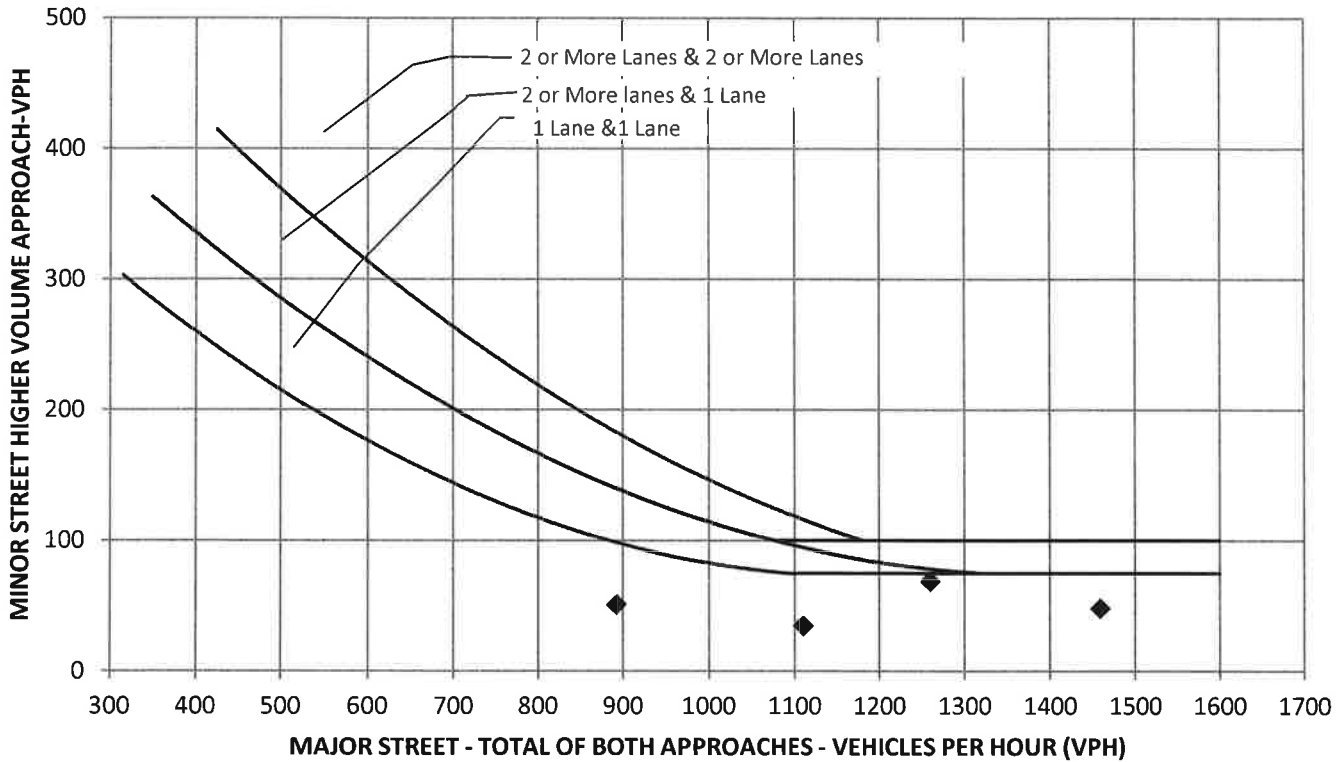
<b>How Many Hours Are Met</b>	<b>0</b>
<b>Is Warrant (70%) Met?</b>	<b>NO</b>



**WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	Future Conditions		
Intersection:	Haggerty Road @ Heatherbrook Drive		
Date	2/20/2017	by	F&V

<b>2</b>	<b>: No. of Lanes on Major St.</b>
<b>2</b>	<b>: No. of Lanes on Minor St.</b>
<b>45</b>	<b>: Speed limit or 85th Percentile? (MPH)</b>
<b>NO</b>	<b>: Is the intersection within an Isolated community?</b>
<b>0</b>	<b>: What is the of the population isolated community?</b>

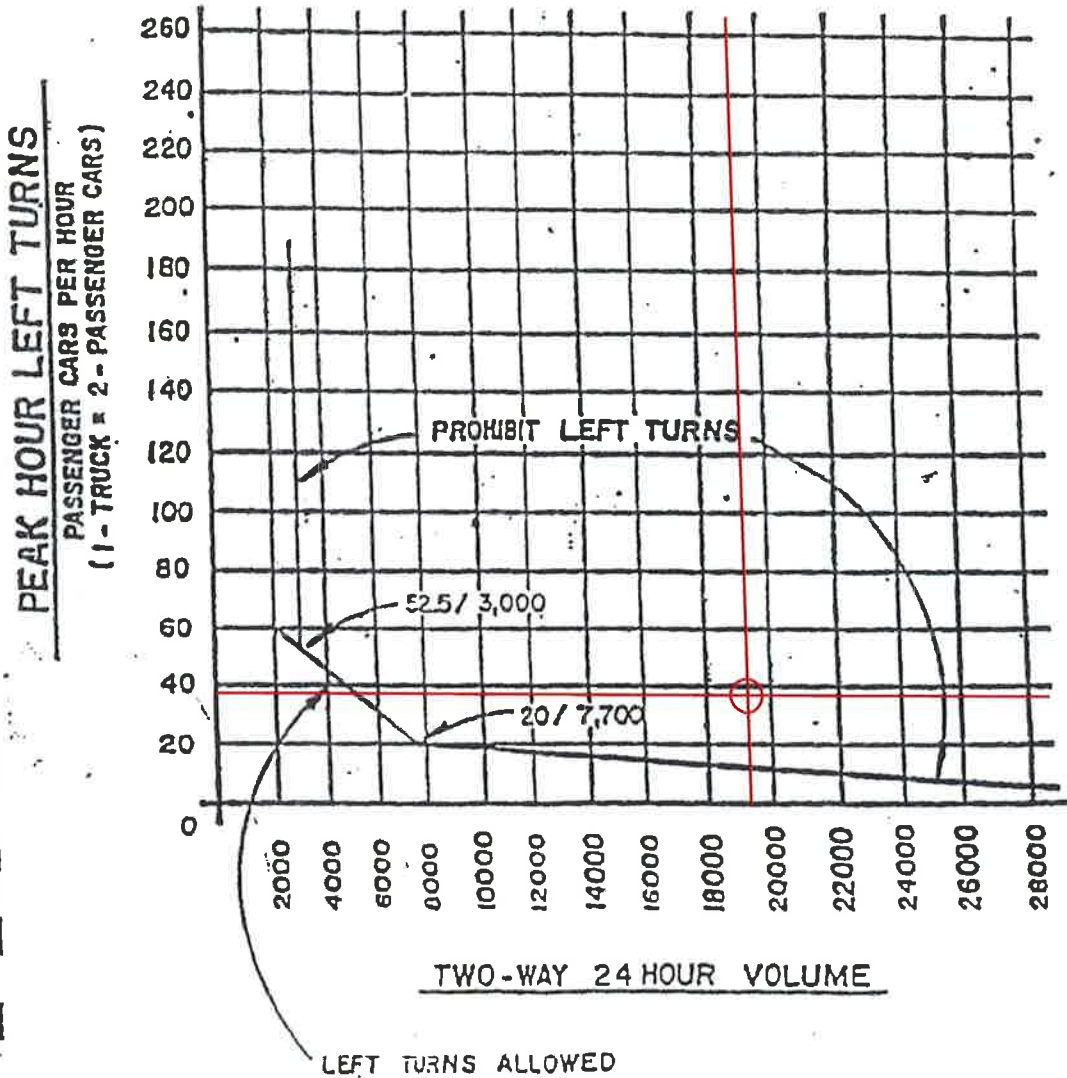


<b>How Many Hours Are Met</b>	<b>0</b>
<b>Is Warrant (70%) Met?</b>	<b>NO</b>

HAGGERTY ROAD & SITE DRIVE LT LANE WARRANT

WARRANT FOR PERMITTING  
LEFT TURNS

(BASED ON TOTAL DEVELOPMENT)



