



BEACON HILL JSP15-08 with Rezoning 18.710

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Public hearing at the request of The Ivanhoe Companies for Planning Commission's recommendation to the City Council for rezoning of property in Section 12, located on the northeast corner of Twelve Mile Road and Meadowbrook Road from RA (Residential Acreage) to R-4 (One-Family Residential) and B-3 (General Business), with a Planned Rezoning Overlay (PRO). The subject property is approximately 21.13 acres. The applicant is proposing a 42-unit single-family residential development with frontage on and access to Meadowbrook Road, up to 22,000 square feet of commercial space with frontage and two access drives on Twelve Mile Road, and an open space/park area at the corner of the intersection.

REQUIRED ACTION

Recommend to the City Council approval or denial of rezoning request from RA to R-4 and B-3 with a Planned Rezoning Overlay.

| REVIEW | RESULT | DATE | COMMENTS |
|-------------|---|---------|---|
| Planning | Approval Recommended | 3-18-16 | Items to be addressed on the Preliminary Site Plan submittal. |
| Engineering | Approval Recommended | 4-15-16 | Items to be addressed on the Preliminary Site Plan submittal. |
| Landscaping | Approval Recommended with reservations | 4-15-16 | <ul style="list-style-type: none"> • Landscape waivers requested are not consistent with the Landscape Ordinance. • Items to be addressed on the Preliminary Site Plan submittal. |
| Traffic | Approval Recommended | 3-18-16 | Items to be addressed on the Preliminary Site Plan submittal. |
| Wetlands | Approval Recommended | 3-21-16 | Items to be addressed on the Preliminary Site Plan submittal. |
| Woodlands | Approval Recommended | 4-19-16 | Items to be addressed on the Preliminary Site Plan submittal. |
| Facade | No Review | | |
| Fire | Approval Recommended | 4-15-16 | Items to be addressed on the Preliminary Site Plan submittal. |

MOTION SHEET

Approval

In the matter of the request of The Ivanhoe Companies for Beacon Hill JSP 15-08 with Zoning Map Amendment 18.710 motion to **recommend approval** to the City Council to rezone the subject property RA (Residential Acreage) to R-4 (One-Family Residential) and B-3 (General Business) with a Planned Rezoning Overlay (PRO).

The recommendation shall include the following ordinance deviations for consideration by the City Council:

- a. Reduction in the required minimum lot size and minimum lot width for one-family detached dwellings reviewed against R-4 Zoning standards to allow for smaller lots (10,000 square feet and 80 feet required, 6,000 square feet and 50 feet provided);
- b. Reduction in minimum front yard setback for one-family detached dwellings reviewed against R-4 Zoning standards (30 feet required, 20 feet provided);
- c. Reduction in minimum side yard setback and aggregate side yard setback for one-family detached dwellings reviewed against R-4 Zoning standards (10 feet with 25 feet aggregate required, 7.5 feet with 15 feet aggregate provided);
- d. Reduction in minimum rear yard setback for one-family detached dwellings reviewed against R-4 Zoning standards (35 feet required, 30 feet provided);
- e. Deviation of ordinance standards to allow proposed upsizing of Woodland Replacement Trees (evergreens) throughout the site in an amount not to exceed 33 percent of the evergreen trees provided (102 on the concept plan), as recommended in the Landscape Review letter, and based on the standards of the Landscape Design Manual, which does not allow additional credit for upsizing of Woodland Replacement Trees; and
- f. Deviation from landscaping ordinance standards for the following areas due to the proposed heavily landscaped design, and the proposed improvements to the pond and wetlands:
 - i. Deviation for the required landscape berm, and the required trees and subcanopy trees to be planted on the berm, along the residential frontage of Meadowbrook Road due to the existing wetlands and heavy vegetation in this area;
 - ii. Deviation for the required greenbelt landscaping south of the residential area (approximately 540 feet) due to the existing wetlands, and other heavy plantings proposed for this location; and
 - iii. Deviation from the required greenbelt landscaping along the western 235 feet of the Twelve Mile Road frontage due to the existing wetlands and other heavy plantings proposed for this location.

If the City Council approves the rezoning, the Planning Commission recommends the following conditions be requirements of the Planned Rezoning Overlay Agreement:

- a. Applicant's offer to dedicate 3.28 acres to the City for the establishment of a public park with the following improvements made by the developer:

- i. Mass and fine grading of 5.63 acres, including topography enhancement, wetland and woodland replacement plantings, and seeding on upland park.
- ii. Augmenting the creek, removal of damaged culverts, and realignment of creek.
- iii. Creation of a weir system to effectuate a waterfall/spillway to be viewed from the bank of the park.
- iv. Enhanced design for landscaped retention ponds.
- v. Habitat restoration.
- vi. Installation of wetland enhancement plantings.
- vii. Applicant to construct six parking spaces, a bench, and bike racks.
- b. A minimum of 42% or 8.8 acres of open space as shown on the Concept Plan.
- c. Limiting the number of dwelling units to 42, in accordance with the Concept Plan.
- d. Limiting the commercial square footage to 22,000 square feet or less.
- e. A maximum of two drive-through establishments in the commercial area. The applicant offers to exclude many of the more intense uses permitted in the B-3 District including fast food restaurants, fueling stations, produce sales, day care centers, business schools and colleges, private clubs, motels, veterinary hospitals and clinics, auto washes, bus passenger stations, new and used car salesrooms, tattoo parlors, outdoor space for automobile sales, and automobile service centers.
- f. Preservation of a 10 foot wide wooded buffer along the east property line, and a minimum of a 50 foot wide buffer along Meadowbrook Road, as shown on the proposed Concept Plan.
- g. At the time of Preliminary Site Plan Review, the Landscaping and Façade plans for the commercial phase shall meet minimum Zoning Ordinance standards.
- h. Woodland Replacement Trees shall not be used in place of the required Street Trees along Meadowbrook and Twelve Mile Roads, per the recommendations of the Landscape Review Letter, with modifications to be shown on subsequent submittals.
- i. Applicant complying with the conditions listed in the staff and consultant review letters.

This motion is made for the following reasons:

- a. The proposed density shown on the PRO Concept Plan is generally consistent with the proposed density recommendation in the Master Plan for Land Use (currently in Draft form).
- b. The proposed development is consistent with several objectives of the Master Plan for Land Use, as detailed in the Planning Review Letter.
- c. While the proposal calls for a significant departure from the vision of the 2010 Master Plan, which is to provide for a maximum of 0.8 dwelling units to the acre north of Twelve Mile Road, both east and west of Meadowbrook road, the submitted PRO Concept Plan displays sensitivity to the adjacent large lot RA properties in the area through the use of buffering along the edges of the site, including preservation of existing vegetation.
- d. The proposed Concept Plan shows the preservation and enhancement of wetlands on the site.
- e. The applicant has worked cooperatively with the Tollgate Education Center to create landscaping along Meadowbrook Road that presents a more natural look that blends well with the Tollgate frontage.
- f. The site will be adequately served by public utilities.
- g. The Traffic Impact Statement that was submitted with the rezoning request was found to be acceptable and the Level of Service (LOS) at study intersections is expected to remain at acceptable levels.

- h. Submittal of a Concept Plan, and any resulting PRO Agreement, provides assurances to the Planning Commission and to the City Council of the manner in which the property will be developed.

-OR-

Denial

In the matter of the request of The Ivanhoe Companies for Beacon Hill JSP 15-08 with Zoning Map Amendment 18.710 motion to **recommend denial** to the City Council to rezone the subject property RA (Residential Acreage) to R-4 (One-Family Residential) and B-3 (General Business) with a Planned Rezoning Overlay... *because the proposed concept plan for residential use is not consistent with maximum residential density recommended by the Master Plan for Land Use, and the commercial use is not consistent with the Master Plan for Land Use recommendation for single-family residential uses on the subject property.*

Maps
Location
Zoning
Future Land Use
Natural Features

JSP 15-08 Beacon Hill

Location

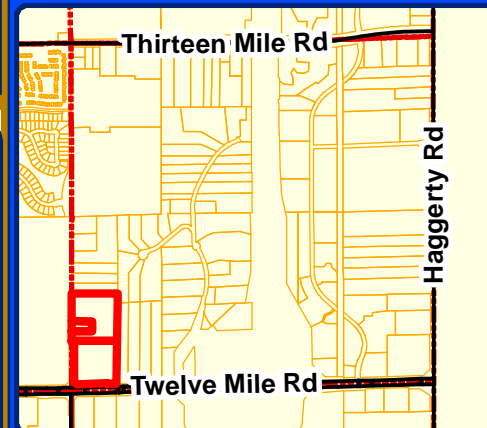


Subject Property

These 3 parcels will be combined as part of the proposal

Meadowbrook Road

Twelve Mile Road



Legend

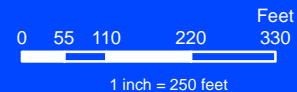
 Sections



City of Novi

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

Map Author: Sri Komaragiri
Date: 08/31/15
Project: JSP15-08 Beacon Hill
Version #: 1

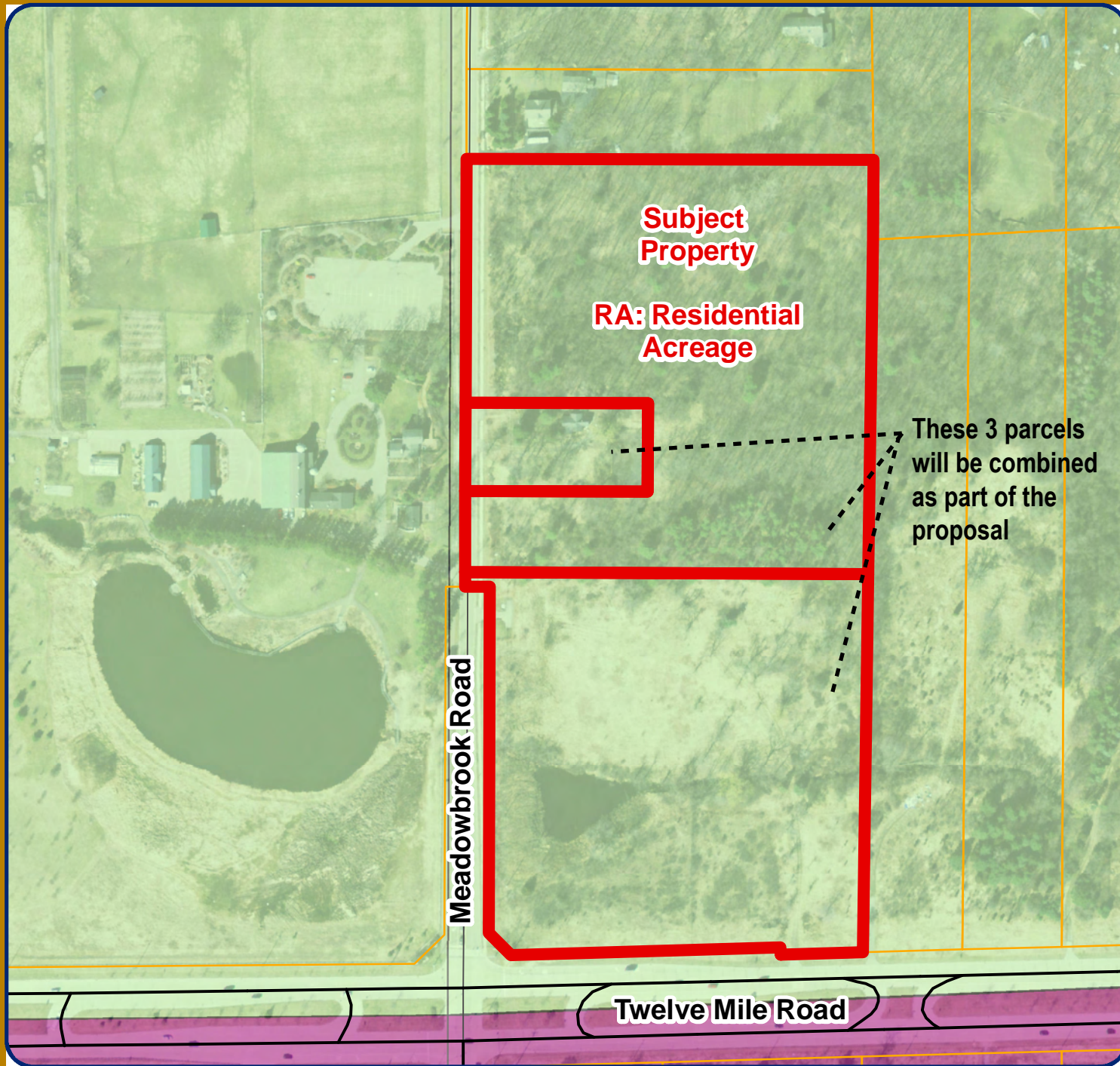


MAP INTERPRETATION NOTICE

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JSP 15-08 Beacon Hill

Zoning



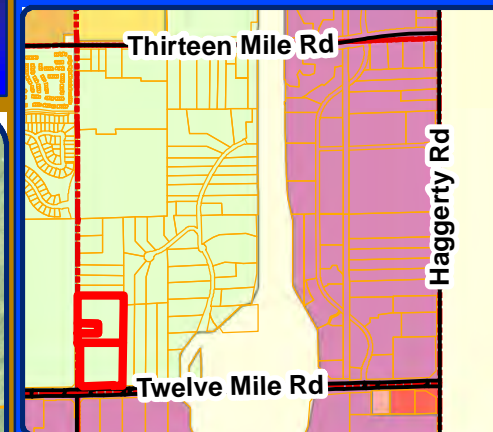
Subject Property

RA: Residential Acreage

These 3 parcels will be combined as part of the proposal

Meadowbrook Road

Twelve Mile Road



Legend

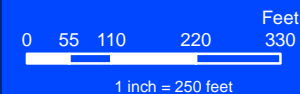
- Sections
- R-A: Residential Acreage
- RM-1: Low-Density Multiple Family
- MH: Mobile Home District
- B-2: Community Business District
- B-3: General Business District
- OST: Office Service Technology



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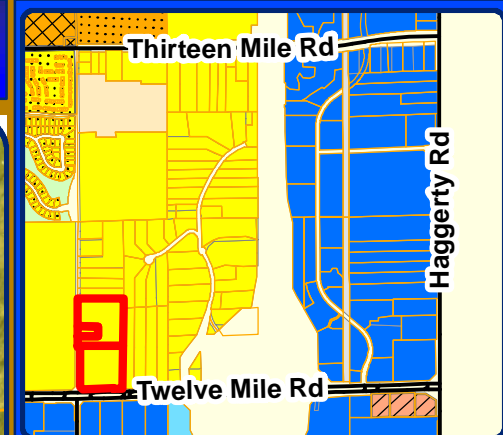
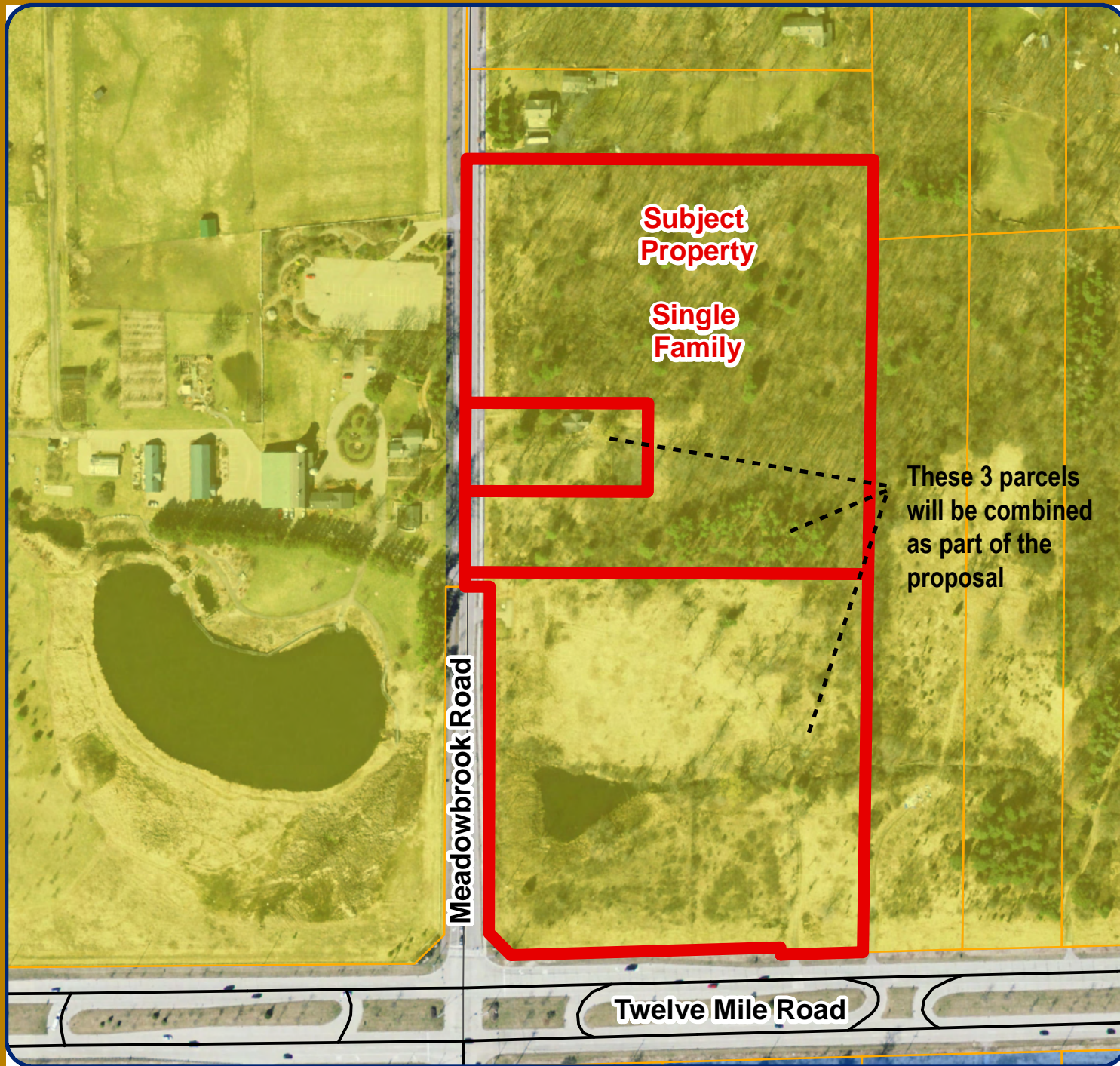


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JSP 15-08 Beacon Hill

Future Landuse



Legend

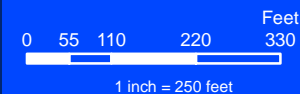
- SINGLE FAMILY
- PUD
- PD1
- MOBILE HOME PARK
- OFFICE RES DEV TECH
- COMMUNITY COMMERCIAL
- EDUCATIONAL FACILITY
- PUBLIC
- PRIVATE PARK
- UTILITY



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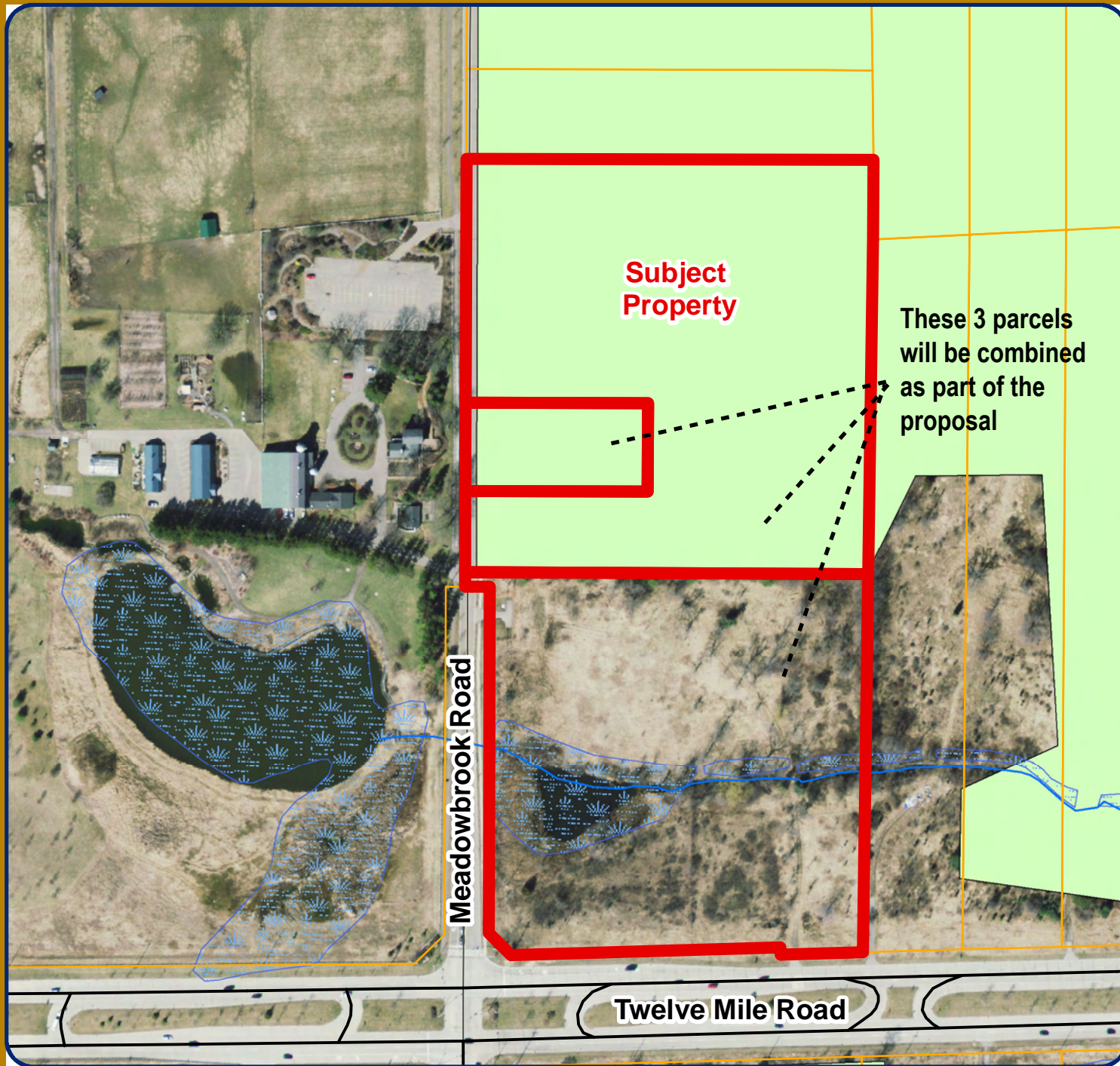


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JSP 15-08 Beacon Hill

Natural Features

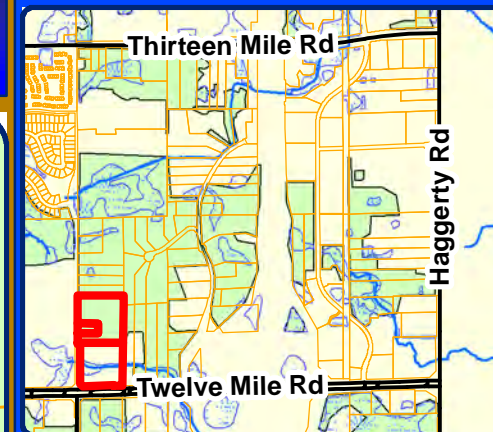


Subject Property

These 3 parcels will be combined as part of the proposal

Meadowbrook Road

Twelve Mile Road



Legend

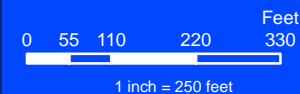
-  Wetlands
-  Woodlands



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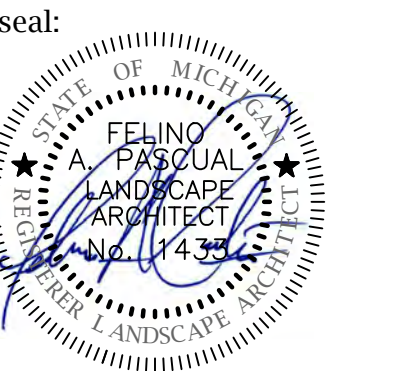


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CONCEPT PLAN

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



client:
IVANHOE
MEADOWBROOK
LLC
 6689 Orchard Lake Road,
 Suite 314
 West Bloomfield, Michigan
 48332
 ph. (248) 626-6114

project:
Beacon Hill
Park
 A planned Single Family
 and Neighborhood
 Commercial Retail

project location:
 City of Novi, MI
 12-Mile Road &
 Meadowbrook Road

sheet title:
 site plan

job no./issue/revision date:
 LS15.010.06 SPA 6-26-2015
 LS16.008.01 PSP 1-11-2016
 LS16.008.04 PSP 4-13-2016

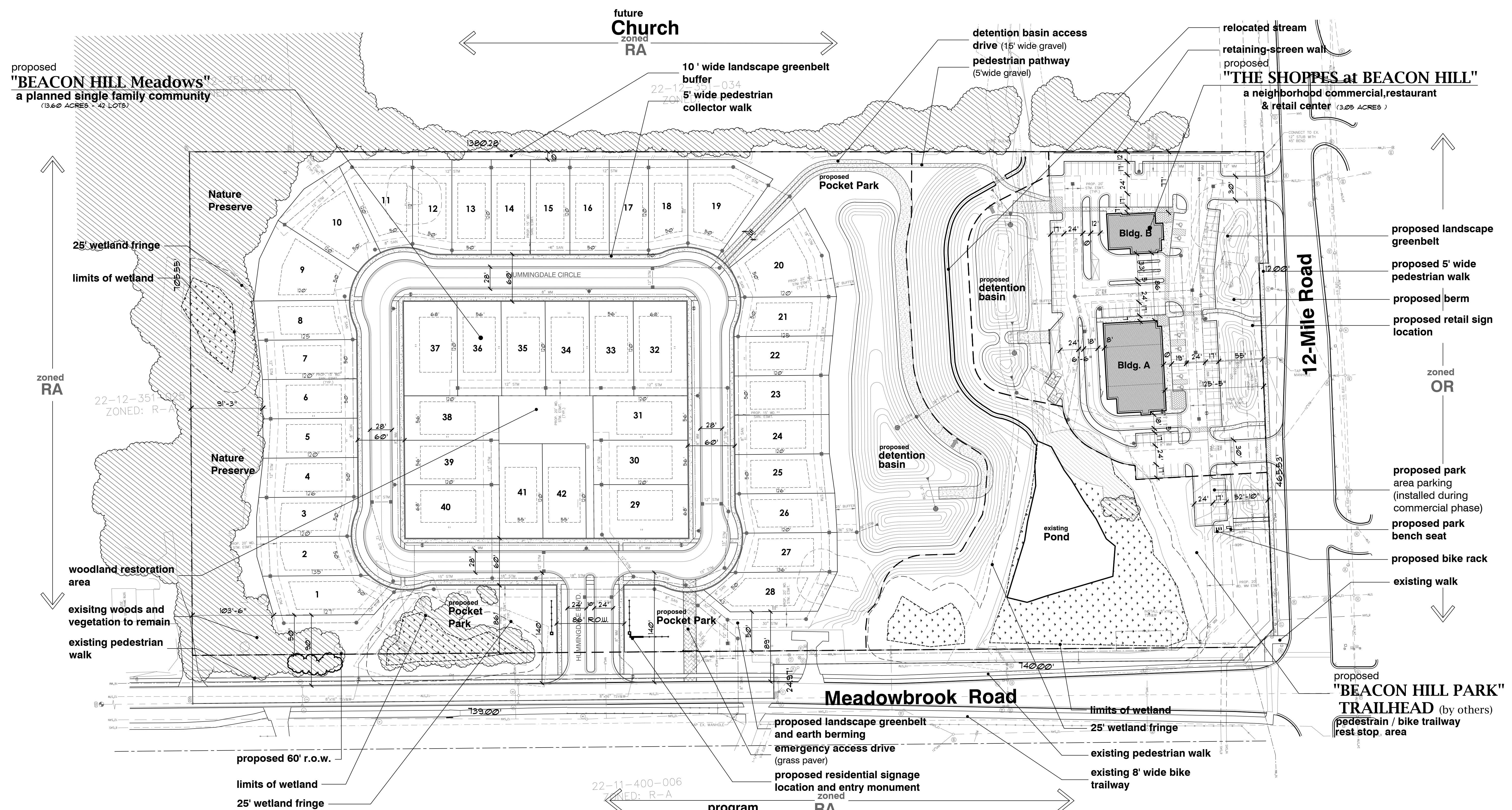
drawn by:
 JP, KH
 checked by:
 FP
 date:
 1-4-2016

notice:
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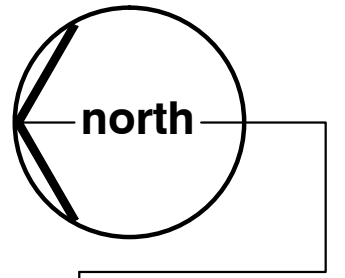
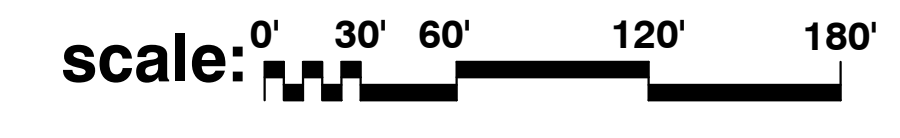


The location and elevations of existing
 underground utilities as shown on this
 drawing are only approximate. no guarantee
 is either expressed or implied as to the
 completeness of accuracy; contractor shall be
 exclusively responsible for determining the
 exact location and elevation prior to the start
 of construction

project no:
LS16.008.01
 sheet no:

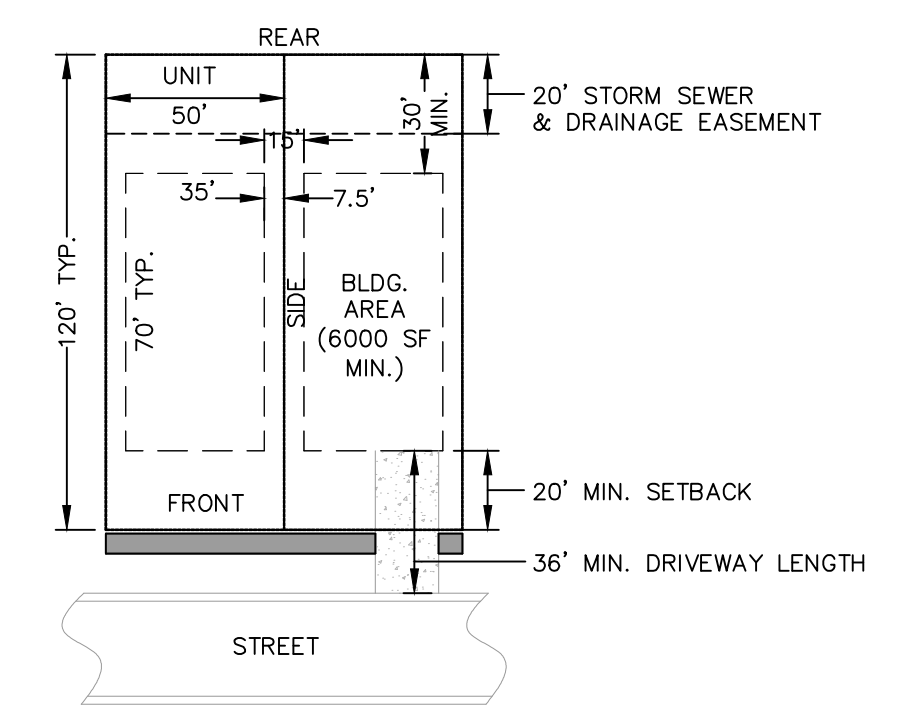


site plan for:
"Beacon Hill Park"
 City of Novi, Michigan



| program RA | |
|---|-------------|
| TOTAL ACRES OF SITE GROSS | 2113 ± |
| ACRES OF PROPOSED "THE SHOPPES AT BEACON HILL" | 3.05 |
| POTENTIAL BUILDING AREA | 11,550 S.F. |
| RETAIL AREA | 3,100 S.F. |
| BANK AREA | 3,250 S.F. |
| RESTAURANT AREA | 4,600 S.F. |
| TOTAL NO. OF PARKING REQUIRED FOR "THE SHOPPES AT BEACON HILL" | 109 |
| RETAIL PARKING | 19 SPACES |
| (1-SPACE / 100 SF. = 3,100 / 100 = 18.5 SPACES) | |
| BANK PARKING | 22 SPACES |
| (1-SPACE / 150 SF. = 3,250 / 150 = 21.67 SPACES) | |
| RESTAURANT PARKING | 68 SPACES |
| RESTAURANT "A-1" PARKING | 32 SPACES |
| (48-SEATS / 2-24-SPACES = 10 EMPLOYEE/24-SPACES = 100 S.F.FT. WAITING AREA / 19-3.33-SPACES = 32.33 SPACES TOTAL) | |
| RESTAURANT "A-3" PARKING | 36 SPACES |
| (86-SEATS / 2-28-SPACES = 10 EMPLOYEE/28-SPACES = 100 S.F.FT. WAITING AREA / 19-3.33-SPACES = 32.33 SPACES TOTAL) | |
| TOTAL NO. OF PARKING PROVIDED FOR "THE SHOPPES AT BEACON HILL" | 110 |

| | |
|--|-------------------|
| BEACON HILL PARK TRAILHEAD PARKING (INSTALLED DURING COMMERCIAL PHASE) | 6 SPACES |
| ACRES OF "BEACON HILL MEADOWS" SITE AREA | 13.6 ± |
| TOTAL NO. OF LOTS | 42 |
| TYP. LOT SIZE | 50' X 120' |
| MIN. LOTS WIDTH | 50' |
| TYP. CORNER LOT WIDTH | 63' |
| FRONT YARD SETBACK | 20' |
| SIDE YARD SETBACK | 15'/15' |
| REAR YARD SETBACK | 30' |
| DENSITY PER ACRE (MEADOWS) | 3.09 ± |
| DENSITY PER ACRE (MEADOWS & PARK) | 2.49 ± |
| TOTAL ACRES OF ROW, DEDICATED | 124 ± |
| TOTAL ACRES OF BEACON HILL PARK TRAILHEAD AREA | |
| ACRES OF BEACON HILL PARK TRAILHEAD AREA | 3.28 ± 8.8% (42%) |
| ACRES OF OPEN SPACE IN BEACON HILL MEADOWS | 4.54 ± |
| ACRES OF OPEN SPACE IN THE SHOPPES AT BEACON HILL | .98 ± |



typ. unit layout
 NO SCALE

PREVIOUS PLANNING COMMISSION MEETING MINUTES
September 9, 2015



PLANNING COMMISSION MINUTES

CITY OF NOVI

Regular Meeting

September 9, 2015 7:00 PM

Council Chambers | Novi Civic Center | 45175 W. Ten Mile
(248) 347-0475

CALL TO ORDER

The meeting was called to order at 7:00 PM.