AM: 15  
PM: 38

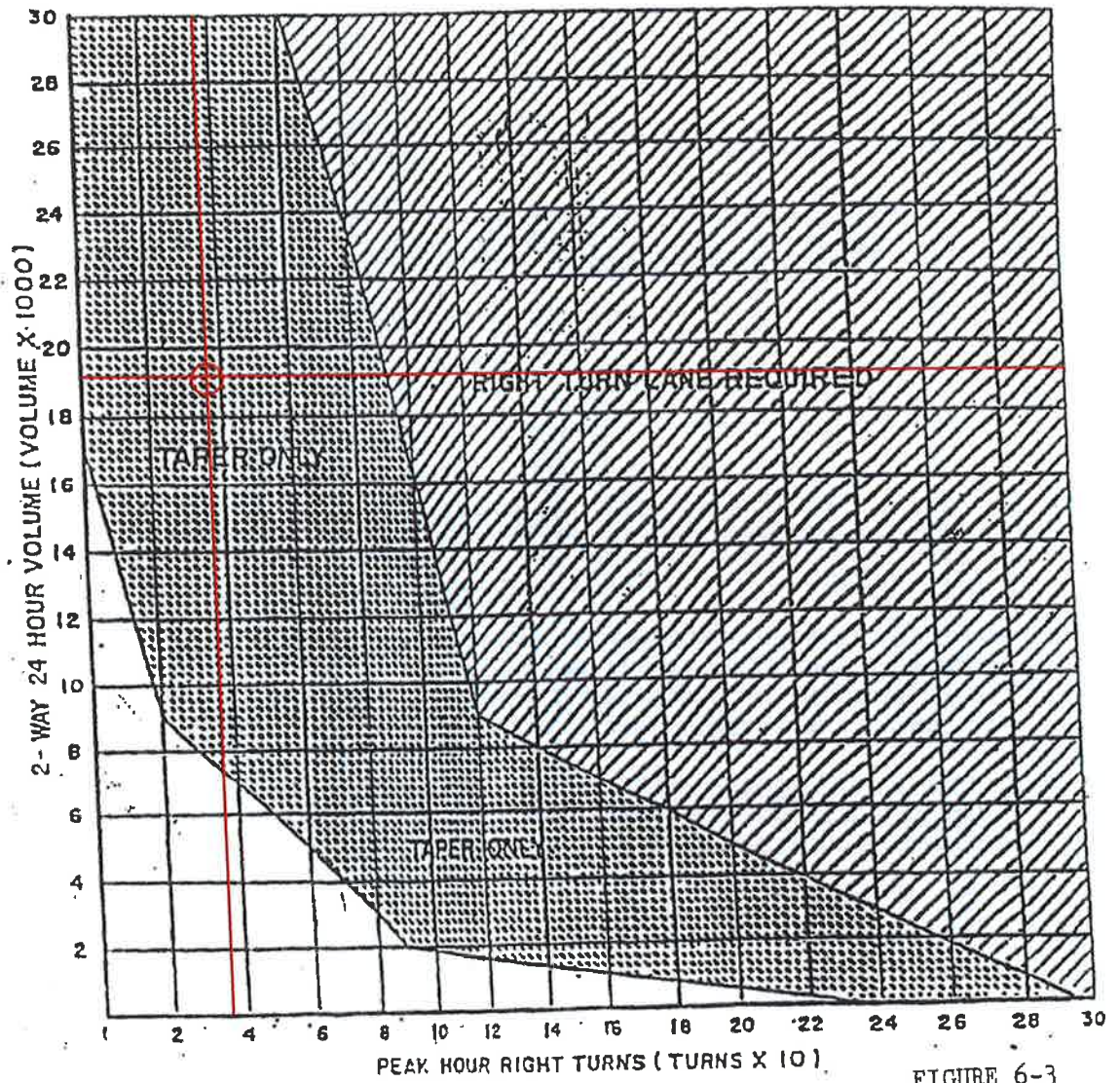
FIGURE 6-2  
REVISED 8-6-79

2017 AADT = 16,320  
+ 1% per year to 2022 = 17,152  
+ 2,015 new daily trips  
= 19,167 2022 two-way 24 hour volume

**LT TREATMENT  
RECOMMEND**

# HAGGERTY ROAD & SITE DRIVE RT LANE WARRANT

## WARRANTS FOR RIGHT TURN DECELERATION LANE OR TAPER



AM: 9  
PM: 35

**RT DECELERATION  
TAPER RECOMMENDED**

2017 AADT = 16,320  
+ 1% per year to 2022 = 17,152  
+ 2,015 new daily trips  
= 19,167 2022 two-way 24 hour volume

## SIGN LOCATION PLAN

**FLOODPLAIN NOTE:**  
 BY GRAPHICAL PLOTTING, THIS SITE IS WITHIN ZONE 'X'. AREA DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP NUMBERS 26125C0489F & 26125C0493F, DATED SEPTEMBER 29, 2006.

**LEGAL DESCRIPTION**  
 PARCEL ID 50-22-12-400-009  
 T. 1N, R. 8E, SEC. 12 N 22 ACRES OF NE 1/4 OF SE 1/4, EXC BEG AT PT DIST S 380.10 FT FROM E 1/4 COR., TH S 317.60 FT, TH S 88-51-00 W 1374.20 FT, TH N00-02-00 E 317.60 FT, TH N 88-51-00 E 1374 FT TO BEG. 11.98 AC

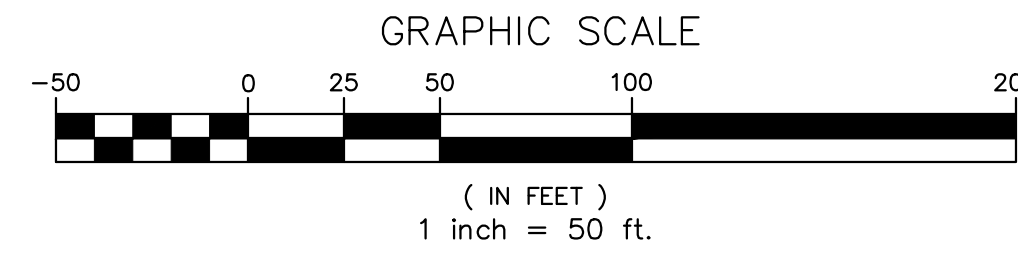
PARCEL ID 50-22-12-400-010  
 T. 1N, R. 8E, SEC. 12 PART OF SE 1/4 BEG AT PT DIST S 380.10 FT FROM E 1/4 COR., TH S 158.80 FT, TH S88-51-00W 1374.10 FT, TH N00-02-00 E 158.80 FT, TH N88-51-00E 1374 FT TO BEG. 5.01AC

PARCEL ID 50-22-12-400-011  
 T. 1N, R. 8E, SEC. 12 PART OF SE 1/4 BEG AT PT DIST S 538.90 FT FROM E 1/4 COR., TH S 158.80 FT, TH S 88-51-00W 1374.20 FT, TH N00-02-00E 158.80 FT, TH N88-51-00E 1374.10 FT TO BEG. 5.01AC

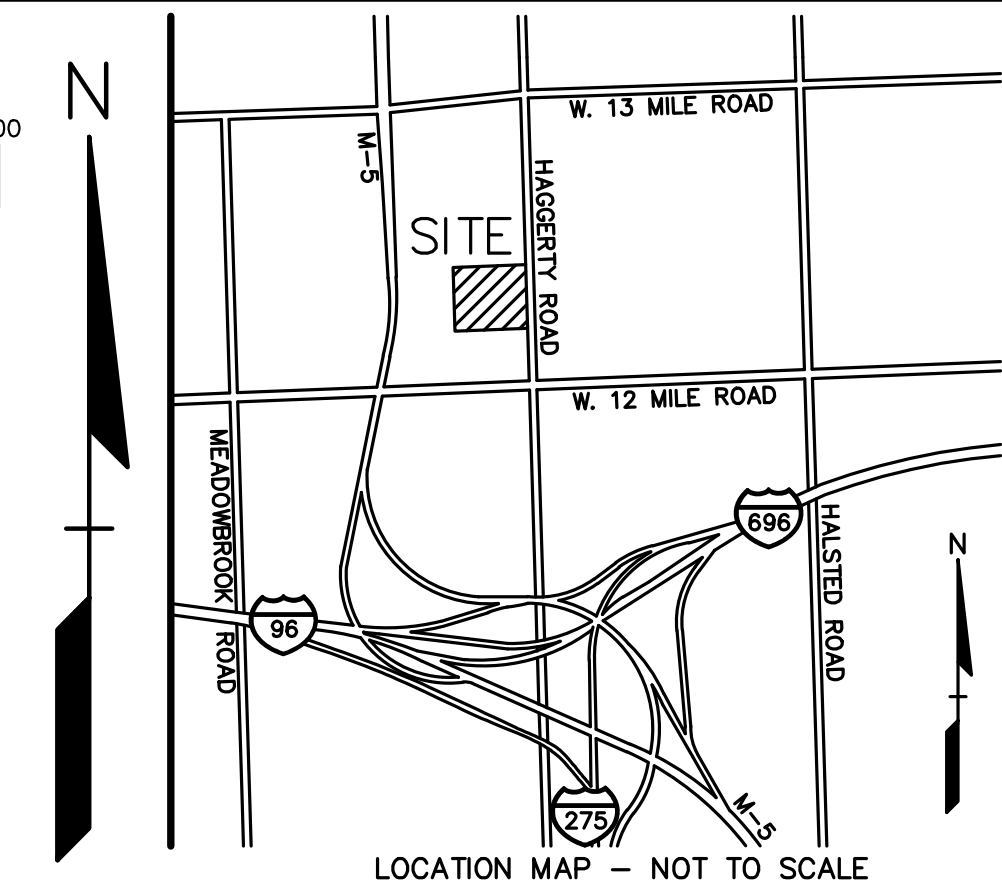
**REFERENCE BENCHMARKS**  
 CITY OF NOVI BM #12-14  
 NORTH RIM OF SOUTHERLY MON. BOX  
 ELEV. = 905.13

BM#302  
 PUNCH MARK IN ARROW ON A HYDRANT LOCATED ON THE WEST SIDE OF HAGERTY RD., OPPOSITE OF HEATHERBROOK DR.  
 ELEV. = 916.06

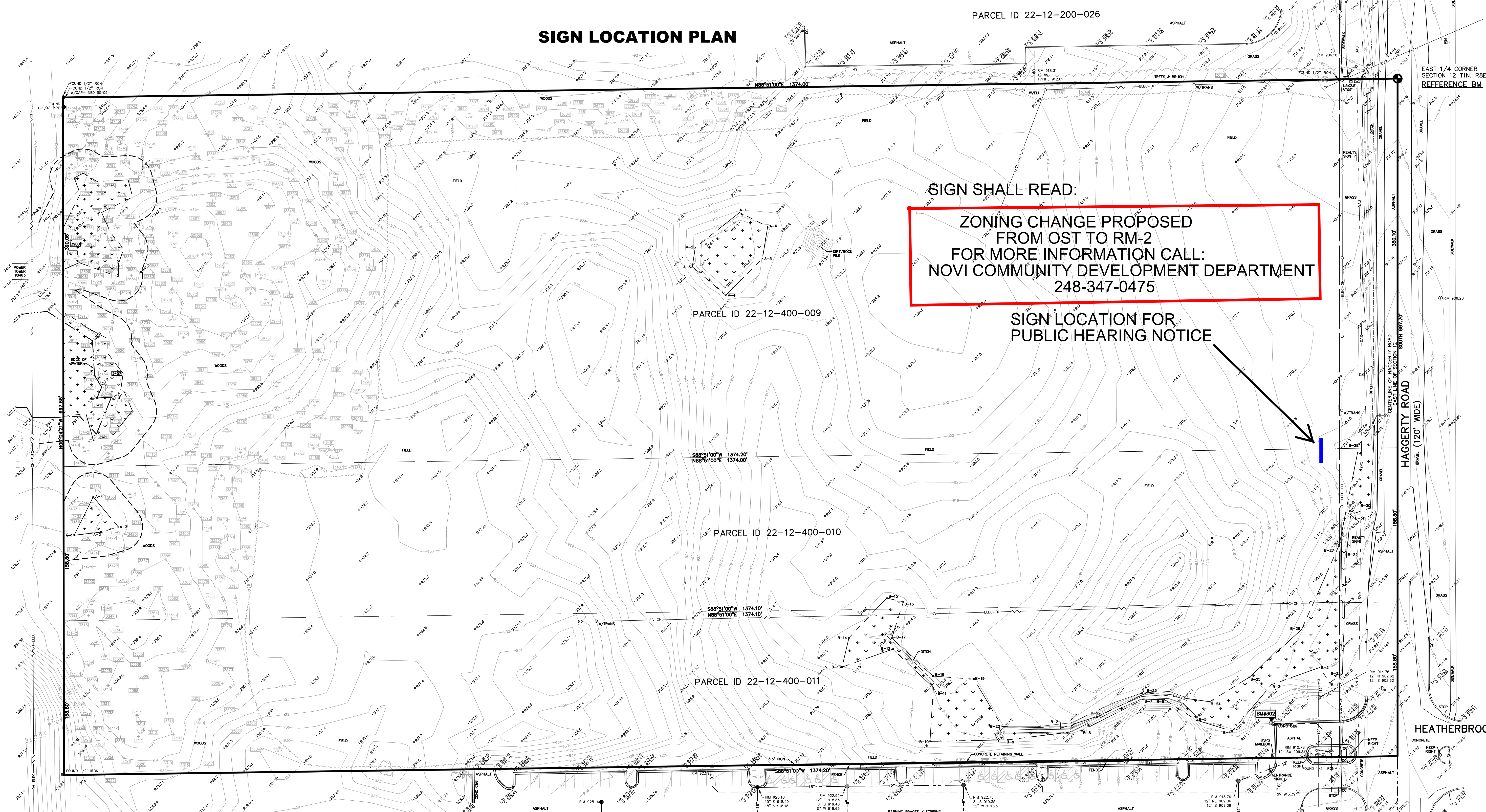
- LEGEND**
- IRON FOUND
  - ⊗ IRON SET
  - ⊗ NAIL FOUND
  - ⊗ NAIL & CAP SET
  - ⊗ BRASS PLUG SET
  - ⊗ MONUMENT FOUND
  - ⊗ MONUMENT SET
  - ⊗ SEC. CORNER FOUND
  - ⊗ RECORDED
  - ⊗ MEASURED
  - ⊗ CALCULATED
- EXISTING**
- OH-ELEC-W— ELEC. PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
  - UG-CATV— UNDERGROUND CABLE TV, CATV PEDESTAL
  - UG-PHONE— UNDERGROUND CABLE, PEDESTAL & MANHOLE
  - UG-ELEC— ELEC. U.G. CABLE, MANHOLE, METER & HANDHOLE
  - GAS— GAS MAIN, VALVE & GAS LINE MARKER
  - WATER— WATERMAIN, HYD. GATE VALVE, TAPPING SLEEVE & VALVE
  - SANITARY— SANITARY SEWER, CLEANOUT & MANHOLE
  - STORM— STORM SEWER, CLEANOUT & MANHOLE
  - COMB— COMBINED SEWER & MANHOLE
  - SQ. ROAD & BEDDING CATCH BASIN
  - INLET, YARD DRAIN
  - POST INDICATOR VALVE
  - WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
  - METER BOX, TRANSFORMER, IRRIGATION CONTROL VALVE
  - SPOT ELEVATION
  - CONTOUR LINE
  - FENCE
  - TREE LINE
  - STREET LIGHT
  - SIGN
- CONC.** CONCRETE  
**ASPH.** ASPHALT  
**GRAVEL** GRAVEL SHOULDER  
**WETLAND** WETLAND  
**B-2** WETLAND FLAG NUMBER



**REFERENCE DRAWINGS**  
 AS-BUILT UTILITY PLAN, PEA JOB NO. 2004-090, DWG. NO. C-5, AS-BUILT DATE 9-25-05  
 AS-BUILT UTILITY PROFILES, PEA JOB NO. 2004-090, DWG. NO. C-6, AS-BUILT DATE 9-25-05



**SIGN LOCATION PLAN**



NO.	DATE	DESCRIPTION	BY
1	08/18/2017	CITY OF NOVI PRE-APPLICATION REVIEW	JBT

NO.	DATE	DESCRIPTION	BY
1	08/18/2017	CITY OF NOVI PRE-APPLICATION REVIEW	JBT

**CAUTION!**  
 THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS MADE AS TO THE ACCURACY OF THESE LOCATIONS OR ELEVATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTENCE, DEPTH, LOCATION AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

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**BEZTAK COMPANIES**  
 31751 FARMINGTON HILLS, MI 48334

**TOPOGRAPHIC SURVEY**  
**BEZTAK-NOVI**  
 PART OF THE SE 1/4 OF SECTION 12, T. 01N., R. 08E., CITY OF NOVI, OKLAHOMA COUNTY, MICHIGAN

DES. DSK DN. DSK SUR. KR P.M.

ORIGINAL ISSUE DATE:  
 AUGUST 18, 2017

PEA JOB NO. 2015-298

DRAWING NUMBER:  
**C-1.0**

**NOT FOR CONSTRUCTION**

XREF: S:\PROJECTS\2015\2015298\DWG\15298-TOPO.DWG  
 XREF: S:\PROJECTS\2015\2015298\DWG\SITE PLANS\PEA-C-1.0.DWG  
 XREF: S:\PROJECTS\2015\2015298\DWG\SITE PLANS\V-TBLK-15298.DWG

## SOIL BORING REPORT

**MCDOWELL & ASSOCIATES**

21355 Hatcher Avenue  
Ferndale, Michigan 48220

Phone: (248) 399-2066  
Fax: (248) 399-2157

February 17, 1999

The Beztak Companies  
31731 Northwestern Highway  
Suite 250W  
Farmington Hills, MI 48334-1654

Job No. 99-036

Attention: Mr. Mike Fellows

Subject: Soils Investigation  
Research/Office Park Development  
28635 Haggerty Road  
Novi, Michigan

Gentlemen:

In accordance with your request, we have made a Soils Investigation on the subject site.