ROLL CALL

Present: Member Anthony, Member Greco, Member Giacobetti, Member Zuchlewski

Absent: Member Baratta (excused), Member Lynch (excused), Chair Pehrson (excused)

Also Present: Barbara McBeth, Community Development Deputy Director; Sri Komaragiri, Planner; Rick Meader, Landscape Architect; Jeremy Miller, Engineer; Pete Hill, Environmental Consultant; Matt Klawon, Traffic Engineering Consultant; Rod Arroyo, Planning Consultant; Gary Dovre, City Attorney

APPROVAL OF AGENDA

Moved by Member Zuchlewski and seconded by Member Anthony

PUBLIC HEARING

1. BEACON HILL JSP15-08 with Rezoning 18.710

Public hearing at the request of The Ivanhoe Companies for Planning Commission's recommendation to the City Council for rezoning of property in Section 12, located on the northeast corner of Twelve Mile Road and Meadowbrook Road from RA (Residential Acreage) to RM-1 (Low Density, Low-Rise Multiple-Family Residential) and B-3 (General Business), or any appropriate zoning district, with a Planned Rezoning Overlay (PRO). The subject property is approximately 21.13 acres and the applicant is proposing a 42 unit single family residential development with frontage on and access to Meadowbrook Road, up to 22,000 square feet of commercial space with frontage and two access drives on Twelve Mile Road, and an open space/park area at the corner of the intersection.

Deputy Director McBeth presented a brief overview of the project. Staff has been meeting with the applicant on this property for about 18 months or so. The property is current zoned RA – Residential Acreage and the planned residential density is 0.8 units per acre. The applicant stated that he will be seeking an alternative to the Master Plan. Over the 18 months multiple plans were discussed. A multiple family development with approximately 200 units was shown initially. Later plans showed detached single family homes and various iterations with commercial uses along the Twelve Mile Road frontage. Each time the staff met with Mr. Shapiro we received additional detail from the applicant and then provided additional responses to the applicant.

Deputy Director McBeth said there is a creek that runs through the property and the natural features that exist on the property. Our environmental consultant has walked the site with the applicant's consultants and taken a look at the habitat features that are there. Staff recommended that the plan be presented to the Master Plan and Zoning Committee. The Committee reviewed the plan that was submitted at that time and provided comments. Staff also recommended earlier this year that a Land Use study be prepared for this property as well as two other properties in the city, for review of rezoning requests that are not consent with the Master Plan. We presented this request to the City Council for assistance from an outside consultant, but the request was declined at that point. We have been proceeding with reviews that we would typically

provide for the Planning Commission's consideration. Due to the workload and amount of projects coming in, we asked Rod Arroyo from Clearzoning to prepare a Planning review on this project. Since this plan is a Concept Plan associated with the rezoning request we do not see all the details that we would typically see with a Preliminary Site Plan. A lot of this information was highlighted in the review letters that are included in the Planning Commission packet. As you hear the presentations from Mr. Arroyo and Planner Komaragiri you will hear that there is some additional information that staff and consultants suggest could be provided before the project moves forward with the Planning Commission's recommendation to the City Council.

Rod Arroyo provided highlights from his review letter regarding the PRO Overlay and Concept Plan request. The zoning to the north, east and west as well as the subject property is Residential Acreage. The area on the north side of Twelve Mile Road on both sides of Meadowbrook is Master Planned for 0.8 dwelling units per acre in terms of residential density. Property on the south side of Twelve Mile Road is Master Planned and zoned for Office Service Technology. To the east, the property is zoned RA, Residential Acreage to M-5.

The gross size of this site is just over 21 acres. The applicant is asking to rezone the property to two zoning classifications with the Twelve Mile Road frontage being rezoned to B-3 and the remainder of the parcel being rezoned to RM-1, low density multiple family. The intent on the residential portion is to build single family detached units in a cluster format. This is the seen in the concept plan. The proposal is for commercial development along Twelve Mile Road. At the northeast corner of the intersection, the applicant is proposing to dedicate land and also partially construct improvements for a trail head as well as an expanded park area. The balance of the property is residential with 42 units that are proposed as part of this development.

Mr. Arroyo explained the PRO process. Essentially a Concept Plan is submitted with an application for rezoning. The applicant is requesting a change in zoning but at the same time there is a Concept Plan that would be approved along with the rezoning. With that there is a specific Development Agreement where the applicant will offer certain community benefits and if ultimately the City Council finds that it is consistent with the ordinance standards, and that the proposal is meeting the objectives of the PRO, and Zoning Ordinance as a whole the City Council can potentially approve the rezoning. What is attached to it is the concept plan and the limitations that go along with it. In this particular instance if they are asking for RM-1 which is multiple family development they can't build traditional multiple family units, because the concept plan shows detached single family homes, showing the maximum number of units in the general layout. The process is that it comes here first for a Public Hearing, the Planning Commission makes a recommendation, and the City Council makes the ultimate decision on the concept plan and the rezoning. The PRO Agreement would go through final Approval. The Planning Commission would then have site plans submitted for approval.

This is property is currently zoned RA-Residential Acreage, allowing 0.8 units per acre. The net site area for residential is just over 16 acres, allowing for 13 single family homes on this property. The portion that the applicant is looking at for residential zoning is about 14.5 acres. This would result in about 11 homes under the current zoning. The applicant is looking for 2.9 dwelling units per acre vs 0.8 units per acre currently allowed. This is a significant departure from the Master Plan. This type of process is important to get public input and evaluate in terms of neighborhood compatibility. There are lots in the area that are 1 acre or larger in size. There is another development that is located to the north in to a much more dense area. The proposed density is closely tied with the R-4 zoning district. They are asking for RM-1. The R-4 zoning district allows for 3.3 dwelling units per acre. The density as proposed is 2.9 dwellings per acre. The point is that if the R-4 was granted with the PRO plan, the same density could be achieved as long as the relief was granted for the lot size, lot width and setbacks.

Mr. Arroyo said, the applicant is requesting B-3, General Business zoning, but this is not an area planned for commercial. On the Concept Plan, there is a potential for two drive-through facilities. There are some ordinance deviations that are being requested as part of the PRO process which allows the applicant to request deviations. The applicants are looking to reduce the lot size and lot width. The ordinance reads that if you have RM-1 zoning and you want single family you have to use the R-4 standards. With R-4 you would have to have 10,000 square feet as a minimum lot size and 80 feet for the minimum lot width. The proposed calls for 6000 square foot lot size and a 50 foot lot with. R-4 setbacks are 30 feet for the front yard setback. Side yards are 10 feet setback with 20 feet aggregate. The applicant's proposal calls for a 20 front yard setback and a 15 side yard setback.

Mr. Arroyo recommended that the Planning Commission's action should be postponed at this time allowing time for more information to be submitted.

Planner Komaragiri stated that this property includes a total of seven individual wetland areas, including an open water/emergent wetland and a headwater stream which is tributary to the Walled Lake Branch of the Rouge River. The site contains City- regulated Woodland mapped across approximately the northern half of the project site. As mentioned, the applicant is using the PRO option to develop the subject property with both residential and commercial components.

Engineering was unable to recommend approval due to key information missing from the submittal. The applicant is requested to provide additional information on stormwater runoff calculations, provide one stub street every 1300 feet. The current plan does not propose one and would require a DCS variance. The reasons provided by the applicant in his response letter do not meet the requirements to support a DCS variance at this time. The current plan proposes pathways along Twelve Mile and Meadowbrook Road ROW. Engineering also requested internal pathways connections between subject property and surrounding properties.

Landscape identified a City Council waiver for the lack of the required separation between residential and non-residential uses. Landscaping is willing to support a waiver if the applicant establishes a proper alternative screening for the required berm or separation. Proposed landscaping should provide significant opacity between the uses. The applicant can demonstrate that using some illustrative renderings. Landscape recommends approval with additional comments to be addressed during the next submittal.

Planner Komaragiri said, of the seven individual wetland areas located on the site, only two of these wetland areas will be preserved as part of this proposed Plan. The other wetlands will be filled for the purpose of construction, or impacted as part of the stream channel relocation/abandonment, etc. The Plan appears to propose encroachment into several of these setback areas. This would require a City of Novi Non-Minor Wetland Use Permit and a City of Novi Authorization to encroach the 25-Foot Natural Features Setback. A plan to replace or mitigate for any permanent impacts to existing wetland buffers should be provided by the Applicant. Due to deficiencies in the Plan with regard to proposed wetland impacts, the Wetlands consultant currently does not recommend approval of the Concept Plan.

It appears as if the proposed site development will involve a significant amount of impact to the regulated woodlands and will include a significant number of tree removals. The applicant intends to provide a tree survey with the next submittal. ECT was unable to determine how many trees are being preserved, removed and replaced. Wetlands and Woodlands currently do not recommend approval of the Concept/PRO Plan.

Planner Komaragiri said the applicant requested a waiver for the required Traffic Impact Study prior to the Concept Plan approval and provided preliminary traffic information, but there was insufficient information to complete the review. The City's Traffic Engineering consultant did not support the waiver and requested additional information along with the Traffic Impact Study to be provided during the next submittal.

Façade drawings were not provided with this submittal. Fire recommends approval noting that the secondary emergency access shall meet the Fire code requirements. The Planning Commission is asked tonight to hold a public hearing and postpone making a recommendation on the proposed PRO and Concept Plan to allow the applicant time to address concerns and consider making further modifications to the Concept Plan. The applicant Gary Shapiro from The Ivanhoe Companies is here with his design team.

Gary Shapiro from The Ivanhoe Companies along with Brad Strader, Andy Wozniak and Greg Obloy. Mr. Shapiro shared his history regarding the property and the history of the zoning. He states that this project is perfect for the future master plan of the area. Mr. Shapiro referenced the Commercial part of the project. He stated that it is needed in this area. There is a mile stretch between M-5 connector and Novi Road. This location can intercept people that are already on the road traveling to their destination. The current plan is for 22,000 square feet of boutique commercial. This would include two drive-through facilities which would yield only 12,500 square feet. For this location there is a tremendous amount of demand. The options would be either a bank or 1 or 2 restaurants.

Mr. Shapiro reviewed the changes in the marketplace since 2008. There is a certain amount demand for locations for boutique restaurants that look for drive throughs and outside seating. An example is Panera Bread. The template now is a drive through with outside seating. Andiamos and Noodles are opening up those types of facilities. Their vision for this corner is to donate 2.46 acres to the city. The balance of the two ponds and redoing all the wetland and the creek. So from the corner to Novi you would look at a pond, a creek a waterfall. It will be a five acre park and it is right at the apex where your bike paths intersect.

Mr. Strader recapped the project overview. There are 4 major components to this project. The city park and trailhead which has 5.46 acres overall. The park was selected because there is a natural barrier that separates what we are proposing as commercial and residential. The current plan is for 41% open space along with single family homes and neighborhood commercial. For this site they feel that the Master Plan does not fit with the development trends in the area.

For the residential plan, it has 50 foot wide lots, looking to appeal to millennials, young professionals and also independent seniors. Separating the commercial and residential is a connecting pathway. The buffer that is along Meadowbrook and to the east and especially the 100 foot buffer to the north. A park and trailhead has 5.46 acres total with some public and some private land. It would be 2.46 acres of high value land that would be dedicated to the city and it would be seeded and ready to develop. It would provide the trailhead connection that the city has been looking for. As identified in the Parks and Recreation Plan there is need for some additional trailhead amenities and parkland in this area. The developer feels that with this plan they will meet all the requirements in the PRO as regards to the benefits to the residents and to the public within the city.

Chairperson Greco opened the Public Hearing for this project.

Marie Jackson, 41528 Thoreau stated that she is opposed to the rezoning. She said that traffic is already congested. She disagrees that there is need for more commercial development.

Greg Bartanian a member of the St. Sarkis Board of Trustees and owner of the property to the east. They have no objection and feel that it will be great development for their community.

David Sass 28680 Summit Court said that his property directly abuts the proposal. He is not in favor of the rezoning. He stated that there is enough commercial.

Walter Everett, Tollgate Ravines stated that there is enough commercial development and does not see the need for this proposal.

Tom O'Neil, 28350 Meadowbrook said that his property is one property to the north of this proposed development. For 25 years he has watched the changes that have occurred on Meadowbrook. He is concerned about the traffic on Meadowbrook Road.

Dennis Fitzgerald, resident in the Tollgate Ravines stated that he would like to see the developer and the City make this proposal work. It will be good for the area.

Roy Prentiss 28115 Meadowbrook, Farm Manager of the Tollgate Education Center stated that is present as a resident of Novi. He has lived on the property since 1993. Mr. Prentiss stated that he feels that the area should be developed with the current zoning that is already in place. The character of the neighborhood is outlined in the Master Plan. He mentioned that with the additional home sites, the amount of traffic would increase on Meadowbrook Road.

David Shahrigan, a member of the St. Sarkis Church that owns the property next door and also a Novi resident for over 20 years. He has been involved with building various homes in the area as well as the Tollgate Woods Development. He stated that of what he has seen of Gary Shapiro's work in other communities it has always been top notch. He stated that this is a tough site to develop and is impressed that Mr. Shapiro has found a way to develop the site. Mr. Shahrigan feels that this is the best use of this site.

Gary Rentrop attorney representing American Foundation and MSU stated that he has been involved with this 160 acre property on the northwest corner of Twelve Mile and Novi Road since the 1970s. The goal has

been to keep this as an agricultural farm and open space or everyone. It is an educational facility that is important to this community. Mr. Rentropp's first concern is with the wording of the public hearing notice. The ordinance is not permitted with the term "or any appropriate zoning district with a planned rezoning overlay (PRO)". The applicant is supposed to select the zoning classification and then work from there to identify what the benefits are. There seems to be some procedural defects.

Mr. Rentrop referenced the items that have already been discussed in regards to density, traffic, woodlands and wetlands. He would like to see Novi make the decision on whether this zoning is out of date rather than Mr. Shapiro makes that decision. The process is: first comes planning then comes zoning, not allowing zoning to drive planning. He requested that the Planning Commission move slow and research what they have before making the final decision.

Seeing no one else wishing to speak, Chair Greco asked if there was any correspondence

Member Anthony read the correspondence from Tom O'Neill, 23850 Meadowbrook, which stated that the traffic on Meadowbrook has increased significantly. Meadowbrook, as a "natural beauty road" will be degraded and Tollgate Farms deserves a better neighboring development to maintain its distinct character.

Chair Greco closed Public Hearing and referred the item to the Planning Commission.

Member Anthony questioned Mr. Shapiro regarding the targeting the young professional families to get that price point. In Novi we already have those areas to support that market. Some examples are in the Eight Mile and Meadowbrook area; Village Oaks, Turtle Creek, and Orchard Hills. The reasons those work is because they are integrated with parks, schools and the non-motorized master plan. The parks are integrated where you can really live as a family and take your kids to the parks, and to the elementary schools. This is vitally important to professional families with kids. The Novi schools attract families. He is concerned about the type of resident that this proposal will attract. It does not have all of the same features that the Meadowbrook and Eight Mile areas have.

Member Anthony asked why the applicant would want to waive the required traffic study.

Mr. Strader responded to the question that they were deferring the traffic study until later in the approval process. Twelve Mile Road is what they believe to be Level Service B. They will do the traffic study but they would like to wait until they get further in the process.

Member Anthony was not certain if they had done wetlands study or was that left to the city and their consultants to take a look at? How would overlay with the timing of the development?

Mr. Shapiro responded that they did a wetlands study, and are proposing a very, very comprehensive enhancement and cleaning up problems found with the creek. The water goes in an easterly direction. Mr. Shapiro said that he is an environmentally-sensitive developer.

Member Anthony talked about the wetlands and woodlands all being interconnected through the city. He asked Mr. Shapiro if he would be willing to work with staff when it is time to finalize the plan so that it would be consistent with the goals of our community.

Mr. Shapiro responded that they would absolutely work with the staff to meet the goals of the community. He further mentioned that what they have planned is well beyond the enhancement that is required by your ordinance and your consultants.

Member Zuchlewski asked the price range of the homes.

Mr. Shapiro responded that the price range will be in the high \$390,000 to the mid \$400,000 range.

Member Zuchlewski questioned the amount of traffic coming off of Meadowbrook and the widening of Meadowbrook. Member Zuchlewski also asked about the type of tenants expected for the commercial center.

Mr. Shapiro responded that the tenants he is looking for are high quality restaurants that would have a drive through and a patio with outdoor seating. He reminded the citizens and the Commission that whatever comes in as commercial would go through the plan review process and the Commission would see the full architectural plans then. There will be over 130 feet of park in front of the boutique commercial center. There will be 1000 feet of frontage that will be a mass of landscaping. You will see through the landscaping to the boutique commercial wrapping around on Meadowbrook Road.

Member Giacometti questioned the City Attorney regarding whether the procedure of the Public Hearing Notice notification was adequate and whether the PRO wording is vague.

City Attorney Dove responded that the PRO by itself allows the applicant to change their proposal during the process. If this wasn't a concern regarding the PRO but rather just the rezoning. As long as the zoning ends up being approved as advertised then there is no problem. There was no mention about changing the zoning other than what was advertised. Attorney Dove doesn't see a problem with the procedure regarding the public hearing.

Member Giacometti asked Mr. Shapiro if his market analysis is contrary with some of the studies that other developers have shared recently. Other developers are telling the Commission that there is no place for commercial development. Member Giacometti wondered if Mr. Shapiro's study showed favorable for commercial because it is so close to M-5.

Mr. Shapiro responded that this area is different than the 13 Mile and Novi Road corridor. This area is much different. The proximity to M-5 with people traveling to Twelve Oaks or other destinations nearby indicates there is a demand for commercial here.

Member Giacometti asked Mr. Shapiro about his statement that this property has been zoned incorrectly for 75 years. Given the wetland migration concerns it is also not a very marketable site. That might be part of the reason it hasn't been developed.

Mr. Shapiro stated that it has been zoned for big lots. That is not something that someone wants now that you have two major roads and M-5 nearby. Large lots no longer make sense in that location. Mr. Shapiro understands the PRO in Novi is like a contract that holds him accountable to do what it says he will do. Bottom line here is he wants to zone it to put 2.9 units per acre for a total of 42 units. If the Planning Commission wants R-4 zoning, we will request R-4 zoning, and we will do what we say we will do under the PRO Agreement.

Member Giacometti stated in terms of the PRO, limits can be structured on the use of the B-3 development. We could strike some of the special uses. The drive-through concept is contrary to the recommended land use. Member Giacometti asked the applicant, if the drive-through were off the table would you still be interested in this concept?

Mr. Shapiro stated that they can better define the use, although he thinks that it would be a mistake to preclude the high-end restaurants that would augment their success, as an exceptional drive-through.

Member Giacometti questioned that, should the City not want to maintain the donated land had Mr. Shapiro considered donating the land to MSU as opposed to the City.

Mr. Shapiro said that had not been a consideration thus far.

Member Anthony asked Planner Komaragiri if she felt comfortable with the information that has been provided.

Planner Sri Komaragiri stated that she believes that the applicant has provided comprehensive information with regard to planning and density. As approving a concept plan, additional information in regard to landscape and traffic is being requested so that any deviation can be identified and included in the PRO agreement. We would rather identify the deviations before the Concept plan has been recommended and/or approved and before proceeding with further reviews.

Chair Greco commented on why the process has taken 18 months is because the concept that has been requested is a drastic change. He stated that while he feels that the plan is unbelievably attractive it is too drastic of a change.

Member Anthony made the motion, seconded by Member Zuchlewski:

ROLL CALL VOTE TO POSTPONE MAKING A RECOMMENDATION ON THE PROPOSED PRO AND CONCEPT PLAN, BEACON HILL JSP15-08 WITH REZONING 18.710 BY MEMBER ANTHONY AND SECONDED BYMEMBER ZUCHLEWSKI

In the matter of the request of The Ivanhoe Companies for Beacon Hill JSP 15-08 with Zoning Map Amendment 18.710 motion to postpone making a recommendation on the proposed PRO and Concept Plan to allow the applicant time to address concerns and consider making further modifications to the Concept Plan and that if that process results in the applicant changing the requested rezoning to a district other than RM-1 or B-3, that the recommendation be after a Public Hearing with notice of the requested districts as changed. This recommendation is made for the following reasons:

- a. Additional discussion is needed regarding the proposed development density, offered public benefits and conditions of approval, and the neighborhood compatibility issues raised in the staff and consultant review letters.
- b. Applicant should address the following concerns highlighted in the Engineering Review letter on a subsequent submittal:
Provide stub streets to the subdivision boundary at intervals not to exceed 1300 feet, or seek a DCS variance/deviation from the ordinance standards for this requirement;
 - Provide a pathway connection to the parcel to the east and the parcel to the north outside of the public right of way; and
 - Provide additional information regarding water main and sanitary sewer stubs, storm water runoff and detention volume calculations, and additional details regarding secondary emergency access.
- c. Applicant has requested a waiver of the required Traffic Impact Study, but the City's Traffic Engineering Consultant is not in favor of the requested waiver at this time. Additional information is needed for review before the next submittal.
- d. Further information is needed to quantify and gauge potential woodland and wetland impacts, and presentation of alternative plans to reduce impacts.

Motion carried 3-1(Greco)

PLANNING REVIEW

March 20, 2016

Barbara McBeth, AICP
Deputy Director of Community Development
City of Novi
45175 W. Ten Mile Rd.
Novi, MI 48375

**SUBJECT: Review of Beacon Hill Park
JSP15-0008 Rezoning 18.710 with a PRO Concept Plan**

Dear Ms. McBeth:

At your request, we have reviewed the request for rezoning with a Planned Rezoning Overlay referenced above and offer the following analysis:

Applicant

Ivanhoe Meadowbrook, LLC

Review Type

Rezoning from RA Residential Acreage to R-4 One-Family Residential with a Planned Rezoning Overlay (PRO)

Property Characteristics

- Site Location: Northeast corner of 12 Mile and Meadowbrook
- Site Zoning: RA Residential Acreage
- Adjoining Zoning: North, east and west: RA Residential Acreage; south and southwest: OST Office Service Technology District
- Current Site Use: One single family home on one small lot; otherwise vacant
- Adjoining Uses: North, northeast: single family homes; east, vacant (proposed church); south: vacant; west: MSU Tollgate Center; southwest: South University Novi
- School District: Walled Lake Community School District
- Site Size: 21.13 gross acres

Project Summary

The applicant is requesting a Zoning Map amendment for a 21.13-acre property currently comprised of three existing parcels at the northeast corner of 12 Mile Road and Meadowbrook Road (Section 12). The rezoning sought is from RA Residential Acreage to R4 Single Family and B-3 General Business, utilizing the City's Planned Rezoning Overlay (PRO) option. The applicant requests the rezoning in order to develop a 42-unit single-family residential development with frontage on and access to Meadowbrook Road, up to 22,000 square feet of commercial space with frontage and two access drives on 12 Mile Road, and an open space/park area at the corner of the intersection. The applicant proposes to dedicate the open space/park area at the corner of the intersection, and commits to building vehicle and bicycle parking for a trailhead.

The residential portion of the concept plan is arranged as a cluster, with open space dedicated to parks, buffers, wetlands, and detention; homes are arranged along a ring road with a single access point on Meadowbrook Road. Secondary access for emergency vehicles and pedestrians is provided at the rear of the development by a semi-paved access path. The proposed commercial area includes two driveways onto 12 Mile Road, as well as a small parking lot adjacent to the park and trailhead.

The letter and site plan indicate that this is a preliminary site plan. However, we note that this is a conceptual PRO plan.

Summary of PRO Agreements

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 RA to R4 and B-3) and the applicant enters into a PRO agreement with the City, whereby the City and the applicant agree to tentative approval of a conceptual plan for development of the site. 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.

Amendments to Initial Proposal

This is an amended version of an earlier concept plan. Generally, this version of the proposal reduced overall residential density and increases the amount of land dedicated as open space, including an increase in the amount of land donated for a park.

Potential Development with Existing Zoning

The existing zoning, RA, permits 0.8 dwelling units per acre. Under current zoning, the full 21.13 acres of the site could be developed with 16 single family homes, while the 16.88 net acres devoted to residential development on the concept plan could be developed with 13 single family homes. Homes are proposed to be clustered; the open space preservation option, however, does not offer a density bonus for clustered homes. The sole existing use of the site is a single family home fronting on Meadowbrook Road. Single family development of these 16.88 acres to the maximum density permitted in the R4 district would result in approximately 55 units on the site.¹

Master Plan for Land Use

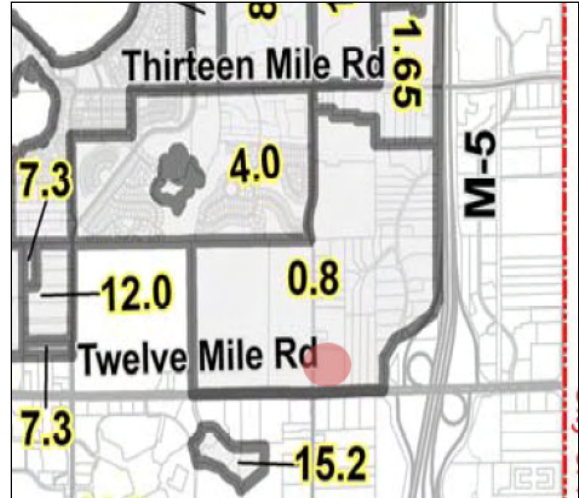
The Future Land Use Map of the 2010 City of Novi Master Plan for Land Use identifies this property and all adjacent land north of 12 Mile as Single Family, with a density of 0.8 dwelling units per acre. This designation matches the existing zoning of the site. The Master Plan designates land to the south across 12 Mile as Office Research Development and Technology, matching existing zoning (see planned density map next page).

The Master Plan establishes numerous goals and supporting objectives for the City. This concept plan supports several objectives and conflicts with others:

¹ Based on a density of 3.3 dus/acre.

Objective: Encourage the use of functional open space in new residential developments. *The concept plan includes functional open space in the form of a park and non-motorized, off-street pathways.*

Objective: 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 development would provide small-lot single family dwelling units, which is a generally desirable type of unit based on general observations of the existing market.*



City of Novi Master Plan for Land Use
Planned Residential Densities (dus/acre)

Subject site shown with pink oval

Objective: Encourage residential developments that promote healthy lifestyles. *The concept plan’s integration of the park and potential trailhead (if developed by the City), as well as a direct pedestrian connection between the residential and commercial developments, provides opportunities for residents to access non-motorized infrastructure and run certain errands without driving.*

Objective: Protect and maintain open space throughout the community. *It could be argued that the concept plan both supports and conflicts with this objective. The provision of 42 percent of the site as open space, some functional, and some not, supports the goal of preserving open space. However, development of the site to a much higher intensity than existing zoning permits preserves less open space (considering both public and private open space) than developing it to the currently permitted density. Large open lots, which are a characteristic of the RA district, would not be provided under the proposed development. Under RA zoning, it is likely that far less public open space would be provided.*

Objective: Continue to strive toward making the City of Novi a more bikeable and more walkable community. *The provision of the property that could be utilized as a trailhead, combined with the proposed connections to existing non-motorized paths, as well as the extension of sidewalks along 12 Mile Road, support this objective.*

The proposal notes that the development would create a transitional district between more intense land uses along Twelve Mile Road and less dense single family development to the north. While this is consistent with the broadly stated goal to “Provide for planned development areas that provide a transition between high intensity office, industrial and commercial uses and one-family residential uses,” we note that the objective supporting this goal was the impetus for the City’s creation of its PSLR Planned Suburban Low-Rise Overlay District, which is not the designation sought here.

The proposal calls for a significant departure from the vision of the Master Plan, which is to provide for 0.8 dus/acre north of Twelve Mile, both east and west of Meadowbrook Road (see below for addition density discussion). *Neighborhood compatibility with existing large lot RA properties in the area should be considered. The PRO concept plan displays sensitivity to this adjacency through the use of buffering along the edges of the site, including preservation of existing vegetation.*

Proposed Residential Density

The applicant is proposing 42 units on 16.88 net acres for a net density of 2.49 units per acre. As mentioned above, the Master Plan calls for a density of 0.8 dwelling units per acre on this land and surrounding sites. The proposed density exceeds the Master Plan recommendation for the site.

Proposed density is most consistent with the R-3 One-Family Residential District (maximum density of 2.7 units per acre). The applicant is seeking a relaxation of the required minimum lot size under the PRO to an average of approximately 6,000 square feet.

Compatibility with Surrounding Land Use

| Summary of Land Use and Zoning of Subject and Adjacent Properties | | | |
|--|-------------------------------|-------------------------------------|--------------------------------|
| | Existing Zoning | Existing Land Use | Master Plan Designation |
| Subject Property | RA Residential Acreage | Mostly Vacant; 1 Single Family Home | Single Family, 0.8/acre |
| To the North | RA Residential Acreage | Single Family Home | Single Family, 0.8/acre |
| To the East | RA Residential Acreage | Vacant | Single Family, 0.8/acre |
| To the South | OST Office Service Technology | Vacant | Office Research |
| To the West | RA Residential Acreage | MSU Tollgate Farms | Single Family, 0.8/acre |

The surrounding land uses are detailed in the table above. In making its recommendation to City Council, the Planning Commission should consider the compatibility of the PRO concept plan with existing adjacent land uses and zoning.

In general, standard construction noise during development and increased traffic after development are the most likely negative effects of this development on surrounding properties. The availability of some local commercial and a new park could provide some convenience shopping and a new space for recreation for nearby residents and office workers. The primary step taken on the plan to minimize negative externalities from the property is the preservation of the woodland strip at the northern end of the site to provide screening of adjacent single family homes.

Comparison of Zoning Districts

| | RA Zoning (Existing) | R4 Zoning (Proposed) | B-3 Zoning (Proposed) |
|--------------------------|--|---|--|
| Principal Permitted Uses | <ul style="list-style-type: none"> 1. One-family dwellings 2. Farms and greenhouses 3. Publicly owned and operated parks 4. Cemeteries 5. Schools 6. Home occupations 7. Accessory buildings and uses 8. Family day care homes | <ul style="list-style-type: none"> 1. One-family detached dwellings 2. Farms and greenhouses 3. Publicly owned and operated parks, parkways and outdoor recreational facilities 4. Home occupations 5. Keeping of horses and ponies 6. Family day care homes 7. Accessory buildings and uses customarily incident to any of the above uses | <ul style="list-style-type: none"> 1. Retail business uses 2. Retail business service uses 3. Dry cleaning establishments 4. Business establishments which perform services on the premises 5. Professional services 6. Professional and medical offices 7. Fueling station 8. Auto wash 9. Bus passenger station 10. New and used car salesroom, showroom or office 11. Similar uses 12. Tattoo parlors |

| | | | |
|-------------------|--|--|---|
| | | | <ul style="list-style-type: none"> 13. Publicly owned and operated parks, parkways and outdoor recreational facilities 14. Accessory structures and uses 15. Public or private health and fitness facilities and clubs 16. Microbreweries 17. Brewpubs |
| Special Land Uses | <ul style="list-style-type: none"> 1. Raising of nursery plant materials 2. Dairies 3. Keeping and raising of livestock 4. All special land uses in Section 402 5. Nonresidential uses of historical buildings 6. Bed and breakfasts | <ul style="list-style-type: none"> 1. Places of worship 2. Public, parochial and private elementary, intermediate or secondary schools 3. Utility and public service buildings and uses (without storage yards) 4. Group day care homes, day care centers, and adult day care 5. Private noncommercial recreational areas, institutional or community recreation centers, nonprofit swimming pool clubs 6. Golf courses 7. Colleges, universities and other such institutions of higher learning 8. Private pools 9. Cemeteries 10. Railroad right-of-way, but not including terminal freight facilities, transfer and storage tracks 11. Mortuary establishments 12. Bed and breakfasts 13. Accessory buildings and uses customarily incident to any of the above permitted uses | <ul style="list-style-type: none"> 1. Outdoor space for exclusive sale or rental of new or used automobiles, etc. 2. Motel 3. Drive-in or open front store 4. Veterinary hospital or clinic 5. Plant materials nursery 6. Public or private indoor and private outdoor recreational facilities 7. Mini-lube or oil change establishment 8. Sale of produce and seasonal plant materials outdoors 9. Restaurant in the character of a fast food carryout, drive-in, fast food drive-through or fast food sit-down |

| | RA Zoning (Existing) | R4 Zoning (Proposed) | B-3 Zoning (Proposed) |
|-------------------|--|--|--|
| Minimum Lot Size | 43,560 sq ft (1 acre) | 10,000 sq. ft. | Determined by off-street parking, loading, greenbelt screening, yard setback or usable open space requirements |
| Minimum Lot Width | 150 ft | 80 feet for single-family dwellings | Determined by off-street parking, loading, greenbelt screening, yard setback or usable open space requirements |
| Building Height | 2.5 stories or 35 ft | 35 feet or 2.5 stories, whichever is less | 30 ft |
| Building Setbacks | Front: 45 ft Side: 20 ft (aggregate 50 ft) Rear: 50 ft | Front: 30 ft Side: 10 ft (aggregate 25 ft) Rear: 35 ft | Front: 30 ft Side: 15 ft Rear: 20 ft |

Infrastructure

Water and sanitary sewer are available at the site. The Subdivision Ordinance requires a stub street at intervals of 1,300 feet unless either 1) the extension is impractical because of topography, the dimensions of the property subdivided, or other natural features, including but not limited to, regulated woodlands and wetlands; or 2) The extension will result in the creation of undesirable traffic patterns not customarily found in residential areas. With a place of worship proposed to the east and a large natural buffer proposed to the north, it does not appear that a stub street is warranted. This determination should be addressed by the Planning Commission in its recommendation.