Nine (9) Soil Test Borings, designated as 1 through 9, have been made at the approximate locations shown on the Soil Boring Location Plan which accompanies this report. The borings were advanced to a depth of about fifteen feet six inches (15'6") below the existing ground surface.

Soil descriptions, groundwater observations and the results of field and laboratory tests are to be found on the accompanying Logs of Soil Test Borings and summary sheet of Partial Sieve Analysis results.

Borings 1, 2, 4, 6, 8 and 9 encountered nine inches (9") and ten inches (10") of topsoil, followed by stiff to extremely stiff brown to blue sandy clay and compact brown fine to medium sand which were found throughout the remainder of these borings. Borings 3, 5 and 7 encountered eight inches (8") to two feet eight inches (2'8") of topsoil and possible peat, two feet one inch (2'1") to six feet four inches (6'4") of soft to stiff brown sandy clay and compact brown clayey fine sand, followed by stiff to extremely stiff brown to blue sandy clay which was found down to the maximum depth of these borings.

Soil descriptions and depths shown on the boring logs are approximate indications of change from one soil type to another and are not intended to represent an area of exact geological change or stratification.

Water was encountered in Borings 1, 2, 3 and 6 at depths ranging from ten inches (10") to six feet six inches (6'6") below the existing ground surface. Water was measured upon completion of the

Page -2-

Job No. 99-036

drilling operation in Boring 3 at a depth of two feet (2'). Borings 1, 2 and 6 were found dry upon completion. No water was encountered in the other borings. It should be noted that short-term groundwater observations may not provide a reliable indication of the depth of the water table. In cohesive soils, this is due to the slow rate of infiltration of water into the borehole as well as the potential for water to become trapped in overlying layers of granular soils during periods of heavy rainfall. Water levels in granular soils fluctuate with seasonal and climatic changes as well as the amount of rainfall in the area immediately prior to the measurements. It should be expected that wet sand seams may be encountered in the clay soils at the site.

Standard Penetration Tests made during sampling indicate that the native soils at the site have generally good to very good strengths and densities. Tests taken at a depth of two feet six inches (2'6") gave results ranging from eleven (11) to twenty-one (21) blows per foot. The five foot (5') test values varied from two (2) blows per foot to twenty-two (22) blows per six inches (6"). At a depth of seven feet six inches (7'6"), the results ranged from nine (9) blows per foot to twenty-two (22) blows per six inches (6"). At ten feet (10') and below, penetration indices varied from thirteen (13) blows per foot to eighteen (18) blows per six inches (6").

It is understood that the site will be developed as a research/office park with several one to two story slab-on-grade type buildings. It is assumed that the structures will transmit light to moderate loads to the supporting soils.

Based on the project information provided and the results of field and laboratory tests, it is believed that the structures could be supported by conventional spread or strip footings. All exterior footings should be constructed at, or below, a minimum frost penetration depth of three feet six inches (3'6") below finished grade. All footings should extend through non-engineered fill soils, soils containing a significant amount of organic substances or excessively weak soils. All strip footings should be continuously reinforced in order to minimize the noticeable effects of differential settlement.

Building footings constructed at the boring locations could be proportioned for the design soil pressures listed below provided this results in the footings bearing on non-organic soils.

<u>Boring</u>	<u>Depth</u>	<u>Soil Pressure (psf)</u>
1	1'6" to 3'0"	2500
	3'6" to 12'0"	4000



Page -3-

Job No. 99-036

<u>Boring</u>	<u>Depth</u>	<u>Soil Pressure (psf)</u>
2	1'6" to 2'6"	3000
	3'0" to 12'0"	4000
3	6'0" to 9'0"	2500
	9'6" to 12'0"	4000
4	1'6" to 2'6"	3000
	3'0" to 12'0"	4000
5	2'0" to 5'6"	3000
	6'0" to 12'0"	4000
6	1'6" to 2'6"	3000
	3'0" to 12'0"	4000
7	1'6" to 3'0"	3500
	3'6" to 12'0"	4000
8	1'6" to 3'6"	3000
	4'0" to 12'0"	4000
9	1'6" to 3'0"	3500
	3'6" to 12'0"	4000

Higher design soil pressures are available at various depths in the borings and could be detailed if required.

Water was encountered in Borings 1, 3 and 6 at depths of ten inches (10") and two feet eight inches (2'8"). Depending upon the depth of the building footings relative to the existing ground surface and the actual conditions at the time of construction, it may be necessary to depress the water table to allow for footings to be constructed. Water seepage in sand seams in clay soils in the vicinity of these borings may be manageable with construction pumping and sumps. However, this is not known for certain. If large volumes of water or saturated granular soils are encountered, special dewatering techniques may be required.

If any truck docks or below grade structures are contemplated, they should be provided with an adequate drainage system to protect the floors and walls from the possible effects of hydrostatic pressure. The drainage system should be designed and installed to minimize the potential for soil fines to erode into the underdrainage system.

Concrete floors or floor supporting backfill could be placed at, or near, the present grade. Any topsoil, highly organic soil, fill soil, soft soil, loose soil or other obviously objectionable material should be removed and the subgrade thoroughly proof-

compacted with heavy, rubber-tired equipment. If, during the proof-compaction operation, areas are found where the soils yield excessively, the yielding materials should be scarified, dried and recompacted or removed and replaced with engineered fill. Where fill or backfill is required to raise the subgrade for concrete floors, it is suggested that clean, well-graded granular soils be used. If clay material is utilized, it should be placed within two percent (2%) of its optimum moisture content. The fill should be deposited in horizontal lifts not to exceed nine inches (9") in thickness with each lift being compacted uniformly to a minimum density of ninety-five percent (95%) of its maximum value as determined by the Modified Proctor Test (A.A.S.H.T.O. T-180 or A.S.T.M. D-1557).

High moisture contents over twenty percent (20%) were encountered in the upper soils at Borings 1, 3 and 5. These soils may be unstable under vehicular loading. During periods of wet weather in the spring and fall, these soils could rut and pump under construction traffic. Crushed stone may be required in various areas to stabilize the roadway and parking area subgrades.

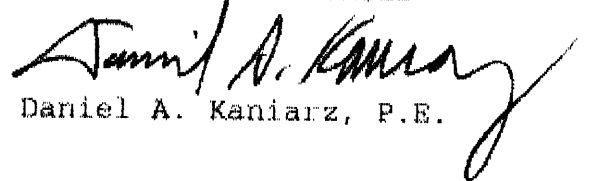
Experience indicates that the actual subsoil conditions at the site could vary from those generalized on the basis of test borings made at specific locations. It is, therefore, essential that McDowell & Associates be notified of any variation of soil conditions to determine their effects on the recommendations presented in this report. The evaluations and recommendations presented in this report have been formulated on the basis of reported or assumed data relating to the proposed project. Any significant change in this data in the final design plans should be brought to our attention for review and evaluation with respect to the prevailing subsoil conditions.

It is recommended that the services of McDowell & Associates be engaged to observe the soils in the footing excavations prior to concreting in order to test the soils for the required bearing capacities. Testing should also be performed to check that suitable materials are being used for controlled fills and that they are properly placed and compacted.

If we can be of any further service, please feel free to call.

Very truly yours,

MCDOWELL & ASSOCIATES



Daniel A. Kaniarz, P.E.



**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

JOB NO. 99-036

LOG OF SOIL BORING NO. 1

PROJECT Soils Investigation

LOCATION Site Development

Haggerty between I2 & I3 Mile  
Novi, Michigan

SURFACE ELEV. \_\_\_\_\_ DATE 2-5-99

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 8"	Moisture %	Natural Wt. P.C.F.	Dry Den. Wt. P.C.F.	Unsat. Comp. Strength PSF	Str. %				
	1		0'10" Moist dark brown sandy clayey TOPSOIL with vegetation										
A	2		Stiff moist brown sandy CLAY with pebbles, occasional topsoil streaks and wet sand lenses	3	3.6	136	*	3460					
UL	3			5									
	4			12									(4500)
B	5		4'0" Extremely stiff moist brown sandy CLAY with sand & pebbles and occasional wet sand lenses	12	22.4	145	*	9780					
UL	6			15									
	6			24									(9000+)
C	7		6'6" Extremely stiff moist brown sandy CLAY with sand & pebbles	12									
UL	8			22									
	8			--									
D	9		9'6" Extremely stiff moist blue sandy CLAY with sand & pebbles	9									
UL	10			12									
	11			14									
E	12		15'6" Extremely stiff moist blue sandy CLAY with sand & pebbles	8									
UL	16			11									
	16			15									
	17												
	18												
	19												
	20												
	21												
	22												
	23												
	24												
	26												

<b>TYPE OF SAMPLE</b> D. - DISTURBED U.L. - UNDIST. LINER S.T. - SHELBY TUBE S.S. - SPLIT SPOON R.C. - ROCK CORE ( ) - PENETROMETER	<b>REMARKS:</b> * Calibrated Penetrometer  Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made At 8" Intervals	<b>GROUND WATER OBSERVATIONS</b> G.W. ENCOUNTERED AT 0 FT. 10 INS. G.W. ENCOUNTERED AT 4 FT. 0 INS. G.W. AFTER COMPLETION Dry FT. INS. G.W. AFTER HRS FT. INS. G.W. VOLUMES Very Light
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**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

JOB NO. 99-036

LOG OF SOIL BORING NO. 2

PROJECT Soils Investigation

LOCATION Site Development

Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. DATE 2-5-99

Sample # Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows Per 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Str. %
	1		0'10" Moist dark brown sandy clayey TOPSOIL with vegetation						
A	2		Stiff moist brown sandy CLAY with sand & pebbles	4					
UL	3			6	12.8	263		6075	
	4			8			*	(6000)	
B	5		4'0" Very stiff to extremely stiff moist brown sandy CLAY with sand & pebbles	9					
UL	6			13	12.0	140		6660	
	8			17			*	(9000)	
C	7		6'6" Extremely stiff moist brown sandy CLAY with wet sand lenses	13					
UL	8			14					
	9			16					
D	10		9'0" Extremely stiff moist brown sandy CLAY with sand & pebbles	9					
UL	11			12					
	12			14					
	13		11'0" Extremely stiff moist blue sandy CLAY with sand & pebbles						
	14								
	15								
E	14		13'0" Compact moist brown fine to medium SAND						
UL	15			7					
	16			6					
	18		15'6"	7					
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

<p><b>TYPE OF SAMPLE</b></p> <ul style="list-style-type: none"> <li>D. DISTURBED</li> <li>U.L. UNDIST. LINER</li> <li>S.T. SHELBY TUBE</li> <li>S.S. SPLIT SPOON</li> <li>R.C. ROCK CORE</li> <li>( ) PENETROMETER</li> </ul>	<p><b>REMARKS:</b></p> <p>* Calibrated Penetrometer</p> <p>Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals</p>	<p><b>GROUND WATER OBSERVATIONS</b></p> <p>G.W. ENCOUNTERED AT 6 FT 6 INS.</p> <p>G.W. ENCOUNTERED AT FT INS.</p> <p>G.W. AFTER COMPLETION Dry FT INS.</p> <p>G.W. AFTER HRS FT INS.</p> <p>G.W. VOLUMES Very Light</p>
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**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

JOB NO. 99-036

LOG OF SOIL BORING NO. 3

PROJECT Soils Investigation

LOCATION Site Development  
Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. DATE 2-5-99

Sample # Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Str. %
	1								
A UL	2		Stiff moist dark brown sandy clayey TOPSOIL with vegetation and trace of gravel	5					
	3			6	37.0	118			
	4			5			*	(1500)	
B UL	5		Soft wet brown sandy CLAY with pebbles and trace of gravel	1					
	6			1	20.5	125			
	6			1			*	( 500)	
C UL	7		Firm to stiff moist brown sandy CLAY with sand & pebbles	3					
	8			4	18.1	131		2390	
	9			5			*	(2500)	
D UL	10		Stiff to very stiff moist brown sandy CLAY with sand & pebbles	7					
	11			8					
	11			13					
E UL	12		Very stiff to extremely stiff moist blue sandy CLAY with sand & pebbles						
	13								
	14								
	15		15'6"	8					
	16			13					
	16			14					
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

<p><b>TYPE OF SAMPLE</b></p> <ul style="list-style-type: none"> <li>D - DISTURBED</li> <li>U.L. - UNDER LINDER</li> <li>S.T. - SHELBY TUBE</li> <li>S.S. - SPLIT SPOON</li> <li>R.C. - ROCK CORE</li> <li>( ) - PENETROMETER</li> </ul>	<p><b>REMARKS:</b></p> <p>* Calibrated Penetrometer</p> <p>Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals</p>	<p><b>GROUND WATER OBSERVATIONS</b></p> <p>G.W. ENCOUNTERED AT 2 FT 8 INS.</p> <p>G.W. ENCOUNTERED AT 2 FT 0 INS.</p> <p>G.W. AFTER COMPLETION 2 FT 0 INS.</p> <p>G.W. AFTER HRS FT INS.</p> <p>G.W. VOLUMES Heavy</p>
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**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

JOB NO. 99-036

LOG OF SOIL BORING NO. 4

PROJECT Soils Investigation

LOCATION Site Development

Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. \_\_\_\_\_ DATE 2-5-99

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Str. %
	1		0'10" Moist dark brown sandy clayey TOPSOIL with vegetation						
A UL	2		Stiff to very stiff moist brown sandy CLAY with sand & pebbles	5					
	3			6	16.5	132		5045	
	4			11			*	(5000)	
B UL	5		4'0" Extremely stiff moist brown sandy CLAY with sand & pebbles	7					
	6			14	10.4	146		6745	
	8			16			*	(9000)	
C UL	7		9'0" Extremely stiff moist blue sandy CLAY with sand & pebbles and occasional sand lenses	8					
	8			15					
	9			20					
D UL	10			12					
	11			14					
	12		14						
E UL	13		15'6"	11					
	14			14					
	15			14					
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE  
 D. DISTURBED  
 U.L. UNDIST. LINER  
 S.T. SHELBY TUBE  
 S.S. SPLIT SPOON  
 R.C. ROCK CORE  
 ( ) PENETROMETER

REMARKS:  
 \* Calibrated Penetrometer  
 Standard Penetration Test - Driving 2" OD Sampler 1' With  
 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS  
 G.W. ENCOUNTERED AT FT INS.  
 G.W. ENCOUNTERED AT FT INS.  
 G.W. AFTER COMPLETION None FT INS.  
 G.W. AFTER HRS FT INS.  
 G.W. VOLUMES



**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

JOB NO. 99-036

LOG OF SOIL BORING NO. 6

PROJECT Soils Investigation

LOCATION Site Development  
Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. \_\_\_\_\_ DATE 2-5-99

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc Comp. Strength PSF	Str. %
	1		0'10" Moist dark brown sandy clayey TOPSOIL with vegetation						
A	2		Stiff to very stiff moist variegated sandy CLAY with sand & pebbles and occasional wet sand lenses	4					
UL	3			7	13.4	141			
	4			14			*	(6500)	
B	5		4'0" Extremely stiff moist variegated sandy CLAY with sand & pebbles	8					
UL	6			12	11.5	142		5760	
	6			16			*	(8000)	
C	7		7'0" Extremely stiff moist brown sandy CLAY with sand & pebbles	11					
UL	8			17					
	8			--					
D	9		9'0" Extremely stiff moist blue sandy CLAY with sand & pebbles	12					
UL	10			15					
	11			15					
	12		12'0" Extremely stiff moist blue sandy CLAY with sand & pebbles and wet sand lenses						
	13								
	14								
E	15		5'6"	9					
UL	15			12					
	16			14					
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

<b>TYPE OF SAMPLE</b> D. DISTURBED UL. UNDIST. LINER S.T. SHELBY TUBE S.S. SPLIT SPOON R.C. ROCK CORE ( ) PENETROMETER	<b>REMARKS:</b> * Calibrated Penetrometer  Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals	<b>GROUND WATER OBSERVATIONS</b> G.W. ENCOUNTERED AT 0 FT. 10 INS. G.W. ENCOUNTERED AT 12 FT. 8 INS. G.W. AFTER COMPLETION Dry FT. INS. G.W. AFTER 48 HRS. FT. INS. G.W. VOLUMES Very Light
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LOG OF SOIL BORING NO. 5



**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

PROJECT Soils Investigation

JOB NO. 99-036

LOCATION Site Development

Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. \_\_\_\_\_ DATE 2-5-99

Sample # Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 8"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Str %
	1		1'0" Moist dark brown sandy clayey TOPSOIL with vegetation						
A UL	2		2'0" Stiff moist black sandy clayey TOPSOIL with vegetation (possible peat)	3					
	3			5	60.7	95			
	4		4'0" Stiff moist brown sandy CLAY with sand seams and trace of gravel	5			*	(3000)	
B UL	5			3					
	6		5'2" Compact moist brown fine SAND	5	15.1	132			
	8			5			*	(3000)	
C UL	7		8 Stiff moist brown sandy CLAY with pebbles	5					
	8			8	3.0	106			
	9		9'0" Very stiff to extremely stiff moist brown sandy CLAY with sand & pebbles	8					
D UL	10			13					
	11			15					
	12		11'6" Extremely stiff moist blue sandy CLAY with sand & pebbles and occasional sand seams						
	13								
E UL	14			17					
	15			18					
	16		15'6"						
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