Natural Features

The northern portion of the site contains significant regulated woodlands. A swath of this woodland is proposed to be preserved as an open space buffer between the development and the adjacent homes to the north and northeast. Mitigation is required for any regulated woodlands impacted by the proposed development.

A regulated wetland consisting of a creek and pond exists on the site near 12 Mile Road. The applicant proposes to enhance these features as a public benefit of the development; this would include a relocation of a portion of the creek and the construction of a weir over which water would fall into the existing pond.

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 completely voluntary by the applicant, the applicant and City Council can agree on a series of conditions to be included as part of the approval.

The applicant's submittal includes conditions for the rezoning, summarized as such in the applicant's letter accompanying the plans (quoted from the letter):

1. Park and Open Space
 - a. Developed in accordance with the PRO plan, including the donation of the park with six parking spaces, a bench and bike racks
 - b. 42% of the site to remain open space
2. Residential- R4
 - a. Up to 42 single family residences, density of 2.49 units per acre
 - b. Lot dimension minimums are modified:
 - i. Minimum 50 foot width
 - ii. Minimum 7.5 foot side yard setback
 - iii. Minimum 20 foot front yard setback
 - iv. Minimum 30 foot rear yard setback
3. Commercial- B3

- a. The size shall be limited to 12,000 square feet if there are two drive-through uses and 22,000 square feet if there is one or no drive-through, with details on the tenant mix, parking, drive-through operations to be described at the time of final site plan review.
 - b. Rezoning to B3 with an agreement that the developer will prohibit the following uses that would otherwise be permitted, including: fast food restaurants (a change from the previous plan), fueling stations, produce sales, day care centers, business schools and colleges, private clubs, motels, veterinary hospitals and clinics, auto washes, bus passenger stations, new and used car salesrooms, tattoo parlors, outdoor space for car sales, and automobile service centers.
4. Woodlands and Landscaping
- a. Substitution of a wide, well-landscaped open space corridor instead of the typical berm between the commercial and residential areas. This wide open space complements the park and wetland habitat restoration area, and provides more benefit to the public.
 - b. Upsizing woodlands replacement to provide a more immediate screening benefit and to expedite the landscape aesthetics along Meadowbrook Road. Instead of planting the minimum size trees, tree “Credits” will be provided for the larger trees as follows:
 - i. Each of the 196 3-inch caliper new trees counts as 1.5 trees and 4-inch caliper new tree counts as two trees (instead of the typical minimum 2-inch caliper tree)
 - ii. Each of the 114 9 to 10-foot-tall evergreen trees shall be counted as 1.5 evergreen trees and each of the 34 twelve-foot-tall new evergreen trees shall be counted as two evergreen trees (instead of planting the minimum seven-foot-tall evergreens)

Ordinance Deviations

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. The proposed PRO agreement would be considered by City Council after tentative approval of the proposed concept plan and rezoning.

Deviations from the Zoning Ordinance on the concept plan are listed below:

1. Minimum lot size and width: 10,000 square feet and 80 feet required, 6,000 square feet and 50 feet proposed.
2. Building setbacks: 30 foot front yard, 35 foot rear yard and 10 foot side yard (25 feet aggregate) required; 20 foot front yard, 30 foot rear yard and 15 foot aggregate side yard proposed.

Applicant Burden under PRO Ordinance

The Planned Rezoning Overlay ordinance requires the applicant to demonstrate that certain requirements and standards are met. The applicant should be prepared to discuss these items. 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 Benefit under PRO Ordinance

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 public benefits of the proposed PRO rezoning would clearly outweigh the detriments. The applicant has identified the public benefits listed below at this time. These proposed benefits will be weighed against the proposal to determine if they clearly outweigh any detriments of the proposed rezoning.

1. Donation of 3.28 acres to the City for the establishment of a public park with the following improvements made by the developer:
 - a. Enhanced wetland and creek
 - b. Preparation of trailhead and parking lot, including bike parking and a bench
 - c. Entire park area graded and seeded
2. 42 percent of gross site preserved as open space. This includes 3.28 acres of park, 4.54 acres residential open space, and 0.98 acres of commercial open space area (8.8 total acres).
3. The applicant notes that the provision of commercial services in this location will complement changing development in the area, and that the overall site will function as a transition between non-residential uses to the south and single family uses to the north.
4. Development is consistent with several Master Plan objectives.
5. Trailhead serves City's non-motorized transportation goals.

Submittal Requirements

- Rezoning signs must be erected along the property's frontage in accordance with submittal requirements and in accordance with the public hearing requirements for the rezoning request. The signs should be erected no later than 15 days prior to the scheduled public hearing. The concept plan does not show the proposed locations of the two required rezoning signs.
- A traffic study has been submitted and reviewed by the City's Traffic Consultant.

Other Notes on the Concept Plan

- The commercial layout is speculative and it is implied in the submittal materials that it will change on the basis of the needs of tenants.

Planning Commission Options

The Planning Commission has the following options for its recommendation to City Council:

1. Recommend City Council conditionally approve the request to rezone the parcel to B-3 General Business and R4 One-Family Residential with a Planned Rezoning Overlay (APPLICANT REQUEST); OR
2. Recommend City Council deny the request to rezone the parcel to B-3 and R4 with a PRO, with the zoning of the property to remain RA; OR
3. Recommend City Council rezone the parcel to a zoning district other than RA, B-3 or R4 (an additional public hearing may be required); OR
4. Recommend City Council conditionally approve only a portion of the request for rezoning (such as the B-3 portion) while recommending denial of the rezoning request for the rest of the site; OR
5. Postpone consideration of the request for further study or consideration of another alternative.

Recommendation

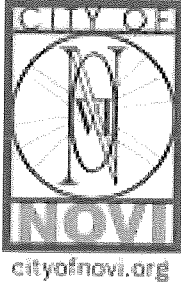
The applicant has made significant improvements to the PRO plan and is presenting a concept that is sensitive to the unique character and location of this area. It also provides for public benefits and buffering that would not be provided through conventional development. The City's Master Plan is currently undergoing a review and amendment. The proposed density in the PRO concept plan is generally consistent with what we will be recommending to the Planning Commission for this site. We recommend that the Planning Commission consider making a positive recommendation to the City Council.

Sincerely,
CLEARZONING, INC.



Rodney L. Arroyo, AICP
President

ENGINEERING REVIEW



PLAN REVIEW CENTER REPORT

04/15/2016

Engineering Review

BEACON HILL PARK PRO

JSP15-0008

Applicant

CONGREGATION SHAAREY ZEDEK

Review Type

Revised Concept Plan

Property Characteristics

- Site Location: N. of 12 Mile Rd. and E. of Meadowbrook Rd.
- Site Size: 21.19 acres
- Plan Date: 04/13/16

Project Summary

- Construction of a 42 lot residential development, and approximately 22,000 square-foot of retail buildings and associated parking. Site access would be provided by 2 curb cuts on 12 Mile Rd. for the retail buildings and a new roadway from Meadowbrook Rd. for the residential area.
- Water service would be provided by 2 extensions from the existing 16-inch water main along the east side of Meadowbrook Rd. Along with 9 additional hydrants.
- Sanitary sewer service would be provided an extension for the existing 12-inch sanitary sewer on the west side of Meadowbrook Rd. for the residential development. And an extension from the existing 12-inch sanitary sewer along the north side of 12 Mile Rd.
- Storm water would be collected by a single storm sewer collection system for the residential development and a single storm sewer collection system for the retail development. Each will be detained in separate basins for a 100-year storm event.

Recommendation

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

Comments:

The Concept Plan meets the general requirements of Chapter 11, the Storm Water Management Ordinance and the Engineering Design Manual with the following items to be addressed at the time of Final Site Plan submittal (further engineering detail will be required at the time of the final site plan submittal):

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

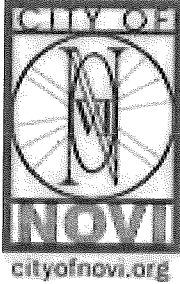
General

1. The applicant responses letter from Zeimet Wozniak & Associates dated 04/14/16 adequately address the three major concerns detailed in the Engineering review letter dated 03/21/16.
2. For additional comments see the Engineering review letter dated 03/21/16.

Please contact Jeremy Miller at (248) 735-5694 with any questions.

A handwritten signature in cursive script, reading "Jeremy J. Miller", is written over a horizontal line.

cc: Adam Wayne, Engineering
Brian Coburn, Engineering
Kirsten Mellem, Community Development
Sabrina Lilla, Water & Sewer



PLAN REVIEW CENTER REPORT

03/21/2016

Engineering Review

BEACON HILL PARK PRO

JSP15-0008

Applicant

CONGREGATION SHAAREY ZEDEK

Review Type

Revised Concept Plan

Property Characteristics

- Site Location: N. of 12 Mile Rd. and E. of Meadowbrook Rd.
- Site Size: 21.19 acres
- Plan Date: 06/25/15

Project Summary

- Construction of a 42 lot residential development, and approximately 22,000 square-foot of retail buildings and associated parking. Site access would be provided by 2 curb cuts on 12 Mile Rd. for the retail buildings and a new roadway from Meadowbrook Rd. for the residential area.
- Water service would be provided by 2 extensions from the existing 16-inch water main along the east side of Meadowbrook Rd. Along with 9 additional hydrants.
- Sanitary sewer service would be provided an extension for the existing 12-inch sanitary sewer on the west side of Meadowbrook Rd. for the residential development. And an extension from the existing 12-inch sanitary sewer along the north side of 12 Mile Rd.
- Storm water would be collected by a single storm sewer collection system for the residential development and a single storm sewer collection system for the retail development. Each will be detained in separate basins for a 100-year storm event.

Recommendation

Approval of the Concept Plan and the Concept Storm Water Management Plan is NOT recommended.

Comments:

The Concept Plan does not meet the general requirements of Chapter 11 of the Code of Ordinances, the Storm Water Management Ordinance and/or the Engineering Design Manual. The following items must be addressed prior to resubmittal:

1. Provide a stub street to the subdivision boundary at intervals not to exceed 1,300 feet along the subdivision perimeter.
2. Provide water main and sanitary sewer stubs to the north and the east.
3. Provide a pathway connection to the parcel to the east and the parcel to the north.

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

General

4. A full engineering review was not performed due to the limited information provided in this submittal. Further information related to the utilities, easements, etc. will be required to provide a more detailed review.
5. The site plan shall be designed in accordance with the Design and Construction Standards (Chapter 11) and the Engineering Design Manual (www.cityofnovi.org/DesignManual).
6. A right-of-way permit will be required from the City of Novi and Oakland County.
7. Provide material type for all proposed utilities.
8. Provide a minimum of two ties to established section or quarter section corners.
9. Show and label the master planned 60-foot half right-of-way width for Meadowbrook Rd.
10. If it is the intent to dedicate the additional right-of-way to the master planned width along Meadowbrook Rd., label the new delineation as "proposed" right-of-way.
11. 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.
12. A letter from either the applicant or the applicant's engineer must be submitted with the Preliminary Site Plan submittal highlighting the changes made to the plans addressing each of the comments in this review.
13. The City standard detail sheets are not required for the Final Site Plan submittal. They will be required with the Stamping Set submittal. They can be found on the City website (www.cityofnovi.org/DesignManual).

Water Main

14. The water main stubs shall terminate with a hydrant followed by a valve in well. If the hydrant is not a requirement of the development for another

reason the hydrant can be labeled as temporary allowing it to be relocated in the future.

15. Three (3) sealed sets of revised utility plans along with the MDEQ permit application (1/07 rev.) for water main construction and the Streamlined Water Main Permit Checklist should be submitted to the Engineering Department for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets and the standard detail sheets.

Sanitary Sewer

16. Because Wayne County has expressed capacity concerns, a temporary moratorium has been placed on approval of sanitary sewer permits from the City. We are working with the County to resolve this as quickly as possible. Until then all sanitary sewer permit applications will be on hold.
17. Seven (7) sealed sets of revised utility plans along with the MDEQ permit application (04/14 rev.) for sanitary sewer construction and the Streamlined Sanitary Sewer Permit Certification Checklist should be submitted to the Engineering Department for review, assuming no further design changes are anticipated. Utility plan sets shall include only the cover sheet, any applicable utility sheets and the standard detail sheets. Also, the MDEQ can be contacted for an expedited review by their office.

Storm Water Management Plan

18. The Storm Water Management Plan for this development shall be designed in accordance with the Storm Water Ordinance and Chapter 5 of the new Engineering Design Manual.
19. 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 and volumes. The area being used for this off-site discharge should be delineated and the ultimate location of discharge shown.
20. 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.
21. A 25-foot vegetated buffer shall be provided around the perimeter of the residential storm water basin. This buffer cannot encroach onto adjacent lots.

Paving & Grading

22. Staff would support a variance to remove the paved eyebrows at the 90-degree bends. The right-of-way would remain as currently shown.

23. Relocate the proposed sidewalk to 5-feet from the back of curb, not along the lot lines as shown.
24. Provide a 10-foot wide regional pathway along the east side of Meadowbrook Road in accordance with the City's Non-motorized Master Plan.
25. Revise the sidewalk detail to show a maximum 2-percent cross-slope.

The following must be provided at the time of Concept Plan resubmittal:

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

Please contact Jeremy Miller at (248) 735-5694 with any questions.

A handwritten signature in cursive script, reading "Jeremy Miller", is written over a horizontal line.

cc: Adam Wayne, Engineering
Brian Coburn, Engineering
Barb McBeth, Community Development

LANDSCAPE REVIEW



PLAN REVIEW CENTER REPORT

April 15, 2016

Revised Conceptual Site Plan #3

Beacon Hill

Review Type

Revised Conceptual/PRO Landscape Review

Job

JSP15-0008

Property Characteristics

- Site Location: Northeast corner of 12 Mile Road and Meadowbrook Road
- Site Zoning: RA – Residential Acreage – seeking PRO
- Site Size: 19.93 acres
- Adjacent Zoning: RA – Residential Acreage N&E, OST across 12 Mile, RA across Meadowbrook
- Plan Date: 4/13/2016

Ordinance Considerations

This project was reviewed for general 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 Preliminary Site Plan submittal. Underlined items will need to be addressed in Final Site Plans. Please follow guidelines of the Zoning Ordinance and Landscape Design Guidelines. This review is a summary and not intended to substitute for any Ordinance.

Recommendation:

This conceptual plan is **recommended for approval, with reservations**. The overall plan as proposed meets most of the requirements and provides very attractive landscaping throughout the development. The residential area appears to meet all landscape requirements except some minor count differences. The area between the commercial and residential appears to provide sufficient screening despite the lack of the required berm. The applicant has worked with representatives from the Tollgate Education Center to create a more natural look along the Meadowbrook frontage which will provide a more pleasant experience along that stretch of road.

There are two main areas of concern with the plan. The first is that the commercial area is very deficient in terms of meeting the landscape requirements. The applicant has indicated that the tenants for the commercial buildings have not been determined, and as such the layout may change significantly. It is impossible to approve that portion of the project as proposed given that and/or the current layout and landscaping.

The other main area of concern relates to woodland replacement trees on the plan - specifically, the use of replacement trees in place of required street trees along Meadowbrook and Twelve Mile, and the use of upsized evergreen trees for additional woodland replacement credits. We understand that the applicant has worked with the Tollgate Education Center to develop a very attractive alternate streetscape along Meadowbrook, and support that streetscape concept, as well as the use of woodland replacement trees and shrubs to supplement the required trees along Meadowbrook, but do not support the replacement of required street trees with replacement trees. A more detailed discussion of this situation follows below.

The other concern is the large benefit the applicant is seeking with regard to upsized evergreen trees. 40% of the proposed evergreen trees are upsized from 7 feet to 10 feet. For planting trees 3 feet taller, they are requesting 1.5 credits per tree instead of 0.67 credits which are normally allowed per the Woodland Protection ordinance. This works out to an additional 85 credits on 102 trees planted. This seems unreasonable. As this is a PRO, there could be some flexibility in terms of allowing extra credits for the use of upsized trees which is normally not allowed by the Landscape Design Manual. In light of this, I support the use of some upsized evergreens to provide more interest along Meadowbrook, and more screening between the residential lots "fronting" the commercial, but I don't believe that the total benefit in credits for this should be more than 33% of the trees planted (in other words 33, not 85). As ECT is officially responsible for reviewing plans for the Woodlands, I defer to their review on this matter.

General Note:

If at all possible, the reconfigured stream should be re-graded to allow more floodplain room. As designed, it appears to be a narrow streambed with little to no room for the stream to develop a more natural meandering course, or to allow for flooding over the banks in times of heavier flow. Also, some sort of protection for the streambank where the Meadows detention pond outlets to the stream should be provided.

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

1. A full tree survey has been provided on the site plans and a woodland analysis has been provided in the accompanying project manual.
2. Calculations for the trees removed and required woodland replacements have been provided.
3. **While ECT will provide the woodland review, it should be noted that the Landscape Design Manual specifically forbids the use of upsizing credits for Woodland Replacement Trees (Section 3.c.(2)). The applicant can request a deviation as part of the PRO agreement, and staff supports the use of some upsizing with credit within the PRO to provide additional interest and screening along Meadowbrook, and along the south edge of the residential part of the development to provide additional screening from the commercial part of the development. That being said, the number of credits sought seems excessive, as noted in the discussion above.**

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

MEADOWBROOK

A 50' wide greenbelt (minimum) is proposed along the Meadowbrook frontage adjacent to the residential units. This exceeds the requirement for a 40' non-access easement.

BERM

- a. The frontage along Meadowbrook (1336 less 86' ROW for Hummingdale) is required to have an undulating berm with a minimum height of 4' and a 4' wide crest.
- b. **A landscape waiver for the berm could be sought for the wetland just north of the residential entry (approximately 170 lf) and the wet areas south of the residential area (approximately 420 lf). This waiver would be supported by staff.**
- c. **If the developer wishes to not build berms along the remaining frontage, this would require a deviation as part of the PRO. Given the heavy vegetation proposed within the greenbelt and right-of-way, this would also be supported by staff.**

PLANTINGS

- a. The frontage along Meadowbrook (1336 less 86' ROW for Hummingdale) is required to have 1 large evergreen tree or deciduous canopy tree per 35' lf of frontage and 1 subcanopy tree per 20 lf of frontage.
- b. **A landscape waiver could be sought for the required trees and subcanopy trees in the wetland areas described above for the berms. This waiver would be supported**

- by staff.
- c. No required greenbelt landscaping is proposed for the 540 lf of frontage south of the residential section. Some of this deviation is due to the existing wetland areas, and some is due to the heavy plantings of woodland replacement trees. Normally, required trees cannot be replaced with woodland trees. However, in this case, the Planning Commission is allowed leeway in allowing a waiver for the greenbelt plantings if it finds that “the site would be enhanced by an alternate design solution” As the park area will be heavily landscaped and protected with a conservation easement, and much of the existing natural area will be enhanced through restoration, a waiver for the required greenbelt trees in this section can be requested and will be supported by staff.
 - d. The required plantings for the remaining 540lf of frontage (1336lf – 540lf – 86lf – 170lf) should be provided. Existing trees may be able to meet some or all of the requirements for that section of frontage, but their size and identity need to be shown with size and identity on the plan. They need to be acceptable size and acceptable species to count.

TWELVE MILE ROAD

1. A 42' wide greenbelt (minimum) is proposed along the Twelve Mile Road frontage adjacent to the commercial units. This exceeds the requirement for a 20' greenbelt adjacent to parking.
2. An undulating berm at least 3' tall with a 2' crest is required between the road and the parking lot. No berm is proposed. A privet hedge is proposed, but this does not provide the same screening of automobile headlights as a berm would. **A landscape waiver may be requested from the Planning Commission, but would not be supported by staff as there is no topographical reason for not providing this berm. Also, while allowed by ordinance, privet is known to be an invasive plant that invades area woodlands and should be substituted with another non-invasive species if the applicant elects to pursue the hedge as screening.**
3. In addition to the berm, one large evergreen or deciduous canopy tree per 35 lf frontage and 1 subcanopy tree per 20 lf frontage is required along the parking lot. The calculations and trees provided need to be revised.
4. The total frontage for Twelve Mile Road should be included in the calculations. **A landscaping waiver for the western 160' can be sought and will be supported for the same reason described in 3.c. above.**

Screening Between Residential and Non-residential – Berm (Wall) & Buffer (Zoning Sec. 5.5.3.A)

1. A landscaped berm 6-8' high is required between residential and commercial uses. As the commercial area is below the residential area, and the detention ponds are between the two uses, a berm of that height is not feasible.
2. The applicant has proposed an attractive mix of dense landscaping between the residential and commercial parts of the development and in the proposed park area, most of which are woodland replacement trees.
3. **It appears that the proposed landscaping will provide the required screening, despite the difference in height, but a section view from Meadowbrook should be added to show the proposed buffering capability of that landscaping, showing the buildings at proposed elevations and the landscaping at a height that can be expected after 2 years of growth.**
4. **If that section reveals that the screening is insufficient, additional screening in the form of dense evergreens, a landscaped berm high enough to provide the required buffering, or other screening will be required.**
5. The seed mixes are identified through callouts, and a diverse upland seed mix is proposed for the upland areas to be densely planted.

Street Tree Requirements (Zoning Sec. 5.5.3.E.i.c and LDM 1.d.)

RESIDENTIAL INTERIOR:

1. Street tree requirements appear to have been calculated correctly, and the trees placed correctly.
2. An additional street tree needs to be added to the plan to match the numbers shown as provided in the calculations.

MEADOWBROOK AND TWELVE MILE ROADS:

1. Please break out the frontage by road in the calculations (1336lf less 86lf for Meadowbrook and 607 lf for Twelve Mile Road).
2. 1 deciduous canopy tree per 35 lf is required along areas facing parking, and 1 tree per 45 lf is required along other right-of-way frontage for commercial, and 1 tree per 35 lf is required for residential. 1 tree per 45 lf can be used for the Meadowbrook frontage south of the residential areas.
3. Woodland replacement trees can't replace required street trees. Excess trees can be counted toward replacements. Please revise the woodland replacement trees accordingly.

COMMERCIAL – Please see discussion at start of this review.

Parking Lot Landscape (Zoning Sec. 5.5.3.C.) – Commercial only

1. Parking lot interior landscaping was not calculated correctly. The non-parking space vehicular use area landscape area should have been calculated at 5% of the area, not 1%. Please revise the calculations and provide the correct number of trees.
2. Islands and/or planting areas need to be at least 10' wide in parking areas and 300sf in area. There are numerous trees in planting areas that are much less than 300sf and/or 10 feet wide. These trees can't be counted toward the total. Please enlarge the islands that are to have trees in them.
3. Parking lot trees must be deciduous canopy trees, not evergreen trees or subcanopy trees. Please replace the above with deciduous canopy trees. Per the ordinance definition, deciduous canopy trees must have a mature canopy width of at least 20' to provide shading effect for adjacent spaces.
4. The replacement trees shown along the parking lots' perimeters must be changed to be interior or perimeter parking lot trees to provide the greatest number of trees possible toward meeting those requirements. Replacement trees can only be used along the perimeter if the other requirements are met.

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

1. Perimeter calculations have been provided as requested. Please check to see that the perimeter length is correctly measured. **Once the replacement trees along the perimeter are converted to perimeter or interior trees as noted above and the parking lot is reconfigured to provide a greater number of interior trees in acceptable islands, the shortage of trees may be considered acceptable.**
2. Parking lot perimeter trees are required to be deciduous canopy trees. Please replace any evergreen perimeter trees with deciduous canopy species.

Transformer/Utility Box Screening (Zoning Sec 5.5.3.D.)

1. When transformers/utility boxes are added to the plans, be sure to screen them per the city standard detail.
2. Please include the utility box screening detail on the plans if actual plantings are not proposed.

Building Foundation Landscape (Zoning Sec 5.5.3.D.)

1. Building foundation landscaping is calculated as the entire building perimeter * 8 feet. I calculated the total perimeters of the two buildings as approximately 584 feet. This would result in a requirement for a total of 4672 square feet of foundation landscape area. The basis of calculation does not appear to be correct. Please correct that and the required area.
2. 60% of the frontage visible from Twelve Mile Road should be landscaped. As proposed, there is no foundation landscaping proposed along the Twelve Mile frontage of either building. Landscaping needs to be added along the south elevation of the two buildings and needs to be adjacent to outdoor patios.
3. If, because of the nature of the operations, all of the required foundation landscaping cannot be located immediately adjacent to the building, a landscape waiver can be requested, but the balance of the required space must be provided elsewhere on the commercial area of the site.
4. Please label all landscape areas in SF on site plans.

GENERAL/OTHER

Planting Notations and Details (LDM)

Provided.

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

1. Storm basin shrubs are provided per the ordinance in terms of coverage.
2. The proposed seed mixes have a good diversity.

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

Irrigation plans for landscaped areas are required for Final Site Plan.

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

Proposed topography has been provided for the site.

Snow Deposit (LDM.2.q.)

Snow deposit areas have been proposed. The areas may need to be adjusted to provide more areas for trees (for example, the island along the eastern edge of the commercial parking lot that only has a fire hydrant in it).

Proposed trees to be saved (Sec 37 Woodland Protection 37-9, LDM 2.e.(1))

1. Trees scheduled to be removed are shown on both the plan and tree chart.
2. **Please leave the labels for trees to remain on the landscape plan.**

Corner Clearance (Zoning Sec 5.9)

Corner clearance is provided for both the residential and commercial sections of the property.

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.



WETLANDS REVIEW

March 21, 2016

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

Re: Beacon Hill (JSP15-0008)
Wetland Review of the Revised Concept Plan (PSP16-0018)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Revised Concept/Planned Rezoning Overlay Plan for the proposed Beacon Hill Park project prepared by Zeimet-Wozniak & Associates, Inc. dated January 11, 2016 (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 has previously visited the site for the purpose of a woodland verification as well as a wetland boundary verification with the applicant's wetland consultant King and MacGregor Environmental, Inc. (KME).

ECT currently recommends approval of the Revised Concept Pan for Wetlands. ECT recommends that the Applicant address the items noted in the *Wetland and Watercourse Comments* section of this letter prior to approval of the Final Site Plan.

The proposed development is located at the northeast corner of Twelve Mile Road and Meadowbrook Road, in Section 12. The Plan continues to propose both single-family residential lots (42 lots on 13.60 acres) as well as a commercial, restaurant and retail center (3.05 acres). An area of park trailhead is also proposed on the Plan totaling 3.28 acres. In addition the Plan proposes two (2) storm water detention basins as well as associated roads, parking and utilities. The total site acreage is approximately 20 acres. The proposed development has been divided in the following three (3) development areas:

- Beacon Hill Meadows (Residential);
- The Shoppes at Beacon Hill (Commercial);
- Beacon Hill Park Trailhead.

Based on our review of the application, Novi aerial photos, Novi GIS, the City of Novi Official Wetlands and Woodlands Maps (see Figure 1, attached), and a previously-completed on-site wetland boundary verification, it appears as if this proposed project site contains both Regulated Wetlands and Regulated Woodlands. This property includes a total of seven (7) individual wetland areas, including an open water/emergent wetland and a stream/drain which is tributary to the Walled Lake Branch of the Rouge River.

On-Site Wetland Evaluation & Proposed Wetland Impacts

ECT has previously completed a wetland boundary verification for this property. At that time, ECT verified the on-site wetland boundaries with the applicant’s wetland consultant, King & MacGregor Environmental, Inc. (KME). The nine (9) existing wetland areas that were flagged on-site (Wetlands A, B, C, D, E, EE, F, G, and H) are indicated on the current Plan along with the wetland flag number information. The wetlands appear to be accurately portrayed on the Plan. Wetland A is a forested wetland. Wetland B is a scrub-shrub wetland. Wetland C is an emergent/scrub-shrub wetland located along Meadowbrook Road. Wetlands D, E, G and H are emergent/wet meadow wetlands. Wetland EE is a larger emergent/open water wetland located in the southwest corner of the proposed development site, and Wetland F is an emergent/open water wetland associated with the drain that runs from west to east within the southern portion of the site. It should be noted that emergent Wetlands D, G, and H are of marginal quality and offer little in terms of environmental benefit (i.e., habitat and storm water storage capacity appear to be minimal/limited).

The emergent wetland area associated with the existing drain (Wetlands EE and F) is currently dominated by invasive species including common reed and reed canary grass. The adjoining upland is also dominated by invasive species such as common buckthorn. The Plan proposes a plan to treat some of these areas for invasive species and restore with native wildflower and plant species.

Currently, the Plan appears to indicate impacts to seven (7) of the nine (9) on-site wetlands. Based on the *Wetland and Wetland Buffer Impact Table*, Wetlands A and C will not be impacted. The other wetlands will be filled for the purpose of construction, or otherwise impacted as part of the stream channel relocation/abandonment, etc.

The Plan also proposes to abandon approximately 350 lineal feet of the existing stream channel (Wetland F). The stream will be relocated via approximately 485 lineal feet of constructed stream channel design. The following table summarizes the existing wetlands and the proposed wetland impacts as listed on the *Wetland & Buffer Impact Plan* (Sheet SP-14):

Table 1. Existing Wetlands and Proposed Wetland Impacts

| Development Area | Wetland ID | Wetland Area | Impact Area | Estimated Impact Volume | City Regulated? | MDEQ Regulated? |
|------------------|------------|-----------------|-----------------|-------------------------|-----------------|-----------------|
| | | Sq. Ft. (Acres) | Sq. Ft. (Acres) | (cubic yards) | | |
| Meadows | | | | | | |
| | A | 4,572 (0.10) | N/A | N/A | YES | No |
| | B | 382 (0.009) | 382 (0.009) | Not Indicated | YES | No |
| | C | 5,903 (0.14) | N/A | N/A | YES | No |
| | D | 770 (0.02) | 770 (0.02) | Not Indicated | YES | YES |

| <i>Development Area</i> | <i>Wetland ID</i> | <i>Wetland Area</i> | <i>Impact Area</i> | <i>Estimated Impact Volume</i> | <i>City Regulated?</i> | <i>MDEQ Regulated?</i> |
|-------------------------|-------------------|----------------------|----------------------|--------------------------------|------------------------|------------------------|
| Shoppes | | | | | | |
| | G | 783 (0.02) | 783 (0.02) | Not Indicated | YES | YES |
| | H | 876 (0.02) | 876 (0.02) | Not Indicated | YES | YES |
| Park Trailhead | | | | | | |
| | E | 4,477 (0.10) | 3,092 (0.07) | Not Indicated | YES | YES |
| | EE | 48,121 (1.10) | 3,223 (0.07) | Not Indicated | YES | YES |
| | F | 1,411 (0.03) | 1,411 (0.03) | Not Indicated | YES | YES |
| TOTAL | -- | 67,295 (1.54) | 10,537 (0.24) | Not Indicated | -- | -- |

It should be noted that the Plan indicates an impact to Wetland E, however no wetland impact hatch is shown on the *Wetland & Buffer Impact Plan* (Sheet SP-14). The applicant should review and revise as necessary on the Plan. Currently, the Plan proposes impacts to 0.24-acre of the total 1.54 acres of on-site wetland (i.e., approximately **16%** of the existing wetlands).

The following table summarizes the existing wetland/watercourse setbacks and the proposed wetland/watercourse setback impacts as listed on the Plan:

Table 2. Proposed 25-Foot Wetland/Watercourse Buffer Impacts

| <i>Development Area</i> | <i>Wetland Buffer ID</i> | <i>Wetland Buffer Area</i> | <i>Buffer Impact Area</i> | <i>Estimated Impact Volume (cubic yards)</i> | <i>City Regulated?</i> | <i>MDEQ Regulated?</i> |
|-------------------------|--------------------------|----------------------------|---------------------------|--|------------------------|------------------------|
| | | <i>Sq. Ft. (Acres)</i> | <i>Sq. Ft. (Acres)</i> | | | |
| Meadows | | | | | | |
| | A | 6,753 (0.16) | N/A | N/A | YES | No |
| | B | 3,985 (0.09) | 3,985 (0.09) | Not Indicated | YES | No |
| | C | 12,456 (0.29) | 1,775 (0.04) | N/A | YES | No |
| | D | 5,347 (0.12) | 5,347 (0.12) | Not Indicated | YES | No |
| Shoppes | | | | | | |
| | G | * | * | Not Indicated | YES | No |

| <i>Development Area</i> | <i>Wetland Buffer ID</i> | <i>Wetland Buffer Area</i> | <i>Buffer Impact Area</i> | <i>Estimated Impact Volume</i> | <i>City Regulated?</i> | <i>MDEQ Regulated?</i> |
|-------------------------|--------------------------|----------------------------|---------------------------|--------------------------------|------------------------|------------------------|
| | H | 8,950 (0.21) | 8,950 (0.21) | Not Indicated | YES | No |
| Park Trailhead | | | | | | |
| | E | ** | ** | Not Indicated | YES | No |
| | EE | 48,516 (1.11) | 23,285 (0.53) | Not Indicated | YES | No |
| | F | ** | ** | Not Indicated | YES | No |
| TOTAL | 0.02 | 86,007 (1.98) | 43,342 (0.99) | Not Indicated | -- | -- |

**Included in buffer area for Wetland H.*
***Included in buffer area for Wetland EE.*

Currently, the Plan proposes impacts to 0.99-acre of the total 1.98 acres of on-site wetland buffer (i.e., approximately **50%** of the existing wetland buffer). It should be noted however that the applicant proposes a total of 28,636 square feet (0.66-acre) of restoration within these areas. Therefore 0.66-acre of the 0.99-acre of wetland buffer disturbance is essentially temporary in nature. The Plan proposes:

- 28,636 square feet (0.66-acre) of temporary buffer impacts (67% of all buffer impacts);
- 0.33-acre of permanent buffer impacts (33% of all buffer impacts).

As noted above, the Plan proposes to restore the degraded functions of both the wetland and the stream located on the southern end of the site. The following restoration activities are proposed:

- Approximately 350-feet of the existing stream channel will be abandoned;
- A relocated stream channel (approximately 480-feet) will be constructed using natural channel design;
- The applicant proposes to improve plant species diversity within the existing open water/emergent wetland through mechanical and chemical treatment of common reed and reed canary grass. These areas will be replanted with native species, including wildflowers and trees.
- The applicant proposes to restore the 25-foot natural features setback in all areas of temporary impact. A 25-foot watercourse setback is also proposed along the drain that is to be relocated. It should be noted that the area of proposed seed mix does not appear to be graphically indicated on the *Stream Relocation Plan* (Sheet W-3). The hatching associated

with the proposed seed mix does not appear to be indicated on the Plan. The applicant should review and clarify this information on the Plan.

The current Plan does include the construction of two (2) storm water management basins located adjacent to the existing stream/proposed relocated stream channel. As indicated on the Preliminary Utility Plan, there will be proposed storm water outlets to the relocated stream/wetland.

Wetland Permit Requirements

It appears as though a MDEQ Wetland Permit, a City of Novi *Non-Minor Wetland Use Permit* and a City *Authorization to Encroach the 25-Foot Wetland Setback* would be required for any proposed impacts to site wetlands. In a letter from the Michigan Department of Environmental Quality (MDEQ) dated January 20, 2016, it is stated that Wetlands D, E, EE, F, G, and H are regulated by the MDEQ as they are either directly connected or contiguous (i.e., within 500 feet) to the stream. Wetlands A, B, and C are not regulated by the MDEQ as they are greater than 500 feet from the stream/drain and otherwise isolated and less than five acres in size.

Regarding the stream, DEQ and the applicant's wetland consultant (KME) agreed upon a representative cross section, bankfull bench and stream reach slope that can be used to measure morphological data for the relocated channel. The bankfull bench must be at least three (3) bankfull widths wide to maintain a stable floodplain. The MDEQ notes that by applying these dimensions and maintaining a slope greater than or equal to 0.2% the stream work will meet MDEQ permit requirements for the stream relocation.

In addition, the MDEQ states that the proposed wetland restoration would be an improvement over the dense common reed (*Phragmites australis*) vegetation that currently surrounds the pond on site. Treatment of the Phragmites to the west, was also discussed and encouraged in order to help ensure the restoration will be successful on the project site.

As noted above, 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.

Wetland and Watercourse Comments

The following are repeat comments from our Wetland Review of the Concept/Planned Rezoning Overlay Plan (PSP15-0108) letter dated August 3, 2015. The current status of each follows in ***bold italics***:

1. It appears as though a MDEQ Wetland Permit and a City of Novi *Wetland Use Permit* would be required for any proposed impacts to site wetlands. The wetlands associated with the existing stream are likely regulated by MDEQ due to their proximity to an inland stream. 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.

This comment still applies. As noted in the applicant's wetland consultant's (KME) plan review comments response letter dated January 11, 2016, an on-site pre-application meeting was held with MDEQ staff members Sue Tepatti and Patrick Durack on December 3, 2015. The MDEQ confirmed that the Agency would have jurisdiction over the stream and wetlands within 500 feet of the stream and that a MDEQ permit will be required for the proposed development. KME states that the applicant intends to apply for all necessary wetland related approvals from the City of Novi.

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 Wetland and Watercourse Permit cannot be issued until this information has been provided.

2. 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 site design to preserve wetland and wetland buffer areas. 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".

This comment has been addressed. The applicant's wetland consultant (KME) has noted that the wetlands and wetland buffers proposed for impact are primarily emergent/wet meadow wetland habitats that are largely dominated by non-native wetland plant species. The Plan proposes the establishment of open space adjoin the wetlands to remain. The Plan appears to propose wetland and watercourse buffers/setbacks equal to or greater than 25 feet.

It should be noted that the area of proposed seed mix associated with the wetland buffers does not appear to be graphically indicated on the Stream Relocation Plan (Sheet W-3). The hatching associated with the proposed seed mix does not appear to be indicated on the Plan. The applicant should review and clarify this information on the Plan.

3. While the Plan appears to involve proposed impacts to on-site wetlands and the associated 25-foot wetland setbacks, these impacts do not appear to be indicated, quantified and labeled on the Plan. In addition, the overall on-site acreage of wetlands and wetland setbacks should be included on the Plan. The Plan should be reviewed and revised as necessary.

This comment has been addressed. As noted in Comment #2, the area of proposed seed mix associated with the wetland buffers does not appear to be graphically indicated on the Stream Relocation Plan (Sheet W-3). The hatching associated with the proposed seed mix does not

appear to be indicated on the Plan. The applicant should review and clarify this information on the Plan.

4. A plan to replace or mitigate for any permanent impacts to existing wetland buffers should be provided by the Applicant. In addition, the Plan should address how any temporary impacts to wetland buffers shall be restored, if applicable.

This comment has been addressed. See Comments #2 and #3 above.

5. The City's threshold for the requirement of wetland mitigation is 0.25-acre of proposed wetland impact. This should be taken into account on subsequent site Plan submittals, if necessary.

This comment still applies. The Plan currently proposes impacts to 0.24-acre of the total 1.54 acres of on-site wetland (i.e., approximately 16% of the existing wetlands). The MDEQ states that the proposed wetland restoration would be an improvement over the dense common reed (*Phragmites australis*) vegetation that currently surrounds the pond on site. ECT agrees with the MDEQ's comments and believes that the proposed Plan and the associated wetland and wetland buffer restoration aspects will provide an improvement to the natural features to remain on-site.

6. The Applicant should demonstrate that alternative site layouts that would reduce the overall impacts to wetlands and wetland setbacks have been reviewed and considered.

This comment has been addressed. The Plan proposes impacts to four small, isolated wetlands (B, D, G, and H) and a small portion of the largest wetland on-site; Wetland EE. Many of the areas of impact are dominated by invasive wetland plant species. The applicant has provided an acceptable wetland and wetland buffer restoration plan.

7. The Applicant is encouraged to provide wetland conservation easements for any areas of remaining wetland or 25-foot wetland buffer.

The applicant's wetland consultant (KME) notes that that the applicant is willing to provide conservation easements for remaining areas of wetland, wetland buffer setback and woodland areas which will not conflict with future use of the property by residents and visitors. All proposed conservation easements shall be graphically indicated on the Plan. Please review and revise the Plan as necessary.

8. 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 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. Based on a search of the MDEQ's Coastal and Inland Waters Permit Information System (CIWPIS), there does not appear to be an active file associated with this project location. This information is required before the City of Novi can issue a Wetland Permit.

This comment still applies. As noted in Comment #1, 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 Wetland and Watercourse Permit cannot be issued until this information has been provided.

Please also consider the following additional comment:

9. The MDEQ has noted that the treatment of the Phragmites to the west of the property (i.e., at Tollgate Farms) was also discussed and encouraged in order to help ensure the restoration will be successful on the project site. The applicant should address this request from MDEQ and provide any associated restoration details on the Plan as necessary. Applicable notes should be added to the Wetland Restoration Plan as necessary.

Conclusion

In general, the small, isolated wetlands that are proposed to be impacted provide minimal environmental benefit in terms of wildlife habitat and/or stormwater storage capacity, etc. These wetlands and wetland buffers are primarily emergent/wet meadow wetland habitats that are largely dominated by non-native wetland plant species. The Plan does propose the establishment of open space adjoining the wetlands to remain. The Plan appears to propose wetland and watercourse buffers/setbacks equal to or greater than 25 feet. ECT agrees with the MDEQ's comment stating that the proposed wetland restoration would be an improvement over the dense common reed (*Phragmites australis*) vegetation that currently surrounds the pond on site.

Recommendation

ECT currently recommends approval of the Revised Concept Pan for Wetlands. ECT recommends that the Applicant address the items noted in the *Wetland and Watercourse Comments* section of this letter prior to approval of the Final Site Plan.

Beacon Hill (JSP15-0008)
Wetland Review of the Revised Concept Plan (PSP16-0018)
March 21, 2016
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If you have any questions regarding the contents of this letter, please contact us.

Respectfully submitted,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.



Peter Hill, P.E.
Senior Associate Engineer



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cc: Sri Komaragiri, AICP, City of Novi Planner
Richelle Leskun, City of Novi Planning Assistant
Rick Meader, City of Novi, Landscape Architect
Kirsten Mellem, City of Novi Planner

Attachments: Figure 1 & Site Photos



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

Site Photos



Photo 1. Looking southeast at open water wetland (Wetland EE) on Southside of the subject property (July 24, 2015).



Photo 2. Looking north at forested wetland (Wetland A) along northern edge of the subject property (July 24, 2015).



Photo 3. Looking east at emergent wetland (Wetland C) on the west side of the subject property (July 24, 2015).



Photo 4. Looking south towards Wetland E on the west side of the subject property (July 24, 2015).

WOODLANDS REVIEW

April 19, 2016

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

Re: Beacon Hill (JSP15-0008)
Woodland Review of the Revised Conceptual Site Plan #3 (PSP16-0036)

Dear Ms. McBeth:

Environmental Consulting & Technology, Inc. (ECT) has reviewed the Preliminary Site Plan for Beacon Hill Park, Beacon Hill Meadows, The Shoppes at Beacon Hill, and Beacon Hill Park Trailhead prepared by Zeimet-Wozniak & Associates, Inc. dated April 13, 2016 (Plan). The Plan was reviewed for conformance with the City of Novi Woodland Protection Ordinance Chapter 37. ECT has previously visited the site for the purpose of a woodland and wetland verification. 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.*

ECT currently recommends approval of the Revised Conceptual Site Plan #3 for Woodlands. ECT recommends that the Applicant address the items noted in the *Woodland Comments* section of this letter prior to approval of the Final Stamping Set Plan.

The proposed development is located at the northeast corner of Twelve Mile Road and Meadowbrook Road, in Section 12. The Plan continues to propose both single-family residential lots (42 lots on 13.60 acres) as well as a commercial, restaurant and retail center (3.05 acres). An area of park trailhead is also proposed on the Plan totaling 3.28 acres. In addition the Plan proposes two (2) storm water

Beacon Hill (JSP15-0008)

Woodland Review of the Revised Conceptual Site Plan #3 (PSP16-0036)

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detention basins as well as associated roads, parking and utilities. The total site acreage is approximately 20 acres. The proposed development has been divided in the following three (3) development areas:

- Beacon Hill Meadows (Residential);
- The Shoppes at Beacon Hill (Commercial);
- Beacon Hill Park Trailhead.

The applicant has noted that the total number of trees being removed for the site development is unchanged from the last submittal. The number of Woodland Replacement trees required did increase as the applicant was not correctly calculating the Woodland Replacement credits required for trees containing multiple stems. This oversight has been corrected on the current Plan.

In addition, to working with City Staff and Consultants the applicant has been working to have a proposed development that will be complimentary to the Tollgate Education Center property directly to the west. The applicant notes that this collaboration has resulted in an open space running north and south the entire length of Meadowbrook Road, adjacent to the 5-acre park within the development and the deeper open space park area in front of the commercial section of the property. The community is now designed to have 42% open space. The applicant has specifically revised the Plan to include an additional 50-foot landscaped natural corridor along Meadowbrook Road. The Tollgate Education Center has strongly recommended that the applicant propose landscaping on the east side of Meadowbrook Road that presents a natural progression of plantings from low shrubs to medium understory plantings to canopy trees, in order to provide a natural appearance. In order to accomplish this, the applicant will require flexibility in the proposed landscaping along Meadowbrook Road. The Plan proposes to move some of the required landscaping into the Meadowbrook Road right-of-way in order to preserve the existing vegetation and provide a natural buffer while maintaining site distance visibility.

Onsite Woodland Evaluation

ECT has reviewed the City of Novi Official Woodlands Map and completed an onsite Woodland Evaluation on July 24, 2015. Previously, the applicant's engineer, Zeimet Wozniak & Associates (ZWA), noted in a supplemental letter dated June 22, 2015 that the locations of the regulated trees shown on previously-submitted plans are depicted with a tree symbol and that this information was obtained from an old tree survey. They stated that a new tree survey, meeting the requirements of the City of Novi Woodland Ordinance/Code of Ordinances, would be addressed on subsequent site plan submittals. The tree identification and sizing list was updated by King & MacGregor Environmental, Inc. (KME) in October of 2015.

It should be noted that the surveyed trees were marked with white spray paint in the field (see Site Photos). The current Plan now includes a *Tree Removal List* (Sheet SP-4). Based on field notes recorded in July 2015, ECT was able to verify the specific information with regard to tree location, species and diameters of trees observed in the field. In general, the tree survey and *Tree Removal List* appear to accurately represent the on-site trees.

The entire site is approximately 20 acres, with City-regulated Woodland mapped across approximately the northern half of the project site (see Figure 1). A portion of the southern half of the site contains previously-disturbed/cleared land located along Twelve Mile Road. The highest quality woodlands on site are found in the northern section of the site. Some of these areas also contain regulated wetlands (i.e. forested wetland area located along the northern project boundary). It appears as if the proposed site development will involve a significant amount of impact to regulated woodlands and will include a significant number of tree removals.

On-site woodland within the project area consists of species including box elder (*Acer negundo*), Norway maple (*Acer platanoides*), silver maple (*Acer saccharinum*), bitternut hickory (*Carya ovata*), white ash (*Fraxinus americana*), black walnut (*Juglans nigra*), eastern red cedar (*Juniperus virginiana*), apple (*Malus pumila*), eastern white pine (*Pinus strobus*), common pear (*Pyrus communis*), American basswood (*Tilia americana*), Scotch pine (*Pinus sylvestris*), eastern cottonwood (*Populus deltoides*), black cherry (*Prunus serotina*), choke cherry (*Prunus virginiana*), American elm (*Ulmus americana*), Siberian elm (*Ulmus pumila*), and red elm (*Ulmus rubra*). Based on the existing tree data provided by KME, about 50% of the on-site tree species consist of American basswood, Scotch pine and black walnut.

Based on the information provided on the Plan, the maximum size tree diameters on the site are a 63-inch diameter-at-breast-height (DBH) white willow (Tree No. 603) and a 51-inch dbh white willow (Tree No. 764). Both of these trees will be removed for the proposed site development. The average diameter of the surveyed trees is 13 inches. In terms of habitat quality and diversity of tree species, the on-site areas of mapped City regulated woodlands are of fair quality. Although many areas of the site have been previously disturbed, the wooded areas (i.e., approximately the north ½ of the development site) provide a fair level of environmental benefit. As the on-site woodlands are connected to a larger wooded system that extends both east and north of the subject property. In terms of a scenic asset, wind block, noise buffer or other environmental asset, the woodland areas proposed for impact are considered to be of good quality.

After our woodland evaluation and review of the tree survey information provided by KME the applicant's woodland consultant, there are nineteen (19) trees on-site that meet the minimum caliper size for designation as a specimen tree. These trees include:

- Tree #60, 24" silver maple (measures ≥24", the minimum caliper size for specimen trees);
- Tree #743, 24" silver maple (measures ≥24", the minimum caliper size for specimen trees);
- Tree #703, 24.3" black walnut (measures ≥24", the minimum caliper size for specimen trees);
- Tree #707, 24.8" black walnut (measures ≥24", the minimum caliper size for specimen trees);
- Tree #251, 25.3" black walnut (measures ≥24", the minimum caliper size for specimen trees);
- Tree #169, 25.4" black walnut (measures ≥24", the minimum caliper size for specimen trees);
- Tree #23, 26"/17" black cherry (measures ≥24", the minimum caliper size for specimen trees);
- Tree #737, 26" Norway maple (measures ≥24", the minimum caliper size for specimen trees);
- Tree #171, 27.3" black walnut (measures ≥24", the minimum caliper size for specimen trees);
- Tree #700, 27.4" black walnut (measures ≥24", the minimum caliper size for specimen trees);

- Tree #268, 28.2" black walnut (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #283, 28.3" American basswood (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #702, 28.4" black walnut (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #252, 28.8" American basswood (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #168, 29.8" black walnut (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #20, 30.5" black walnut (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #676, 34.2" black walnut (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #300, 35.2" American basswood (measures $\geq 24"$, the minimum caliper size for specimen trees);
- Tree #170, 38.0" American basswood (measures $\geq 24"$, the minimum caliper size for specimen trees);

Of these nineteen (19) potential specimen trees, two (2) of these trees (11% of the potential specimen trees) will be saved (Tree No. 268 and No. 283) and seventeen (17) are proposed for removal (89% removal of the potential specimen trees). The Applicant should be aware of the City's Specimen Tree Designation as outlined in Section 37-6.5 of the Woodland Ordinance. This section states that:

"A person may nominate a tree within the city for designation as a historic or specimen tree based upon documented historical or cultural associations. Such a nomination shall be made upon that form provided by the community development department. A person may nominate a tree within the city as a specimen tree based upon its size and good health. Any species may be nominated as a specimen tree for consideration by the planning commission.

Any tree designated by the planning commission as an historical or specimen tree shall be so depicted on an historic and specimen tree map to be maintained by the community development department. The removal of any designated specimen or historic tree will require prior approval by the planning commission. Replacement of the removed tree on an inch for inch basis may be required as part of the approval".

Proposed Woodland Impacts and Replacements

It appears as if the proposed development will cover a large portion of the site and will involve a considerable number of tree removals. The current Plan, however has incorporated some revisions to the site design that have resulted in the removal of fewer total regulated trees. The current Plan now includes several areas of woodland preservation. This includes areas along the northern section, the northwest section and a section in the center of the Beacon Hill Meadows section of the development.

It should be noted that the tree survey information provided by KME appears to include a total of **577** total trees surveyed on the development site. Of these existing trees, some are non-woodland trees (i.e., not located within City of Novi Regulated Woodland per the City's Regulated Woodland Map). It should be noted that the City of Novi replacement requirements pertain to regulated trees with DBH greater than or equal to 8 inches located within areas mapped as regulated woodland on the City of

Novi Regulated Woodland Map. The woodland replacement requirements also pertain to any tree 36" inches or greater DBH.

The following table (Table 1) summarizes the proposed Woodland Impacts. This information is from Sheet LS-7 of 7:

Table 1. Proposed Woodland Impacts and Required Replacements

| | Meadows | Shoppes | Trailhead | Total |
|--|----------------|----------------|------------------|--------------|
| Total No. of existing trees to be removed | 432 | 22 | 6 | 460 |
| No. of exempt trees (dead or poor condition) to be removed | 55 | 3 | - | 58 |
| No. of regulated trees removed | 377 | 19 | 6 | 402 |
| Trees 8"-11" DBH removed | 183 | 3 | 1 | 187 |
| Trees 11"-20" DBH removed | 144 | 9 | 4 | 157 |
| Trees 20"-29" DBH removed | 17 | 3 | - | 20 |
| Trees 30" or greater DBH removed | 4 | 1 | 1 | 6 |
| No. of trees with multi-trunk | 29 | 3 | - | 32 |
| | | | | |
| Total No. of tree replacement credits required | 657 | 48 | 13 | 718 |
| 187 – (8"-11" DBH) x 1-Tree Credit | 183 | 3 | 1 | 187 |
| 157 – (11"-20" DBH) x 2-Tree Credit | 288 | 18 | 8 | 314 |
| 20 – (20"-29" DBH) x 3-Tree Credit | 51 | 9 | - | 60 |
| 6 – (30" DBH or greater) x 4-Tree Credit | 16 | 4 | 4 | 24 |
| 32 – (Multi-trunk) 954.3"/8" | 1191 | 14 | - | 133 |
| | | | | |
| Total No. of tree replacement credits provided | 422.5 | 15 | 280.5 | 718 |
| 351 – 2 ½" deciduous tree @ 1.0 credits | 174 | 15 | 162 | 351 (49%) |
| 151 – 7' evergreen @ .67 credits | 75 | - | 26 | 101 (14%) |
| 102 – 10' evergreen @ 1.5 credits | 109.5 | - | 43.5 | 153 (21%) |
| 681 – 30" shrubs @ 6:1 credits | 64 | - | 49 | 113 (16%) |

For multi-stemmed trees, Woodland Replacements required are calculated by summing the d.b.h. of each stem greater than or equal to 8 inches and dividing the total by 8. All fractional Woodland Replacements required are rounded up to the nearest whole tree replacement. This calculation was not calculated properly on the previous plan submittal but has been corrected on the current Plan.

The current plan also includes a *Tree Replacement Plan Material List* on Sheet LS-7 of 7. This applicant has provided a list of proposed deciduous and coniferous trees as well as shrubs that are intended to meet the Woodland Replacement credit requirements. The proposed species all appear to be acceptable.

The current Plan does appear to quantify the proposed number, location and species of the trees that are intended to satisfy the total required Woodland Replacement Tree credits. As noted in the City's Landscape Review of the Revised Conceptual Site Plan #3 letter dated April 15, 2016, the applicant has proposed the use (in some areas of the site) of Woodland Replacement Trees in place of the required Street Trees along Meadowbrook Road and Twelve Mile, and the use of upsized evergreen trees (i.e., 10-foot height) for additional Woodland Replacement credits. Like the City's Landscape architect, ECT supports the alternate streetscape landscaping that the applicant has developed through coordinated work with the Tollgate Education Center. ECT supports the use of Woodland Replacement Trees and shrubs as currently proposed in order to supplement the required trees along Meadowbrook Road but we do not support the replacement of Street Tree requirements with Woodland Replacement Trees. Please see the specific comments in the Landscape Review letter dated April 15, 2016.

It should be noted that the City's Landscape Design Manual specifically forbids the upsizing of Woodland Replacement Trees for additional Credits (Section 3.c.(2)). The applicant can, however, request a deviation as part of the PRO agreement. ECT and the City Landscape Architect support the use of some upsizing with credit within the PRO in order to provide additional landscape interest and screening along Meadowbrook Road and along the south edge of the residential portion of the development to provide additional screening from the commercial part of the development. That being said, the number of additional credits through the use of upsized Woodland Replacement trees (i.e., 10-foot evergreen trees) seems excessive.

As noted in the Landscape Review, 40% of the proposed evergreen trees are upsized from 7' to 10' height (i.e., 102 of 253 total evergreens are proposed as 10' tall trees). Consistent with the Landscape Design Manual, the applicant is requesting 1.5 credits per 10' tree instead of the 0.67-credit per tree that is normally allowed for a 7' tall evergreen per the Woodland Ordinance. The result is an additional 85 Woodland Replacement Credits on 102 replacement trees provided. As this is a PRO, there can be some flexibility in terms of allowing extra Woodland Replacement credits for the use of upsized trees which are normally not allowed by the Landscape Design Manual. ECT does support the use of some upsized evergreens in this development in order to provide more interest along Meadowbrook Road and more screening between the residential and commercial portions of the site. ECT concurs with the Landscape Review in that the amount of credits for the providing upsized evergreen trees as Woodland Replacement trees should be limited. The total benefit in credits derived from the "upsized" Woodland Replacement material should not be more than 33% of the total number of "upsized" trees planted.

With regard to the location of woodland replacement trees, the Woodland Ordinance states:

- *The location of replacement trees shall be subject to the approval of the planning commission and shall be such as to provide the optimum enhancement, preservation and protection of woodland areas. Where woodland densities permit, tree relocation or replacement shall be within the same woodland areas as the removed trees. Such woodland replanting shall not be used for the landscaping requirements of the subdivision ordinance or the zoning landscaping;*
- *Where the tree relocation or replacement is not feasible within the woodland area, the relocation or replacement plantings may be placed elsewhere on the project property;*

- *Where tree relocation or replacement is not feasible within the woodland area, or on the project property, the permit grantee shall pay into the city tree fund monies for tree replacement in a per tree amount representing the market value for the tree replacement as approved by the planning commission. The city tree fund shall be utilized for the purpose of woodland creation and enhancement, installation of aesthetic landscape vegetation, provision of care and maintenance for public trees and provision and maintenance of specialized tree care equipment. Tree fund plantings shall take place on public property or within right-of-ways with approval of the agency of jurisdiction. Relocation or replacement plantings may be considered on private property provided that the owner grants a permanent conservation easement and the location is approved by the planning commission;*
- *Where replacements are installed in a currently non-regulated woodland area on the project property, appropriate provision shall be made to guarantee that the replacement trees shall be preserved as planted, such as through a conservation or landscape easement to be granted to the city. Such easement or other provision shall be in a form acceptable to the city attorney and provide for the perpetual preservation of the replacement trees and related vegetation.*

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.

City of Novi Woodland Review Standards and Woodland Permit Requirements

Based on Section 37-29 (*Application Review Standards*) of the City of Novi Woodland Ordinance, the following standards shall govern the granting 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”.*

There are a significant number of replacement trees required for the construction of the proposed development. Some degree of impact to on-site woodlands is deemed unavoidable if this property is to be developed for the proposed use, however, the current Plan appears to clear all proposed lots of existing trees. The current site development plan appears to propose the removal of 460 of the 577 total on-site trees. Of these removals, 402 are regulated trees.

Woodland Comments

ECT recommends that the Applicant address the items noted below prior to submitting the Final Stamping Set Plan:

1. ECT supports the use of Woodland Replacement Trees and shrubs as currently proposed in order to supplement the required trees along Meadowbrook Road but we do not support the replacement of Street Tree requirements with Woodland Replacement Trees. Please see the specific comments in the Landscape Review letter dated April 15, 2016.
2. The City's Landscape Design Manual specifically forbids the upsizing of Woodland Replacement Trees for additional Credits (Section 3.c.(2)). The applicant can, however, request a deviation as part of the PRO agreement. ECT and the City Landscape Architect support the use of some upsizing with credit within the PRO in order to provide additional landscape interest and screening along Meadowbrook Road and along the south edge of the residential portion of the development to provide additional screening from the commercial part of the development. That being said, the number of additional credits through the use of upsized Woodland Replacement trees (i.e., 10-foot evergreen trees) seems excessive.

As noted in the Landscape Review, 40% of the proposed evergreen trees are upsized from 7' to 10' height (i.e., 102 of 253 total evergreens are proposed as 10' tall trees). Consistent with the Landscape Design Manual, the applicant is requesting 1.5 credits per 10' tree instead of the 0.67-credit per tree that is normally allowed for a 7' tall evergreen per the Woodland Ordinance. The result is an additional 85 Woodland Replacement Credits on 102 replacement trees provided. ECT concurs with the Landscape Review in that the amount of credits for the providing upsized evergreen trees as Woodland Replacement trees should be limited. The total benefit in credits derived from the "upsized" Woodland Replacement material should not be more than 33% of the total number of "upsized" trees planted.

3. The Applicant is encouraged to provide preservation/conservation easements for any areas of remaining woodland.
4. The Applicant is encouraged to provide woodland conservation easements for any areas containing woodland replacement trees, if applicable. It is not clear how all of the proposed replacement trees will be guaranteed in perpetuity. As stated in the woodland ordinance:

Where replacements are installed in a currently non-regulated woodland area on the project property, appropriate provision shall be made to guarantee that the replacement trees shall be preserved as planted, such as through a conservation or landscape easement to be granted to the city. Such easement or other provision shall be in a form acceptable to the city attorney and provide for the perpetual preservation of the replacement trees and related vegetation.

5. A Woodland Permit from the City of Novi would be required for proposed impacts to any trees 8-inch d.b.h. or greater. Such trees shall be relocated or replaced by the permit grantee. All replacement trees shall be two and one-half (2 ½) inches caliper or greater deciduous trees or 6-foot tall (minimum) coniferous trees. Deciduous replacement trees shall be provided at a

1:1 replacement ratio and coniferous replacement trees shall be provided at a 1.5:1 replacement ratio. See the Woodland Tree Replacement Chart (attached) for acceptable replacement tree species.

6. A Woodland Replacement financial guarantee for the planting of replacement trees will be required, if applicable. 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.

Based on a successful inspection of the installed on-site Woodland Replacement trees, seventy-five percent (75%) of the original Woodland Financial Guarantee shall be returned to the Applicant. Twenty-five percent (25%) of the original Woodland Replacement financial guarantee will be kept for a period of 2-years after the successful inspection of the tree replacement installation as a *Woodland Maintenance and Guarantee Bond*.

7. 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.
8. Replacement material should not be located 1) within 10' of built structures or the edges of utility easements and 2) over underground structures/utilities or within their associated easements. In addition, replacement tree spacing should follow the *Plant Material Spacing Relationship Chart for Landscape Purposes* found in the *City of Novi Landscape Design Manual*.

Recommendation

ECT currently recommends approval of the Revised Conceptual Site Plan #3 for Woodlands. ECT recommends that the Applicant address the items noted in the *Woodland Comments* section of this letter prior to approval of the Final Stamping Set Plan.

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

Respectfully submitted,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.



Peter Hill, P.E.
Senior Associate Engineer



Matthew Carmer
Senior Scientist
Professional Wetland Scientist #1746

cc: Sri Komaragiri, AICP, City of Novi Planner
Richelle Leskun, City of Novi Planning Assistant
Rick Meader, City of Novi, Landscape Architect

Kirsten Mellem, City of Novi Planner

Attachments: Figure 1 and Site Photos



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

Site Photos



Photo 1. Looking southwest towards southwest corner of site. Site is relatively open and previously disturbed (ECT, July 24, 2015).



Photo 2. Looking west along north side of existing drain area. (ECT, July 24, 2015).



Photo 3. Tree No. 251 (25.3" black walnut) located in the north-central section of the site. This potential specimen tree is proposed for removal (ECT, July 24, 2015).



Photo 4. Higher quality trees located in the northern section of the site; near existing forested wetland area (ECT, July 24, 2015).

Site Photos



Photo 1. Looking southwest towards southwest corner of site. Site is relatively open and previously disturbed (ECT, July 24, 2015).



Photo 2. Looking west along north side of existing drain area. (ECT, July 24, 2015).



Photo 3. Tree No. 251 (25.3" black walnut) located in the north-central section of the site. This potential specimen tree is proposed for removal (ECT, July 24, 2015).



Photo 4. Higher quality trees located in the northern section of the site; near existing forested wetland area (ECT, July 24, 2015).

Woodland Tree Replacement Chart

(from Chapter 37 Woodlands Protection)

(All canopy trees to be 2.5" cal or larger, evergreens as listed)

| Common Name | Botanical Name |
|-------------------------------------|-------------------------------|
| Black Maple | Acer nigrum |
| Striped Maple | Acer pennsylvanicum |
| Red Maple | Acer rubrum |
| Sugar Maple | Acer saccharum |
| Mountain Maple | Acer spicatum |
| Ohio Buckeye | Aesculus glabra |
| Downy Serviceberry | Amelanchier arborea |
| Yellow Birch | Betula alleghaniensis |
| Paper Birch | Betula papyrifera |
| American Hornbeam | Carpinus caroliniana |
| Bitternut Hickory | Carya cordiformis |
| Pignut Hickory | Carya glabra |
| Shagbark Hickory | Carya ovata |
| Northern Hackberry | Celtis occidentalis |
| Eastern Redbud | Cercis canadensis |
| Yellowwood | Cladrastis lutea |
| Beech | Fagus sp. |
| Thornless Honeylocust | Gleditsia triacanthos inermis |
| Kentucky Coffeetree | Gymnocladus dioica |
| Walnut | Juglans sp. |
| Eastern Larch | Larix laricina |
| Sweetgum | Liquidambar styraciflua |
| Tuliptree | Liriodendron tulipifera |
| Tupelo | Nyssa sylvatica |
| American Hophornbeam | Ostrya virginiana |
| White Spruce_(1.5:1 ratio) (6' ht.) | Picea glauca |
| Black Spruce_(1.5:1 ratio) (6' ht.) | Picea mariana |
| Red Pine | Pinus resinosa |
| White Pine_(1.5:1 ratio) (6' ht.) | Pinus strobus |
| American Sycamore | Platanus occidentalis |
| Black Cherry | Prunus serotina |
| White Oak | Quercus alba |
| Swamp White Oak | Quercus bicolor |
| Scarlet Oak | Quercus coccinea |
| Shingle Oak | Quercus imbricaria |
| Burr Oak | Quercus macrocarpa |
| Chinkapin Oak | Quercus muehlenbergii |
| Red Oak | Quercus rubra |
| Black Oak | Quercus velutina |
| American Bladdernut | Staphylea trifolia |
| Bald Cypress | Taxodium distichum |
| American Basswood | Tilia americana |
| Hemlock (1.5:1 ratio) (6' ht.) | Tsuga canadensis |

TRAFFIC REVIEW

Memorandum

| | | | |
|---------|--|------|---|
| To | Barbara McBeth, AICP | Page | 1 |
| CC | Sri Komaragiri, Kirsten Mellem, Brian Coburn, Jeremy Miller, Richelle Leskun | | |
| Subject | JSP 15-0008 – Beacon Hill – Revised Concept – Traffic Review | | |
| From | Matt Klawon, PE | | |
| Date | March 18, 2016 | | |

The revised concept site plan was reviewed to the level of detail provided and AECOM **recommends approval** for the applicant to move forward with the condition that the comments provided below are adequately addressed to the satisfaction of the City.

GENERAL COMMENTS

1. The applicant, Ivanhoe Companies, is proposing to develop a 21 acre parcel in the northeast quadrant of 12 Mile Road and Meadowbrook Road. The proposed development would be mixed-use and could include 42 residential lots, retail/restaurant and recreation/park elements.
2. The parcel is currently zoned RA (Residential Acreage) and the applicant is requesting a PRO approval to accommodate the proposed mixed-use development (B-3, General Business, and RM-1, Multiple Family Residential).

TRAFFIC IMPACTS

1. A full-scale Traffic Impact Statement (TIS) was included with the most recent submittal. Comments regarding the TIS can be found in a separate letter intended to specifically summarize and address the TIS.