<b>TYPE OF SAMPLE</b> D. - DISTURBED U.L. - UNDIST. LINER S.T. - SHELBY TUBE S.S. - SPLIT SPOON R.C. - ROCK CORE ( ) - PENETROMETER	<b>REMARKS:</b> * Calibrated Penetrometer  Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals	<b>GROUND WATER OBSERVATIONS</b> G.W. ENCOUNTERED AT _____ FT. INS. G.W. ENCOUNTERED AT _____ None FT. INS. G.W. AFTER COMPLETION _____ FT. INS. G.W. AFTER _____ HRs FT. INS. G.W. VOLUMES _____
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LOG OF SOIL BORING NO. 7



**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

PROJECT Soils Investigation

JOB NO. 99-036

LOCATION Site Development

SURFACE ELEV. \_\_\_\_\_

DATE 2-5-99

Haggerty between 12 & 13 Mile  
Novi, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Str. %
	1		0'8" Moist dark brown sandy clayey TOPSOIL with vegetation						
A	2		2'9" Compact moist brown clayey fine SAND with trace of gravel	3					
UL	3			5	12.7	134			
	4		6'6" Stiff to very stiff moist brown sandy CLAY with occasional pebbles	7					
B	5			8					
UL	6			10	9.7	116			
	8			14			*	(7000)	
C	7		11'0" Extremely stiff moist brown sandy CLAY with sand & pebbles	13					
UL	8			20					
	9			--					
D	10			14					
UL	11			19					
	12			--					
	13		15'6" Extremely stiff moist variegated sandy CLAY with sand & pebbles						
E	14			9					
UL	15			13					
	16			16					
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

<p><b>TYPE OF SAMPLE</b>                  D - DISTURBED                  UL - UNDIST. LINER                  S.T. - SHELBY TUBE                  S.S. - SPLIT SPDM                  R.C. - ROCK CORE                  ( ) - PENETROMETER</p>	<p><b>REMARKS:</b>                  * Calibrated Penetrometer                   Standard Penetration Test - Driving 2" OD Sample 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals</p>	<p><b>GROUND WATER OBSERVATIONS</b></p> <table border="0"> <tr> <td>G.W. ENCOUNTERED AT</td> <td></td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. ENCOUNTERED AT</td> <td>None</td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. AFTER COMPLETION</td> <td></td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. AFTER</td> <td>HRS</td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. VOLUMES</td> <td></td> <td></td> <td></td> </tr> </table>	G.W. ENCOUNTERED AT		FT.	INS.	G.W. ENCOUNTERED AT	None	FT.	INS.	G.W. AFTER COMPLETION		FT.	INS.	G.W. AFTER	HRS	FT.	INS.	G.W. VOLUMES			
G.W. ENCOUNTERED AT		FT.	INS.																			
G.W. ENCOUNTERED AT	None	FT.	INS.																			
G.W. AFTER COMPLETION		FT.	INS.																			
G.W. AFTER	HRS	FT.	INS.																			
G.W. VOLUMES																						

LOG OF SOIL BORING NO. 8



**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

PROJECT Soils Investigation

JOB NO. 99-036

LOCATION Site Development  
Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. \_\_\_\_\_ DATE 2-5-99

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows For 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unn. Comp. Strength PSF.	Sr. %
	1		0'9" Moist dark brown sandy clayey TOPSOIL with vegetation						
A UL	2	[Hatched Legend]	Stiff moist brown sandy CLAY with trace of gravel and occasional sand seams	4	16.9	128	*	(3000)	
	3			5					
	4			6					
B UL	6	[Hatched Legend]	3'6" Extremely stiff moist brown sandy CLAY with sand & pebbles and occasional sand & gravel seams	28	11.9	138	*	(9000+)	
	8			22					
	9								
C UL	10	[Hatched Legend]	6'6" Extremely stiff moist brown sandy CLAY with sand & pebbles	13					
	11			16					
	12								
D UL	13	[Hatched Legend]		12					
	14			16					
	15			18					
E UL	16	[Hatched Legend]	14'9" Extremely stiff moist blue sandy CLAY with sand & pebbles	13					
	17			14					
	18			16					
	19								
	20								
	21								
	22								
	23								
	24								
	25								

<p><b>TYPE OF SAMPLE</b>                  O - DISTURBED                  U.L. - UNDIST. LINER                  S.T. - SHEILDY TUBE                  S.S. - SPLIT SPOON                  R.C. - ROCK CORE                  ( ) - PENETROMETER</p>	<p><b>REMARKS:</b>                  * Calibrated Penetrometer                   Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30". Count Made At 8" Intervals</p>	<p><b>GROUND WATER OBSERVATIONS</b></p> <table> <tr> <td>G.W. ENCOUNTERED AT</td> <td>None</td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. ENCOUNTERED AT</td> <td></td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. AFTER COMPLETION</td> <td></td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. AFTER</td> <td>HRS.</td> <td>FT.</td> <td>INS.</td> </tr> <tr> <td>G.W. VOLUMES</td> <td></td> <td></td> <td></td> </tr> </table>	G.W. ENCOUNTERED AT	None	FT.	INS.	G.W. ENCOUNTERED AT		FT.	INS.	G.W. AFTER COMPLETION		FT.	INS.	G.W. AFTER	HRS.	FT.	INS.	G.W. VOLUMES			
G.W. ENCOUNTERED AT	None	FT.	INS.																			
G.W. ENCOUNTERED AT		FT.	INS.																			
G.W. AFTER COMPLETION		FT.	INS.																			
G.W. AFTER	HRS.	FT.	INS.																			
G.W. VOLUMES																						

LOG OF SOIL BORING NO. 9



**McDOWELL & ASSOCIATES**  
Geotechnical Engineers

JOB NO. 99-036

PROJECT Soils Investigation

LOCATION Site Development

Haggerty between 12 & 13 Mile  
Novi, Michigan

SURFACE ELEV. \_\_\_\_\_ DATE 2-5-99

Sample # Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows Per 8"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Sh. %
	1		0'10" Moist dark brown sandy clayey TOPSOIL with vegetation						
A UL	2		3'0" Stiff moist variegated sandy CLAY with sand & pebbles	4					
	3			5	17.2	132		5900	
	4			8			*	(6000)	
B UL	6		6'6" Very stiff to extremely stiff moist brown sandy CLAY with sand & pebbles	8					
	8			13	12.6	140		6335	
	10			17			*	(9000)	
C UL	10		9'8" Extremely stiff moist brown sandy CLAY with sand & pebbles and sand seams	8					
	11			12					
	12			14					
D UL	14		15'6" Very stiff moist blue sandy CLAY with sand & pebbles and occasional sand lenses	7					
	15			10					
	16			10					
E UL	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE  
 B. - DISTURBED  
 U.L. - UNDIST. LINER  
 S.T. - SHELBY TUBE  
 S.S. - SPLIT SPOON  
 R.C. - ROCK CORE  
 ( ) - PENETROMETER

REMARKS:  
 \* Calibrated Penetrometer  
  
 Standard Penetration Test - Driving 2" OD Sampler 1' With  
 140# Hammer Falling 30"; Count Made At 8" Intervals