EXTERNAL SITE ACCESS AND OPERATIONS

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

1. Provide dimensions for the nose offset, boulevard length, and entering and exiting radii of the divided entrance at Hummingdale Blvd.
2. Provide dimensions for the entering and exiting radii of the two driveways of the commercial development along 12 Mile Road.
3. Tapers are required at both driveways to the commercial development on 12 Mile Road, based on the volumes indicated in the TIS.
 - a. The west driveway already has a taper.
 - b. The east driveway is close to the property line and may require additional right-of-way to install a properly designed taper.

4. Provide sight distance measurements at the driveway entrances along Meadowbrook Road and 12 Mile Road.
5. Driveway spacing meets the requirements provided by the City's Code of Ordinances.
6. The number of site access drives is adequate.
7. The emergency access gate does not meet the required widths shown in Figure VIII-K of Chapter 11 of the City's Code of Ordinances.

INTERNAL SITE OPERATIONS

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

1. General traffic flow
 - a. Provide turning radii in order to confirm that large trucks and emergency vehicles are able to access and maneuver throughout the site.
 - b. Please provide details describing the location and dimensions of the proposed loading zones for the commercial portion of the development.
 - c. Provide additional dimensions for drive-thru lanes including turning radii and the amount of stacking spaces provided.
2. Parking facilities
 - a. The amount of parking spaces provided is generally in compliance with the City of Novi standards. Additional review will be required once the tenant is determined and the number of spaces is finalized.
 - b. Please provide:
 - i. Additional parking space dimensions, such as width.
 - ii. Additional details and dimensions to the handicap accessible parking area.
 - iii. Width, length, and radii of parking end islands.
 - iv. Clarification on the proposed locations of the various curb & gutter designs.
 - c. Consider providing bicycle parking for the commercial area in addition to the bicycle parking provided for the proposed park.
3. Road and aisle widths meet City requirements; however, turning radii dimensions are needed for most curves (including the eyebrow designs) through the development.
4. Sidewalk Requirements
 - a. Provide details such as width, ADA compliant ramp design, and connections and stubs for the proposed sidewalks in both the residential and commercial development.
5. Proposed signing and pavement markings were not included in this submittal and will be reviewed in detail when provided.

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

Sincerely,

AECOM

A handwritten signature in blue ink, appearing to read "Sterling Frazier".

Sterling J. Frazier, E.I.T.
Reviewer, Traffic/ITS Engineer

A handwritten signature in blue ink, appearing to read "Matthew G. Klawon".

Matthew G. Klawon, PE
Manager, Traffic Engineering and ITS Engineering Services

TRAFFIC IMPACT STUDY REVIEW



AECOM
 27777 Franklin Road
 Suite 2000
 Southfield, MI 48034
 www.aecom.com

248.204.5900 tel
 248.204.5901 fax

March 18, 2016

Barbara McBeth, AICP
 Deputy Director of Community Development
 City of Novi
 45175 W. 10 Mile Road
 Novi, MI 48375

**SUBJECT: Beacon Hill Park Traffic Impact Statement (TIS) Review
 JSP15-0008**

Dear Ms. McBeth,

The traffic impact statement (TIS) was reviewed to the level of detail provided and AECOM **recommends approval** for the applicant to move forward with the condition that the comments provided below are adequately addressed to the satisfaction of the City.

General TIS Comments:

1. Analysis was performed for three separate scenarios. The three different scenarios accounted for different land uses of the commercial section of the development. Scenario one was used for analysis based upon the highest number of trips.

Table 1: Trip Generation Scenarios

| Scenario | ITE Code | Land Use | Unit | Units | Daily Trips | AM Peak Hour Trips | PM Peak Hour Trips |
|----------|--------------|-------------------------------------|----------------|-------|-------------|--------------------|--------------------|
| 1 | 934 | Fast-Food with Drive Thru | 1000 SF GFA | 2.2 | 1091 | 100 | 72 |
| | 210 | Single-Family Detached Housing | Dwelling Units | 42 | 473 | 39 | 48 |
| | 826 | Specialty Retail Center | 1000 SF GFA | 3.7 | 164 | N/A | 10 |
| | 912 | Drive-in Bank | 1000 SF GFA | 3.25 | 481 | 39 | 79 |
| | 932 | High Turnover (sit down) Restaurant | 1000 SF GFA | 2.4 | 305 | 26 | 24 |
| | TOTAL | | | | | 2,514 | 204 |
| 2 | 934 | Fast-Food with Drive Thru | 1000 SF GFA | 2.5 | 1091 | 100 | 72 |
| | 210 | Single-Family Detached Housing | Dwelling Units | 42 | 473 | 39 | 48 |
| | 826 | Specialty Retail Center | 1000 SF GFA | 16.5 | 714 | N/A | 44 |
| | TOTAL | | | | | 2,444 | 153 |
| 3 | 210 | Single-Family Detached Housing | Dwelling Units | 42 | 473 | 39 | 48 |
| | 826 | Specialty Retail Center | 1000 SF GFA | 22 | 975 | N/A | 60 |
| | TOTAL | | | | | 1,448 | 39 |

2. For estimating the number of PM peak hour trips for a specialty retail center the average rate was used over the fitted curve equation. However, the fitted curve equation would be valid and also more conservative in each given scenario yielding roughly a 30% increase in the amount of estimated trips.
3. There are inconsistencies between the trip generation values from letters dated February 18, 2016 and January 8, 2015. The values for Table 3 Concept 1 in the older letter, do not align with Scenario 1 from the newest letter. Callouts and comments can be found in a mark-up version of the letters attached to this letter.
4. The PM peak hour EB volumes are incorrect in Table 1. The correct volumes can be found in Attachment C of the TIS. Analyses were performed using the correct volumes and ratios.
5. For the largest scenario (Concept C), the site is expected to generate 2,209 daily trips with 204 trips during the AM peak hour and 233 trips during the PM peak hour.
6. Traffic counts over the past 10 years were used to determine background growth. Traffic volumes in the vicinity of the development fluctuated from year to year. Ultimately a growth rate of 1% was used for three years as the full buildout date is late 2017. The growth rate was applied over three years because the most recent volume data was from 2014.
7. Peak hour turning movement counts were collected on June 10, 2014. The peak hours from the turning movement counts were determined to be 7:45-8:45 AM and 4:45-5:45 PM.
8. Trips were distributed onto 12 Mile Road and Meadowbrook Road by the ratio of approach volumes to total intersection volume per each peak hour.
9. Synchro was used to produce the Level of Service (LOS) for each approach of every impacted intersection for existing, background, and future traffic. Analysis was only performed on the largest trip generator of the three scenarios, which was scenario number one in Table 1 above.
 - a. Typically, the lowest acceptable LOS rating for an intersection is a LOS of D.
 - i. All existing, background, and future LOS conditions were acceptable.
 - ii. The northbound right turn movement is LOS D for both existing and future conditions during the AM peak hour.
 - iii. Both the northbound right turn and through movements are LOS D for existing and future conditions during the PM peak hour.
 - iv. Generally, intersection approaches operated at LOS C or above for existing and future conditions.
10. A right turn taper at both of the site driveways on 12 Mile Road are required.

In conclusion, the TIS was found to be acceptable and the LOS at study intersections is expected to remain at acceptable levels under proposed conditions. Should the City or applicant have questions regarding this review, they should contact AECOM for further clarification.

Sincerely,

AECOM



Sterling J. Frazier, E.I.T.
Reviewer, Traffic/ITS Engineer



Matthew G. Klawon, PE
Manager, Traffic Engineering and ITS
Engineering Services

TRAFFIC IMPACT STUDY FROM APPLICANT



HUBBELL, ROTH & CLARK, INC.
CONSULTING ENGINEERS SINCE 1915

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February 18, 2016

Ivanhoe Meadowbrook LLC
c/o Ivanhoe Companies
6689 Orchard Lake Road #314
West Bloomfield, MI 48322

Attn: Mr. Gary Shapiro

Re: Beacon Hill Park
Trip Generation Comparison

HRC Job No. 20150819.23

Dear Mr. Shapiro:

At your request, Hubbell, Roth & Clark, Inc. (HRC) prepared a trip generation comparison for the proposed Beacon Hill Park in the City of Novi, Michigan.

HRC was asked to compare trip generation for three alternative site plans for the south section of the Beacon Hill Park development that corresponds to the commercial portion of the development. The residential portion of the development is the same for all three site plans. The three site plans show a mix of commercial uses that range in size from 11,500 to 22,000 square feet. The three site plans compared are:

1. Mixed commercial – drive-in bank, restaurants, and retail (as evaluated in the Beacon Hill Park Traffic Impact Study dated 1/8/16)
 - a. fast casual restaurant with drive thru – 2,200 square feet
 - b. specialty retail center – 3,700 square feet
 - c. drive-in bank – 3,250 square feet
 - d. hi-turnover (sit down) restaurant – 2,400 square feet
2. Mixed commercial – drive-in bank, restaurants, and retail (as evaluated in the Beacon Hill Park Traffic Impact Study dated 1/8/16)
 - a. fast casual restaurant with drive thru – 2,200 square feet
 - b. specialty retail center – 16,100 square feet
3. Single commercial - specialty retail center – 22,000 square feet

The attached table shows the total number of trips generated by all three scenarios compared. Scenario 1, as studied in the TIS, generated the highest number of peak hour trips of the three scenarios and found no impact to operations of the adjacent roadways. In my professional opinion, any of the three alternatives could be constructed and the trips generated accommodated by the adjacent roadways and the signalized intersection of 12 Mile and Meadowbrook Roads.

If you have any questions or require any additional information, please contact me.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Colleen Hill-Stramsak, P.E., PTOE
Associate – Transportation Department

CHS/chs

Attachment

pc: HRC; File

**Trip Generation Comparison for the Beacon Hill Park Development
Novi, MI**

2/18/2016

9th Edition

| Scenario | ITE Code | Land Use | Unit | Daily Trip Rate | AM Peak Hour Trip Rate | | PM Peak Hour Trip Rate | | Unit | Daily Trips | AM Peak Hour Trips | | PM Peak Hour Trips | | |
|--------------|-----------------------------------|--------------------------------|----------|-----------------|------------------------|----------|------------------------|----------|------|--------------|--------------------|------------|--------------------|------------|----|
| | | | | | In | Out | In | Out | | | In | Out | In | Out | |
| 1 | 934 | Fast-Food with Drive Thru | 1000 SF | Rate | Rate | Rate | Rate | Rate | 2.2 | 1091 | 100 | | | | |
| | | Adjacent Street Traffic | GFA | | | 51% | 49% | 52% | 48% | | | 51 | 49 | 37 | 35 |
| | 210 | Single-Family Detached Housing | Dwelling | Equation | Equation | Equation | Equation | Equation | 42 | 473 | 39 | | | | 48 |
| | | Adjacent Street Traffic | Units | | | 25% | 75% | 63% | 37% | | | 10 | 29 | 30 | 18 |
| | 826 | Specialty Retail Center | 1000 SF | Rate | Rate | N/A | | Rate | Rate | 3.7 | 164 | | | | 10 |
| | | Adjacent Street Traffic | GFA | | | | 44% | 56% | | | | 0 | 0 | 4 | 6 |
| 912 | Drive-in Bank | 1000 SF | Rate | Rate | Rate | Rate | Rate | Rate | 3.25 | 481 | 39 | | | 79 | |
| | Adjacent Street Traffic | GFA | | | 57% | 43% | 50% | 50% | | | 22 | 17 | 40 | 39 | |
| 932 | Hi-Turnover (sit down) restaurant | 1000 SF | Rate | Rate | Rate | Rate | Rate | Rate | 2.4 | 305 | 26 | | | 24 | |
| | Adjacent Street Traffic | GFA | | | 55% | 45% | 60% | 40% | | | 14 | 12 | 14 | 10 | |
| Total | | | | | | | | | | 2,109 | 107 | 107 | 125 | 108 | |
| 2 | 934 | Fast-Food with Drive Thru | 1000 SF | Rate | Rate | Rate | Rate | Rate | 2.2 | 1091 | 100 | | | | |
| | | Adjacent Street Traffic | GFA | | | 51% | 49% | 52% | 48% | | | 51 | 49 | 37 | 35 |
| | 210 | Single-Family Detached Housing | Dwelling | Equation | Equation | Equation | Equation | Equation | 42 | 473 | 39 | | | | 48 |
| | | Adjacent Street Traffic | Units | | | 25% | 75% | 63% | 37% | | | 10 | 29 | 30 | 18 |
| | 826 | Specialty Retail Center | 1000 SF | Rate | Rate | N/A | | Rate | Rate | 16.1 | 714 | | | | 44 |
| | | Adjacent Street Traffic | GFA | | | | 44% | 56% | | | | 61 | 78 | 86 | 78 |
| Total | | | | | | | | | | 2,278 | 61 | 78 | 86 | 78 | |
| 3 | 210 | Single-Family Detached Housing | Dwelling | Equation | Equation | Equation | Equation | Equation | 42 | 473 | 39 | | | | |
| | | Adjacent Street Traffic | Units | | | 25% | 75% | 63% | 37% | | | 10 | 29 | 30 | 18 |
| | 826 | Specialty Retail Center | 1000 SF | Rate | Rate | N/A | | Rate | Rate | 22.0 | 975 | | | | 60 |
| | | Adjacent Street Traffic | GFA | | | | 44% | 56% | | | | 0 | 0 | 26 | 34 |
| Total | | | | | | | | | | 1,448 | 10 | 29 | 56 | 52 | |



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January 8, 2015

Ivanhoe Meadowbrook LLC
c/o Ivanhoe Companies
6689 Orchard Lake Road #314
West Bloomfield, MI 48322

Attn: Mr. Gary Shapiro

Re: Beacon Hill Park
Traffic Impact Study

HRC Job No. 20150819.02

Dear Mr. Shapiro:

At your request, Hubbell, Roth & Clark, Inc. (HRC) prepared a traffic impact study for the proposed Beacon Hill Park in the City of Novi, Michigan. The site plan is shown in **Attachment A**. To meet the requirements of the City of Novi, HRC completed the following tasks:

- Reviewed the AECOM traffic review letter, dated 8/3/15, to confirm our scope of services.
- Provided a description of the adjacent roadway system.
- Utilized turning movement counts taken at the intersection of 12 Mile and Meadowbrook on 6/10/14.
- Utilized 24 hour counts taken from the RCOC Traffic database.
- Forecast background growth based on build out date.
- Estimated the trips to be generated by the proposed land use using the techniques in the Institute of Transportation Engineer's Trip Generation Manual. Estimated trips generated for two future concepts before selecting one concept to analyze further.
- Distributed and assigned the site generated trips to the adjacent roadway system. Take into account the pass-by trip effect.
- Conducted a capacity analyses for existing, background, and future conditions for the AM and PM peak hours using Synchro 9 software on the adjacent roadway network using the techniques outlined in the Transportation Research Board Highway Capacity Manual.
- Determined if site plan meets access management policies adopted by the City of Novi.
- Determined any road improvements necessary to mitigate the impact of additional traffic on the adjacent roadway system.
- Conducted a turning lane warrant study to determine a taper and/or turning lane are required at the site driveways.
- Prepared a letter report with our findings and recommendations.

Existing Roadway System

The site for Beacon Hill Park is located on the northeast corner of 12 Mile Road and Meadowbrook Road. Access to the site will be from both streets. The site location is shown in **Figure 1**.

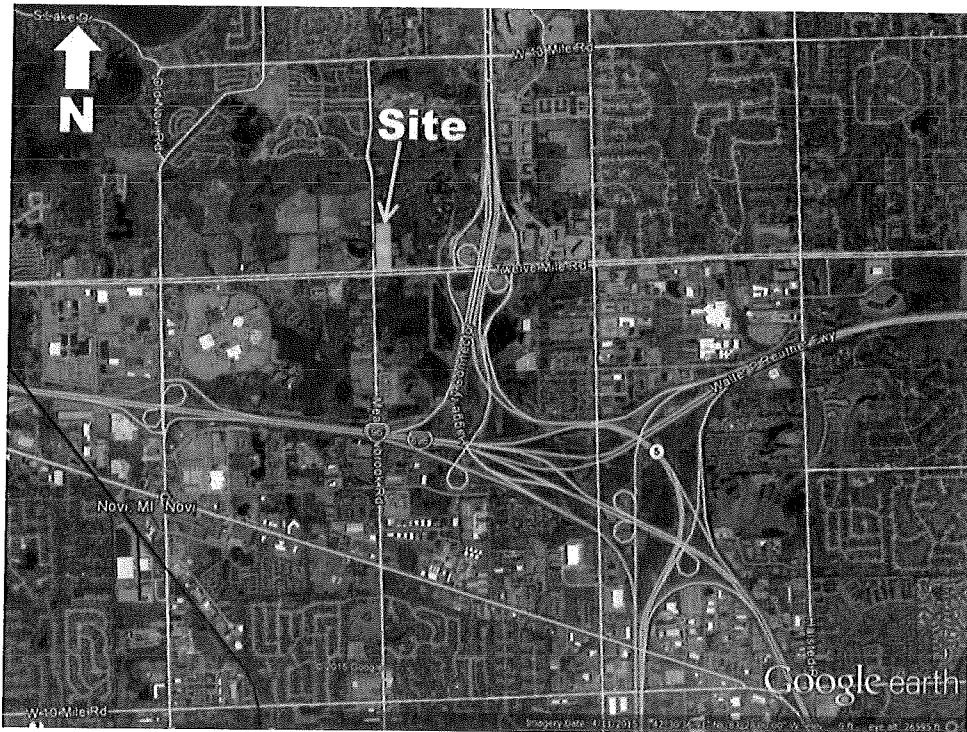


Figure 1. Location Map

Twelve Mile Road is a 6-lane boulevard with a posted speed of 45 mph. Twelve Mile Road is classified an Other Principal Arterial and is under the jurisdiction of the Road Commission for Oakland County (RCOC). Approximately 0.4 mile to the east is an interchange with M-5. There is a dedicated right turn lane (250 feet in length) on westbound 12 Mile Road at Meadowbrook. The traffic signals are on mast arms and the traffic signal is operated through RCOC's FAST-TRAC program (Faster And Safer Travel Through Routing and Advanced Controls) operating with Sydney Coordinated Adaptive Traffic Control System (SCATS). Meadowbrook Road is a 2-lane road with a posted speed of 30 mph. Meadowbrook is classified an Urban Minor Arterial and is under the jurisdiction of the City of Novi. There is a dedicated right turn lane (250 feet in length) on southbound Meadowbrook. Because 12 Mile Road is a boulevard, no direct left turns are permitted; all left turning vehicles must use crossovers. Both roads have curb and gutters.

Existing Traffic Volumes

HRC utilized the Average Annualized Daily Traffic (AADT) from the RCOC website. The 2014 AADT on Meadowbrook is 4,969 northbound and 1,894 southbound. The 2014 AADT on 12 Mile Road is 13,125 eastbound and 15,143 westbound. The summary data is provided in **Attachment B**.

Turning movement counts were taken by HRC at the intersection of 12 Mile Road and Meadowbrook Road on June 10, 2014. Counts were collected for four hours from 7:00 – 9:00 AM and from 4:00 – 6:00 PM. The AM peak hour is 7:45-8:45 AM and the PM peak hour is 4:45-5:45 PM. **Table 1** summarizes the peak hour turning movement counts. The complete turning movement counts are provided in **Attachment C**.

Table 1. Turning Movement Counts at Meadowbrook & 12 Mile

| Peak Hour | SB Meadowbrook | | WB 12 Mile | | NB Meadowbrook | | EB 12 Mile | | Intersection Total |
|-----------|----------------|----|------------|-----|----------------|-----|------------|-----|--------------------|
| | TH | RT | TH | RT | TH | RT | TH | RT | |
| AM | 211 | 56 | 636 | 43 | 103 | 362 | 1284 | 387 | 3082 |
| PM | 156 | 44 | 2183 | 111 | 235 | 545 | 239 | 87 | 4562 |

Background Traffic Growth

HRC proposed to use a growth rate of 1% per year for this study. This assumption was based on historic AADT data and annual growth trends provided by RCOC. **Table 2** shows that the annual rates vary. Most recently, the traffic volumes on 12 Mile Road are increasing slowly while the reverse is true on Meadowbrook Road. An average is difficult to estimate so a small growth rate was used. The development has a full build out date of late 2017, so a background growth was used for three years as the volume data is from 2014.

Table 2. Annual Growth Trend in Study Area

| Approach | 2005-2008 | 2008-2009 | 2009-2011 | 2011-2014 |
|----------------|-----------|-----------|-----------|-----------|
| WB 12 Mile | 14% | -7% | 7% | 1% |
| EB 12 Mile | 3% | -10% | 0% | 1% |
| SB Meadowbrook | -2% | - | 12% | -4% |
| NB Meadowbrook | -4% | - | 12% | -6% |

Trip Generation

One of the most critical elements of a traffic study is estimating the amount of traffic to be generated by a proposed development. This is usually done by using trip generation rates or equations to provide an estimate of all future trips generated by a proposed development.

Rates are commonly expressed in trips per unit of development. For example, trips per dwelling unit are commonly used for residential developments, while trips per 1,000 square feet of gross floor area are used

for offices and retail. Equations provide a direct estimate of trips based upon development units being multiplied in a mathematical relationship.

Trips are defined as a single or one directional movement with either the origin or destination of the trip inside the study site. Thus, a car entering and leaving a site would be recorded as generating two trips. Trip generation estimates are often the most critical factors in assessing impacts and needs of a proposed development.

There are several sources for trip generation rates and equations, which are based on data collected from locations in the United States and Canada. These are compilations of data that have been gathered over many years for various land uses. National data sources are starting points in estimating the amount of traffic that may be generated by a specific building or land use. Whenever possible, the National rates should be adjusted to reflect local or forecasted conditions. These National sources are not intended to be used without question, deviation or sound judgment. They often reflect what are supposed to be the average or typical conditions. Data collected from local sites may be more representative than National averages of other developments within the area.

The most widely used source of national trip generation data is the Trip Generation Manual, published by the Institute of Transportation Engineers (ITE). The information in this report is almost solely derived from suburban and urban sites. Data included in trip generation was obtained from actual driveway counts of vehicular traffic entering and exiting the site. The eighth edition contains more than 4,800 data sets from individual trip generation studies. The report also includes discussions on the application and use of trip generation rates and equations; descriptions of the characteristics of each land use; maximum/minimum average rates for weekdays, weekends and peak hours of the generator and adjacent street traffic; and additional statistical data regarding data variability.

HRC was asked to provide trip generation for two concepts for the 21.15 acre site. The concepts included:

1. Proposed 42 single family homes, a fast casual restaurant with a drive-thru window, a bank with a drive-thru window, a high-turnover restaurant, and retail
2. Proposed 42 single family homes, a fast casual restaurant with a drive-thru window, and a small shopping plaza

HRC selected the most appropriate ITE Land Use Codes for the comparison. An ITE Land Use Code does not exist for a fast casual type restaurant with a drive thru window, i.e. Tim Horton's or Panera, so the Fast Food land use was used to be conservative.

Table 3 provides the trip generation for the two concepts.

Table 3. Trip Generation By Concept for Beacon Hill Park Site

| Concept | ITE Code | ITE Land Use Description | Variable | Units | Daily Trips | AM Peak Hour Trips | | PM Peak Hour Trips | |
|---------|--------------|---------------------------|-------------|-------|-------------|--------------------|-----------|--------------------|------------|
| | | | | | | IB | OB | IB | OB |
| 1. | 210 | Single Family | DU | 42 | 473 | 10 | 29 | 30 | 18 |
| | 826 | Specialty Retail | 1000 SF GFA | 3.7 | 164 | 0 | 0 | 4 | 6 |
| | 912 | Drive-in Bank | 1000 SF GFA | 3.25 | 481 | 22 | 17 | 40 | 39 |
| | 932 | Hi-Turnover Restaurant | 1000 SF GFA | 2.4 | 305 | 14 | 12 | 14 | 10 |
| | 934 | Fast Casual w/drive thru* | 1000 SF GFA | 2.2 | 1091 | 51 | 49 | 37 | 35 |
| | TOTAL | | | | | 2,413 | 97 | 107 | 125 |
| 2. | 210 | Single Family | DU | 42 | 473 | 10 | 29 | 30 | 18 |
| | 826 | Specialty Retail | 1000 SF GFA | 16.5 | 731 | - | - | 20 | 25 |
| | 934 | Fast Casual w/drive thru* | 1000 SF GFA | 2.5 | 1240 | 58 | 56 | 43 | 39 |
| | TOTAL | | | | | 2,444 | 68 | 85 | 93 |

*Fast Food with Drive Thru was used because no land use was available for Fast Casual with Drive Thru

To compare the proposed site plan with the worst case scenario if the entire property were developed as commercial, a concept was developed showing only commercial land uses. Trip generation was calculated for the 21.15 acre site if it was developed into a shopping center with several stores, outlets, and a gasoline station with a convenience store (see **Table 4**).

Table 4. Trip Generation for Full Retail Alternative

| ITE Code | ITE Land Use Description | Variable | Units | Daily Trips | AM Peak Hour Trips | | PM Peak Hour Trips | |
|--------------|--------------------------|------------------|-------|---------------|--------------------|-----------|--------------------|------------|
| | | | | | IB | OB | IB | OB |
| 820 | Shopping Center | 1000 SF GLA | 156.5 | 9086 | 93 | 57 | 388 | 421 |
| 945 | Gasoline Station | Fueling Position | 8 | 1302 | 41 | 40 | 54 | 54 |
| TOTAL | | | | 10,388 | 134 | 97 | 442 | 475 |

The commercial only alternative would generate more than 4 times the number of daily trips as the proposed development.

Pass-By and Diverted Linked Trips

The trip generation rates and equations contained in the ITE manuals were derived from actual measurements of traffic on the driveways of land uses or buildings. However, in some cases, the driveway volume at a generator is different from the amount of traffic added to the street system. Buildings such as retail establishments, restaurants, banks and drug stores attract a portion of their trips from traffic passing the site on the way from one location to another. Trip making where this phenomenon occurs can be broken down into two categories of trips: 1) Primary Trips and 2) Pass-by and Diverted Linked Trips. These trips are defined as follows:

Primary Trips are trips made for the specific purpose of visiting the generator. The stop at that generator is the primary reason for the trip. For example, going from home to church is a primary trip set.

Pass-by and Diverted Link Trips are trips with more than one purpose. Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on an adjacent street that contains direct access to the generator. These trips do not require a diversion from any other roadway. Diverted link trips are trips attracted from the traffic volume on roadways within the vicinity of the generator but which require a diversion from that roadway to another roadway to gain access to the site. These roadways could include streets or freeways adjacent to the generator, but without access to the generator.

It is essential that this phenomenon be considered when examining the traffic impact of a development on the street system. The pass-by and diverted link trip estimation is calculated as a percentage of the total number of trips entering the generator. The results of the pass-by trip percentages analyzed can be enhanced further with a methodology that also accounts for the effects of the magnitude of the passing traffic stream volume on the adjacent road system.

All the options have proposed land uses that are affected by the pass-by and diverted link trip phenomenon. HRC followed guidelines for Pass-By Trips provided by the Third Edition of the ITE Trips Generation Handbook. The effect of the pass-by link trip reduction will be seen in the future at the intersection of Meadowbrook and 12 Mile Roads. **Table 5** provides the percentages of pass-by trips for the proposed land use and the new trips.

Table 5. AM & PM Peak Hour Pass-by Trips

| Concept | ITE Land Use Code | Factor | AM Peak Hour Trips | | PM Peak Hour Trips | |
|---------|-------------------------------|-------------------|--------------------|-----|--------------------|-----|
| | | | In | Out | In | Out |
| 1. | 912-Drive-in Bank | Percent Reduction | -29% | | -35% | |
| | | New Trips | 16 | 12 | 26 | 25 |
| | 932-Hi-turnover Restaurant | Percent Reduction | n/a | | -43% | |
| | | New Trips | 14 | 12 | 8 | 6 |
| | 934-Fast food with drive thru | Percent Reduction | -49% | | -50% | |
| | | New Trips | 26 | 25 | 18 | 17 |
| 2. | 934-Fast food with drive thru | Percent Reduction | -49% | | -50% | |
| | | New Trips | 30 | 29 | 21 | 19 |

Because Concept 1 will generate slightly higher peak hour trips, the rest of the analysis was completed for Concept 1 only.

Tables 6 & 7 summarize the total new trips expected to be generated by Concept 1 during peak hours.

Table 6. AM Peak Hour Total Pass-by and New Trips

| ITE Code | Land Use | Total Trips | Pass-by Trip Ratio | Pass-by Trips | New Trips | Distribution | |
|--------------|---------------------------|-------------|--------------------|---------------|------------|--------------|-----------|
| | | | | | | In | Out |
| 210 | Single Family | 39 | N/A | 0 | 39 | 10 | 29 |
| 826 | Specialty Retail | 0 | N/A | 0 | 0 | 0 | 0 |
| 912 | Drive-in Bank | 39 | 29% | 11 | 28 | 16 | 12 |
| 932 | Hi-Turnover Restaurant | 26 | N/A | 0 | 26 | 14 | 12 |
| 934 | Fast Casual w/drive thru* | 100 | 49% | 49 | 51 | 26 | 25 |
| TOTAL | | 204 | | 60 | 144 | 66 | 78 |

*Fast Food with Drive Thru was used because no land use was available for Fast Casual with Drive Thru

Table 7. PM Peak Hour Total Pass-by and New Trips

| ITE Code | Land Use | Total Trips | Pass-by Trip Ratio | Pass-by Trips | New Trips | Distribution | |
|--------------|---------------------------|-------------|--------------------|---------------|------------|--------------|-----------|
| | | | | | | In | Out |
| 210 | Single Family | 48 | N/A | 0 | 48 | 30 | 18 |
| 826 | Specialty Retail | 10 | N/A | 0 | 10 | 4 | 6 |
| 912 | Drive-in Bank | 79 | 35% | 28 | 51 | 26 | 25 |
| 932 | Hi-Turnover Restaurant | 24 | 43% | 10 | 14 | 8 | 6 |
| 934 | Fast Casual w/drive thru* | 72 | 50% | 36 | 36 | 18 | 18 |
| TOTAL | | 233 | | 74 | 159 | 86 | 73 |

*Fast Food with Drive Thru was used because no land use was available for Fast Casual with Drive Thru

To be conservative, all traffic generated by the development has been assumed to be automobile traffic, while it is anticipated that there will be pedestrian traffic between the residential and commercial portions of the development and between the commercial portion of the development and South University (southwest corner of 12 Mile/Meadowbrook).

Trip Distribution and Assignment

Traffic expected to be generated by a project must be distributed and assigned to the roadway system so that the impacts of the proposed project on roadway links and intersections within the study area can be analyzed. After an estimate of the total traffic into and out of the site has been made, that traffic must be

distributed and assigned to the roadway system. The trip distribution step produces estimates of trip origins and destinations. The assignment step produces estimates of the amount of site traffic that will use certain access routes between their origin and destination.

The trips expected to be generated by Concept 1 were assigned to the road. Trips were distributed based on the directional split of traffic at the intersection of Meadowbrook & 12 Mile Roads for the peak hours studied. The split varied by inbound and outbound during the AM and PM peak hours. **Table 8** shows the how the trips were assigned to road network.

Table 8. Traffic Split Based on Volumes at Meadowbrook & 12 Mile

| Direction | AM Peak Hour | PM Peak Hour |
|-----------|--------------|--------------|
| North | 15% | 17% |
| South | 9% | 5% |
| East | 54% | 28% |
| West | 22% | 50% |
| Total | 100% | 100% |

Overall trip assignment to the roadway for the AM and PM peak hours are shown in the two figures provided in **Attachment D**.

Capacity Analysis at Intersection

At signalized intersections, the Highway Capacity Manual (HCM) defines level of service in terms of control delay. Delay may be measured in the field, or it may be estimated. 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 volume to capacity ratio for the lane group or approach in question. **Table 9** indicates the control delay criteria used for determining level of service (LOS) for signalized intersections.

Table 9. Level of Service Criteria for Signalized Intersections

| Level of Service | Control Delay per Vehicle (Seconds) |
|------------------|-------------------------------------|
| A | <10 |
| B | >10 to ≤ 20 |
| C | >20 to ≤ 35 |
| D | >35 to ≤ 55 |
| E | >55 to ≤ 80 |
| F | >80 |

Level of Service A describes operations with very low control delay up to 10.0 sec per vehicle. This occurs when progression is exceptionally 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.

Level of Service B describes operations with control delay in the range of 10.1 to 20.0 sec per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.

Level of Service C describes operations with control delay in the range of 20.1 to 35.0 sec per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of Service D describes operations with control delay in the range of 35.1 to 55.0 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 volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of Service E describes operations with control delay in the range of 55.1 to 80.0 sec per vehicle. This is considered to be above the limit of acceptable delay for an urban roadway in the study area. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.

Level of Service F describes operations with control delay in excess of 80.1 sec per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

A capacity analysis was conducted at the intersection of Meadowbrook and 12 Mile Road using Synchro 9 software during the AM and PM peak hours for existing, background, and future traffic volumes. **Table 10** shows the background growth and development traffic assigned that were used in the traffic model.

Table 10. Turning Movement Counts at Meadowbrook & 12 Mile

| Peak Hour | Scenarios | SB | | WB | | NB | | EB | | Total |
|-----------|--------------|-------------|-----------|-------------|------------|-------------|------------|-------------|------------|-------------|
| | | Meadowbrook | | 12 Mile | | Meadowbrook | | 12 Mile | | |
| | | TH | RT | TH | RT | TH | RT | TH | RT | |
| AM | Existing | 211 | 56 | 636 | 43 | 103 | 362 | 1284 | 387 | 3082 |
| | Background | 6 | 2 | 19 | 1 | 3 | 11 | 39 | 12 | 93 |
| | Future | 3 | 31 | 15 | 15 | 1 | 5 | 39 | 4 | 113 |
| | Total | 220 | 89 | 670 | 59 | 107 | 378 | 1362 | 403 | 3288 |
| PM | Existing | 156 | 44 | 2183 | 111 | 235 | 545 | 239 | 87 | 3600 |
| | Background | 5 | 1 | 65 | 3 | 7 | 16 | 7 | 3 | 107 |
| | Future | 2 | 23 | 35 | 31 | 3 | 3 | 61 | 3 | 161 |
| | Total | 163 | 68 | 2283 | 145 | 245 | 564 | 307 | 93 | 3881 |

Results of the capacity analysis of existing, background, and future traffic volumes for Concept 1 at the intersection of Meadowbrook and 12 Mile Road during the AM and PM peak hours are provided in **Table 11**. The Synchro reports are provided in **Attachment E**.

Table 11. Level of Service Results by Scenario and Peak Hour

| Peak Hour | Approach & Movement | | Existing | | Background | | Future | |
|-----------|---------------------|----|----------|---------------|------------|---------------|----------|---------------|
| | | | LOS | Delay sec/veh | LOS | Delay sec/veh | LOS | Delay sec/veh |
| AM | WB | TH | A | 9.8 | B | 12.5 | B | 13.9 |
| | | RT | A | 6.0 | B | 10.9 | B | 12.0 |
| | SB | TH | C | 31.9 | C | 32.1 | C | 32.1 |
| | | RT | C | 27.5 | C | 27.5 | C | 27.8 |
| | Overall | | B | 14.5 | B | 16.3 | B | 17.4 |
| | EB | TH | B | 16.5 | B | 16.7 | B | 17.0 |
| | | RT | B | 14.4 | B | 14.5 | B | 14.6 |
| | NB | TH | C | 29.0 | C | 29.1 | C | 29.1 |
| | | RT | D | 41.2 | D | 43.0 | D | 44.2 |
| | Overall | | B | 19.1 | B | 19.5 | B | 19.8 |
| PM | WB | TH | B | 18.4 | B | 19.0 | B | 19.4 |
| | | RT | A | 9.7 | A | 9.8 | A | 9.9 |
| | SB | TH | C | 34.8 | C | 34.9 | C | 35.0 |
| | | RT | C | 32.1 | C | 32.1 | C | 32.7 |
| | Overall | | B | 17.8 | B | 18.0 | B | 18.3 |
| | EB | TH | A | 9.7 | A | 9.7 | A | 9.9 |
| | | RT | A | 9.6 | A | 9.6 | A | 9.7 |
| | NB | TH | D | 36.9 | D | 38.8 | D | 39.0 |
| | | RT | D | 35.4 | D | 38.2 | D | 42.9 |
| | Overall | | C | 24.7 | C | 27.2 | C | 28.6 |

Because the 12 Mile/Meadowbrook intersection is controlled by an adaptive traffic signal, the signal timing is continually optimized based on the flow of traffic. Background and Future traffic scenarios have optimized signal timing.

Capacity Analysis at Driveways

HRC conducted a capacity analysis at the three site driveways using Synchro 9 software. The intersections were analyzed following the procedures for unsignalized intersections as outlined in the

2000 Highway Capacity Manual. **Table 12** indicates the control delay criteria used for determining level of service (LOS) for un-signalized intersections.

Table 12. Level of Service Criteria for Un-Signalized Intersections

| Level of Service | Control Delay per Vehicle (Seconds) |
|------------------|-------------------------------------|
| A | <10 |
| B | >10 to ≤ 15 |
| C | >15 to ≤ 25 |
| D | >25 to ≤ 35 |
| E | >35 to ≤ 50 |
| F | >50 |

The capacity analysis at the proposed driveways during the AM and PM peak hours is provided in **Table 13**. The Synchro reports are provided in **Attachment E**. Given the high volume of westbound traffic in the PM peak hour, the vehicles leaving both commercial driveways will experience delays.

Table 13. Level of Service by Driveway and Movement in AM and PM Peak Hours

| Driveway & Movement | | AM Peak | | PM Peak | |
|--|----|---------|---------------|---------|---------------|
| | | LOS | Delay sec/veh | LOS | Delay sec/veh |
| Residential on Meadowbrook | SB | A | 0.1 | A | 0.2 |
| | WB | B | 11.6 | B | 13.1 |
| Fast Food/Retail/Restaurant on 12 Mile | SB | B | 10.3 | C | 19.1 |
| Bank on 12 Mile | SB | B | 10.5 | C | 21.5 |

Right Lane Warrant

HRC conducted an analysis of the need for a right lane or taper at the development driveways using Figure 6-3 from the RCOC *Permit Rules, Specifications And Guidelines, adopted March 14, 2013*. There is no need for a right turn lane or taper for northbound Meadowbrook Road at the proposed residential driveway. The two commercial driveways on westbound 12 Mile do meet the warrants for a right turn taper. See **Figure 3**.

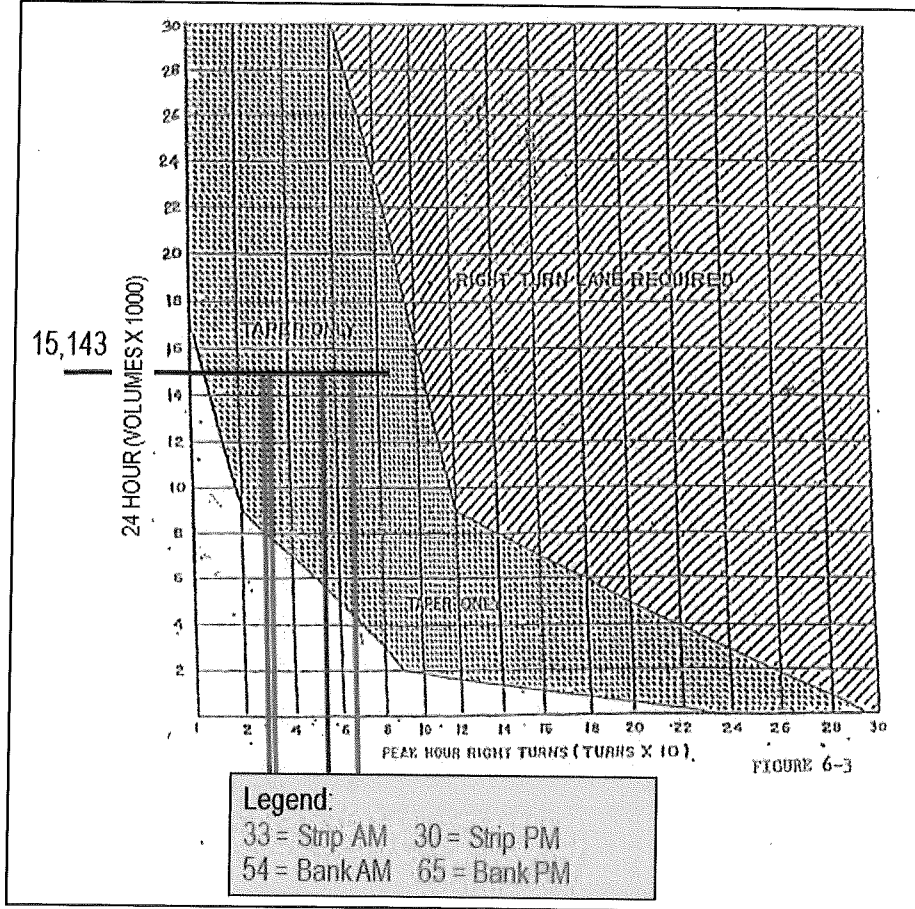


Figure 3. RCOC Figure 6-3, Warrants for Right Turn Lane or Taper

The figure is typically used for four or five lane roads and provides a conservative analysis based on the six lane boulevard on 12 Mile Road. The 12 Mile Road west driveway already has a taper and the east driveway will be too close to the property line to add a right turn taper.

Summary and Recommendations


The traffic study results are as follows:

1. Trip generation projections show that the trips from the Concept 1 site plan are less than 5% of the total volume of the adjacent intersection during the peak hours.
2. To be conservative, background traffic was projected to grow at 1% annually.
3. The 12 Mile/Meadowbrook intersection operates at an acceptable level of service during both AM and PM peak hours.
4. All development driveways (Meadowbrook and 12 Mile) operate at acceptable levels of service during both AM and PM peak hours. Most development traffic will come from 12 Mile Road and further south.
5. Both driveways onto 12 Mile Road meet warrants for a right turn taper according to RCOC Permit Guidelines. The 12 Mile Road west driveway already has a taper and the east driveway will be too close to the property line to add a right turn taper.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.



Colleen Hill-Stramsak, P.E., PTOE
Transportation Department Head

CH-S/bjl/kk

Attachments A-Site Plan
 B-AADT
 C-Turning Movement Counts
 D-Trip Assignment Figures
 E-Synchro Reports
 F-Resume of Preparer

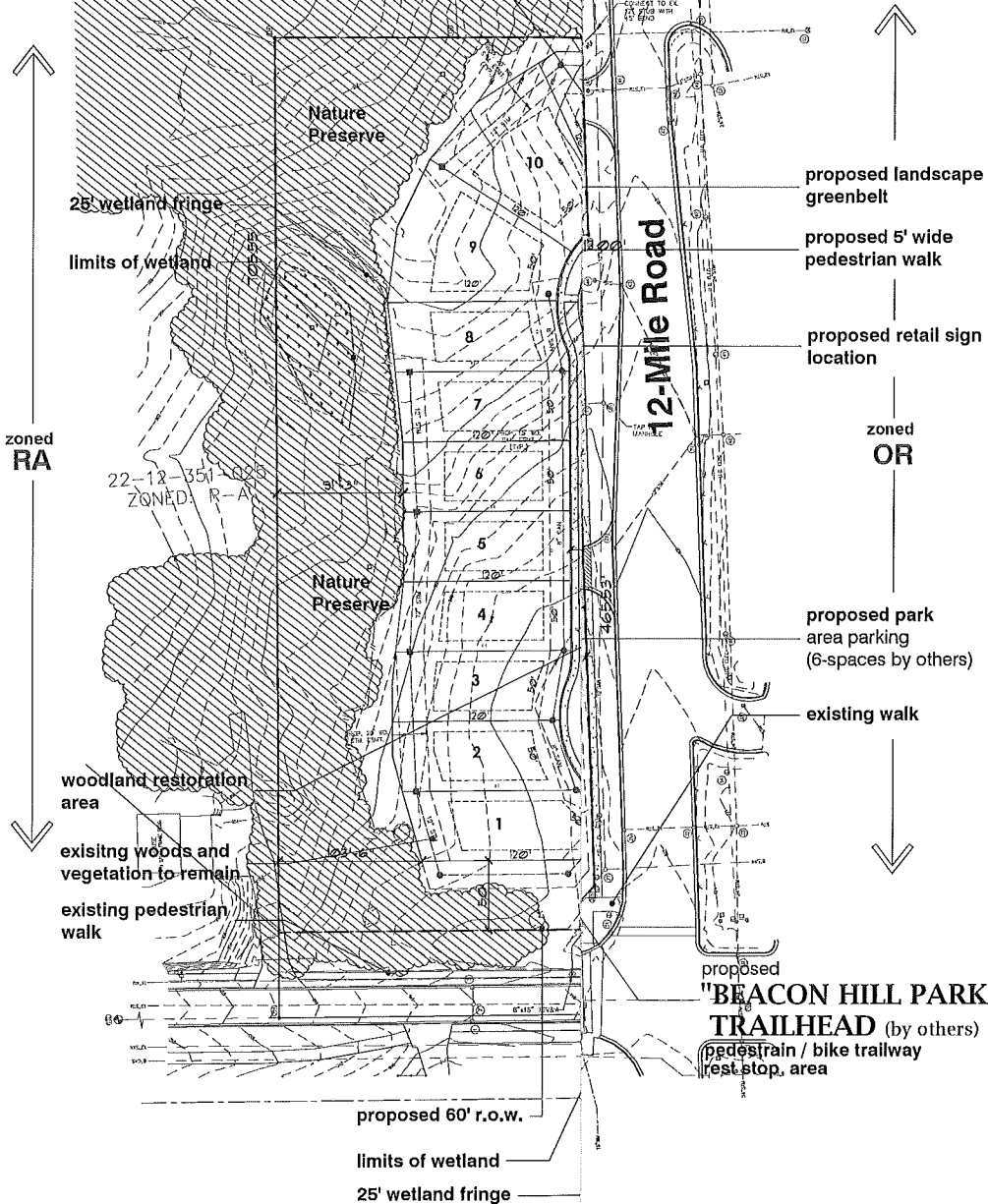
pc: HRC; File



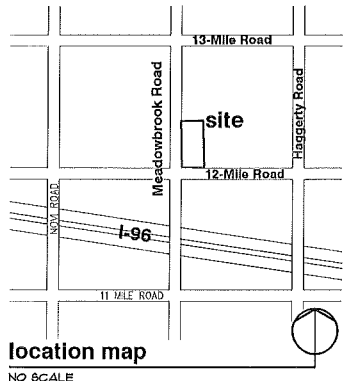
Attachment A: Site Plan

proposed
"BEACON HILL Meadows"
 a planned single family community
 (13.60 ACRES - 42 LOTS)

"SHOPPES at BEACON HILL"
 neighborhood commercial, restaurant
 & retail center (3.25 ACRES)



site plan for:
"Beacon Hill"
 City of Novi, Michigan



location map
 NO SCALE



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seal:



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 ph. (248) 626-6114

project:

Beacon Hill Park
 A planned Single Family and Neighborhood Commercial Retail

project location:

City of Novi, MI
 12-Mile Road & Meadowbrook Road

sheet title:

site plan

job no./issue/revision date:

| | | |
|-------------|-----|------------|
| LS15.010.06 | SPA | 6-26-2015 |
| LS15.010.12 | SPA | 12-28-2015 |

drawn by:

JP, KH

checked by:

FP

date:

6-10-2015

notice:

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Do Not scale drawings. Use figured dimensions only



The location and elevations of existing underground utilities as shown on this drawing are only approximations. No guarantee is either expressed or implied as to the completeness of accuracy. Contractor shall be exclusively responsible for determining the exact location and elevation prior to the start of construction.

project no:

LS15.010.06

sheet no:

SP-6



Attachment B: AADT



Transportation Data Management System

List View All DIRs All Approaches

Record 1 of 1 Goto Record go

| | | | |
|---------------|-------------|-------------|-------|
| Location ID | 7322 | MPO ID | 15112 |
| Type | SPOT | HPMS ID | |
| On NHS | | On HPMS | |
| LRS ID | | LRS Loc Pt. | |
| SF Group | 01 | Route Type | |
| AF Group | | Route | |
| GF Group | | | |
| Funct'l Class | - | Milepost | |
| Located On | MEADOWBROOK | | |
| Loc On Alias | | | |
| AT | TWELVE MILE | | |
| PR | MP | PT | |
| 656706 | 4.005 | 63059963 | |

More Detail

STATION DATA

Directions: NB

AA DT

| Year | AA DT | DHV-30 | K % | D % | PA | BC | Src |
|------|-------|--------|-----|-----|----|----|-----|
| 2014 | 4,969 | | | | | | |
| 2011 | 6,057 | | | | | | |
| 2009 | 4,850 | | | | | | |
| 2005 | 5,670 | | | | | | |

| Model Year | Model AADT | AM PHV | AM PPV | MD PHV | MD PPV | PM PHV | PM PPV | NT PHV | NT PPV |
|------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | | | |

| Date | Int | Total |
|---------------|-----|-------|
| Mon 7/14/2014 | 60 | 5,476 |
| Tue 7/12/2011 | 60 | 6,744 |
| Mon 3/23/2009 | 60 | 4,944 |
| Wed 6/15/2005 | 60 | 6,535 |

| Year | Annual Growth |
|------|---------------|
| 2014 | -6% |
| 2011 | 12% |
| 2009 | -4% |

| Date | Int | Pace | 85th | Total |
|---------|-----|------|------|-------|
| No Data | | | | |

| Date | Int | Total |
|---------|-----|-------|
| No Data | | |

| Date | Axles | Avg GVW | Total |
|---------|-------|---------|-------|
| No Data | | | |

| Date | Axles | 85th | Total |
|---------------------|-------|------|-------|
| Could not load data | | | |

| Date | Int | Total |
|------|-----|-------|
| | | |



Transportation Data Management System

List View All DIRs All Approaches

Record 1 of 1 Goto Record go

| | | | |
|---------------|-------------|-------------|-----|
| Location ID | 7324 | MPO ID | 313 |
| Type | SPOT | HPMS ID | |
| On NHS | | On HPMS | |
| LRS ID | | LRS Loc Pt. | |
| SF Group | 01 | Route Type | |
| AF Group | | Route | |
| GF Group | | | |
| Funct'l Class | - | Milepost | |
| Located On | TWELVE MILE | | |
| Loc On Alias | | | |
| AT | MEADOWBROOK | | |
| | PR | MP | PT |
| 662106 | 3.018 | 63060041 | |

More Detail

STATION DATA

Directions: EB

AADT

| Year | AADT | DHV-30 | K % | D % | PA | BC | Src |
|------|--------|--------|-----|-----|----|----|-----|
| 2014 | 13,125 | | | | | | |
| 2011 | 12,686 | | | | | | |
| 2009 | 12,570 | | | | | | |
| 2008 | 13,990 | | | | | | |
| 2005 | 12,910 | | | | | | |

| Model Year | Model AADT | AM PHV | AM PPV | MD PHV | MD PPV | PM PHV | PM PPV | NT PHV | NT PPV |
|------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | | | |

| Date | Int | Total |
|---------------|-----|--------|
| Mon 7/14/2014 | 60 | 14,481 |
| Tue 7/12/2011 | 60 | 14,131 |
| Mon 3/23/2009 | 60 | 12,837 |
| Tue 6/24/2008 | 60 | 15,468 |
| Tue 6/14/2005 | 60 | 14,553 |

| Year | Annual Growth |
|------|---------------|
| 2014 | 1% |
| 2011 | 0% |
| 2009 | -10% |
| 2008 | 3% |

| Date | Int | Pace | 85th | Total |
|---------|-----|------|------|-------|
| No Data | | | | |

| Date | Int | Total |
|---------|-----|-------|
| No Data | | |

| Date | Axles | Avg GVW | Total |
|---------|-------|---------|-------|
| No Data | | | |

| Date | Axles | 85th | Total |
|---------------------|-------|------|-------|
| Could not load data | | | |

Attachment C: Turning Movement Counts

Hubbell, Roth & Clark, Inc.

801 Broadway NW, Suite 215
Grand Rapids, MI 49504
(616) 454-4286

Job Number: 20150819
Counted By:
Weather: Clear
Location: Meadowbrook/ 12 Mile

File Name : 12_Mile_Combined
Site Code : 00000000
Start Date : 6/10/2014
Page No : 1

Groups Printed- Unshifted

| Start Time | MEADOWBROOK Southbound | | | | | 12 MILE Westbound | | | | | MEADOWBROOK Northbound | | | | | 12 MILE Eastbound | | | | | Int. Total |
|------------|------------------------|------|-------|------|------------|-------------------|------|-------|------|------------|------------------------|------|-------|------|------------|-------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| 07:00 AM | 0 | 23 | 5 | 0 | 28 | 0 | 69 | 2 | 0 | 71 | 0 | 13 | 61 | 0 | 74 | 0 | 296 | 48 | 0 | 344 | 517 |
| 07:15 AM | 0 | 25 | 16 | 1 | 42 | 0 | 92 | 3 | 0 | 95 | 0 | 15 | 61 | 0 | 76 | 0 | 307 | 62 | 0 | 369 | 582 |
| 07:30 AM | 0 | 43 | 18 | 0 | 61 | 0 | 121 | 9 | 0 | 130 | 0 | 15 | 75 | 0 | 90 | 0 | 365 | 62 | 0 | 427 | 708 |
| 07:45 AM | 0 | 65 | 16 | 1 | 82 | 0 | 160 | 5 | 0 | 165 | 0 | 29 | 91 | 0 | 120 | 0 | 324 | 100 | 0 | 424 | 791 |
| Total | 0 | 156 | 55 | 2 | 213 | 0 | 442 | 19 | 0 | 461 | 0 | 72 | 288 | 0 | 360 | 0 | 1292 | 272 | 0 | 1564 | 2598 |
| 08:00 AM | 0 | 44 | 9 | 0 | 53 | 0 | 154 | 6 | 0 | 160 | 0 | 22 | 86 | 0 | 108 | 0 | 348 | 99 | 0 | 447 | 768 |
| 08:15 AM | 0 | 62 | 17 | 0 | 79 | 0 | 150 | 18 | 0 | 168 | 0 | 28 | 104 | 0 | 132 | 0 | 310 | 98 | 0 | 408 | 787 |
| 08:30 AM | 0 | 40 | 14 | 1 | 55 | 0 | 172 | 14 | 0 | 186 | 0 | 24 | 81 | 0 | 105 | 0 | 302 | 90 | 0 | 392 | 738 |
| 08:45 AM | 0 | 41 | 11 | 0 | 52 | 0 | 183 | 11 | 0 | 194 | 0 | 20 | 56 | 0 | 76 | 0 | 214 | 82 | 0 | 296 | 618 |
| Total | 0 | 187 | 51 | 1 | 239 | 0 | 659 | 49 | 0 | 708 | 0 | 94 | 327 | 0 | 421 | 0 | 1174 | 369 | 0 | 1543 | 2911 |

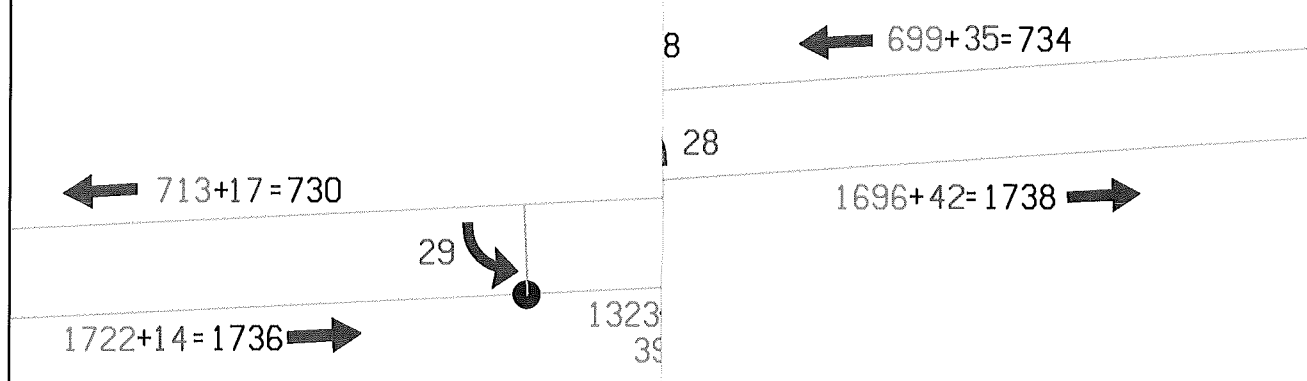
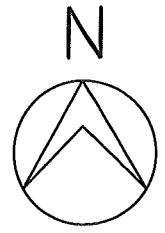
*** BREAK ***

| | | | | | | | | | | | | | | | | | | | | | |
|-------------|---|------|-----|-----|-----|---|------|-----|---|------|---|------|------|---|------|---|------|------|---|------|-------|
| 04:00 PM | 0 | 26 | 15 | 0 | 41 | 0 | 390 | 17 | 0 | 407 | 0 | 54 | 139 | 0 | 193 | 0 | 244 | 72 | 0 | 316 | 957 |
| 04:15 PM | 0 | 27 | 14 | 0 | 41 | 0 | 375 | 12 | 0 | 387 | 0 | 26 | 84 | 0 | 110 | 0 | 219 | 65 | 0 | 284 | 822 |
| 04:30 PM | 0 | 19 | 22 | 0 | 41 | 0 | 462 | 22 | 0 | 484 | 0 | 61 | 161 | 0 | 222 | 0 | 237 | 74 | 0 | 311 | 1058 |
| 04:45 PM | 0 | 35 | 9 | 0 | 44 | 0 | 554 | 22 | 0 | 576 | 0 | 56 | 108 | 0 | 164 | 0 | 216 | 86 | 0 | 302 | 1086 |
| Total | 0 | 107 | 60 | 0 | 167 | 0 | 1781 | 73 | 0 | 1854 | 0 | 197 | 492 | 0 | 689 | 0 | 916 | 297 | 0 | 1213 | 3923 |
| 05:00 PM | 0 | 39 | 14 | 0 | 53 | 0 | 513 | 32 | 0 | 545 | 0 | 61 | 180 | 0 | 241 | 0 | 261 | 82 | 0 | 343 | 1182 |
| 05:15 PM | 0 | 38 | 10 | 0 | 48 | 0 | 585 | 26 | 0 | 611 | 0 | 65 | 134 | 0 | 199 | 0 | 229 | 88 | 0 | 317 | 1175 |
| 05:30 PM | 0 | 44 | 11 | 0 | 55 | 0 | 531 | 31 | 0 | 562 | 0 | 53 | 123 | 0 | 176 | 0 | 239 | 87 | 0 | 326 | 1119 |
| 05:45 PM | 0 | 25 | 9 | 0 | 34 | 0 | 563 | 38 | 0 | 601 | 0 | 39 | 78 | 0 | 117 | 0 | 210 | 95 | 0 | 305 | 1057 |
| Total | 0 | 146 | 44 | 0 | 190 | 0 | 2192 | 127 | 0 | 2319 | 0 | 218 | 515 | 0 | 733 | 0 | 939 | 352 | 0 | 1291 | 4533 |
| Grand Total | 0 | 596 | 210 | 3 | 809 | 0 | 5074 | 268 | 0 | 5342 | 0 | 581 | 1622 | 0 | 2203 | 0 | 4321 | 1290 | 0 | 5611 | 13965 |
| Apprch % | 0 | 73.7 | 26 | 0.4 | | 0 | 95 | 5 | 0 | | 0 | 26.4 | 73.6 | 0 | | 0 | 77 | 23 | 0 | | |
| Total % | 0 | 4.3 | 1.5 | 0 | 5.8 | 0 | 36.3 | 1.9 | 0 | 38.3 | 0 | 4.2 | 11.6 | 0 | 15.8 | 0 | 30.9 | 9.2 | 0 | 40.2 | |

| Start Time | MEADOWBROOK Southbound | | | | | 12 MILE Westbound | | | | | MEADOWBROOK Northbound | | | | | 12 MILE Eastbound | | | | | Int. Total |
|--|------------------------|------|-------|------|------------|-------------------|------|-------|------|------------|------------------------|------|-------|------|------------|-------------------|------|-------|------|------------|------------|
| | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | Left | Thru | Right | Peds | App. Total | |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:45 AM | 0 | 65 | 16 | 1 | 82 | 0 | 160 | 5 | 0 | 165 | 0 | 29 | 91 | 0 | 120 | 0 | 324 | 100 | 0 | 424 | 791 |
| 08:00 AM | 0 | 44 | 9 | 0 | 53 | 0 | 154 | 6 | 0 | 160 | 0 | 22 | 86 | 0 | 108 | 0 | 348 | 99 | 0 | 447 | 768 |
| 08:15 AM | 0 | 62 | 17 | 0 | 79 | 0 | 150 | 18 | 0 | 168 | 0 | 28 | 104 | 0 | 132 | 0 | 310 | 98 | 0 | 408 | 787 |
| 08:30 AM | 0 | 40 | 14 | 1 | 55 | 0 | 172 | 14 | 0 | 186 | 0 | 24 | 81 | 0 | 105 | 0 | 302 | 90 | 0 | 392 | 738 |
| Total Volume | 0 | 211 | 56 | 2 | 269 | 0 | 636 | 43 | 0 | 679 | 0 | 103 | 362 | 0 | 465 | 0 | 1284 | 387 | 0 | 1671 | 3084 |
| % App. Total | 0 | 78.4 | 20.8 | 0.7 | | 0 | 93.7 | 6.3 | 0 | | 0 | 22.2 | 77.8 | 0 | | 0 | 76.8 | 23.2 | 0 | | |
| PHF | .000 | .812 | .824 | .500 | .820 | .000 | .924 | .597 | .000 | .913 | .000 | .888 | .870 | .000 | .881 | .000 | .922 | .968 | .000 | .935 | .975 |

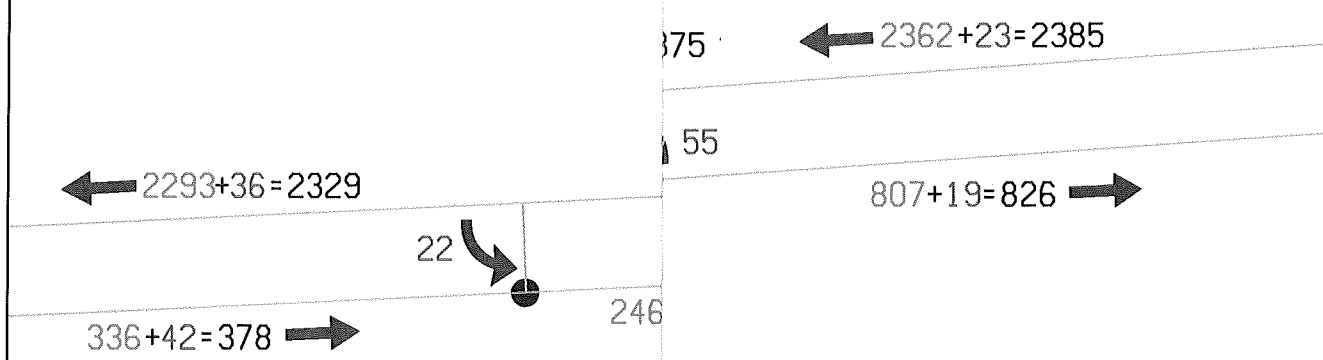
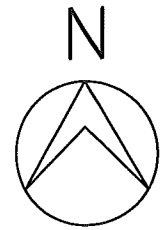


Attachment D: Trip Assignment Figures



HUBBELL, ROTH & CLARK, INC.
CONSULTING ENGINEERS
AM TRAFFIC VOLUMES

SHEET NO.
1
OF 2



HUBBELL, ROTH & CLARK, INC.
CONSULTING ENGINEERS
PM TRAFFIC VOLUMES

SHEET NO.
2
OF 2



Attachment E: Synchro Reports

HCM Signalized Intersection Capacity Analysis
1001: Meadowbrook & 12 Mile WB

AM Existing
12/15/2015



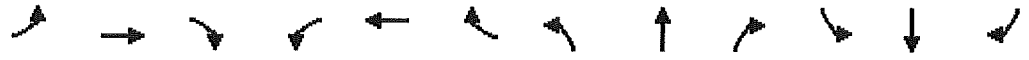
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|------|-------|------|
| Lane Configurations | | | | | ↑↑↑ | ↑ | | ↑↑ | | | ↑ | ↑ |
| Traffic Volume (vph) | 0 | 0 | 0 | 0 | 636 | 43 | 0 | 103 | 0 | 0 | 211 | 56 |
| Future Volume (vph) | 0 | 0 | 0 | 0 | 636 | 43 | 0 | 103 | 0 | 0 | 211 | 56 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | 4.9 | 4.9 | | 5.6 | | | 8.6 | 8.6 |
| Lane Util. Factor | | | | | 0.91 | 1.00 | | 0.95 | | | 1.00 | 1.00 |
| Frt | | | | | 1.00 | 0.85 | | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | | | | | 1.00 | 1.00 | | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | 5085 | 1583 | | 3539 | | | 1863 | 1583 |
| Flt Permitted | | | | | 1.00 | 1.00 | | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | 5085 | 1583 | | 3539 | | | 1863 | 1583 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.91 | 0.91 | 0.91 | 0.88 | 0.88 | 0.88 | 0.82 | 0.82 | 0.82 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 699 | 47 | 0 | 117 | 0 | 0 | 257 | 68 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 46 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 699 | 26 | 0 | 117 | 0 | 0 | 257 | 22 |
| Turn Type | | | | | NA | Perm | | NA | | | NA | Perm |
| Protected Phases | | | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | | | | | | 6 | | | | | | 8 |
| Actuated Green, G (s) | | | | | 67.1 | 67.1 | | 42.4 | | | 39.4 | 39.4 |
| Effective Green, g (s) | | | | | 67.1 | 67.1 | | 42.4 | | | 39.4 | 39.4 |
| Actuated g/C Ratio | | | | | 0.56 | 0.56 | | 0.35 | | | 0.33 | 0.33 |
| Clearance Time (s) | | | | | 4.9 | 4.9 | | 5.6 | | | 8.6 | 8.6 |
| Vehicle Extension (s) | | | | | 3.0 | 3.0 | | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | | | | | 2843 | 885 | | 1250 | | | 611 | 519 |
| v/s Ratio Prot | | | | | c0.14 | | | 0.03 | | | c0.14 | |
| v/s Ratio Perm | | | | | | 0.02 | | | | | | 0.01 |
| v/c Ratio | | | | | 0.25 | 0.03 | | 0.09 | | | 0.42 | 0.04 |
| Uniform Delay, d1 | | | | | 13.5 | 11.9 | | 25.9 | | | 31.4 | 27.5 |
| Progression Factor | | | | | 0.71 | 0.50 | | 0.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | 0.2 | 0.1 | | 0.1 | | | 0.5 | 0.0 |
| Delay (s) | | | | | 9.8 | 6.0 | | 0.1 | | | 31.9 | 27.5 |
| Level of Service | | | | | A | A | | A | | | C | C |
| Approach Delay (s) | | 0.0 | | | 9.6 | | | 0.1 | | | 31.0 | |
| Approach LOS | | A | | | A | | | A | | | C | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 14.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.31 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 58.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1001: Meadowbrook & 12 Mile WB