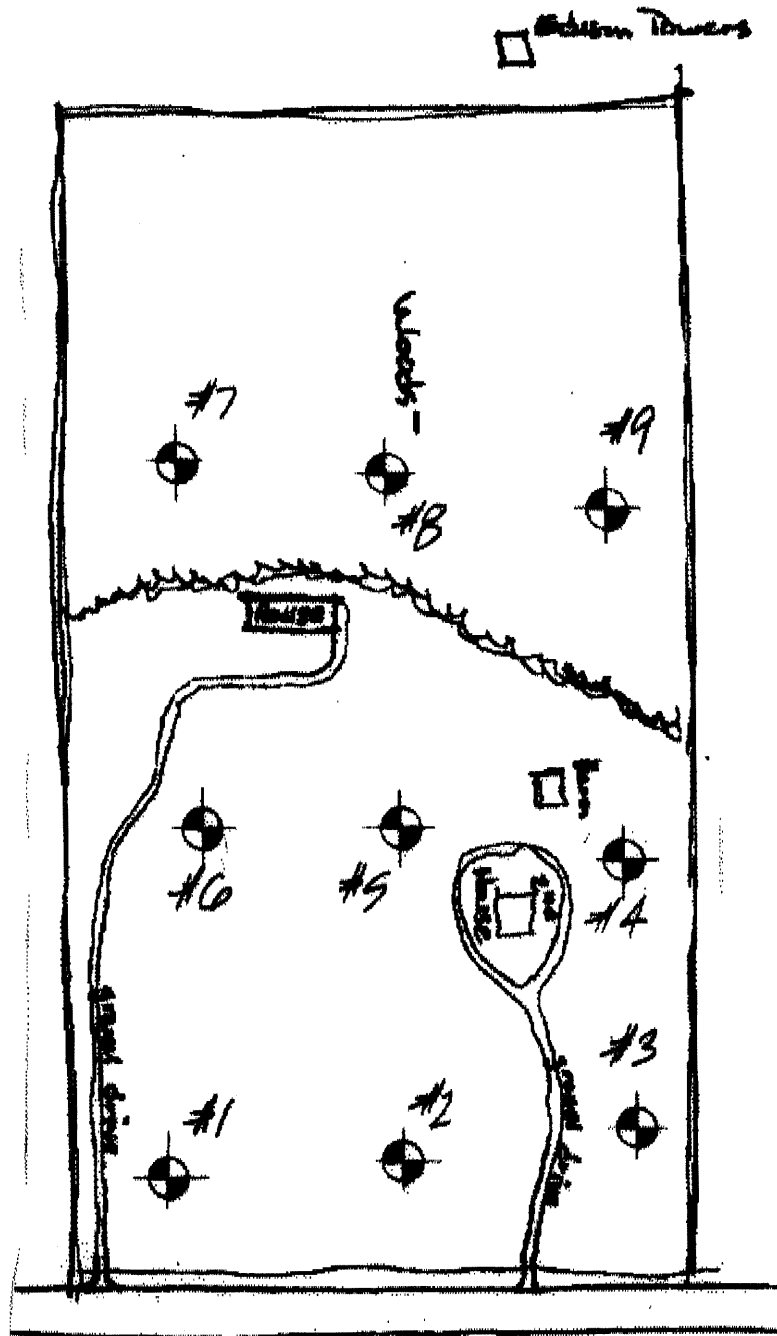
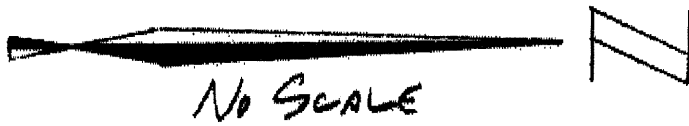
GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT		FT	INS
G.W. ENCOUNTERED AT	None	FT	INS.
G.W. AFTER COMPLETION		FT.	INS.
G.W. AFTER	HRS	FT	INS.
G.W. VOLUMES			

Job No. 99-036

SIEVE ANALYSIS

BORING	SAMPLE	% PASSING				
		#4 SIEVE	#10 SIEVE	#40 SIEVE	#100 SIEVE	#200 SIEVE
5	C	96.0	94.2	76.9	12.5	7.5
7	A	98.1	96.5	87.9	46.2	35.4



SOIL BORING LOCATION PLAN

#99-036



THE BEZTAK COMPANIES

Real Estate Development, Construction, Management, Financing & Investments

### FAX TRANSMITTAL COVER SHEET

DATE: 1.29.99

TO: Dan Kaniarz and/or Joe Jones

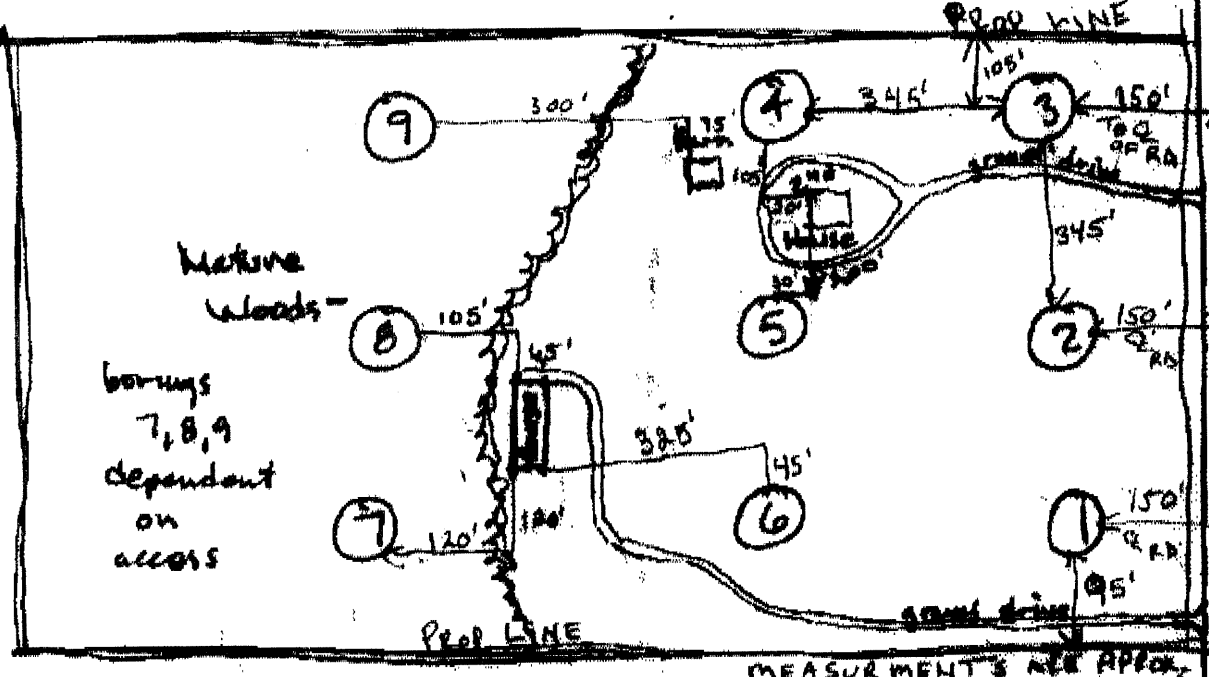
FAX NUMBER: 399-2157

FROM: Mike Fellows

NUMBER OF PAGES INCLUDING COVER SHEET: ①

COMMENTS: 22 Acres on Haggerty Rd  
Soil Boring Locations

BUCKEYE PIPELINE, ALONG HAGGERTY



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If you have any questions, please call me at (248) 737-6193

## WETLAND BOUNDARY DETERMINATION



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING



C. HEIDI GREYHER  
DIRECTOR

July 5, 2018

Mr. Mark Highlen  
Bezteck Companies  
31731 Northwestern Highway, Suite 250W  
Farmington Hills, Michigan 48334

Dear Mr. Highlen:

SUBJECT: Wetland Identification Report  
Wetland Identification Site Name: 63-Haggerty Road-Novi  
MiWaters Submission Number: HND-0H69-FWMKW

The Department of Environmental Quality (DEQ) conducted a Level 3 Wetland Identification Review of approximately 22 acres on property (Property Tax Identification Numbers 50-22-12-400-009, -010, and -011) located in Town 01 North, Range 08 East, Section 12, city of Novi, Oakland County on June 7, 2018. The wetland identification was conducted in accordance with Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), and Rule 4 (1), Wetland Identification and Assessment (R 281.924), of the Administrative Rules for Part 303. This is a report of our findings in response to your Wetland Identification Program (WIP) application.

Based on our on-site investigation which included a review of plants, hydrology, and soils, the DEQ confirms, in part, the wetland boundary lines flagged by your consultant. The DEQ also reviewed other pertinent information such as aerial imagery, soil survey data, topographic mapping data, and surface hydrology data.

Approximately 0.72 acre of wetland area was overlooked and omitted by the consultant. The DEQ extended the consultant's wetland delineation boundary flagging associated with wetlands within the western and northcentral portion of the WIP review area and located two other wetlands within the southwest portion of the WIP review area. The wetland areas showed evidence of sustained surface (or near-surface) hydrology occurring during the growing season and were associated with hydrophytic plant species and hydric soil.

Modified boundaries were documented on the enclosed site map (Figure 2). The site map of the WIP review area was created by combining information from your consultant and the DEQ. The new map identifies areas containing regulated wetland, unregulated wetland, and non-wetland (upland).



Mr. Mark Highlen

Page 2

July 5, 2018

Approximately **0.60 acre (38 percent)** of the 1.58 acres of wetland within the WIP review area are regulated by the DEQ because of wetland size and/or proximity to a pond, lake, or stream/drain. For those areas identified as regulated wetland on the site map, specifically **Wetlands A, B, and C**, please be advised that any of the following activities require a permit under Part 303:

- a) Deposit or permit the placing of fill material in a regulated wetland.
- b) Dredge, remove, or permit the removal of soil or minerals from regulated wetland.
- c) Construct, operate, or maintain any use or development in a regulated wetland.
- d) Drain surface water from a regulated wetland.