AM Background
 12/15/2015



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|------|-------|------|
| Lane Configurations | | | | | ↑↑↑ | ↑ | | ↑↑ | | | ↑ | ↑ |
| Traffic Volume (vph) | 0 | 0 | 0 | 0 | 655 | 44 | 0 | 106 | 0 | 0 | 217 | 58 |
| Future Volume (vph) | 0 | 0 | 0 | 0 | 655 | 44 | 0 | 106 | 0 | 0 | 217 | 58 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | 4.9 | 4.9 | | 5.6 | | | 8.6 | 8.6 |
| Lane Util. Factor | | | | | 0.91 | 1.00 | | 0.95 | | | 1.00 | 1.00 |
| Frt | | | | | 1.00 | 0.85 | | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | | | | | 1.00 | 1.00 | | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | 5085 | 1583 | | 3539 | | | 1863 | 1583 |
| Flt Permitted | | | | | 1.00 | 1.00 | | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | 5085 | 1583 | | 3539 | | | 1863 | 1583 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.91 | 0.91 | 0.91 | 0.88 | 0.88 | 0.88 | 0.82 | 0.82 | 0.82 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 720 | 48 | 0 | 120 | 0 | 0 | 265 | 71 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 48 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 720 | 27 | 0 | 120 | 0 | 0 | 265 | 23 |
| Turn Type | | | | | NA | Perm | | NA | | | NA | Perm |
| Protected Phases | | | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | | | | | | 6 | | | | | | 8 |
| Actuated Green, G (s) | | | | | 67.1 | 67.1 | | 42.4 | | | 39.4 | 39.4 |
| Effective Green, g (s) | | | | | 67.1 | 67.1 | | 42.4 | | | 39.4 | 39.4 |
| Actuated g/C Ratio | | | | | 0.56 | 0.56 | | 0.35 | | | 0.33 | 0.33 |
| Clearance Time (s) | | | | | 4.9 | 4.9 | | 5.6 | | | 8.6 | 8.6 |
| Vehicle Extension (s) | | | | | 3.0 | 3.0 | | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | | | | | 2843 | 885 | | 1250 | | | 611 | 519 |
| v/s Ratio Prot | | | | | c0.14 | | | 0.03 | | | c0.14 | |
| v/s Ratio Perm | | | | | | 0.02 | | | | | | 0.01 |
| v/c Ratio | | | | | 0.25 | 0.03 | | 0.10 | | | 0.43 | 0.04 |
| Uniform Delay, d1 | | | | | 13.6 | 11.9 | | 26.0 | | | 31.6 | 27.5 |
| Progression Factor | | | | | 0.91 | 0.91 | | 0.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | 0.2 | 0.1 | | 0.2 | | | 0.5 | 0.0 |
| Delay (s) | | | | | 12.5 | 10.9 | | 0.2 | | | 32.1 | 27.5 |
| Level of Service | | | | | B | B | | A | | | C | C |
| Approach Delay (s) | | 0.0 | | | 12.4 | | | 0.2 | | | 31.1 | |
| Approach LOS | | A | | | B | | | A | | | C | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.32 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 59.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1001: Meadowbrook & 12 Mile WB

AM Future
12/23/2015



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|------|------|------|------|-------|------|
| Lane Configurations | | | | | ↑↑↑ | ↑ | | ↑↑ | | | ↑ | ↑ |
| Traffic Volume (vph) | 0 | 0 | 0 | 0 | 670 | 59 | 0 | 107 | 0 | 0 | 220 | 89 |
| Future Volume (vph) | 0 | 0 | 0 | 0 | 670 | 59 | 0 | 107 | 0 | 0 | 220 | 89 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | | 4.9 | 4.9 | | 5.6 | | | 8.6 | 8.6 |
| Lane Util. Factor | | | | | 0.91 | 1.00 | | 0.95 | | | 1.00 | 1.00 |
| Frt | | | | | 1.00 | 0.85 | | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | | | | | 1.00 | 1.00 | | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | | | | | 5085 | 1583 | | 3539 | | | 1863 | 1583 |
| Flt Permitted | | | | | 1.00 | 1.00 | | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (perm) | | | | | 5085 | 1583 | | 3539 | | | 1863 | 1583 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.91 | 0.91 | 0.91 | 0.88 | 0.88 | 0.88 | 0.82 | 0.82 | 0.82 |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 736 | 65 | 0 | 122 | 0 | 0 | 268 | 109 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 73 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 736 | 36 | 0 | 122 | 0 | 0 | 268 | 36 |
| Turn Type | | | | | NA | Perm | | NA | | | NA | Perm |
| Protected Phases | | | | | 6 | | | 4 | | | 8 | |
| Permitted Phases | | | | | | 6 | | | | | | 8 |
| Actuated Green, G (s) | | | | | 67.1 | 67.1 | | 42.4 | | | 39.4 | 39.4 |
| Effective Green, g (s) | | | | | 67.1 | 67.1 | | 42.4 | | | 39.4 | 39.4 |
| Actuated g/C Ratio | | | | | 0.56 | 0.56 | | 0.35 | | | 0.33 | 0.33 |
| Clearance Time (s) | | | | | 4.9 | 4.9 | | 5.6 | | | 8.6 | 8.6 |
| Vehicle Extension (s) | | | | | 3.0 | 3.0 | | 3.0 | | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | | | | | 2843 | 885 | | 1250 | | | 611 | 519 |
| v/s Ratio Prot | | | | | c0.14 | | | 0.03 | | | c0.14 | |
| v/s Ratio Perm | | | | | | 0.02 | | | | | | 0.02 |
| v/c Ratio | | | | | 0.26 | 0.04 | | 0.10 | | | 0.44 | 0.07 |
| Uniform Delay, d1 | | | | | 13.6 | 11.9 | | 26.0 | | | 31.6 | 27.7 |
| Progression Factor | | | | | 1.00 | 1.00 | | 0.00 | | | 1.00 | 1.00 |
| Incremental Delay, d2 | | | | | 0.2 | 0.1 | | 0.2 | | | 0.5 | 0.1 |
| Delay (s) | | | | | 13.9 | 12.0 | | 0.2 | | | 32.1 | 27.8 |
| Level of Service | | | | | B | B | | A | | | C | C |
| Approach Delay (s) | | 0.0 | | | 13.7 | | | 0.2 | | | 30.9 | |
| Approach LOS | | A | | | B | | | A | | | C | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 17.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.33 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 61.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 9001: Meadowbrook & Single Family Driveway

AM Future
 12/23/2015



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|-----------------------------------|------|------|-------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 25 | 4 | 158 | 8 | 2 | 284 |
| Future Volume (Veh/h) | 25 | 4 | 158 | 8 | 2 | 284 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 27 | 4 | 172 | 9 | 2 | 309 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh | | | | | | |
| Upstream signal (ft) | | | 625 | | | |
| pX, platoon unblocked | 0.97 | 0.97 | | | 0.97 | |
| vC, conflicting volume | 490 | 176 | | | 181 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 455 | 131 | | | 136 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 95 | 100 | | | 100 | |
| cM capacity (veh/h) | 544 | 888 | | | 1400 | |
| Direction, Lane # | WB 1 | NB 1 | SB 1 | | | |
| Volume Total | 31 | 181 | 311 | | | |
| Volume Left | 27 | 0 | 2 | | | |
| Volume Right | 4 | 9 | 0 | | | |
| cSH | 572 | 1700 | 1400 | | | |
| Volume to Capacity | 0.05 | 0.11 | 0.00 | | | |
| Queue Length 95th (ft) | 4 | 0 | 0 | | | |
| Control Delay (s) | 11.6 | 0.0 | 0.1 | | | |
| Lane LOS | B | | A | | | |
| Approach Delay (s) | 11.6 | 0.0 | 0.1 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.7 | | | |
| Intersection Capacity Utilization | | | 26.5% | ICU Level of Service | | A |
| Analysis Period (min) | | | 15 | | | |

HCM Unsignalized Intersection Capacity Analysis
 9003: 12 Mile WB & Bank Driveway

AM Future
 12/23/2015



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | | ↑↑↑ | | | ↗ |
| Traffic Volume (veh/h) | 0 | 0 | 708 | 54 | 0 | 47 |
| Future Volume (Veh/h) | 0 | 0 | 708 | 54 | 0 | 47 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 0 | 770 | 59 | 0 | 51 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (ft) | | 637 | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 829 | | | | 800 | 286 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 829 | | | | 800 | 286 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 93 |
| cM capacity (veh/h) | 798 | | | | 323 | 711 |
| Direction, Lane # | WB 1 | WB 2 | WB 3 | SB 1 | | |
| Volume Total | 308 | 308 | 213 | 51 | | |
| Volume Left | 0 | 0 | 0 | 0 | | |
| Volume Right | 0 | 0 | 59 | 51 | | |
| cSH | 1700 | 1700 | 1700 | 711 | | |
| Volume to Capacity | 0.18 | 0.18 | 0.13 | 0.07 | | |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | | |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 10.5 | | |
| Lane LOS | | | | B | | |
| Approach Delay (s) | 0.0 | | | 10.5 | | |
| Approach LOS | | | | B | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.6 | | | |
| Intersection Capacity Utilization | | | 24.9% | | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | | |

HCM Signalized Intersection Capacity Analysis
1002: Meadowbrook & 12 Mile EB

PM Existing
12/15/2015

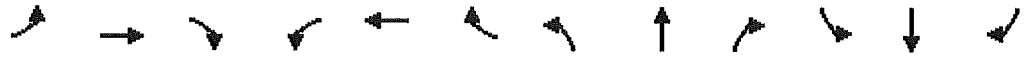


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|-------|-------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | | ↑↑↑ | ↑ | | | | | ↑ | ↑ | | ↑↑ | |
| Traffic Volume (vph) | 0 | 239 | 87 | 0 | 0 | 0 | 0 | 235 | 545 | 0 | 156 | 0 |
| Future Volume (vph) | 0 | 239 | 87 | 0 | 0 | 0 | 0 | 235 | 545 | 0 | 156 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.9 | 4.9 | | | | | 8.6 | 8.6 | | 5.6 | |
| Lane Util. Factor | | 0.91 | 1.00 | | | | | 1.00 | 1.00 | | 0.95 | |
| Frt | | 1.00 | 0.85 | | | | | 1.00 | 0.85 | | 1.00 | |
| Flt Protected | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | |
| Satd. Flow (prot) | | 5085 | 1583 | | | | | 1863 | 1583 | | 3539 | |
| Flt Permitted | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | |
| Satd. Flow (perm) | | 5085 | 1583 | | | | | 1863 | 1583 | | 3539 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 0 | 260 | 95 | 0 | 0 | 0 | 0 | 255 | 592 | 0 | 170 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 427 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 260 | 58 | 0 | 0 | 0 | 0 | 255 | 165 | 0 | 170 | 0 |
| Turn Type | | NA | Perm | | | | | NA | Perm | | NA | |
| Protected Phases | | 2 | | | | | | 8 | | | 4 | |
| Permitted Phases | | | 2 | | | | | | 8 | | | |
| Actuated Green, G (s) | | 73.1 | 73.1 | | | | | 33.4 | 33.4 | | 36.4 | |
| Effective Green, g (s) | | 73.1 | 73.1 | | | | | 33.4 | 33.4 | | 36.4 | |
| Actuated g/C Ratio | | 0.61 | 0.61 | | | | | 0.28 | 0.28 | | 0.30 | |
| Clearance Time (s) | | 4.9 | 4.9 | | | | | 8.6 | 8.6 | | 5.6 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | 3097 | 964 | | | | | 518 | 440 | | 1073 | |
| v/s Ratio Prot | | c0.05 | | | | | | c0.14 | | | 0.05 | |
| v/s Ratio Perm | | | 0.04 | | | | | | 0.10 | | | |
| v/c Ratio | | 0.08 | 0.06 | | | | | 0.49 | 0.37 | | 0.16 | |
| Uniform Delay, d1 | | 9.7 | 9.5 | | | | | 36.2 | 34.9 | | 30.6 | |
| Progression Factor | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 0.00 | |
| Incremental Delay, d2 | | 0.1 | 0.1 | | | | | 0.7 | 0.5 | | 0.3 | |
| Delay (s) | | 9.7 | 9.6 | | | | | 36.9 | 35.4 | | 0.3 | |
| Level of Service | | A | A | | | | | D | D | | A | |
| Approach Delay (s) | | 9.7 | | | 0.0 | | | 35.9 | | | 0.3 | |
| Approach LOS | | A | | | A | | | D | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 24.7 | | | | | | | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.21 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 120.0 | | | | | | | | 13.5 | |
| Intersection Capacity Utilization | | | 61.6% | | | | | | | | B | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1002: Meadowbrook & 12 Mile EB

PM Background
12/15/2015



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
|-----------------------------------|------|-------|-------|------|------|------|------|-------|------|------|------|---------------------------|------|
| Lane Configurations | | ↑↑↑ | ↑ | | | | | ↑ | ↑ | | ↑↑ | | |
| Traffic Volume (vph) | 0 | 246 | 90 | 0 | 0 | 0 | 0 | 242 | 561 | 0 | 161 | 0 | |
| Future Volume (vph) | 0 | 246 | 90 | 0 | 0 | 0 | 0 | 242 | 561 | 0 | 161 | 0 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 4.9 | 4.9 | | | | | 8.6 | 8.6 | | 5.6 | | |
| Lane Util. Factor | | 0.91 | 1.00 | | | | | 1.00 | 1.00 | | 0.95 | | |
| Frt | | 1.00 | 0.85 | | | | | 1.00 | 0.85 | | 1.00 | | |
| Flt Protected | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | | |
| Satd. Flow (prot) | | 5085 | 1583 | | | | | 1863 | 1583 | | 3539 | | |
| Flt Permitted | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | | |
| Satd. Flow (perm) | | 5085 | 1583 | | | | | 1863 | 1583 | | 3539 | | |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.81 | 0.81 | 0.81 | 0.91 | 0.91 | 0.91 | |
| Adj. Flow (vph) | 0 | 262 | 96 | 0 | 0 | 0 | 0 | 299 | 693 | 0 | 177 | 0 | |
| RTOR Reduction (vph) | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 454 | 0 | 0 | 0 | |
| Lane Group Flow (vph) | 0 | 262 | 58 | 0 | 0 | 0 | 0 | 299 | 239 | 0 | 177 | 0 | |
| Turn Type | | NA | Perm | | | | | NA | Perm | | NA | | |
| Protected Phases | | 2 | | | | | | 8 | | | 4 | | |
| Permitted Phases | | | 2 | | | | | | 8 | | | | |
| Actuated Green, G (s) | | 73.1 | 73.1 | | | | | 33.4 | 33.4 | | 36.4 | | |
| Effective Green, g (s) | | 73.1 | 73.1 | | | | | 33.4 | 33.4 | | 36.4 | | |
| Actuated g/C Ratio | | 0.61 | 0.61 | | | | | 0.28 | 0.28 | | 0.30 | | |
| Clearance Time (s) | | 4.9 | 4.9 | | | | | 8.6 | 8.6 | | 5.6 | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | | |
| Lane Grp Cap (vph) | | 3097 | 964 | | | | | 518 | 440 | | 1073 | | |
| v/s Ratio Prot | | c0.05 | | | | | | c0.16 | | | 0.05 | | |
| v/s Ratio Perm | | | 0.04 | | | | | | 0.15 | | | | |
| v/c Ratio | | 0.08 | 0.06 | | | | | 0.58 | 0.54 | | 0.16 | | |
| Uniform Delay, d1 | | 9.7 | 9.5 | | | | | 37.2 | 36.8 | | 30.7 | | |
| Progression Factor | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 0.00 | | |
| Incremental Delay, d2 | | 0.1 | 0.1 | | | | | 1.6 | 1.4 | | 0.3 | | |
| Delay (s) | | 9.7 | 9.6 | | | | | 38.8 | 38.2 | | 0.3 | | |
| Level of Service | | A | A | | | | | D | D | | A | | |
| Approach Delay (s) | | 9.7 | | | 0.0 | | | 38.4 | | | 0.3 | | |
| Approach LOS | | A | | | A | | | D | | | A | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 27.2 | | | | | | | | | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | | | 0.24 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 120.0 | | | | | | | | | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | | | 63.2% | | | | | | | | | ICU Level of Service | B |
| Analysis Period (min) | | | 15 | | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1002: Meadowbrook & 12 Mile EB

PM Future
 1/8/2016



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|-------|-------|------|------|------|------|------|-------|------|------|------|
| Lane Configurations | | ↑↑↑ | ↑ | | | | | ↑ | ↑ | | ↑↑ | |
| Traffic Volume (vph) | 0 | 307 | 93 | 0 | 0 | 0 | 0 | 245 | 564 | 0 | 163 | 0 |
| Future Volume (vph) | 0 | 307 | 93 | 0 | 0 | 0 | 0 | 245 | 564 | 0 | 163 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.9 | 4.9 | | | | | 8.6 | 8.6 | | 5.6 | |
| Lane Util. Factor | | 0.91 | 1.00 | | | | | 1.00 | 1.00 | | 0.95 | |
| Frt | | 1.00 | 0.85 | | | | | 1.00 | 0.85 | | 1.00 | |
| Flt Protected | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | |
| Satd. Flow (prot) | | 5085 | 1583 | | | | | 1863 | 1583 | | 3539 | |
| Flt Permitted | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 1.00 | |
| Satd. Flow (perm) | | 5085 | 1583 | | | | | 1863 | 1583 | | 3539 | |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.81 | 0.81 | 0.81 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 0 | 327 | 99 | 0 | 0 | 0 | 0 | 302 | 696 | 0 | 179 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 395 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 327 | 60 | 0 | 0 | 0 | 0 | 302 | 301 | 0 | 179 | 0 |
| Turn Type | | NA | Perm | | | | | NA | Perm | | NA | |
| Protected Phases | | 2 | | | | | | 8 | | | 4 | |
| Permitted Phases | | | 2 | | | | | | 8 | | | |
| Actuated Green, G (s) | | 73.1 | 73.1 | | | | | 33.4 | 33.4 | | 36.4 | |
| Effective Green, g (s) | | 73.1 | 73.1 | | | | | 33.4 | 33.4 | | 36.4 | |
| Actuated g/C Ratio | | 0.61 | 0.61 | | | | | 0.28 | 0.28 | | 0.30 | |
| Clearance Time (s) | | 4.9 | 4.9 | | | | | 8.6 | 8.6 | | 5.6 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | 3097 | 964 | | | | | 518 | 440 | | 1073 | |
| v/s Ratio Prot | | c0.06 | | | | | | 0.16 | | | 0.05 | |
| v/s Ratio Perm | | | 0.04 | | | | | | c0.19 | | | |
| v/c Ratio | | 0.11 | 0.06 | | | | | 0.58 | 0.68 | | 0.17 | |
| Uniform Delay, d1 | | 9.8 | 9.5 | | | | | 37.3 | 38.6 | | 30.7 | |
| Progression Factor | | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | 0.00 | |
| Incremental Delay, d2 | | 0.1 | 0.1 | | | | | 1.7 | 4.3 | | 0.3 | |
| Delay (s) | | 9.9 | 9.7 | | | | | 39.0 | 42.9 | | 0.3 | |
| Level of Service | | A | A | | | | | D | D | | A | |
| Approach Delay (s) | | 9.8 | | | 0.0 | | | 41.7 | | | 0.3 | |
| Approach LOS | | A | | | A | | | D | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 28.6 | | | | | | | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.29 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 120.0 | | | | | | | | 13.5 | |
| Intersection Capacity Utilization | | | 63.9% | | | | | | | | B | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 9002: 12 Mile WB & Fast Food/Retail/Restaurant Driveway

PM Future
 1/8/2016



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | | ↑↑↑ | | | ↑ |
| Traffic Volume (veh/h) | 0 | 0 | 2407 | 30 | 0 | 29 |
| Future Volume (Veh/h) | 0 | 0 | 2407 | 30 | 0 | 29 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 0 | 2616 | 33 | 0 | 32 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage (veh) | | | | | | |
| Upstream signal (ft) | | 361 | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 2649 | | | | 2632 | 888 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 2649 | | | | 2632 | 888 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 89 |
| cM capacity (veh/h) | 156 | | | | 19 | 287 |
| Direction, Lane # | WB 1 | WB 2 | WB 3 | SB 1 | | |
| Volume Total | 1046 | 1046 | 556 | 32 | | |
| Volume Left | 0 | 0 | 0 | 0 | | |
| Volume Right | 0 | 0 | 33 | 32 | | |
| cSH | 1700 | 1700 | 1700 | 287 | | |
| Volume to Capacity | 0.62 | 0.62 | 0.33 | 0.11 | | |
| Queue Length 95th (ft) | 0 | 0 | 0 | 9 | | |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 19.1 | | |
| Lane LOS | | | | C | | |
| Approach Delay (s) | 0.0 | | | 19.1 | | |
| Approach LOS | | | | C | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.2 | | | |
| Intersection Capacity Utilization | | | 57.2% | | ICU Level of Service | B |
| Analysis Period (min) | | | 15 | | | |



Attachment F: Resume of Preparer



Education

B.S., Civil Engineering,
Transportation
Wayne State University 2000

M.S., C.E., Transportation
Wayne State University 2002

**Professional Registration/
Certification**

Professional Engineer, Michigan
No. 51514

Professional Traffic Operations
Engineer
No. 1427

Affiliations

American Society of Civil Engineers

Institute of Transportation Engineers

Tau Beta Pi, The Engineering Honor
Society

Women's Transportation Seminar

Intelligent Transportation Society of
Michigan

Colleen Hill-Stramsak, P.E., PTOE

Associate

Ms. Hill-Stramsak has been with HRC since 2002. She manages the Traffic Engineering Department and provides municipal traffic engineering services to several communities in Michigan. She prepares transportation studies, impact studies for land developments, traffic crash analysis, traffic operations, safety studies and traffic maintenance plans. She is responsible for modeling and simulating transportation networks to optimize, also evaluating safety and operational improvements. Software proficiency in Highway Capacity Software, Synchro/SimTraffic, CORSIM, ACCUSIM II, MicroStation, Autodesk Map 3D, RODEL and VISSIM. Ms. Hill-Stramsak is also responsible for preparing traffic control and detours plans, traffic signal design and layout plans. She conducted the Older Driver Highway Design Workshop while at Wayne State University. She is a past member of the International Board of Direction and the Great Lakes District President (2012-2014) of the Institute of Transportation Engineers and a member of the Michigan Section.

Professional Experience

***I-75 & Sashabaw Road Interchange Improvements
Independence Township & RCOC***

Independence Township received authorization from the FHWA and MDOT to modify Exit 89 of I-75 and the intersection of Sashabaw and Waldon Roads, immediately south of the interchange. Project manager responsible for preliminary engineering, utility coordination, traffic and safety engineering (including traffic signal design for four locations), preparation of cost estimate and bid documents.

***Improvements to Belleville Road and Costco Truck Depot Driveway
V3 Companies***

Project manager responsible for the off-site improvements for a private development in Van Buren Township. The project was designed to Wayne County Department of Public Services standards. Plans included the design of pavement and grading, traffic signal, pavement markings and signs to be included in the permit and bid packages submitted to Van Buren Township and Wayne County.

***Tienken Road Rehabilitation, Adams to Livernois
Road Commission for Oakland County***

Rehabilitation of Tienken Road from Adams Road to the roundabout at Livernois Road. HRC was responsible for preliminary engineering, utility coordination, traffic and safety engineering, preparation of cost estimate and bid documents. QA/QC engineer for the traffic signals, maintenance of traffic, signing and pavement marking plans.

***Evergreen Road Reconstruction, 10 Mile to 11 Mile
City of Southfield***

Designed the reconstruction of 1.02 miles Evergreen Road to a four-lane boulevard, with two modern roundabouts, drainage, storm sewer, concrete pavement, curb, gutter, sidewalk and ramps, water main, landscaping, lighting, traffic signals, storm water retention and streetscaping. QA/QC engineer for traffic signals and construction assistance.

***Farmington Road Reconstruction, 10 Mile to 11 Mile
City of Farmington Hills***

Designed 1.0 mile reconstruction of 2-lane Farmington Road including bike lanes and pedestrian facilities in a rolling terrain. Project included new water main and was located adjacent to protected historical and

Colleen Hill-Stramsak, P.E., PTOE

Associate

utilizing Synchro software for the AM and PM peak hours of existing configuration and two conceptual designs, and analyzing vehicle queues on the crossovers in order to recommend storage length. Based on analyses, made recommendation for reconfiguring median to City of Berkley and MDOT. Assisted city staff with securing funding to make the geometric improvements.

West Avenue and Fourth Street Traffic Study

City of Jackson

Project manager to conduct a corridor analysis to investigate the appropriate corridor design in preparation for the reconstruction and rehabilitation of portions of West Avenue and Fourth Street. Project included studying laneage and width to maximize green space while maintaining acceptable traffic flow based on desires by area residents and businesses. Tasks included data collection, analysis of various options for the intersection of Fourth Street/Greenwood Avenue/Griswold Street to mitigate the existing congestion and safety issues and preparation of optimized signal timing plans for the entire network.

Site Circulation and Traffic Impact Assessment

Yeshiva Beth Yehudah Schools

A traffic study was performed for the proposed school expansion of Yeshiva Beth Yehudah at the 10 Mile Road campus in the City of Oak Park, Michigan. Extensive data collection was conducted to analyze the site access, circulation and parking needs at the existing girls' school and the preschool center. Recommendations were provided for future traffic operations, site access and student drop off and pick areas for the proposed school building.

University of Michigan Central Campus Transit Center

University of Michigan Architecture, Engineering and Construction Department

Engineering services to design and develop complete construction documents to reconstruct North University Avenue between Fletcher Street and Church Street and to provide shelters for major transit transfer point. Stakeholders include the City of Ann Arbor, Ann Arbor Transportation Authority (AATA) and the University of Michigan's Parking and Transportation Services.

Mixed Use Development in Northville Township

Real Estate interests Group, Inc.

Project manager for comprehensive traffic data collection for a proposed mixed use development in Northville Township. Work included two traffic signal warrant studies.

Traffic Impact and Parking Analysis for Heritage Park North

Grand Sakwa of Grand Blanc, LLC

Traffic Engineer for traffic impact analysis of 600,000 SF mixed commercial development in Grand Blanc Township to accompany rezoning request and subsequent site plan review. Study included data collection, trip generation and comparisons, trip assignment, capacity analysis of existing and future traffic conditions, parking analysis, signal optimization and recommendations. Conducted signal warrant analysis and access management review. Retained to develop alternatives for access issues, design the new traffic signal on Saginaw Road and modify traffic signal on Dort Highway.

Colleen Hill-Stramsak, P.E., PTOE

Associate

Owen Road Signal Optimization

City of Fenton

Project manager on a signal optimization study to coordinate and provide progression at eight signalized intersections along the Owen/Shiawassee Road corridor as part of a signal modernization project funded by CMAQ. Work included data collection, development and calibration of Synchro model, optimizing signal timing plans by time of day and red-lining existing permits. Two of the intersections are controlled by MDOT as they are ramps to/from US-23. All work was done in accordance with current MDOT

Oakland County Signal Systems Optimization Project (Phase 2)

Road Commission for Oakland County

Performed QA/QC for transportation networks modeled and optimized through this project. Calculated clearance intervals as per RCOC accepted practice. Performed safety analysis for over 160 study intersections, performed traffic crash pattern analysis and prepared recommendations for safety improvements. Prepared red-lined traffic signal timing plans. Also assisted with field checks of installed signal timing plans and prepared recommendations for revised signal timing.

Mack Traffic Signal Design

Wayne County Department of Public Services

Project manager for a project to prepare plans, specifications and an estimate to upgrade the traffic signals at two intersections on Mack Avenue on the boarder of Detroit and Grosse Pointe. This is a CMAQ funded project. HRC was responsible for road survey, utility coordination, preparing plan sheets, special provisions, cost estimate and a bid proposal.

Traffic Signal Improvements-Silver Lake/Leroy and South Long Lake/Torrey

City of Fenton

Traffic engineer coordinating the preparation of traffic signal plans for the construction and installation of 2 traffic signals, one of which was incorporated into the adjacent rail-highway grade crossing. Prepared permanent pavement markings and signing plan; maintenance of traffic plans in accordance with MDOT standards and the Michigan MUTCD. Coordination of permits and scheduling with Canadian National Railroad.

Bloomfield Traffic Signals

Bloomfield Township and City of Bloomfield Hills

Traffic engineer responsible for preparing plans and special provisions per RCOC standards for the construction and installation of 2 traffic signals, one of which was incorporated into the adjacent rail-highway grade crossing. Plans were prepared in accordance with the Michigan MUTCD. Coordinated construction activities between Canadian National Railroad and Contractor. Prepared permanent pavement markings and signing plan; maintenance of traffic plans in accordance with MDOT standards and the Michigan MUTCD.

2006 Troy CMAQ Intersection Improvements

City of Troy

Traffic engineer responsible for preparing PS&E per RCOC standards for the redesign of three adaptive-controlled traffic signals affected by the addition of right turn lanes. Box span configuration with flashing yellow arrow used for permissive protected left turns.

Colleen Hill-Stramsak, P.E., PTOE
Associate

Road Safety Audit for the Proposed Brandon Elementary School

Charter Township of Brandon

Project Engineer for the road safety audit of a driveway onto Oakwood Road from the proposed Brandon Elementary School. The road safety audit included: 24 hour traffic volumes and speeds; sight distance evaluation; a detailed crash analysis; projected traffic volumes and patterns for the proposed elementary school. Performed a sight distance evaluation and a detailed crash analysis for the road segment to be accessed by the proposed driveway, and recommended road improvements for safe access to and from the site.

Dixie Highway Safety Study

Charter Township of Springfield

Project manager for safety study of Dixie Highway corridor from Big Lake Road north to Davisburg Road. The study included crash analysis, review and evaluation of safety countermeasures, access management techniques, signal warrant study, left-turn phasing study and possible realignment of Big Lake Road/Dixie Highway intersection with Deerhill Drive/Dixie Highway intersection. A comprehensive report was prepared and the results presented to the Township Board of Trustees.

Intersection Safety Studies

City of Wixom

Conducted safety studies at for two adjacent intersections on Beck Road in Wixom. Performed peak hour turning movement counts, collected 24-hour traffic volume and speed data, reviewed crash history, reviewed geometrics, and suggested countermeasures with cost estimates.

State Farm Intersection Safety Studies

Road Commission for Oakland County

Reviewed geometrics, traffic volume, traffic crash and traffic conflict characteristics for three high crash intersections. Evaluated existing safety issues, recommended potential traffic safety engineering countermeasures, and developed an implementation plan of action.

Upgrade and Rehabilitation of Non-Freeway Signing

Michigan Department of Transportation

Project Manager to upgrade 129 miles of non-freeway signing in Berrien County in the Southwest Region. The project required verification of the existing inventory, collecting new sign data, updating the MTSIS inventory and making recommendations to MDOT Lansing and MDOT Coloma TSC. HRC conducted a review of crashes and TCOs to see if there are possible safety improvements. HRC prepared sign plan sheets, created SignCAD details, and assembled the e-proposal for the bid package.

Non-Freeway Signing Upgrade on M-150 in Oakland County

Michigan Department of Transportation

Project manager for log job to upgrade all non-freeway signs on M-150 from M-59 to Tienken Road in Oakland County. The project required verification of the existing inventory, collecting new sign data, updating the MTSIS inventory and making recommendations to MDOT Lansing and MDOT Oakland TSC. A contract was prepared containing all upgrades needed to the existing signs.



Colleen Hill-Stramsak, P.E., PTOE

Associate

concept report. Conducted noise analysis in accordance with provisions of 23 CFR Section 772 of Federal Code of Regulations. Type I project did not trigger noise abatement measures.

26 Mile Road Environmental Assessment

Road Commission of Macomb County

Collected turning movement counts and geometric information for 27 intersections along 26 Mile Road in Macomb County. Performed traffic crash analysis for intersections and segments in the study area. Modeled the 19 mile long corridor using Synchro software for Build and No Build scenarios.

Williams Lake Road Environmental Assessment

Road Commission for Oakland County

Conducted a traffic and safety analysis to better determine appropriate termini of the project and provide the necessary justification for the preferred alternative for a realigned Williams Lake Road. Conducted traffic crash analysis and license plate survey to determine the safety and traffic flow impacts of the proposed realignment. Conducted air quality analysis for microscale carbon monoxide pollution using CAL3QHC, Version 2.0. CO concentrations were all below NAAQS for 1-hour and 8-hour exposures.

Presentations/Publications

"Road Safety Audits," ACEC/MDOT (American Council of Engineering Companies of Michigan/Michigan Department of Transportation) Partnering Workshop January 2014 (with Jeffrey Bagdade, P.E., PTOE, and Steven Loveland, P.E., PTOE).

"Intersection Safety within a Signal Optimization Project," Institute of Transportation Engineers 2004 Technical Conference and Exhibit Compendium of Technical Papers, March 2004 (with Stephen B. Dearing, P.E.).

"Intersection Safety within a Signal Optimization Project," Presented Institute of Transportation Engineers 2004 Technical Conference and Exhibit, March 31, 2004.

"Intersection Safety within a Signal Optimization Project," Presented Institute of Transportation Engineers Michigan Section Technical Session, February 12, 2004.

"Michigan ITE Website Update," Presented Institute of Transportation Engineers Michigan Section Technical Session, February 12, 2004.

"Change and Clearance Interval Design on Red-Light Running and Late Exits," Transportation Research Record, No. 1856 (p. 193-201), Washington D.C., 2003 (with Kerrie L. Schattler and Tapan K. Datta).

FIRE REVIEW



April 15, 2016

TO: Barbara McBeth- Deputy Director of Community Development
Sri Komaragiri- Plan Review Center

CITY COUNCIL

Mayor
Bob Gatt

Mayor Pro Tem
Dave Staudt

Gwen Markham

Andrew Mutch

Wayne Wrobel

Laura Marie Casey

Brian Burke

City Manager
Pete 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
Jerrod S. Hart

RE: Beacon Hill

PSP# 16-0036

Project Description: A 42 single family and commercial development at Meadowbrook and Twelve Mile

Comments:

Emergency drive must meet city standards.

Recommendation:

- 1) A secondary access driveway shall be a minimum of twenty (20 feet in width and paved to provide all-weather access and shall be designed to support a vehicle of thirty-five (35) tons. Minimum easement width for secondary access driveways shall be twenty-five (25) feet. A permanent "break-away" gate shall be provided at the secondary access driveway's intersection with the public roadway in accordance with Figure VIII-K of the Design and Construction Standards. To discourage non-emergency vehicles, emergency access roads shall be designated by signage as for emergency access only, shall be separated from the other roadways by mountable curbs, and shall utilize entrance radii designed to permit emergency vehicles while discouraging non-emergency traffic. **(D.C.S. Sec 11-194 (a)(19))**

Recommendation

Approved

Sincerely,

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

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

cityofnovi.org

cc: file

APPLICANT RESPONSE LETTER

Z EIMET W OZNIAK
& ASSOCIATES

Civil Engineers & Land Surveyors

55800 Grand River Avenue, Suite 100
New Hudson, Michigan 48165-9318
248.437.5099 · 248.437.5222 fax
www.zeimetwozniak.com

April 8, 2016

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

RE: Beacon Hill Park rezoning with a PRO, JSP15-0008
Response to Planning Review

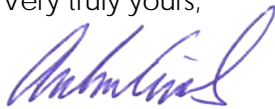
Dear Ms. McBeth:

We would like to thank Community Development and Clearzoning for the recommendation to the Planning Commission to consider a positive recommendation to the City Council.

We have reviewed the Clearzoning report dated March 18, 2016 and are prepared to address any comments on subsequent submittals.

Should you need any additional information please don't hesitate to contact us.

Very truly yours,



Andrew J. Wozniak

Z EIMET W OZNIAK
& ASSOCIATES
Civil Engineers & Land Surveyors

55800 Grand River Avenue, Suite 100
New Hudson, Michigan 48165-9318
248.437.5099 · 248.437.5222 fax
www.zeimetwozniak.com

April 20, 2016

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

RE: Beacon Hill Park PRO
Response to Engineering Review

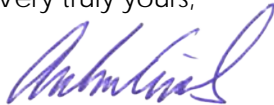
Dear Ms. McBeth:

We would like to thank Engineering for their recommendation for approval of the Revised Concept Plan and Concept Storm Water Management Plan.

We have reviewed their letter dated April 15, 2016 and will address additional comments detailed in their review letter dated March 21, 2016 during Final Site Plan submittal.

Should you need any additional information please don't hesitate to contact us.

Very truly yours,



Andrew J. Wozniak

ZEIMET WOZNIAK & ASSOCIATES

Civil Engineers & Land Surveyors

55800 Grand River Avenue, Suite 100
New Hudson, Michigan 48165-9318
248.437.5099 · 248.437.5222 fax
www.zeimetwozniak.com

April 21, 2016

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

RE: Beacon Hill Park rezoning with a PRO, JSP15-0008
Response to Landscape Review

Dear Ms. McBeth:

We would like to thank City staff for their landscape review the recommendation for approval with reservations of the revised site plan.

We have reviewed the landscape report dated April 15, 2016 and will address the comments during Final Site Plan submittal. **We are requesting five deviations/waivers pertaining to this review, all of which are supported by City staff.**

We offer the following response to the review comments.

Existing Trees

“As this is a PRO, there could be some flexibility in terms of allowing extra credits for the use of upsized trees which is normally not allowed by the Landscape Design Manual. In light of this, I support the use of some upsized evergreens to provide more interest along Meadowbrook, and more screening between the residential lots “fronting” the commercial, but I don’t believe that the total benefit in credits for this should be more than 33% of the trees planted (in other words 33, not 85). As ECT is officially responsible for reviewing plans for the Woodlands, I defer to their review on this matter”.

- 3. While ECT will provide the woodland review, it should be noted that the Landscape Design Manual specifically forbids the use of upsizing credits for Woodland Replacement Trees (Section 3.c.(2)). The applicant can request a deviation as part of the PRO agreement, and staff supports the use of some upsizing with credit within the PRO to provide additional interest and screening along Meadowbrook, and along the south edge of the residential part of the development to provide additional screening from the commercial part of the development. That being said, the number of credits sought seems excessive, as noted in the discussion above.***

With the support of City Staff, Tollgate Education Community and MSU Horticulture staff, we are proposing larger trees along the Meadowbrook Road Frontage and between the commercial and residential developments. As City staff suggests and everyone agrees, larger trees will "provide additional landscape interest and screening along Meadowbrook Road and along the south edge of the residential portion of the development to provide additional screening from the commercial part of the development".

We are proposing to upsize only evergreen trees as suggested by Toll Gate Educational Community and MSU Horticulture Department staff to maximize the impact of the upsizing and to create a more natural landscape. Upsizing only evergreen trees was discussed and supported by City staff at our meeting on April 13, 2016.

A total of 604 replacement trees and 681 replacement shrubs are proposed to satisfy 100% of the required replacement credits. It's important to note that only 102 trees will be upsized. We believe that the proper way to analyze the requested upsizing is to look at the total amount of Woodland Replacement Trees, not just the evergreen trees. We are proposing to upsize 153 of the total 718 required woodland replacement tree credits which is only 21% of the total.

Larger trees cost more money and we are requesting credit for upsizing these trees. We will plant Woodland Replacement Trees and shrubs that are not upsized to satisfy the requirements, but feel that this will not achieve the effect that everyone desires.

Thank you for your support to "use of some upsized evergreen trees to provide more interest along Meadowbrook, and more screening between the residential lots "fronting" the commercial" We are requesting a deviation from the PRO to receive credit for upsizing 102 Woodland Replacement Trees as part of the Woodland review.

Meadowbrook

b. A landscape waiver for the berm could be sought for the wetland just north of the residential entry (approximately 170 lf) and the wet areas south of the residential area (approximately 420 lf). This waiver would be supported by staff.

A berm cannot be provided due to topography, existing vegetation and topography.

Thank you for your support of our request for a waiver to not provide a berm just north of the residential entry (approximately 107 lf)

c. If the developer wishes to not build berms along the remaining frontage, this would require a deviation as part of the PRO. Given the heavy vegetation proposed within the greenbelt and right-of-way, this would also be supported by staff.

A berm cannot be provided due to existing vegetation.

Thank you for your support of our request for a deviation as part of the PRO to not build a berm along the remaining residential frontage of Meadowbrook Road.

Plantings

b. A landscape waiver could be sought for the required trees and subcanopy trees in the wetland areas described above for the berms. This waiver would be supported by staff.

A berm and the required trees cannot be installed due to existing vegetation and topography.

Thank you for your support of our request for a waiver for the required for the required trees and subcanopy trees required to be installed on the berms.

c. No required greenbelt landscaping is proposed for the 540 lf of frontage south of the residential section. Some of this deviation is due to the existing wetland areas, and some is due to the heavy plantings of woodland replacement trees. Normally, required trees cannot be replaced with woodland trees. However, in this case, the Planning Commission is allowed leeway in allowing a waiver for the greenbelt plantings if it finds that "the site would be enhanced by an alternate design solution" As the park area will be heavily landscaped and protected with a conservation easement, and much of the existing natural area will be enhanced through restoration, a waiver for the required greenbelt trees in this section can be requested and will be supported by staff.

We are proposing to heavily landscape the Meadowbrook Road frontage. Additional landscaping should not be required since this parcel is not being developed and is being donated to the City.

Thank you for your support of our request for a waiver for installation of the greenbelt landscaping along the Meadowbrook Road frontage south of the residential development (approximately 540 feet).

d. The required plantings for the remaining 540lf of frontage (1336lf – 540lf – 86lf – 170lf) should be provided. Existing trees may be able to meet some or all of the requirements for that section of frontage, but their size and identity need to be shown with size and identity on the plan. They need to be acceptable size and acceptable species to count.

We are proposing to heavily landscape the Meadowbrook road frontage which will be supplemented by existing trees and vegetation. The size and identity of the existing trees is show on sheet SP-4 but will be clarified on the landscape plans during Final Site Plan submittal.

Twelve Mile Road

- 2 An undulating berm at least 3' tall with a 2' crest is required between the road and the parking lot. No berm is proposed. A privet hedge is proposed, but this does not provide the same screening of automobile headlights as a berm would. A landscape waiver may be requested from the Planning Commission, but would not be supported by staff as there is no topographical reason for not providing this berm. Also, while allowed by ordinance, privet is known to be an invasive plant that invades area woodlands and***

should be substituted with another non-invasive species if the applicant elects to pursue the hedge as screening.

A berm has been provided along Twelve Mile Road on the revised plans.

- 3 In addition to the berm, one large evergreen or deciduous canopy tree per 35 lf frontage and 1 subcanopy tree per 20 lf frontage is required along the parking lot. The calculations and trees provided need to be revised.***

The required trees will be provided during Final Site Plan submittal.

- 4 The total frontage for Twelve Mile Road should be included in the calculations. A landscaping waiver for the western 160' can be sought and will be supported for the same reason described in 3.c. above.***

We are providing extensive landscaping along the entire Twelve Mile Road frontage. We suggest that the western 160 feet of the Twelve Mile Road frontage should not require additional landscaping and should not be included in the calculation for the commercial development since this parcel is not being developed and is being donated to the City.

Thank you for your support of our request for a deviation for landscaping along the western 160 feet of the Twelve Mile Road frontage.

Screening Between Residential and Non-residential – Berm (Wall) & Buffer

- 3 It appears that the proposed landscaping will provide the required screening, despite the difference in height, but a section view from Meadowbrook should be added to show the proposed buffering capability of that landscaping, showing the buildings at proposed elevations and the landscaping at a height that can be expected after 2 years of growth.***

A section view will be provided during Final Site Plan submittal.

- 4 If that section reveals that the screening is insufficient, additional screening in the form of dense evergreens, a landscaped berm high enough to provide the required buffering, or other screening will be required.***

Noted

Street Tree Requirements

Residential Interior:

- 2 An additional street tree needs to be added to the plan to match the numbers shown as provided in the calculations.***

An additional street tree will be provided during Final Site Plan submittal.

Meadowbrook Road:

- 1 Please break out the frontage by road in the calculations (1336lf less 86lf for Meadowbrook and 607 lf for Twelve Mile Road).**

The frontage calculations will be broken down by road during Final Site Plan submittal. As previously stated, the Twelve Mile Road and Meadowbrook Road frontage should not be included since this parcel is not being developed and is being donated to the City

- 2 1 deciduous canopy tree per 35 lf is required along areas facing parking, and 1 tree per 45 lf is required along other right-of-way frontage for commercial, and 1 tree per 35 lf is required for residential. 1 tree per 45 lf can be used for the Meadowbrook frontage south of the residential areas.**

Noted and will be addressed during Final Site Plan submittal.

- 3 Parking lot trees must be deciduous canopy trees, not evergreen trees or subcanopy trees. Please replace the above with deciduous canopy trees. Per the ordinance definition, deciduous canopy trees must have a mature canopy width of at least 20' to provide shading effect for adjacent spaces.**

Noted and will be addressed during Final Site Plan submittal.

- 4 The replacement trees shown along the parking lots' perimeters must be changed to be interior or perimeter parking lot trees to provide the greatest number of trees possible toward meeting those requirements. Replacement trees can only be used along the perimeter if the other requirements are met.**

Noted and will be addressed during Final Site Plan submittal.

Parking Lot Perimeter Canopy Trees

- 1 Perimeter calculations have been provided as requested. Please check to see that the perimeter length is correctly measured. Once the replacement trees along the perimeter are converted to perimeter or interior trees as noted above and the parking lot is reconfigured to provide a greater number of interior trees in acceptable islands, the shortage of trees may be considered acceptable.**

Noted and will be addressed during Final Site Plan submittal.

- 2 Parking lot perimeter trees are required to be deciduous canopy trees. Please replace any evergreen perimeter trees with deciduous canopy species.**

Noted and will be addressed during Final Site Plan submittal.

Transformer/Utility Box Screening

- 1 When transformers/utility boxes are added to the plans, be sure to screen them per the city standard detail.**

Noted and will be addressed during Final Site Plan submittal.

Building Foundation Landscape

- 1 Building foundation landscaping is calculated as the entire building perimeter * 8 feet. I calculated the total perimeters of the two buildings as approximately 584 feet. This would result in a requirement for a total of 4672 square feet of foundation landscape area. The basis of calculation does not appear to be correct. Please correct that and the required area.**

Noted and will be addressed during Final Site Plan submittal.

- 2 60% of the frontage visible from Twelve Mile Road should be landscaped. As proposed, there is no foundation landscaping proposed along the Twelve Mile frontage of either building. Landscaping needs to be added along the south elevation of the two buildings and needs to be adjacent to outdoor patios.**

Noted and will be addressed during Final Site Plan submittal.

- 3 If, because of the nature of the operations, all of the required foundation landscaping cannot be located immediately adjacent to the building, a landscape waiver can be requested, but the balance of the required space must be provided elsewhere on the commercial area of the site.**

Noted and will be addressed during Final Site Plan submittal.

- 4 Please label all landscape areas in SF on site plans.**

Noted and will be addressed during Final Site Plan submittal.

General/Other

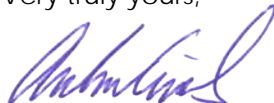
Proposed Trees to be saved

- 3 Please leave the labels for trees to remain on the landscape plan.**

Noted and will be addressed during Final Site Plan submittal.

Again, we would like to thank you for this review and we look forward to working with you on this project.

Very truly yours,



Andrew J. Wozniak

Z EIMET W OZNIAK
& ASSOCIATES

Civil Engineers & Land Surveyors

55800 Grand River Avenue, Suite 100
New Hudson, Michigan 48165-9318
248.437.5099 · 248.437.5222 fax
www.zeimetwozniak.com

April 21, 2016

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

RE: Beacon Hill Park rezoning with a PRO, JSP15-0008
Response to Woodland Review

Dear Ms. McBeth:

We would like to thank ECT for their woodland review the recommendation for approval of the revised site plan.

We have reviewed the ECT report dated April 19, 2016 and will address the comments on the Final Stamping Set as requested. **We are requesting two deviations pertaining to this review.**

We offer the following response to the review comments.

- 1. ECT supports the use of Woodland Replacement Trees and shrubs as currently proposed in order to supplement the required trees along Meadowbrook Road but we do not support the replacement of Street Tree requirements with Woodland Replacement Trees. Please see the specific comments in the Landscape Review letter dated April 15, 2016.***

The required number of Street Trees along the residential (Meadows) and commercial (Shoppes) have been provided and are shown on sheets LS-2 and LS-3 of the landscape plans. In addition to the required Street Trees, we are proposing to install Woodland Replacement Trees within the right-of-way to enhance the design as suggested by Toll Gate Education Community. The Woodland Replacement Trees are shown on sheets LS-6 and LS-7.

We are proposing to heavily landscape the frontage of the Park Trailhead along the Meadowbrook Road and Twelve Mile Road rights-of-way. These plantings would be Woodland Replacement Trees and are shown on sheet LS-6 and LS-7. We are proposing that Street Trees along the proposed frontage of the Park Trailhead should not be required since this parcel is not being developed and is being donated to the City.

We request a deviation from this requirement if necessary.

- 2. The City's Landscape Design Manual specifically forbids the upsizing of Woodland Replacement Trees for additional Credits (Section 3.c.(2)). The applicant can, however, request a deviation as part of the PRO agreement. ECT and the City Landscape Architect support the use of some upsizing with credit within the PRO in order to provide additional landscape interest and screening along Meadowbrook Road and along the south edge of the residential portion of the development to provide additional screening from the commercial part of the development. That being said, the number of additional credits through the use of upsized Woodland Replacement trees (i.e., 10-foot evergreen trees) seems excessive.***

As noted in the Landscape Review, 40% of the proposed evergreen trees are upsized from 7' to 10' height (i.e., 102 of 253 total evergreens are proposed as 10' tall trees). Consistent with the Landscape Design Manual, the applicant is requesting 1.5 credits per 10' tree instead of the 0.67-credit per tree that is normally allowed for a 7' tall evergreen per the Woodland Ordinance. The result is an additional 85 Woodland Replacement Credits on 102 replacement trees provided. ECT concurs with the Landscape Review in that the amount of credits for the providing upsized evergreen trees as Woodland Replacement trees should be limited. The total benefit in credits derived from the "upsized" Woodland Replacement material should not be more than 33% of the total number of "upsized" trees planted.

With the support of City Staff, Tollgate Education Community and MSU Horticulture staff, we are proposing larger trees along the Meadowbrook Road Frontage and between the commercial and residential developments. As City staff suggests and everyone agrees, larger trees will "provide additional landscape interest and screening along Meadowbrook Road and along the south edge of the residential portion of the development to provide additional screening from the commercial part of the development".

We are proposing to upsize only evergreen trees as suggested by Toll Gate Educational Community and MSU Horticulture Department staff to maximize the impact of the upsizing and to create a more natural landscape. Upsizing only evergreen trees was discussed and supported by City staff at our meeting on April 13, 2016.

A total of 604 replacement trees and 681 replacement shrubs are proposed to satisfy 100% of the required replacement credits. It's important to note that only 102 trees will be upsized. We believe that the proper way to analyze the requested upsizing is to look at the total amount of Woodland Replacement Trees, not just the evergreen trees. We are proposing to upsize 153 of the total 718 required woodland replacement tree credits which is only 21% of the total.

Larger trees cost more money and we are requesting credit for upsizing these trees. We will plant Woodland Replacement Trees and shrubs that are not upsized to satisfy the requirements, but feel that this will not achieve the effect that everyone desires.

Thank you for your support to "use some upsizing with credit within the PRO". We are requesting a deviation from the PRO to receive credit for upsizing 102 Woodland Replacement Trees.

- 3. The Applicant is encouraged to provide preservation/conservation easements for any areas of remaining woodland.***

Preservation/ conservation easements will be provided.

- 4. The Applicant is encouraged to provide woodland conservation easements for any areas containing woodland replacement trees, if applicable. It is not clear how all of the proposed replacement trees will be guaranteed in perpetuity. As stated in the woodland ordinance.***

Where replacements are installed in a currently non-regulated woodland area on the project property, appropriate provision shall be made to guarantee that the replacement trees shall be preserved as planted, such as through a conservation or landscape easement to be granted to the city. Such easement or other provision shall be in a form acceptable to the city attorney and provide for the perpetual preservation of the replacement trees and related vegetation.

Woodland conservation easements will be provided. Provisions to guarantee that the replacement trees shall be preserved as planted will be provided.

- 5. A Woodland Permit from the City of Novi would be required for proposed impacts to any trees 8-inch d.b.h. or greater. Such trees shall be relocated or replaced by the permit grantee. All replacement trees shall be two and one-half (2 ½) inches caliper or greater deciduous trees or 6-foot tall (minimum) coniferous trees. Deciduous replacement trees shall be provided at a 1:1 replacement ratio and coniferous replacement trees shall be provided at a 1.5:1 replacement ratio. See the Woodland Tree Replacement Chart (attached) for acceptable replacement tree species.***

Noted

- 6. A Woodland Replacement financial guarantee for the planting of replacement trees will be required, if applicable. 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. Based on a successful inspection of the installed on-site Woodland Replacement trees, seventy-five percent (75%) of the original Woodland Financial Guarantee shall be returned to the Applicant. Twenty-five percent (25%) of the original Woodland Replacement financial guarantee will be kept for a period of 2-years after the successful inspection of the tree replacement installation as a Woodland Maintenance and Guarantee Bond.***

Noted

- 7. 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.***

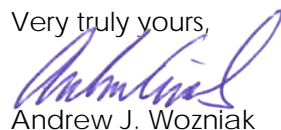
Noted

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

Noted

Again, we would like to thank you for this review and we look forward to working with you on this project.

Very truly yours,



Andrew J. Wozniak

The Ivanhoe Companies

April 14, 2016

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

RE: **Beacon Hill Park**
Landscape and Woodlands: Ivanhoe; Americana Foundation; Tollgate Education Center; and the City of Novi Site Plan Collaboration

Dear Ms. McBeth:

Since the Planning Commission meeting on September 9, 2015, we have had multiple collaborative meetings with you, Clear Zoning, ECT and City staff to achieve our mutual goal. As you are aware, there have been numerous revisions accommodating the requests from the consultants' letters.

For well over a year, we have been working and adjusting the plan to have a complementary development to the Tollgate Education Center property directly to the west. The key accommodation and collaboration resulted in an extraordinary open space running north and south the entire length of Meadowbrook Road, adjacent to the 5 acre park and the deeper open space park area in front of the commercial, effectuating a continuous buffer on the main roads whereby the community will have 42% open space.

We redesigned the community, specifically as recommended by Tollgate Education Center, whereby the Beacon Hill Meadows road is located approximately 140 feet from Meadowbrook Road which will provide a visual extension of the farm. We revised the plan and added an additional 50 foot landscaped nature corridor. Tollgate Education Center strongly recommended and we have agreed, that the proposed landscaping on the east side of Meadowbrook Road should present a natural progression of plantings from low shrubs to medium understory plantings to canopy trees, to provide a natural appearance.

Under the direction of the Americana Foundation and their consultants, in collaboration with our consultants; Felino Pascual & Associates, Zeimet Wozniak & Associates and King & MacGregor, we have been working with Toll Gate Education Center staff and Michigan State University staff to revise the proposed landscaping plans for Beacon Hill Park along Meadowbrook Road. We have met, and revised the plans multiple times, with the direction of Mr. Roy Prentice, Farm Manager of the Tollgate Education Center and Dr. Robert Schutzki, Associate Professor with the Department of Horticulture at MSU in a collaborative effort to achieve our goal. It is essential to all that the proposed landscaping not only provide a buffer between the farm and the proposed homes, but blends seamlessly with the existing features of Tollgate Education Center and the west side of Meadowbrook Road.

In order to accomplish this we will require flexibility in the proposed landscaping, unique to our sites on Meadowbrook Road. Rather than a single row of trees located along the proposed Meadowbrook Road right-of-way, north of the proposed entrance to Beacon Hill Meadows, we are proposing clusters of bushes be located nearest the sidewalk then a variation of sub-canopy ornamental trees which finally give way to larger canopy trees. Beyond the canopy trees we propose to preserve the natural

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The Ivanhoe Companies

vegetation within the green belt area. We are proposing to move some of the required landscaping into the Meadowbrook Road right-of-way in order to preserve the existing vegetation and provide a natural buffer while maintaining site distance visibility. This will offer a natural feel for Meadowbrook Road that we, along with Tollgate Education Center, are hoping to achieve. I have attached correspondence from Mr. Roy Prentice, Dr. Schutzki, and representatives from Americana Foundation and Tollgate Education Center outlining their desires that include achieving the set-back and natural design of the project including tree and shrubs species.

The park area located adjacent to the proposed community residential entrance has been revised to incorporate a natural progression from low plantings to large canopy trees. South of the entrance park we are proposing that the street trees be clustered both in and adjacent to the Meadowbrook Road right-of-way to introduce the natural feel of the corridor as you proceed north from 12 Mile Road.

As you are aware, we have met with Novi's woodland consultant and responded to his comments, and updated him on the restoration plan as well as clarifying that over the course of two years there have been multiple alternative uses and revised site plans that have transpired throughout the process. The Meadowbrook Road landscaped corridor was further improved by a large woodland buffer preservation area on the north property line. We have also added a creative woodland restoration area in the center of the residential component. We have located the placement of the trees to create a contiguous wooded corridor the entire length of Meadowbrook with extensive planting of trees in the trailhead park on the corner of 12 Mile Road that we are donating to the City.

Tollgate and MSU suggested that some of the proposed trees be larger particularly along Meadowbrook Road. It was also suggested that larger evergreen trees will provide a more varied and natural looking buffer between the proposed residential (Meadows) and the commercial (Shoppes). A total of 604 replacement trees and 681 replacement shrubs are proposed to satisfy 100% of the required replacement credits. It's important to note that only 102 trees (approximately 21%) will be upsized. As proposed by Tollgate and endorsed by City staff, all of the upsized trees will be evergreens, which will provide maximum impact.

In order to achieve the desired contiguous, natural landscape, the following deviations are requested:

- 1) Credit for upsizing 102 Woodland Replacement Trees.
- 2) Locate street trees in clusters both in and adjacent to the Meadowbrook Road right-of-way.
- 3) Locate replacement trees and shrubs, Meadow Brook Road street trees and greenbelt plantings within the Meadowbrook Road right-of-way.

I would like to thank you, your staff, and consultants for working with us collaboratively to achieve what is an exemplary design that will flow seamlessly into the 5 acre open space park and the Beacon Hill Trailhead on the corner.

Sincerely,



Gary Shapiro

Attachments: Beacon Hill Landscape overview from Roy Prentice, Tollgate Education Center
Letter of Collaboration from Gary Rentrop, Americana Foundation/Tollgate Farms
Copy of email regarding Native Plants

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March 18, 2016

Beacon Hill Landscape

Objective: Create a more naturalistic look with enhanced and strategic plant density and more integrated plantings. In general, planting heights should mimic a woods edge: low shrubs toward the road blending to intermediate sized deciduous and evergreens blending to taller tree species near the development.

Procedure:

Buffer along Meadowbrook Road of 90' to 140' gives a great opportunity to create a visual break for residents of the development between Meadowbrook and their homes. This buffer also will promote the "Natural Beauty" aspects of Meadowbrook. Below are ways to take full advantage of the opportunities offered by this buffer.

- Street trees along Meadowbrook: Make more naturalistic by placing at a random distance from Meadowbrook (either side of the sidewalk) and mixing species.

Shapiro and Pascual indicated that the planting of the trees along Meadowbrook as pictured on the landscape plan was performed by the City with funds provided by the developer. Shapiro and Pascual said that it may be possible to work with the City to alter the plan if the City understands that the intent of the new landscape plan is to create a more naturalistic appearance.

- Use evergreens near the homes in the development as a screen from the road. This practice will also give homeowners a greater sense of seclusion. Smaller hardwoods like serviceberry, redbud, alternate leaf dogwood and Ostrya can be mixed into and toward the road from the evergreens. Shrubs and other low plants (viburnums, witch hazel- Arnold Promise and Jelena, physocarpus – green varieties if planting in natural area) can be placed

closer to the road. Each group of plants of similar height blended into the next plant height group. Avoid obvious lines of similar species.

The landscaper, Pascual, indicated that he understood the concept of what we would like to achieve and that he would work on this.

- What happens in Pocket Park on Meadowbrook Road (located on the north end of the development)? Does this area remain an unmanaged wetland, or are shrubs and other plantings added? Will there be efforts to control Phragmites?

Activities in controlled wetlands (as designated by the City of Novi) may not be possible. Will attempt to control Phragmites and other invasive species in this area.

- It looks like new plantings are to be placed in an existing woodlot at north end of development. If this is true, these new plantings will have a low chance of outcompeting existing vegetation.

Indicated that they would be willing to make use of current woodlot by only selectively removing trees where necessary to promote the growth of new plantings. Willing to relocate plantings on the plan to take advantage of cover provided by existing woodlot. Indicated that he would still keep the same number of trees along the road even if their location was changed.

- Will there be any grading/excavation work done along Meadowbrook Road in the planting zone? There should be a fairly decent top soil layer in this area unless disturbed and reduced during construction.

Civil Engineer, Andrew Wozniak indicated that there would be a significant amount of soil grading and redistribution south of the wetland "Pocket Park." Wozniak indicated that after grading a minimum of 4" of top soil would be returned to all areas. After I indicated that 4" was marginal depth of top soil for trees and shrubs, Shapiro indicated that there was always a lot of top soil on job sites and they would make sure that depth was adequate.

- Review tree and shrub planting guidelines. Soil surface should overlap planted root ball. If planting material established as indicated in guidelines, moisture will naturally flow to the area around root ball. Water may not enter root ball readily due to difference in texture between the newly planted stock and the soil on the planting site. This could easily lead to insufficient moisture entering the root ball death of planting stock.

This was a point that Bob Schutzki brought up after looking at the planting specifications on the landscape plan. Pascual indicated that he would alter the planting specifications to accommodate the new planting guidelines outlined by Dr. Schutzki.

I appreciate the responsiveness of Ivanhoe Developments on this project. I am happy to provide further assistance on the landscape design along Meadowbrook Road. I am sure that one of the attractions for potential residents of the Beacon Hill property is the unique “rural feel” of Meadowbrook road and the proximity of the 160 acre Tollgate Farm and Education Center. With a few strategic changes to the landscape plan, I believe that the Beacon Hill Development can successfully blend with the existing look of Meadowbrook Road.

Roy Prentice
MSU Tollgate Farm Manager

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February 22, 2016

Gary Shapiro
Ivanhoe Meadowbrook, LLC
6689 Orchard Lake Road, Suite 314
Farmington Hills, MI 48322

Re: Proposed Beacon Hill Park Development NE Comer - Twelve Mile and Meadowbrook Roads.

Dear Gary:

I am writing to outline conditions which, if satisfied, would result in Americana Foundation (AF) and Michigan State University (MSU) not opposing a PRO approval for Beacon Hill Park development as outlined for us in your February 11, 2016 letter to me and your site plan drawings dated January 4, 2016 provided to the AF and MSU representatives by you at our meeting with you on February 18, 2016.

1. Meadowbrook Landscape: We appreciate your revisions to provide a deeper greenbelt buffer with an average depth in excess of 100 feet as illustrated and referenced in your site plan drawing and letter. The landscaping plan, however, is too "parklike" with trees neatly in a row. We would like to see a landscape plan in the buffer area which is more rural in character using native plant and tree species. We would like to have the opportunity to have input directly with your landscape architect for the purpose of developing a revised landscape plan for this area. Insofar as possible the plan should include trees of height and density to screen the view of homes to be built in your development from Meadowbrook Road and from the farm. MSU will make available land on its property across from the area proposed for homes to be constructed for plantings which will contribute to this screening. We would like you to consider the planting of evergreen trees instead of all deciduous trees to provide screening in the winter months. We recognize much of the plantings proposed in your plans are required to meet the requirements of the city's ordinance. We will work with you and the city to obtain a variance from the city's requirements in order to achieve an approved rural landscaping plan.

2. Construction: If it is possible, access to the property for construction should be off of 12 Mile Road. If it is not possible due to the requirement of wetlands crossing, best efforts shall be made by you, your contractors and employees to minimize construction traffic and adverse conditions due to construction traffic on Meadowbrook Road. Specific details of what best effort steps will entail needs to be provided by you.

3. The Beacon Hill Park property must obtain Planned Rezoning Overlay (PRO) from the City of Novi.

I look forward to continue to work with you toward resolution.

Sincerely,
Gary



Gary Shapiro

From: Felino Pascual <felino@fpa.design>
Sent: Tuesday, April 12, 2016 8:59 AM
To: Gary Shapiro; Andy Wozniak
Subject: Fwd: native plants

----- Forwarded message -----

From: **Prentice, Roy** <prentic1@anr.msu.edu>
Date: Tue, Apr 12, 2016 at 8:02 AM
Subject: native plants
To: "felino@fpa.design" <felino@fpa.design>

Hi Joel,

At our last meeting you asked for recommendations for native plants that would do well in our area. Sorry to be so tardy getting these to you. Below are some good selections. Although I love the look of the native viburnums, I would not feel good about recommending them to you at this time. There is a viburnum leaf beetle that has started to show up in SE Michigan plantings. It can be pretty devastating to the foliage of viburnums. A good site to see an overview of native plants is maintained by the City of Ann Arbor: <http://www.a2gov.org/departments/Parks-Recreation/NAP/Native-Plants/Pages/NativeShrubs.aspx>

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|----------------------------------|--|
| <i>Amelanchier laevis</i> | Serviceberry |
| <i>Cephalanthus occidentalis</i> | Common buttonbush |
| <i>Cornus alternifolia</i> | Alternate-leafed Dogwood |
| <i>Cornus sericea</i> | Red osier dogwood, Red-twig dogwood |
| <i>Corylus americana</i> | American hazelnut |
| <i>Dasiphora fruticosa</i> | Shrubby cinquefoil |
| <i>Hamamelis virginiana</i> | American witch hazel |

The witch hazels are great for fall flowering. Arnold Promise and Jelena are good varieties.

| | |
|-----------------------------|------------------------------------|
| <i>Ilex verticillata</i> | Winterberry, Michigan holly |
| <i>Photinia melanocarpa</i> | Black chokeberry |

| | |
|---|---------------------|
| <i>Physocarpus opulifolius</i> | Common Ninebark |
| <i>Sambucus racemosa</i> var. <i>racemose</i> | Red elderberry |
| <i>Sambucus nigra</i> | Common elderberry |
| <i>Staphylea trifolia</i> | American bladdernut |

Roy Prentice

MSU Tollgate Farm Manager

28115 Meadowbrook Rd.

Novi, MI 48377

[248 330 3623](tel:2483303623)

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Felino A. Pascual (Joel), RLA, CLARB
Principal

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Land Planners & Landscape Architects

24333 Orchard Lake Road, Suite G

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Z EIMET W OZNIAK
& ASSOCIATES

Civil Engineers & Land Surveyors

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www.zeimetwozniak.com

April 8, 2016

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

RE: Beacon Hill Park rezoning with a PRO, JSP15-0008
Response to Wetland Review

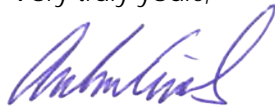
Dear Ms. McBeth:

We would like to thank ECT for the recommendation to approve the revised plan for wetlands.

We have reviewed the ECT report dated March 21, 2016 and will address the comments on the Final Site Plan submittal as requested.

Should you need any additional information please don't hesitate to contact us.

Very truly yours,



Andrew J. Wozniak

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April 8, 2016

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

RE: Beacon Hill Park rezoning with a PRO, JSP15-0008
Response to Traffic Review

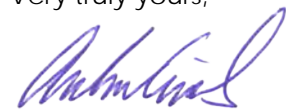
Dear Ms. McBeth:

We would like to thank AECOM for the recommendation to approve the revised plan for traffic.

We have reviewed the AECOM report dated March 18, 2016 and will address the comments to the satisfaction of the City on subsequent submittals, as requested.

Should you need any additional information please don't hesitate to contact us.

Very truly yours,



Andrew J. Wozniak

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April 20, 2016

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

RE: Beacon Hill Park PRO
Response to Fire Department Review

Dear Ms. McBeth,

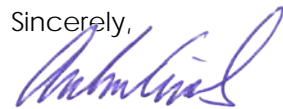
We would like to thank the Fire Department for their recommendation for approval of the revised site plan.

We have reviewed their letter dated April 15, 2016 and will meet the specifications for the required secondary access and break away gate.

Should you need any additional information please don't hesitate to contact us.

Thank you.

Sincerely,



Andrew Wozniak