For those areas identified as unregulated wetland or non-wetland (upland) on the site map, the DEQ lacks jurisdiction under Part 303 for activities occurring in those areas. The unregulated wetlands are not regulated by the DEQ because they are not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and are five acres or less in size.

This Wetland Identification Report is limited to findings pursuant to Part 303 and does not constitute a determination of jurisdiction under other DEQ-administered programs. Any land use activities undertaken within the WIP review area may be subject to regulation pursuant to the NREPA under Part 91, Soil Erosion and Sedimentation Control.

Please be aware that this wetland identification report does not constitute a determination of the jurisdiction under local ordinances or federal law. The United States Army Corps of Engineers (USACE) retains regulatory authority over certain wetlands pursuant to Section 404 of the Clean Water Act (CWA), and specifically those wetlands associated with traditionally navigable waters of the state. Navigable waters are generally the Great Lakes, their connecting waters, and river systems and lakes connected to these waters. In other areas of the state, the DEQ is responsible for identification of wetland boundaries for purposes of compliance with the CWA under an agreement with the United States Environmental Protection Agency. Your review area does not appear to be within those areas also regulated by the USACE. Additional information may be obtained by contacting the USACE at 313-226-2218.

You may request the DEQ reassess the wetland boundaries and regulatory status of wetlands within any portion of the review area, should you disagree with the findings, within 60 days of the date of this report. A written request to reassess the Wetland Identification review area must be accompanied by supporting evidence with regard to wetland vegetation, soils, or hydrology different from, or in addition to, the information relied upon by DEQ staff in preparing this report. The request should be submitted to:

Wetland Identification Program  
Department of Environmental Quality  
Water Resources Division  
P.O. Box 30458  
Lansing, Michigan 48909-7958

Mr. Mark Highlen

Page 3

July 5, 2018

The findings contained in this report do not convey, provide, or otherwise imply approval of any governing act, ordinance, or regulation, nor does it waive the obligation to acquire any applicable federal, state, county, or local approvals. This Wetland Identification Report is not a permit for any activity that requires a permit from the DEQ.

Should you need to apply for a permit for future work within this site, please use the same site name listed within the subject line of this letter when you are listing the site location within the MiWaters online permit application.

The findings contained in this report are binding on the DEQ until July 5, 2021, a period of three years from the date of this Wetland Identification Report unless a reassessment has been conducted. Please contact me at 517-243-5002; [gyekisk@michigan.gov](mailto:gyekisk@michigan.gov); or DEQ, P.O. Box 30458, Lansing, Michigan 48909-7958, if you have any questions regarding this report.

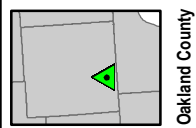
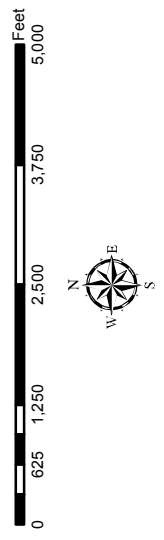
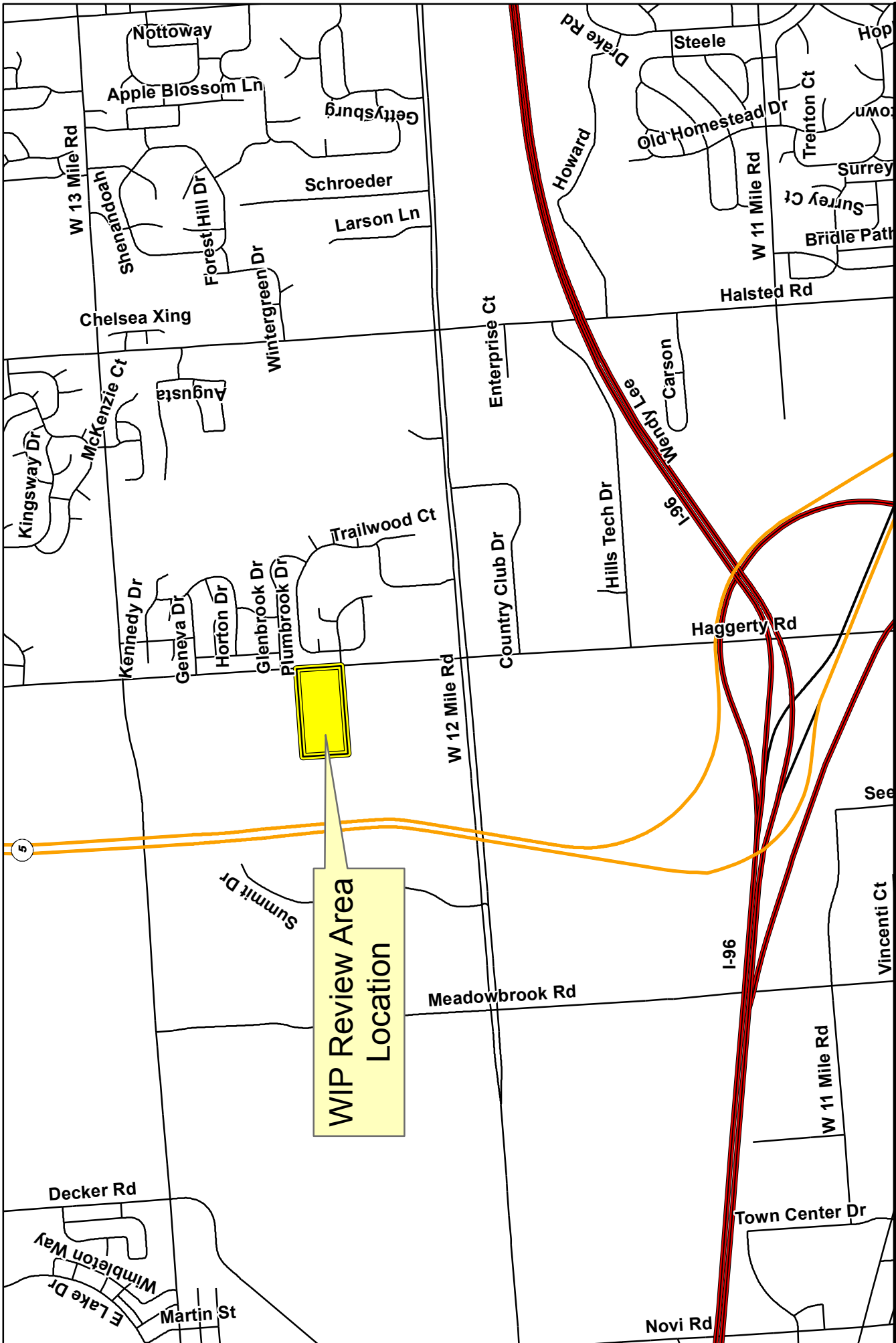
Sincerely,

A handwritten signature in black ink that reads "Keto Gyekis". The signature is fluid and cursive, with the first name "Keto" being more prominent and the last name "Gyekis" following in a similar style.

Keto Gyekis  
Wetland Identification Program Coordinator  
Water Resources Division

Enclosures

cc: Oakland County Soil Erosion Enforcement Agent (CEA)  
Oakland County Health Division  
City of Novi Clerk  
Mr. Jeffrey Smith, PEA, Inc.  
Mr. Andrew Hartz, DEQ  
Ms. Susan Tepatti, DEQ



**Figure 1.**  
 DEQ Wetland Identification Location  
 Haggerty Road  
 Novi

**Wetlands A, B, and C are regulated under Part 303 of NREPA**



Haggerty Rd

Upland

Upland

Upland

Upland

Upland

Regulated Wetland A  
0.55 acre

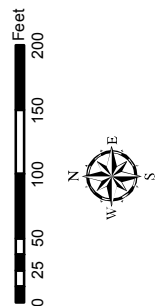
Regulated Wetland B  
0.04 acre




Regulated Wetland C  
0.01 acre

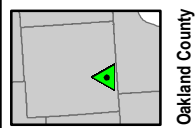
Regulated Wetland  
Continues  
Off Site



This drawing showing those areas containing wetland and not containing wetland and the boundary boundaries flagged on-site. This drawing does not authorize or permit activities in wetlands in accordance with Part 303 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.



-  Regulated Wetlands
-  Unregulated Wetlands
-  WIP Review Area Boundary



**Figure 2.**  
**DEQ Wetland Identification Detail**  
**Haggerty Road**  
**Novi**